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Notes & Notes for MRCP
By Dr. Yousif Abdallah Hamad

 serious allergic reactions (including a rash over the whole body, shortness of breath, wheezing, dizziness, swelling around the mouth or eyes, fast pulse, and sweating), alveolar hemorrhage, acute respiratory distress syndrome, and hemoptysis. Severe sickle cell crises, in patients with sickle cell disorders. Sargramostim • Action granulocyte macrophage colony-stimulating factor (GM-CSF) • It is produced in yeast • stimulate other myeloid and megakaryocyte • Indications for myeloid reconstitution after bone marrow transplantation. neutropenia induced by chemotherapy • side effects GM-CSF can cause more severe effects, including fever, arthralgias, and capillary damage with edema. edema

Updated 2022

Third edition Notes & Notes

For MRCP By Dr. Yousif Abdallah Hamad Volume 3

Foreword

With the grace of the Almighty Allah, I have introduced the third edition of the popular book, the Notes & Notes for MRCP Part & 2. The MRCP exam requires a wide range of information, particular thinking, and question directed experience. This book is directed mainly at those who need comprehensive revision of the topics which commonly appear in the written MRCP exams. It will be helpful to go through these topics before you start solving the best of the five questions; it is also recommended to go quickly over this book in the last few weeks before the day of your exam. This new edition contains the new published guidelines.

I hope you will find the maximum benefits from this book to get through MRCP written exams.

To practice the best of five questions we advise you to join the best website for MRCP passonexam.com For any enquiry or comment, please do not hesitate to contact me.

“The mind is not a vessel to be filled, but a fire to be kindled.” — Plutarch.

March - 2022 Dr. Yousif Abdallah Hamad
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The 10 Golden Tips for MRCP written exams you will ever need

1. ```
   For MRCP, do not read hard; read smart.
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2. Three to six months is usually enough for preparation.
3. Practice the best of the five questions as much as possible.
4. The few days before the exam date, stop revising questions and concentrate on your MRCP notes and top tips.
5. Remember, you are getting ideas and concepts from the questions.
6. Time factor in the exam room is the leading killer after poor preparation.
7. Manage your time wisely.
8. Read the end of the question first; if you can answer it without reading the whole scenario, it will save your time for the other tuff question (long scenario, .what is the action of imatinib?)
9. Take care for any single word in the question, e.g. (the initial test, the diagnostic test, the best test, the next step)
10. Practice, practice and practice.
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..... Scleritis / Episcleritis .....

Increased skin fragility / Basal cell carcinoma (BCC) Squamous cell carcinoma (SCC) ..... Keratoacanthoma (KA) ..... Actinic keratoses / Malignant melanoma Moles / Systemic mastocytosis / Angiosarcoma Pyogenic granuloma ..... Skin disorders associated with malignancy Otitis externa / Livedo reticularis (LR) ..... Hyperhidrosis / Seborrheic keratosis ..... Solar keratosis / Telogen phase .....

Generalised anxiety disorder ..... Mood disorder ..... Cognitive behavioural therapy ..... Seasonal affective disorder (SAD) ..... Body dysmorphic disorder ..... Post-partum mental health problems ..... Alcohol - problem drinking: management Alcohol withdrawal ..... Schizophrenia ..... Electroconvulsive therapy (ECT) ..... Charles Bonnet syndrome (CBS) ..... Delusions / Personality disorders ..... Panic disorder ..... Acute confusional state ..... Hypnogogic and hypnopompic hallucinations

Conjunctivitis / Subconjunctival haemorrhage Posterior uveitis / Retinitis ..... Retinitis pigmentosa ..... Sudden painless loss of vision ..... Tunnel vision / Ectopia lentis ..... Fundoscopic features in eye infections ..... Eye signs in Systemic diseases ..... Hyphaema .....

Chapter 13 Pharmacology Pharmacokinetics: metabolism / Drug absorption First-pass metabolism / Drug kinetics ..... Zero-order kinetics ..... Acetylator status / Half-life ..... Trough level / Affinity & efficacy ..... Dosage intervals ..... Clinical trial: phases ..... Prodrugs ..... P450 enzyme system ..... Drugs required therapeutic monitoring ..... Drug causes gingival hyperplasia ..... Drugs causing photosensitivity ..... Drugs causing specific skin reactions ..... Drug affects folic acid metabolism ..... Drug causes SIADH / Drug causes of urticaria ..... Drugs induced galactorrhoea ..... Drugs associated with gynaecomastia ..... Drug-induced impaired glucose tolerance ..... Drug-induced lupus erythematosus ..... Drug-induced Pancytopaenia ..... Drug-induced thrombocytopenia / Sulfa drugs Disulfiram ..... Drug-induced long QT / Drugs causing ocular problems Drug induced photosensitivity / Drug induced ototoxicity Drug induced seizures ..... Drug causes erythema multiforme, and the Stevens-Johnson syndrome subtype. ..... Drugs which act on serotonin receptors ..... Drugs that can be cleared with Hemodialysis Prescribing in patients with heart failure Antiarrhythmics: Vaughan Williams classification Atropine / Adenosine ..... Flecainide ..... Amiodarone ..... Dobutamine & Dopamine / Adrenaline ..... Antiplatelets ..... Acetylsalicylic acid (ASA, aspirin) ..... Salicylate overdose ..... Clopidogrel ..... IIb/IIIa inhibitors (eg: Abciximab) ..... Phosphodiesterase III (PDE) inhibitors (dipyridamole & cilostazol) Angiotensin-converting enzyme (ACE) inhibitors Adrenoceptor antagonists / Beta-blockers ..... Calcium channel blockers ..... Centrally acting antihypertensives / Bosentan

Collagen Types / Vitamin B3 (Niacin) deficiency

Heavy metal poisoning / Lead poisoning ..... Mercury poisoning / Cadmium (Cd) poisoning Thallium poisoning / Iron overdose ..... LSD intoxication / New recreational drugs Paracetamol overdose ..... Paraquat poisoning ..... Organophosphate insecticide poisoning ..... Carbon Monoxide (CO) Poisoning ..... Antiemetics ..... 5-HT3 antagonists ..... Antihistamines ..... Human and animal bite / Botox ..... D-Penicillamine / Isotretinoin ..... Cinnarizine / Ergotamine ..... Finasteride / Acetazolamide ..... Bicarbonate therapy / Bisphosphonates ..... Botulinum toxin / Immunoglobulins: Therapeutics Malignant hyperthermia (MH) ..... Intravenous fluid therapy ..... Lactulose ..... Bismuth / Non-steroidal anti-inflammatory drugs (NSAID) Celecoxib ..... Aminosalicylate drugs / Anti-TNF therapy Monoclonal antibodies ..... Abatacept / Proton pump inhibitors / Sildenafil Anaesthetic drugs / Inhaled anaesthetic-like agent Pseudocholinesterase deficiency ..... Succinyl choline ..... Local spinal anesthetics / Fentanyl ..... Ketamine / Topoisomerase inhibitors .....

itamin C (ascorbic acid) (scurvy) ..... Vitamin B12 deficiency ..... Vitamin B1 (Thiamine) deficiency ..... Vitamin E deficiency ..... Vitamin K Deficiency / Vitamin A deficiency Vitamin deficiency ..... Zinc deficiency / Pyruvate kinase .....

Chapter 15 Immunology Human leukocyte antigen (HLA) ..... Cluster of Differentiation (CD Markers) ..... Complement pathways ..... Anaphylaxis ..... Exercised induced anaphylaxis ..... Anaphylactic reactions associated with anaesthesia Allergy tests ..... Latex allergy ..... Serum Sickness ..... Immune system response ..... Macrophages ..... Pathogenesis of atherosclerosis ..... Fibroblasts / Immunoglobulins ..... Protein analysis: Gamma globulins ..... Immunoglobulins: therapeutics ..... Leukotrienes / Acute phase proteins ..... ANCA / Antibodies and immunological markers Interleukins ..... Interferon ..... Tumour necrosis factor (TNF) ..... Chapter 16 Genetics Autosomal dominant conditions ..... Achondroplasia ..... Osteogenesis imperfecta (“brittle bone disease”) Down›s syndrome (trisomy 21) ..... Noonan’s syndrome ..... Ehlers–Danlos syndrome (EDS) ..... Pseudoxanthoma elasticum (PXE) ..... Phenylketonuria (PKU) ..... Alkaptonuria ..... X-linked recessive ..... X-linked dominant disorders ..... Vitamin D-resistant rickets ..... Mitochondrial diseases ..... Kearns-Sayre syndrome ..... Kallman›s syndrome ..... Klinefelter›s syndrome ..... Turner›s syndrome .....

Nitric oxide (NO) ..... Endothelin-1 (ET-1) / Kinins ..... Erythrocyte sedimentation rate (ESR) ..... Leukocyte alkaline phosphatase ..... Thymus / B cells (B lymphocytes) ..... T cells (T lymphocytes) ..... Primary

Third edition Notes & Notes For MRCP part 1 & 2 By Dr. Yousif Abdallah Hamad Rheumatology Updated 2022

Chapter 8

Rheumatology

Bone markers Bone remodeling • Cells involved Osteoclasts: degrade bone tissue by secreting collagenase and H+ Osteoblasts: Build bone tissue by secreting type I collagen Activity assessed by an increase in bone ALP, osteocalcin, and type I procollagen propeptides Bone markers are useful for: • prediction of prognosis • prediction of fracture risk • assessing suitability for therapy and • monitoring the success of therapy. Markers of bone formation (measured in serum) • Bone-derived alkaline phosphatase (ALP). • Osteocalcin • Procollagen type 1 propeptides. • Hydroxyproline.

Rheumatoid factor Overview • Rheumatoid factor (RF) is a circulating antibody (usually IgM) which reacts with the Fc portion of the patients own IgG. • Rheumatoid factor is an antibody with reactivity to the heavy chain of IgG. • The rheumatoid factor may be of IgM, IgG or IgA class. • The conventional (agglutination) test, detects only IgM RF. • high titre levels are associated with severe progressive disease (but NOT a marker of disease activity). A positive rheumatoid factor is associated with: • More severe erosive disease • Extra-articular manifestations including subcutaneous nodules and • Increased mortality. Conditions associated with a positive RF include: • Sjogren's syndrome (around 100%) • Felty's syndrome (around 100%) • Mixed cryoglobulinemia (types II and III) - 40 to 100% Notes & Notes for MRCP
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Markers of bone resorption (measurable in serum or urine) • Telopeptides • Pyridinium cross-linking molecules • Tartrate-resistant acid phosphatase (TRAP)

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• rheumatoid arthritis (70-80%) • Mixed connective tissue disease - 50 to 60% • infective endocarditis (= 50%) • SLE (= 20-30%) • systemic sclerosis (= 30%) • Polymyositis/dermatomyositis - 5 to 10% • general population (= 5%)

Rheumatoid arthritis • Around 70% of patients with rheumatoid arthritis are HLA-DR4. • Patients with Felty's syndrome (a triad of rheumatoid arthritis, splenomegaly and neutropaenia) are even more strongly associated with 90% being HLA-DR4 Epidemiology • Prevalence = 1% • F:M ratio = 3:1 • Peak onset = 30-50 years, although occurs in all age groups Aetiology • Idiopathic inflammatory autoimmune disorder of unknown etiology • Genetic disposition: associated with HLA-DR4 and HLA-DR1 Pathophysiology • Autoimmune — inflammation induces formation of pannus (proliferative granulation tissue), which erodes articular cartilage and bone. • Citrullinated proteins (converted from arginine to citrulline) are recognized as foreign → Activation and migration of CD4+ T cells to synovial joints → recruitment of macrophages → secretion of cytokines (TNF-α, IL-1, IL-6) → inflammation and proliferation → pannus and synovial hypertrophy → invasion, progressive destruction, and deterioration of cartilage and bone • TNF is an important in the pathogenesis of rheumatoid arthritis. • Rheumatoid factor (RF) Antibodies against Fc portion of IgG (rheumatoid factor, RF) are produced to aid in removing autoantibodies and immune complexes. RF excess triggers formation of new immune complexes and type III hypersensitivity reaction Individuals with positive RF are more likely to develop extraarticular manifestations. Rheumatoid arthritis - TNF is key in pathophysiology Diagnosis • The diagnosis of RA is clinical

Chapter 8

Rheumatology

• NICE have stated that clinical diagnosis is more important than criteria such as those defined by the American College of Rheumatology. • Consider RA in patients with arthralgia, joint stiffness, and synovitis lasting ≥ 6 weeks 2010 American College of Rheumatology criteria • Target population. Patients who:

1. have at least 1 joint with definite clinical synovitis
2. with the synovitis not better explained by another disease • Classification criteria for rheumatoid arthritis (add score of categories A-D; a score of 6/10 is needed definite rheumatoid arthritis) Factor A. Joint involvement B. Serology (at least 1 test result is needed for classification) C. Acute-phase reactants (at least 1 test result is needed for classification) D. Duration of symptoms Notes & Notes for MRCP
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Scoring 1 large joint

2 - 10 large joints

1 - 3 small joints (with or without involvement of large joints)

4 - 10 small joints (with or without involvement of large joints)

10 joints (at least 1 small joint)

Negative rheumatoid factor (RF) and negative anti-cyclic citrullinated peptide (Anti-CCP)

Low-positive RF or low-positive Anti-CCP

High-positive RF or high-positive Anti-CCP

Normal CRP and normal ESR

Abnormal CRP or abnormal ESR

< 6 weeks

> “ 6 weeks

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Articular manifestations • Polyarthralgia Symmetrical pain and swelling of affected joints (also at rest) Frequently affected joints Metacarpophalangeal (MCP) joints Proximal interphalangeal (PIP) joints (DIP joints are NOT typically affected in RA.) Wrist joints • Morning stiffness (often > 30 min) that usually improves with activity • Joint deformities Swan neck deformity: PIP hyperextension and DIP flexion Boutonniere deformity: PIP flexion and DIP hyperextension. Hitchhiker thumb deformity (Z deformity of the thumb): hyperextension of the interphalangeal joint with fixed flexion of the MCP joint Ulnar deviation of the fingers Piano key sign: dorsal subluxation of the ulna Atlanto-axial subluxation: A loss of ligamentous stability between the atlas (C1) and axis (C2), which can result in compression of the spinal cord, medulla, and/or vertebral arteries by the odontoid process, especially upon neck flexion. Most commonly caused by

Down syndrome, rheumatoid arthritis, and trauma. The earliest manifestation of rheumatoid arthritis in the feet → swelling of the metatarsophalangeal joints Extraarticular manifestations • Constitutional symptoms: Low-grade fever, myalgie, malaise, fatigue, weight loss • Rheumatoid nodules: Nontender, firm, subcutaneous swellings (2 mm–5 cm). Commonly occur in areas exposed to higher pressure, e.g., extensor side of the forearm, bony prominences Rheumatoid pulmonary nodules may be accompanied by fibrosis and pneumoconiosis (Caplan syndrome). • Lungs: pleuritis, pleural effusions, interstitial lung disease (e.g., organizing pneumonia) rheumatoid pleural effusion: characterised by →low glucose level cricoarytenoid arthritis:

Notes & Notes for MRCP
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Rheumatology seen in up to 75% of patients with RA It can cause stridor, but is often asymptomatic. symptoms can rapidly worsen in the post-operative period. the most helpful diagnostic test →Spirometry with flow–volume loop Patients can need urgent tracheostomy and steroids, both orally and via joint injection. • Eye: keratoconjunctivitis sicca (dry eyes) (most common) scleritis, and episcleritis • Endocrine and exocrine glands: secondary Sjogren syndrome • Hematological Anemia of chronic disease (normocytic anemia) NSAIDs and/or steroids → increased risk of GI bleeding → iron deficiency anemia (microcytic anemia) Methotrexate → decreased folate level → macrocytic anemia Neutropenia Splenomegaly • Heart: Pericarditis and myocarditis, constrictive pericarditis is the commonest cardiac complication of rheumatoid arthritis ↑↑risk of myocardial infarction, stroke. • Musculoskeletal: Tenosynovitis and bursitis, Carpal tunnel syndrome • Vascular: Peripheral vasculitis, manifests as livedo reticularis Raynaud phenomenon Investigations Anti-cyclic citrullinated peptide antibodies are associated with rheumatoid arthritis • Specific parameters (serological studies) Anti-cyclic citrullinated peptide (Anti-CCP) antibodies It has sensitivity similar to RF (70-80%) with a much higher specificity of 9095%. a prognostic marker. Rheumatoid factor (RF) IgM autoantibodies against the Fc region of IgG antibodies Present in 70–80% of patients, but not specific to RA Serological studies may be negative (i.e., seronegative RA): Up to 30% of patients with RA are negative for Anti-CCP and RF. • Radiographic features X-ray of both hands and feet: initial test Early findings : soft tissue swelling, osteopenia (juxta-articular) Late findings: joint space narrowing, marginal erosions of cartilage and bone, osteopenia (generalized), subchondral cysts • Typical RA findings on x-rays may be subtle or absent upon diagnosis in many patients with early RA; therefore, ultrasound or MRI may be more informative, as they have higher sensitivity for detecting early signs of inflammation and erosion. • Analysis of synovial fluid Sterile specimen with leukocytosis (WBC count 5000–50,000/mcL) Abundant neutrophils. High protein levels.

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The radiographic features of rheumatoid arthritis can be remembered by the mnemonic LESS: Loss of joint space, Erosions, Soft tissue swelling, and Soft bones (osteopenia) Early x-ray findings Late x-ray findings • loss of joint space • juxta-articular osteoporosis • soft-tissue swelling • periarticular erosions • subluxation Differential diagnosis • Rheumatoid arthritis typically affects the metacarpophalangeal and proximal interphalangeal joints symmetrically. Psoriatic arthritis affects the distal interphalangeal joints and tends to be asymmetrical. • Rheumatoid arthritis vs

osteoarthritis Rheumatoid arthritis Osteoarthritis pathophysiology autoimmune (inflammatory) degenerative due to ↑ wear and tear on joints loss of cartilage (noninflammatory) Age of starting At any age Usually later in life Speed of onset Rapid, over weeks to months Slow, over yeas Pain improves with movement worse with movement and better with rest Primary joint affected Proximal interphalangeal Distal interphalangeal Metacarpophalangeal Carpometacarpal Heberdens nodes Absent Present Joint characteristics Soft, warm and tender Hard and bony (little or no swelling) Stiffness Worse after resting (morning stiffness) If present, worse after effort, may be described as evening stiffness Usually ˃ 1 hour Usually ˂1 hour Systemic symptoms Present (eg: fatigue) Absent RF and anti-CCP Positive Negative ESR and Creactive protein Elevated Normal x-ray Osteophytes absent Osteophytes may be present

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Rheumatology Referral • Indications for urgent referral for specialist opinion: any person with suspected persistent synovitis of undetermined cause. Refer urgently if any of the following apply: the small joints of the hands or feet are affected more than one joint is affected there has been a delay of 3 months or longer between onset of symptoms and seeking medical advice. Prognosis: poor prognostic features:
• Anti-CCP antibodies (The poorest prognostic factor) • Rheumatoid factor positive • HLA DR4 • Insidious onset : Acute or Sudden onset is not a poor prognosis. • Poor functional status at presentation • X-ray: early articular erosions (e.g. within the first 6 months of presentation and in less than < 2 years) • Extra articular features e.g. nodules • Female sex. Which micro-organisms may be associated with the development of rheumatoid arthritis in susceptible patients? →Proteus mirabilis Felty's syndrome (RA + splenomegaly + low white cell count) Poorly controlled rheumatoid arthritis + proteinuria and hypoalbuminaemia raises the possibility of systemic amyloidosis → Rectal biopsy MRCPUK-part-1-September- 2009 exam: MRCPUK-part-1-jan-2018: Which (HLA) types is most associated with rheumatoid arthritis? HLA DR4

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A patient of RA on etanercept, scheduled for elective surgery. What advice regarding his medication should be given prior to surgery? Stop etanercept 2–4 weeks prior to surgery Updated British Society for Rheumatology (BSR) guidelines (January 2005) for prescribing tumour necrosis factor (TNF-α) blockers in adults with RA recommend: • withholding etanercept and other TNF-blockers (infliximab and adalimumab) for 2–4 weeks prior to a major surgical procedure. • restarted postoperatively if there is no evidence of infection and once wound healing is satisfactory.

Rheumatoid arthritis: Management Approach • Acute anti-inflammatory treatment Temporary (< 3 months) symptomatic treatment with glucocorticoids and/or NSAIDs is indicated for disease flares (i.e., episodes of increased disease activity and symptom worsening). Glucocorticoids (prednisone) Short-term (i.e., < 3 months) therapy at the lowest effective dose is preferred. Longer term therapy only used in patients with highly active RA who do not respond to maximum doses of DMARDs. Glucocorticoids should be used at the lowest effective dose and only for short

periods of time to reduce the risk of their many adverse effects (e.g., hypertension, osteoporosis, infections). NSAIDs and selective COX-2 inhibitors: relieve symptoms, but do not improve the prognosis. • Long-term treatment Initiation of treatment: all patients with evidence of joint inflammation should start a combination of disease-modifying drugs (DMARD) as soon as possible. Consider short-term concomitant use of acute anti-inflammatory therapy (i.e., glucocorticoids and/or NSAIDs) for symptom control until the onset of action of DMARDs (e.g., ≥ 6 weeks). Disease-modifying anti-rheumatic drugs (DMARDs) • DMARD therapy reduces RA mortality and morbidity by up to 30%. • If DMARD therapy induce disease control →reduce drug doses to levels that still maintain disease control. • Methotrexate (MTX) first-line treatment in patients with moderate to high disease activity All patients should be co-prescribed folic acid supplementation at a minimal dose of 5 mg once weekly to minimize adverse effects. Monitoring of FBC & LFTs is essential due to the risk of myelosuppression and liver cirrhosis. Other important side-effects include pneumonitis • Azathioprine (AZA) Patients should have baseline thio-purine methyl-transferase (TPMT) status assessed • Sulfasalazine Consider in patients with low disease activity if MTX is contraindicated, e.g., during pregnancy.

  Adverse effects: diarrhea, agranulocytosis, cutaneous hypersensitivity reactions • Hydroxychloroquine (HCQ) Consider in patients with low disease activity. Adverse effects: hyperpigmentation and retinopathy Patients should have baseline formal ophthalmic examination, ideally including objective retinal assessment for example using optical coherence tomography, within 1 year of commencing an antimalarial drug • Leflunomide Consider if all other conventional DMARDs are contraindicated. Mechanism of action: reversibly inhibits dihydroorotate dehydrogenase → impaired pyrimidine synthesis → inhibition of T-cell proliferation Other indications: psoriatic arthritis Monitoring rheumatoid arthritis • Recommended DMARD Blood Monitoring Schedule when Starting or Adding a New DMARD (BSR guidelines February 2017) Check FBC, creatinine/calculated GFR, ALT and/or AST and albumin every 2 weeks until on stable dose for 6 weeks; then once on stable dose, monthly for 3 months; thereafter, at least every 12 weeks. Contact rheumatology team urgently and consider interruption in treatment if any of the following develop: white cell count <3.5 × 109/l; mean cell volume >105 fL; neutrophils <1.6 × 109/l; creatinine increase >30% over 12 months and/or calculated GFR <60 ml/min; unexplained eosinophilia >0.5 × 109/l; ALT and/or AST >100 U/l; platelet count <140 × 109/l; unexplained reduction in albumin <30 g/l In the setting of acute infection, most DMARDs (except hydroxychloroquine) should be discontinued until the infectious process has resolved.
• Measure CRP and key components of disease activity (using a composite score such as DAS28) regularly (monthly until treatment has controlled the disease) to inform decision-making about: increasing treatment to control disease cautiously decreasing treatment when disease is controlled. The first-line treatment for newly diagnosed active RA →combination of DMARDs (including methotrexate and at least one other DMARD, plus short-term glucocorticoids) as soon as possible, ideally within 3 months of the onset of persistent symptoms. TNF-inhibitor • The current indication for a TNF-inhibitor is an inadequate response to at least two DMARDs including

methotrexate • Examples of anti-TNF alpha agents: Etanercept: SC administration twice weekly Infliximab: IV administration Adalimumab: SC administration • Adverse effects of TNF blockers include: reactivation of latent tuberculosis and demyelination. The risk of TB reactivation is most pronounced in the first 3 months of treatment.

 BTS guidelines therefore recommend a clinical examination, and chest radiograph to check for TB. In the UK, patients have a baseline CXR and assessment of risk of infection with Mycobacterium tuberculosis prior to starting treatment with anti-TNF α. • Any patient with active TB, should receive standard chemotherapy. They must complete two months full treatment before starting anti-TNF alpha treatment. • Patients with past TB, who have received previous adequate therapy can be started on anti-TNF alpha therapy but need to be monitored regularly. TB not previously adequately treated, chemoprophylaxis should be given before commencing anti-TNF alpha treatment. What is the optimal TB screening test in patient with previous TB? Interferon gamma release assay The test is not altered by previous TB or previous BCG vaccination. Positive testing indicates a need for anti-tuberculous treatment alongside golimumab, for example isoniazid. Mantoux testing is less indicative of prior infection because it is likely to evoke a positive reaction in patients with previous TB or who have received BCG vaccination. • Patients with a normal chest radiograph who have not started immunosuppressive threrapy →a tuberculin test is helpful. • Patients with a normal chest radiograph + already on immunosuppressive treatment, the result of the tuberculin test is dampened and it is therefore not useful. An individual risk assessment should be made: if the annual risk of TB is greater than that of drug-induced hepatitis then chemoprophylaxis should be given. If not, the patient should be monitored and investigated early if symptoms consistent with TB develop. Chemoprophylaxis is generally with isoniazid for 6 months. • Patients who test positive with either of Quantiferon Gold test and Elispot tests should be treated with chemoprophylaxis (either isoniazid for 6 months, or dual therapy Rifampicin + INH for 2 months) at the same time as being started on anti-TNF alpha treatment. • TNF-inhibitors should be stopped 2-4 wks before any major operation. Rituximab • Action Anti-CD20 monoclonal antibody, results in B-cell depletion. • Prescription Two doses of 1g intravenous infusions are given two weeks apart. • Indications rheumatoid arthritis Nice guidelines of RA Rituximab in combination with methotrexate is recommended as an option for treatment of rheumatoid arthritis who have had an inadequate response to or intolerance of other disease-modifying antirheumatic drugs (DMARDs), including treatment with at least one tumour necrosis factor α (TNF-α) inhibitor therapy. non-Hodgkin lymphoma (The primary clinical use) idiopathic thrombocytopenic purpura. • Follow up Treatment with rituximab plus methotrexate should be continued only if: There is an adequate response following initiation of therapy. An adequate response is defined as an improvement in disease activity score