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01 - 5.1 Psychiatric Interview, History, and Menta

5.1 Psychiatric Interview, History, and Mental Status Examination

Examination and Diagnosis of the Psychiatric Patient 5.1 Psychiatric Interview, History, and Mental Status Examination The psychiatric interview is the most important element in the evaluation and care of persons with mental illness. A major purpose of the initial psychiatric interview is to obtain information that will establish a criteria-based diagnosis. This process, helpful in the prediction of the course of the illness and the prognosis, leads to treatment decisions. A well-conducted psychiatric interview results in a multidimensional understanding of the biopsychosocial elements of the disorder and provides the information necessary for the psychiatrist, in collaboration with the patient, to develop a person-centered treatment plan. Equally important, the interview itself is often an essential part of the treatment process. From the very first moments of the encounter, the interview shapes the nature of the patient–physician relationship, which can have a profound influence on the outcome of treatment. The settings in which the psychiatric interview takes place include psychiatric inpatient units, medical nonpsychiatric inpatient units, emergency rooms, outpatient offices, nursing homes, other residential programs, and correctional facilities. The length of time for the interview, and its focus, will vary depending on the setting, the specific purpose of interview, and other factors (including concurrent competing demands for professional services). Nevertheless, there are basic principles and techniques that are important for all psychiatric interviews, and these will be the focus of this section. There are special issues in the evaluation of children that will not be addressed. This section focuses on the psychiatric interview of adult patients. GENERAL PRINCIPLES Agreement as to Process At the beginning of the interview the psychiatrist should introduce himself or herself and, depending on the circumstances, may need to identify why he or she is speaking with the patient. Unless implicit (the patient coming to the office), consent to proceed with the interview should be obtained and the nature of the interaction

and the approximate (or specific) amount of time for the interview should be stated. The patient

should be encouraged to identify any elements of the process that he or she wishes to alter or add. A crucial issue is whether the patient is, directly or indirectly, seeking the evaluation on a voluntary basis or has been brought involuntarily for the assessment. This should be established before the interview begins, and this information will guide the interviewer especially in the early stages of the process. Privacy and Confidentiality Issues concerning confidentiality are crucial in the evaluation/treatment process and may need to be discussed on multiple occasions. Health Insurance Portability and Accountability Act (HIPAA) regulations must be carefully followed, and the appropriate paperwork must be presented to the patient. Confidentiality is an essential component of the patient–doctor relationship. The interviewer should make every attempt to ensure that the content of the interview cannot be overheard by others. Sometimes, in a hospital unit or other institutional setting, this may be difficult. If the patient is sharing a room with others, an attempt should be made to use a different room for the interview. If this is not feasible, the interviewer may need to avoid certain topics or indicate that these issues can be discussed later when privacy can be ensured. Generally, at the beginning, the interviewer should indicate that the content of the session(s) will remain confidential except for what needs to be shared with the referring physician or treatment team. Some evaluations, including forensic and disability evaluations, are less confidential and what is discussed may be shared with others. In those cases, the interviewer should be explicit in stating that the session is not confidential and identify who will receive a report of the evaluation. This information should be carefully and fully documented in the patient's record. A special issue concerning confidentiality is when the patient indicates that he or she intends to harm another person. When the psychiatrist's evaluation suggests that this might indeed happen, the psychiatrist may have a legal obligation to warn the potential victim. (The law concerning notification of a potential victim varies by state.) Psychiatrists should also consider their ethical obligations. Part of this obligation may be met by appropriate clinical measures such as increasing the dose of antipsychotic medication or hospitalizing the patient. Often members of the patient's family, including spouse, adult children, or parents, come with the patient to the first session or are present in the hospital or other institutional setting when the psychiatrist first sees the patient. If a family member wishes to talk to the psychiatrist, it is generally preferable to meet with the family member(s) and the patient together at the conclusion of the session and after the patient's consent has been obtained. The psychiatrist should not bring up material the patient has shared but listen to the input from family members and discuss items that the patient introduces during the joint session. Occasionally, when family members have not asked to be seen, the psychiatrist may feel that including a family member or

caregiver might be helpful and raise this subject with the patient. This may be the case when the patient is not able to communicate effectively. As always, the patient must give consent except if the psychiatrist determines that the patient is a danger to himself or herself or others. Sometimes family members might telephone the psychiatrist. Except in an emergency, consent should be obtained from the patient before the psychiatrist speaks to the relative. As indicated above, the psychiatrist should not bring up material that the patient has shared but listen to the input from the family member. The patient should be told when a family member has contacted the psychiatrist even if the patient has given consent for this to occur. In educational and, occasionally, forensic settings, there may be occasions when the session is recorded. The patient must be fully informed about the recording and how the recording will be used. The length of time the recording

will be kept and how access to it will be restricted must be discussed. Occasionally in educational settings, one-way mirrors may be used as a tool to allow trainees to benefit from the observation of an interview. The patient should be informed of the use of the one-way mirror and the category of the observers and be reassured that the observers are also bound by the rules of confidentiality. The patient's consent for proceeding with the recording or use of the one-way mirror must be obtained, and it should be made clear that the patient's receiving care will not be determined by whether he or she agrees to its use. These devices will have an impact on the interview that the psychiatrist should be open to discussing as the session unfolds. Respect and Consideration As should happen in all clinical settings, the patient must be treated with respect, and the interviewer should be considerate of the circumstances of the patient's condition. The patient is often experiencing considerable pain or other distress and frequently is feeling vulnerable and uncertain of what may happen. Because of the stigma of mental illness and misconceptions about psychiatry, the patient may be especially concerned, or even frightened, about seeing a psychiatrist. The skilled psychiatrist is aware of these potential issues and interacts in a manner to decrease, or at least not increase, the distress. The success of the initial interview will often depend on the physician's ability to allay excessive anxiety. Rapport/Empathy Respect for and consideration of the patient will contribute to the development of rapport. In the clinical setting, rapport can be defined as the harmonious responsiveness of the physician to the patient and the patient to the physician. It is important that patients increasingly feel that the evaluation is a joint effort and that the psychiatrist is truly interested in their story. Empathic interventions ("That must have been very difficult for you" or "I'm beginning to understand how awful that felt") further increase the rapport. Frequently a nonverbal response (raised eyebrows or leaning toward the patient) or a very brief response ("Wow") will be similarly effective. Empathy is understanding what

the patient is thinking and feeling and it occurs when the psychiatrist is able to put himself or herself in the patient's place while at the same time maintaining objectivity. For the psychiatrist to truly understand what the patient is thinking and feeling requires an appreciation of many issues in the patient's life. As the interview progresses, the patient's story unfolds and patterns of behaviors become evident, and it becomes clearer what the patient may actually have experienced. Early in the interview, the psychiatrist may not be as fully confident of where the patient is or was (although the patient's nonverbal cues can be very helpful). If the psychiatrist is uncertain about the patient's experience, it is often best not to guess but to encourage the patient to continue. Head nodding, putting down one's pen, leaning toward the patient, or a brief comment, "I see," can accomplish this objective and simultaneously indicate that this is important material. In fact the large majority of empathic responses in an interview are nonverbal. An essential ingredient in empathy is retaining objectivity. Maintaining objectivity is crucial in a therapeutic relationship and it differentiates empathy from identification. With identification, psychiatrists not only understand the emotion but also experience it to the extent that they lose the ability to be objective. This blurring of boundaries between the patient and psychiatrist can be confusing and distressing to many patients, especially to those who as part of their illness already have significant boundary problems (e.g., individuals with borderline personality disorder). Identification can also be draining to the psychiatrist and lead to disengagement and ultimately burnout. Patient–Physician Relationship The patient–physician relationship is the core of the practice of medicine. (For many years the term used was "physician–patient" or "doctor–patient," but the order is sometimes reversed to reinforce that the treatment should always be patient centered.) Although the relationship between any one patient and physician will vary depending on each of their

personalities and past experiences as well as the setting and purpose of the encounter, there are general principles that, when followed, help to ensure that the relationship established is helpful. The patient comes to the interview seeking help. Even in those instances when the patient comes on the insistence of others (i.e., spouse, family, courts), help may be sought by the patient in dealing with the person requesting or requiring the evaluation or treatment. This desire for help motivates the patient to share with a stranger information and feelings that are distressing, personal, and often private. The patient is willing, to various degrees, to do so because of a belief that the doctor has the expertise, by virtue of training and experience, to be of help. Right from the very first encounter (sometimes the initial phone call), the patient's willingness to share is increased or decreased depending on the verbal and often the nonverbal interventions of the physician and other staff. As the physician's behaviors demonstrate respect and consideration, rapport begins to develop. This is increased as the patient feels safe and comfortable. If the patient feels secure that what is said in the interview remains

confidential, he or she will be more open to sharing. The sharing is reinforced by the nonjudgmental attitude and behavior of the physician. The patient may have been exposed to considerable negative responses, actual or feared, to their symptoms or behaviors, including criticism, disdain, belittlement, anger, or violence. Being able to share thoughts and feelings with a nonjudgmental listener is generally a positive experience. There are two additional essential ingredients in a helpful patient–physician relationship. One is the demonstration by physicians that they understand what the patient is stating and emoting. It is not enough that the physician understands what the patient is relating, thinking, and feeling; this understanding must be conveyed to the patient if it is to nurture the therapeutic relationship. The interview is not just an intellectual exercise to arrive at a supportable diagnosis. The other essential ingredient in a helpful patient–physician relationship is the recognition by the patient that the physician cares. As the patient becomes aware that the physician not only understand but also cares, trust increases and the therapeutic alliance becomes stronger. The patient–physician relationship is reinforced by the genuineness of the physician. Being able to laugh in response to a humorous comment, admit a mistake, or apologize for an error that inconvenienced the patient (e.g., being late for or missing an appointment) strengthens the therapeutic alliance. It is also important to be flexible in the interview and responsive to patient initiatives. If the patient brings in an item, for example, a photo that he or she wants to show the psychiatrist, it is good to look at it, ask questions, and thank the patient for sharing it. Much can be learned about the family history and dynamics from such a seemingly sidebar moment. In addition, the therapeutic alliance is strengthened. The psychiatrist should be mindful of the reality that there are no irrelevant moments in the interview room. At times patients will ask questions about the psychiatrist. A good rule of thumb is that questions about the physician's qualifications and position should generally be answered directly (e.g., board certification, hospital privileges). On occasion, such a question might actually be a sarcastic comment ("Did you really go to medical school?"). In this case it would be better to address the issue that provoked the comment rather than respond concretely. There is no easy answer to the question of how the psychiatrist should respond to personal questions ("Are you married?," "Do you have children?," "Do you watch football?"). Advice on how to respond will vary depending on several issues, including the type of psychotherapy being used or considered, the context in which the question is asked, and the wishes of the psychiatrist. Often, especially if the patient is being, or might be, seen for insight-oriented psychotherapy, it is useful to explore why the question is being asked. The question about children may be precipitated by the patient wondering if the psychiatrist

has had personal experience in raising children, or more generally does the psychiatrist have the skills and experience necessary to meet the patient's needs. In this instance, part of the psychiatrist's response may be that he or she has had considerable experiences in helping people deal with issues of parenting. For patients being seen for supportive psychotherapy or medication management, answering the question, especially if it is not very personal, such as "Do you watch

football?," is quite appropriate. A major reason for not answering personal questions directly is that the interview may become psychiatrist centered rather than patient centered. Occasionally, again depending on the nature of the treatment, it can be helpful for the psychiatrist to share some personal information even if it is not asked directly by the patient. The purpose of the self-revelation should always be to strengthen the therapeutic alliance to be helpful to the patient. Personal information should not be shared to meet the psychiatrist's needs. Conscious/Unconscious In order to understand more fully the patient–physician relationship, unconscious processes must be considered. The reality is that the majority of mental activity remains outside of conscious awareness. In the interview, unconscious processes may be suggested by tangential references to an issue, slips of the tongue or mannerisms of speech, what is not said or avoided, and other defense mechanisms. For example, phrases such as "to tell you the truth" or "to speak frankly" suggest that the speaker does not usually tell the truth or speak frankly. In the initial interview it is best to note such mannerisms or slips but not to explore them. It may or may not be helpful to pursue them in subsequent sessions. In the interview, transference and countertransference are very significant expressions of unconscious processes. Transference is the process of the patient unconsciously and inappropriately displacing onto individuals in his or her current life those patterns of behavior and emotional reactions that originated with significant figures from earlier in life, often childhood. In the clinical situation the displacement is onto the psychiatrist, who is often an authority figure or a parent surrogate. It is important that the psychiatrist recognizes that the transference may be driving the behaviors of the patient, and the interactions with the psychiatrist may be based on distortions that have their origins much earlier in life. The patient may be angry, hostile, demanding, or obsequious not because of the reality of the relationship with the psychiatrist but because of former relationships and patterns of behaviors. Failure to recognize this process can lead to the psychiatrist inappropriately reacting to the patient's behavior as if it were a personal attack on the psychiatrist. Similarly, countertransference is the process where the physician unconsciously displaces onto the patient patterns of behaviors or emotional reactions as if he or she were a significant figure from earlier in the physician's life. Psychiatrists should be alert to signs of countertransference issues (missed appointment by the psychiatrist, boredom, or sleepiness in a session). Supervision or consultations can be helpful as can personal therapy in helping the psychiatrist recognize and deal with these issues. Although the patient comes for help, there may be forces that impede the movement to health. Resistances are the processes, conscious or unconscious, that interfere with the therapeutic objectives of treatment. The patient is generally unaware of the impact of these feelings, thinking, or behaviors, which take many different forms including exaggerated emotional responses, intellectualization, generalization, missed

appointments, or acting out behaviors. Resistance may be fueled by repression, which is an unconscious process that keeps issues or feelings out of awareness. Because of repression, patients may not be aware of the conflicts that may be central to their illness. In insight-oriented psychotherapy, interpretations are interventions that undo the process of repression and allow the

unconscious thoughts and feelings to come to awareness so that they can be dealt with. As a result of these interventions, the primary gain of the symptom, the unconscious purpose that it serves, may become clear. In the initial session, interpretations are generally avoided. The psychiatrist should make note of potential areas for exploration in subsequent sessions. Person-Centered and Disorder-Based Interviews A psychiatric interview should be person (patient) centered. That is, the focus should be on understanding the patient and enabling the patient to tell his or her story. The individuality of the patient's experience is a central theme, and the patient's life history is elicited, subject to the constraints of time, the patient's willingness to share some of this material, and the skill of the interviewer. Adolf Meyer's "life-charts" were graphic representations of the material collected in this endeavor and were a core component of the "psychobiological" understanding of illness. The patient's early life experiences, family, education, occupation(s), religious beliefs and practices, hobbies, talents, relationships, and losses are some of the areas that, in concert with genetic and biological variables, contribute to the development of the personality. An appreciation of these experiences and their impact on the person is necessary in forming an understanding of the patient. It is not only the history that should be person centered. It is especially important that the resulting treatment plan be based on the patient's goals, not the psychiatrist's. Numerous studies have demonstrated that often the patient's goals for treatment (e.g., safe housing) are not the same as the psychiatrist's (e.g., decrease in hallucinations). This dichotomy can often be traced to the interview where the focus was not sufficiently person centered but rather was exclusively or largely symptom based. Even when the interviewer specifically asks about the patient's goals and aspirations, the patient, having been exposed on numerous occasions to what a professional is interested in hearing about, may attempt to focus on "acceptable" or "expected" goals rather than his or her own goals. The patient should be explicitly encouraged to identify his or her goals and aspirations in his or her own words. Traditionally, medicine has focused on illness and deficits rather than strengths and assets. A person-centered approach focuses on strengths and assets as well as deficits. During the assessment, it is often helpful to ask the patient, "Tell me about some of the things you do best," or, "What do you consider your greatest asset?" A more open-ended question, such as, "Tell me about yourself," may elicit information that focuses more on either strengths or deficits depending on a number of factors including the patient's mood and self-image. Safety and Comfort

Both the patient and the interviewer must feel safe. This includes physical safety. On occasion, especially in hospital or emergency room settings, this may require that other staff be present or that the door to the room where the interview is conducted be left ajar. In emergency room settings, it is generally advisable for the interviewer to have a clear, unencumbered exit path. Patients, especially if psychotic or confused, may feel threatened and need to be reassured that they are safe and the staff will do everything possible to ensure their safety. Sometimes it is useful to explicitly state, and sometimes demonstrate, that there are sufficient staff to prevent a situation from spiraling out of control. For some, often psychotic patients who are fearful of losing control, this can be reassuring. The interview may need to be shortened or quickly terminated if the patient becomes more agitated and threatening. Once issues of safety have been assessed (and for many outpatients this may be accomplished within a few seconds), the interviewer should inquire about the patient's comfort and continue to be alert to the patient's comfort throughout the interview. A direct question may be helpful in not only making the patient feel more comfortable but also in enhancing the patient–doctor relationship. This might include, "Are you warm enough?" or "Is that chair comfortable for you?" As the interview progresses, if the patient desires tissues or water it

should be provided. Time and Number of Sessions For an initial interview, 45 to 90 minutes is generally allotted. For inpatients on a medical unit or at times for patients who are confused, in considerable distress, or psychotic, the length of time that can be tolerated in one sitting may be 20 to 30 minutes or less. In those instances, a number of brief sessions may be necessary. Even for patients who can tolerate longer sessions, more than one session may be necessary to complete an evaluation. The clinician must accept the reality that the history obtained is never complete or fully accurate. An interview is dynamic and some aspects of the evaluation are ongoing, such as how a patient responds to exploration and consideration of new material that emerges. If the patient is coming for treatment, as the initial interview progresses, the psychiatrist makes decisions about what can be continued in subsequent sessions. PROCESS OF THE INTERVIEW Before the Interview For outpatients, the first contact with the psychiatrist office is often a telephone call. It is important that whomever is receiving the call understands how to respond if the patient is acutely distressed, confused, or expresses suicidal or homicidal intent. If the receiver of the call is not a mental health professional, the call should be transferred to the psychiatrist or other mental health professional, if available. If not available, the caller should be directed to a psychiatric emergency center or an emergency hotline. The receiver of the call should obtain the name and phone number of the caller and offer to initiate the call to the hotline if that is preferred by the caller.

Most calls are not of such an urgent nature. The receptionist (or whomever receives the call) should obtain the information that setting has deemed relevant for the first contact. Although the requested information varies considerably, it generally includes the name, age, address and telephone number(s) of the patient, who referred the patient, the reason for the referral, and insurance information. The patient is given relevant information about the office including length of time for the initial session, fees, and whom to call if there are additional questions. In many practices the psychiatrist will call the patient to discuss the reason for the appointment and to determine if indeed an appointment appears warranted. The timing of the appointment should reflect the apparent urgency of the problem. Asking the patient to bring information about past psychiatric and medical treatments as well as a list of medications (or preferably the medications themselves) can be very helpful. Frequently a patient is referred to the psychiatrist or a psychiatric facility. If possible, reviewing records that precede the patient can be quite helpful. Some psychiatrists prefer not to read records prior to the initial interview so that their initial view of the patient’s problems will not be unduly influenced by prior evaluations. Whether or not records are reviewed, it is important that the reason for the referral be understood as clearly as possible. This is especially important for forensic evaluations where the reason for the referral and the question(s) posed will help to shape the evaluation. Often, especially in the outpatient setting, a patient is referred to the psychiatrist by a primary care physician or other health care provider. Although not always feasible, communicating with the referring professional prior to the evaluation can be very helpful. It is critical to determine whether the patient is referred for only an evaluation with the ongoing treatment to be provided by the primary care physician or mental health provider (e.g., social worker) or if the patient is being referred for evaluation and treatment by the psychiatrist. If the patient is referred by the court, a lawyer, or some other non–treatment-oriented agency such as an insurance company, the goals of the interview may be different from diagnosis and treatment recommendations. These goals can include determination of disability, questions of competence or capacity, or determining, if possible, the cause or contributors of the psychiatric illness. In these special circumstances, the patient and clinician are not entering a treatment

relationship, and often the usual rules of confidentiality do not apply. This limited confidentiality must be explicitly established with the patient and must include a discussion of who will be receiving the information gathered during the interview. The Waiting Room When the patient arrives for the initial appointment, he or she is often given forms to complete. These generally include demographic and insurance information. In addition, the patient receives information about the practice (including contact information for evenings and weekends) and HIPAA-mandated information that must be read and signed. Many practices also ask for a list of medications, the name and address of the

primary care physician, and identification of major medical problems and allergies. Sometimes the patient is asked what his or her major reason is for coming to the office. Increasingly, some psychiatrists ask the patient to fill out a questionnaire or a rating scale that identifies major symptoms. Such scales include the Patient Health Questionnaire 9 (PHQ-9) or the Quick Inventory of Depression Symptomatology Self Report (QIDS-SR), which are scales of depressive symptoms based on the Diagnostic and Statistical Manual of Mental Diseases (DSM). The Interview Room The interview room itself should be relatively soundproof. The decor should be pleasant and not distracting. If feasible, it is a good idea to give the patient the choice of a soft chair or a hard-back chair. Sometimes the choice of the chair or how the chair is chosen can reveal characteristics of the patient. Many psychiatrists suggest that the interviewer’s chair and the patient’s chair be of relatively equal height so that the interviewer does not tower over the patient (or vice versa). It is generally agreed that the patient and the psychiatrist should be seated approximately 4 to 6 feet apart. The psychiatrist should not be seated behind a desk. The psychiatrist should dress professionally and be well groomed. Distractions should be kept to a minimum. Unless there is an urgent matter, there should be no telephone or beeper interruptions during the interview. The patient should feel that the time has been set aside just for him or her and that for this designated time he or she is the exclusive focus of the psychiatrist’s attention. Initiation of the Interview The patient is greeted in the waiting room by the psychiatrist who, with a friendly face, introduces himself or herself, extends a hand, and, if the patient reciprocates, gives a firm handshake. If the patient does not extend his or her hand, it is probably best not to comment at that point but warmly indicate the way to the interview room. The refusal to shake hands is probably an important issue, and the psychiatrist can keep this in mind for a potential inquiry if it is not brought up subsequently by the patient. Upon entering the interview room, if the patient has a coat, the psychiatrist can offer to take the coat and hang it up. The psychiatrist then indicates where the patient can sit. A brief pause can be helpful as there may be something the patient wants to say immediately. If not, the psychiatrist can inquire if the patient prefers to be called Mr. Smith, Thomas, or Tom. If this question is not asked, it is best to use the last name as some patients will find it presumptive to be called by their first name especially if the interviewer is many years younger. These first few minutes of the encounter, even before the formal interview begins, can be crucial to the success of the interview and the development of a helpful patient–doctor relationship. The patient, who is often anxious, forms an initial impression of the psychiatrist and begins to make decisions as to how much can be shared with this doctor. Psychiatrists can convey interest and support by exhibiting a warm, friendly face and other nonverbal communications such as leaning forward in

their chair. It is generally useful for the psychiatrist to indicate how much time is available for the interview. The patient may have some questions about what will happen during this time,

confidentiality, and other issues, and these questions should be answered directly by the psychiatrist. The psychiatrist can then continue with an openended inquiry, “Why don’t we start by you telling me what has led to your being here,” or simply, “What has led to your being here?” Often the response to this question will establish whether or not the patient has been referred. When a referral has been made, it is important to elicit from the patient his or her understanding of why he or she has been referred. Not uncommonly, the patient may be uncertain as to why he or she has been referred or may even feel angry at the referrer, often a primary care physician. Open-Ended Questions As the patient responds to these initial questions, it is very important that the psychiatrist interacts in a manner that allows the patient to tell his or her story. This is the primary goal of the data collection part of the interview, to elicit the patient’s story of his or her health and illness. In order to accomplish this objective, open-ended questions are a necessity. Open-ended questions identify an area but provide minimal structure as to how to respond. A typical open-ended question is, “Tell me about your pain.” This is in contrast to closed-ended questions that provide much structure and narrow the field from which a response may be chosen. “Is your pain sharp?” The ultimate closed-ended question leads to a “yes” or “no” answer. In the initial portion of the interview questions should be primarily open ended. As the patient responds, the psychiatrist reinforces the patient continuing by nodding or other supportive interventions. As the patient continues to share his or her story about an aspect of his or her health or illness, the psychiatrist may ask some increasingly closed-ended questions to understand some of the specifics of the history. Then, when that area is understood, the psychiatrist may make a transition to another area again using open-ended questions and eventually closed-ended questions until that area is well described. Hence, the interview should not be a single funnel of open-ended questions in the beginning and closed-ended questions at the end of the interview but rather a series of funnels, each of which begins with open-ended questions. ELEMENTS OF THE INITIAL PSYCHIATRIC INTERVIEW The interview is now well launched into the present illness. Table 5.1-1 lists the sections or parts of the initial psychiatric interview. Although not necessarily obtained during the interview in exactly this order, these are the categories that conventionally have been used to organize and record the elements of the evaluation. Table 5.1-1 Parts of the Initial Psychiatric Interview

The two overarching elements of the psychiatric interview are the patient history and the mental status examination. The patient history is based on the subjective report of the patient and in some cases the report of collaterals including other health care providers, family, and other caregivers. The mental status examination, on the other hand, is the interviewer’s objective tool similar to the physical examination in other areas of medicine. The physical examination, although not part of the interview itself, is included because of its potential relevance in the psychiatric diagnosis and also because it usually is included as part of the psychiatric evaluation especially in the inpatient setting. (In addition, much relevant information can be verbally obtained by the physician as parts of the physical examination are performed.) Similarly, the formulation, diagnosis, and treatment plan are included because they are products of the interview and also influence the course of the interview in a dynamic fashion as the interview moves back and forth pursuing, for example, whether certain diagnostic criteria are met or whether potential elements of the treatment plan are realistic. Details of the psychiatric interview are discussed below. I. Identifying Data This section is brief, one or two sentences, and typically includes the patient’s name, age, sex, marital status (or significant other relationship), race or ethnicity, and occupation. Often the referral source is also included. II. Source and Reliability It is important to clarify where the information has come from, especially if others have provided information or records reviewed, and the interviewer’s

assessment of how reliable the data are. III. Chief Complaint This should be the patient's presenting complaint, ideally in his or her own words. Examples include, "I'm depressed" or "I have a lot of anxiety."

A 64-year-old man presented in a psychiatric emergency room with a chief complaint, "I'm melting away like a snowball." He had become increasingly depressed over 3 months. Four weeks before the emergency room visit, he had seen his primary care physician who had increased his antidepressant medication (imipramine) from 25 to 75 mg and also added hydrochlorothiazide (50 mg) because of mild hypertension and slight pedal edema. Over the ensuing 4 weeks, the patient's condition deteriorated. In the emergency room he was noted to have depressed mood, hopelessness, weakness, significant weight loss, and psychomotor retardation and was described as appearing "depleted." He also appeared dehydrated, and blood work indicated he was hypokalemic. Examination of his medication revealed that the medication bottles had been mislabeled; he was taking 25 mg of imipramine (generally a nontherapeutic dose) and 150 mg of hydrochlorothiazide. He was indeed, "melting away like a snowball." Fluid and potassium replacement and a therapeutic dose of an antidepressant resulted in significant improvement. IV. History of Present Illness The present illness is a chronological description of the evolution of the symptoms of the current episode. In addition, the account should also include any other changes that have occurred during this same time period in the patient's interests, interpersonal relationships, behaviors, personal habits, and physical health. As noted above, the patient may provide much of the essential information for this section in response to an open-ended question such as, "Can you tell me in your own words what brings you here today?" Other times the clinician may have to lead the patient through parts of the presenting problem. Details that should be gathered include the length of time that the current symptoms have been present and whether there have been fluctuations in the nature or severity of those symptoms over time. ("I have been depressed for the past two weeks" vs. "I've had depression all my life"). The presence or absence of stressors should be established, and these may include situations at home, work, school, legal issues, medical comorbidities, and interpersonal difficulties. Also important are factors that alleviate or exacerbate symptoms such as medications, support, coping skills, or time of day. The essential questions to be answered in the history of the present illness include what (symptoms), how much (severity), how long, and associated factors. It is also important to identify why the patient is seeking help now and what are the "triggering" factors ("I'm here now because my girlfriend told me if I don't get help with this nervousness she is going to leave me."). Identifying the setting in which the illness began can be revealing and helpful in understanding the etiology of, or significant contributors to, the condition. If any treatment has been received for the current episode, it should be defined in terms of who saw the patient and how often, what was done (e.g., psychotherapy or medication), and the specifics of the modality used. Also, is that treatment continuing and, if not, why not? The psychiatrist should be alert for any hints of abuse by former therapists as this experience, unless addressed, can be a major

impediment to a healthy and helpful therapeutic alliance. Often it can be helpful to include a psychiatric review of systems in conjunction with the history of the present illness to help rule in or out psychiatric diagnoses with pertinent positives and negatives. This may help to identify whether there are comorbid disorders or disorders that are actually more bothersome to the patient but are not initially identified for a variety of reasons. This review can be split into four major categories of mood, anxiety, psychosis, and other (Table 5.1-2). The clinician will want to ensure that these areas

are covered in the comprehensive psychiatric interview. Table 5.1-2 Psychiatric Review of Systems V. Past Psychiatric History

In the past psychiatric history, the clinician should obtain information about all psychiatric illnesses and their course over the patient's lifetime, including symptoms and treatment. Because comorbidity is the rule rather than the exception, in addition to prior episodes of the same illness (e.g., past episodes of depression in an individual who has a major depressive disorder), the psychiatrist should also be alert for the signs and symptoms of other psychiatric disorders. Description of past symptoms should include when they occurred, how long they lasted, and the frequency and severity of episodes. Past treatment episodes should be reviewed in detail. These include outpatient treatment such as psychotherapy (individual, group, couple, or family), day treatment or partial hospitalization, inpatient treatment, including voluntary or involuntary and what precipitated the need for the higher level of care, support groups, or other forms of treatment such as vocational training. Medications and other modalities such as electroconvulsive therapy, light therapy, or alternative treatments should be carefully reviewed. One should explore what was tried (may have to offer lists of names to patients), how long and at what doses they were used (to establish adequacy of the trials), and why they were stopped. Important questions include what was the response to the medication or modality and whether there were side effects. It is also helpful to establish whether there was reasonable compliance with the recommended treatment. The psychiatrist should also inquire whether a diagnosis was made, what it was, and who made the diagnosis. Although a diagnosis made by another clinician should not be automatically accepted as valid, it is important information that can be used by the psychiatrist in forming his or her opinion. Special consideration should be given to establishing a lethality history that is important in the assessment of current risk. Past suicidal ideation, intent, plan, and attempts should be reviewed including the nature of attempts, perceived lethality of the attempts, save potential, suicide notes, giving away things, or other death preparations. Violence and homicidality history will include any violent actions or intent. Specific questions about domestic violence, legal complications, and outcome of the victim may be helpful in defining this history more clearly. History of nonsuicidal self-injurious behavior should also be covered including any history of cutting, burning, banging head, and biting oneself. The feelings, including relief of distress, that accompany or follow the behavior should also be explored as well as the degree to which the patient has gone to hide the evidence of these behaviors. VI. Substance Use, Abuse, and Addictions A careful review of substance use, abuse, and addictions is essential to the psychiatric interview. The clinician should keep in mind that this information may be difficult for the patient to discuss, and a nonjudgmental style will elicit more accurate information. If the patient seems reluctant to share such information specific questions may be helpful (e.g., "Have you ever used marijuana?" or "Do you typically drink alcohol every day?"). History of use should include which substances have been used, including alcohol, drugs, medications (prescribed or not prescribed to the patient), and routes of

use (oral, snorting, or intravenous). The frequency and amount of use should be determined, keeping in mind the tendency for patients to minimize or deny use that may be perceived as socially unacceptable. Also, there are many misconceptions about alcohol that can lead to erroneous data. The definition of alcohol may be misunderstood, for example, "No, I don't use alcohol," yet later in the same interview, "I drink a fair amount of beer." Also the amount of alcohol can be confused with the volume of the drink: "I'm not worried about my alcohol use. I mix my own drinks and I add a lot of water." in response to a follow-up question, "How much bourbon? Probably

three or four shots?” Tolerance, the need for increasing amounts of use, and any withdrawal symptoms should be established to help determine abuse versus dependence. Impact of use on social interactions, work, school, legal consequences, and driving while intoxicated (DWI) should be covered. Some psychiatrists use a brief standardized questionnaire, the CAGE or RAPS4, to identify alcohol abuse or dependence. CAGE includes four questions: Have you ever Cut down on your drinking? Have people Annoyed you by criticizing your drinking? Have you ever felt bad or Guilty about your drinking? Have you ever had a drink the first thing in the morning, as an Eye-opener, to steady your nerves or get rid of a hangover? The Rapid Alcohol Problem Screen 4 (RAPS4) also consists of four questions: Have you ever felt guilty after drinking (Remorse), could not remember things said or did after drinking (Amnesia), failed to do what was normally expected after drinking (Perform), or had a morning drink (Starter)? Any periods of sobriety should be noted including length of time and setting such as in jail, legally mandated, and so forth. A history of treatment episodes should be explored, including inpatient detoxification or rehabilitation, outpatient treatment, group therapy, or other settings including self-help groups, Alcoholics Anonymous (AA) or Narcotics Anonymous (NA), halfway houses, or group homes. Current substance abuse or dependence can have a significant impact on psychiatric symptoms and treatment course. The patient’s readiness for change should be determined including whether they are in the precontemplative, contemplative, or action phase. Referral to the appropriate treatment setting should be considered. Other important substances and addictions that should be covered in this section include tobacco and caffeine use, gambling, eating behaviors, and Internet use. Exploration of tobacco use is especially important because persons abusing substances are more likely to die as a result of tobacco use than because of the identified abused substance. Gambling history should include casino visits, horse racing, lottery and scratch cards, and sports betting. Addictive type eating may include binge eating disorder. Overeaters Anonymous (OA) and Gamblers Anonymous (GA) are 12-step programs, similar to AA, for patients with addictive eating behaviors and gambling addictions. VII. Past Medical History The past medical history includes an account of major medical illnesses and conditions as well as treatments, both past and present. Any past surgeries should be also

reviewed. It is important to understand the patient’s reaction to these illnesses and the coping skills employed. The past medical history is an important consideration when determining potential causes of mental illness as well as comorbid or confounding factors and may dictate potential treatment options or limitations. Medical illnesses can precipitate a psychiatric disorder (e.g., anxiety disorder in an individual recently diagnosed with cancer), mimic a psychiatric disorder (hyperthyroidism resembling an anxiety disorder), be precipitated by a psychiatric disorder or its treatment (metabolic syndrome in a patient on a second-generation antipsychotic medication), or influence the choice of treatment of a psychiatric disorder (renal disorder and the use of lithium carbonate). It is important to pay special attention to neurological issues including seizures, head injury, and pain disorder. Any known history of prenatal or birthing problems or issues with developmental milestones should be noted. In women, a reproductive and menstrual history is important as well as a careful assessment of potential for current or future pregnancy. (“How do you know you are not pregnant?” may be answered with “Because I have had my tubes tied” or “I just hope I’m not.”) A careful review of all current medications is very important. This should include all current psychiatric medications with attention to how long they have been used, compliance with schedules, effect of the medications, and any side effects. It is often helpful to be very specific in determining compliance and side effects including asking questions such as, “How

many days of the week are you able to actually take this medication?" or "Have you noticed any change in your sexual function since starting this medication?," as the patient may not spontaneously offer this information, which may be embarrassing or perceived to be treatment interfering. Nonpsychiatric medications, over-the-counter medications, sleep aids, herbal, and alternative medications should also be reviewed. These can all potentially have psychiatric implications including side effects or produce symptoms as well as potential medication interactions dictating treatment options. Optimally the patient should be asked to bring all medications currently being taken, prescribed or not, over-the-counter preparations, vitamins, and herbs to the interview. Allergies to medications must be covered, including which medication and the nature of, the extent of, and the treatment of the allergic response. Psychiatric patients should be encouraged to have adequate and regular medical care. The sharing of appropriate information among the primary care physicians, other medical specialists, and the psychiatrist can be very helpful for optimal patient care. The initial interview is an opportunity to reinforce that concept with the patient. At times a patient may not want information to be shared with his or her primary care physician. This wish should be respected, although it may be useful to explore if there is some information that can be shared. Often patients want to restrict certain social or family information (e.g., an extramarital affair) but are comfortable with other information (medication prescribed) being shared. VIII. Family History

Because many psychiatric illnesses are familial and a significant number of those have a genetic predisposition, if not cause, a careful review of family history is an essential part of the psychiatric assessment. Furthermore, an accurate family history helps not only in defining a patient's potential risk factors for specific illnesses but also the formative psychosocial background of the patient. Psychiatric diagnoses, medications, hospitalizations, substance use disorders, and lethality history should all be covered. The importance of these issues is highlighted, for example, by the evidence that, at times, there appears to be a familial response to medications, and a family history of suicide is a significant risk factor for suicidal behaviors in the patient. The interviewer must keep in mind that the diagnosis ascribed to a family member may or may not be accurate and some data about the presentation and treatment of that illness may be helpful. Medical illnesses present in family histories may also be important in both the diagnosis and the treatment of the patient. An example is a family history of diabetes or hyperlipidemia affecting the choice of antipsychotic medication that may carry a risk for development of these illnesses in the patient. Family traditions, beliefs, and expectations may also play a significant role in the development, expression, or course of the illness. Also the family history is important in identifying potential support as well as stresses for the patient and, depending on the degree of disability of the patient, the availability and adequacy of potential caregivers. IX. Developmental and Social History The developmental and social history reviews the stages of the patient's life. It is an important tool in determining the context of psychiatric symptoms and illnesses and may, in fact, identify some of the major factors in the evolution of the disorder. Frequently, current psychosocial stressors will be revealed in the course of obtaining a social history. It can often be helpful to review the social history chronologically to ensure all information is covered. Any available information concerning prenatal or birthing history and developmental milestones should be noted. For the large majority of adult patients, such information is not readily available and when it is it may not be fully accurate. Childhood history will include childhood home environment including members of the family and social environment including the number and quality of friendships. A detailed school history including how far the patient went in school and how old he or she was at that level, any

special education circumstances or learning disorders, behavioral problems at school, academic performance, and extracurricular activities should be obtained. Childhood physical and sexual abuse should be carefully queried. Work history will include types of jobs, performance at jobs, reasons for changing jobs, and current work status. The nature of the patient's relationships with supervisors and coworkers should be reviewed. The patient's income, financial issues, and insurance coverage including pharmacy benefits are often important issues. Military history, where applicable, should be noted including rank achieved, combat exposure, disciplinary actions, and discharge status. Marriage and relationship history,

including sexual preferences and current family structure, should be explored. This should include the patient's capacity to develop and maintain stable and mutually satisfying relationships as well as issues of intimacy and sexual behaviors. Current relationships with parents, grandparents, children, and grandchildren are an important part of the social history. Legal history is also relevant, especially any pending charges or lawsuits. The social history also includes hobbies, interests, pets, and leisure time activities and how this has fluctuated over time. It is important to identify cultural and religious influences on the patient's life and current religious beliefs and practices. A brief overview of the sexual history is given in Table 5.1-3. Table 5.1-3 Sexual History X. Review of Systems The review of systems attempts to capture any current physical or psychological signs and symptoms not already identified in the present illness. Particular attention is paid to neurological and systemic symptoms (e.g., fatigue or weakness). Illnesses that might contribute to the presenting complaints or influence the choice of therapeutic agents

should be carefully considered (e.g., endocrine, hepatic, or renal disorders). Generally, the review of systems is organized by the major systems of the body. XI. Mental Status Examination The mental status examination (MSE) is the psychiatric equivalent of the physical examination in the rest of medicine. The MSE explores all the areas of mental functioning and denotes evidence of signs and symptoms of mental illnesses. Data are gathered for the mental status examination throughout the interview from the initial moments of the interaction, including what the patient is wearing and their general presentation. Most of the information does not require direct questioning, and the information gathered from observation may give the clinician a different dataset than patient responses. Direct questioning augments and rounds out the MSE. The MSE gives the clinician a snapshot of the patient's mental status at the time of the interview and is useful for subsequent visits to compare and monitor changes over time. The psychiatric MSE includes cognitive screening most often in the form of the Mini-Mental Status Examination (MMSE), but the MMSE is not to be confused with the MSE overall. The components of the MSE are presented in this section in the order one might include them in the written note for organizational purposes, but as noted above, the data are gathered throughout the interview. Appearance and Behavior. This section consists of a general description of how the patient looks and acts during the interview. Does the patient appear to be his or her stated age, younger or older? Is this related to the patient's style of dress, physical features, or style of interaction? Items to be noted include what the patient is wearing, including body jewelry, and whether it is appropriate for the context. For example, a patient in a hospital gown would be appropriate in the emergency room or inpatient unit but not in an outpatient clinic. Distinguishing features, including disfigurations, scars, and tattoos, are noted. Grooming and hygiene also are included in the overall appearance and can be clues to the patient's level of functioning. The description of a patient's behavior includes a general statement about whether he or she is exhibiting acute distress and then a more specific statement

about the patient’s approach to the interview. The patient may be described as cooperative, agitated, disinhibited, disinterested, and so forth. Once again, appropriateness is an important factor to consider in the interpretation of the observation. If a patient is brought involuntarily for examination, it may be appropriate, certainly understandable, that he or she is somewhat uncooperative, especially at the beginning of the interview. Motor Activity. Motor activity may be described as normal, slowed (bradykinesia), or agitated (hyperkinesia). This can give clues to diagnoses (e.g., depression vs. mania) as well as confounding neurological or medical issues. Gait, freedom of movement, any unusual or sustained postures, pacing, and hand wringing are described. The presence or absence of any tics should be noted, as should be jitteriness, tremor, apparent

restlessness, lip-smacking, and tongue protrusions. These can be clues to adverse reactions or side effects of medications such as tardive dyskinesia, akathisia, or parkinsonian features from antipsychotic medications or suggestion of symptoms of illnesses such as attention-deficit/hyperactivity disorder. Speech. Evaluation of speech is an important part of the MSE. Elements considered include fluency, amount, rate, tone, and volume. Fluency can refer to whether the patient has full command of the English language as well as potentially more subtle fluency issues such as stuttering, word finding difficulties, or paraphasic errors. (A Spanish-speaking patient with an interpreter would be considered not fluent in English, but an attempt should be made to establish whether he or she is fluent in Spanish.) The evaluation of the amount of speech refers to whether it is normal, increased, or decreased. Decreased amounts of speech may suggest several different things ranging from anxiety or disinterest to thought blocking or psychosis. Increased amounts of speech often (but not always) are suggestive of mania or hypomania. A related element is the speed or rate of speech. Is it slowed or rapid (pressured)? Finally, speech can be evaluated for its tone and volume. Descriptive terms for these elements include irritable, anxious, dysphoric, loud, quiet, timid, angry, or childlike. Mood. The terms mood and affect vary in their definition, and a number of authors have recommended combining the two elements into a new label “emotional expression.” Traditionally, mood is defined as the patient’s internal and sustained emotional state. Its experience is subjective, and hence it is best to use the patient’s own words in describing his or her mood. Terms such as “sad,” “angry,” “guilty,” or “anxious” are common descriptions of mood. Affect. Affect differs from mood in that it is the expression of mood or what the patient’s mood appears to be to the clinician. Affect is often described with the following elements: quality, quantity, range, appropriateness, and congruence. Terms used to describe the quality (or tone) of a patient’s affect include dysphoric, happy, euthymic, irritable, angry, agitated, tearful, sobbing, and flat. Speech is often an important clue to assessment of affect but it is not exclusive. Quantity of affect is a measure of its intensity. Two patients both described as having depressed affect can be very different if one is described as mildly depressed and the other as severely depressed. Range can be restricted, normal, or labile. Flat is a term that has been used for severely restricted range of affect that is described in some patients with schizophrenia. Appropriateness of affect refers to how the affect correlates to the setting. A patient who is laughing at a solemn moment of a funeral service is described as having inappropriate affect. Affect can also be congruent or incongruent with the patient’s described mood or thought content. A patient may report feeling depressed or describe a depressive theme but do so with laughter, smiling, and no suggestion of sadness.

Thought Content. Thought content is essentially what thoughts are occurring to the patient. This is inferred by what the patient spontaneously expresses, as well as responses to specific questions aimed at eliciting particular pathology. Some patients may perseverate or ruminate on specific content or thoughts. They may focus on material that is considered obsessive or compulsive. Obsessional thoughts are unwelcome and repetitive thoughts that intrude into the patient's consciousness. They are generally ego alien and resisted by the patient. Compulsions are repetitive, ritualized behaviors that patients feel compelled to perform to avoid an increase in anxiety or some dreaded outcome. Another large category of thought content pathology is delusions. Delusions are false, fixed ideas that are not shared by others and can be divided into bizarre and nonbizarre (nonbizarre delusions refer to thought content that is not true but is not out of the realm of possibility). Common delusions include grandiose, erotomanic, jealous, somatic, and persecutory. It is often helpful to suggest delusional content to patients who may have learned to not spontaneously discuss them. Questions that can be helpful include, "Do you ever feel like someone is following you or out to get you?" and "Do you feel like the TV or radio has a special message for you?" An affirmative answer to the latter question indicates an "idea of reference." Paranoia can be closely related to delusional material and can range from "soft" paranoia, such as general suspiciousness, to more severe forms that impact daily functioning. Questions that elicit paranoia can include asking about the patient worrying about cameras, microphones, or the government. Suicidality and homicidality fall under the category of thought content but here are discussed separately because of their particular importance in being addressed in every initial psychiatric interview. Simply asking if someone is suicidal or homicidal is not adequate. One must get a sense of ideation, intent, plan, and preparation. Although completed suicide is extremely difficult to accurately predict, there are identified risk factors, and these can be used in conjunction with an evaluation of the patient's intent and plan for acting on thoughts of suicide. Thought Process. Thought process differs from thought content in that it does not describe what the person is thinking but rather how the thoughts are formulated, organized, and expressed. A patient can have normal thought process with significantly delusional thought content. Conversely, there may be generally normal thought content but significantly impaired thought process. Normal thought process is typically described as linear, organized, and goal directed. With flight of ideas, the patient rapidly moves from one thought to another, at a pace that is difficult for the listener to keep up with, but all of the ideas are logically connected. The circumstantial patient overincludes details and material that is not directly relevant to the subject or an answer to the question but does eventually return to address the subject or answer the question. Typically the examiner can follow a circumstantial train of thought, seeing connections between the sequential statements. Tangential thought process may at first appear similar, but the patient never returns to the original point or question. The tangential thoughts are seen as irrelevant and related in a minor, insignificant manner. Loose thoughts or associations differ from circumstantial and tangential thoughts in that with

loose thoughts it is difficult or impossible to see the connections between the sequential content. Perseveration is the tendency to focus on a specific idea or content without the ability to move on to other topics. The perseverative patient will repeatedly come back to the same topic despite the interviewer's attempts to change the subject. Thought blocking refers to a disordered thought process in which the patient appears to be unable to complete a thought. The patient may stop midsentence or midthought and leave the interviewer waiting for the completion. When asked about this, patients will often remark that they don't know what happened and may not remember

what was being discussed. Neologisms refer to a new word or condensed combination of several words that is not a true word and is not readily understandable, although sometimes the intended meaning or partial meaning may be apparent. Word salad is speech characterized by confused, and often repetitious, language with no apparent meaning or relationship attached to it. A description of formal thought disorders is given in Table 5.1-4. Table 5.1-4 Formal Thought Disorders Perceptual Disturbances. Perceptual disturbances include hallucinations, illusions, depersonalization, and derealization. Hallucinations are perceptions in the absence of stimuli to account for them. Auditory hallucinations are the hallucinations most frequently encountered in the psychiatric setting. Other hallucinations can include

visual, tactile, olfactory, and gustatory (taste). In the North American culture, nonauditory hallucinations are often clues that there is a neurological, medical, or substance withdrawal issue rather than a primary psychiatric issue. In other cultures, visual hallucinations have been reported to be the most common form of hallucinations in schizophrenia. The interviewer should make a distinction between a true hallucination and a misperception of stimuli (illusion). Hearing the wind rustle through the trees outside one's bedroom and thinking a name is being called is an illusion. Hypnagogic hallucinations (at the interface of wakefulness and sleep) may be normal phenomena. At times patients without psychosis may hear their name called or see flashes or shadows out of the corners of their eyes. In describing hallucinations the interviewer should include what the patient is experiencing, when it occurs, how often it occurs, and whether or not it is uncomfortable (ego dystonic). In the case of auditory hallucinations, it can be useful to learn if the patient hears words, commands, or conversations and whether the voice is recognizable to the patient. Depersonalization is a feeling that one is not oneself or that something has changed. Derealization is a feeling that one's environment has changed in some strange way that is difficult to describe. Cognition. The elements of cognitive functioning that should be assessed are alertness, orientation, concentration, memory (both short and long term), calculation, fund of knowledge, abstract reasoning, insight, and judgment. Note should be made of the patient's level of alertness. The amount of detail in assessing cognitive function will depend on the purpose of the examination and also what has already been learned in the interview about the patient's level of functioning, performance at work, handling daily chores, balancing one's checkbook, among others. In addition the psychiatrist will have already elicited data concerning the patient's memory for both remote and recent past. A general sense of intellectual level and how much schooling the patient has had can help distinguish intelligence and educational issues versus cognitive impairment that might be seen in delirium or dementia. Table 5.1-5 presents an overview of the questions used to test cognitive function in the mental status examination. Table 5.1-5 Questions Used to Test Cognitive Functions in the Sensorium Section of the Mental Status Examination

Abstract Reasoning. Abstract reasoning is the ability to shift back and forth between general concepts and specific examples. Having the patient identify similarities between like objects or concepts (apple and pear, bus and airplane, or a poem and a painting) as well as interpreting proverbs can be useful in assessing one's ability to abstract. Cultural and educational factors and limitations should be kept in mind when assessing the ability to abstract. Occasionally, the inability to abstract or the idiosyncratic manner of grouping items can be dramatic. Insight. Insight, in the psychiatric evaluation, refers to the patient's understanding of how he or she is feeling, presenting, and functioning as well as the potential causes of his or her psychiatric presentation. The patient may have no insight, partial insight, or full insight. A component of insight often is reality testing in

the case of a patient with psychosis. An example of intact reality testing would be, “I know that there are not really little men talking to me when I am alone, but I feel like I can see them and hear their voices.” As indicated by this example, the amount of insight is not an indicator of the severity of the illness. A person with psychosis may have good insight, while a person with a mild anxiety disorder may have little or no insight. Judgment. Judgment refers to the person’s capacity to make good decisions and act on them. The level of judgment may or may not correlate to the level of insight. A patient may have no insight into his or her illness but have good judgment. It has been traditional to use hypothetical examples to test judgment, for example, “What would you do if you found a stamped envelope on the sidewalk?” It is better to use real situations from the patient’s own experience to test judgment. The important issues in assessing judgment include whether a patient is doing things that are dangerous or going to get him or her into trouble and whether the patient is able to effectively participate in his or

her own care. Significantly impaired judgment can be cause for considering a higher level of care or more restrictive setting such as inpatient hospitalization. Table 5.1-6 lists some common questions for the psychiatric history and mental status. Table 5.1-6 Common Questions for Psychiatric History and Mental Status

XII. Physical Examination The inclusion and extent of physical examination will depend on the nature and setting of the psychiatric interview. In the outpatient setting, little or no physical examination may be routinely performed, while in the emergency room or inpatient setting, a more complete physical examination is warranted. Vital signs, weight, waist circumference, body mass index, and height may be important measurements to follow particularly given the potential effects of psychiatric medications or illnesses on these parameters. The Abnormal Involuntary Movement Scale (AIMS) is an important screening test to be followed when using antipsychotic medication to monitor for potential side effects such as tardive dyskinesia. A focused neurological evaluation is an important part of the psychiatric assessment.

In those instances where a physical examination is not performed the psychiatrist should ask the patient when the last physical examination was performed and by whom. As part of the communication with that physician, the psychiatrist should inquire about any abnormal findings. XIII. Formulation The culmination of the data-gathering aspect of the psychiatric interview is developing a formulation and diagnosis (diagnoses) as well as recommendations and treatment planning. In this part of the evaluation process, the data gathering is supplanted by data processing where the various themes contribute to a biopsychosocial understanding of the patient’s illness. Although the formulation is placed near the end of the reported or written evaluation, actually it is developed as part of a dynamic process throughout the interview as new hypotheses are created and tested by further data that are elicited. The formulation should include a brief summary of the patient’s history, presentation, and current status. It should include discussion of biological factors (medical, family, and medication history) as well as psychological factors such as childhood circumstances, upbringing, and past interpersonal interactions and social factors including stressors, and contextual circumstances such as finances, school, work, home, and interpersonal relationships. These elements should lead to a differential diagnosis of the patient’s illness (if any) as well as a provisional diagnosis. Finally, the formulation should include a summary of the safety assessment, which contributes to the determination of level of care recommended or required. XIV. Treatment Planning The assessment and formulation will appear in

the written note correlating to the psychiatric interview, but the discussion with the patient may only be a summary of this assessment geared toward the patient's ability to understand and interpret the information. Treatment planning and recommendations, in contrast, are integral parts of the psychiatric interview and should be explicitly discussed with the patient in detail. The first part of treatment planning involves determining whether a treatment relationship is to be established between the interviewer and patient. Cases where this may not be the case include if the interview was done in consultation, for a legal matter or as a third-party review, or in the emergency room or other acute setting. If a treatment relationship is not being started, then the patient should be informed as to what the recommended treatment is (if any). In certain cases this may not be voluntary (as in the case of an involuntary hospitalization). In most cases there should be a discussion of the options available so that the patient can participate in the decisions about next steps. If a treatment relationship is being initiated, then the structure of that treatment should be discussed. Will the main focus be on medication management, psychotherapy, or both? What will the frequency of visits be? How will the clinician be paid for service and what are the expectations for the patient to be considered engaged in treatment?

Medication recommendations should include a discussion of possible therapeutic medications, the risks and benefits of no medication treatment, and alternative treatment options. The prescriber must obtain informed consent from the patient for any medications (or other treatments) initiated. Other clinical treatment recommendations may include referral for psychotherapy, group therapy, chemical dependency evaluation or treatment, or medical assessment. There also may be recommended psychosocial interventions including case management, group home or assisted living, social clubs, support groups such as a mental health alliance, the National Alliance for the Mentally Ill, and AA. Collaboration with primary care doctors, specialists, or other clinicians should always be a goal, and proper patient consent must be obtained for this. Similarly, family involvement in a patient's care can often be a useful and integral part of treatment and requires proper patient consent. A thorough discussion of safety planning and contact information should occur during the psychiatric interview. The clinician's contact information as well as after-hours coverage scheme should be reviewed. The patient needs to be informed of what he or she should do in the case of an emergency, including using the emergency room or calling 911 or crisis hotlines that are available. TECHNIQUES General principles of the psychiatric interview such as the patient–doctor relationship, open-ended interviewing, and confidentiality are described above. In addition to the general principles, there are a number of specific techniques that can be effective in obtaining information in a manner consistent with the general principles. These helpful techniques can be described as facilitating interventions and expanding interventions. There are also some interventions that are generally counterproductive and interfere with the goals of helping the patient tell his or her story and reinforcing the therapeutic alliance. Facilitating Interventions These are some of the interventions that are effective in enabling the patient to continue sharing his or her story and also are helpful in promoting a positive patient– doctor relationship. At times some of these techniques may be combined in a single intervention. Reinforcement. Reinforcement interventions, although seemingly simplistic, are very important in the patient sharing material about himself or herself and other important individuals and events in the patient's life. Without these reinforcements, often the interview will become less productive. A brief phrase such as "I see," "Go on," "Yes," "Tell me more," "Hmm," or "Uh-huh" all convey the interviewer's interest in the patient continuing. It is important that these phrases fit naturally into the dialogue.

Reflection. By using the patient's words, the psychiatrist indicates that he or she has heard what the patient is saying and conveys an interest in hearing more. Summarizing. Periodically during the interview it is helpful to summarize what has been identified about a certain topic. This provides the opportunity for the patient to clarify or modify the psychiatrist's understanding and possibly add new material. When new material is introduced, the psychiatrist may decide to continue with a further exploration of the previous discussion and return to the new information at a later point. Education. At times in the interview it is helpful for the psychiatrist to educate the patient about the interview process. Reassurance. It is often appropriate and helpful to provide reassurance to the patient. For example, accurate information about the usual course of an illness can decrease anxiety, encourage the patient to continue to discuss his or her illness, and strengthen his or her resolve to continue in treatment. It is generally inappropriate for psychiatrists to reassure patients when the psychiatrist does not know what the outcome will be. In these cases, psychiatrists can assure patients they will continue to be available and will help in whatever way they can. Encouragement. It is difficult for many patients to come for a psychiatric evaluation. Often they are uncertain as to what will happen, and receiving encouragement can facilitate their engagement. Psychiatrists should be careful not to overstate the patient's progress in the interview. The psychiatrist may provide the patient feedback about his or her efforts, but the secondary message should be that there is more work to be done. Acknowledgment of Emotion. It is important for the interviewer to acknowledge the expression of emotion by the patient. This frequently leads to the patient sharing more feelings and being relieved that he or she can do so. Sometimes a nonverbal action, such as moving a tissue box closer, can suffice or be used adjunctly. If the display of the emotion is clear (e.g., patient openly crying), then it is not helpful to comment directly on the expression of the emotion. It is better to comment on the associated feelings. Humor. At times the patient may make a humorous comment or tell a brief joke. It can be very helpful if the psychiatrist smiles, laughs, or even, when appropriate, add another punch line. This sharing of humor can decrease tension and anxiety and reinforce the interviewer's genuineness. It is important to be certain that the patient's comment was indeed meant to be humorous and that the psychiatrist clearly conveys that he or she is laughing with the patient, not at the patient.

Silence. Careful use of silence can facilitate the progression of the interview. The patient may need time to think about what has been said or to experience a feeling that has arisen in the interview. The psychiatrist whose own anxiety results in any silence quickly being terminated can retard the development of insight or the expression of feeling by the patient. On the other hand, extended or repeated silences can deaden an interview and become a struggle as to who can outwait the other. If the patient is looking at his or her watch or looking about the room, then it might be helpful to comment, "It looks like there are other things on your mind." If the patient has become silent and looks like he or she is thinking about the subject, then the psychiatrist might ask, "What thoughts do you have about that?" Nonverbal Communication In many good interviews, the most common facilitating interventions are nonverbal. Nodding of the head, body posture including leaning toward the patient, body positioning becoming more open, moving the chair closer to the patient, putting down the pen and folder, and facial expressions including arching of eyebrows all indicate that the psychiatrist is concerned, listening attentively, and engaged in the interview. Although these interventions can be very helpful, they can also be overdone especially if the same action is repeated too frequently or done in an exaggerated fashion. The interviewer does not want to reinforce the popular caricature of a psychiatrist nodding his or her head repeatedly regardless of the content of what is being said or the emotion being expressed. Expanding Interventions There

are a number of interventions that can be used to expand the focus of the interview. These techniques are helpful when the line of discussion has been sufficiently mined, at least for the time being, and the interviewer wants to encourage the patient to talk about other issues. These interventions are most successful when a degree of trust has been established in the interview and the patient feels that the psychiatrist is nonjudgmental about what is being shared. Clarifying. At times carefully clarifying what the patient has said can lead to unrecognized issues or psychopathology. A 62-year-old widow describes how it feels since her husband died 14 months ago. She repeatedly comments that “everything is empty inside.” The resident interprets this as meaning her world feels empty without her spouse and makes this interpretation on a few occasions. The patient’s nonverbal cues suggest that she is not on the same wavelength. The supervisor asks the patient to clarify what she means by “empty inside.” After some avoidance, the patient states that she is indeed empty inside; all her organs are missing—they have “disappeared.”

The resident’s interpretation may actually have been psychodynamically accurate, but a somatic delusion was not identified. The correct identification of what the patient was actually saying led to an exploration of other thoughts, and other delusions were uncovered. This vignette of “missing” the delusion is an example of the interviewer “normalizing” what the patient is saying. The interviewer was using secondary process thinking in understanding the words of the patient, while the patient was using primary process thinking. Associations. As the patient describes his or her symptoms, there are other areas that are related to a symptom that should be explored. For example, the symptom of nausea leads to questions about appetite, bowel habits, weight loss, and eating habits. Also, experiences that are temporally related may be investigated. When a patient is talking about his or her sleeping pattern, it can be a good opportunity to ask about dreams. Leading. Often, continuing the story can be facilitated by asking a “what,” “when,” “where,” or “who” question. Sometimes the psychiatrist may suggest or ask about something that has not been introduced by the patient but that the psychiatrist surmises may be relevant. Probing. The interview may point toward an area of conflict, but the patient may minimize or deny any difficulties. Gently encouraging the patient to talk more about this issue may be quite productive. Transitions. Sometimes transitions occur very smoothly. The patient is talking about her primary education major in college and the psychiatrist asks, “Did that lead to your work after college?” On other occasions, the transition means moving to a different area of the interview and a bridge statement is useful. Redirecting. A difficult technique for unseasoned interviewers is redirecting the focus of the patient. If the interviewer is concentrating on reinforcing the patient’s telling of his or her story, it can be especially difficult to move the interview in a different direction. However, this is often crucial to a successful interview because of the time constraints and the necessity to obtain a broad overview of the patient’s life as well as the current problems. Also, the patient may, for conscious or often unconscious reasons, avoid certain important areas and need guidance in approaching these subjects. Redirection can be used when the patient changes the topic or when the patient continues to focus on a nonproductive or well-covered area. Obstructive Interventions Although supportive and expanding techniques facilitate the gathering of information

and the development of a positive patient–doctor relationship, there are a number of other interventions that are not helpful for either task. Some of these activities are in the same categories as the more useful interventions but are unclear, unconnected, poorly timed, and not responsive to the patient’s issues or concerns. Closed-Ended Questions. A series of closed-ended

questions early in the interview can retard the natural flow of the patient's story and reinforces the patient giving one word or brief answers with little or no elaboration. Compound Questions. Some questions are difficult for patients to respond to because more than one answer is being sought. Why Questions. Especially early in the psychiatric interview, "why" questions are often nonproductive. Very often the answer to that question is one of the reasons that the patient has sought help. Judgmental Questions or Statements. Judgmental interventions are generally nonproductive for the issue at hand and also inhibit the patient from sharing even more private or sensitive material. Instead of telling a patient that a particular behavior was right or wrong, it would be better for the psychiatrist to help the patient reflect on how successful that behavior was. Minimizing Patient's Concerns. In an attempt to reassure patients, psychiatrists sometimes make the error of minimizing a concern. This can be counterproductive in that rather than being reassured, the patient may feel that the psychiatrist does not understand what he or she is trying to express. It is much more productive to explore the concern; there is likely much more material that has not yet been shared. Premature Advice. Advice given too early is often bad advice because the interviewer does not yet know all of the variables. Also it can preempt the patient from arriving at a plan for himself or herself. Premature Interpretation. Even if it is accurate, a premature interpretation can be counterproductive as the patient may respond defensively and feel misunderstood. Transitions. Some transitions are too abrupt and may interrupt important issues that the patient is discussing. Nonverbal Communication. The psychiatrist that repeatedly looks at a watch, turns away from the patient, yawns, or refreshes the computer screen conveys boredom, disinterest, or annoyance. Just as reinforcing nonverbal communications can be powerful facilitators of a good interview, these obstructive actions can quickly shatter an interview and undermine the patient–doctor relationship.

Closing of Interview The last 5 to 10 minutes of the interview are very important and are often not given sufficient attention by inexperienced interviewers. It is important to alert the patient to the remaining time: "We have to stop in about 10 minutes." Not infrequently, a patient will have kept an important issue or question until the end of the interview and having at least a brief time to identify the issue is helpful. If there is to be another session, then the psychiatrist can indicate that this issue will be addressed at the beginning of the next session or ask the patient to bring it up at that time. If the patient repeatedly brings up important information at the end of sessions, then this should be explored as to its meaning. If no such item is spontaneously brought up by the patient, then it can be useful to ask the patient if there are any other issues that have not been covered that the patient wanted to share. If such an issue can be dealt with in short order, then it should be; if not, then it can be put on the agenda for the next session. It can also be useful to give the patient an opportunity to ask a question: "I've asked you a lot of questions today. Are there any other questions you'd like to ask me at this point?" If this interview was to be a single evaluative session, then a summary of the diagnosis and options for treatment should generally be shared with the patient (exceptions may be a disability or forensic evaluation for which it was established at the outset that a report would be made to the referring entity). If the patient was referred by a primary care physician, then the psychiatrist also indicates that he or she will communicate with the primary care physician and share the findings and recommendations. If this was not to be a single session and the patient will be seen again, then the psychiatrist may indicate that he or she and the patient can work further on the treatment plan in the next session. A mutually agreed upon time is arrived at and the patient is escorted to the door. Motivational Interviewing Motivational interviewing is a technique used to motivate the patient to change his or her maladaptive behavior.

The therapist relies on empathy to convey understanding, provides support by noting the patient's strengths, and explores the ambivalence and conflicting thoughts or feelings the patient may have about change. Guidance is provided in the interview by imparting information about issues (e.g., alcoholism, diabetes), while at the same time, getting the patient to talk about resistances to altering behavior. It has been used effectively in persons with substance-use disorders to get them to join AA, to help change lifestyles, or to enter psychotherapy. It has the potential to combine diagnosis and therapy in a single interview with the patient and can be applied to a wide range of mental disorders. MEDICAL RECORD Most psychiatrists take notes throughout the interview. Generally these are not verbatim recordings, except for the chief complaint or other key statements. Many psychiatrists use a form that covers the basic elements in the psychiatric evaluation. Occasionally, patients may have questions or concerns about the note taking. These concerns, which often have to do with confidentiality, should be discussed (and during this discussion

notes should not be taken). After the discussion, it is rare for a patient to insist that notes not be taken. In fact, it is much more common for patients to feel comfortable about the note taking, feeling reassured that their experiences and feelings are important enough to be written. However, too much attention to the record can be distracting. It is important that eye contact be maintained as much as possible during the note taking. Otherwise patients will feel that the record is more important than what they are saying. Also, the interviewer may miss nonverbal communications that can be more important than the words being recorded. Increasingly, the electronic health record (EHR) is now being used throughout medicine. There are great advantages of computerized records, including rapid retrieval of information, appropriately sharing data among various members of the health care team, access to important data in an emergency, decreasing errors, and as a tool for research and quality improvement activities. Evidence-based practice guidelines can also be integrated with EHRs so that information or recommendations can be provided at the point of service. However, the use of computers can also present significant challenges to the developing patient–physician relationship. Frequently, physicians using computers during an interview will turn away from the patient to enter data. Especially in a psychiatric interview, this can be very disruptive to a smooth and dynamic interaction. As improved technology becomes more widespread (e.g., the use of notepads held in the lap) and psychiatrists become more accustomed to using the equipment, some of these disruptions can be minimized. CULTURAL ISSUES Culture can be defined as a common heritage, a set of beliefs, and values that set expectations for behaviors, thoughts, and even feelings. A number of culture-bound syndromes that are unique to a particular population have been described (see Section 3.3). Culture can influence the presentation of illness, the decision when and where to seek care, the decision as to what to share with the physician, and the acceptance of and participation in treatment planning. Often, individuals from a minority population may be reluctant to seek help from a physician who is from the majority group especially for emotional difficulties. Some minority groups have strong beliefs in faith healers, and in some areas of the United States "root doctors" carry significant influence. These beliefs may not be apparent in the interview as the patient may have learned to be quite guarded about such matters. A patient may only report that he or she is "frightened" and not discuss the reality that this fear began when he or she realized someone was working "roots" on him or her. The psychiatrist needs to be alert to the possibility that the patient's thoughts about what has happened may be unusual from a traditional Western medical perspective and at the same time recognize that these culturally shared beliefs are not indications of psychosis. By being

humble, open, and respectful the psychiatrist increases the possibility of developing a trusting working relationship with the patient and learning more about the patient's actual experiences. The psychiatrist clearly understanding what the patient is saying and the patient

clearly understanding what the psychiatrist is saying are obviously crucial for an effective interview. It is not just both being fluent in the language of the interview, but the psychiatrist should also be aware of common slang words and phrases that the patient, depending on their cultural background, may use. If the psychiatrist does not understand a particular phrase or comment, then he or she should ask for clarification. If the patient and psychiatrist are not both fluent in the same language, then an interpreter is necessary. Interviewing with an Interpreter When translation is needed, it should be provided by a non–family-member professional interpreter. Translation by family members is to be avoided because (1) a patient, with a family member as an interpreter, may justifiably be very reluctant to discuss sensitive issues including suicidal ideation or drug use and (2) family members may be hesitant to accurately portray a patient's deficits. Both of these issues make accurate assessment very difficult. It is helpful to speak with the interpreter prior to the interview to clarify the goals of the exam. If the interpreter does not primarily work with psychiatric patients, then it is important to highlight the need for verbatim translation even if the responses are disorganized or tangential. If the translator is not aware of this issue, then the psychiatrist may have difficulty diagnosing thought disorders or cognitive deficits. Occasionally, the patient will say several sentences in response to a question and the interpreter will remark, "He said it's okay." The interpreter should again be reminded that the psychiatrist wants to hear everything that the patient is saying. It is helpful to place the chairs in a triangle so that the psychiatrist and patient can maintain eye contact. The psychiatrist should continue to refer to the patient directly to maintain the therapeutic connection rather than speaking to the interpreter. The examiner may need to take a more directive approach and interrupt the patient's responses more frequently to allow for accurate and timely translation. Once the interview is concluded, it may be helpful to again meet briefly with the interpreter. If the interpreter is especially knowledgeable about the patient's cultural background, they may be able to provide helpful insights regarding cultural norms. INTERVIEWING THE DIFFICULT PATIENT Patients with Psychosis Patients with psychotic illnesses are often frightened and guarded. They may have difficulty with reasoning and thinking clearly. In addition, they may be actively hallucinating during the interview, causing them to be inattentive and distracted. They may have suspicions regarding the purpose of the interview. All of these possibilities are reasons that the interviewer may need to alter the usual format and adapt the interview to match the capacity and tolerance of the patient. Auditory hallucinations are the most common hallucinations in psychiatric illnesses in

North America. Many patients will not interpret their experiences as hallucinations, and it is useful to begin with a more general question: "Do you ever hear someone talking to you when no one else is there?" The patient should be asked about the content of the hallucinations, the clarity, and the situations in which they occur. Often it is helpful to ask the patient about a specific instance and if he or she can repeat verbatim the content of the hallucination. It is important to specifically ask if the patient has ever experienced command hallucinations, hallucinations in which a patient is ordered to perform a specific act. If so, the nature of the commands should be clarified, specifically if the commands have ever included orders to harm himself or herself or others, and if the patient has ever felt compelled to follow the commands. The validity of the patient's perception should not

be dismissed, but it is helpful to test the strength of the belief in the hallucinations: “Does it seem that the voices are coming from inside your head? Who do you think is speaking to you?” Other perceptual disturbances should be explored including visual, olfactory, and tactile hallucinations. These disturbances are less common in psychiatric illness and may suggest a primary medical etiology to the psychosis. The psychiatrist should be alert for cues that psychotic processes may be part of the patient’s experience during the interview. It is usually best to ask directly about such behaviors or comments. By definition, patients with delusions have fixed false beliefs. With delusions, as with hallucinations, it is important to explore the specific details. Patients are often very reluctant to discuss their beliefs as many have had their beliefs dismissed or ridiculed. They may ask the interviewer directly if the interviewer believes the delusion. Although an interviewer should not directly endorse the false belief, it is rarely helpful to directly challenge the delusion, particularly in the initial exam. It can be helpful to shift the attention back to the patient’s rather than the examiner’s beliefs and acknowledge the need for more information: “I believe that what you are experiencing is frightening and I would like to know more about your experiences.” For patients with paranoid thoughts and behaviors it is important to maintain a respectful distance. Their suspiciousness may be increased by an overly warm interview. It may be helpful to avoid sustained direct eye contact as this may be perceived as threatening. Harry Stack Sullivan recommended that rather than sitting face to face with the patient who is paranoid, the psychiatrist might sit more side by side, “looking out” with the patient. Interviewers should keep in mind that they themselves may become incorporated into the paranoid delusions, and it is helpful to ask directly about such fears: “Are you concerned that I am involved?” The psychiatrist should also ask whether there is a specific target related to the paranoid thinking. When asked regarding thoughts about hurting others, the patient may not disclose plans for violence. Exploration of the patient’s plan on how to manage his or her fears may elicit information regarding violence risk: “Do you feel you need to protect yourself in any way? How do you plan to do so?” If there is some expression of possible violence toward others, the psychiatrist then needs to do further risk assessment. This is further discussed in the section below on hostile, agitated, and violent patients.

Depressed and Potentially Suicidal Patients The depressed patient may have particular difficulty during the interview as he or she may have cognitive deficits as a result of the depressive symptoms. The patients may have impaired motivation and may not spontaneously report their symptoms. Feelings of hopelessness may contribute to a lack of engagement. Depending on the severity of symptoms, patients may need more direct questioning rather than an open-ended format. A suicide assessment should be performed for all patients including prior history, family history of suicide attempts and completed suicides, and current ideation, plan, and intent. An open-ended approach is often helpful: “Have you ever had thoughts that life wasn’t worth living?” It is important to detail prior attempts. The lethality risk of prior attempts and any potential triggers for the attempt should be clarified. This can help with assessing the current risk. The patient should be asked about any current thoughts of suicide, and if thoughts are present, what is the patient’s intent. Some patients will describe having thoughts of suicide but do not intend to act on these thoughts or wish to be dead. They report that although the thoughts are present, they have no intent to act on the thoughts. This is typically referred to as passive suicidal ideation. Other patients will express their determination to end their life and are at higher risk. The presence of psychotic symptoms should be assessed. Some patients may have hallucinations compelling them to hurt themselves even though they do not have a desire to die. If the patient reports suicidal ideation, they should be asked if they have a plan to end his or her life. The specificity of the plan

should be determined and whether the patient has access to the means to complete the plan. The interviewer should pursue this line of questioning in detail if the patient has taken any preparatory steps to move forward with the plan. (A patient who has purchased a gun and has given away important items would be at high risk.) If the patient has not acted upon these urges, then it is helpful to ask what has prevented him or her from acting on these thoughts: “What do you think has kept you from hurting yourself?” The patient may disclose information that may decrease their acute risk, such as religious beliefs that prohibit suicide or awareness of the impact of suicide on family members. This information is essential to keep in mind during treatment especially if these preventative factors change. (A patient who states he or she could never abandon a beloved pet may be at increased risk if the pet dies.) Although the intent of the psychiatric interview is to build rapport and gather information for treatment and diagnosis, the patient’s safety must be the first priority. If the patient is viewed to be at imminent risk, then an interview may need to be terminated and the interviewer must take action to secure the safety of the patient. Hostile, Agitated, and Potentially Violent Patients Safety for the patient and the psychiatrist is the priority when interviewing agitated

patients. Hostile patients are often interviewed in emergency settings, but angry and agitated patients can present in any setting. If interviewing in an unfamiliar setting, then the psychiatrist should familiarize himself or herself with the office setup, paying particular attention to the chair placement. The chairs should ideally be placed in a way in which both the interviewer and patient could exit if necessary and not be obstructed. The psychiatrist should be aware of any available safety features (emergency buttons or number for security) and should be familiar with the facility’s security plan. If the psychiatrist is aware in advance that the patient is agitated, then he or she can take additional preparatory steps such as having security closely available if necessary. As increased stimulation can be agitating for a hostile patient, care should be taken to decrease excess stimulation as much as feasible. The psychiatrist should be aware of his or her own body position and avoid postures that could be seen as threatening, including clenched hands or hands behind the back. The psychiatrist should approach the interview in a calm, direct manner and take care not to bargain or promise to elicit cooperation in the interview: “Once we finish here you will be able to go home.” These tactics may only escalate agitation. As stated above, the priority must be safety. An intimidated psychiatrist who is fearful regarding his or her own physical safety will be unable to perform an adequate assessment. Similarly, a patient who feels threatened will be unable to focus on the interview and may begin to escalate thinking that he or she needs to defend himself or herself. An interview may need to be terminated early if the patient’s agitation escalates. Generally, unpremeditated violence is preceded by a period of gradually escalating psychomotor agitation such as pacing, loud speech, and threatening comments. At this point the psychiatrist should consider whether other measures are necessary, including assistance from security personnel or need for medication or restraint. If the patient makes threats or gives some indication that he or she may become violent outside the interview setting, then further assessment is necessary. Because past history of violence is the best predictor of future violence, past episodes of violence should be explored as to setting, what precipitated the episode, and what was the outcome or potential outcome (if the act was interrupted). Also, what has helped in the past in preventing violent episodes (medication, timeout, physical activity, or talking to a particular person) should be explored. Is there an identified victim and is there a plan for the violent behavior? Has the patient taken steps to fulfill the plan? Depending on the answers to these questions the psychiatrist may decide to prescribe or increase antipsychotic medication,

recommend hospitalization, and perhaps, depending on the jurisdiction, notify the threatened victim. (See discussion of confidentiality above.) Deceptive Patients Psychiatrists are trained to diagnose and treat psychiatric illness. Although psychiatrists are well trained in eliciting information and maintaining awareness for deception, these abilities are not foolproof. Patients lie or deceive their psychiatrists for many different

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reasons. Some are motivated by secondary gain (e.g., for financial resources, absence from work, or for a supply of medication). Some patients may deceive, not for an external advantage, but for the psychological benefits of assuming a sick role. As noted above, unconscious processes may result in events or feelings being outside the patient's awareness. There are no current biological markers to definitively validate a patient's symptoms. Psychiatrists are dependent on the patient's self-report. Given these limitations, it may be useful, especially when there is a question about the patient's reliability (possibly related to inconsistencies in the patient's report), to gather collateral information regarding the patient. This allows the psychiatrist to have a more broad understanding of the patient outside the interview setting, and discrepancies in symptom severity between self-report and collateral information may suggest deception. There are also some psychological tests that can help in further evaluating the reliability of the patient. REFERENCES Daniel M, Gurczynski J. Mental status examination. In: Segal DL, Hersen M, eds. Diagnostic Interviewing. 4th ed. New York: Springer; 2010:61. Kolanowski AM, Fick DM, Yevchak AM, Hill NL, Mulhall PM, McDowell JA. Pay attention! The critical importance of assessing attention in older adults with dementia. J Gerontol Nurs. 2012;38(11):23. McIntyre KM, Norton JR, McIntyre JS. Psychiatric interview, history, and mental status examination. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:886. Pachet A, Astner K, Brown L. Clinical utility of the Mini-Mental Status Examination when assessing decision-making capacity. J Geriatr Psychiatry Neurol. 2010;23:3. Recupero PR. The mental status examination in the age of the Internet. J Am Acad Psychiatry Law. 2010;38:15. Stowell KR, Florence P, Harman HJ, Glick RL. Psychiatric evaluation of the agitated patient: Consensus statement of the American Association for Emergency Psychiatry project BETA psychiatric evaluation workgroup. West J Emerg Med. 2012;13:11. Thapar A, Hammerton G, Collishaw S, Potter R, Rice F, Harold G, Craddock N, Thapar A, Smith DJ. Detecting recurrent major depressive disorder within primary care rapidly and reliably using short questionnaire measures. Br J Gen Pract. 2014; 64(618), e31–e37. 5.2 The Psychiatric Report and Medical Record PSYCHIATRIC REPORT This section complements the previous section, "Psychiatric Interview, History, and Mental Status Examination," in that it provides a comprehensive outline on how to write the psychiatric report (see Table 5.2-1). The need to follow some sort of outline in gathering data about a person

in order to make a psychiatric diagnosis is universally recognized. The one that follows calls for including a tremendous amount of potential information about the patient, not all of which need be obtained, depending on the

circumstances in the case. Beginning clinicians are advised to get as much information as possible; more experienced clinicians can pick and choose among the series of questions they might ask. In all cases, however, the person is best understood within the context of his or her life events. Table 5.2-1 Psychiatric Report

The psychiatric report covers both the psychiatric history and the mental status. The

history, or anamnesis (from the Greek meaning “to remember”), describes life events within the framework of the life cycle, from infancy to old age, and the clinician should attempt to elicit the emotional reaction to each event as remembered by the patient. The mental status examination covers what the patient is thinking and feeling at the moment and how he or she responds to specific questions from the examiner. Sometimes it may be necessary to report, in detail, the questions asked and the answers received; but this should be kept to a minimum, so that the report does not read like a verbatim transcript. Nevertheless, the clinician should try to use the patient’s own words as much as possible, especially when describing certain symptoms such as hallucinations or delusions. Finally, the psychiatric report includes more than the psychiatric history and mental status. It also includes a summary of positive and negative findings and an interpretation of the data. It has more than descriptive value; it has meaning that helps provide an understanding of the case. The examiner addresses critical questions in the report: Are future diagnostic studies needed, and, if so, which ones? Is a consultant needed? Is a comprehensive neurological workup, including an electroencephalogram (EEG) or computed tomography (CT) scan, needed? Are psychological tests indicated? Are psychodynamic factors relevant? Has the cultural context of the patient’s illness been considered? The report includes a diagnosis made according to the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). A prognosis is also discussed in the report, with good and bad prognostic factors listed. The report concludes with a discussion of a treatment plan and makes firm recommendations about management of the case. MEDICAL RECORD The psychiatric report is a part of the medical record; however, the medical record is more than the psychiatric report. It is a narrative that documents all events that occur during the course of treatment, most often referring to the patient’s stay in the hospital. Progress notes record every interaction between doctor and patient; reports of all special studies, including laboratory tests; and prescriptions and orders for all medications. Nurses’ notes help describe the patient’s course: Is the patient beginning to respond to treatment? Are there times during the day or night when symptoms get worse or remit? Are there adverse effects or complaints by the patient about prescribed medication? Are there signs of agitation, violence, or mention of suicide? If the patient requires restraints or seclusion, are the proper supervisory procedures being followed? Taken as a whole, the medical record tells what happened to the patient since first making contact with the health care system. It concludes with a discharge summary that provides a concise overview of the patient’s course with recommendations for future treatment, if necessary. Evidence of contact with a referral agency should be documented in the medical record to establish continuity of care if further intervention is necessary.

Use of the Record The medical record is not only used by physicians, but is also used by regulatory agencies and managed care companies to determine length of stay, quality of care, and reimbursement to doctors and hospitals. In theory, the inpatient medical record is accessible to authorized persons only and is safeguarded for confidentiality. In practice, however, absolute confidentiality cannot be guaranteed. Guidelines for what material needs to be incorporated into the medical record are provided in Table 5.2-2. Table 5.2-2 Medical Record The medical record is also crucial in malpractice litigation. Robert I. Simon summarized the liability issues as follows: Properly kept medical records can be the psychiatrist's best ally in malpractice litigation. If no record is kept, numerous questions will be raised regarding the psychiatrist's competence and credibility. This failure to keep medical records may also violate state statutes or licensing provisions. Failure to keep medical records may arise out of the psychiatrist's concern that patient treatment information be totally protected. Although this is an admirable ideal, in real life the psychiatrist may be legally compelled under certain circumstances to testify directly about confidential treatment matters.

Outpatient records are also subject to scrutiny by third parties under certain circumstances, and psychiatrists in private practice are under the same obligation to maintain a record of the patient in treatment as the hospital psychiatrist. Table 5.2-3 lists documentation issues of concern to third-party payers. Table 5.2-3 Documentation Issues

Personal Notes and Observations

According to laws relating to access to medical records, some jurisdictions (such as in the Public Health Law of New York State) have a provision that applies to a physician's personal notes and observations. Personal notes are defined as "a practitioner's speculations, impressions (other than tentative or actual diagnosis) and reminders." The data are maintained only by the clinician and cannot be disclosed to any other person, including the patient. Psychiatrists concerned about material that may prove damaging or otherwise hurtful to the patient if released to a third party may consider using this provision to maintain doctor–patient confidentiality. Psychotherapy Notes Psychotherapy notes include details of transference, fantasies, dreams, personal information about persons with whom the patient interacts, and other intimate details of the patient's life. They may also include the psychiatrist's comments on his or her countertransference and feelings toward the patient. Psychotherapy notes should be kept separate from the rest of the medical records. Patient Access to Records Patients have a legal right to access their medical records. This right represents society's belief that the responsibility for medical care has become a collaborative process between doctor and patient. Patients see many different physicians, and they can be more effective historians and coordinators of their own care with such information. Psychiatrists must be careful in releasing their records to the patient if, in their judgment, the patient can be harmed emotionally as a result. Under these circumstances, the psychiatrist may choose to prepare a summary of the patient's course of treatment, holding back material that might be hurtful—especially if it were to get into the hands of third parties. In malpractice cases, however, it may not be possible to do so. When litigation occurs, the entire medical record is subject to discovery. Psychotherapy notes are usually protected, but not always. If psychotherapy notes are ordered to be produced, the judge would probably review them privately and select what is relevant to the case in question. Blogs Blogs or web logs are used by persons who wish to record their day-to-day experiences or to express their thoughts and feelings about events. Physicians

should be especially cautious about such activities because they are subject to discovery in lawsuits. Pseudonyms and aliases offer no protection because they can be traced. Writing about patients on blogs is a breach in confidentiality. In one case a doctor detailed his thoughts about a lawsuit that included hostile comments about the plaintiff and his attorney. His blog was discovered inadvertently and was used against him in court. Physicians are advised not to use blogs to vent emotions and to write nothing that they would not write for attribution even if their identity were discovered.

E-Mail E-mail is increasingly being used by physicians as a quick and efficient way to communicate not only with patients but also with other doctors about their patients; however, it is a public document and should be treated as such. The dictum of not diagnosing or prescribing medication over the telephone to a patient one has not examined should also apply to e-mail. It is not only dangerous but also unethical. All email messages should be printed to include with the paper chart unless electronic archives are regularly backed up and secure. Ethical Issues and the Medical Record Psychiatrists continually make judgments about what is appropriate material to include in the psychiatric report, the medical record, the case report, and other written communications about a patient. Such judgments often involve ethical issues. In a case report, for example, the patient should not be identifiable, a position made clear in the American Psychiatric Association's (APA's) Principles of Medical Ethics with Annotations Especially Applicable to Psychiatry, which states that published case reports must be suitably disguised to safeguard patient confidentiality without altering material to provide a less-than-complete portrayal of the patient's actual condition. In some instances, obtaining a written release from the patient that allows the psychiatrist to publish the case may also be advisable, even if the patient is appropriately disguised. Psychiatrists sometimes include material in the medical record that is specifically directed toward warding off future culpability if liability issues are ever raised. This may include having advised the patient about specific adverse effects of medication to be prescribed. Health Insurance Portability and Accountability Act (HIPAA) The Health Insurance Portability and Accountability Act (HIPAA) was passed in 1996 to address the medical delivery system's mounting complexity and its rising dependence on electronic communication. The act orders that the federal Department of Health and Human Services (HHS) develop rules protecting the transmission and confidentiality of patient information, and all units under HIPAA must comply with such rules. Two rules were finalized in February 2003: the Transaction Rule and the Privacy Rule (see Tables 5.2-4 and 5.2-5). The Transaction Rule facilitates transferring health information effectively and efficiently by means of regulations created by the HHS that established a uniform set of formats, code sets, and data requirements. The Privacy Rule, administered by the Office of Civil Rights (OCR) at HHS, protects the confidentiality of patient information. This means that a patient's medical information belongs to the patient and that the patient has the right to access it, with the exception of psychotherapy notes, which are deemed as property of the psychotherapist who wrote them.

Table 5.2-4 Transaction Rule Code Sets Table 5.2-5 Patient's Rights under the Privacy Rule

In 2003, the Privacy Rule was executed. Under the Privacy Rule, there are certain guidelines by which every practice must abide:

1. Every practice must establish written privacy procedures. These include administrative, physical, and technical safeguards that establish who has access to the patient's

information, how this information is used within the facility, and when the information will and will not be disclosed to others.
2. Every practice must take steps to make sure that its business associates protect the privacy of medical records and other health information.
3. Every practice must train employees to comply with the rule.
4. Every practice must have a designated person to serve as a privacy officer. If it is an individual practice or private practice, this person can be the physician.
5. Every practice must establish complaint procedures for patients who wish to ask or to complain about the privacy of their records. The OCR at HHS is responsible for making sure that Privacy Rule is enforced; however, it is not clear as to how it will be done. One method expressed by the

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government is a complaint-driven system in which the OCR will respond to complaints made by patients concerning confidentiality violations or denied access to records, all of which are covered under HIPAA. In such cases, OCR may follow up and audit compliance. The APA's Committee on Confidentiality, along with legal experts, has developed a set of sample forms. They are part of the APA's HIPAA educational packet, which can be obtained on the APA web site (www.psych.org/). On the web site, there are also recommendations for enabling physicians to comply with HIPAA. REFERENCES Dougall N, Lambert P, Maxwell M, Dawson A, Sinnott R, McCafferty S, Springbett A. Deaths by suicide and their relationship with general and psychiatric hospital discharge: 30-year record linkage study. Br J Psychiatry . 2014;204(4). Simon RI. Clinical Psychiatry and the Law. American Psychiatric Pub; 2003. 5.3 Psychiatric Rating Scales The term psychiatric rating scales encompasses a variety of questionnaires, interviews, checklists, outcome assessments, and other instruments that are available to inform psychiatric practice, research, and administration. Psychiatrists must keep up with major developments in rating scales for several reasons. Most critically, many such scales are useful in psychiatric practice for monitoring patients over time or for providing information that is more comprehensive than what is generally obtained in a routine clinical interview. In addition, health care administrators and payors are increasingly requiring standardized assessments to justify the need for services or to assess quality of care. Lastly, but equally important, rating scales are used in research that informs the practice of psychiatry, so familiarity with them provides a deeper understanding of the results of that research and the degree to which it applies to psychiatric practice. POTENTIAL BENEFITS AND LIMITATIONS OF RATING SCALES IN PSYCHIATRY The key role of rating scales in psychiatry and elsewhere is to standardize the information collected across time and by various observers. This standardization ensures a consistent, comprehensive evaluation that may aid treatment planning by establishing a diagnosis, ensuring a thorough description of symptoms, identifying comorbid conditions, and characterizing other factors affecting treatment response. In addition, the use of a rating scale can establish a baseline for follow up of the progression of an illness over time or in response to specific interventions. This is particularly useful when more than one clinician is involved—for instance, in a group practice or in the conduct of psychiatric research. In addition to standardization, most rating scales also offer the user the advantages of a formal evaluation of the measure's performance characteristics. This allows the

clinician to know to what extent a given scale produces reproducible results (reliability) and how it compares to more definitive or established ways of measuring the same thing (validity). TYPES OF SCALES AND WHAT THEY MEASURE Scales are used in psychiatric research and practice to achieve a variety of goals. They also cover a broad range of areas and use a broad range of procedures and formats. Measurement Goals Most psychiatric rating scales in common use fall into one or more of the following categories: making a diagnosis; measuring severity and tracking change in specific symptoms, in general functioning, or in overall outcome; and screening for conditions that may or may not be present. Constructs Assessed Psychiatric practitioners and investigators assess a broad range of areas, referred to as constructs, to underscore the fact that they are not simple, direct observations of nature. These include diagnoses, signs and symptoms, severity, functional impairment, quality of life, and many others. Some of these constructs are fairly complex and are divided into two or more domains (e.g., positive and negative symptoms in schizophrenia or mood and neurovegetative symptoms in major depression). Categorical versus Continuous Classification. Some constructs are viewed as categorical or classifying, whereas others are seen as continuous or measuring. Categorical constructs describe the presence or absence of a given attribute (e.g., competency to stand trial) or the category best suited to a given individual among a finite set of options (e.g., assigning a diagnosis). Continuous measures provide a quantitative assessment along a continuum of intensity, frequency, or severity. In addition to symptom severity and functional status, multidimensional personality traits, cognitive status, social support, and many other attributes are generally measured continuously. The distinction between categorical and continuous measures is by no means absolute. Ordinal classification, which uses a finite, ordered set of categories (e.g., unaffected, mild, moderate, or severe) stands between the two. Measurement Procedures Rating scales differ in measurement methods. Issues to be considered include format, raters, and sources of information. Format. Rating scales are available in a variety of formats. Some are simply checklists or guides to observation that help the clinician achieve a standardized rating.

Others are self-administered questionnaires or tests. Still others are formal interviews that may be fully structured (i.e., specifying the exact wording of questions to be asked) or partly structured (i.e., providing only some specific wording, along with suggestions for additional questions or probes). Raters. Some instruments are designed to be administered by doctoral-level clinicians only, whereas others may be administered by psychiatric nurses or social workers with more limited clinical experience. Still other instruments are designed primarily for use by lay raters with little or no experience with psychopathology. Source of Information. Instruments also vary in the source of information used to make the ratings. Information may be obtained solely from the patient, who generally knows the most about his or her condition. In some instruments, some or all of the information may be obtained from a knowledgeable informant. When the construct involves limited insight (e.g., cognitive disorders or mania) or significant social undesirability (e.g., antisocial personality or substance abuse), other informants may be preferable. Informants may also be helpful when the subject has limited ability to recall or report symptoms (e.g., delirium, dementia, or any disorder in young children). Some rating scales also allow or require information to be included from medical records or from patient observation. ASSESSMENT OF RATING SCALES In clinical research, rating scales are mandatory to ensure interpretable and potentially generalizable results and are selected based on coverage of the relevant constructs, expense (based on the nature of the raters, purchase price if any, and necessary training), length and administration time, comprehensibility to the intended audience, and quality of the ratings provided. In clinical practice,

one considers these factors and, also, whether a scale would provide more or better information than what would be obtained in ordinary clinical practice or would contribute to the efficiency of obtaining that information. In either case, the assessment of quality is based on psychometric, or mind-measuring, properties. Psychometric Properties The two principal psychometric properties of a measure are reliability and validity. Although these words are used almost interchangeably in everyday speech, they are distinct in the context of evaluating rating scales. To be useful, scales should be reliable, or consistent and repeatable even if performed by different raters at different times or under different conditions, and they should be valid, or accurate in representing the true state of nature. Reliability. Reliability refers to the consistency or repeatability of ratings and is largely empirical. An instrument is more likely to be reliable if the instructions and

questions are clearly and simply worded and the format is easy to understand and score. There are three standard ways to assess reliability: internal consistency, interrater, and test–retest. Internal Consistency. Internal consistency assesses agreement among the individual items in a measure. This provides information about reliability, because each item is viewed as a single measurement of the underlying construct. Thus, the coherence of the items suggests that each is measuring the same thing. Interrater and Test–Retest Reliability. Interrater (also called interjudge or joint) reliability is a measure of agreement between two or more observers evaluating the same subjects using the same information. Estimates may vary with assessment conditions—for instance, estimates of interrater reliability based on videotaped interviews tend to be higher than those based on interviews conducted by one of the raters. Test–retest evaluations measure reliability only to the extent that the subject's true condition remains stable in the time interval. Issues in Interpreting Reliability Data. When interpreting reliability data, it is important to bear in mind that reliability estimates published in the literature may not generalize to other settings. Factors to consider are the nature of the sample, the training and experience of the raters, and the test conditions. Issues regarding the sample are especially critical. In particular, reliability tends to be higher in samples with high variability in which it is easier to discriminate among individuals. Validity. Validity refers to conformity with truth, or a gold standard that can stand for truth. In the categorical context, it refers to whether an instrument can make correct classifications. In the continuous context, it refers to accuracy, or whether the score assigned can be said to represent the true state of nature. Although reliability is an empirical question, validity is partly theoretical—for many constructs measured in psychiatry, there is no underlying absolute truth. Even so, some measures yield more useful and meaningful data than others do. Validity assessment is generally divided into face and content validity, criterion validity, and construct validity. FACE AND CONTENT VALIDITY. Face validity refers to whether the items appear to assess the construct in question. Although a rating scale may purport to measure a construct of interest, a review of the items may reveal that it embodies a very different conceptualization of the construct. For instance, an insight scale may define insight in either psychoanalytic or neurological terms. However, items with a transparent relationship to the construct may be a disadvantage when measuring socially undesirable traits, such as substance abuse or malingering. Content validity is similar to face validity but describes whether the measure provides good balanced coverage of the construct and is less focused on whether the items give the appearance of validity. Content validity is often assessed with formal procedures such as expert consensus or

factor analysis. CRITERION VALIDITY. Criterion validity (sometimes called predictive or concurrent validity) refers to whether or not the measure agrees with a gold standard or criterion of accuracy.

Suitable gold standards include the long form of an established instrument for a new, shorter version, a clinician-rated measure for a self-report form, and blood or urine tests for measures of drug use. For diagnostic interviews, the generally accepted gold standard is the Longitudinal, Expert, All Data (LEAD) standard, which incorporates expert clinical evaluation, longitudinal data, medical records, family history, and any other sources of information. CONSTRUCT VALIDITY. When an adequate gold standard is not available—a frequent state of affairs in psychiatry—or when additional validity data are desired, construct validity must be assessed. To accomplish this, one can compare the measure to external validators, attributes that bear a well-characterized relationship to the construct under study but are not measured directly by the instrument. External validators used to validate psychiatric diagnostic criteria and the diagnostic instruments that aim to operationalize them include course of illness, family history, and treatment response. For example, when compared with schizophrenia measures, mania measures are expected to identify more individuals with a remitting course, a family history of major mood disorders, and a good response to lithium. SELECTION OF PSYCHIATRIC RATING SCALES The scales discussed below cover various areas such as diagnosis, functioning, and symptom severity, among others. Selections were made based on coverage of major areas and common use in clinical research or current (or potential) use in clinical practice. Only a few of the many scales available in each category are discussed here. Disability Assessment One of the most widely used scales to measure disability was developed by the World Health Association (WHO), known as the WHO Disability Assessment Schedule, now in its second iteration (WHODAS 2.0). It is self-administered and measures disability along a number of parameters such as cognition, interpersonal relations, work and social impairment, among many others. It can be taken at intervals along the course of a person’s illness and is reliable in tracking changes that indicate a positive or negative response to therapeutic interventions or course of illness (Table 5.3-1). Table 5.3-1 WHODAS 2.0

A number of assessment scales were developed for inclusion in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association, (DSM-5); however, they were developed by and intended for use by research psychiatrists and are not as well tested as the WHO scales. It is expected that, in time, they will eventually be better adapted for clinical use. Some clinicians may wish to use the scales known as Cross-Cutting Symptom Measure Scales, but at this time the WHO scale is recommended for general use. Psychiatric Diagnosis Instruments assessing psychiatric diagnosis are central to psychiatric research and may be useful in clinical practice as well. However, they tend to be rather long, especially with individuals reporting many symptoms, potentially requiring many follow-up questions. When such instruments are evaluated, it is important to ensure they implement the current diagnostic criteria and cover the diagnostic areas of interest. Structured Clinical Interview for DSM (SCID). The SCID begins with a section on demographic information and clinical background. Then there are seven diagnostic modules focused on different diagnostic groups: mood, psychotic, substance abuse, anxiety, somatic, eating, and adjustment disorders; the modules can be administered separately. Both required and optional probes are provided, and skip outs are suggested where no further questioning is warranted. All available information, including that from hospital records, informants, and patient observation, should be used to rate the SCID. The SCID is designed to be administered by experienced clinicians and is generally not recommended for use by lay interviewers. In addition, formal training in the SCID is required, and training books and videos are available to facilitate this. Although the primary focus is research with psychiatric patients, a nonpatient version (with no reference to a chief complaint) and a more clinical version (without as much

detailed subtyping) are also available. Reliability data on the SCID suggest that it performs better on more severe disorders (e.g., bipolar disorder or alcohol dependence) than on milder ones (e.g., dysthymia). Validity data are limited, as the SCID is more often used as the gold standard to evaluate other instruments. It is considered the standard interview to verify diagnosis in clinical trials and is extensively used in other forms of psychiatric research. Although its length precludes its use in routine clinical practice, the SCID can sometimes be useful to ensure a systematic evaluation in psychiatric patients—for instance, on admission to an inpatient unit or at intake into an outpatient clinic. It is also used in forensic practice to ensure a formal and reproducible examination. Psychotic Disorders A variety of instruments are used for patients with psychotic disorders. Those discussed here are symptom severity measures. A developing consensus suggests that the

distinction between positive and negative symptoms in schizophrenia is worthwhile, and more recently developed instruments implement this distinction. Brief Psychiatric Rating Scale (BPRS). The BPRS (Table 5.3-2) was developed in the late 1960s as a short scale for measuring the severity of psychiatric symptomatology. It was developed primarily to assess change in psychotic inpatients and covers a broad range of areas, including thought disturbance, emotional withdrawal and retardation, anxiety and depression, and hostility and suspiciousness. Reliability of the BPRS is good to excellent when raters are experienced, but this is difficult to achieve without substantial training; a semistructured interview has been developed to increase reliability. Validity is also good as measured by correlations with other measures of symptom severity, especially those assessing schizophrenia symptomatology. The BPRS has been used extensively for decades as an outcome measure in treatment studies of schizophrenia; it functions well as a measure of change in this context and offers the advantage of comparability with earlier trials. However, it has been largely supplanted in more recent clinical trials by the newer measures described below. In addition, given its focus on psychosis and associated symptoms, it is only suitable for patients with fairly significant impairment. Its use in clinical practice is less well supported, in part because considerable training is required to achieve the necessary reliability. Table 5.3-2 Brief Psychiatric Rating Scale

Positive and Negative Syndrome Scale (PANSS). The PANSS was developed in the late 1980s to remedy perceived deficits in the BPRS in the assessment of positive and negative symptoms of schizophrenia and other psychotic disorders by adding additional items and providing careful anchors for each. The PANSS requires a clinician rater because considerable probing and clinical judgment are required. A semistructured interview guide is available. Reliability for each scale has been shown to be fairly high, with excellent internal consistency and interrater reliability. Validity also appears good based on correlation with other symptom severity measures and factor analytic validation of the subscales. The PANSS has become the standard tool for assessing clinical outcome in treatment studies of schizophrenia and other psychotic disorders and has been shown to be easy to administer reliably and sensitive to change with treatment. Its high reliability and good coverage of both positive and negative symptoms make it excellent for this purpose. It may also be useful for tracking severity in clinical practice, and its clear anchors make it easy to use in this setting. Scale for the Assessment of Positive Symptoms (SAPS) and Scale for the Assessment of Negative Symptoms (SANS). The SAPS and SANS (Tables 5.3-3 and 5.3-4) were designed to provide a detailed assessment of positive and negative

symptoms of schizophrenia and may be used separately or in tandem. SAPS assesses hallucinations, delusions, bizarre behavior, and thought disorder, and SANS assesses affective flattening, poverty of speech, apathy, anhedonia, and inattentiveness. The SAPS and SANS are mainly used to monitor treatment effects in clinical research. Table 5.3-3 Scale for the Assessment of Positive Symptoms (SAPS)

Table 5.3-4 Scale for the Assessment of Negative Symptoms (SANS)

Mood Disorders The domain of mood disorders includes both unipolar and bipolar disorder, and the instruments described here assess depression and mania. For mania, the issues are similar to those for psychotic disorders in that limited insight and agitation may hinder accurate symptom reporting, so clinician ratings including observational data are

generally required. Rating depression, on the other hand, depends, to a substantial extent, on subjective assessment of mood states, so interviews and self-report instruments are both common. Because depression is common in the general population and involves significant morbidity and even mortality, screening instruments— especially those using a self-report format—are potentially quite useful in primary care and community settings. Hamilton Rating Scale for Depression (HAM-D). The HAM-D was developed in the early 1960s to monitor the severity of major depression, with a focus on somatic symptomatology. The 17-item version is the most commonly used version, although versions with different numbers of items, including the 24-item version in Table 5.3-5, have been used in many studies as well. The 17-item version does not include some of the symptoms for depression in DSM-III and its successors, most notably the so-called reverse neurovegetative signs (increased sleep, increased appetite, and psychomotor retardation). The HAM-D was designed for clinician raters but has been used by trained lay administrators as well. Ratings are completed by the examiner based on the patient interview and observations. A structured interview guide has been developed to improve reliability. The ratings can be completed in 15 to 20 minutes. Reliability is good to excellent, particularly when the structured interview version is used. Validity appears good based on correlation with other depression symptom measures. The HAM-D has been used extensively to evaluate change in response to pharmacological and other interventions and, thus, offers the advantage of comparability across a broad range of treatment trials. It is more problematic in the elderly and the medically ill, in whom the presence of somatic symptoms may not be indicative of major depression. Table 5.3-5 Hamilton Rating Scale for Depression

Beck Depression Inventory (BDI). The BDI was developed in the early 1960s to rate depression severity, with a focus on behavioral and cognitive dimensions of depression. The current version, the Beck-II, has added more coverage of somatic symptoms and covers the most recent 2 weeks. Earlier versions are focused on the past week or even shorter intervals, which may be preferable for monitoring treatment response. The scale can be completed in 5 to 10 minutes. Internal consistency has been high in numerous studies. Test–retest reliability is not consistently high, but this may reflect changes in underlying symptoms. Validity is supported by correlation with other depression measures. The principal use of the BDI is as an outcome measure in clinical trials of interventions for major depression, including psychotherapeutic interventions. Because it is a self-report instrument, it is sometimes used to screen for major depression. Anxiety Disorders The anxiety disorders addressed by the measures below include panic disorder, generalized anxiety

disorder, posttraumatic stress disorder (PTSD), and obsessivecompulsive disorder (OCD). When anxiety measures are examined, it is important to be aware that there have been significant changes over time in how anxiety disorders are defined. Both panic and OCD are relatively recently recognized, and the conceptualization of generalized anxiety disorder has shifted over time. Thus, older measures have somewhat less relevance for diagnostic purposes, although they may identify symptoms causing considerable distress. Whether reported during an interview or on a self-report rating scale, virtually all measures in this domain, like the measures of depression discussed above, depend on subjective descriptions of inner states.

Hamilton Anxiety Rating Scale (HAM-A). The HAM-A (Table 5.3-6) was developed in the late 1950s to assess anxiety symptoms, both somatic and cognitive. Because the conceptualization of anxiety has changed considerably, the HAM-A provides limited coverage of the “worry” required for a diagnosis of generalized anxiety disorder and does not include the episodic anxiety found in panic disorder. A score of 14 has been suggested as the threshold for clinically significant anxiety, but scores of 5 or less are typical in individuals in the community. The scale is designed to be administered by a clinician, and formal training or the use of a structured interview guide is required to achieve high reliability. A computer-administered version is also available. Reliability is fairly good based on internal consistency, interrater, and test–retest studies. However, given the lack of specific anchors, reliability should not be assumed to be high across different users in the absence of formal training. Validity appears good based on correlation with other anxiety scales but is limited by the relative lack of coverage of domains critical to the modern understanding of anxiety disorders. Even so, the HAM-A has been used extensively to monitor treatment response in clinical trials of generalized anxiety disorder and may also be useful for this purpose in clinical settings. Table 5.3-6 Hamilton Anxiety Rating Scale

Panic Disorder Severity Scale (PDSS). The PDSS was developed in the 1990s as a brief rating scale for the severity of panic disorder. It was based on the Yale-Brown Obsessive-Compulsive Scale and has seven items, each of which is rated on an itemspecific, 5-point Likert scale. The seven items address frequency of attacks, distress associated with attacks, anticipatory anxiety, phobic avoidance, and impairment. Reliability is excellent based on interrater studies, but, in keeping with the small number of items and multiple dimensions, internal consistency is limited. Validity is supported by correlations with other anxiety measures, both at the total and item levels; lack of correlation with the HAM-D; and, more recently, by brain imaging studies. Growing experience with the PDSS suggests that it is sensitive to change with treatment and is useful as a change measure in clinical trials or other outcome studies for panic disorder, as well as for monitoring panic disorder in clinical practice. Clinician-Administered PTSD Scale (CAPS). The CAPS includes 17 items required to make the diagnosis, covering all four criteria: (1) the event itself, (2) reexperiencing of the event, (3) avoidance, and (4) increased arousal. The diagnosis requires evidence of a traumatic event, one symptom of re-experiencing, three of avoidance, and two of arousal (typically, an item is counted if frequency is rated at least 1 and intensity is at least 2). The items can also be used to generate a total PTSD severity score obtained by summing the frequency and intensity scales for each item. The CAPS also includes several global rating scales for the impact of PTSD symptomatology on social and occupational functioning, for general severity, for recent changes, and for the validity of the patient’s report. The CAPS must be administered by a trained clinician and requires 45 to 60 minutes to complete, with follow-up examinations somewhat briefer. It has demonstrated reliability and validity in multiple settings and multiple languages, although it has

had more limited testing in the setting of sexual and criminal assault. It performs well in the research setting for diagnosis and severity assessment but is generally too lengthy for use in clinical practice. Yale-Brown Obsessive-Compulsive Scale (YBOCS). The YBOCS was developed in the late 1980s to measure the severity of symptoms in OCD. It has ten items rated based on a semistructured interview. The first five items concern obsessions: the amount of time that they consume, the degree to which they interfere with normal functioning, the distress that they cause, the patient's attempts to resist them, and the patient's ability to control them. The remaining five items ask parallel questions about compulsions. The semistructured interview and ratings can be completed in 15 minutes or less. A self-administered version has recently been developed and can be completed in 10 to 15 minutes. Computerized and telephone use have also been found to provide acceptable ratings. Reliability studies of the YBOCS show good internal consistency, interrater reliability, and test–retest reliability over a 1-week interval. Validity appears good, although data are fairly limited in this developing field. The YBOCS has become the standard instrument for assessing OCD severity and is used in virtually every drug trial. It may also be used clinically to monitor treatment response.

Substance Use Disorders Substance use disorders include abuse and dependence on both alcohol and drugs. These disorders, particularly those involving alcohol, are common and debilitating in the general population, so screening instruments are particularly helpful. Because these behaviors are socially undesirable, underreporting of symptoms is a significant problem; thus, the validity of all substance use measures is limited by the honesty of the patient. Validation against drug tests or other measures is of great value, particularly when working with patients who have known substance abuse. CAGE. The CAGE was developed in the mid-1970s to serve as a very brief screen for significant alcohol problems in a variety of settings, which could then be followed up by clinical inquiry. CAGE is an acronym for the four questions that comprise the instrument: (1) Have you ever felt you should Cut down on your drinking? (2) Have people Annoyed you by criticizing your drinking? (3) Have you ever felt bad or Guilty about your drinking? (4) Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (Eye-opener)? Each "yes" answer is scored as 1, and these are summed to generate a total score. Scores of 1 or more warrant follow up, and scores of 2 or more strongly suggest significant alcohol problems. The instrument can be administered in a minute or less, either orally or on paper. Reliability has not been formally assessed. Validity has been assessed against a clinical diagnosis of alcohol abuse or dependence, and these four questions perform surprisingly well. Using a threshold score of 1, the CAGE achieves excellent sensitivity and fair to good specificity. A threshold of 2 provides still greater specificity but at the cost of a drop in sensitivity. The CAGE performs well as an extremely brief screening instrument for use in primary care or in psychiatric practice focused on problems unrelated to alcohol. However, it has limited ability to pick up early indicators of problem drinking that might be the focus of preventive efforts. Addiction Severity Index (ASI). The ASI was developed in the early 1980s to serve as a quantitative measure of symptoms and functional impairment due to alcohol or drug disorders. It covers demographics, alcohol use, drug use, psychiatric status, medical status, employment, legal status, and family and social issues. Frequency, duration, and severity are assessed. It includes both subjective and objective items reported by the patient and observations made by the interviewer. Eating Disorders Eating disorders include anorexia nervosa, bulimia, and binge-eating disorder. A wide variety of instruments, particularly self-report scales, are available. Because of the secrecy that may surround dieting, bingeing, purging, and other symptoms, validation against other indicators (e.g., body weight for anorexia or dental examination

for bulimia) may be very helpful. Such validation is particularly critical for patients with anorexia, who may lack insight into their difficulties.

Eating Disorders Examination (EDE). The EDE was developed in 1987 as the first interviewer-based comprehensive assessment of eating disorders, including diagnosis, severity, and an assessment of subthreshold symptoms. A self-report version (the EDE-Q) as well as an interview for children have since been developed. The EDE focuses on symptoms during the preceding 4 weeks, although longer-term questions are included to assess diagnostic criteria for eating disorders. Each item on the EDE has a required probe with suggested follow-up questions to judge severity, frequency, or both, which are then rated on a 7-point Likert scale. For the self-report version, subjects are asked to make similar ratings of frequency or severity. The instrument provides both global severity ratings and ratings on four subscales: restraint, eating concern, weight concern, and shape concern. The interview, which must be administered by a trained clinician, requires 30 to 60 minutes to complete, whereas the self-report version can be completed more quickly. Reliability and validity data for both the EDE and EDE-Q are excellent, although the EDE-Q may have greater sensitivity for binge-eating disorder. The EDE performs well in both the diagnosis and the detailed assessment of eating disorders in the research context. It also has the sensitivity to change as is required for use in clinical trials or monitoring of individual therapy. Even in the research setting, however, the EDE is fairly lengthy for repeated use, and the EDE-Q may be preferable for some purposes. Although the EDE is too lengthy for routine clinical practice, the EDE or EDE-Q might be helpful in providing a comprehensive assessment of a patient with a suspected eating disorder, particularly during an evaluation visit or on entry into an inpatient facility. Bulimia Test–Revised (BULIT-R). The BULIT-R was developed in the mid-1980s to provide both a categorical and a continuous assessment of bulimia. Patients with bulimia typically score above 110, whereas patients without disordered eating typically score below 60. The instrument can be completed in approximately 10 minutes. The BULIT-R shows high reliability based on studies of internal consistency and test–retest reliability in multiple studies. Validity is supported by high correlations with other bulimia assessments. The recommended cutoff of 104 suggested to identify probable cases of bulimia shows high sensitivity and specificity for a clinical diagnosis of bulimia nervosa. With cutoffs between 98 and 104, the BULIT-R has been used successfully to screen for cases of bulimia nervosa. As with any screening procedure, follow-up by clinical examination is indicated for individuals scoring positive; clinical follow-up is particularly critical because the BULIT-R does not distinguish clearly between different types of eating disorders. The BULIT-R may also be useful in clinical and research practice to track symptoms over time or in response to treatment, although more detailed measures of the frequency and severity of bingeing and purging may be preferable in research settings. Cognitive Disorders A wide variety of measures of dementia are available. Most involve cognitive testing

and provide objective, quantifiable data. However, scores vary by educational level in subjects without dementia, so these instruments tend to be most useful when the patient’s own baseline scores are known. Other measures focus on functional status, which can be assessed based on a comparison with a description of the subject’s baseline function; these types of measures generally require a knowledgeable informant and, thus, may be more cumbersome to administer but tend to be less subject to educational biases. A third type of measure focuses on the associated behavioral symptoms that are frequently seen in demented patients. Mini-Mental State Examination (MMSE). The MMSE is a 30-point cognitive test developed in the mid-1970s to provide a bedside assessment

of a broad array of cognitive function, including orientation, attention, memory, construction, and language. It can be administered in less than 10 minutes by a busy doctor or a technician and scored rapidly by hand. The MMSE has been extensively studied and shows excellent reliability when raters refer to consistent scoring rules. Validity appears good based on correlations with a wide variety of more comprehensive measures of mental functioning and clinicopathological correlations. Since its development in 1975, the MMSE was widely distributed in textbooks, pocket guides, and on web sites and has been used at the bedside. In 2001 the authors granted a worldwide exclusive license to Psychological Assessment Resources (PAR) to publish, distribute, and manage all intellectual property rights to the test. A licensed version of the MMSE must now be purchased from PAR per test. The MMSE form is gradually disappearing from textbooks, web sites, and clinical tool kits. In an article in the New England Journal of Medicine (2011;365:2447–2449) John C. Newman and Robin Feldman concluded: “The restrictions on the MMSE’s use present clinicians with difficult choices: increase practice costs and complexity, risk copyright infringement, or sacrifice 30 years of practical experience and validation to adopt new cognitive assessment tools.” Neuropsychiatric Inventory (NPI). The NPI was developed in the mid-1990s to assess a wide range of behavioral symptoms that are often seen in Alzheimer’s disease and other dementing disorders. The current version rates 12 areas: delusions, hallucinations, dysphoria, anxiety, agitation/aggression, euphoria, disinhibition, irritability/lability, apathy, aberrant motor behavior, nocturnal disturbances, appetite and eating. The standard NPI is an interview with a caregiver or other informant that can be performed by a clinician or trained lay interviewer and requires 15 to 20 minutes to complete. There is also a nursing home interview version, the NPI-NH, and a selfreport questionnaire, the NPI-Q. For each area, the NPI asks whether a symptom is present and, if so, assesses frequency, severity, and associated caregiver distress. The instrument has demonstrated reliability and validity and is useful to screen for problem behaviors in both clinical and research settings. Because of the detailed frequency and severity ratings, it is also useful to monitor change with treatment. Scored General Intelligence Test (SGIT). This test was developed and

validated by N. D. C. Lewis at the New York State Psychiatric Institute in the 1930s. It is one of the few tests that attempts to measure general intelligence that can be administered by the clinician during the psychiatric interview. A decline in general intelligence will be seen in cognitive disorders, and the SGIT can alert the clinician to begin a workup for disease states that interfere with cognition. This test deserves more widespread use (Table 5.3-7). Table 5.3-7 Scored General Intelligence Test (SGIT) Personality Disorders and Personality Traits Personality may be conceptualized categorically as personality disorders or dimensionally as personality traits, which may be viewed as normal or pathological.

The focus here is on personality disorders and the maladaptive traits generally viewed as their milder forms. There are ten personality disorders that are divided into three clusters. Patients tend not to fall neatly into DSM personality categories; instead, most patients who meet the criteria for one personality disorder also meet the criteria for at least one other, particularly within the same cluster. This and other limitations in the validity of the constructs themselves make it difficult to achieve validity in personality measures. Personality measures include both interviews and self-report instruments. Self-report measures are appealing in that they require less time and may appear less threatening to the patient. However, they tend to overdiagnose personality disorders. Because many of the symptoms suggesting personality problems are socially undesirable and

because patients' insight tends to be limited, clinician-administered instruments, which allow for probing and patient observation, may provide more accurate data. Personality Disorder Questionnaire (PDQ). The PDQ was developed in the late 1980s as a simple self-report questionnaire designed to provide categorical and dimensional assessment of personality disorders. The PDQ includes 85 yes-no items designed primarily to assess the diagnostic criteria for personality disorders. Within the 85 items, two validity scales are embedded to identify underreporting, lying, and inattention. There is also a brief clinician-administered Clinical Significance Scale to address the impact of any personality disorder identified by the self-report PDQ. The PDQ can provide categorical diagnoses, a scaled score for each, or an overall index of personality disturbance based on the sum of all of the diagnostic criteria. Overall scores range from 0 to 79; normal controls tend to score below 20, personality disordered patients generally score above 30, and psychotherapy outpatients without such disorders tend to score in the 20 to 30 range. Childhood Disorders A wide variety of instruments are available to assess mental disorders in children. Despite this rich array of instruments, however, the evaluation of children remains difficult for several reasons. First, the child psychiatric nosology is at an earlier stage of development, and construct validity is often problematic. Second, because children change markedly with age, it is virtually impossible to design a measure that covers children of all ages. Lastly, because children, particularly young children, have limited ability to report their symptoms, other informants are necessary. This often creates problems because there are frequent disagreements among child, parent, and teacher reports of symptoms, and the optimal way to combine information is unclear. Child Behavior Checklist (CBCL). The CBCL is a family of self-rated instruments that survey a broad range of difficulties encountered in children from preschool through adolescence. One version of the CBCL is designed for completion by parents of children between 4 and 18 years of age. Another version is available for parents of children between 2 and 3 years of age. The Youth Self-Report is completed by

children between 11 and 18 years of age, and the Teacher Report Form is completed by teachers of school-age children. The scale includes not only problem behaviors, but also academic and social strengths. Each version includes approximately 100 items scored on a 3-point Likert scale. Scoring can be done by hand or computer, and normative data are available for each of the three subscales: problem behaviors, academic functioning, and adaptive behaviors. A computerized version is also available. The CBCL does not generate diagnoses but, instead, suggests cutoff scores for problems in the "clinical range." Parent, teacher, and child versions all show high reliability on the problem subscale, but the three informants frequently do not agree with one another. The CBCL may be useful in clinical settings as an adjunct to clinical evaluation, as it provides a good overall view of symptomatology and may also be used to track change over time. It is used frequently for similar purposes in research involving children and, thus, can be compared with clinical experience. The instrument does not, however, provide diagnostic information, and its length limits its efficiency for tracking purposes. Diagnostic Interview Schedule for Children (DISC). The current DISC, the DISC-IV, covers a broad range of DSM diagnoses, both current and lifetime. It has nearly 3,000 questions but is structured with a series of stem questions that serve as gateways to each diagnostic area, with the remainder of each section skipped if the subject answers no. Subjects who enter each section have very few skips, so complete diagnostic and symptom scale information can be obtained. Child, parent, and teacher versions are available. Computer programs are available to implement diagnostic criteria and generate severity scales based on each version or to combine parent and child information. A typical DISC interview may take more than 1 hour for

a child, plus an additional hour for a parent. However, because of the stem question structure, the actual time varies widely with the number of symptoms endorsed. The DISC was designed for lay interviewers. It is fairly complicated to administer, and formal training programs are highly recommended. Reliability of the DISC is only fair to good and generally better for the combined child and parent interview. Validity judged against a clinical interview by a child psychiatrist is also fair to good—better for some diagnoses and better for the combined interview. The DISC is well tolerated by parents and children and can be used to supplement a clinical interview to ensure comprehensive diagnostic coverage. Because of its inflexibility, some clinicians find it uncomfortable to use, and its length makes it less than optimal for use in clinical practice. However, it is used frequently in a variety of research settings. Conners Rating Scales. The Conners Rating Scales are a family of instruments designed to measure a range of childhood and adolescent psychopathology but are most commonly used in the assessment of attention-deficit/hyperactivity disorder (ADHD). The main uses of the Conners Rating Scales are in screening for ADHD in school or clinic populations and following changes in symptom severity over time; sensitivity to change in response to specific therapies has been demonstrated for most versions of the Conners Rating Scales. There are teacher, parent, and self-report (for adolescents) versions and

both short (as few as ten items) and long (as many as 80 items, with multiple subscales) forms. Reliability data are excellent for the Conners Rating Scales. However, the teacher and parent versions tend to show poor agreement. Validity data suggest that the Conners Rating Scales are excellent at discriminating between ADHD patients and normal controls. Autism Diagnostic Interview–Revised (ADI-R). The Autism Diagnostic Interview (ADI) was developed in 1989 as a clinical assessment of autism and related disorders. The ADI-R was developed in 2003 with an aim to provide a shorter instrument with better ability to discriminate autism from other developmental disorders. The instrument has 93 items, is designed for individuals with a mental age greater than 18 months, and covers three broad areas, consistent with the diagnostic criteria for autism: language and communication; reciprocal social interactions; and restricted, repetitive, and stereotyped behaviors and interests. There are three versions: one for lifetime diagnosis, one for current diagnosis, and one for patients under age 4 focused on an initial diagnosis. It must be administered by a clinician trained in its use and takes about 90 minutes to complete. When clinicians are properly trained, it has good to excellent reliability and validity but performs poorly in the setting of severe developmental disabilities. It is generally intended for the research setting when a thorough assessment of autism is required but may have use in clinical practice as well. REFERENCES Aggarwal NK, Zhang XY, Stefanovics E, Chen da C, Xiu MH, Xu K, Rosenheck RA. Rater evaluations for psychiatric instruments and cultural differences: The positive and negative syndrome scale in China and the United States. J Nerv Ment Dis. 2012;200(9):814. Blacker D. Psychiatric rating scales. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:1032. Gearing RE, Townsend L, Elkins J, El-Bassel N, Osterberg L. Strategies to Predict, Measure, and Improve Psychosocial Treatment Adherence. Harv Rev Psychiatry. 2014;22:31–45. Gibbons RD, Weiss DJ, Pilkonis PA, Frank E, Moore T, Kim JB, Kupfer DJ. Development of a computerized adaptive test for depression. Arch Gen Psychiatry. 2012;69(11):1104. Leentjens AFG, Dujardin K, Marsh L, Richard IH, Starkstein SE, Martinez-Martin P. Anxiety rating scales in Parkinson’s disease: A validation study of the Hamilton anxiety rating scale, the Beck anxiety inventory, and the hospital anxiety and depression scale. Mov Disord. 2011;26:407. McDowell I, Newell C. Measuring Health: A Guide to Rating Scales and Questionnaires. New York: Oxford University Press; 2006. Posner K, Brown GK,

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04 - 5.4 Clinical Neuropsychology and Intellectual

5.4 Clinical Neuropsychology and Intellectual Assessment of Adults

5.4 Clinical Neuropsychology and Intellectual Assessment of Adults Clinical neuropsychology is a specialty in psychology that examines the relationship between behavior and brain functioning in the realms of cognitive, motor, sensory, and emotional functioning. The clinical neuropsychologist integrates the medical and psychosocial history with the reported complaints and the pattern of performance on neuropsychological procedures in order to determine whether results are consistent with a particular area of brain damage or a particular diagnosis. NEUROANATOMICAL CORRELATES The early history of neuropsychology was driven in large part by the goal of linking behavioral deficits to specific neuroanatomical areas of dysfunction or damage. Although this early assessment method helped to validate neuropsychological tests that are commonly used today, the localizing function of neuropsychological assessment is now considered less important in light of recent advances in neuroimaging techniques. Increasing knowledge in the neurosciences has also led to a more sophisticated view of brain–behavior relationships, in which complex cognitive, perceptual, and motor activities are controlled by neural circuits rather than single structures within the brain. An understanding of these brain–behavior relationships is particularly helpful when evaluating patients with focal damage. It is crucial to ensure that the neuropsychological evaluation adequately assesses relevant behavior that is likely to be associated with that area and its interconnecting pathways. Hemispheric Dominance and Intrahemispheric Localization Many functions are mediated by both the right and left hemispheres. However, important qualitative differences between the two hemispheres can be demonstrated in the presence of lateralized brain injury. Various cognitive skills that have been linked to the left or right hemisphere in right-handed individuals are listed in Table 5.4-1. Although language is the most obvious function that is largely controlled by the left hemisphere, especially among right-handed individuals, the left hemisphere is

also generally considered to be dominant for limb praxis (i.e., performing complex movements, such as brushing teeth, to command, or imitation), and it has been associated with the cluster of deficits identified as Gerstmann syndrome (i.e., finger agnosia, dyscalculia, dysgraphia, and right–left disorientation). In contrast, the right hemisphere is thought to play a more important role in controlling visuospatial abilities and hemispatial attention, which are associated with the clinical presentations of constructional apraxia and neglect, respectively. Table 5.4-1

Selected Neuropsychological Deficits Associated with Left or Right Hemisphere Damage Although lateralized deficits such as these are typically characterized in terms of damage to the right or left hemisphere, it is important to keep in mind that the patient's performance can also be characterized in terms of preserved brain functions. In other words, it is the remaining intact brain tissue that drives many behavioral responses following injury to the brain and not only the absence of critical brain tissue. Language Disorders. Appreciation for the special role of the left hemisphere in the control of language functions in most right-handed individuals has been validated in many studies. These include the results of sodium amytal testing in epilepsy surgery patients, as well as the incidence of aphasia following unilateral stroke to the left versus right hemisphere. Although it is rare for right-handed individuals to be right hemisphere dominant for language, it does occur in about 1 percent of the cases. Hemispheric dominance for language in left-handed individuals is less predictable. About two-thirds of left-handed individuals are actually left hemisphere dominant for language, while about 20 percent each are right hemisphere dominant or bilaterally dominant. A number of classification systems have been developed over the years for describing various patterns of language breakdown. A common method takes into account the presence or absence of three key features: (1) fluency, (2) comprehension, and (3) repetition (i.e., intact ability to repeat verbally presented words or phrases). BROCA'S APHASIA. Broca's aphasia (also called nonfluent or expressive aphasia) has traditionally been characterized by nonfluent speech but intact auditory comprehension and somewhat impaired repetition. It has long been thought to be associated with damage to Broca's area (i.e., left inferior frontal convolution) or Brodmann area 44 (Fig. 5.4-1). However, more recent neuroimaging data in stroke patients have shown that the full syndrome of Broca's aphasia, including agrammatism (telegraphic speech), is found only in the presence of more extensive damage, which encompasses the suprasylvian area from Broca's area to the posterior extent of the sylvian fissure.

FIGURE 5.4-1 Brodmann's areas of the human cortex, showing convex surface (top) and medial surface (bottom). (From Elliott HC. Textbook of Neuroanatomy. Philadelphia: Lippincott; 1969, with permission.) WERNICKE'S APHASIA. Wernicke's aphasia (also called fluent or receptive aphasia) is characterized by fluent speech, impaired comprehension, and somewhat impaired repetition. It has been associated with damage to Wernicke's area in the region of the superior temporal gyrus. The impaired ability to comprehend language directly affects the individual's ability to self-monitor language output and may be related to a breakdown of the syntactic structure of language. Unlike patients with Broca's aphasia, who are usually painfully and obviously aware of their communication difficulty, patients with Wernicke's aphasia are typically not aware of their communication problems, because Wernicke's area is critical for comprehending their own speech as

well as the language of others. This lack of insight is similar to the condition of anosognosia, in which patients fail to appreciate their own deficits, and presents a particularly frustrating condition

for many family members and caregivers. CONDUCTION APHASIA. Patients with conduction aphasia demonstrate relatively intact auditory comprehension and spontaneous speech, due to the preservation of Wernicke's and Broca's areas. However, the ability to repeat words and phrases is specifically impaired and has traditionally been attributed to damage to the arcuate fasciculus, which interconnects Wernicke's and Broca's areas. This type of aphasia is much more subtle and tends to have less negative impact on daily functioning. GLOBAL APHASIA. Another common classification, global aphasia, is characterized by impairment in all three dimensions of fluency, comprehension, and repetition due to damage to the core language areas on the lateral surface of the left hemisphere. In reality many aphasic patients cannot be neatly classified within a specific system because the pattern of deficits does not exactly fit clear descriptive categories. In fact, detailed language assessment of most aphasic patients typically demonstrates deficits in all three areas, although the degree of deficit among the three areas varies. Limb Apraxia. Limb apraxia and other cognitive-motor skills deficits are more commonly seen with left than with right hemisphere damage. However, Kathleen Haaland and Deborah Harrington reviewed data showing that the difference in the incidence of limb apraxia after left or right hemisphere damage is not as great as with language, suggesting that left hemisphere dominance for disorders of complex movement is not as strong as that for language. Although limb apraxia has not traditionally been considered to be of substantial functional importance, recent data reviewed by Leslie Rothi and Kenneth Heilman also suggest that limb apraxia significantly affects rehabilitation outcome. Conceptual apraxia might result in using the wrong object to perform a movement, such as attempting to use a toothbrush to eat. Finally, sequencing errors and ideational errors can lead to disrupted activities, such as trying to light a candle before striking the match. Arithmetic. Arithmetic skills can be impaired after either left or right hemisphere damage. Left hemisphere damage, especially of the parietal lobe, produces difficulty in reading and appreciating the symbolic meaning of numbers (number dyslexia). Left hemisphere damage also can be associated with impaired conceptual understanding of the arithmetic problem (anarithmetria). In contrast, the deficits in arithmetic computation that can accompany right hemisphere damage are more likely to be observed in written problems. These emerge as problems with the spatial aspects of arithmetic, such as errors resulting from hemispatial visual neglect, poor alignment of columns, or visual misperceptions and rotations that can result in confusion of signs for addition and multiplication. Spatial Disorders. Right hemisphere damage in right-handed individuals is

frequently associated with deficits in visuospatial skills. Common assessment techniques include drawings and constructional or spatial assembly tasks. VISUOSPATIAL IMPAIRMENT. Distinctive qualitative errors in constructing block designs and in drawing a complex geometric configuration (e.g., Rey-Osterrieth Complex Figure test) can be seen with either right or left hemisphere damage. In the presence of lateralized damage to the right hemisphere, impaired performance often reflects the patient's inability to appreciate the "Gestalt" or global features of a design. In the example shown in Figure 5.4-2, this is seen in the patient's failure to maintain the 2 × 2 matrix of blocks and instead converting this matrix into a column of four blocks. In contrast, damage to the left hemisphere commonly results in inaccurate reproduction of internal details of the design, including improper orientation of individual blocks, but the 2 × 2 matrix (i.e., the Gestalt) is more likely to be preserved. Many neuropsychologists emphasize that a neuropsychological understanding of the impairment depends not just on a set of test scores but also on a qualitative description of the type of error. This often allows the impairment to be linked to a specific neuroanatomical region as well as enabling a better understanding of the mechanisms of the deficit for rehabilitation purposes.

This qualitative focus on the type of error is similar to the pathognomonic approach that is often used by behavioral neurologists. FIGURE 5.4-2 Examples of block design construction seen in a right hemisphere stroke patient and a left hemisphere stroke patient. (From Sadock BJ, Sadock VA, Ruiz P. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009, with permission.) In another example, damage to the right hemisphere tends to be associated with decreased appreciation of global features of visual stimuli, while left hemisphere damage tends to be associated with decreased analysis of local features and detail. This notion is illustrated in Figure 5.4-3, where a patient with left hemisphere damage focuses on the larger Gestalt of the triangle or letter M with no regard for the internal characters that actually make up the designs. In contrast, the "local" approach of a patient with right hemisphere damage emphasizes the internal details (small rectangles or letter Z)

without appreciation of the Gestalt that is formed by the internal details. This example also illustrates the important point that behavioral responses (including errors) are driven as much by preserved regions of intact brain functioning as by the loss of other regions of brain functioning. FIGURE 5.4-3 Global local target stimuli with drawings from memory by a patient with right hemisphere cerebrovascular accident (CVA) and by a patient with left hemisphere CVA. (From Robertson LC, Lamb MR. Neuropsychological contributions to theories of part/whole organization. Cognit Psychol. 1991;23:325, with permission from Elsevier Science.) NEGLECT. Neglect syndromes are characterized by failure to detect visual or tactile stimuli or to move the limb in the contralateral hemispace. They are most commonly associated with right hemisphere damage in the parietal region, but damage to other areas within the cerebral cortex and subcortical areas can also produce this problem. Although neglect syndromes have a similar incidence and may co-occur with visual field cuts or somatosensory deficits, the neglect syndrome is distinct and not explained by any motor or sensory problems that may be present. Visual neglect can be assessed with line cancellation and line bisection tasks, in which the paper is placed at the patient's midline, and the patient is asked to either cross out all of the lines on the page or to bisect the single line presented. The method of double simultaneous stimulation or visual extinction is another standard procedure for demonstrating the deficit. Neglect syndromes can have devastating functional effects on safety and the ability to live independently and should be taken into account as a standard consideration in the evaluation process. DRESSING APRAXIA. The syndrome of dressing apraxia tends to arise in association with spatial deficits following right hemisphere damage. The resulting difficulty in

coordinating the spatial and tactual demands of dressing can be seen in the patient's difficulty in identifying the top or bottom of a garment, as well as right–left confusion in inserting his or her limbs into the garment. As a result, dressing time can be painfully protracted, and the patient may actually present with a greater level of functional dependence than might otherwise be expected from assessment of simple motor or spatial skills alone. Memory Disorders. Memory complaints constitute the most common referral to neuropsychology. Thorough neuropsychological examination of memory considers the modality (e.g., verbal vs. spatial) in which the material is presented, as well as presentation formats that systematically assess different aspects of the informationprocessing and storage system that forms the basis for memory. Accumulated research indicates that specialized processing of verbal and spatial memory material tends to be differentially mediated by the left and right hemispheres, respectively. In addition to interhemispheric differences in functional localization, specific memory problems can be associated with breakdown at any stage in the information-processing model of memory. These stages include

(1) registration of the material through attention, (2) initial processing and encoding of the material within short-term memory, also known as working memory, (3) consolidation and storage of material in long-term memory, and (4) retrieval processes, in which material moves from long-term memory storage back into consciousness. A great advantage of neuropsychological assessment is that these various types of memory problems can be readily isolated and described in the course of the examination procedures. Once identified, the specific nature of the deficit can then have important implications for diagnosis, treatment, and prognosis. ENCODING. The initial encoding of new material can be influenced by a variety of factors, including deficits in attention, language, and spatial processing abilities. It is usually measured by immediate recall of newly learned information (e.g., narrative stories or designs) or by demonstrating the ability to learn new material that has been presented across multiple “learning trials” (e.g., word lists). Attention itself is a relatively fragile cognitive function that can be affected by many factors, including neurologically based disorders (e.g., head injury or acute confusional state) and psychiatric disorders (e.g., depression or anxiety), so it is a crucial aspect of a proper assessment of memory. STORAGE AND RETRIEVAL. Deficits in recall can be associated with impaired storage of information, or it can be due to impaired retrieval, in which case the material is still present but not readily accessible. The best way of differentiating these problems is to examine recognition memory, in which a patient is typically asked to choose from a set of multiple-choice alternatives or to discriminate target words from false-positive foils. If the patient demonstrates accurate recognition but poor recall, then the problem most likely lies in poor retrieval. However, if recognition is impaired, then the problem is more likely to be related to impaired storage of new information. This distinction is important because the functions of retrieval and storage are subserved by different

neuroanatomical structures. Impaired storage is more often associated with dysfunction of the medial temporal lobe–diencephalic systems, whereas impaired retrieval can be associated with a variety of structures, including the frontal lobes. Executive Function. The prefrontal lobes and their interconnections to the rest of the brain are known to play an important role in executive functions, which are essential in planning and organizing, self-monitoring, and controlling complex problem-solving responses. Damage to the frontal lobes also has been associated with significant personality changes. This was historically exemplified by the famous 19th-century case of Phineas Gage, who became irresponsible, socially inappropriate, and unable to carry out plans after a tamping iron was blown through his frontal lobes. As conceptualized by Muriel Lezak, the executive functions include volition (i.e., formulation of a goal, motivation to achieve the goal, and awareness of one’s own ability to achieve the goal), planning, purposive action (response selection and initiation, maintenance, switching, and stopping), and execution, which involves self-monitoring and self-correction as well as control of the spatiotemporal aspects of the response. Hemispheric differences in the control of executive functions by the frontal lobes have not been as well documented as in the parietal and temporal lobes. Motor Skills. The neuropsychological evaluation commonly includes formal tests of motor skills, such as measures of finger tapping speed, grip strength, and fine motor dexterity. These tests, which have demonstrated validity and reliability, are useful for assessing lateralized motor impairment and have implications for functioning in daily life as well as vocational planning. GENERAL REFERRAL ISSUES Referents turn to neuropsychology for many reasons that include differential diagnosis, baseline measurement, and treatment planning, as well as opinions regarding causality and decisional capacity. Because many referents have limited experience and knowledge of the scope of neuropsychology, it is both reasonable and important for the neuropsychologist to take an active role in refining the specific questions that are

asked and providing realistic information about the limitations of the consultation. Level of Functioning A common referral issue involves documentation of level of functioning for a variety of purposes, including assessment of change or capacity to make decisions, especially in the presence of diagnoses such as dementia, stroke, and head injury. Differential Diagnosis Like any other diagnostic procedure, the results of a neuropsychological examination must be interpreted in light of all available information, including the history and any

associated medical factors that are documented or reported for the individual. Many neurological and psychiatric disorders have similar clusters of symptoms in common, with complaints of concentration or memory problems being among the most frequently reported problems. Age- or Stress-Related Cognitive Change. Many middle-aged and older adults have concerns about everyday concentration and memory failures, and with heightened public awareness about conditions such as Alzheimer's disease, an increasing number of these individuals seek evaluations for these concerns. Neuropsychological testing provides a detailed, objective picture of different aspects of memory and attention, which can be helpful in reassuring healthy persons about their abilities. It also provides an opportunity for assessing undetected mood or anxiety disorders that may be reflected in cognitive concerns and for offering suggestions about mnemonic strategies that can sharpen everyday function. A 77-year-old, left-handed man with a high school education was referred for neuropsychological assessment by his primary care physician after the patient mentioned a recent episode of getting turned around while driving. Results of neuropsychological assessment indicated variable performance on tests of attention and concentration. His performance was excellent on tests of memory, language, and executive problem-solving abilities, but visual-spatial and constructional abilities were moderately impaired. Mild Traumatic Brain Injury. Traumatic brain injury (TBI) is usually classified as mild, moderate, or severe. However, the vast majority of TBI cases referred for neuropsychological consultation involve mild TBI. A significant proportion of persons who have suffered a mild TBI complain of problems with attention and inefficient information processing, memory, and mood, in addition to headache or other forms of pain, for many months after the injury. Neuropsychological testing plays a crucial role in determining the extent of objective cognitive deficit and examining the possible role of psychological factors in perpetuating cognitive problems. The neuropsychologist should bear in mind that many patients with mild TBI are involved in litigation, which can complicate the neuropsychologist's ability to identify the causes for impairment. Although outright malingering is probably relatively infrequent, subtle presentations of chronic illness behavior should be a prominent consideration when potential legal settlements or disability benefits are in question. This is a particularly important factor in the case of mild head injury, when subjective complaints may be disproportionate to the objectively reported circumstances of the injury, especially because most follow-up studies of mild head injury indicate return to neuropsychological baseline with no objective evidence of significant cognitive sequelae after 3 to 12 months following injury.

Poststroke Syndromes. After the acute phase of recovery from stroke, patients may be left with residual deficits, which can affect memory, language, sensory/motor skills, reasoning, or mood. Neuropsychological testing can help to identify areas of strength, which can be used in planning additional rehabilitation and can provide feedback on the functional implications of residual deficits for work or complex activities of daily living. Assessment of functional skills can also be helpful to a psychiatrist who is managing mood and behavioral symptoms or dealing with family caregivers. Detecting Early Dementia. Conditions that particularly warrant neuropsychological assessment for

early detection and potential treatment include HIVrelated cognitive deficits and normal pressure hydrocephalus. When concerns about a person's memory functioning are expressed by relatives instead of the patient, there is a higher probability of a neurological basis for the functional problems. Neuropsychological testing, combined with a good clinical history and other medical screening tests, can be highly effective in distinguishing early dementia from the mild changes in memory and executive functioning that can be seen with normal aging. Neuropsychological evaluation is particularly helpful in documenting cognitive deterioration and differentiating among different forms of dementia. An additional incentive for early diagnosis of dementia now lies in the fact that a portion of patients with early dementia may be candidates for memory-enhancing therapies (e.g., acetylcholinesterase inhibitors), and testing can provide an objective means of monitoring treatment efficacy. Distinguishing Dementia and Depression. A substantial minority of patients with severe depression exhibit serious generalized impairment of cognitive functioning. In addition to problems with attention and slowing of thought and action, there may be significant forgetfulness and problems with reasoning. By examining the pattern of cognitive impairment, neuropsychological testing can help to identify a dementia syndrome that is associated with depression, usually known as pseudodementia. Mixed presentations are also common, in which symptoms of depression coexist with various forms of cognitive decline and exacerbate the effects of cognitive dysfunction beyond what would be expected from the neurological impairment alone. Neuropsychological testing in this case can be very helpful by providing a baseline for measuring the effect of antidepressant or other therapy in alleviating cognitive and mood symptoms. A 75-year-old man with a Ph.D. in the social sciences sought neuropsychological reexamination for ongoing memory complaints, stating that "several of my friends have Alzheimer's." In an initial examination 1 year prior, he had performed in the expect range (above average) for most procedures, despite variable performance on measures of attention and concentration. Results of the follow-up examination again clustered in the expected above average range with variable performance on

measures of attention. On list learning tests of memory, his initial learning of a word list was lower than expected, but delayed retention of the material was above average, with excellent discrimination of target items on a recognition subtest. He also endorsed a large number of symptoms of depression on a self-report inventory. Change in Functioning Over Time Because many neurological diagnoses carry clear expectations regarding normal rates of recovery and decline over time, it is frequently important to re-examine a given patient with follow-up neuropsychological assessment after 6 months to a year. For example, it might be important to monitor declines in independent functioning that could be associated with a progressive dementia or to identify improvement following a stroke or tumor resection. Follow-up examinations also provide an opportunity to objectively examine complaints of long-standing or worsening cognitive sequelae following mild head trauma, even though the current literature indicates that the greatest proportion of recovery of function is likely to occur over the initial 6 months to 1 year postinjury. Although continuing subtle signs of recovery can continue after that period, failure to improve following the injury—or worsening of complaints—would suggest the possibility of contributing psychological factors or the existence of a preexisting or coexisting condition, such as substance abuse, dementia, or outright malingering. Assessment of Decision-Making Capacity Neuropsychologists are often asked to assist in determining an individual's capacity to make decisions or to manage personal affairs. Neuropsychological testing can be useful in these cases by documenting areas of significant impairment and by identifying areas of strength and well-

preserved skills. Opinions about decision-making capacity are seldom based on test findings alone and usually rely heavily on information gleaned from clinical interview, collateral interviews with family or caregivers, and direct observations (e.g., in-home assessment) of everyday function. In fact, appraisal of an individual's level of insight and capacity to appreciate his or her own limitations is typically the single most important aspect of the assessment. Standards for decisionmaking capacity are generally defined by state statutes, and, of course, the ultimate determination of competence rests in the authority of the presiding judge. However, the neuropsychologist or other health care professional can play a significant role in shaping the judge's ruling by providing a professional opinion that is supported by compelling behavioral data that have strong face validity. As a general rule of thumb, consideration of decision-making capacity is usually best approached in the narrowest possible sense so as to infringe as little as possible on the individual's freedom to represent his or her own interests. Therefore, consultation requests for assessment of decision-making capacity should identify specific areas of decision making and behavior that are of concern. Frequent concerns having to do with decision-making capacity involve the areas of (1) financial and legal matters, (2) health care and medical

treatment, and (3) ability to live independently. Some capacity issues involve higher standards, such as ability to drive, ability to work, or practice in a given profession (e.g., air traffic controller, surgeon, or financial advisor). In such cases, it is particularly important for the neuropsychologist to rely on normative expectations that are appropriate for the type of activity, as well as the patient's demographics. Forensic Evaluation Neuropsychological evaluation of individuals in matters pertaining to criminal or civil law usually requires specialized knowledge beyond expertise in neuropsychology. Neuropsychologists are frequently called upon as experts in matters involving head injury, especially in the case of mild head injury associated with a motor vehicle accident. As a distinct subspecialty, this area of practice requires integration of knowledge of statutes, laws, precedents, and legal procedures as well as expertise in identifying and describing the impact of an injury or event on cognitive, emotional, and behavioral functioning. APPROACHES TO NEUROPSYCHOLOGICAL ASSESSMENT The neuropsychological examination systematically assesses functioning in the realms of attention and concentration, memory, language, spatial skills, sensory and motor abilities, as well as executive functioning and emotional status. Because deficits in cognitive performance can only be interpreted in comparison to a person's longstanding or premorbid level of functioning, overall intellectual abilities are typically examined in order to measure the current level of overall functioning and to identify any changes in intellectual functioning. Psychological contributions to performance are also considered with regard to personality and coping style, emotional lability, presence of thought disorder, developmental history, and significant past or current stressors. The expertise of the neuropsychologist lies in integrating findings that are obtained from many diverse sources, including the history, clinical presentation, and several dozen discrete performance scores that make up the neuropsychological data. Battery Approach The battery approach, exemplified by the Halstead-Reitan Neuropsychological Test Battery (HRNTB) or the Neuropsychological Assessment Battery (NAB), grew directly out of the psychometric tradition in psychology. This approach typically includes a large variety of tests that measure most cognitive domains as well as sensory and motor skills. Traditionally, all parts of the test battery are administered regardless of the patient's presenting problem, although the NAB has a screening exam that covers all appropriate domains. The battery approach has the advantage of identifying problems that the patient might not have mentioned and that the medical history may not necessarily predict. However, it has the disadvantage of

being very time-consuming (i.e., 6- to 8hour examination for the HRNTB).

Hypothesis Testing Approach The qualitative hypothesis testing approach is historically best exemplified by the work of Alexander Luria and more recently developed as the Boston Process Approach by Edith Kaplan and her colleagues. It is characterized by detailed evaluation of areas of functioning that are related to the patient's complaints and predicted areas of impairment, with relatively less emphasis on aspects of functioning that are less likely to be impaired. The hypothesis testing approach has been particularly helpful in illuminating the differential roles of the two hemispheres, as discussed above. This approach has the advantage of efficiently honing in on areas of impairment and producing a detailed description of the deficits from a cognitive processing standpoint, but it has the shortcoming of potentially overlooking unexpected areas of deficits. Screening Approaches Many practitioners have moved away from strict battery or hypothesis testing approaches since the 1990s and developed more flexible and efficient screening approaches. In this model, the neuropsychologist utilizes a core set of screening procedures as a first step in determining whether a diagnosis can be made with less information or whether additional testing is necessary in order to identify more subtle problems. Therefore, a screening protocol that efficiently assesses the major areas of neuropsychological functioning may or may not be followed by more detailed testing in selected areas that might provide better understanding of the reasons for the deficits demonstrated on the screening evaluation. Mental Status Examinations In some cases, usually involving very acute or severe cognitive impairment, it is simply not feasible to administer extensive cognitive examination procedures, so the neuropsychologist might appropriately rely on bedside mental status examination or very brief cognitive screening procedures to address the referral issues. However, research has shown that, even with brief screening procedures, the systematic use of a structured examination format can greatly increase the accuracy of detecting cognitive impairment. One of the most widely used screening instruments for documenting gross changes in mental status is the Mini-Mental State Examination (MMSE). However, it is important to note that the MMSE does have distinct limitations. Other than serial seven counting, the MMSE does not really assess executive functions, which are often impaired in dementing patients. In addition, the MMSE is likely to underestimate the prevalence of cognitive deficits in well-educated older persons with early Alzheimer's disease or in younger adults with focal brain injury, but it is more likely to overestimate the presence of cognitive deficits in persons with little education. Therefore, cutoff scores should be adjusted for age and education before concluding that impairment is present. Although mental status examinations can be very useful in screening for gross signs of cognitive impairment, they do not provide a sufficient foundation for diagnosing specific etiologies of cognitive impairment, and they are not interchangeable with neuropsychological testing.

DOMAINS OF FORMAL NEUROPSYCHOLOGICAL ASSESSMENT The past decade has seen a virtual explosion in the growth of more sophisticated and better standardized tests and procedures for neuropsychological evaluation. A list of examples of common neuropsychological tests and techniques is provided in Table 5.4-2. Table 5.4-2 Selected Tests of Neuropsychological Functioning

Interview The clinical interview provides the single best opportunity for identifying the patient's concerns and questions, eliciting a direct description of current complaints from the patient, and understanding the context of the patient's history and current circumstances. Although the patient typically serves as the primary interview source, it is important to seek corroborating information

for the patient’s account from interviews with caregivers or family members as well as thorough review of relevant records, such as medical and mental health treatment, educational, and employment experiences. Intellectual Functioning Assessment of intellectual functioning serves as the cornerstone of the neuropsychological examination. The Wechsler Intelligence Scales have represented the

traditional gold standard in intellectual assessment for many years, based on carefully developed normative standards. The scope and variety of subtests on which the summary IQ values are based also provide useful benchmarks against which to compare performance on other tests of specific abilities. The latest revision of this instrument, the Wechsler Adult Intelligence Scale III (WAIS-III), offers the additional advantage of greatly extended age norms (ages 16 to 89) that are directly related to normative performances on the Wechsler Memory Scale III (WMS-III). The Wechsler Intelligence Scales utilize a broad set of complex verbal and visuospatial tasks that have traditionally been summarized as a verbal IQ, a performance IQ, and full-scale IQ. In the context of a neuropsychological examination, the patient’s performance across the procedures provides useful information regarding long-standing abilities as well as current functioning. Most neuropsychologists recognize that the summary IQ values provide only a ballpark range for characterizing an individual’s general level of functioning. Therefore, it is usually more appropriate and meaningful to characterize an individual’s intellectual functioning in terms of the range of functioning (e.g., borderline, low average, average, high average, or superior) that is represented by the IQ value rather than the specific value itself. Careful examination of the individual’s performance across the various verbal and performance subtests can provide information regarding the patient’s pattern of strengths and weaknesses as well as the degree to which these performance characteristics are consistent with the history and performance on other aspects of the neuropsychological examination. Tests of long-standing knowledge, such as for vocabulary or general information, provide a basis for estimating an individual’s longstanding (or premorbid) level of intellectual abilities, which in turn can help to gauge the degree to which an individual may have deteriorated. The verbal IQ and performance IQ (VIQ and PIQ) have historically been reported to be associated with left and right hemisphere functioning, respectively. However, more recent research indicates that, in addition to language and spatial skills, the subtests of the Wechsler Intelligence Scales reflect other contributions such as speed, sustained concentration, and novel experience. Therefore, experienced neuropsychologists do not simply assume that a discrepancy between VIQ and PIQ is due to unilateral hemispheric damage. Important clues to the nature of the contributing problem can often be gleaned by considering the pattern of performance across other aspects of the examination and by carefully analyzing the types of errors that are observed. Attention Attention underlies performance in virtually all other areas of functioning and should always be considered a potential contributor to impairment on any tests that require sustained concentration and vigilance or rapid integration of new information. Measures of attention and concentration have traditionally been included in the Wechsler Intelligence and Wechsler Memory Scales in order to assess orientation and “freedom from distractibility.” These procedures also provide a useful basis for

“previewing” the individual’s ability to comprehend, process information, and otherwise engage in the assessment process. Digit span requires patients to repeat increasingly longer strings of digits as a way of assessing ability to process relatively simple information, while digit span backward reflects more complex simultaneous processing and cognitive manipulation demands or working

memory. Memory Complaints of memory problems constitute one of the most common reasons for referral to neuropsychology. As described above, the neuropsychologist utilizes an informationprocessing approach to assess memory problems that might involve difficulty with encoding, retrieval, or storage of new information. The WMS-III is the latest revision of a widely used battery of subtests that utilizes several measures of attention, memory, and new learning ability. Language Assessment of language examines both expressive abilities and comprehension. However, most neuropsychologists screen for language impairment rather than administer an extensive formal language assessment battery, such as the Boston Diagnostic Aphasia Examination. Expressive language is commonly assessed by measures of verbal fluency, which require the patient to rapidly generate words within semantic (e.g., names of animals) and phonetic categories (e.g., words beginning with specified letters of the alphabet). Visuospatial Functions Complex visuospatial abilities can be assessed through procedures that were developed in Arthur Benton's laboratory, such as facial recognition and judgment of line orientation. Measures of visual constructional ability examine the person's ability to draw spatial designs or assemble two- or three-dimensional figures (see Fig. 5.4-3). In addition to the significant visuospatial component, these tasks reflect contributions of executive planning and organizational abilities. More impaired individuals can be asked to copy simple geometric forms, such as a Greek cross or intersecting pentagons, in order to examine visuospatial abilities that are less influenced by planning and organization. The widely used technique of clock drawing provides a surprisingly sensitive measure of planning and organization, especially for older individuals who are at risk for dementia. Although problems involving poor organization, perseveration, and possible neglect are obvious in the drawing that is illustrated in Figure 5.4-4, more subtle difficulties can also be detected, especially when a patient's performance is evaluated in light of premorbid expectations.

FIGURE 5.4-4 Clock drawing by a patient with vascular dementia, showing poor planning and organization, perseveration, and possible neglect. (From Sadock BJ, Sadock VA, Ruiz P. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009, with permission.) Sensory and Motor Functions Double simultaneous stimulation in the visual, tactile, and auditory modalities is a standard component of the HRNTB and can be useful for assessing the integrity of basic sensory functions as well as neglect if deficits are present on one side only on the bilateral simultaneous trials and not when stimulation is unilateral. Grip strength and rapid finger tapping are commonly used measures of motor strength and speed that are sensitive to lateralized brain dysfunction. Executive Functions One of the most important aspects of the neuropsychological examination lies in the assessment of higher executive functions, which play an important role in the planning and initiation of independent activities, self-monitoring of performance, inhibition of inappropriate responses, switching between tasks, and planning and control of complex motor and problem-solving responses. Although the prefrontal lobes have long been regarded as an important component in mediating these functions, more recent developments in the neurosciences have also led to an increased appreciation for the essential role that is played by extensive cerebral interconnections between subcortical

and cortical regions of the brain. Psychological Factors A key component of any neuropsychological examination involves consideration of the degree to which long-standing personality or other psychological factors (including current stressors) might contribute to the patient's presentation. Common techniques for assessing personality and psychological factors include the Minnesota Multiphasic Personality Inventory 2 (MMPI-2) and paper and pencil techniques, such as the Beck

Depression Inventory II. Assessment of Effort and Motivation Because the results of neuropsychological examinations may eventually be introduced as evidence in litigation or other forensic proceedings or be used for determining disability compensation, it is important for the neuropsychologist to address any possible concerns about effort and motivation as a routine matter. Several instruments have been developed recently that directly assess a patient's level of effort and motivation to perform at his or her best. Normative research indicates that patients with histories of bona fide brain injury or even dementia perform close to perfect levels on many such instruments, so poor performance suggests poor effort or tendencies to exaggerate symptoms. Many other indicators of effort are based on the pattern of an individual's performance on standard procedures in a neuropsychological examination. A 32-year-old woman with 13 years' education was seen for disability evaluation, claiming current "trouble remembering things." Her account of personal history was vague, and she "forgot" information, such as her own birth date and mother's maiden name. Response latencies were extremely long, even for highly familiar information (e.g., count from 1 to 20), she could not repeat more than three digits forward consistently, and on a word list learning procedure, she was not able to correctly recognize more items (only five) than she could freely recall (also five). Despite otherwise fluent language, she was only able to generate five examples of animals in 1 minute. When asked to recall 15 items on a procedure (Rey's Memory Test) that is presented as a challenging task, but in reality is fairly simple, her performance demonstrated exaggerated errors of commission (Fig. 5.4-5). The evaluation concluded that current levels of cognitive functioning could not be conclusively established, due to overt symptoms exaggeration.

FIGURE 5.4-5 Rey's Memory Test with example of a response that is typical of exaggerated "memory" problems. (From Sadock BJ, Sadock VA, Ruiz P. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009, with permission.) THERAPEUTIC DISCUSSION OF RESULTS A key component of the neuropsychological examination process is found in the opportunity to discuss results of the examination with the patient and family or other caregivers. This meeting can represent a powerful therapeutic opportunity to educate and clarify individual and relationship issues, which can impact the identified patient's functioning. If the patient's active cooperation in the initial examination has been appropriately enlisted, then the patient will be prepared to invest value and confidence in the findings of the examination. At the time of the results discussion, it is useful to review the goals of the examination with the patient and supportive family or caregivers and to clarify the expectations of those who are present. Typically, these sessions will include information about the patient's diagnosis, with emphasis on the natural course and prognosis as well as compensation and coping strategies for the patient and family. Given the impact of chronic neurological disease on the family system as well as the patient, explicit discussion of these issues is critical in maximizing adjustment to brain injury. It is equally important to relate the impact of the results to the patient's current living circumstances, future goals, and course of adjustment. It is not unusual for strong emotions and underlying tensions within family relationships to come to light in the context of honest discussion, so the results discussion can represent an important therapeutic opportunity to model effective communication and problemsolving techniques. REFERENCES Allott K, Proffitt TM, McGorry PD, et al. Clinical neuropsychology within adolescent and young-adult psychiatry: Conceptualizing theory and practice. Appl Neuropsychol Child. 2013;2(1):47–63. Boosman H, Visser-Meily JM, Winken I, van Heugten CM. Clinicians' views on learning in brain injury rehabilitation. Brain Inj. 2013;27(6):685–688. Calamia M, Markon K, Tranel D. Scoring higher the second time around: Meta-

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suicide potential can be quantified by the means of personality assessment. Personality assessment can be of utmost importance in the scientific study of psychology and psychiatry. PURPOSES OF PSYCHOLOGICAL TESTING Personality testing can be an expensive undertaking. A considerable amount of time is required to administer, score, and interpret psychological test results. Personality testing should not be routinely obtained from all psychiatric patients. Personality testing can be helpful with selective patients from both a clinical and a cost–benefit analysis perspective. Assisting in Differential Diagnosis Psychiatric diagnosis can be a difficult and, at times, confusing exercise. However,

knowing a patient's diagnosis is essential to treatment, as a proper diagnosis can assist in understanding the etiology of the presenting psychiatric problem and the prognosis of the disorder. A 49-year-old man had abruptly resigned his position as an accountant and decided he was going to start an oil exploration business. He had never worked in the oil business and knew nothing about the profession. The patient had received a revelation from an unknown entity through an auditory hallucination. This voice told him he would become quite wealthy in the business if he would simply follow the directions given to him. Around this time, the patient had a marked change in personality. Although his grooming was formally very neat and appropriate, he became disheveled. He began sleeping about 3 hours a night. He became somewhat agitated and talked loudly to those around him. The differential diagnosis in this case includes schizophrenia and bipolar disorder. Psychological testing might be helpful in assisting in this differential diagnosis, as well as in formulation of a treatment plan. Aiding in Psychotherapy Psychological tests can be useful in psychotherapy. The usefulness of these tests can be even more important for short-term, problem-centered therapy, where understanding the patient and his or her problem must be accomplished quickly. Psychological assessment can be used in pretreatment planning, assessing progress once therapy begins, and in evaluating the effectiveness of therapy. Patients need to have objective information about themselves at the time of therapy if they are to go about changing themselves productively. Personality tests, particularly objective tests, allow patients to compare themselves to objective norms and evaluate the extent and magnitude of their problem. Testing also can reveal areas of the patient's life that may be problematic but for which the patient may not have a full appreciation. Information about patients' willingness to reveal information about themselves can also be helpful. Psychological tests may reveal considerable information concerning the patient's inner life, feelings, and images, which may make therapy progress faster. Psychological testing can provide baseline information at the beginning of therapy, and repeat testing can then be used to assess change that occurred during the course of therapy. Providing Narrow-Band Assessment Narrow-band personality tests measure a single personality characteristic or a few related characteristics. Broad-bank personality tests, on the other hand, are designed to measure a wide spectrum of personality characteristics. A psychiatrist may need answers to specific questions, such as those that arise when assessing the degree of clinical depression, measuring the intensity of the state or trait anxiety, or, possibly, quantifying the

amount of a patient's anger. Such quantification can be helpful in measuring severity or in providing a baseline for future assessment. PSYCHOMETRIC PROPERTIES OF PERSONALITY ASSESSMENT INSTRUMENTS The quality of personality tests varies widely. On the one hand, there are wellconstructed, empirically validated instruments, and, on the other hand, there are "psychological tests" that one can find in the Sunday supplement of the newspaper or on the Internet. Evaluating the usefulness of particular psychological instruments can be challenging,

even to the well informed. Normative Sample To construct a personality test, a representative sample of subjects (normative sample) should be administered the test to establish expected performance. Basic issues, such as the size and representativeness of the sample used to construct the test, must be evaluated. To illustrate this point, the Minnesota Multiphasic Personality Inventory 2 (MMPI-2), a well-constructed instrument, initially tested approximately 2,900 subjects. However, approximately 300 subjects were eliminated because of test invalidity or incompleteness of needed information. Test Characteristics To be useful, any psychological test must be completed, in its entirety, by the intended test taker. If the questions are offensive or are difficult to understand, then the individual taking the test may not complete all items. These omissions can create problems, especially when normative tables are used to interpret results. Validity Issues Perhaps the most important characteristic in evaluating the scientific merit of a given personality test is the validity of the instrument. Does the test measure what it purports to measure? If a test is designed to measure depression, does it indeed measure depression? Although validity may seem like a simple issue to address, it can become complex, especially when attempting to measure such characteristics as self-esteem, assertiveness, hostility, or self-control. Face Validity. Face validity refers to the content of the test items themselves. In other words, do the items appear to measure what they purport to measure? One problem with face validity is that professionals differ in their subjective appraisal of individual items. Criteria and Construct Validity. Although face validity refers to the degree that

test items appear on the surface to measure what the instrument, as a whole, purports to measure, criterion validity uses data outside the test itself to measure validity. For example, if a test were designed to measure hypochondria, one would expect that a patient with high scores would have more visits to the physician’s office, complain of more physical symptoms, and use prescribed and over-the-counter medications more extensively. Concurrent and Predictive Validity. To determine test concurrent validity, external measures are obtained at the same time that the test is given to the sample of subjects. Thus, the concurrent validity of the test reveals that, at a given point of time, high scorers on a test may be more likely than low scorers on a test to manifest the behavior reflected in the criteria (e.g., more physician visits or more medication for a hypochondriac patient). Occasionally, however, a test developer is interested in predicting future events. The discriminant validity of a test tells whether the test is able to discriminate between known groups of patients at a given time. Is a measure of depression able to statistically discriminate among mild, moderate, and severe major depression disorder? Factor Validity. Factor validity utilizes a multivariate statistical technique known as factor analysis to determine if certain major groups of items on a given test empirically cluster together. For example, on a personality test measuring depression, do items concerning vegetative symptoms tend to covary together? Reliability Reliability refers to the degree that a test measures what it purports to measure, consistently. The key word here is consistently. There are several means of checking reliability, including test–retest reliability, internal consistency reliability, and parallel form reliability. Test–Retest Reliability. Test–retest reliability is obtained by simply administering the same test on two occasions to a group of subjects and statistically correlating the results. To be useful, the correlation coefficient should be at least 0.80 if the two tests were administered within 2 weeks of each other and if the trait in question is stable. Internal Consistency Reliability. Another approach to determine internal consistency reliability is to divide a given test into two equal parts and statistically correlate the two halves for the test with each other. This technique determines the splithalf reliability of a test. The first half of the test should be highly correlated with the second half of the test if the test is

consistently measuring what it purportedly measures. Alternatively, the odd-numbered items could be correlated with the even-numbered items (odd–even consistent reliability). A reliability coefficient of 0.80 to 0.85 is needed to demonstrate usefulness in most circumstances. However, the higher the reliability as

measured by the correlation coefficient, the better the test instrument. Parallel Form Reliability. Sometimes, two separate forms of the same test are needed. For example, if the process of taking a test at one point in time would by itself influence a patient's score the second time he or she took the same test, then parallel forms of the tests are needed. Parallel forms of a test measure the same construct but use different items to do so. To ensure that the test does, in fact, measure the same construct, the correlation coefficient between the two parallel forms of the same test is computed. Such parallel form reliability should be at least 0.90 or higher. Use of Standard Error of Measurement to Assess Reliability. Another way to assess the usefulness of a given test is to examine the test's standard error of measurement (SEM), which should be included in the test's manual. The SEM is a single statistic that is used to estimate what the score of a given patient would be on the test if the patient took the same test again within a short period of time. ADULT PSYCHOLOGICAL TESTS Objective Personality Tests Objective personality tests are rather straightforward in approach. Patients are usually asked specific and standard questions in a structured written or oral format. Each patient is typically asked the same question. The data obtained from a given patient are compared to similar data obtained from the normative group. The degree to which the patient deviates from the norm is noted and is used in the interpretive process. The patient's responses are scored according to certain agreed-upon criteria. The obtained scores are then compared with normative tables and often converted to standardized scores or percentiles, or both. The MMPI-2 is an example of an objective personality test. Table 5.5-1 lists a sample of objective personality test along with a brief description and brief list of strengths and weaknesses. Table 5.5-1 Objective Measures of Personality

Minnesota Multiphasic Personality Inventory. The MMPI-2 is relatively easy to administer and score and takes approximately 1.5 hours for most patients to complete. It consists of 567 true or false questions concerning a wide variety of issues and requires only an eighth-grade reading comprehension. Scoring of the MMPI-2 involves adding up the number of responses on numerous scales and comparing the results to certain normative information. Interpretation of the MMPI-2 is more straightforward than with many other tests. When a patient takes the MMPI-2, questions are not grouped in any particular order to aid in interpretation. Various items in the MMPI-2 can be selected, sorted, and analyzed according to various criteria. A new version of the MMPI-2 was developed in 2008, the MMPI-2 Restructured Form (MMPI-2 RF). It contains 338 questions and allows less time to administer. The MMPI-2

RF is meant to be an alternative to the MMPI-2, not a replacement. Personality Assessment Inventory (PAI). Another increasingly popular objective personality test is the Personality Assessment Inventory (PAI). This test consists of 344 items that are written at a fourth-grade reading level. This reading level ensures that most patients can complete it without experiencing any reading problems. The PAI takes about 45 to 50 minutes to complete for most patients. The PAI was normed on 1,000 community-dwelling individuals stratified according to sex, race, and age. There are no separate norms for male and female as there are in the MMPI. In addition, data were gathered on 1,246 clinical subjects and 1,051 college students in the normative process. The

clinical subjects were drawn from a variety of different clinical settings, including inpatient psychiatric facilities (25 percent), outpatient psychiatric facilities (35 percent), correctional institutions (12 percent), medical settings (2 percent), and substance abuse treatment programs (15 percent). The PAI has 11 clinical scales. These main clinical scales are similar to the MMPI-2 clinical scales and measure such personality issues as somatic concerns, depression, paranoia, borderline features, or alcohol or drug problems. The PAI also has five treatment-related scales that are designed to address such issues as treatment rejection, suicide ideation, or aggression. Projective Personality Test Projective personality tests, in contrast to objective personality instruments, are more indirect and unstructured. Unlike objective tests in which the patient may simply mark true or false to given questions, the variety of responses to projective personality tests are almost unlimited. Instructions are usually very general in nature, allowing the patient's fantasies to be expressed. The patient generally does not know how his or her responses will be scored or analyzed. Consequently, trying to feign the test becomes difficult. Projective tests typically do not measure one particular personality characteristic such as "type A personality" (e.g., narrow-band measurement) but instead are designed to assess one's personality as a whole (e.g., broad-band measurement). Projective tests often focus on "latent" or unconscious aspects of personality. Obviously, psychologists and others differ in the degree to which they rely on "unconscious" information. In many projective techniques, the patient is simply shown a picture of something and asked to tell what the picture reminds him or her of. An underlying assumption of projective techniques (projective hypothesis) is that, when presented with an ambiguous stimulus, such as an inkblot, for which there are an almost unlimited number of responses, the patient's responses will reflect fundamental aspects of his or her personality. The ambiguous stimulus is a sort of screen on which the individual projects his or her own needs, thoughts, or conflicts. Different persons have different thoughts, needs, and conflicts and, hence, have widely different responses. A schizophrenic's responses often reflect a rather bizarre, idiosyncratic view of the world. Table 5.5-2 lists the common projective tests together with a description and strengths

and weaknesses for each test. Table 5.5-2 Projective Measures of Personality Rorschach Test. Herman Rorschach, a Swiss psychiatrist, developed the first major use of projective techniques around 1910. The Rorschach test is the most frequently used projective personality instrument (Fig. 5.5-1). The test consists of ten ambiguous symmetrical inkblots. The inkblot card appears as if a blot of ink were poured onto a piece of paper and folded over—hence, the symmetrical appearance. FIGURE 5.5-1 Card I of the Rorschach test. (From Hermann Rorschach, Rorschach®-Test. Copyright © Verlag Hans Hubar AG, Bern, Switzerland, 1921, 1948, 1994, with permission.)

Minimal interaction between the examiner and the patient occurs while the Rorschach is administered, which ensures standardization procedures are upheld. The examiner writes down verbatim what the patient says during the above-described "free association" or "response proper" phase. If the patient rotates the card during his or her response, then the examiner makes the appropriate notation on the test protocol. After the patient has given responses to all ten cards, an inquiry phase of administration begins. The examiner asks the patient to go through the cards again and help the examiner see the responses he or she gave. The examiner reads the patient's initial response and asks the patient to point out what he or she saw and explain what made it look like that to him or her. An almost unlimited range of responses is possible with the Rorschach test and most projective tests. Thematic Apperception Test. Although the Rorschach test is clearly the most frequently used projective personality test, the Thematic Apperception Test (TAT) is probably

in second place. Many clinicians will include both the TAT and the Rorschach test in a battery of tests for personality assessment. The TAT consists of a series of ten black-and-white pictures that depict individuals of both sexes and of different age groups, who are involved in a variety of different activities. An example of a TAT card is presented in Figure 5.5-2. FIGURE 5.5-2 Card 12F of the Thematic Apperception Test. (Reprinted from Henry A. Murray, Thematic Apperception Test, Harvard University Press, Cambridge, MA. Copyright © 1943 President and Fellows of Harvard College, © 1971 Henry A. Murray, with

permission.) Henry Murray developed the TAT in 1943 at the Harvard Psychological Clinic. The stories that the patient makes up concerning the pictures, according to the projective hypothesis, reflect the patient's own needs, thoughts, feelings, stresses, wishes, desires, and view of the future. According to the theory underlying the test, a patient identifies with a particular individual in the picture. This individual is called the hero. The hero is usually close to the age of the patient and frequently of the same sex, although not necessarily so. Theoretically, the patient would attribute his or her own needs, thoughts, and feelings to this hero. The forces present in the hero's environment represent the press of the story, and the outcome is the resolution of the interaction between the hero's needs and desires and the press of the environment. Sentence Completion Test. Although a projective instrument, the sentence completion test is much more direct in soliciting responses from the patient. He or she is simply presented with a series of incomplete sentences and is asked to complete the sentence with the first response that comes to mind. The following are examples of possible incomplete sentences: My father seldom... Most people don't know that I'm afraid of... When I was a child, I... When encountering frustration, I usually... The purpose of the test is to elicit, in a somewhat indirect manner, information about the patient that cannot be elicited from other measures. Because the patient responds in writing, the examiner's time is limited. The length of time it takes to complete the sentence completion varies greatly depending on the number of incomplete sentences. Tests can range from less than ten sentences to greater than 75. Behavioral Assessment Behavioral assessment involves the direct measurement of a given behavior. Rather than focus primarily on human characteristics, such as repression, ego strength, or self-esteem (vague terms to a behaviorist), strict behavioral measurement concentrates on the direct measurement that can be observed, such as a number of temper tantrums per unit of time, duration and intensity and number of hyperventilation episodes, or the number of cigarettes smoked per 24-hour period. Although early strict behaviorists would count only behaviors that were observable, a broader definition of behavior has emerged, under which just about anything people do —whether it is overt such as crying, swearing, or hand-washing or covert such as feeling and thinking—is considered behavior. Direct Counting of Behavior. Measuring overt behavior is direct and can be

done by the patient himself or herself, a family member, or an impartial observer. Cognitive behavior therapists use these measurements to establish baselines of a given undesirable behavior (i.e., violent thoughts that the patient may wish to reduce). Similarly, therapists can measure behavior that the patient wants to increase (time studying, time out of bed, or distance walked on a treadmill). Follow-up measures of the same behavior monitor progress and quantify improvement. ASSESSMENT OF PERSONALITY IN CHILDREN AND ADOLESCENTS Assessment of emotional and interpersonal characteristics in children presents many challenges to the clinician because of the discontinuities in development that exist throughout childhood, adolescence, and adulthood. Many clinicians are reluctant to assign the diagnosis of a personality disorder before the

ages of 16 to 18 years due to rapid changes that occur during childhood. However, assessment of children and adolescents can often reveal antecedent symptoms, behaviors, or traits associated with emotional disorders at an age when these problems are very amenable to intervention. For this reason, facility in assessment of emotional disorders in children and adolescents is important for mental health professionals. Special Considerations in Assessment of Children Assessment of children with symptoms of emotional or behavioral disorders is best accomplished within developmental and ecological contexts—both of which help one interpret the child's symptoms from the perspective of developmental influences on behavior and also with consideration of the risk and protective factors in the child's social environment. Indeed, the balance of risk and protective factors may often provide important clues as to the etiology of the child's current problems and the prognosis for effective intervention. The Developmental Context. Knowledge about the normal sequence and transitions of development forms a fundamental backdrop from which to view children's suspected psychopathology. The major developmental transition of infancy related to formation of a secure attachment relationship with significant caregivers gives way to the movement from dependence to greater self-reliance in the toddler years. The developmental tasks most salient during the preschool years involve development of a growing capacity for empathy and self-control, while showing a desire for mastery of developmental tasks. Within the early to middle elementary years, youngsters strive for greater mastery of knowledge and intellectual and academic skills, leading to feelings of productivity and competence. The developmental tasks of adolescence center around separation–individuation, resolving conflicts with authority figures, peer group identification, and realistic appraisal and evaluation of self-qualities. Although development does not occur in a linear stage, familiarity with the primary developmental themes and transitions of each age period provides an important context from which to view current symptoms.

Decisions about appropriate assessment methods are also based on developmental factors. Before children participate in projective testing procedures, such as storytelling tasks, clinicians must have developmental information about their expressive language, receptive language, and conceptualization ability. Knowledge of a child's reading proficiency is critical when presenting self-report measures. If children are asked to complete projective drawings, information about their level of visual–motor development is important for interpretation. Young children often do not have the motor or language abilities to provide meaningful responses to projective testing procedures, but they may reveal much about their socialization abilities, fears, anxieties, and significant relationships through play. Therefore, play observation techniques can be a useful alternative to more formal projective measures. Likewise, some adolescents may resist providing responses on projective measures that require verbal disclosure to a clinician but may willingly complete objective paper-and-pencil personality measures that require a less direct response. Choosing an approach to assessment with the developmental context in mind will enhance the validity of the information obtained. Ecological Context. The broad social–ecological context of children's family, peer group and social relationships, and the culture in which they live can influence the interpretation of assessment information. From a developmental psychopathology perspective, most psychopathology is expressed as an interaction among various factors that are operating at the levels of the individual (including developmental and personality attributes), the family (e.g., parenting skill, the security of primary attachment relationships, marital stability, and extended family support), the community (e.g., including the influences of work, school, informal social networks, socioeconomic factors, and degree of family social isolation), and the larger cultural

context of society (e.g., cultural values and beliefs that govern behavior). Two 4-year-olds were referred by their Head Start teacher due to concerns about a recent onset of regressive behavior (e.g., enuresis during the school day and immature speech patterns). Both girls were interviewed separately but were reluctant to talk with the clinician. A play interview was set up with each girl, using dolls and a dollhouse with a variety of furniture. The first girl assumed the role of “mother” and played out the scenario of feeding and diapering the baby doll in a nurturing manner. The second girl was aggressive in her play, with enactment of the “adult” dolls hitting the “child” dolls and making them “die.” The child dolls were described as having blood on them. The family context for the first girl revealed that a new baby sibling had been born just prior to the onset of regressive symptoms; the infant was born prematurely and the mother spent much time with the infant in the hospital. Both the arrival of the new sibling and the mother’s separation from her 4-year-old daughter created the social context for the emergence of the child’s regressive behavior. In the second case, the girl’s mother was interviewed. After the clinician provided a description of the girl’s play, the mother revealed that she had a new boyfriend who just moved into the house. She said she had noted her daughter’s fear of the boyfriend and her frequent tearfulness at home. She reported suspicion that her boyfriend might be sexually molesting her daughter and agreed to call Protective Services in the presence of the clinician to make a report.

There can be vastly different explanations for similar presenting symptoms, and often, the projective assessment procedures only suggest concerns without providing enough specific information about the nature and etiology of the problems. The social context can reveal both risk and protective factors that are important in conceptualizing the child’s problems. The ecological approach allows one to examine the possible multiple determinants of emotional psychopathology in children and to better understand the interaction between risk and protective factors that are present in the child’s life. Use of Informant Information. Children and adolescents usually are referred for assessment due to concerns of their parents or caregivers. Teachers also may be the source of specific concerns. For this reason, information relevant to the diagnosis is typically obtained from these significant adults who can provide important information regarding the child’s behavior in various settings. Reliance on persons other than the client as reporters of the primary symptoms represents a fundamental difference in the process of diagnosis compared with adult assessment. Therefore, the validity of the information presented about children’s symptoms is often a concern for clinicians. During intake, parents often express feelings of anxiety or frustration regarding their child’s problems, and their descriptions of the child may be exaggerated or vague (e.g., “She never minds” or “He always acts like a monster”). It is not uncommon for depressed parents to report an increased number and severity level of symptoms in their children. In cases where one suspects that the informant’s perceptions may be distorted, it is critical to obtain collateral information from teachers or others who are familiar with the child’s current problems. A primary task is to help informants translate imprecise complaints to specific descriptions of behaviors of concern, using methods that help the clinician ascertain the nature, frequency, and severity of symptoms. The behavioral assessment procedures described later are very useful in providing age- and gender-referenced ratings of symptom characteristics. Specialized Training. Clinicians who conduct personality assessment of children need training not only in clinical assessment methods but also in developmental psychology and child psychopathology. Presentation of many emotional disorders in prelatency years differs from postlatency presentation. Training and experience in how to assist the child with the demands of the testing situation are also critical. Children’s ability to participate in testing depends on their attention and

concentration ability, anxiety regarding separation from significant others during the testing, fatigue or hunger states, motivation and persistence, and the relatively greater influence of familial, cultural, and environmental variables on their ability to participate effectively in the testing. A clinician with specialized training to work with children will have both the understanding of these influences on child test-taking behavior and the skills to work with the challenges of testing children so as to achieve more valid results.

ASSESSMENT FOR CHILDREN AND ADOLESCENTS Like assessment of adults, personality assessment of children can be accomplished via three primary methods: projective, objective, and behavioral tests and procedures. The projective methods involve direct interaction with the child and adolescent, whereas the objective and behavioral methods often involve obtaining information from significant adults in the child's life as well as direct interaction with the child. With the evolution of more sophisticated statistical methodology and psychometric science in recent years has come the development of new objective and behavioral measures of personality. Improved validity indices and psychometric procedures that take into account informant reporting are now routinely included. Many of the projective procedures have changed less, although improvements in developmental norms for interpretation have increased the diagnostic validity of measures such as the Rorschach. Projective Assessment Procedures As stated in the adult subsection, objective tests of personality present the patient with a structured set of questions and a finite range of answers. Projective tests, on the other hand, present more ambiguous stimuli and ask the adult or child to make up something (i.e., story, percept, or drawing) related to the stimulus. The most common projective assessment procedures for children and adolescents are the Rorschach test, various projective storytelling measures (i.e., Roberts Apperception Test for Children–2nd edition, or Children's Apperception Test), projective drawings (such as human figure and kinetic family drawings), and incomplete sentence procedures (Table 5.5-3). Table 5.5-3 Projective Assessment Procedures for Children

Rorschach Test. Projective instruments such as the Rorschach test allow the clinician to explore dynamics of the child's personality by gathering information on both the child's perceptual–cognitive world and inner fantasy world. The Rorschach test ideally is used as part of a more comprehensive battery that includes an interview with the child and significant adults, expressive (play) techniques, and perhaps storytelling techniques to allow the child the maximum freedom and spontaneity of expression. The Rorschach test with children has a long research and clinical history of examining developmental norms and symbolic interpretations. Clinicians using the Rorschach test for the evaluation of children and adolescents must take care to analyze the structural summary within the context of appropriate age norms, as a given result may be interpreted as normal for a young child but could be of concern in an adolescent. Children's Rorschach responses have been examined as a function of their cognitive functioning, academic performance, and behavioral problems within the school setting. The underlying conceptual framework for this work hypothesizes that there is a direct relationship between the degree of secondary process development and school achievement. As with adults, there are numerous systems for administering and scoring the Rorschach with children, but all ask children to say what they see on the inkblot (i.e., the percept), followed by an inquiry referring back to each response. Whether the inquiry should be done following the child's free association responses to all ten inkblots

or best accomplished after each individual blot is controversial. Proponents of the latter approach suggest that young children may have difficulty remembering the reasoning behind the original free associations or may become fatigued by the end of the test, thus limiting their cooperation and responsiveness to the inquiry. Clinicians must also be aware of state anxiety as a potential confounding variable in children's responses to the Rorschach test. Care in building rapport and an explanation of the purpose and process of testing can ease the situational anxiety. As with adults, scoring is done on the basis of response characteristics, or determinants, such as form, color, shading, texture, and dimensionality. The content and form quality of the child's responses are also used in scoring and interpretation. Projective Storytelling Procedures. In projective storytelling approaches, the child is presented with a picture stimulus of human or animal figures in rather ambiguous situations. The child is asked to make up a story about the figures—a story that has a beginning and end and includes the thinking and feeling of the persons represented in the pictures. A fantasy response is evoked, and the resulting projective information is a combination of the perceptual and the imaginative. Stories are typically analyzed for repetitive, unique, intense, or problematic themes, beliefs, or affects. This procedure is very similar to the TAT approach used with adults. Children's Apperception Test. The initial Children's Apperception Test (CAT), developed in 1949, used animal figures and was developed for children ages 3 to 10 years. Animal figures were thought to be more culture-free than human characters. In 1965, the human figures version (CAT-H) was produced, showing human figures in situations as analogous as possible to those pictured in the animal version. During administration, the cards are presented individually in the numbered order of the card (because certain cards were designed for sequential impact). The child is asked to tell a story about each picture (e.g., what is going on, what happened before, and what will happen next). There is some debate about the use of prompts with young children and whether such prompts (e.g., "How did the story end?") may contaminate important projective information. Generally, prompts are often necessary to help the young child understand what is expected. Young children have a tendency to merely label or describe portions of the picture and may not understand the concept of telling a story with a beginning, middle, and conclusion. However, the clinician must always guard against overly intrusive or helpful prompts that guide the child's responses in a particular direction or suggest a specific format for the story. The various scoring protocols for the CAT have focused on the analysis of ego functions and evaluation of the relative use of various defense mechanisms. However, qualitative interpretation is also made based on recurrent or sequential themes and determination of identification figures, while taking into consideration the child's family and case history information. Roberts Apperception Test for Children—2nd Edition. The original Roberts

Apperception Test for Children (RATC) was developed specifically for children and provided a standardized system for scoring the thematic content and structural characteristics of the child's responses. The 2nd edition of the RATC is now available, and it provides normative data (stratified by geographic region, sex, ethnicity, and parental education) on a sample of 1,000 children and adolescents, ages 6 to 18 years, to aid in clinical interpretation. The RATC-2 asks the child or adolescent to tell a story in response to each of 16 test pictures that represent important interpersonal themes. The RATC-2 assesses two independent dimensions: adaptive social perception (which is a developmental measure) and the presence of maladaptive or atypical social perception (which is a clinical measure). The responses indicate where a child is on a continuum of social understanding. Interpretation of the RATC-2, like that of other projective measures, is based on the assumption that children presented with ambiguous drawings of children and adults in

everyday interaction will project their typical thoughts, concerns, conflicts, and coping styles into the stories that they create. The RATC-2 has three parallel versions of the test pictures—one for Caucasian children, one featuring African American children, and the other depicting Hispanic children. Objective Personality Measures Objective approaches to child personality assessment typically have straightforward test stimuli and clear instructions regarding completion of the tests, as opposed to projective approaches, which typically use more unstructured, ambiguous test stimuli. Objective tests typically have good standardization, reliability, and validity, and they often are norm referenced so as to provide comparisons with a particular criterion group. The advantages of using objective measures with children are similar to those previously discussed with adults. Disadvantages include the length of the measures (some have several hundred questions to which the informant must respond), the reading level required for completion (which could place children and adolescents at a disadvantage), and the initial outlay of expense to purchase either computer administration or computer scoring software. Despite the disadvantages, objective personality measures remain an important part of a comprehensive personality assessment by providing a broad survey of major areas of psychopathology at the initial stages of the evaluation. Table 5.5-4 list some of the major objective personality measures for children. Table 5.5-4 Objective Personality Measures for Children

Personality Measures for Specific Disorders in Children. In contrast to the multidimensional personality measures already discussed, several measures address more specific disorders in children, such as depressive and anxiety disorders. Examples of several of these measures are found in Table 5.5-5. Table 5.5-5 Personality Measures for Specific Disorders in Children

Often, clinicians will use the multidimensional personality measures to obtain a broad overview of risk for psychopathology and then use the more narrow-band, specific measures to explore a particular set of symptoms in greater detail. Neither type of personality inventory is used to confirm a diagnosis, but both provide valuable information about the nature and severity of symptoms that can be combined with other approaches to arrive at a diagnosis. Advantages of the specific personality inventories include their brevity, low cost in terms of time to administer, and ease in scoring and interpreting. However, as with similar adult measures, caution should be taken in reviewing the psychometric qualities of these personality measures, particularly with regard to discriminant validity for the disorder under study versus other disorders versus children without disorders.

Behavioral Assessment Procedures Behavioral assessment procedures offer a highly structured method of obtaining information about behavioral or emotional functioning and social competencies of children and adolescents. These procedures include direct observations and informant ratings on normed age and sex scales. The popularity of these measures has grown in recent years, in part due to their improved psychometric properties, their costeffectiveness, and their utility in multitrait–multimethod diagnostic procedures (Table 5.5-6 presents examples of these measures). Table 5.5-6 Behavioral Assessment Procedures for Children

Validity of Informant Reports. Use of behavioral rating scales raises questions about the validity of informant information. The research regarding agreement among various raters of child behaviors is consistent in showing greater agreement between

raters who interact with a child in similar situations (e.g., between mothers and fathers) than between raters who interact with the child in different situations (e.g., between parents and teachers or parents and children). Advantages and Disadvantages of Behavioral Approaches. There are several advantages of the behavioral approaches to assessment of behavior and emotional functioning in children and youth. These procedures are cost-effective in that they maximize the amount of information obtained with little clinician time. They often have convenient hand-score or computer scoring methodology, another cost-effective aspect. Use of behavioral assessment increases the likelihood of obtaining information from multiple sources (e.g., teachers and parents) across multiple settings (e.g., school, home, and day care). These sources of information are necessary for some diagnoses, such as attention-deficit/hyperactivity disorder (ADHD), and likely increase the validity of other diagnoses. Many of the scales are empirically derived, factor-analytic scales that are normed for age and sex and generally possess good psychometric properties. Disadvantages of behavioral rating methods in children include questions about the validity of informants' reports and concerns about informant reading level. The behavioral ratings are filtered through the perceptions of the informant, and the degree of frustration, emotional pathology (e.g., depression), and intellectual and academic skills of the informant are critical to understanding the report. There is much debate about how to handle discrepant ratings across informants. Although perfect correlation is not expected, the issue of how to weigh one person's observations against those of another is an important issue that is as yet unresolved. Achenbach Child Behavior Checklists. The checklists developed by Thomas Achenbach have been perhaps the most widely used behavioral rating scales in child and adolescent clinics in recent years. Similar to the Behavior Assessment System for Children, 2nd edition (BASC-2), the Achenbach scales include a parent rating (the Child Behavior Checklist [CBCL]), a teacher rating (Teacher Report Form [TRF]), and a selfreport (Youth Self-Report [YSR]). The CBCL is appropriate for children from the ages of 6 to 18 years, the TRF is used for children from the ages of 6 to 18 years, and the YSR is appropriate for those from the ages of 11 to 18 years. Each scale is interpreted in comparison to a large normative sample stratified by age and sex. A cross-informant computerized scoring paradigm is provided to assist with comparisons of the CBCL, TRF, and YSR measures regarding a given client. A version of the CBCL and TRF for toddlers (CBCL 1.5–5 and Caregiver–Teacher Report Form for Ages 1.5–5) is also available. The Internalizing, Externalizing, and Total Problems scales are scored from both forms. The CBCL 1.5–5 also includes the Language Development Survey and a Sleep Problems syndrome scale. The C-TRF asks teachers and caregivers to provide descriptions of problems, disabilities, issues that concern the respondent most about the child, and things that the respondent views to be best about the child. A separate computerized scoring system is available for the toddler versions of the CBCL.

06 - 5.6 Neuropsychological and Cognitive Assessme

5.6 Neuropsychological and Cognitive Assessment of Children

Other Behavioral Personality Approaches. Many other behavioral approaches to assessment are available in addition to behavior rating scales, as discussed in the earlier part of this section. Direct observations of child and adolescent behavior can be a useful adjunct to other assessment procedures, whether the observation is unstructured or structured according to a specific format. REFERENCES Adams RL, Culbertson JL. Personality assessment: Adults and children. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:951. Bram AD. The relevance of the Rorschach and patient-examiner relationship in treatment planning and outcome assessment. J Pers Assess. 2010;92(2):91. DeShong HL, Kurtz JE. Four factors of impulsivity differentiate antisocial and borderline personality disorders. J Pers Disord. 2013;27(2):144–156. Hentschel AG, Livesley W. Differentiating normal and disordered personality using the General Assessment of Personality Disorder (GAPD). Pers Mental Health. 2013;7(2):133–142. Hoff HA, Rypdal K, Mykletun A, Cooke DJ. A prototypicality validation of the Comprehensive Assessment of Psychopathic Personality model (CAPP). J Pers Disord. 2012;26:414. Hopwood CJ, Moser JS. Personality Assessment Inventory internalizing and externalizing structure in college students: Invariance across sex and ethnicity. Pers Individ Dif. 2011;50:116. Israel S, Moffitt TE, Belsky DW, Hancox RJ, Poulton R, Roberts B, Thomson WM, Caspi A. (2014). Translating personality psychology to help personalize preventive medicine for young adult patients. J Pers Soc Psychol. 2014;106:484. Samuel DB, Hopwood CJ, Krueger RF, Patrick CJ. Comparing methods for scoring personality disorder types using maladaptive traits in DSM-5. Assessment. 2013;20(3):353–361. Schuppert HM, Bloo J, Minderaa RB, Emmelkamp PM, Nauta MH. Psychometric evaluation of the Borderline Personality Disorder Severity Index-IV—adolescent version and parent version. J Pers Disord. 2012;26:628. Strickland CM, Drislane LE, Lucy M, Krueger RF, Patrick CJ. Characterizing psychopathy using DSM-5 personality traits. Assessment. 2013;20(3):327–338. 5.6 Neuropsychological and Cognitive Assessment of Children Although cognitive and neuropsychological assessments might overlap, these approaches

analyze behavior according to two different paradigms. Cognitive assessment is undertaken without reference to the possible neurobiological underpinnings of overt behavior, and it describes the patient very much as others might observe him or her in the world. Neuropsychological assessment is undertaken in the context of growing knowledge about brain–behavior relationships, and it has the additional possibility of describing the child in terms of unseen neural pathways. These approaches provide ways of conceptualizing how children integrate information (and their thinking, learning, and responding) at different levels. General cognitive assessment focuses on understanding behavior at a cognitive level and in descriptive terms. Focused

neuropsychological assessment introduces the additional possibility of understanding behavior at neural levels and in neurobiological terms. However, regardless of the theoretical differences among the psychologists undertaking these evaluations, in a practical way it is the patient's referral issues that shape the assessment process and focus the interpretation of results. BASICS OF PSYCHOLOGICAL ASSESSMENT Psychological assessment involves more than testing. Although measurements are useful, testing involves more than scores. The Testing Process In addition to testing, assessment procedures include examining past records (medical examinations, prior testing, report cards), interviewing the client and his or her family (in structured and unstructured formats), obtaining information from home and school (and, sometimes, onsite observations), and obtaining rating scales that have been filled out by the child's parents and teachers (regarding developmental, behavioral, emotional, and diagnostic issues). The diagnostic aspect of the process involves an attempt to determine the psychiatric and educational categories for which the client meets the criteria. Cognitive and neuropsychological testings are only two aspects of an attempt to get a broad view of the way a child solves problems in the world, to understand his or her unique interaction with any diagnostic category, and to provide recommendations for interventions. Measurements in Testing Although many techniques might be used to help understand a child client and his or her referral question, the emphasis here is on standardized testing (based on regularized procedures as well as normative data). The point of testing is to create a way of comparing one individual to a population of such individuals, as well as the strengths and weaknesses within one individual. The psychologist will select an instrument that is valid (it measures what is intended) and reliable (it measures it consistently). The testing involves establishing a basal level (the level at which all items are passed) and a ceiling (the level at which no items are passed). The testing process involves converting a raw score to a standard score that can be compared with other scores along what is thought of as a normal distribution with predictable statistical properties. The standard deviation (SD) is a measure of dispersion around the mean; the farther scores are from the mean and each other in terms of the SD, the more meaningful is the discrepancy. It is accepted that a measurement is an approximation and not exact. This approximation is recognized by the concept of standard error of measurement (SEM), which is the naturally occurring (random) error that takes place in the real world as one attempts to measure anything. The fact that measurements are not exact is also recognized by the concepts of confidence intervals (the probability that the true score falls within a range

of scores) and statistical significance (the probability of finding a result by chance). Beyond Scores and Tests It should be noted that the testing process involves more than scores. Although scores are important, how the patient goes about solving cognitive problems is also carefully observed. The examiner is interested not only in test performance, but also in the patient's reaction. It is important to the psychologist to note how the patient arrives at right as well as wrong answers and

to explore the patient’s cognitive strategies on tasks. In general, it is important to note whether the patient responds in a deliberate or impulsive way. The testing process is not separate from the therapeutic process. If well handled, the testing can become an extension of the treatment. Feedback about results and their relationship to the presenting problems can be presented as the evaluation unfolds. COGNITIVE AND NEUROPSYCHOLOGICAL ASSESSMENT The general cognitive assessment tends to be a descriptive and practical event with an eye to the policies and possibilities in the outside world. As a result, the cognitive tests tend to be “comprehensive” instruments. The very factors that make them useful for general assessment limit them when it comes to understanding neurobiological functioning. The neuropsychological instruments tend to be more “precision” tests that attempt to assess very specific behaviors that represent neural constructs in an inner world. Even when the results are explored at more descriptive levels, functioning within the domains is not seen as separate or independent of their neurobiological underpinnings. Tables 5.6-1 and 5.6-2 list the current cognitive and neuropsychological tests. Table 5.6-1 Cognitive Tests

Table 5.6-2 Neuropsychological Tests

Description of Cognitive Tests Although psychologists use diverse tests, three kinds of cognitive testing are described in this subsection: intellectual, achievement, and processing instruments. Generally, intellectual tests measure overall mental ability, achievement tests assess past learning, and processing tests measure discrete cognitive functions.

Intellectual Testing. Intelligence is defined as the ability to learn from and adapt to the environment and the ability to think abstractly. Intelligence tests are used to determine the patient’s general intellectual functioning. The intelligence quotient (IQ) is a measure of present intellectual functioning. Although intelligence tests yield one IQ score (or several IQ or index scores), they are, in fact, devices for “sampling” many tasks in a variety of verbal and nonverbal areas. Intelligence testing is often part of a variety of psychological assessment batteries, including psychoeducational and neuropsychological evaluation, along with more general developmental and clinical evaluations. Although there is some disagreement, IQ scores tend to be relatively stable starting as young as 5 to 7 years of age. In general, the older the child is when tested and the smaller the interval between test administrations, the greater is the correlation between two IQ scores. Although using an IQ score can be useful as a way of assessing the client’s basic trajectory through life, the prudent practitioner must be aware that there are a number of factors that can affect intellectual functioning and, thus, IQ scores. Factors associated with a disorder and illness can suppress scores, particularly in psychiatric practice. These can include situational factors, such as lack of motivation, as well as transient factors, including inattention, depression, and psychosis. Despite conceptual and practical complications, high intelligence is associated with better prognosis in a wide range of psychiatric conditions; lower rates for behavior, conduct, and emotional problems in children; and lower rates of referral for psychiatric problems in adults. In the case of any kind of brain damage (neuronal death), intellectual level accounts for a great deal of variance in predicting outcome, with lower IQs associated with poorer outcomes and higher IQs associated with better outcomes. ASSESSMENT. Although IQ is what is obtained with an IQ test, there are a variety of intellectual tests, as well as other ways of calculating intellectual level. There are a number of instruments from which to choose, and psychologists must make their selection based on the specific characteristics of each test (e.g., normative sample and construction of the

instrument) as they relate to the characteristics of the client (e.g., age and referral question). Once the test has been administered, the clinician must make interpretations based on the analysis of overall and subtest scores and their pattern in the context of the diagnostic process. Comprehensive Intellectual Tests. The two best-known intellectual tests are the Wechsler Intelligence Scales and the Stanford-Binet Intelligence Scales (SB). The current editions of both are divided into separate subtests, and the data are analyzed in separate spheres. There are three separate instruments within the Wechsler tests that are designed for three different age groups over the life span: Wechsler Preschool and Primary Scale of Intelligence (WPPSI), Wechsler Intelligence Scale for Children (WISC), and Wechsler Adult Intelligence Scale (WAIS). One SB instrument covers a lifetime. Both instruments have made attempts to assist in decision making regarding attentional problems. The WISC has made particular attempts to link its findings to memory, adaptive, and giftedness scales. The SB includes a routing system so that the examiner

can “adapt” the administration to the functioning level of the examinee. Table 5.6-3 provides the intellectual classifications systems for the SB and the Wechsler tests. These categories are also relevant to the cognitive results of other psychometrically similar tests. Table 5.6-3 Comparison of Wechsler Intelligence Scales and Stanford-Binet Intelligence Scales–5th Edition (SB5) Intellectual Rangesa Achievement Testing. Achievement testing is used to determine a student’s level of functioning in basic academic areas (i.e., reading, mathematics, and writing). The purpose of the assessment is to identify learning problems and usually to rule out other psychological factors that might be complicating learning. Unlike intellectual testing, achievement testing is not necessarily expected to be stable over time because it measures the child’s success in formal learning and is highly dependent on the home environment and the school curriculum. Learning disability is commonly defined in terms of “unexpected underachievement”—that is, the child has the potential and opportunities to have learned more. When achievement testing is undertaken along with intellectual and processing testing, the overall evaluation is commonly referred to as a psychoeducational assessment. ASSESSMENT. Psychologists commonly begin an assessment of academic achievement by giving a comprehensive test in order to get a sense of a client’s areas of weakness in contrast to his or her strengths in reading, math, and writing. These findings are compared with school records. Because reading problems are a relatively common reason for referral and their causes are increasingly understood, where indicated, this comprehensive test is commonly followed by other tests of reading skills that separate out accuracy, fluency, and comprehension. Comprehensive Achievement Tests. Each of the tests assesses a range of academic areas,

so that they can be compared with each other for any individual or to academic achievement according to more external standards (age/grade expectations). The Wechsler Individual Achievement Tests (WIAT) and the Woodcock-Johnson Tests of Achievement (WJ-ACH) allow for the systematic assessment of reading (basic word recognition/decoding and comprehension), mathematics (calculation and reasoning), and writing (brief to extensive composition), as well as spelling and other academic spheres. FOCUSED NEUROPSYCHOLOGICAL ASSESSMENT Neuropsychology is dedicated to the study of brain–behavior relations and has matured into a clinical discipline for the diagnosis and characterization of brain function and dysfunction. Assessment of Functioning Neuropsychological assessment was originally developed for the assessment of adult patients and was not generally applied to child assessment until later. This functional assessment was important because the effect of trauma to the brain is highly variable

across individuals, even when the precise location and size of the lesion is known. In these situations, neuropsychological tests could provide specific functional information that take the child's age and developmental status into account. This continues to be a prominent point of referral for pediatric neuropsychology because it discusses not just the existence of the brain disruption but also its meaning in terms of the child's ability to function. This use of neuropsychological assessment is important with gross injury to the brain, but it is also valuable in situations in which sequelae are subtle and at risk of being attributed to psychological factors such as grief or poor motivation. Technical Advances Recent advances in neuroimaging have added to the use of neuropsychology in child assessment. One reason that neuropsychology was later in being applied to children was that technology for learning about children's normal brain development was not available. Given that neuropsychology studies the relationship between behavior and the brain, this gap in knowledge meant that inferences about brain function could not be applied to children. Because techniques such as positron emission tomography (PET) were prohibited in research with children, it was not until the introduction of functional magnetic resonance imaging (fMRI) in the early 1990s that full-scale research of child brain development could begin. Since that time, there has been an unprecedented explosion of knowledge that has expanded the scientific understanding of child brain development exponentially every year up to the present. Developments in Test Instruments Other advances in pediatric neuropsychology include the introduction of tests

specifically designed for use with children. These instruments assess similar behaviors as do their adult counterparts but use paradigms that are more engaging to children and better measure developmental transitions throughout childhood. These instruments are used in clinical assessments but are now also part of many research protocols examining childhood diseases and genetic conditions. Given its precision in measuring behavior, neuropsychological assessment is now involved, not just in the assessment of function after an injury but also in the initial diagnostic processes. Another example of this specificity is the now-routine use of neuropsychological testing in genetic research of developmental disorders of childhood, given the precision that it adds to questions of endophenotype expression. Neuropsychology's Application to Diagnosis and Treatment Planning These new technologies have greatly enlarged our understanding of both normal and atypical brain development in children, affecting our knowledge of childhood brain–behavior relationships, as well as diagnosis and treatment planning in pediatric groups. This increased understanding of typical as well as atypical brain development has made neuropsychological assessment useful, not just for children with acquired disorders but also in cases of developmental disorders. In this context, the term developmental disorders is used in reference to a child who is not developing in step with peers but who for unknown reasons struggles greatly or fails to develop specific abilities. Examples are difficulty in learning to read in an otherwise intact child (referred to as the developmental disorder of dyslexia) and problems with developing social or selfregulatory skills (seen in, respectively, autism spectrum and attention-deficit disorders). These disorders stand in contrast to "acquired" disorders, in which a known event, such as injury or illness, has affected the child's developmental trajectory. Integration of Neuropsychological, Educational, and Psychological Paradigms in Testing The effect on testing that these breakthroughs have made has also been significant. Most of this subsection focuses on test instruments that are foundational when assessing developmental differences in children. These measures (including tests of IQ or academic achievement) are central when youngsters are not keeping up with their peers in one regard or another and are the backbone of testing, regardless of

whether the assessor is trained as a psychologist or a neuropsychologist or has a background in education. These instruments are pivotal because they measure the major paradigms of both education and psychology, paradigms that govern both diagnosis and the provision of services. More recently, however, these established paradigms have been joined and affected by new information emerging from cognitive and neuropsychology in concert with the aforementioned breakthroughs in neuroimaging. The integration of these findings has led to relatively rapid changes in educational law and in the instruments used to test

children for learning disabilities. Applications of Neuropsychological Assessment The functional and diagnostic assessment of children and adolescents often begins (and ends) with the kinds of evaluations described in the “General Cognitive Assessment” subsection. There are situations, however, in which the use of educational or psychological or cognitive testing alone is not able to clarify the diagnosis and determine the most appropriate treatment plan. In those cases, the psychiatrist should consider additional neuropsychological testing. Descriptions and Assessment of Typical Neuropsychological Domains Typically, in addition to assessing IQ, academic achievement, and social and emotional functioning, neuropsychologists assess domains of memory, attention, executive functioning, language, visual perception, and sensory-motor development. Tests have been developed to examine specific aspects of these domains in isolation so as to increase diagnostic clarity. Although these domains are discussed as different constructs in this subsection, in truth they overlap with one another in many different ways. For example, the term working memory is often conceptualized as being an aspect of attention as well as a necessary component of good planning (which is part of executive functioning). It is also a component of memory in that, when it is not well developed, it leads to the phenomenon of forgetfulness. Memory. Memory is defined as the ability to reproduce or recall what has been learned or retained through activities or experiences. The process of memorizing includes two steps: encoding and retrieving. One metaphor for this two-step memory process is a filing cabinet. Encoding, then, is when a person puts information into the “filing cabinet drawer.” Someone with a true amnesic disorder (such as Alzheimer’s disease) never gets the information into the drawer. No amount of cueing or reminders later on will help the person to recall the information because it never “got into the drawer” in the first place. This type of impairment can be seen in some children, most often those with seizure disorders that adversely affect the temporal lobes. For most children, however, the problem described as “poor memory” is actually a difficulty with retrieval. Retrieval is the ability to get information out of the “file cabinet drawer” once it has been put in. Poor retrieval is associated with problems of organization (the folders are missing labels) and is more often the issue when children are described as being forgetful. To differentiate between encoding and retrieval, children are asked to memorize material and then, 20 to 30 minutes later, to recall it. If they are unable to remember it spontaneously, the examiner does not know whether they have not encoded it or are having problems with retrieval. If the child can remember the material with cueing (e.g., “In the story I read you, was the boy’s name Johnny or Sam?”), retrieval is implicated. For the child who cannot encode, however, cueing will not help.

ASSESSMENT. In assessing memory, several guidelines should be followed. Both visual and verbal memory tasks should be given. Visual memory tasks (such as learning the location of dots or memorizing faces) are usually aided by the right hemisphere. In most people, verbal memory tasks (such as memorizing a shopping list or a story) are supported by the left hemisphere. In addition, material to be memorized should include rote tasks (such as word lists) as well as material that is

presented in context (such as stories). Some memory tasks assess learning, or the child's ability to benefit from several presentations of the material. It is expected that, after three exposures to a picture of dots, the child's memory of it will be stronger than it was after the first exposure. If not, encoding may be implicated. A 20- to 30-minute delay should also be part of the memory assessment, and cues should be available to differentiate between encoding and retrieval difficulties. Other terms in the neuropsychological literature appear to describe memory but are actually probably better classified as part of the attention system. These include short-term memory and working memory. These terms are discussed in the following subsection on attention. Attention. The attention literature is large and includes many different conceptualizations. The following illustration demonstrates some elements of good attention. Suppose you arrive at a lecture hall, open your notebook, and rather than scanning the room indiscriminately, turn your attention to the instructor, who is just beginning to speak (selective attention). The lecture is mildly interesting, and you are able to pay attention for the full 20-minute presentation (sustained attention or vigilance). At the same time that you are listening to the instructor, you are taking handwritten notes incorporating headings and subheadings. It appears that you are able simultaneously to listen, write, and organize rather effortlessly, although you are probably shifting your attention among these competing tasks (divided attention). A fire engine goes by the lecture hall and you look up (distraction) but are then able to ignore the dimming noise of the siren (inhibition) and continue to listen to the lecture (again, sustained attention). Suddenly, the fire alarm rings, and you smell smoke. These distracters capture your full attention (disengagement from lecture), and their importance causes you to change your attention and behavior (set shifting) as you hurriedly head for the door. A breakdown in any one of these areas can lead to a breakdown in attention. ASSESSMENT. Assessment of attention requires a number of approaches. Children with attention problems exhibit them at home and at school whenever a task becomes less interesting to them. They function better when working one-on-one with a person or when working on a new activity because it is more stimulating. For this reason, the testing environment may not elicit the inattentive behavior (especially on the first day). To assess the child's attention "in real life" and across settings, attention questionnaires should be completed by both parents and teachers. Many researchers consider this aspect of the assessment of attention to be the most important. Some neuropsychological measures have been found to be sensitive to attention as well. Computerized measures of sustained attention that are designed to be long and boring can capture the loss of attention described here. In addition, specific kinds of

performance patterns on these measures have been shown to differentiate different types of attention problems. Assessment of verbal short-term memory might include the repetition of digits or of short sentences. Assessment of visual short-term memory can be achieved by having the child point to dots or circles on the page in the same order in which the examiner has just pointed to them. Working memory is usually assessed as the second part of a shortterm memory test. It requires that the material that has been stored in short-term memory be manipulated in some way. Verbal working memory can be assessed by having the child repeat digits backward or by doing mathematics in his or her head. Saying the months of the year backward can also assess verbal working memory (as long as the child is able to give them in their usual order without difficulty). Having the child point to the dots on the page in the reverse order in which they are shown can assess visual-spatial working memory. Executive Functioning. Executive functioning could be considered to be the mature product of good attention. Although not developed in earnest until children reach adolescence, many aspects of executive functioning begin to appear when children

are younger and, thus, can be measured. Executive functioning refers to the person's ability to organize his or her behaviors to perform a specific goal. Good executive functioning allows a person to identify problems, generate solutions, choose among them, follow through on the chosen strategy, and evaluate its effectiveness as the work progresses. Without good executive functioning, children who are bright have difficulty demonstrating their abilities. Their parents often report school underachievement that cannot be explained by learning problems. The issue is not about "knowledge" but rather the application of that knowledge to everyday functioning. ASSESSMENT. Assessment of executive functioning requires several tests, given its many facets. Good attention and working memory, already discussed, are crucial to goaldirected behavior. Inhibition can be tested by giving the child a task in which he or she must control an automatic response. Fluency can be assessed by having the child generate category words under a time limit. For example, a child might be asked to name as many kinds of toys as he or she can in 1 minute. A variant of this task requires the child to create as many designs as he or she can in a 1-minute period, according to strict guidelines. Cognitive flexibility is often tested with the Wisconsin Card Sorting Test (WCST), a measure of problem solving. On this test, the child is not told how to solve the puzzles; rather, he or she must use feedback that his or her attempts are "right" or "wrong" and is then expected to use this information to generate strategies. During the course of this test, the rules often change without warning, requiring that the child "regroup" and develop a new strategy. This measure generates information about the child's ability to initially figure out the task, his or her tendency to perseverate on wrong responses, and his or her ability to use feedback to generate new responses. Planning is another aspect of executive functioning. Variants of a "tower" test are

often used to assess this ability. On a tower test, the child is shown a picture with colored balls or disks stacked on top of one another on wooden pegs in a specific configuration. The child is told to move the balls or disks on the pegs for an actual model on the table to match the configuration shown in the picture. The child is instructed to move only one ball or disk at a time and to use as few moves as possible. To perform the task well, the child must first "hold back" and not make impulsive moves that may get him or her "cornered." The child must also visualize the first few steps of the problem. Thus, both impulse control and visual working memory are required to exhibit good planning on this rather entertaining test. Language. Human language organizes, supports, and communicates knowledge, memories, and ideas. Beyond just allowing us to communicate with others, language organizes both thoughts and emotions, as well as helping us sequence our actions. Although traditionally discussed in terms of left hemisphere functioning, much of the human cortex is involved in various aspects of language. Communication includes both speech, the rapid and complex motor movements involved in talking, and language, the code used to express thoughts and ideas. Linguists conceptualize language as being composed of four separate parts: phonemes, defined as the smallest units of sound in a language; morphemes, the smallest units of meaning; syntax at the level of the sentence (e.g., use of direct or indirect pronouns); and discourse, the stringing together of sentences to create a narrative. In considering language, perhaps the most common distinction made is between expressive and receptive language. Expressive language requires the production of language, including articulating clearly, finding the right word, and applying grammar and syntax to one's ideas, in addition to vocal fluency and voice tone (prosody). Receptive language involves the ability to comprehend and remember what is said. Children with expressive language problems may appear to have little to say and considered to be shy. In fact, however, their difficulty may be with self-expression. Some children who are very

talkative (fluent) may also have difficulty with finding the word they want or organizing their sentences to make them clear. The paradox of a fluent child with an expressive language disorder may cause his or her problems to be overlooked. Receptive language, or the ability to understand what is being said, represents another aspect of the language system. Children with poor receptive language have difficulty in processing information that is spoken to them and may have difficulty learning in the classroom or appear to be inattentive. Sometimes they appear to be oppositional because of their difficulty with understanding (and therefore doing) what they are told. Secondary problems of children with language disorders include difficulties with social interactions and processing of emotions. Language is what humans use to interact and communicate their ideas to one another. When this ability is compromised, children may isolate or try to find less language-intense activities to occupy their time. Emotional problems may ensue from the child's difficulty with using language to express and,

therefore, process his or her inner world. ASSESSMENT. Assessment of language should include several measures meant to identify the child's specific language profile. Tests should assess all levels of language, including phonemes, single words, simple phrases, complex sentences, and conversation. Measures of both expressive and receptive language should be included. In the assessment of receptive language, children are asked to distinguish between similar sounds and words, remember and repeat word lists and related strings of words, point to a picture that depicts a vocabulary word, and follow increasingly complex directions presented only once. In the assessment of expressive language, children are asked to perform tasks such as listing as many round objects as they can within a time limit, naming a depicted or described item, defining words or concepts, or creating a syntactically complex sentence according to strict guidelines. In addition, the psychologist might explore pragmatics, which is the child's ability to participate in conversation and use social language. This involves interpreting nonverbal aspects of communication, as well as observing basic social rules, such as turn-taking in conversation. Although neuropsychologists often evaluate pragmatics in addition to receptive and expressive language, they also work in concert with speech and language specialists when additional assessment is indicated. Visuoperceptual Functioning. There are several associated constructs in neuropsychology that reflect people's ability to make sense of what they see, to organize it, or to copy it. These abilities are referred to as visuoperceptual–visuoconstructive abilities. Problems with visuoperception are distinct from problems with vision. A person with acute eyesight can struggle with perceptual difficulties, such as identifying which of several figures are exactly alike. Some children have difficulty seeing exactly where something is, and these children may have trouble localizing a point in space or judging the direction of a line. Visuoconstruction abilities allow a child to join parts to make a whole. These skills require the integration of the motor system with the visual system. Examples include the ability to put together blocks to form a design or to draw three lines to form a triangle. Problems with visuoperceptual development have academic, as well as social, ramifications. Academic areas, such as mathematics, that are less reliant on verbal support are at risk. In addition, concepts such as time and monetary values may not be clearly understood. Students with these difficulties often exhibit a poor sense of direction, and problems with integrating complex visual arrays may lead to feelings of being overwhelmed. They may also have difficulty "reading between the lines," thereby making comprehension of less tangible reading concepts (such as theme) more elusive. Social problems are also often seen in students with these delays. Many elements of good social interactions are nonverbal, including the ability to notice and interpret gestures, facial expression, body posture, and tone of voice. Students with visuoperceptual delays may be overreliant on

verbal information and may not understand when people are being sarcastic or when something is said in jest. ASSESSMENT. Assessment of visual processing must address each of the specific elements of this system. The visuoperceptual abilities should be tested using tasks that do not

require the child to use his or her hands to produce the response—for example, activities that require the child to identify designs that match or differ from the target, as well as measures of mental rotation (determining which design is the same as the target, only rotated). Visuoconstruction tasks add the demand of integrating the hands and eyes in producing the response—for example, having the child draw copies of designs or use blocks to create a replica of a model. Sensory/Motor Functioning. The sensory/motor system is also assessed as part of the neuropsychological examination. Lateralized sensory or motor problems suggest neurological problems on the opposite side of the brain and are often correlated with cognitive processes localized to the right or left hemisphere. Tasks requiring the perception of visual or auditory fields or specific actions with right or left sides of the body are part of this domain. In addition, integration of perceptions or movements is also assessed. Motor assessment is further categorized into the assessment of handedness and tests of large versus fine motor development, as well as the ability to plan motor responses (praxis). ASSESSMENT. The sensory exam usually includes assessment of visual fields using clinical methods, such as having the child look at the examiner's nose and then determine whether the assessor is moving the right or left extended hand. Similarly, assessment of bilateral auditory perception might include the assessor standing behind the child and rubbing his or her fingers near the child's right or left ear. Other perceptual tests might assess the ability to name unseen objects placed in the child's right or left hand. Finger agnosia is tested by touching a finger when the child's hand is hidden behind a screen and then having him or her indicate which finger was touched. Integration of perception might include having the child follow directions involving a picture that is shown. Agebased normative data are available for all of these tasks. Both fine and large motor tests are usually assessed on both the right and left sides of the body. Lateralized fine motor tasks include quickly placing pegs in holes with each hand or squeezing a hand dynamometer with each hand to assess grip strength. Fingertip tapping is one way of testing motor sequencing, as are activities that require the child to repeat sequences of movements from memory. Handedness is best assessed by having the child do a number of tasks with one hand (e.g., "Show me how you use this spoon," "Hand me the dime," and "Throw me the ball.") in random order. Assessment of difficulties with motor planning can be done using pantomime. Large motor testing involves having the child demonstrate gait while walking forward and backward, running, skipping, walking a straight line, and balancing on one foot. In cases in which the findings of motor screening are significant, the neuropsychologist might refer the child to an occupational or physical therapist for further, more specific, evaluation. Neuropsychological testing is commonly undertaken according to several discrete domains that reflect areas of brain functioning. Typically, these include attention and

executive functioning, memory, and language as well as visuoperceptual and sensory/motor functioning. In considering neuropsychological issues, the following factors should be kept in mind: After early brain injury, language and motor functioning are the most likely to benefit from "plasticity." Some research suggests that, with this process of reorganization, other functions (most notably, visuoperceptual abilities) may be "crowded out," yielding scores that are lower than expected. Interventions for neurologically driven developmental delays have their most profound effect on younger children. Recent studies have shown that, in children with reading disabilities,

bilateral representation of language identified with fMRI before intervention shifted to the left hemisphere by several orders of magnitude in every subject after only 80 hours of reading intervention. These changes in the brain were accompanied by improved reading skills. Thus, the philosophy of delaying intervention until a deficit is fully expressed may keep children from receiving the full benefit that early intervention provides. Risk factors for reading disabilities include family history, early language delays, poor articulation, chronic ear infections, poor early rhyming abilities, inability to recite (not sing) the alphabet by the end of kindergarten, and early brain injury. Ambidexterity (consistently using the right hand for some specific tasks and the left hand for other specific tasks) often runs in families in which several members are left handed. In contrast, ambiguous handedness (or the use of either hand for the same task; sometimes writing with the right hand, sometimes writing with the left hand) can be a pathognomonic sign suggesting poor cerebral organization for specific behaviors. Attention-deficit/hyperactivity disorder (ADHD) more adversely affects abilities typically associated with right hemisphere functioning (such as fine motor skills and visuoperceptual abilities) and affects attention and executive functioning. Psychostimulant medication has been shown to improve functioning in all of these domains in children with ADHD. REFERENCES Cleary MJ, Scott AJ. Developments in clinical neuropsychology: Implications for school psychological services. J School Health. 2011;81:1. Dawson P, Guare R. Executive Skills in Children and Adolescents: A Practical Guide to Assessment and Intervention. 2nd ed. New York: Gilford; 2010. Fletcher JM, Lyon RG, Fuchs LS, Barnes MA. Learning Disabilities: From Identification to Intervention. New York: Guilford; 2007. Jura MB, Humphrey LA. Neuropsychological and cognitive assessment of children. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:973. Korja M, Ylijoki M, Japinleimu H, Pohjola P, Matomäki J, Kusśmierek H, Mahlman M, Rikalainen H, Parkkola R, Kaukola

07 - 5.7 Medical Assessment and Laboratory Testing

5.7 Medical Assessment and Laboratory Testing in Psychiatry

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colleagues.

PHYSICAL HEALTH MONITORING Monitoring the physical health of psychiatric patients has two goals: to provide appropriate care for existing illnesses and to protect the patient's current health from possible future impairment. Disease prevention should begin with a clear concept of the condition to be avoided. Ideally, in psychiatry this would be a focus on commonly found conditions that could be a significant source of morbidity or mortality. It is clear that in psychiatry a small number of clinical problems underlie a significant number of impairments and premature deaths. ROLE OF HISTORY AND PHYSICAL EXAMINATION A thorough history, including a review of systems, is the basis for a comprehensive patient assessment. The history guides the clinician in the selection of laboratory studies that are relevant for a specific patient. Many psychiatric patients, owing to their illnesses, are not capable of providing sufficiently detailed information. Collateral sources of information, including family members and prior clinicians and their medical records, may be particularly helpful in the assessment of such patients. The patient's medical history is an important component of the history. It should include notation of prior injuries and, in particular, head injuries that resulted in loss of consciousness and other causes of unconsciousness. The patient's medical history also should note pain conditions, ongoing medical problems, prior hospitalizations, prior surgeries, and a list of the patient's current medications. Toxic exposures are another important component of the medical history. Such exposures are often workplace related. The social history contains many of the details relevant to the assessment of character pathology, including risk factors for personality disorders as well as information relevant to the assessment of major disorders. Commonly, the social history includes a legal history, information about family and other significant relationships, and an occupational history. In evaluating patients who appear demented, the role of the physical examination is to elucidate possible causative factors such as the cogwheel rigidity and tremor associated with Parkinson's disease or neurological deficits suggestive of prior strokes. Standard laboratory studies commonly assessed in dementia patients include a complete blood count (CBC), serum electrolytes, liver function tests, blood urea nitrogen (BUN), creatinine (Cr), thyroid function tests, serum B12 and folate levels, Venereal Disease Research Laboratory (VDRL) test, and a urinalysis. Currently, there is no clear clinical indication for testing for the apolipoprotein E epsilon 4 allele. Often, a computed tomography (CT) scan is performed if there are focal neurological findings, and an electroencephalogram (EEG) may be performed if there is delirium. When patients are delirious, the neurological examination may be complicated by inattention due to altered levels of consciousness. Delirium workup often includes the same laboratory

workup described above for dementia. Urine or blood cultures, chest radiograph, neuroimaging studies, or EEG also may be appropriate. IMAGING OF THE CENTRAL NERVOUS SYSTEM Imaging of the central nervous system (CNS) can be broadly divided into two domains: structural and functional. Structural imaging provides detailed, noninvasive visualization of the morphology of the brain. Functional imaging provides a visualization of the spatial distribution of specific biochemical processes. Structural imaging includes X-ray CT and magnetic resonance imaging (MRI). Functional imaging includes positron emission tomography (PET), single photon emission computed tomography (SPECT), functional MRI (fMRI), and magnetic resonance spectroscopy (MRS). With the limited exception of PET scanning, functional imaging techniques are still considered research tools that are not yet ready for routine clinical use. Magnetic Resonance Imaging MRI scans are used to distinguish structural brain abnormalities that may be associated with a patient's behavioral

changes. These studies provide the clinician with images of anatomical structures viewed from cross-sectional, coronal, or oblique perspectives. MRI scans can detect a large variety of structural abnormalities. The MRI is particularly useful in examining the temporal lobes, the cerebellum, and the deep subcortical structures. It is unique in its ability to identify periventricular white matter hyperintensities. MRI scans are useful in examining the patient for particular diseases, such as nonmeningeal neoplasms, vascular malformations, seizure foci, demyelinating disorders, neurodegenerative disorders, and infarctions. Advantages of MRI include the absence of ionizing radiation and the absence of iodine-based contrast agents. MRI scans are contraindicated when the patient has a pacemaker, aneurysm clips, or ferromagnetic foreign bodies. Computed Tomography CT scans are used to identify structural brain abnormalities that may contribute to a patient's behavioral abnormalities. These studies provide the clinician with crosssectional X-ray images of the brain. CT scans can detect a large variety of structural abnormalities in the cortical and subcortical regions of the brain. CT scans are useful when a clinician is looking for evidence of a stroke, subdural hematoma, tumor, or abscess. These studies also permit visualization of skull fractures. CT scans are the preferred modality when there is suspicion of a meningeal tumor, calcified lesions, acute subarachnoid or parenchymal hemorrhage, or acute parenchymal infarction. CT scans may be performed with or without contrast. The purpose of contrast is to enhance the visualization of diseases that alter the blood–brain barrier, such as tumors, strokes, abscesses, and other infections.

Positron Emission Tomography PET scans are performed predominately at university medical centers. PET scans require a positron emission tomograph (the scanner) and a cyclotron to create the relevant isotopes. This type of scan involves the detection and measurement of emitted positron radiation after the injection of a compound that has been tagged with a positronemitting isotope. Typically, PET scans use fluorodeoxyglucose (FDG) to measure regional brain glucose metabolism. Glucose is the principal energy source for the brain. These scans can provide information about the relative activation of brain regions because regional glucose metabolism is directly proportionate to neuronal activity. Brain FDG scans are useful in the differential diagnosis of dementing disease. The most consistent finding in the PET literature is the pattern of temporal-parietal glucose hypometabolism in patients with Alzheimer's type dementia. PET scanning using FDDNP (2-(1-{6-[(2-[fluorine-18]fluoroethyl)(methyl)amino]-2naphthyl}-ethylidene) malononitrile) has the ability to differentiate between normal aging, mild cognitive impairment, and Alzheimer's disease by determining regional cerebral patterns of plaques and tangles associated with Alzheimer's disease. FDDNP binds to the amyloid senile plaques and tau neurofibrillary tangles. FDDNP appears to be superior to FDG PET in differentiating Alzheimer's patients from those with mild cognitive impairment and subjects with normal aging and no cognitive impairment. Single Photon Emission Computed Tomography SPECT is available in most hospitals but is rarely used to study the brain. SPECT is more commonly used to study other organs, such as the heart, liver, and spleen. Some recent work, however, attempts to correlate SPECT brain imaging with mental disorders. Functional Magnetic Resonance Imaging fMRI is a research scan used to measure regional cerebral blood flow. Often, fMRI data are superimposed on conventional MRI images, resulting in detailed brain maps of brain structure and function. The measurement of blood flow involves the use of the heme molecule as an endogenous contrast agent. The rate of flow of heme molecules can be measured, resulting in an assessment of regional cerebral metabolism. Magnetic Resonance Spectroscopy MRS is another research method to measure regional brain metabolism. MRS scans are performed on conventional MRI devices that have had specific upgrades to their

hardware and software. The upgrades permit the signal from protons to be suppressed and other compounds to be measured. (Conventional MRI images are, in reality, a map of the spatial distribution of protons found in water and fat.) Magnetic Resonance Angiography

Magnetic resonance angiography (MRA) is a method for creating three-dimensional maps of cerebral blood flow. Neurologists and neurosurgeons more commonly use this test. It is rarely used by psychiatrists. TOXICOLOGY STUDIES Urine drugs of abuse screens are immunoassays that detect barbiturates, benzodiazepines, cocaine metabolites, opiates, phencyclidine, tetrahydrocannabinol, and tricyclic antidepressants. These rapid tests provide results within an hour. However, they are screening tests; additional testing is required to confirm the results of this screening. Testing to determine blood concentrations of certain psychotropic medications enables the clinician to ascertain whether blood levels of medications are at therapeutic, subtherapeutic, or toxic levels. Psychiatric symptoms are not uncommon when prescribed medications are at toxic levels. In the debilitated and the elderly, pathological symptoms may occur at therapeutic concentrations. The normal reference range varies between laboratories. It is important to check with the laboratory performing the test to obtain the normal reference range for that laboratory. Testing for drugs of abuse is usually performed on urine specimens. It also may be performed on specimens of blood, breath (alcohol), hair, saliva, and sweat. Urine screens provide information about recent use of frequently abused drugs such as alcohol, amphetamines, cocaine, marijuana, opioids, and phencyclidine along with 3,4methylenedioxymethamphetamine (MDMA) (ecstasy). Many substances may produce false positives with urine drug screening tests. When a false positive is suspected, a confirmatory test may be requested. Comprehensive qualitative toxicology screening is usually performed by liquid and gas chromatography. This may require many hours to perform and is rarely done in routine clinical situations. It is usually performed in patients with unexplained toxicity and an atypical clinical picture. Qualitative toxicology assessments may be useful in managing patients who have overdosed, when combined with clinical assessment and knowledge of when the ingestion occurred. Drug Abuse Patients are frequently unreliable when reporting their drug abuse history. Drug-induced mental disorders often resemble primary psychiatric disorders. Furthermore, substance abuse can exacerbate preexisting mental illness. Indications for ordering a drug abuse screen include unexplained behavioral symptoms, a history of illicit drug use or dependence in a new patient evaluation, or a high-risk background (e.g., criminal record, adolescents, and prostitutes). A drug abuse screen is also frequently used to monitor patient abstinence during treatment of substance abuse. Such tests can be ordered on a scheduled or random basis. Many clinicians believe random testing may be more accurate in the assessment of abstinence. The tests also may help to motivate the

patient. Other laboratory data may suggest a problem with substance abuse. An increase in the mean corpuscular volume is associated with alcohol abuse. Liver enzymes may be increased with alcohol abuse or from hepatitis B or C acquired from intravenous (IV) drug abuse. Serological testing for hepatitis B or C can confirm that diagnosis. IV drug abusers are at risk for bacterial endocarditis. If bacterial endocarditis is suspected, further medical workup is indicated. Tested Substances. Routine tests are available for phencyclidine (PCP), cocaine, tetrahydrocannabinol (THC; also known as marijuana), benzodiazepines, methamphetamine and its metabolite amphetamine, morphine (Duramorph), codeine, methadone (Dolophine), propoxyphene (Darvon), barbiturates, lysergic acid diethylamide (LSD), and MDMA. Drug screening tests may have high false-positive rates. This is often due to the interaction of prescribed medication with the test,

resulting in false-positive results and lack of confirmatory testing. False-negative tests are common as well. False-negative results may be due to problems with specimen collection and storage. Testing is most commonly performed on urine, although serum testing is also possible for most agents. Hair and saliva testing are also available in some laboratories. Alcohol can also be detected in the breath (breathalyzer). With the exception of alcohol, drug levels are not usually determined. Instead, only the presence or absence of the drug is determined. There is usually not a meaningful or useful correlation between the level of the drug and clinical behavior. The length of time that a substance can be detected in the urine is listed in Table 5.7-1. Table 5.7-1 Drugs of Abuse that Can Be Detected in Urine Alcohol There is no single test or finding on physical examination that is diagnostic for alcohol abuse. The history of the pattern of alcohol ingestion is most important in making the diagnosis. Laboratory test results and findings on physical examination may help to

confirm the diagnosis. In patients with acute alcohol intoxication, a blood alcohol level (BAL) may be useful. A high BAL in a patient who clinically does not show significant intoxication is consistent with tolerance. Significant clinical evidence of intoxication with a low BAL should suggest intoxication with additional agents. Intoxication is commonly found with levels between 100 and 300 mg/dL. The degree of alcohol intoxication can also be assessed using the concentration of alcohol in expired respirations (breathalyzer). Chronic alcohol use is commonly associated with other laboratory abnormalities, including elevation in liver enzymes, such as aspartate aminotransferase (AST), which is usually greater than serum alanine aminotransferase (ALT). Bilirubin also is often elevated. Total protein and albumin may be low, and prothrombin time (PT) may be increased. A macrocytic anemia may be present. Alcohol abuse may be associated with rhinophyma, telangiectasias, hepatomegaly, and evidence of trauma on physical examination. In withdrawal, patients may have hypertension, tremulousness, and tachycardia. Laboratory studies in patients who abuse alcohol may reveal macrocytosis. This occurs in most patients who consume four or more drinks per day. Alcoholic liver disease is characterized by elevations in AST and ALT, typically in a ratio of AST to ALT of 2:1 or greater. The γ-glutamyl transpeptidase (GGT) level may be elevated. Carbohydratedeficient transferrin (CDT) may be helpful in the identification of chronic heavy alcohol use. It has a sensitivity of 60 to 70 percent and a specificity of 80 to 90 percent. BAL is used to legally define intoxication in the determination of whether an individual is driving under the influence. The legal limit in many states is 80 mg/dL. However, clinical manifestations of intoxication vary with an individual’s degree of alcohol tolerance. At the same BAL, an individual who chronically abuses alcohol may exhibit less impairment than an alcohol-naive individual. Generally a BAL in the range of 50 to 100 mg/dL is associated with impaired judgment and coordination, and levels greater than 100 mg/dL produce ataxia. Environmental Toxins Specific toxins are associated with a variety of behavioral abnormalities. Exposure to toxins commonly occurs through occupation or hobbies. Aluminum intoxication can cause a dementia-like condition. Aluminum can be detected in the urine or blood. Arsenic intoxication may cause fatigue, loss of consciousness, anemia, and hair loss. Arsenic can be detected in urine, blood, and hair. Manganese intoxication may present with delirium, confusion, and a parkinsonian syndrome. Manganese may be detected in urine, blood, and hair. Symptoms of mercury intoxication include apathy, poor memory, lability, headache, and fatigue. Mercury can be detected in urine, blood, and hair. Manifestations of lead intoxication include encephalopathy, irritability, apathy, and anorexia. Lead can be detected in blood or urine. Lead levels typically are

assessed by collecting a 24-hour urine sample. The free erythrocyte protoporphyrin test is a screening test for chronic lead intoxication. This test is commonly coupled with a blood lead level. The Centers for Disease Control and Prevention specify that a lead level greater than 25 µg/dL is significant for children. The incidence of lead toxicity in children has been falling recently. Significant exposure to organic compounds, such as insecticides, may produce behavioral abnormalities. Many insecticides have strong anticholinergic effects. There are no readily available laboratory tests to detect these compounds. Poison control centers may assist in the identification of appropriate testing facilities. Volatile Solvent Inhalation Volatile substances produce vapors that are inhaled for their psychoactive effect. The most commonly abused volatile solvents include gasoline, glue, paint thinner, and correction fluid (white-out). The aerosol propellants from cleaning sprays, deodorant sprays, and whipped cream containers may be abused. Nitrites, such as amyl nitrite (“poppers”) and butyl nitrite vials (“rush”), and anesthetic gases, such as chloroform, ether, and nitrous oxide, are also abused. Chronic abuse of volatile solvents is associated with damage to the brain, liver, kidneys, lung, heart, bone marrow, and blood. Abuse may produce hypoxia or anoxia. Signs of abuse include short-term memory loss, cognitive impairment, slurred and “scanning” speech, and tremor. Cardiac arrhythmias may occur. Exposure to toluene, which is present in many cleaning solutions, paints, and glues, has been associated with loss of clear gray–white matter differentiation and with brain atrophy on MRI scans. Methemoglobinemia has occurred with butyl nitrite abuse. Chronic use of volatile solvents is associated with the production of panic attacks and an organic personality disorder. Chronic use may also produce impairment in working memory and executive cognitive function. SERUM MEDICATION CONCENTRATIONS Serum concentrations of psychotropic medications are assessed to minimize the risk of toxicity to patients receiving these medications and to ensure the administration of amounts sufficient to produce therapeutic response. This is particularly true for medications with therapeutic blood levels. Medication levels are often influenced by hepatic metabolism. This metabolism occurs via the action of enzymes in the liver. Acetaminophen Acetaminophen may produce hepatic necrosis, which in some cases may be fatal. Acetaminophen is one of the most frequently used agents in intentional drug overdoses and is a common cause of overdose-related deaths. Toxicity is associated with levels greater than 5 mg/dL (>330 µmol/L) in patients without preexisting liver disease. Chronic abusers of alcohol are particularly vulnerable to the effects of overdose.

Acetylcysteine (Mucomyst) treatment must occur promptly after overdose to prevent hepatotoxicity. Salicylate Toxicity Aspirin is frequently ingested in overdose. Consequently, serum salicylate levels often are obtained in overdose cases. Some rheumatic patients may chronically ingest large amounts of salicylate for therapeutic reasons. Ingestion of 10 to 30 g of aspirin may be fatal. Most patients will develop symptoms of toxicity when salicylate levels are greater than 40 mg/dL (2.9 mmol/L). Common symptoms of toxicity include acid-base abnormalities, tachypnea, tinnitus, nausea, and vomiting. In cases of severe toxicity, symptoms may include hyperthermia, altered mental status, pulmonary edema, and death. Antipsychotic Agents Clozapine. Clozapine (Clozaril) levels are trough levels determined in the morning before administration of the morning dose of medication. A therapeutic range for clozapine has not been established; however, a level of 100 mg/mL is widely considered to be the minimum therapeutic threshold. At least 350 mg/mL of clozapine is considered to be necessary to achieve therapeutic response in patients with refractory schizophrenia. The likelihood of seizures and other side effects increases with clozapine levels greater than 1,200 mg/mL or doses greater than 600 mg per day or both. Clozapine is a common cause of a leukopenia in psychiatry. When moderate to severe leucopenia develops, clozapine

treatment must be interrupted, but patients may be retreated with clozapine in the future. Mood Stabilizers Carbamazepine. Carbamazepine (Tegretol) may produce changes in the levels of white blood cells, platelets, and, under rare circumstances, red blood cells. Anemia, aplastic anemia, leucopenia, and thrombocytopenia may all occur but are rare. Pretreatment evaluations typically include CBC. Carbamazepine may produce hyponatremia. This hyponatremia is usually mild and does not produce clinical symptoms. However, carbamazepine may cause the syndrome of inappropriate secretion of antidiuretic hormone (SIADH). Carbamazepine may produce a variety of congenital abnormalities, including spina bifida and anomalies of the fingers. Manifestations of toxicity may include nausea, vomiting, urinary retention, ataxia, confusion, drowsiness, agitation, or nystagmus. At very high levels, symptoms may also include cardiac dysrhythmias, seizures, and respiratory depression. Lithium. Lithium (Eskalith) has a narrow therapeutic index. Consequently, blood levels of lithium must be monitored to achieve therapeutic dosing and avoid toxicity.

Side effects are dose dependent. Symptoms of toxicity include tremors, sedation, and confusion. At higher levels delirium, seizures, and coma may occur. Symptoms of toxicity may begin to manifest with serum levels of greater than 1.2 mEq/L and are common with levels greater than 1.4 mEq/L. Elderly or debilitated patients may show signs of toxicity with levels less than 1.2 mEq/L. Valproate. Because of the risk of hepatotoxicity, ranging from mild dysfunction to hepatic necrosis, pretreatment liver function tests are usually obtained. More commonly valproate (valproic acid [Depakene] and divalproex [Depakote]) may cause a sustained elevation in liver transaminase levels of as much as three times the upper limit of normal. Valproate may increase the risk of birth defects. A pretreatment urine pregnancy test is usually obtained in women of childbearing years. Women should be cautioned to use adequate contraception. Hematological abnormalities are also possible and include leucopenia and thrombocytopenia. Treatment with valproate may increase serum ammonia levels. It is prudent to obtain an ammonia level in a patient undergoing valproate treatment who presents with altered mental status or lethargy. Acute pancreatitis may also occur. Antidepressants Monoamine Oxidase Inhibitors. Treatment with monamine oxidase inhibitors (MAOIs) can cause orthostasis and, rarely, hypertensive crisis. Baseline blood pressure measurement should be obtained before the initiation of treatment, and blood pressure should be monitored during treatment. There are no meaningful blood levels for MAOIs, and direct monitoring of MAOI blood levels is not clinically indicated. Treatment with MAOIs is occasionally associated with hepatotoxicity. For this reason, liver function tests usually are obtained at the initiation of treatment and periodically after. Tricyclic and Tetracyclic Antidepressants. Routine laboratory studies obtained before initiation of tricyclic or tetracyclic antidepressants (TCAs) typically include CBC, serum electrolytes, and liver function tests. Because TCAs affect cardiac conduction, clinicians also may obtain an electrocardiogram (ECG) to assess for the presence of abnormal cardiac rhythms and prolonged PR, QRS, and QTc complexes before initiation of these medication. NEUROLEPTIC MALIGNANT SYNDROME Neuroleptic malignant syndrome (NMS) is a rare, potentially fatal, consequence of neuroleptic administration. The syndrome consists of autonomic instability, hyperpyrexia, severe extrapyramidal symptoms (i.e., rigidity), and delirium. Sustained muscle contraction results in peripheral heat generation and muscle breakdown. Muscle breakdown contributes to elevated levels of creatine kinase (CK). Peripheral heat

generation with impaired central mechanisms of thermoregulation results in hyperpyrexia. Myoglobinuria and leukocytosis are common. Hepatic and renal failure may occur. Liver enzymes become elevated with liver failure. Patients may die from hyperpyrexia, aspiration pneumonia,

renal failure, hepatic failure, respiratory arrest, or cardiovascular collapse. Treatment includes discontinuation of the neuroleptic, hydration, administration of muscle relaxants, and general supportive nursing care. A typical laboratory workup for NMS includes a CBC, serum electrolytes, BUN, Cr, and CK. A urinalysis, including an assessment of urine myoglobin, is also usually performed. As part of the differential diagnosis, blood and urine cultures are performed as part of a fever workup. Pronounced elevations in the white blood cell (WBC) count may occur in NMS. White blood cell counts are typically in the range from 10,000 to 40,000 per mm3. Muscle Injury Serum CK levels may rise in response to repeated intramuscular (IM) injections, prolonged or agitated periods in restraint, or NMS. Dystonic reactions from neuroleptic administration may also result in elevated levels of CK. ELECTROCONVULSIVE THERAPY Electroconvulsive therapy (ECT) is usually reserved for patients with the most treatment-resistant depression. Typical laboratory tests obtained before the administration of ECT include a CBC, serum electrolytes, urinalysis, and liver function tests. However, no specific laboratory tests are required in the pre-ECT evaluation. Usually, an ECG is also obtained. A spinal X-ray series is no longer considered routinely indicated because of the low risk of spinal injury associated with modern administration techniques that use paralyzing agents. A comprehensive medical history and physical examination are useful screening tools to identify possible conditions that could complicate treatment. ENDOCRINE EVALUATIONS Endocrine disease is of great relevance to psychiatry. Management of psychiatric illness is complicated by comorbid endocrine disease. Endocrine illness frequently has psychiatric manifestations. For these reasons, screening for endocrine disease is often of relevance to the psychiatrist. Adrenal Disease Adrenal disease may have psychiatric manifestations, including depression, anxiety, mania, dementia, psychosis, and delirium. However, patients with adrenal disease rarely come to the attention of psychiatrists. Assessment and management of these patients are best done in conjunction with specialists.

Low plasma levels of cortisol are found in Addison’s disease. These patients may have symptoms that are also common in psychiatric conditions including fatigue, anorexia, weight loss, and malaise. Patients may also have memory impairment, confusion, or delirium. Depression or psychosis with hallucinations and delusions may occur. Elevated levels of cortisol are seen in Cushing’s syndrome. About half of all patients with Cushing’s syndrome develop psychiatric symptoms. These symptoms may include lability, irritability, anxiety, panic attacks, depressed mood, euphoria, mania, or paranoia. Cognitive dysfunctions may include cognitive slowing and poor short-term memory. Symptoms usually improve when cortisol normalizes. If not, or if symptoms are severe, psychiatric treatment may be necessary. Cortisol levels have not been found to be useful in the assessment or management of primary psychiatric disease. In particular, the dexamethasone-suppression test (DST) remains a research tool in psychiatry that is not used in routine clinical care. Anabolic Steroid Use Use of anabolic steroids has been associated with irritability, aggression, depression, and psychosis. Athletes and bodybuilders are common abusers of anabolic steroids. Urine specimens can be used to screen for these agents. Because so many compounds have been synthesized, a variety of tests may be required to confirm the diagnosis, depending on the compound that has been used. Consultation with a specialist is advised. Generally, androgens other than testosterone can be detected by gas chromatography and mass spectroscopy. Antidiuretic Hormone Arginine vasopressin (AVP), also called antidiuretic hormone (ADH), is decreased in central diabetes insipidus (DI). DI may be central (due to the pituitary or hypothalamus) or nephrogenic. Nephrogenic DI may be acquired or due to an inherited X-linked condition. Lithium-induced DI is an example of an acquired form of DI. Lithium has been shown to

decrease the sensitivity of renal tubules to AVP. Patients with central DI respond to the administration of vasopressin with a decrease in urine output. Secondary central DI may develop in response to head trauma that produces damage in the pituitary or hypothalamus. About one-fifth of patients taking lithium develop polyuria, and a larger amount may have some degree of impairment in concentrating urine. Chronic treatment with lithium is a common cause of nephrogenic DI. However, there are other causes of polyuria in lithium-treated patients in addition to nephrogenic DI. Primary polydipsia is common and is often associated with the dry mouth associated with many psychiatric medications. Central diabetes has also been associated with lithium treatment. Excessive secretion of AVP results in increased retention of fluid in the body. This condition is called SIADH. Water retention in SIADH causes hyponatremia. SIADH may develop in response to injury to the brain or from medication administration (including phenothiazines, butyrophenones, carbamazepine, and oxcarbazepine). The hyponatremia associated with this condition may produce delirium. Human Chorionic Gonadotropin

Human chorionic gonadotropin (hCG) can be assessed in the urine and blood. The urine test for hCG is the basis for the commonly used urine pregnancy test. This immunometric test is able to detect pregnancy approximately 2 weeks after an expected menstrual period has passed. Routine tests are most accurate when performed 1 to 2 weeks after a missed period and are not reliably accurate until the 2-week period has passed. However, there are ultrasensitive urine hCG tests that can accurately detect pregnancy 7 days after fertilization. Pregnancy tests often are obtained before initiating certain psychotropic medications, such as lithium, carbamazepine, and valproate, which are associated with congenital anomalies. Parathormone Parathormone (parathyroid hormone) modulates serum concentrations of calcium and phosphorus. Dysregulation in this hormone and the resulting production of abnormalities in calcium and phosphorus may produce depression or delirium. Prolactin Prolactin levels may become elevated in response to the administration of antipsychotic agents. Elevations in serum prolactin result from the blockade of dopamine receptors in the pituitary. This blockade produces an increase in prolactin synthesis and release. Cerebral MRI is not usually performed if the patient is taking an antipsychotic drug known to cause hyperprolactinemia, and the magnitude of the prolactin elevation is consistent with drug-induced causes. Prolactin levels may briefly rise after a seizure. For this reason, prompt measurement of a prolactin level after possible seizure activity may assist in differentiating a seizure from a pseudoseizure. Thyroid Hormone Disease of the thyroid is associated with many psychiatric manifestations. Thyroid disease is most commonly associated with depression and anxiety but may also give rise to symptoms of panic, dementia, and psychosis. Thyroid disease may mimic depression. It is difficult to achieve euthymia if a patient is not euthyroid. Systemic Lupus Erythematosus Systemic lupus erythematosus (SLE) is an autoimmune disorder. Tests for SLE are based on the detection of antibodies formed as part of the disease. Antinuclear antibodies are found in virtually all patients with SLE. Antibody levels also are used to monitor the severity of the illness. A fluorescent test is used to detect the antinuclear antibodies. This test can be positive in a variety of rheumatic diseases. For this reason, a positive result usually is followed by additional tests, including a test to detect anti-deoxyribonucleic acid (DNA) antibodies. Anti-DNA antibodies, when associated with antinuclear antibodies, are strongly suggestive of a diagnosis of lupus. Anti-DNA antibodies are followed to monitor the response to treatment.

Psychiatric manifestations of lupus include depression, dementia, delirium, mania, and psychosis. About 5 percent of patients with lupus present with symptoms of psychosis including hallucinations

and delusions. Pancreatic Function Measurement of serum amylase is used to monitor pancreatic function. Elevations in amylase levels may occur in alcohol-abusing patients who develop pancreatitis. Serum amylase levels also may be fractionated into salivary and pancreatic components. CLINICAL CHEMISTRY Serum Electrolytes Serum electrolyte levels may be useful in the initial evaluation of a psychiatric patient. Levels of serum electrolytes often are abnormal in patients with delirium. Abnormalities also may occur in response to the administration of psychotropic medications. Low serum chloride levels may occur in eating disorder patients who purge by self-induced vomiting. Serum bicarbonate levels may be elevated in patients who purge or who abuse laxatives. Bicarbonate levels are commonly low in patients who hyperventilate in response to anxiety. Hypokalemia may be present in eating disorder patients who purge or abuse laxatives and in psychogenic vomiting. Diuretic abuse by eating disorder patients also may produce hypokalemia. Low levels of potassium are associated with weakness and fatigue. Characteristic ECG changes occur with hypokalemia and consist of cardiac arrhythmias, U waves, flattened T waves, and ST-segment depression. Eating disorder patients with anorexia nervosa or bulimia nervosa usually receive a fairly standard set of laboratory studies, including serum electrolytes (particularly potassium and phosphorus), blood glucose, thyroid function tests, liver enzymes, total protein, serum albumin, BUN, Cr, CBC, and ECG. Serum amylase is often assessed in bulimic patients. Magnesium levels may be low in alcohol-abusing patients. Low magnesium levels are associated with agitation, confusion, and delirium. If untreated, convulsions and coma may follow. Low levels of serum phosphorus may be present in eating disorder patients with purging behavior. Phosphorus levels may also be low in anxiety patients who hyperventilate. Hyperparathyroidism may produce low serum phosphorus levels. Elevated serum phosphorus levels are seen in hypoparathyroidism. Hyponatremia is seen in psychogenic polydipsia and SIADH and in response to certain medications, such as carbamazepine. Low sodium levels are associated with delirium. Serum calcium abnormalities are associated with a variety of behavioral abnormalities. Low serum calcium levels are associated with depression, delirium, and irritability. Elevated levels are associated with depression, psychosis, and weakness.

Laxative abuse, common in eating disorder patients, can be associated with hypocalcemia. Hypocalcemia secondary to hypoparathyroidism may occur in patients who have undergone surgery for thyroid disease. Serum copper levels are low in Wilson’s disease, a rare abnormality in copper metabolism. Copper is deposited in the brain and liver, resulting in decreased intellectual functioning, personality changes, psychosis, and a movement disorder. Symptoms are usually present in the second and third decades of life. Laboratory assessment for Wilson’s disease includes the measurement of serum ceruloplasmin, the transport protein for copper, which is low, and urine copper, measured in a 24-hour specimen, which is elevated. Renal Function Tests of renal function include BUN and Cr. Other relevant laboratory studies include the routine urinalysis and Cr clearance. An elevated BUN often results in lethargy or delirium. BUN commonly is elevated with dehydration. Elevations in BUN often are associated with impaired clearance of lithium. A less sensitive index of renal function is Cr. Elevations in Cr may indicate extensive renal impairment. Elevated levels occur when approximately 50 percent of the nephrons are damaged. Cr clearance is often assessed in patients taking lithium. It is a sensitive measurement of renal function. The test is performed in a well-hydrated patient by collecting all of the patient’s urine for 24 hours. During the midpoint of the 24-hour collection period, a serum Cr level also is obtained. The resulting data are used to calculate the patient’s Cr clearance. Usually, the laboratory performs the calculation. Elevated levels of porphobilinogen are found in the urine of symptomatic patients with acute

intermittent porphyria. Symptoms of this disease include psychosis, apathy, or depression, along with intermittent abdominal pain, neuropathy, and autonomic dysfunction. If urine porphobilinogen levels are elevated when the patient is symptomatic, collection of a 24-hour urine specimen for quantitative assessment of porphobilinogen and aminolevulinic acid is indicated. Liver Function Liver function tests (LFTs) commonly include the serum aminotransferases, alkaline phosphatase, γ-glutamyl transpeptidase and tests of synthetic function, usually the serum albumin concentration and prothrombin time, and the serum bilirubin, which reflects hepatic transport capability. Elevations in AST may occur with diseases of the liver, heart, lungs, kidneys, and skeletal muscle. In patients with alcohol-induced liver disease, AST typically is more elevated than ALT. In viral- and drug-induced liver disease, ALT is often elevated. Serum GGT is elevated in hepatobiliary disease, including alcohol-induced liver disease and cirrhosis. Alkaline phosphatase elevations occur in many diseases, including diseases of the liver, bone, kidney, and thyroid. Levels of alkaline phosphatase may be elevated in

response to some psychiatric medications, most notably the phenothiazines. Serum ammonia levels are often elevated in patients with hepatic encephalopathy. High levels are associated with the delirium of hepatic encephalopathy. Serum ammonia levels also may be elevated in patients undergoing treatment with valproate. Serum bilirubin is an index of hepatic and bile duct function. Prehepatic, unconjugated, or indirect bilirubin and posthepatic, conjugated, or direct bilirubin are often assessed to help elucidate the origin of the elevation in bilirubin. Lactate dehydrogenase (LDH) may be elevated in diseases of the liver, skeletal muscle, heart, and kidney. It is also elevated in pernicious anemia. Vitamins Folate and B12. Folate and B12 deficiencies are common in patients who abuse alcohol. Folate and B12 deficiencies are associated with dementia; delirium; psychosis, including paranoia; fatigue; and personality change. Folate and B12 can be directly measured. Low folate levels may be found in patients who use contraceptive pills or other forms of estrogen, who drink alcohol, or who take phenytoin (Dilantin). INFECTIOUS DISEASE TESTING Testing for sexually transmitted diseases (STDs) has become common, given the current frequency of these diseases. Some psychiatric illnesses, such as mania and substance abuse, are associated with a higher risk of contracting STDs. STDs include herpes simplex virus types 1 and 2, chlamydia, hepatitis viruses, gonorrhea, syphilis, and human immunodeficiency virus (HIV). Risk factors for STD include contact with sex workers, drug abuse, prior history of STDs, meeting partners on the Internet, multiple sex partners, a new sex partner, and being young or unmarried. Other diseases to think about are Epstein-Barr virus and gonorrhea. Intravenous Drug Use The IV route is used for many substances of abuse. Most commonly, heroin, amphetamines, and cocaine are used alone or in combination via the IV route. Because needles often are contaminated, IV drug users are at risk for bacterial endocarditis, hepatitis B and C, HIV infection, and acquired immunodeficiency syndrome (AIDS) from HIV infection. It has been estimated that over 60 percent of new cases of hepatitis C occur in individuals with a history of injecting illicit drugs. CBC and Serum Blood Cultures. The use of contaminated needles or nonsterile injection sites places IV drug users at risk for bacterial infections, including abscesses, bacteremia, and bacterial endocarditis. Findings on physical examination suggestive of endocarditis, possible bacteremia, or abscess necessitate obtaining a CBC to rule out an elevated WBC count. Blood cultures should be obtained from at least two different sites

if the patient is febrile or if findings are suggestive of bacteremia or endocarditis, and internal medicine consultation should be obtained. Syphilis The fluorescent treponemal antibody absorption

(FTA-ABS) test detects antibody against Treponema pallidum spirochetes and is more sensitive and specific than nontreponemal tests for syphilis. The test is used to confirm positive screening tests for syphilis, such as the rapid plasma reagin (RPR) test and the VDRL test. The FTA-ABS test is also used when neurosyphilis is suspected. Once positive, a patient usually remains so for life. False-positive results may occur in patients with SLE. Viral Hepatitis Several types of viruses can cause viral hepatitis. Viral hepatitis produces abnormalities in LFTs including elevation of liver enzymes, especially ALT. Symptoms range from mild flu-like manifestations to rapidly progressive and fatal liver failure. Psychiatric manifestations include depression, anxiety, weakness, and psychosis. Viral hepatitis can also impair the metabolism of psychotropic medications that are metabolized by the liver. Impaired liver metabolism requires an adjustment of the dose of medications metabolized by the liver or consideration of agents that are less affected by alterations in liver metabolism. Viruses causing hepatitis include: hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), and hepatitis D virus (HDV) (delta agent). The WBC is normal to low in patients with hepatitis, especially in the preicteric phase. Large atypical lymphocytes occasionally are present. Rarely, aplastic anemia follows an episode of acute hepatitis not caused by any of the known hepatitis viruses. Mild proteinuria is common, and bilirubinuria often precedes the appearance of jaundice. Acholic stools frequently are present during the icteric phase. Strikingly elevated AST or ALT occurs early, followed by elevations of bilirubin and alkaline phosphatase. In a minority of patients, elevations of bilirubin and alkaline phosphatase persist after aminotransferase levels have normalized. Cholestasis may be substantial in acute hepatitis A. Marked prolongation of the PT in severe hepatitis correlates with increased mortality. Chronic hepatitis, characterized by elevated aminotransferase levels for more than 6 months, develops in 1 to 2 percent of immunocompetent adults with acute hepatitis B. More than 80 percent of all persons with acute hepatitis C develop chronic hepatitis, which, in many cases, progresses slowly. Ultimately, cirrhosis develops in as many as 30 percent of those with chronic hepatitis C and 40 percent of those with chronic hepatitis B; the risk of cirrhosis is even higher in patients coinfected with both viruses or with HIV. Patients with cirrhosis are at risk, with a rate of 3 to 5 percent per year, of hepatocellular carcinoma. Even in the absence of cirrhosis, patients with chronic hepatitis B—particularly those with active viral replication—are at an increased risk.

ELECTROENCEPHALOGRAM The EEG assesses regional cerebral cortical electrical activity. Clinical neuroscience has a long history of using the EEG. The EEG can be used in different ways to study specific brain states or activities by modifications to the technique of data collection or to the data themselves. EEG data can be displayed on paper tracings in the manner of conventional EEG recordings. Alternatively, the data can be digitized, and the digitized data can be transformed, often using a Fourier transformation, to yield color-coded topographic brain maps of regional activity. The collection periods can be prolonged, and the data can be electronically displayed along with video monitoring of the patient to provide telemetry assessments of patients with epilepsy. Telemetry assessments are typically performed in an effort to correlate behavioral abnormalities with brain electrical activity as part of the workup of seizure disorders. Prolonged periods of EEG recording during sleep, when coupled with recording of a limited lead ECG and facial muscle activity, result in the sleep EEG or polysomnography. Many clinicians also use the EEG to monitor ECT administration. Clinicians use the EEG to localize seizure foci and to evaluate delirium. The EEG and its topographical descendents have not found a clear role in the diagnostic assessment of psychiatric patients. The EEG is usually used in psychiatry to rule out nonpsychiatric disease, such as seizure disorders or delirium, as a cause of psychiatric symptoms. When the

differential diagnosis includes strokes, tumors, subdural hematomas, or dementia, the yield is usually higher with imaging tests. Not surprisingly, the yield is the highest in patients with a history of a seizure disorder or a clinical history that is strongly suggestive of a recent seizure or other organic illness. Such clinical features would include a history of altered consciousness, atypical hallucinations (e.g., olfactory), head injury, and automatism. In addition, the EEG is commonly obtained when there is an abnormal CT or MRI. It is important to remember that seizures are a clinical diagnosis; a normal EEG does not rule out the possibility of a seizure disorder. Evoked Potential Evoked potential (EP) testing is the measurement of the EEG response to specific sensory stimulation. The stimulation may be visual, auditory, or somatosensory. During visual EPs, the patient is exposed to flashing lights or a checkerboard pattern. With auditory EP, the patient hears a specific tone. In somatosensory EP, the patient experiences an electrical stimulation to an extremity. These stimuli occur repeatedly while the patient undergoes a routine EEG. Using a computer, the responses to these stimuli are recorded and averaged. The time frame is measured in milliseconds. These tests are useful in neurology and neurosurgery. For example, they assist in the assessment of demyelinating disorders such as multiple sclerosis (MS). In psychiatry, EP testing may help in the differentiation of organic from functional impairments. A classical example is the use of EP testing to evaluate possible hysterical blindness. The usefulness of these tests in psychiatry is still under investigation.

Polysomnography Polysomnography is used to assess disorders of sleep by concurrently assessing the EEG, ECG, blood oxygen saturation, respirations, body temperature, electromyogram, and electro-oculogram. Polysomnography has demonstrated an increase in the overall amount of rapid eye movement (REM) sleep and a shortened period before the onset of REM sleep (decreased REM latency) in patients with major depression. These studies may assist in differentiating depression from other conditions that mimic depression. For example, patients who appear depressed from dementia do not have a decreased REM latency or an increase in the amount of REM sleep. ELECTROCARDIOGRAM The ECG is a graphical representation of the electrical activity of the heart. Abnormalities in this activity correlate with cardiac pathology. The ECG is most commonly used in psychiatry to assess side effects of psychotropic medications. Ziprasidone (Geodon) has been associated with a dose-related prolongation of the QTc interval. There is a known association of fatal arrhythmias (e.g., torsades de pointes) with QTc prolongation from some other medications. For this reason, clinicians usually obtain an ECG before initiation of treatment with ziprasidone. Ziprasidone is contraindicated in patients with a known history of QTc prolongation (including congenital long QT syndrome), with recent acute myocardial infarction, or with uncompensated heart failure. Bradycardia, hypokalemia or hypomagnesemia, or the concurrent use of other drugs that prolong the QTc interval all increase the risk for serious arrhythmias. Ziprasidone should be discontinued in patients who have persistent QTc measurements greater than 500 milliseconds. Like ziprasidone, thioridazine (Mellaril) has been associated with prolongation of the QTc interval in a dose-related manner. Prolongation of the QTc interval has been associated with torsades de pointes arrhythmias and sudden death. An ECG should be obtained before initiating treatment with thioridazine to rule out QTc prolongation. TCAs are, at times, associated with ECG changes. Anticholinergic effects may increase heart rate. Prolongation of the PR, QT, and QRS intervals, along with ST-segment and T-wave abnormalities, may occur. The TCAs can cause or increase preexisting atrioventricular or bundle branch block. When the QTc exceeds 0.440 second, a patient is at an increased risk for sudden death due to cardiac arrhythmias. Many clinicians obtain an ECG before beginning a TCA in a patient older than 40 years of age and in any patient with known

cardiovascular disease. Lithium therapy can cause benign reversible T-wave changes, can impair sinoatrial (SA) node function, and can cause heart block. ECGs are often obtained before initiation of treatment with lithium and in cases of lithium toxicity or overdose. Psychiatrists, when treating patients with certain psychiatric diagnoses, also use the ECG. Eating disorder patients commonly have low potassium levels that may result in abnormal ECG recordings. As the serum potassium drops below normal, T waves become

flat (or inverted), and U waves may appear. Holter Monitoring Holter monitoring is the continuous recording of a patient's ECG activity for a sustained time period (e.g., 24 hours). Patients are ambulatory during this time. It is useful for the evaluation of dizziness, palpitations, and syncope. It is commonly used in the evaluation of patients with panic disorder who manifest cardiac symptoms. Cardiac Ultrasound Cardiac ultrasound is the visualization of cardiac anatomy by the use of computertransformed echoes of ultrasound. It is commonly used in the evaluation of mitral valve prolapse. There is an unclear association between mitral valve prolapse and panic attacks and anxiety disorders. REFERENCES Baron DA, Baron DA, Baron DH. Laboratory testing for substances of abuse. In: Frances RJ, Miller SI, Mack AH, eds. Clinical Textbook of Addictive Disorders. 3rd ed. New York: Guilford; 2011:63. Blumenthal JA, Sherwood A, Babyak MA, Watkins LL, Smith PJ, Hoffman BM, O'Hayer CV, Mabe S, Johnson J, Doraiswamy PM, Jiang W, Schocken DD, Hinderliter AL. Exercise and pharmacological treatment of depressive symptoms in patients with coronary heart disease: Results from the UPBEAT (Understanding the Prognostic Benefits of Exercise and Antidepressant Therapy) study. J Am Coll Cardiol. 2012;60(12):1053. Cernich AN, Chandler L, Scherdell T, Kurtz S. Assessment of co-occurring disorders in veterans diagnosed with traumatic brain injury. J Head Trauma Rehabil. 2012;27:253. Guze BH, James M. Medical assessment and laboratory testing in psychiatry. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:995. Kim HF, Schulz PE, Wilde EA, Yudosfky SC. Laboratory testing and imaging studies in psychiatry. In: Hales RE, Yudosfky SC, Gabbard GO, eds. Essentials of Psychiatry. 3rd ed. Arlington: American Psychiatric Publishing; 2011:15. Meszaros ZS, Perl A, Faraone SV. Psychiatric symptoms in systemic lupus erythematosus: A systematic review. J Clin Psychiatry. 2012;73(7):993. Mordal J, Holm B, Mørland J, Bramness JG. Recent substance intake among patients admitted to acute psychiatric wards: Physician's assessment and on-site urine testing compared with comprehensive laboratory analyses. J Clin Psychopharm. 2010;30(4):455. Perez VB, Swerdlow NR, Braff DL, Näätänen R, Light GA. Using biomarkers to inform diagnosis, guide treatments and track response to interventions in psychotic illnesses. Biomark Med . 2014;8:9–14. Roffman JL, Silverman BC, Stern TA. Diagnostic rating scales and laboratory testing. In: Stern TA, Fricchione GL, Cassem NH, Jellinek M, Rosenbaum JF, eds. Massachusetts General Hospital Handbook of General Hospital Psychiatry. 6th ed. Philadelphia: Saunders; 2010:61. Saczynski JS, Marcantonio ER, Quach L, Fong TG, Gross A, Inouye SK, Jones RN. Cognitive trajectories after postoperative delirium. N Engl J Med. 2012;367(1):30. Vannest J, Szaflarski JP, Eaton KP, Henkel DM, Morita D, Glauser TA, Byars AW, Patel K, Holland SK. Functional magnetic resonance imaging reveals changes in language localization in children with benign childhood epilepsy with

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5.8 Neuroimaging

centrotemporal spikes. J Child Neurol. 2013;28(4):435–445. 5.8 Neuroimaging Primary observation of structural and functional brain imaging in neuropsychiatric disorders such as dementia, movement disorders, demyelinating disorders, and epilepsy has contributed to a greater understanding of the pathophysiology of neurological and psychiatric illnesses and helps practicing clinicians in difficult diagnostic situations. Neuroimaging methodologies allow measurement of the structure, function, and chemistry of the living human brain. Over the past decade, studies using these methods have provided new information about the pathophysiology of psychiatric disorders that may prove to be useful for diagnosing illness and for developing new treatments. Computer tomographic (CT) scanners, the first widely used neuroimaging devices, allowed assessment of structural brain lesions such as tumors or strokes. Magnetic resonance imaging (MRI) scans, developed next, distinguish gray and white matter better than CT scans do and allow visualizations of smaller brain lesions as well as white matter abnormalities. In addition to structural neuroimaging with CT and MRI, a revolution in functional neuroimaging has enabled clinical scientists to obtain unprecedented insight into the diseased human brain. The foremost techniques for functional neuroimaging include positron emission tomography (PET) and single photon emission computed tomography (SPECT). USES OF NEUROIMAGING Indications for Ordering Neuroimaging in Clinical Practice Neurological Deficits. In a neurological examination, any change that can be localized to the brain or spinal cord requires neuroimaging. Neurological examination includes mental status, cranial nerves, motor system, coordination, sensory system, and reflex components. The mental status examination assesses arousal, attention, and motivation; memory; language; visuospatial function; complex cognition; and mood and affect. Consultant psychiatrists should consider a workup including neuroimaging for patients with new-onset psychosis and acute changes in mental status. The clinical examination always assumes priority, and neuroimaging is ordered on the basis of clinical suspicion of a central nervous system (CNS) disorder. Dementia. Loss of memory and cognitive abilities affects more than 10 million persons in the United States and will affect an increasing number as the population ages. Reduced mortality from cancer and heart disease has increased life expectancy and has allowed persons to survive to the age of onset of degenerative brain disorders, which have proved more difficult to treat. Depression, anxiety, and psychosis are common in patients with dementia. The most common cause of dementia is Alzheimer’s disease, which does not have a characteristic appearance on routine neuroimaging but,

rather, is associated with diffuse loss of brain volume. One treatable cause of dementia that requires neuroimaging for diagnosis is normal pressure hydrocephalus, a disorder of the drainage of cerebrospinal fluid (CSF). This condition does not progress to the point of acutely increased intracranial pressure but stabilizes at a pressure at the upper end of the normal range. The dilated

ventricles, which may be readily visualized with CT or MRI, exert pressure on the frontal lobes. A gait disorder is almost uniformly present; dementia, which may be indistinguishable from Alzheimer's disease, appears less consistently. Relief of the increased CSF pressure may completely restore gait and mental function. Infarction of the cortical or subcortical areas, or stroke, can produce focal neurological deficits, including cognitive and emotional changes. Strokes are easily seen on MRI scans. Depression is common among stroke patients, either because of direct damage to the emotional centers of the brain or because of the patient's reaction to the disability. Depression, in turn, can cause pseudodementia. In addition to major strokes, extensive atherosclerosis in brain capillaries can cause countless tiny infarctions of brain tissue; patients with this phenomenon may develop dementia as fewer and fewer neural pathways participate in cognition. This state, called vascular dementia, is characterized on MRI scans by patches of increased signal in the white matter. Certain degenerative disorders of basal ganglia structures, associated with dementia, may have a characteristic appearance on MRI scans. Huntington's disease typically produces atrophy of the caudate nucleus; thalamic degeneration can interrupt the neural links to the cortex (Fig. 5.8-1).

FIGURE 5.8-1 Brain slices. Top: Huntington disease. Atrophy of caudate nucleus and lentiform nuclei with dilatation of lateral ventricle. Bottom: Normal brain. (From Fahn S. Huntington disease. In: Rowland LP, ed. Merritt's Textbook of Neurology. 10th ed. Philadelphia: Lippincott Williams & Wilkins; 2000:659, with permission.) Space-occupying lesions can cause dementia. Chronic subdural hematomas and cerebral contusions, caused by head trauma, can produce focal neurological deficits or may only produce dementia. Brain tumors can affect cognition in several ways. Skullbased meningiomas can compress the underlying cortex and impair its processing. Infiltrative glial cell tumors, such as astrocytoma or glioblastoma multiforme, can cut off communication between brain centers by interrupting white matter tracts. Tumors located near the ventricular system can obstruct the flow of CSF and gradually increase the intracranial pressure. Chronic infections, including neurosyphilis, cryptococcosis, tuberculosis, and Lyme disease, can cause symptoms of dementia and may produce a characteristic enhancement of the meninges, especially at the base of the brain. Serological studies are needed to complete the diagnosis. Human immunodeficiency virus (HIV) infection can

cause dementia directly, in which case is seen a diffuse loss of brain volume, or it can allow proliferation of Creutzfeldt-Jakob virus to yield progressive multifocal leukoencephalopathy, which affects white matter tracts and appears as increased white matter signal on MRI scans. Chronic demyelinating diseases, such as multiple sclerosis, can affect cognition because of white matter disruption. Multiple sclerosis plaques are easily seen on MRI scans as periventricular patches of increased signal intensity. Any evaluation of dementia should consider medication effects, metabolic derangements, infections, and nutritional causes that may not produce abnormalities on neuroimaging. Indications for Neuroimaging in Clinical Research Analysis of Clinically Defined Groups of Patients. Psychiatric research aims to categorize patients with psychiatric disorders to facilitate the discovery of neuroanatomical and neurochemical bases of mental illness. Researchers have used functional neuroimaging to study groups of patients with such psychiatric conditions as schizophrenia, affective disorders, and anxiety disorders, among others. In schizophrenia, for example, neuropathological volumetric analyses have suggested a loss of brain weight, specifically of gray matter. A paucity of axons and dendrites appears present in the cortex, and CT and MRI may show compensatory enlargement of the lateral and third ventricles. Specifically, the temporal

lobes of persons with schizophrenia appear to lose the most volume relative to healthy persons. Recent studies have found that the left temporal lobe is generally more affected than the right. The frontal lobe may also have abnormalities, not in the volume of the lobe, but in the level of activity detected by functional neuroimaging. Persons with schizophrenia consistently exhibit decreased metabolic activity in the frontal lobes, especially during tasks that require the prefrontal cortex. As a group, patients with schizophrenia are also more likely to have an increase in ventricular size than are healthy controls. Disorders of mood and affect can also be associated with loss of brain volume and decreased metabolic activity in the frontal lobes. Inactivation of the left prefrontal cortex appears to depress mood; inactivation of the right prefrontal cortex elevates it. Among anxiety disorders, studies of obsessive-compulsive disorder with conventional CT and MRI have shown either no specific abnormalities or a smaller caudate nucleus. Functional PET and SPECT studies suggest abnormalities in the corticolimbic, basal ganglial, and thalamic structures in the disorder. When patients are experiencing obsessivecompulsive disorder symptoms, the orbital prefrontal cortex shows abnormal activity. A partial normalization of caudate glucose metabolism appears in patients taking medications such as fluoxetine (Prozac) or clomipramine (Anafranil) or undergoing behavior modification. Functional neuroimaging studies of persons with attention-deficit/hyperactivity disorder (ADHD) either have shown no abnormalities or have shown decreased volume of the right prefrontal cortex and the right globus pallidus. In addition, whereas normally the right caudate nucleus is larger than the left caudate nucleus, persons with

ADHD may have caudate nuclei of equal size. These findings suggest dysfunction of the right prefrontal-striatal pathway for control of attention. Analysis of Brain Activity during Performance of Specific Tasks. Many original conceptions of different brain region functions emerged from observing deficits caused by local injuries, tumors, or strokes. Functional neuroimaging allows researchers to review and reassess classic teachings in the intact brain. Most work, to date, has been aimed at language and vision. Although many technical peculiarities and limitations of SPECT, PET, and functional MRI (fMRI) have been overcome, none of these techniques has demonstrated clear superiority. Studies require carefully controlled conditions, which subjects may find arduous. Nonetheless, functional neuroimaging has contributed major conceptual advances, and the methods are now limited mainly by the creativity of the investigative protocols. Studies have been designed to reveal the functional neuroanatomy of all sensory modalities, gross and fine motor skills, language, memory, calculations, learning, and disorders of thought, mood, and anxiety. Unconscious sensations transmitted by the autonomic nervous system have been localized to specific brain regions. These analyses provide a basis for comparison with results of studies of clinically defined patient groups and may lead to improved therapies for mental illnesses. SPECIFIC TECHNIQUES CT Scans In 1972, CT scanning revolutionized diagnostic neuroradiology by allowing imaging of the brain tissue in live patients. CT scanners are currently the most widely available and convenient imaging tools available in clinical practice; practically every hospital emergency room has immediate access to a CT scanner at all times. CT scanners effectively take a series of head X-ray pictures from all vantage points, 360 degrees around a patient’s head. The amount of radiation that passes through, or is not absorbed from, each angle is digitized and entered into a computer. The computer uses matrix algebra calculations to assign a specific density to each point within the head and displays these data as a set of two-dimensional images. When viewed in sequence, the images allow mental reconstruction of the shape of the brain. The CT image is determined only by the degree to which tissues absorb X-irradiation. The bony structures absorb high amounts of irradiation and tend to obscure details of neighboring structures, an especially troublesome

problem in the brainstem, which is surrounded by a thick skull base. Within the brain itself, there is relatively little difference in the attenuation between gray matter and white matter in X-ray images. Although the gray–white border is usually distinguishable, details of the gyral pattern may be difficult to appreciate in CT scans. Certain tumors may be invisible on CT because they absorb as much irradiation as the surrounding normal brain. Appreciation of tumors and areas of inflammation, which can cause changes in behavior, can be increased by intravenous infusion of iodine-containing contrast agents.

Iodinated compounds, which absorb much more irradiation than the brain, appear white. The intact brain is separated from the bloodstream by the blood–brain barrier, which normally prevents the passage of the highly charged contrast agents. The blood– brain barrier, however, breaks down in the presence of inflammation or fails to form within tumors and thus allows accumulation of contrast agents. These sites appear whiter than the surrounding brain. Iodinated contrast agents must be used with caution in patients who are allergic to these agents or to shellfish. With the introduction of MRI scanning, CT scans have been supplanted as the nonemergency neuroimaging study of choice (Fig. 5.8-2). The increased resolution and delineation of detail afforded by MRI scanning is often required for diagnosis in psychiatry. In addition, performing the most detailed study available inspires the most confidence in the analysis. The only component of the brain better seen on CT scanning is calcification, which may be invisible on MRI. FIGURE 5.8-2 Comparison of computed tomography (CT) and magnetic resonance imaging (MRI). A. CT scan in the axial plane at the level of the third ventricle. The cerebrospinal fluid (CSF) within the ventricles appears black, the brain tissue appears gray, and the skull appears white. There is very poor discrimination between the gray and white matter of the brain. The arrow indicates a small calcified lesion in a tumor of the pineal gland. Detection of calcification is one role in which CT is superior to MRI. B. T2-weighted image of the same patient at roughly the same level. With T2, the CSF appears white, the gray matter appears gray, the white matter is clearly distinguished from the gray matter; the skull and indicated calcification appear black. Much more detail of the brain is visible than with CT. C. T1-weighted image of the same patient at roughly the same level. With T1, the CSF appears dark, the brain appears more uniformly gray, and the skull and indicated calcification appear black. T1 MRI images are the most similar to CT images. (Reprinted from Grossman CB. Magnetic Resonance Imaging and Computed Tomography of the Head and Spine. 2nd ed. Baltimore: Williams & Wilkins; 1996:101, with permission.)

MRI Scans MRI scanning entered clinical practice in 1982 and soon became the test of choice for clinical psychiatrists and neurologists. The technique does not rely on the absorption of X-rays but is based on nuclear magnetic resonance (NMR). The principle of NMR is that the nuclei of all atoms are thought to spin about an axis, which is randomly oriented in space. When atoms are placed in a magnetic field, the axes of all odd-numbered nuclei align with the magnetic field. The axis of a nucleus deviates away from the magnetic field when exposed to a pulse of radiofrequency electromagnetic radiation oriented at 90 or 180 degrees to the magnetic field. When the pulse terminates, the axis of the spinning nucleus realigns itself with the magnetic field, and during this realignment, it emits its own radiofrequency signal. MRI scanners collect the emissions of individual, realigning nuclei and use computer analysis to generate a series of two-dimensional images that represent the brain. The images can be in the axial, coronal, or sagittal planes. By far the most abundant odd-numbered nucleus in the brain belongs to hydrogen. The rate of realignment of the hydrogen axis is determined by its immediate environment, a combination of

both the nature of the molecule of which it is a part and the degree to which it is surrounded by water. Hydrogen nuclei within fat realign rapidly, and hydrogen nuclei within water realign slowly. Hydrogen nuclei in proteins and carbohydrates realign at intermediate rates. Routine MRI studies use three different radiofrequency pulse sequences. The two parameters that are varied are the duration of the radiofrequency excitation pulse and the length of the time that data are collected from the realigning nuclei. Because T1 pulses are brief and data collection is brief, hydrogen nuclei in hydrophobic environments are emphasized. Thus, fat is bright on T1, and CSF is dark. The T1 image most closely resembles that of CT scans and is most useful for assessing overall brain structure. T1 is also the only sequence that allows contrast enhancement with the contrast agent gadolinium-diethylenetriamine pentaacetic acid (gadolinium-DTPA). As with the iodinated contrast agents used in CT scanning, gadolinium remains excluded from the brain by the blood–brain barrier, except in areas where this barrier breaks down, such as inflammation or tumor. On T1 images, gadolinium-enhanced structures appear white. T2 pulses last four times as long as T1 pulses, and the collection times are also extended to emphasize the signal from hydrogen nuclei surrounded by water. Thus, brain tissue is dark, and CSF is white on T2 images. Areas within the brain tissue that have abnormally high water content, such as tumors, inflammation, or strokes, appear brighter on T2 images. T2 images reveal brain pathology most clearly. The third routine pulse sequence is the proton density, or balanced, sequence. In this sequence, a short radio pulse is followed by a prolonged period of data collection, which equalizes the density of the CSF and the brain and allows distinction of tissue changes immediately adjacent to the ventricles. An additional technique, sometimes used in clinical practice for specific indications, is fluid-attenuated inversion recovery (FLAIR). In this method, the T1 image is inverted and added to the T2 image to double the contrast between gray matter and white matter. Inversion recovery imaging is useful for detecting sclerosis of the hippocampus caused by temporal lobe epilepsy and for localizing areas of abnormal metabolism in degenerative neurological disorders. MRI magnets are rated in teslas (T), units of magnetic field strength. MRI scanners in clinical use range from 0.3 to 2.0 T. Higher field-strength scanners produce images of markedly higher resolution. In research settings for humans, magnets as powerful as 4.7 T are used; for animals, magnets up to 12 T are used. Unlike the well-known hazards of X-irradiation,

exposure to electromagnetic fields of the strength used in MRI machines has not been shown to damage biological tissues. MRI scans cannot be used for patients with pacemakers or implants of ferromagnetic metals. MRI involves enclosing a patient in a narrow tube, in which the patient must remain motionless for up to 20 minutes. The radiofrequency pulses create a loud banging noise that may be obscured by music played in headphones. A significant number of patients cannot tolerate the claustrophobic conditions of routine MRI scanners and may need an open MRI scanner, which has less power and thus produces images of lower resolution. The resolution of brain tissue of even the lowest power MRI scan, however, exceeds that of CT scanning. Figure 5.8-3 reveals that a brain tumor is the cause of a patient’s depression. FIGURE 5.8-3 Three axial images from a 46-year-old woman who was hospitalized for the first time for depression and suicidality following the end of a long-standing relationship. A malignant neoplasm extending into the posterior aspect of the left lateral ventricle is clearly seen in all three images. Images A and B are T1 and T2 weighted, respectively. Image C demonstrates the effects of postcontrast enhancement. (Courtesy of Craig N. Carson, M.D., and Perry F. Renshaw, M.D.) MRI Applications to Dementia. Several MRI changes, including increased number of subcortical hyperintensities, generalized atrophy, and ventricular enlargement, are associated with normal aging. However, it is well established that

some changes seem more specific to the diagnosis of Alzheimer's disease and may be clinically useful in formulating the diagnosis and prognosis of the disorder. MRI evidence of medial temporal lobe (MTL) atrophy appears to be most closely associated with the disorder. One approach that may help to improve the clinical utility of MRI in the diagnosis and prognosis of Alzheimer's disease and other forms of dementia is to follow the rate of change in brain structure over time. Longitudinal follow-up studies have shown the rates of volume loss to be significantly greater in subjects with

prodromal Alzheimer's disease (up to 5 percent brain volume per year) compared with those experiencing normal age-related reductions (0.1 percent brain volume per year). MRI Applications to Alcohol Dependence. MRI studies have been the principal tool to describe in vivo the many sources of neurotoxicity associated with alcoholism, including (1) the direct neurotoxic and gliotoxic effect of ethanol, (2) the neurotoxic effects of poor nutrition that often accompany the abuse of alcohol, (3) the excitotoxicity associated with the ethanol withdrawal state, and (4) the possible disruption in adult-neurogenesis–associated ethanol intoxication and withdrawal. These studies documented a striking age dependence of the overall neurotoxicity associated with alcoholism. Magnetic Resonance Spectroscopy Whereas routine MRI detects hydrogen nuclei to determine brain structure, magnetic resonance spectroscopy (MRS) can detect several odd-numbered nuclei (Table 5.8-1). The ability of MRS to detect a wide range of biologically important nuclei allows the use of the technique to study many metabolic processes. Although the resolution and sensitivity of MRS machines are poor compared with those of currently available PET and SPECT devices, the use of stronger magnetic fields will improve this feature to some extent in the future. MRS can image nuclei with an odd number of protons and neutrons. The unpaired protons and neutrons (nucleons) appear naturally and are nonradioactive. As in MRI, the nuclei align themselves in the strong magnetic field produced by an MRS device. A radiofrequency pulse causes the nuclei of interest to absorb and then emit energy. The readout of an MRS device is usually in the form of a spectrum, such as those for phosphorus-31 and hydrogen-1 nuclei, although the spectrum can also be converted into a pictorial image of the brain. The multiple peaks for each nucleus reflect that the same nucleus is exposed to different electron environments (electron clouds) in different molecules. The hydrogen-1 nuclei in a molecule of creatine, therefore, have a different chemical shift (position in the spectrum) than the hydrogen-1 nuclei in a choline molecule, for example. Thus, the position in the spectrum (the chemical shift) indicates the identity of the molecule in which the nuclei are present. The height of the peak with respect to a reference standard of the molecule indicates the amount of the molecule present. Table 5.8-1 Nuclei Available for In Vivo Magnetic Resonance Spectroscopya

The MRS of the hydrogen-1 nuclei is best at measuring N-acetylaspartate (NAA), creatine, and choline-containing molecules; but MRS can also detect glutamate, glutamine, lactate, and myo-inositol. Although glutamate and γaminobutyric acid (GABA), the major amino acid neurotransmitters, can be detected by MRS, the biogenic amine neurotransmitters (e.g., dopamine) are present in concentrations too low to be detected with the technique. MRS of phosphorus-31 can be used to determine the pH of brain regions and the concentrations of phosphorus-containing compounds (e.g., adenosine triphosphate [ATP] and guanosine triphosphate [GTP]), which are important in the energy metabolism of the brain. MRS has revealed decreased concentrations of NAA in the temporal lobes and increased concentrations of inositol in the occipital lobes of persons with dementia of the Alzheimer's type. In a series of subjects with schizophrenia, decreased NAA

concentrations were found in the temporal and frontal lobes. MRS has been used to trace the levels of ethanol in various brain regions. In panic disorder, MRS has been used to record the levels of lactate, whose intravenous infusion can precipitate panic episodes in about three-fourths of patients with either panic disorder or major depression. Brain lactate concentrations were found to be elevated during panic attacks, even without provocative infusion. Additional indications include the use of MRS to measure concentrations of psychotherapeutic drugs in the brain. One study used MRS to measure lithium (Eskalith) concentrations in the brains of patients with bipolar disorder and found that lithium concentrations in the brain were half those in the plasma during depressed and euthymic periods but exceeded those in the plasma during manic episodes. Some compounds, such as fluoxetine and trifluoperazine (Stelazine), contain fluorine-19, which can also be detected in the brain and measured by MRS. For example, MRS has demonstrated that it takes 6 months of steady use for fluoxetine to reach maximal concentrations in the brain, which equilibrate at about 20 times the serum concentrations.

MRS in Dementia. MRS presents the opportunity to noninvasively obtain measures of several neurochemicals related to neurotransmission, energy metabolism, and cellular function. Studies using MRS have shown a trend for a general reduction in NAA measures with increasing age in MTL and frontal cortical brain regions. The studies in MCI and Alzheimer’s disease report patients with these disorders have decreased levels of NAA and increased levels of myo-inositol (a form of inositol normally found in the brain that contributes to osmotic regulation) compared with those of age-matched comparison subjects. MRS in Schizophrenia. MRS has been applied widely in studies of cortical chemistry in schizophrenia. These studies documented reductions in NAA levels in many cortical and limbic brain regions in schizophrenic individuals and smaller reductions in family members of people diagnosed with schizophrenia. Other metabolites have been measured in MRS studies of schizophrenic patients. The most interesting finding may be the description of normal or low levels of glutamate and increased levels of glutamine in medication-free patients with schizophrenia. One preliminary study suggested that glutamine elevations were not present in medication-free patients who were receiving benzodiazepines, drugs that would be predicted to suppress excitatory neurotransmission. MRS in Alcohol Dependence. MRS studies evaluating NAA and choline have provided neurochemical evidence that complements the MRI findings related to the emergence and recovery from alcohol-related neurotoxicity. MRS studies of GABA have provided insights into alterations in cortical inhibitory neurotransmissions associated with the recovery from alcohol dependence. During acute withdrawal, cortical GABA levels appear to be normal. With recovery from alcohol dependence, cortical GABA levels appear to decline and may be significantly below the level seen in healthy subjects with extended sobriety. Functional MRI Recent advances in data collection and computer data processing have reduced the acquisition time for an MRI image to less than 1 second. A new sequence of particular interest to psychiatrists is the T2 or blood oxygen level–dependent (BOLD) sequence, which detects levels of oxygenated hemoglobin in the blood. Neuronal activity within the brain causes a local increase in blood flow, which in turn increases the local hemoglobin concentration. Although neuronal metabolism extracts more oxygen in active areas of the brain, the net effect of neuronal activity is to increase the local amount of oxygenated hemoglobin. This change can be detected essentially in real time with the T2 sequence, which thus detects the functionally active brain regions. This process is the basis for the technique of fMRI. What fMRI detects is not brain activity per se, but blood flow. The volume of brain in which blood flow increases exceeds the volume of activated neurons by about 1 to 2 cm

and limits the resolution of the technique. Sensitivity and resolution can be improved with the use of nontoxic, ultrasmall iron oxide particles. Thus, two tasks that activate clusters of neurons 5 mm apart, such as recognizing two different faces, yield overlapping signals on fMRI and so are usually indistinguishable by this technique. fMRI is useful to localize neuronal activity to a particular lobe or subcortical nucleus and has even been able to localize activity to a single gyrus. The method detects tissue perfusion, not neuronal metabolism. In contrast, PET scanning may give information specifically about neuronal metabolism. No radioactive isotopes are administered in fMRI, a great advantage over PET and SPECT. A subject can perform a variety of tasks, both experimental and control, in the same imaging session. First, a routine T1 MRI image is obtained; then the T2 images are superimposed to allow more precise localization. Acquisition of sufficient images for study can require 20 minutes to 3 hours, during which time the subject's head must remain in exactly the same position. Several methods, including a frame around the head and a special mouthpiece, have been used. Although realignments of images can correct for some head movement, small changes in head position may lead to erroneous interpretations of brain activation. fMRI has recently revealed unexpected details about the organization of language within the brain. Using a series of language tasks requiring semantic, phonemic, and rhyming discrimination, one study found that rhyming (but not other types of language processing) produced a different pattern of activation in men and women. Rhyming activated the inferior frontal gyrus bilaterally in women, but only on the left in men. In another study, fMRI revealed a previously suspected, but unproved, neural circuit for lexical categories, interpolated between the representations for concepts and those for phonemes. This novel circuit was located in the left anterior temporal lobe. Data from patients with dyslexia (reading disorder) doing simple rhyming tasks demonstrated a failure to activate Wernicke's area and the insula, which were active in normal subjects doing the same task (see Color Plate 5.8-4). Sensory functions have also been mapped in detail with fMRI. The activation of the visual and auditory cortices has been visualized in real time. In a recent intriguing study, the areas that were activated while a subject with schizophrenia listened to speech were also activated during auditory hallucinations. These areas included the primary auditory cortex as well as higher-order auditory processing regions. fMRI is the imaging technique most widely used to study brain abnormality related to cognitive dysfunction. fMRI of Dementia. fMRI methods provide information that can potentially be used in the study, diagnosis, and prognosis of Alzheimer's disease and other forms of dementia as well as proving insights into normal age-related changes in cognitive processing. Evidence that aging is associated with weaker and more diffused activations as well as decreased hemispheric lateralization suggests either a compensation for lost regional intensity or a dedifferentiation of processing. The weaker activation, especially prefrontal, suggests potential encoding-stage dysfunctions associated with aging. fMRI

studies have consistently demonstrated that patients with Alzheimer's disease have decreased fMRI activation in the hippocampus and related structures within the MTL during the encoding of new memories compared with cognitively intact older subjects. More recently, fMRI studies of subjects at risk for Alzheimer's disease, by virtue of their genetics or evidence of minimal cognitive impairment, have yielded variable results with some studies suggesting there may be a phase of paradoxically increased activation early in the course of prodromal Alzheimer's disease. fMRI of Alcohol Dependence. fMRI studies have provided insights into the functional consequences of alcoholism-related neurotoxicity. Studies suggest that recovering alcohol-dependent patients show abnormal activation patterns in frontal cortex, thalamus, striatum, cerebellum, and hippocampus related to impairments in attention, learning and memory, motor coordination, and inhibitory

control of behavior. Studies have begun to explore pharmacological modulation of resting circuit activity to probe mechanisms underlying circuit dysfunction in alcoholism, illustrated by blunted responses to benzodiazepines. SPECT Scanning Manufactured radioactive compounds are used in SPECT to study regional differences in cerebral blood flow within the brain. This high-resolution imaging technique records the pattern of photon emission from the bloodstream according to the level of perfusion in different regions of the brain. As with fMRI, it provides information on the cerebral blood flow, which is highly correlated with the rate of glucose metabolism, but does not measure neuronal metabolism directly. SPECT uses compounds labeled with single photon-emitting isotopes: iodine-123, technetium-99m, and xenon-133. Xenon-133 is a noble gas that is inhaled directly. The xenon quickly enters the blood and is distributed to areas of the brain as a function of regional blood flow. Xenon-SPECT is thus referred to as the regional cerebral blood flow (rCBF) technique. For technical reasons, xenon-SPECT can measure blood flow only on the surface of the brain, which is an important limitation. Many mental tasks require communication between the cortex and subcortical structures, and this activity is poorly measured by xenon-SPECT. Assessment of blood flow over the whole brain with SPECT requires the injectable tracers, technetium-99m-D,L-hexamethylpropyleneamine oxime (HMPAO [Ceretec]) or iodoamphetamine [Spectamine]). These isotopes are attached to molecules that are highly lipophilic and rapidly cross the blood–brain barrier and enter cells. Once inside the cell, the ligands are enzymatically converted to charged ions, which remain trapped in the cell. Thus, over time, the tracers are concentrated in areas of relatively higher blood flow. Although blood flow is usually assumed to be the major variable tested in HMPAO SPECT, local variations in the permeability of the blood–brain barrier and in the enzymatic conversion of the ligands within cells also contribute to regional differences in signal levels.

In addition to these compounds used for measuring blood flow, iodine-123–labeled ligands for the muscarinic, dopaminergic, and serotonergic receptors, for example, can be used to study these receptors by SPECT technology. Once photon-emitting compounds reach the brain, detectors surrounding the patient’s head pick up their light emissions. This information is relayed to a computer, which constructs a two-dimensional image of the isotope’s distribution within a slice of the brain. A key difference between SPECT and PET is that in SPECT a single particle is emitted, whereas in PET two particles are emitted; the latter reaction gives a more precise location for the event and better resolution of the image. Increasingly, for both SPECT and PET studies, investigators are performing prestudy MRI or CT studies, then superimposing the SPECT or PET image on the MRI or CT image to obtain a more accurate anatomical location for the functional information (see Color Plate 5.8-5). SPECT is useful in diagnosing decreased or blocked cerebral blood flow in stroke victims. Some have described abnormal flow patterns in the early stages of Alzheimer’s disease that may aid in early diagnosis. PET Scanning The isotopes used in PET decay by emitting positrons, antimatter particles that bind with and annihilate electrons, thereby giving off photons that travel in 180-degree opposite directions. Because detectors have twice as much signal from which to generate an image as SPECT scanners have, the resolution of the PET image is higher. A wide range of compounds can be used in PET studies, and the resolution of PET continues to be refined closer to its theoretical minimum of 3 mm, which is the distance positrons move before colliding with an electron. Relatively few PET scanners are available because they require an onsite cyclotron to make the isotopes. The most commonly used isotopes in PET are fluorine-18 (18F), nitrogen-13, and oxygen-15. These isotopes are usually linked to another molecule, except in the case of oxygen-15 (15O). The most commonly reported ligand has been

[18F]fluorodeoxyglucose (FDG), an analogue of glucose that the brain cannot metabolize. Thus, the brain regions with the highest metabolic rate and the highest blood flow take up the most FDG but cannot metabolize and excrete the usual metabolic products. The concentration of 18F builds up in these neurons and is detected by the PET camera. Water-15 (H215O) and nitrogen-13 are used to measure blood flow, and 15O can be used to determine the metabolic rate. Glucose is by far the predominant energy source available to brain cells, and its use is thus a highly sensitive indicator of the rate of brain metabolism. 18Flabeled 3,4-dihydroxyphenylalanine (DOPA), the fluorinated precursor to dopamine, has been used to localize dopaminergic neurons. PET has been used increasingly to study normal brain development and function as well as to study neuropsychiatric disorders. With regard to brain development, PET studies have found that glucose use is greatest in the sensorimotor cortex, thalamus, brainstem, and cerebellar vermis when an infant is 5 weeks of age or younger. By 3 months of age, most areas of the cortex show increased use, except for the frontal and

association cortices, which do not begin to exhibit an increase until the infant is 8 months of age. An adult pattern of glucose metabolism is achieved by the age of 1 year, but use in the cortex continues to rise above adult levels until the child is about 9 years of age, when use in the cortex begins to decrease and reaches its final adult level in the late teen years. In another study, subjects listened to a rapidly presented list of thematically related words. When asked to recall words in the thematic category that may or may not have been on the list, some subjects falsely recalled that they had heard words that actually were not on the list. By PET scanning, the hippocampus was active during both true and false recollections, whereas the auditory cortex was only active during recollection of words that were actually heard. When pressed to determine whether memories were true or false, subjects activated the frontal lobes. FDG studies have also investigated pathology in neurological disorders and psychiatric disorders. Two other types of studies used precursor molecules and receptor ligands. The dopamine precursor dopa has been used to visualize pathology in patients with Parkinson’s disease, and radiolabeled ligands for receptors have been useful in determining the occupancy of receptors by specific psychotherapeutic drugs. Neurochemical findings from PET radiotracer scan are listed in Table 5.8-2. Table 5.8-2 Neurochemical Findings from Positron Emission Tomography Radiotracer Scans For example, dopamine receptor antagonists such as haloperidol (Haldol) block almost 100 percent of D2 receptors. The atypical antipsychotic drugs block serotonin 5HT2 receptors in addition to D2 receptors; hence, they are referred to as serotonindopamine receptor antagonists. The case study presented illustrates the potential

diagnostic value of three-dimensional PET imaging. Patient A is a 70-year-old man who had gotten more forgetful, to the point that his family was worried about him. The patient’s family was interested in getting a diagnostic workup to evaluate the possible causes for his memory disorder. His PET scan showed that he had functional parietotemporal decrease, which corroborated other neurological evaluations, suggesting that he had Alzheimer’s disease. The patient was treated with tacrine (Cognex) and benefited from some stabilization of his symptoms. (Courtesy of Joseph C. Wu, M.D., Daniel G. Amen, M.D., and H. Stefan Bracha, M.D.) Pharmacological and Neuropsychological Probes With both PET and SPECT and eventually with MRS, more studies and possibly more diagnostic procedures will use pharmacological and neuropsychological probes. The purpose of such probes is to stimulate particular regions of brain activity, so that, when compared with a baseline, workers can reach conclusions about the functional correspondence to particular

brain regions. One example of the approach is the use of PET to detect regions of the brain involved in the processing of shape, color, and velocity in the visual system. Another example is the use of cognitive activation tasks (e.g., the Wisconsin Card Sorting Test) to study frontal blood flow in patients with schizophrenia. A key consideration in the evaluation of reports that measure blood flow is the establishment of a true baseline value in the study design. Typically, the reports use an awake, resting state, but there is variability in whether the patients have their eyes closed or their ears blocked; both conditions can affect brain function. There is also variability in such baseline brain function factors as sex, age, anxiety about the test, nonpsychiatric drug treatment, vasoactive medications, and time of day. REFERENCES Arnone D, McKie S, Elliott R, Thomas EJ, Downey D, Juhasz G, Williams SR, Deakin JF, Anderson IM. Increased amygdala responses to sad but not fearful faces in major depression: Relation to mood state and pharmacological treatment. Am J Psychiatry. 2012;169(8):841. Beck A, Wüstenberg T, Genauck A, Wrase J, Schlagenhauf F, Smolka MN, Mann K, Heinz A. Effect of brain structure, brain function, and brain connectivity on relapse in alcohol-dependent patients. Arch Gen Psychiatry. 2012;69(8):842. Björklund A, Dunnett SB. Dopamine neuron systems in the brain: an update. Trends Neurosci. 2007;30:194. Borairi S, Dougherty DD. The use of neuroimaging to predict treatment response for neurosurgical interventions for treatment-refractory major depression and obsessive-compulsive disorder. Harvard Rev Psychiatry. 2011;19(3):155. Cahn B, Polich J. Meditation states and traits: EEG, ERP, and neuroimaging studies. Psychol Consciousness Theory Res Pract. 2013;1(S):48–96. Fornito A, Bullmore ET. Does fMRI have a role in personalized health care for psychiatric patients? In: Gordon E, Koslow SH, eds. Integrative Neuroscience and Personalized Medicine. New York: Oxford University Press; 2011:55. Holt DJ, Coombs G, Zeidan MA, Goff DC, Milad MR. Failure of neural responses to safety cues in schizophrenia. Arch Gen

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5.9 Physical Examination of the Psychiatric Patient

Psychiatry. 2012;69(9):893. Keedwell PA, Linden DE. Integrative neuroimaging in mood disorders. Curr Opin Psychiatry. 2013;26(1):27–32. Lewis DA, Gonzalez-Burgos G. Pathophysiologically based treatment interventions in schizophrenia. Nat Med. 2006;12:1016. Lim HK, Aizenstein HJ. Recent Findings and Newer Paradigms of Neuroimaging Research in Geriatric Psychiatry. J Geriatr Psychiatry Neurol . 2014;27:3–4. Mason GF, Krystal JH, Sanacora G. Nuclear magnetic resonance imaging and spectroscopy: Basic principles and recent findings in neuropsychiatric disorders. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:248. Migo EM, Williams SCR, Crum WR, Kempton MJ, Ettinger U. The role of neuroimaging biomarkers in personalized medicine for neurodegenerative and psychiatric disorders. In: Gordon E, Koslow SH, eds. Integrative Neuroscience and Personalized Medicine. New York: Oxford University Press; 2011:141. Morgenstern J, Naqvi NH, Debellis R, Breiter HC. The contributions of cognitive neuroscience and neuroimaging to understanding mechanisms of behavior change in addiction. Psychol Addict Behav. 2013;27(2):336–350. Oberheim NA, Wang X, Goldman S, Nedergaard M. Astrocytic complexity distinguishes the human brain. Trends Neurosci. 2006;29:567. Philips ML, Vieta E. Identifying functional neuroimaging biomarkers of bipolar disorder. In: Tamminga CA, Sirovatka PJ, Regier DA, van Os J, eds. Deconstructing Psychosis: Refining the Research Agenda for DSM-V. Arlington: American Psychiatric Association; 2010:131. Robert G, Le Jeune F, Lozachmeur C, Drapier S, Dondaine T, Péron J, Travers D, Sauleau P, Millet B, Vérin M, Drapier D. Apathy in patients with Parkinson disease without dementia or depression: A PET study. Neurology. 2012;79(11):1155. Staley JK, Krystal JH. Radiotracer imaging with positron emission tomography and single photon emission computed tomography. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009:273. 5.9 Physical Examination of the Psychiatric Patient Confronted with a patient who has a mental disorder, the psychiatrist must decide whether a medical, surgical, or

neurological condition may be the cause. Once satisfied that no disease process can be held accountable, then the diagnosis of mental disorder not attributable to a medical illness can be made. Although psychiatrists do not perform routine physical examinations of their patients, a knowledge and understanding of physical signs and symptoms is part of their training, which enables them to recognize signs and symptoms that may indicate possible medical or surgical illness. For example, palpitations can be associated with mitral valve prolapse, which is diagnosed by cardiac auscultation. Psychiatrists are also able to recognize and treat the adverse effects of psychotropic medications, which are used by an increasing number of patients seen by psychiatrists and nonpsychiatric physicians. Some psychiatrists insist that every patient have a complete medical workup; others may not. Whatever their policy, psychiatrists should consider patients' medical status at the outset of a psychiatric evaluation. Psychiatrists must often decide whether a patient needs a medical examination and, if so, what it should include—most commonly, a

thorough medical history, including a review of systems, a physical examination, and relevant diagnostic laboratory studies. A recent study of 1,000 medical patients found that in 75 percent of cases no cause of symptoms (i.e., subjective complaints) could be found, and a psychological basis was assumed in 10 percent of those cases. HISTORY OF MEDICAL ILLNESS In the course of conducting a psychiatric evaluation, information should be gathered about known bodily diseases or dysfunctions, hospitalizations and operative procedures, medications taken recently or at present, personal habits and occupational history, family history of illnesses, and specific physical complaints. Information about medical illnesses should be gathered from the patient, the referring physician, and the family, if necessary. Information about previous episodes of illness may provide valuable clues about the nature of the present disorder. For example, a distinctly delusional disorder in a patient with a history of several similar episodes that responded promptly to diverse forms of treatment strongly suggests the possibility of substance-induced psychotic disorder. To pursue this lead, the psychiatrist should order a drug screen. The history of a surgical procedure may also be useful; for instance, a thyroidectomy suggests hypothyroidism as the cause of depression. Depression is an adverse effect of several medications prescribed for hypertension. Medication taken in a therapeutic dosage occasionally reaches high concentrations in the blood. Digitalis intoxication, for example, can occur under such circumstances and result in impaired mental functioning. Proprietary drugs can cause or contribute to an anticholinergic delirium. The psychiatrist, therefore, must inquire about over-the-counter remedies as well as prescribed medications. A history of herbal intake and alternative therapy is essential in view of their increased use. An occupational history may also provide essential information. Exposure to mercury can result in complaints suggesting a psychosis, and exposure to lead, as in smelting, can produce a cognitive disorder. The latter clinical picture can also result from imbibing moonshine whiskey with a high lead content. In eliciting information about specific symptoms, the psychiatrist brings medical and psychological knowledge into full play. For example, the psychiatrist should elicit sufficient information from the patient complaining of headache to predict whether the pain results from intracranial disease that requires neurological testing. Also, the psychiatrist should be able to recognize that the pain in the right shoulder of a hypochondriacal patient with abdominal discomfort may be the classic referred pain of gallbladder disease. REVIEW OF SYSTEMS An inventory by systems should follow the open-ended inquiry. The review can be organized according to organ systems (e.g., liver, pancreas), functional systems (e.g., gastrointestinal), or a combination of the two, as in the outline presented in the

following subsections. In all cases, the review should be comprehensive and thorough. Even if a psychiatric component is suspected, a complete workup is still indicated. Head Many patients give a history of headache; its duration, frequency, character, location, and severity should be ascertained. Headaches often result from substance abuse, including alcohol, nicotine, and caffeine. Vascular (migraine) headaches are precipitated by stress. Temporal arteritis causes unilateral throbbing headaches and can lead to blindness. Brain tumors are associated with headaches as a result of increased intracranial pressure; but some may be silent, the first signs being a change in personality or cognition. A 63-year-old woman in treatment for depression began to complain of difficulties in concentration. The psychiatrist attributed the complaint to the depressive disorder; however, when the patient began to complain of balance difficulties, a magnetic resonance imaging was obtained, which revealed the presence of meningioma. A head injury can result in subdural hematoma and, in boxers, can cause progressive dementia with extrapyramidal symptoms. The headache of subarachnoid hemorrhage is sudden, severe, and associated with changes in the sensorium. Normal pressure hydrocephalus can follow a head injury or encephalitis and be associated with dementia, shuffling gait, and urinary incontinence. Dizziness occurs in up to 30 percent of persons, and determining its cause is challenging and often difficult. A change in the size or shape of the head may be indicative of Paget’s disease. Eye, Ear, Nose, and Throat Visual acuity, diplopia, hearing problems, tinnitus, glossitis, and bad taste are covered in this area. A patient taking antipsychotics who gives a history of twitching about the mouth or disturbing movements of the tongue may be in the early and potentially reversible stage of tardive dyskinesia. Impaired vision can occur with thioridazine (Mellaril) in high doses (over 800 mg a day). A history of glaucoma contraindicates drugs with anticholinergic effects. Complaints of bad odors may be a symptom of temporal lobe epilepsy rather than schizophrenia. Aphonia may be hysterical in nature. The late stage of cocaine abuse can result in perforations of the nasal septum and difficulty breathing. A transitory episode of diplopia may herald multiple sclerosis. Delusional disorder is more common in hearing-impaired persons than in those with normal hearing. Blue-tinged vision can occur transiently when using sildenafil (Viagra) or similar drugs. Respiratory System

Cough, asthma, pleurisy, hemoptysis, dyspnea, and orthopnea are considered in this subsection. Hyperventilation is suggested if the patient’s symptoms include all or a few of the following: onset at rest, sighing respirations, apprehension, anxiety, depersonalization, palpitations, inability to swallow, numbness of the feet and hands, and carpopedal spasm. Dyspnea and breathlessness can occur in depression. In pulmonary or obstructive airway disease, the onset of symptoms is usually insidious, whereas in depression, it is sudden. In depression, breathlessness is experienced at rest, shows little change with exertion, and can fluctuate within a matter of minutes; the onset of breathlessness coincides with the onset of a mood disorder and is often accompanied by attacks of dizziness, sweating, palpitations, and paresthesias. In obstructive airway disease, patients with the most advanced respiratory incapacity experience breathlessness at rest. Most striking and of greatest assistance in making a differential diagnosis is the emphasis placed on the difficulty in inspiration experienced by patients with depression and on the difficulty in expiration experienced by patients with pulmonary disease. Bronchial asthma has sometimes been associated with a childhood history of extreme dependence on the mother. Patients with bronchospasm should not receive propranolol (Inderal) because it can block catecholamine-induced bronchodilation; propranolol is specifically contraindicated for patients with bronchial asthma because epinephrine given to such patients in an emergency will not be effective. Patients taking angiotensin-converting

enzyme (ACE) inhibitors can develop a dry cough as an adverse effect of the drug. Cardiovascular System Tachycardia, palpitations, and cardiac arrhythmia are among the most common signs of anxiety about which the patient may complain. Pheochromocytoma usually produces symptoms that mimic anxiety disorders, such as rapid heartbeat, tremors, and pallor. Increased urinary catecholamines are diagnostic of pheochromocytoma. Patients taking guanethidine (Ismelin) for hypertension should not receive tricyclic drugs, which reduce or eliminate the antihypertensive effect of guanethidine. A history of hypertension can preclude the use of monoamine oxidase inhibitors (MAOIs) because of the risk of a hypertensive crisis if such patients with hypertension inadvertently ingest foods high in tyramine. Patients with suspected cardiac disease should have an electrocardiogram before tricyclics or lithium (Eskalith) is prescribed. A history of substernal pain should be evaluated, and the clinician should keep in mind that psychological stress can precipitate angina-type chest pain in the presence of normal coronary arteries. Patients taking opioids should never receive MAOIs; the combination can cause cardiovascular collapse. Gastrointestinal System Such topics as appetite, distress before or after meals, food preferences, diarrhea, vomiting, constipation, laxative use, and abdominal pain relate to the gastrointestinal system. A history of weight loss is common in depressive disorders, but depression can

accompany the weight loss caused by ulcerative colitis, regional enteritis, and cancer. Atypical depression is accompanied by hyperphagia and weight gain. Anorexia nervosa is accompanied by severe weight loss in the presence of normal appetite. Avoidance of certain foods may be a phobic phenomenon or part of an obsessive ritual. Laxative abuse and induced vomiting are common in bulimia nervosa. Constipation can be caused by opioid dependence and by psychotropic drugs with anticholinergic side effects. Cocaine or amphetamine abuse causes a loss of appetite and weight loss. Weight gain can occur under stress or in association with atypical depression. Polyphagia, polyuria, and polydipsia are the triad of diabetes mellitus. Polyuria, polydipsia, and diarrhea are signs of lithium toxicity. Some patients take enemas routinely as part of paraphilic behavior, and anal fissures or recurrent hemorrhoids may indicate anal penetration by foreign objects. Some patients may ingest foreign objects that produce symptoms that can be diagnosed only by X-ray (Fig. 5.9-1). FIGURE 5.9-1 A mentally ill patient who is a habitual swallower of foreign objects. Included in his colonic lumen are 13 thermometers and 8 pennies. The dense, round, almost punctate densities are globules of liberated liquid mercury. (Courtesy of Stephen R. Baker, M.D.,

and Kyunghee C. Cho, M.D.) Genitourinary System Urinary frequency, nocturia, pain or burning on urination, and changes in the size and the force of the stream are some of the signs and symptoms emanating from the genitourinary system. Anticholinergic adverse effects associated with antipsychotics and tricyclic drugs can cause urinary retention in men with prostate hypertrophy. Erectile difficulty and retarded ejaculation are also common adverse effects of these drugs, and retrograde ejaculation occurs with thioridazine. A baseline level of sexual responsiveness before using pharmacological agents should be obtained. A history of sexually transmitted diseases—for example, gonorrheal discharge, chancre, herpes, and pubic lice —may indicate sexual promiscuity or unsafe sexual practices. In some cases, the first symptom of acquired immune deficiency syndrome (AIDS) is the gradual onset of mental confusion leading to dementia. Incontinence should be evaluated carefully, and if it persists, further investigation for more extensive disease should include a workup for human immunodeficiency virus (HIV) infection. Drugs with anticholinergic adverse effects should be avoided in men with prostatism. Urethral eroticism, in which catheters or other objects are inserted into the urethra, can cause infection or laceration (Fig. 5.92). FIGURE

5.9-2 A patient brought to the emergency room with lower abdominal pain. X-ray shows a nasogastric tube folded into the bladder. The patient would insert the tube into his urethra as part of a masturbatory ritual (urethral eroticism). (Courtesy of Stephen R. Baker, M.D., and Kyunghee C. Cho, M.D.)

Orgasm causes prostatic contractions, which may artificially raise prostate-specific antigen (PSA) and give a false-positive result for prostatic cancer. Men scheduled to have a PSA test should avoid masturbation or coitus for 7 to 10 days prior to the test. Menstrual History A menstrual history should include the age of the onset of menarche (and menopause, if applicable); the interval, regularity, duration, and amount of flow of periods; irregular bleeding; dysmenorrhea; and abortions. Amenorrhea is characteristic of anorexia nervosa and also occurs in women who are psychologically stressed. Women who are afraid of becoming pregnant or who have a wish to be pregnant may have delayed periods. Pseudocyesis is false pregnancy with complete cessation of the menses. Perimenstrual mood changes (e.g., irritability, depression, and dysphoria) should be noted. Painful menstruation can result from uterine disease (e.g., myomata), from psychological conflicts about the menses, or from a combination of the two. Some women report a perimenstrual increase in sexual desire. The emotional reaction associated with abortion should be explored, because it can be mild or severe. GENERAL OBSERVATION An important part of the medical examination is subsumed under the broad heading of general observation—visual, auditory, and olfactory. Such nonverbal clues as posture, facial expression, and mannerisms should also be noted. Visual Inspection Scrutiny of the patient begins at the first encounter. When the patient goes from the waiting room to the interview room, the psychiatrist should observe the patient’s gait. Is the patient unsteady? Ataxia suggests diffuse brain disease, alcohol or other substance intoxication, chorea, spinocerebellar degeneration, weakness based on a debilitating process, and an underlying disorder, such as myotonic dystrophy. Does the patient walk without the usual associated arm movements and turn in a rigid fashion, such as a toy soldier, as is seen in early Parkinson’s disease? Does the patient have asymmetry of gait, such as turning one foot outward, dragging a leg, or not swinging one arm, suggesting a focal brain lesion? As soon as the patient is seated, the psychiatrist should direct attention to grooming. Is the patient’s hair combed, are the nails clean, and are the teeth brushed? Has clothing been chosen with care and is it appropriate? Although inattention to dress and hygiene is common in mental disorders—in particular, depressive disorders—it is also a hallmark of cognitive disorders. Lapses, such as mismatching socks, stockings, or shoes, may suggest a cognitive disorder. The patient’s posture and automatic movements or the lack of them should be noted. A stooped, flexed posture with a paucity of automatic movements may be caused by Parkinson’s disease or diffuse cerebral hemispheric disease or be an adverse effect of

antipsychotics. An unusual tilt of the head may be adopted to avoid eye contact, but it can also result from diplopia, a visual field defect, or focal cerebellar dysfunction. Frequent quick, purposeless movements are characteristic of anxiety disorders, but they are equally characteristic of chorea and hyperthyroidism. Tremors, although commonly seen in anxiety disorders, may point to Parkinson’s disease, essential tremor, or adverse effects of psychotropic medication. Patients with essential tremor sometimes seek psychiatric treatment because they believe the tremor must be caused by unrecognized fear or anxiety, as others often suggest. Unilateral paucity or excess of movement suggests focal brain disease. The patient’s appearance is then scrutinized to assess general health. Does the patient appear to be robust or is there a sense of ill health? Does

looseness of clothing indicate recent weight loss? Is the patient short of breath or coughing? Does the patient's general physiognomy suggest a specific disease? Men with Klinefelter's syndrome have a feminine fat distribution and lack the development of secondary male sex characteristics. Acromegaly is usually immediately recognizable by the large head and jaw. What is the patient's nutritional status? Recent weight loss, although often seen in depressive disorders and schizophrenia, may be caused by gastrointestinal disease, diffuse carcinomatosis, Addison's disease, hyperthyroidism, and many other somatic disorders. Obesity can result from either emotional distress or organic disease. Moon facies, truncal obesity, and buffalo hump are striking findings in Cushing's syndrome. The puffy, bloated appearance seen in hypothyroidism and the massive obesity and periodic respiration seen in Pickwickian syndrome are easily recognized in patients referred for psychiatric help. Hyperthyroidism is indicated by exophthalmos. The skin frequently provides valuable information. The yellow discoloration of hepatic dysfunction and the pallor of anemia are reasonably distinctive. Intense reddening may be caused by carbon monoxide poisoning or by photosensitivity resulting from porphyria or phenothiazines. Eruptions can be manifestations of such disorders as systemic lupus erythematosus (e.g., the butterfly on the face), tuberous sclerosis with adenoma sebaceum, and sensitivity to drugs. A dusky purplish cast to the face, plus telangiectasia, is almost pathognomonic of alcohol abuse. Careful observation may reveal clues that lead to the correct diagnosis in patients who create their own skin lesions. For example, the location and shape of the lesions and the time of their appearance may be characteristic of dermatitis factitia. The patient's face and head should be scanned for evidence of disease. Premature whitening of the hair occurs in pernicious anemia, and thinning and coarseness of the hair occur in myxedema. In alopecia areata, patches of hair are lost, leaving bald spots; hair pulling disorder (trichotillomania) presents a similar picture. Pupillary changes are produced by various drugs—constriction by opioids and dilation by anticholinergic agents and hallucinogens. The combination of dilated and fixed pupils and dry skin and mucous membranes should immediately suggest the likelihood of atropine use or atropine-like toxicity. Diffusion of the conjunctiva suggests alcohol abuse, cannabis abuse, or obstruction of the superior vena cava. Flattening of the nasolabial fold on one

side or weakness of one side of the face—as manifested in speaking, smiling, and grimacing—may be the result of focal dysfunction of the contralateral cerebral hemisphere or of Bell's palsy. A drooping eyelid may be an early sign of myasthenia gravis. The patient's state of alertness and responsiveness should be evaluated carefully. Drowsiness and inattentiveness may be caused by a psychological problem, but they are more likely to result from organic brain dysfunction, whether secondary to an intrinsic brain disease or to an exogenous factor, such as substance intoxication. Listening Listening intently is just as important as looking intently for evidence of somatic disorders. Slowed speech is characteristic not only of depression but also of diffuse brain dysfunction and subcortical dysfunction; unusually rapid speech is characteristic of manic episodes and anxiety disorders and also of hyperthyroidism. A weak voice with monotonous tone may be a clue to Parkinson's disease in patients who complain mainly of depression. A slow, low-pitched, hoarse voice should suggest the possibility of hypothyroidism; this voice quality has been described as sounding like a drowsy, slightly intoxicated person with a bad cold and a plum in the mouth. A soft or tremulous voice accompanies anxiety. Difficulty initiating speech may be owing to anxiety or stuttering or may indicate Parkinson's disease or aphasia. Easy fatigability of speech is sometimes a manifestation of an emotional problem, but it is also characteristic of myasthenia gravis. Patients with these complaints are likely to be seen by a psychiatrist before the correct

diagnosis is made. Word production, as well as the quality of speech, is important. Mispronounced or incorrectly used words suggests a possibility of aphasia caused by a lesion of the dominant hemisphere. The same possibility exists when the patient perseverates, has trouble finding a name or a word, or describes an object or an event in an indirect fashion (paraphasia). When not consonant with patients' socioeconomic and educational levels, coarseness, profanity, or inappropriate disclosures may indicate loss of inhibition caused by dementia. Smell Smell may also provide useful information. The unpleasant odor of a patient who fails to bathe suggests a cognitive or a depressive disorder. The odor of alcohol or of substances used to hide it is revealing in a patient who attempts to conceal a drinking problem. Occasionally, a uriniferous odor calls attention to bladder dysfunction secondary to a nervous system disease. Characteristic odors are also noted in patients with diabetic acidosis, flatulence, uremia, and hepatic coma. Precocious puberty can be associated with the smell of adult sweat produced by mature apocrine glands.

A 23-year-old woman was referred to a psychiatrist for a second opinion. She had been diagnosed 6 months earlier with schizophrenia after complaining of smelling bad odors that were considered to be hallucinatory. She had been placed on an antipsychotic medication (perphenazine) and was compliant in spite of side effects of tremor and lethargy. Although there was some improvement in her symptoms, they did not remit entirely. The consulting psychiatrist obtained an electroencephalogram, which showed abnormal wave forms consistent with a diagnosis of temporal lobe epilepsy. The antipsychotic medication was replaced with an anticonvulsant (phenytoin) after which she no longer experienced olfactory hallucination, nor did she have to endure the unpleasant side effects of the previous medication. PHYSICAL EXAMINATION Patient Selection The nature of the patient's complaints is critical in determining whether a complete physical examination is required. Complaints fall into the three categories of body, mind, and social interactions. Bodily symptoms (e.g., headaches and palpitations) call for a thorough medical examination to determine what part, if any, somatic processes play in causing the distress. The same can be said for mental symptoms such as depression, anxiety, hallucinations, and persecutory delusions, which can be expressions of somatic processes. If the problem is clearly limited to the social sphere (e.g., longstanding difficulties in interactions with teachers, employers, parents, or a spouse), there may be no special indication for a physical examination. Personality changes, however, can result from a medical disorder (e.g., early Alzheimer's disease) and cause interpersonal conflicts. Psychological Factors Even a routine physical examination may evoke adverse reactions; instruments, procedures, and the examining room may be frightening. A simple running account of what is being done can prevent much needless anxiety. Moreover, if the patient is consistently forewarned of what will be done, the dread of being suddenly and painfully surprised recedes. Comments such as "There's nothing to this" and "You don't have to be afraid because this won't hurt" leave the patient in the dark and are much less reassuring than a few words about what actually will be done. Although the physical examination is likely to engender or intensify a reaction of anxiety, it can also stir up sexual feelings. Some women with fears or fantasies of being seduced may misinterpret an ordinary movement in the physical examination as a sexual advance. Similarly, a delusional man with homosexual fears may perceive a rectal examination as a sexual attack. Lingering over the examination of a particular organ because an unusual but normal variation has aroused the physician's scientific

curiosity is likely to raise concern in the patient that a serious pathological process has been discovered. Such a reaction may be profound in an anxious or hypochondriacal patient. The

physical examination occasionally serves a psychotherapeutic function. Anxious patients may be relieved to learn that, despite troublesome symptoms, no evidence is found of the serious illness that they fear. The young person who complains of chest pain and is certain that the pain heralds a heart attack can usually be reassured by the report of normal findings after a physical examination and electrocardiogram. The reassurance relieves only the worry occasioned by the immediate episode, however. Unless psychiatric treatment succeeds in dealing with the determinants of the reaction, recurrent episodes are likely. Sending a patient who has a deeply rooted fear of malignancy for still another test that is intended to be reassuring is usually unrewarding. Some patients may have a false fixed belief that a disorder is present. During the performance of the physical examination, an observant physician may note indications of emotional distress. For instance, during genital examinations, a patient's behavior may reveal information about sexual attitudes and problems, and these reactions can be used later to open this area for exploration. Timing of the Physical Examination Circumstances occasionally make it desirable or necessary to defer a complete medical assessment. For example, a delusional or manic patient may be combative, resistive, or both. In this instance, a medical history should be elicited from a family member, if possible, but unless a pressing reason exists to proceed with the examination, it should be deferred until the patient is tractable. For psychological reasons, it may be ill advised to recommend a medical assessment at the time of an initial office visit. In view of today's increased sensitivity and openness about sexual matters and a tendency to turn quickly to psychiatric help, young men may complain about their failure to consummate their first coital attempt. After taking a detailed history, the psychiatrist may conclude that the failure was because of situational anxiety. If so, neither a physical examination nor psychotherapy should be recommended; they would have the undesirable effect of reinforcing the notion of pathology. Should the problem be recurrent, further evaluation would be warranted. Neurological Examination If the psychiatrist suspects that the patient has an underlying somatic disorder, such as diabetes mellitus or Cushing's syndrome, referral is usually made for diagnosis and treatment. The situation is different when a cognitive disorder is suspected. The psychiatrist often chooses to assume responsibility in these cases. At some point, however, a thorough neurological evaluation may be indicated. During the history-taking process in such cases, the patient's level of awareness, attentiveness to the details of the examination, understanding, facial expression, speech,

posture, and gait are noted. It is also assumed that a thorough mental status examination will be performed. The neurological examination is carried out with two objectives in mind: to elicit (1) signs pointing to focal, circumscribed cerebral dysfunction and (2) signs suggesting diffuse, bilateral cerebral disease. The first objective is met by the routine neurological examination, which is designed primarily to reveal asymmetries in the motor, perceptual, and reflex functions of the two sides of the body, caused by focal hemispheric disease. The second objective is met by seeking to elicit signs that have been attributed to diffuse brain dysfunction and to frontal lobe disease. These signs include the sucking, snout, palmomental, and grasp reflexes and the persistence of the glabella tap response. Regrettably, with the exception of the grasp reflex, such signs do not correlate strongly with the presence of underlying brain pathology. Other Findings Psychiatrists should be able to evaluate the significance of findings uncovered by consultants. With a patient who complains of a lump in the throat (globus hystericus) and who is found on examination to have hypertrophied lymphoid tissue, it is tempting to wonder about a causal relation. How can a clinician be sure that the finding is not incidental? Has the patient been known to have hypertrophied lymphoid tissue at a time when no complaint was made? Do many persons

with hypertrophied lymphoid tissue never experience the sensation of a lump in the throat? With a patient with multiple sclerosis who complains of an inability to walk but, on neurological examination, has only mild spasticity and a unilateral Babinski sign, it is tempting to ascribe the symptom to the neurological disorder; but the complaint may be aggravated by emotional distress. The same holds true for a patient with profound dementia in whom a small frontal meningioma is seen on a computed tomography (CT) scan. Dementia is not always correlated with the findings. Significant brain atrophy could cause very mild dementia, and minimal brain atrophy could cause significant dementia. A lesion is often found that can account for a symptom, but the psychiatrist should make every effort to separate an incidental finding from a causative one and to distinguish a lesion merely found in the area of the symptom from a lesion producing the symptom. PATIENTS UNDERGOING PSYCHIATRIC TREATMENT While patients are being treated for psychiatric disorders, psychiatrists should be alert to the possibility of intercurrent illnesses that call for diagnostic studies. Patients in psychotherapy, particularly those in psychoanalysis, may be all too willing to ascribe their new symptoms to emotional causes. Attention should be given to the possible use of denial, especially if the symptoms seem to be unrelated to the conflicts currently in focus. Not only may patients in psychotherapy be likely to attribute new symptoms to

emotional causes, but sometimes their therapists do so as well. The danger of providing psychodynamic explanations for physical symptoms is ever present. Symptoms such as drowsiness and dizziness and signs such as a skin eruption and a gait disturbance, common adverse effects of psychotropic medication, call for a medical reevaluation if the patient fails to respond in a reasonable time to changes in the dose or the kind of medication prescribed. If patients who are receiving tricyclic or antipsychotic drugs complain of blurred vision (usually an anticholinergic adverse effect) and the condition does not recede with a reduction in dose or a change in medication, they should be evaluated to rule out other causes. In one case, the diagnosis proved to be toxoplasma chorioretinitis. The absence of other anticholinergic adverse effects, such as a dry mouth and constipation, is an additional clue alerting the psychiatrist to the possibility of a concomitant medical illness. Early in an illness, there may be few if any positive physical or laboratory results. In such instances, especially if the evidence of psychic trauma or emotional conflicts is glaring, all symptoms are likely to be regarded as psychosocial in origin, and new symptoms are also seen in this light. Indications for repeating portions of the medical workup may be missed unless the psychiatrist is alert to clues suggesting that some symptoms do not fit the original diagnosis and, instead, point to a medical illness. Occasionally, a patient with an acute illness, such as encephalitis, is hospitalized with the diagnosis of schizophrenia, or a patient with a subacute illness, such as carcinoma of the pancreas, is treated in a private office or clinic with the diagnosis of a depressive disorder. Although it may not be possible to make the correct diagnosis at the time of the initial psychiatric evaluation, continued surveillance and attention to clinical details usually provide clues leading to the recognition of the cause. The likelihood of intercurrent illness is greater with some psychiatric disorders than with others. Substance abusers, for example, because of their life patterns, are susceptible to infection and are likely to suffer from the adverse effects of trauma, dietary deficiencies, and poor hygiene. Depression decreases the immune response. When somatic and psychological dysfunctions are known to coexist, the psychiatrist should be thoroughly conversant with the patient’s medical status. In cases of cardiac decompensation, peripheral neuropathy, and other disabling disorders, the nature and degree of impairment that can be attributed to the physical disorder should be assessed. It is important to answer the question: Does the patient exploit a disability, or is it ignored or denied with resultant

overexertion? To answer this question, the psychiatrist must assess the patient's capabilities and limitations, rather than make sweeping judgments based on a diagnostic label. Special vigilance about medical status is required for some patients in treatment for somatoform and eating disorders. Such is the case for patients with ulcerative colitis who are bleeding profusely and for patients with anorexia nervosa who are losing appreciable weight. These disorders can become life-threatening. Importance of Medical Screening

Numerous articles have called attention to the need for thorough medical screening of patients seen in psychiatric inpatient services and clinics. (A similar need has been demonstrated for the psychiatric evaluation of patients seen in medical inpatient services and clinics.) The concept of medical clearance remains ambiguous and has meaning in the context of psychiatric admission or clearance for transfers from different settings or institutions. It implies that no medical condition exists to account for the patient's condition. Among identified psychiatric patients, from 24 to 60 percent have been shown to suffer from associated physical disorders. In a survey of 2,090 psychiatric clinic patients, 43 percent were found to have associated physical disorders; of these, almost half the physical disorders had not been diagnosed by the referring sources. (In this study, 69 patients were found to have diabetes mellitus, but only 12 of these cases had been diagnosed before referral.) Expecting psychiatrists to be experts in internal medicine is unrealistic, but they should be able to recognize or have high suspicion of physical disorders when they are present. Moreover, they should make appropriate referrals and collaborate in treating patients who have both physical and mental disorders. Psychiatric symptoms are nonspecific; they can herald medical as well as psychiatric illness. They often precede the appearance of definitive medical symptoms. Some psychiatric symptoms (e.g., visual hallucinations, distortions, and illusions) should evoke a high level of suspicion of a medical toxicity. The medical literature abounds with case reports of patients whose disorders were initially considered emotional but ultimately proved to be secondary to medical conditions. The data in most of the reports revealed features pointing toward organicity. Diagnostic errors arose because such features were accorded too little weight. REFERENCES

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