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ESSENTIALS Healthy ageing, well-being in later life, quality of life, and disability-free life are ideas that drive policy and practice in our ageing society. Their meanings overlap in sometimes confusing ways, but there is consensus that the postponement or containment of disability is a necessary but insufficient precondition of healthy ageing and the optimization of well-being in later life. Psychological factors like self-efficacy and sense of coherence also seem necessary for healthy ageing, but may be difficult to work with for many clinicians trained in a more medical model of healthy ageing. Primary promotion of healthy ageing through the avoidance of disability has had some success, especially through its impact on cardiovascular disease, but we have much to learn about influencing diet and physical activity across the life course for well-being in later life. Secondary promotion of healthy ageing using either highly focused interventions like exercise classes or complex, multicomponent interventions that match the complexity and heterogeneity of the ageing population, has been studied for decades. Experimental studies have been mostly negative, but more recent trials are suggesting that disability can be postponed or reduced. We are coming closer to understanding how best to promote healthy ageing and promote well-being in later life. We may make faster progress if we understand that many older people consider themselves to have aged successfully, even if their doctors do not, and adopt a 'humility of perspective'. Background 'Healthy ageing' and optimizing well-being in later life are similar aspirations. According to the World Health Organization report of 2015, healthy ageing is the process of developing and maintaining the functional ability that enables well-being in older age. Functional ability comprises the health related attributes that enable people to be and to do what they have reason to value. It is made up of the individual's intrinsic capacity (i.e. a composite of all the physical and mental capacities of the individual) and environmental and social factors, and their inter-relationships. Well-being is an idea that is similarly subjective, functional, and social. Measurement of quality of life can capture both features of both healthy ageing and well-being, while the trait of dispositional optimism—the tendency to expect positive outcomes across a variety of life domains—may underpin both states. Most men and women, in all age groups, rate their well-being and mental well-being positively. Bowling points out that self-rated health, mental health symptoms, long-standing illness, and

social support are the main drivers of overall well-being in all age groups. Mental health symptoms, long-standing illness, and social support are the main drivers of mental well-being. In multivariable models, those who reported no long-standing illness had, in comparison with others, almost twice the odds of good, rather than not good, overall well-being, and over three times the odds of good, rather than not good, mental well-being. This association with long-standing illness is only part of the story. People aged 65 years and over are more likely than younger people to define well-being as being able to continue to do the things they had always done. Thus it may be the absence of impediments to chosen activities, rather than the absence of illnesses, that really matters. The preservation of functional ability is, then, a good intermediate goal for those wanting to promote healthy ageing and well-being. The impact on well-being of impairments of functional ability, such as being continent and mobile, depends on personality factors like resilience, dispositional optimism, and sense of coherence, plus life stresses experienced by the individual. While approving the sentiments behind healthy ageing and optimizing well-being, doctors and nurses working in the community may struggle to see their immediate relevance to clinical practice, especially given the brief encounters that are typical of primary care. This uncertainty about having an effect on well-being is understandable given the lack of simple and effective interventions for many common problems (physical, psychological, and social) of later life. Depression in later life is so closely bound up with disability that they are difficult to unravel, while therapies for both are disappointing. Loneliness and social isolation seem largely intractable, despite efforts to relieve them. While all of these factors may seem difficult for practitioners to change, this chapter attempts to counter the pessimistic conclusion that promotion of well-being in later life is not core business for

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6.3 Optimizing well-being into old age 533 primary care or those caring for older patients in secondary care. On the contrary, encounters between doctors and their patients are, over time, a potentially powerful lever for changing attitudes and behaviour in ways that optimize well-being in later life. We start with describing the public health tasks that are required over a person's life course, then focus on the effects that case-finding and both simple and complex interventions can have on older people's well-being. Finally, there is a cautionary note about the risks to well-being of medical over-reach. Primary promotion of physical and mental health and well-being into old age

While the World Health Organization (WHO) perspective captures the overarching themes, operationalizing healthy or successful ageing in later life has proved more difficult. Depp and Jeste's 2006 review of peer-reviewed reports of studies of adults over age 60 that included an operationalized definition of 'successful' ageing identified 28 studies with 29 different definitions. The mean reported proportion of 'successful agers' was 35.8% (standard deviation: 19.8) but varied widely (interquartile range: 31%). The definitions contained multiple components, although 26 of the 29 agreed that disability and loss of physical functioning were important determinants of well-being. The most frequent statistically significant correlates of the various definitions of successful ageing were age itself, not smoking, and absence of disability, arthritis, and diabetes. Moderate correlations were found for greater physical activity, more social contacts, better self-rated health, absence of depression and cognitive impairment, and fewer medical conditions. Surprisingly, in this review, gender, income, education, and marital status generally did not relate to successful ageing. A focused review of eight studies by Peel and colleagues noted that the terms 'healthy' or 'successful' ageing dominated the literature about multidimensional functioning in older age. Studies published between 1985 and 2003 that reported statistical associations between baseline determinants and healthy ageing outcome were identified from a systematic

search of medical, psychological, sociological, and gerontological databases. Modifiable risk factors among the behavioural determinants included smoking status, physical activity level, body mass index, diet, alcohol use, and health practices. The authors argued that, on the basis of these findings, effective healthy ageing policies should enhance opportunities for modification of lifestyle risk factors across the life span. The contribution that physicians, particularly those in primary care, can make to 'healthy ageing' thus includes modification of risk factors for unhealthy ageing in younger adults. Here there has been some success. Between 1981 and 2000, coronary heart disease (CHD) mortality in the United Kingdom fell by 62% in men and 45% in women. Studies based on cohorts and prediction models suggested that falls in the prevalence of cigarette smoking and a reduction in population blood pressure levels were important contributors to this decline. However, the decline in nonhigh-density lipoprotein (HDL) cholesterol levels has been small, there has been no appreciable improvement in physical activity levels, along with an increase in adiposity and obesity. Rising levels of physical inactivity and obesity (and type 2 diabetes) have undermined rather than enhanced declines in CHD mortality. Developing effective responses to these negative trends will involve primary care practitioners, supported by colleagues working in hospitals, exploring how to change behaviour and reinforce public health messages. Inevitably, this will have some impact on healthy ageing—the continuation of what we want to do. A similar pattern may be occurring in ageing as in heart disease, but with a mixed outcome. More people may be living longer, but trajectories of disablement and frailty may not be changing (see Chapter 6.1). In a study from the English Longitudinal Study of Ageing (ELSA), levels of frailty were higher in recent compared with earlier cohorts, especially in the most deprived groups of older people. This may reflect the increased survival of frail individuals, which results in poorer people spending additional years of life in a frail state. This is a contentious view, and other studies show a different picture. For example, in Europe the proportion of older people with disabilities appears to be decreasing, as does their need for help. Longitudinal analyses of disability prevalence and the need for help show this beneficial trend across birth cohorts, independent of age, study, or region. Either way, if 'healthy ageing' is determined in mid-life, attention should be paid to risk factors that currently appear most resistant to change: physical activity and nutrition.

Promoting physical activity If physicians, particularly primary care practitioners, were asked to focus their public health efforts on one change that would enhance well-being in later life, it should probably be falls prevention, through promotion of physical activity. Physical inactivity increases overall mortality and the risk of many diseases including chronic venous disease (CVD) and diabetes. Regular physical activity over the life course can reduce the risk of hip fracture by up to 50%. Much of this benefit is thought to be due to a reduction in falls. Falls are common in people aged 65 years and older and can have serious consequences, including injury, pain, impaired function, loss of confidence in carrying out everyday activities, loss of independence and autonomy, and death. There is evidence that interventions providing some forms of exercise may be effective in preventing falls among older people, and that healthcare costs could be reduced if the number of falls was reduced. Promoting habitual physical activity is therefore an important public health approach to the prevention of frailty, falls, and fractures, and to the promotion of well-being. The pathophysiology, risk assessment, and prevention of falls and fragility fractures are discussed in detail in Chapter 6.8. The Department of Health in England advises adults to perform at least 30 minutes of at least moderate intensity physical activity on five or more days weekly, in at least 10 minute bouts, for optimum health benefits. The full set of recommendations from the English Department of Health is shown in Box 6.3.1. Box 6.3.2 shows the recommendations for physical activity promotion in primary care, from the UK National Institute for Health and Care

Excellence (NICE). However, objective assessment of physical activity using accelerometers in a subsample of the Health Survey for England found that only 5% of men and 4% of women aged 35–64 years, and 5% men and 0% of women aged 65 years or more, achieved the recommended levels.

534 Section 6 Old age medicine Walking is the commonest form of physical activity in adults and should be promoted as a near perfect exercise as it has the lowest risk of harm. However, engagement of inactive people in physical activity is still problematic. A Cochrane review of 17 randomized controlled trials reported moderate positive short-term increases in physical activity. Exercise interventions appear to be effective in the short and mid-term, at least in middle age, but uptake of exercise programmes is low and attrition is high. The best approaches to promoting physical activity are still unclear, although an intervention by practice nurses in the over 60–75 age group shows promise. There is much to be done to understand how to alter motivation to exercise, to incentivize continuation of higher levels of activity, and to make physical activity habitual. Getting nutrition right We are only now beginning to understand how important diet is to healthy ageing, aside from the risks of obesity and diabetes. Sarcopenia (the progressive loss of muscle mass and strength with ageing) is a major cause of disability in older people. Potentially modifiable influences on sarcopenia include physical inactivity, increasing body fatness, and inadequate intake of dietary energy and protein. Evidence from prospective cohort studies has suggested that lower intake of protein, vitamins C, D, and E, and whole grains are associated with increased risk of mobility limitation. There is increasing interest in examining dietary patterns rather than single nutrients, on the assumption that an intervention that aims to improve overall diet quality may be more successful than a single nutrient intervention. Adherence to a Mediterranean diet (characterized by a high intake of fruits and vegetable, and moderate intake of olive oil) is associated with a slower decline of mobility in older people. In contrast, a Westernized dietary pattern with high intake of refined bread, dairy products, and red and processed meat, and low consumption of fruits and vegetables, is associated in older people with weight loss and slow walking speed. Conversion of this understanding into a public health message that primary care practitioners and other physicians can reinforce in face-to-face encounters, and into community initiatives that they can endorse and support, is urgently needed. Mental health and well-being Healthy ageing is not simply about the maintenance of physical or mental health, but also about maximizing psychological resources, especially self-efficacy and resilience. In Bowling's study of the relative predictive ability of independent biomedical, psychological, and social models of successful ageing, only the baseline psychological model (perceived self-efficacy and optimism) had a statistically significant effect on later successful ageing, measured using a quality of life tool. One conclusion from this study was that adding years to life and life to years may require two distinct and different approaches, one physical and the other psychological. Huppert's review of mental capital and well-being emphasized the effect of early environmental factors on mental well-being, as well as social circumstances, but concluded that individuals' learned actions and attitudes may have a greater influence. This does not help doctors, who can rightly point out their inability to change the past; but this misses the point, which is to preserve and enhance well-being and encourage positive attitudes and behaviours over the life course, starting anytime. Self-efficacy and reliance can still be nurtured in later life, as seen in self-management programmes for long-term conditions. Biomedical models emphasize the absence of disease and good physical and mental functioning as signs of successful ageing, while psychosocial models emphasize life satisfaction, social functioning, and participation, or psychological resources.

Lay views about successful ageing are important for testing the validity of existing models and measures, if they are to have any relevance to the population they are applied to. There is little point in developing policy goals if older people do not regard them as relevant. Despite the codification of practice into algorithms, care pathways, and protocols, there remains space in medical encounters for honest (if brief) conversations about how people perceive their ageing. Bowling and Dieppe remind us that there is ample evidence that many elderly people regard themselves as happy and well, even in the presence of disease or disability. Doctors should be aware that many older people consider themselves to have aged successfully, even if medical models do not. Health professionals need to respect the values and attitudes of each elderly person who asks for help, rather than imposing their medical model on to their patients' lives. Or, as Callahan and colleagues put it, we should adopt 'humility of perspective'.

Box 6.3.1 UK Physical Activity Guidelines—weekly recommendations for older people

- At least 150 min of moderate intensity aerobic activity, or at least 75 min of vigorous intensity aerobic activity, or an equivalent combination.
- Aerobic activity should be performed in bouts of at least 10 min duration.
- For additional health benefits, undertake up to 300 min of moderate intensity or 150 min of vigorous intensity aerobic activity, or an equivalent combination.
- Those at risk of falls should do balance exercise on two or more days.
- Muscle-strengthening activities should be done on two or more days.
- Avoid prolonged periods of sitting in the day.
- If older adults are unable to do the recommended amounts of physical activity due to health conditions, they should be as physically active as they are able.

Source: Department of Health (2011).

Box 6.3.2 NICE recommendations for physical activity promotion in primary care

NICE recommendations for promoting physical activity

- identifying adults who are inactive
- delivering brief advice
- following up brief advice
- incorporating brief advice in commissioning
- systems to support brief advice
- information and training to support brief advice

Source data from Physical activity: brief advice for adults in primary care, NICE Guidelines, May 2013.

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Secondary promotion: Screening and case-finding in primary care

Primary care practitioners and other physicians wanting to enhance the well-being of their older patients have two choices. They can focus on one high profile determinant of well-being, or they can opt for more complex, multicomponent interventions. The discussion of public health interventions, as just mentioned, might lead to physical activity promotion being chosen in preference to the less understood topic of nutrition. Complex interventions, on the other hand, are attractive because conceptually they match the complexity of well-being and so fit with the biopsychosocial model that underpins primary care. Focused interventions

Practitioners wanting to prevent falls as a simple way to enhance well-being can do so by screening all their older patients—say 65 and over—using a single question ('Have you fallen in the last year?'), followed with a more complex assessment for those who respond positively. Those with a history of falls and risk factors for future falls can then be offered a place on a specialist-run falls exercise programme. Most will benefit in that they will be at lower risk of falling, will feel subjectively fitter, and may enjoy the social interaction of the programme; a few may conclude that the best way to avoid falling is to avoid moving. An alternative is to offer all those aged 65 and over (apart from those who are dying or have medical disorders that would exclude them from exercise) the chance to join a local physical activity programme, as in the ProAct65 + trial. This large trial, based in general practice, is described in the case study (Box 6.3.3). This approach to physical activity promotion is practical, manageable, and affordable. It recruits older people who need to exercise more, uses exercise instructors who are readily available, and relies on easily accessible local

amenities. The uptake—about 10% of those invited—does not overwhelm the service; since individuals' readiness to increase physical activity levels will change, recruitment of cohorts of the willing could, over time, allow a large proportion of the older population to participate. Complex multicomponent interventions If well-being is complex, then attempts to increase it should logically match its complexity. The belief that searching for hidden but correctable disabilities among the older population will result in less disability, improved quality of life, and greater well-being is an intellectually attractive one, well worth testing in randomized controlled trials. Several such trials took place in the 1980s in the United Kingdom, Denmark, and the United States, and there is much to learn from their histories. Different trials used very different interventions and outcome measures, but there are some common outcomes, as shown in Box 6.3.4. These early studies explored the best ways to provide anticipatory care for older people, and acknowledged the iatrogenic risks of treating unimportant abnormalities, and of medicalizing old age. Brief, nonintrusive strategies for predicting functional problems during routine consultations were sought and tested in randomized controlled trials. The preoccupation of doctors with disease

Box 6.3.3 Case study of the ProAct65+ trial

This trial randomized those who were interested in joining into either an exercise class (based on the Falls Management Exercise programme—FaME), or home-based exercise (the Otago Exercise Programme—OEP), or usual care, for 24 weeks. The open invitation resulted in a participant group who were more physically active than average for their peer group, with higher than average quality of life scores and positive attitudes to exercise, but who were below population norms on the Timed Up and Go tests, functional reach, and 30 second chair rise. The self-selection of participants for the study did not include the most sedentary (who would have been the most likely to benefit), but did allow those who needed to improve their functional abilities to gain the chance to exercise more. The exercise class (FaME) arm had a greater proportion of participants reporting weekly moderately vigorous physical activity at or above the target level compared to treatment as usual, while the home exercise (OEP) arm did not. Participation in exercise classes, in the FaME arm, resulted in increased self-reported physical activity, and reduced inactivity, which persisted for 12 months after the end of the intervention. The proportion of FaME participants who achieved 150 or more minutes of moderate to vigorous physical activity (MVPA) per week rose from 40% at baseline to 54% at the end of intervention, and 49% a year after the classes ended. The proportion of FaME participants who reported no MVPA/week fell from 29% at baseline to 15% a year after closure of the intervention. There was no statistically significant difference in the number of falls between FaME, OEP, and the control arm during the intervention phase, so the exercise programme did not increase risks of falling (which can happen). Unlike some other studies of case-finding for falls prevention, in the 12 months after the close of the intervention phase there was a statistically significant reduction in falls in the FaME arm compared with treatment as usual (OR -0.4, 95% CI -0.720, -0.103, $p = 0.009$). However, the ProAct65 + interventions were designed to promote physical activity for its broad benefits, rather than a narrow objective of reducing falls, and this may explain its success in reducing falls. FaME costs between £218 and £269 per participant, and the cost of each extra person exercising at or above target was £1739.93 at 2011 prices. We need to understand more about attrition and the timing of re-inforcement programmes—the effects on physical activity and falls wear off—but nonetheless the ProAct65 + model could be implemented in primary care, with likely gains to the well-being of older participants.

Box 6.3.4 Outcomes in community-based health promotion trials for older people, up to 1990

- A rise in morale among elderly people involved in screening programmes.
- Referrals to all agencies tended to increase, including to specialist medical care in some studies.
- A reduction in inpatient stay in some studies, possibly through early intervention in

disease processes. • Increased inpatient rates through a greater use of respite care. • Reduction in mortality in some trials, perhaps for the same reason that inpatient stays declined, but not in all. • No improvement in older people's functional ability, and general practitioner workload only decreased in situations where alternative services were organized to bypass existing primary care services.

536 Section 6 Old age medicine to the detriment of its social consequences, the failure to take into account the adaptive powers of older people, and the tendency to underestimate the burden borne by carers, were all identified as major obstacles to progress in developing more effective primary care for older people. Medical and social problems overlapped in ways that were often puzzling to clinicians, screening led to an increase in referrals to other agencies, but without clear evidence of benefit in many instances, and with variations in referral rates determined as much by the referrer as by the patient's problems. Finally, at-risk groups proved harder to identify than anticipated, for more pathological events occurred outside the expected at risk groups than in them. The generation of general practitioners and nurses that did this work introduced important ideas about how ageing in its organic, social, and psychological dimensions affected people's health, how essential multidisciplinary teamwork was to providing appropriate care for ill older people, and ultimately how networking with community-based agencies was a more useful model than referral to specialist care. To this we can add the awareness that unmet need is more complex than it appears at first sight, with multiple reasons why needs may not be met, some of which may not be tractable. Despite these findings, the UK government introduced the '75 and over checks'—essentially a multicomponent screening programme—into British primary care in 1990. The UK Medical Research Council funded a trial which, launched after the introduction of the screening policy, compared universal versus targeted assessments and management by primary care teams versus a multidisciplinary geriatric assessment team. The results suggest that population screening did not produce health gain, and that primary care teams and multidisciplinary geriatric assessment produced similar outcomes. Chronic disease management If whole population screening was finally accepted as inappropriate, targeted screening with intensive management of identified problems was seen as a logical alternative. In the United Kingdom this was implemented as nurse-led chronic disease management for older people with complex comorbidities who made frequent use of hospital services. The evidence base for this approach was arguably as weak as that for 75 and over screening in 1990. In particular, we should note that chronic disease management remains problematic as a model of care, with evidence of limited effectiveness, reliance on traditional forms of patient education, poor linkages to primary care, and reliance on referrals rather than population-based approaches. There is also some discussion about whether chronic disease management is wanted by patients, particularly older people who may feel that their independence and autonomy is threatened by an intrusive care system. Finally, there is a question of how to identify those who are likely to need high levels of care, for there is no linear and unambiguous link between the presence of a condition that can be labelled chronic and the need for health or social care. Despite these negative experiences, research into complex interventions continued in many countries. A systematic review of 15 trials of preventive home visits carried out up to 2000 showed no clear evidence functional improvement. The England arm of the ProAge trial (2000–2002) showed no change in health risk behaviours or functioning following intervention. The picture began to change after 2000. Educational professionals doing preventive home visits in Denmark did appear to improve older people's functional mobility. Similarly, nurse-led case management in Spain did appear to show

positive effects on functional ability, caregiver burden, and satisfaction. Reviews of more recent studies have demonstrated some potential to alter behaviours and promote independent living, but it is unclear which intervention components contribute to effectiveness. It appears that we are slowly developing methods of working with older people that do alter their ability to function, and (we presume) their sense of well-being. Nevertheless, effect sizes are mostly small and there is much still to be done to identify and engage with those most likely to benefit, and to refine interventions. Negative experiences still accumulate; recent primary care interventions designed for frail older people in several European countries failed to show a beneficial effect on disability. To continue to develop this work in the community, and to make interventions usable in primary care, we need a focused, brief assessment which takes into account the individual circumstances of the older patient in two ways. First, by emphasizing the 'person-disease management approach' that requires tailoring of clinical responses, and that is a strength of primary care. Second, by promoting goal-oriented medical practice that permits the older patient to state what outcomes matter most to them; this is an intuitively plausible approach, although the evidence base for it is as yet thin. Preventive care and older people:

Two cautionary notes We need to be cautious about how we promote well-being, for two reasons. One is that prevention, in this case of disability, can do harm. The second is that well-being may alter the way we think and act as we get older, potentially with negative consequences for ourselves and others. Tinetti argues that we are unwittingly subjecting older adults to a wide array of preventive treatments that have no or marginal benefit, or even impart unintended harm. Most people receiving preventive treatments will never experience the outcome regardless of treatment. Recommendations for preventive interventions should take into account the likelihood of benefit and harm, remembering also that the presence of one disease may lessen the effect on well-being of preventing another disease or harm. Her argument was a response to a modelling study of preventing end-stage renal disease in older people. Evidence of effectiveness gained from trials of preventive interventions in younger adults was applied to populations of those aged 70 and over. The reductions in relative risk of developing end stage renal disease in younger adults ranged from 25% to 56%, depending on baseline risk. When extrapolated to older people (who have a higher baseline risk), treatment effects of these sizes yield Numbers Needed to Treat (NNT) values greater than 100 for most; those at highest risk would have an NNT value around 16, and those at lowest risk an NNT value of around 2500. Another example is the prevention of stroke by treatment of hypertension and hyperlipidaemia in the oldest old. At over 80 years of age, hypertension is no longer a risk factor for stroke and cholesterol level has little effect, although it has a small impact when all cardiovascular endpoints

6.3 Optimizing well-being into old age 537 are aggregated. Treatment of hypertension and hyperlipidaemia is largely irrelevant in frail older people, and has only modest benefits in stroke reduction in the nonfrail. However, stroke reduction is not the only important outcome, and patient thresholds for discontinuing statins may be high because they are seen as effective in preventing serious and likely problems which will have a deleterious impact on well-being. No-one can be opposed to 'well-being', but we can be wary of it. As European countries become happier, they become relatively less healthy (in the medium term). Countries with higher well-being tend to spend less on healthcare. Life satisfaction may not be associated with healthy behaviour, but with consumption (eat, drink, and be merry!), and happiness may reduce perceptions of need for healthcare, resulting in delayed help-seeking. Conclusions Healthy ageing and well-being are facets of a complex subject that is bedevilled by boundary problems and paradoxes. Health in later life is

the outcome of the interplay between biological, lifestyle, and social factors over a long period of time, an interplay which helps to explain the heterogeneity of older populations that is obvious to most doctors and other healthcare workers. Increasing physical activity and acquiring a healthy diet are the priorities if we apply a public health perspective to optimizing well-being through primary care. While control of hypertension and cardiovascular risk factors has had an effect on disability, there is much work to be done in developing effective primary prevention approaches across the life course. Secondary prevention in later life uses clinical interventions with older people that are either focused or complex and multicomponent. Falls prevention is an example of the former and could be readily implemented in primary care as either two-stage case-finding, or through community-based exercise programmes. The history of complex interventions is long and mostly negative, but there are signs that community-based interventions are beginning to improve functional ability, although the effect sizes in trials are usually modest. There are many reasons why older people will not or cannot adopt all the activities that promote healthy ageing and well-being, a lesson already learned in primary care. Humility of perspective may help us to make faster progress.

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