Prescribing exercise
it's never too late

Traditionally, advanced age and frailty have been seen as reasons not to prescribe exercise. However, it now appears that these are among the strongest indications for the promotion of lifelong exercise programs by general practitioners.

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An 82-year-old woman living in the community presents to your practice requesting placement in a nursing home. The background medical history includes a mild hemiplegia secondary to a stroke, diabetes, a recent fractured hip secondary to a fall, osteoarthritis of the knees and a past bleeding peptic ulcer secondary to NSAIDs. Three months after hip fracture surgery she is having increasing difficulty mobilising, has lost weight, developed a major depression, has constipation secondary to analgesic use and, because of her inability to walk, feels unable to remain in the community.

All the above conditions and functional impairments can be treated with one medication. What medicine is capable of having a beneficial effect on so many common conditions? There is only one which, prescribed and delivered appropriately, could treat her depression, frailty, falls, osteoporosis, arthritis, constipation, diabetes and gait and balance problems. That 'medication' is exercise.

Exercise as a medicine

Why should we explore exercise as a medicine? Reasons to exercise vary throughout the lifespan. The young exercise to look attractive or be competitive in sport; the middle aged to prevent disease and live longer (as well as to look attractive); the young-old in an attempt to return to middle age, maintaining psychological wellbeing, muscular strength and endurance. Why, then, should the very old exercise? The answer is not primarily any of the above, but is based on the following basic concepts:

- the effect of exercise on the ageing process
- prevention and treatment of functional decline
- the effect of exercise on specific diseases and clusters of diseases common in the aged
- treatment of disuse associated with disease
- combating side effects of dietary or pharmacological treatment.

These concepts will be discussed in this article, as will some basic principles to guide GPs in prescribing and facilitating exercise behaviour in the older patient. Exact exercise instructions are beyond the scope of the article and are covered in other texts.[1]

Types of exercise training

The physiological changes and health effects of exercise are specific to the type and dose of the exercise training. The broad types of exercise referred to in this article include progressive

IN SUMMARY

- **Frailty and functional decline are indications for an exercise prescription in the very old.**
- **Stable chronic diseases do not generally preclude exercise in very old patients.**
- **Screen patients for new cardiovascular or musculoskeletal complaints before prescribing exercise.**
- **Look for deficits in strength, endurance, balance or flexibility and prescribe exercise specifically to correct the most important impairments first.**
- **Provide behavioural incentives to encourage patients to continue new exercise habits over time.**

resistance training or weight lifting exercise, cardiovascular or aerobic or endurance training, balance training and flexibility training. These are described in the box on page 22.

Although it is an area of some dispute, the treatment of established disease appears to require a more intensive exercise intervention than the prevention of the same disease.

Effects of exercise on the ageing process

There are clear similarities between disuse of bodily systems and what we have come to think of as 'ageing'. Exercise has an opposing effect on many of these changes. Much of what we may attribute to age is actually an exercise deficiency syndrome, and is therefore reversible.

The physical changes resulting from ageing and disease or environmental factors, including disuse or underuse of bodily systems, limit the maximal performance or work capacity in a given domain, such as in tests of maximal muscle strength, power, endurance, aerobic capacity, static or dynamic balance, or flexibility. Although such changes would immediately be noticeable and disastrous for an elite athlete, they may accrue insidiously in nonathletic populations over many years without much effect on daily life. Thus, subtle changes in physical activity patterns over the adult lifespan allow most people not engaged in athletic pursuits to lose a very large proportion of their physical work capacity before they notice that something is wrong. They may even find that they have crossed a threshold of disability without realising it.

The good news is that exercise initiated at any age is able to combat even decades of disuse (and the resultant accelerated biological ageing) of the cardiovascular, musculoskeletal, neurological and metabolic systems. Age-associated changes that are improved by regular exercise include:

- atrophy of tendons and ligaments
- decreased ability to use fuel by skeletal muscle
- decreased bone mass and fracture threshold
- decreased capillary density
- decreased glycogen storage, insulin sensitivity and glucose tolerance
- decreased maximal aerobic capacity and cardiovascular efficiency
- decreased muscle mass and strength
- decreased tissue elasticity and joint flexibility
- immune system impairment
- increased total body and abdominal fat mass.

These changes are seen in both healthy and frail people, and thus the presence of chronic disease or disability itself does not appear to be a barrier to successful adaptation in this realm. The most dramatic changes are those which can be seen after weight lifting exercise in the very old, where increases in muscle strength of 100 to 200% have been observed after short periods of exercise training.[2]

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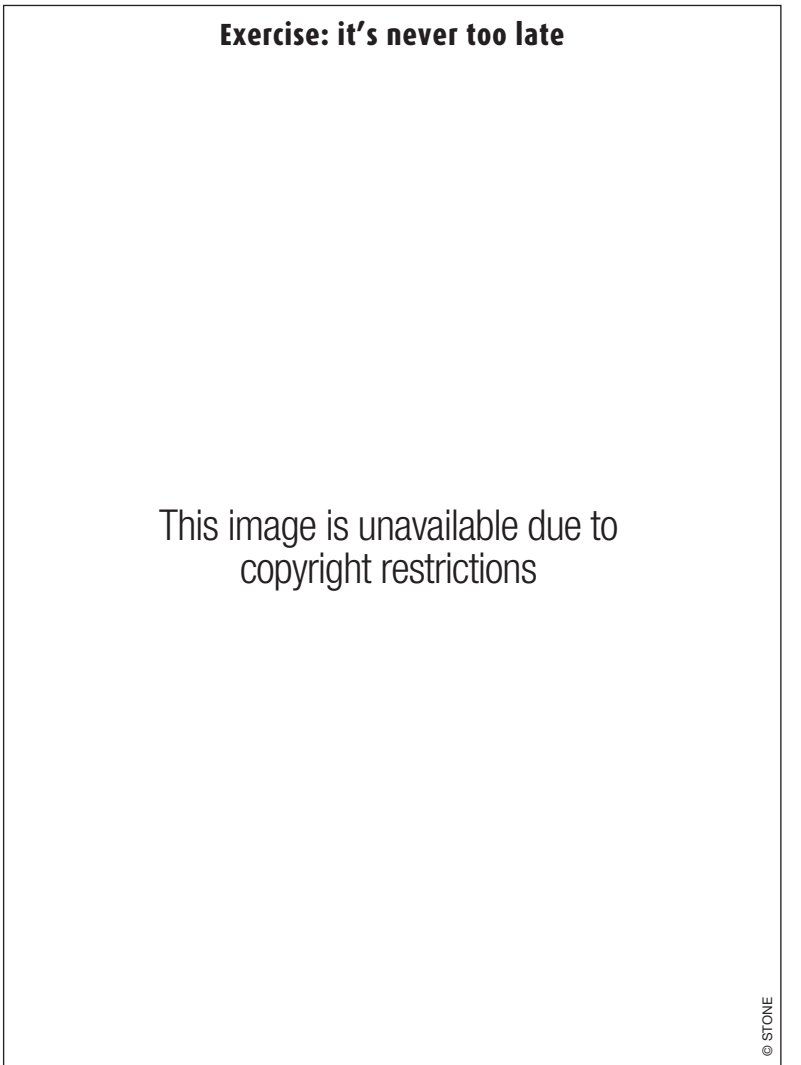

Weight lifting exercise in frail elderly patients increases muscle strength considerably, leading to substantial improvements in quality of life. Frailty, rather than being seen as a contraindication to exercise, is one of the most important reasons to prescribe exercise.

Types of exercise training

Progressive resistance training or weight lifting exercise

Involves a muscle being slowly contracted just a few times in each session against a relatively heavy load. Any muscle may be trained this way although six to 12 major muscle groups with clinical relevance are usually trained for a balanced and functional outcome. The main purpose is to increase strength and muscle mass.

Cardiovascular or aerobic or endurance training

Refers to exercise in which large muscle groups contract many times in a single session against little or no resistance. The main purpose of this training is to increase aerobic capacity. Running, swimming and walking are common examples.

Balance training

Can be defined as any activity that increases one's ability to maintain balance in the face of stressors. Examples include Tai Chi, yoga, dance or simply reducing the base of support in stance such as standing on one leg or tandem walking.

Flexibility training

Includes movements or positions designed to increase range of motion across joints. Standard stretching is the most common example.

Prevention and treatment of functional decline

Biological ageing, high burdens of chronic disease, malnutrition, psychosocial vulnerability and extreme sedentariness are all contributory factors in the syndrome of physical frailty and functional decline. Function includes the ability to perform day-to-day tasks such as dressing, eating, cooking and toileting and also the mobility essential to independent living and quality of life.

The major physiological deficits that are relevant to functional decline and treatable by exercise training include muscle weakness, low muscle mass, low bone density, cardiovascular deconditioning, depression, and poor balance and gait. The greatest early functional and mobility benefit is obtained with programs that include resistance and balance training, and higher intensity training is more beneficial and just as safe as lower intensity training.

Muscle weakness is probably the most functionally relevant and reversible physical parameter related to exercise and the prevention and treatment of frailty in the very old.[3] Specific strategies to enhance muscle function (that is, weight lifting exercise), rather than nonspecific 'movement' programs, are needed to provide such benefit. Associated with gains in strength after resistance training in the frail elderly are improvements in gait velocity, balance, ability to rise from a chair, stair climbing power, aerobic capacity, performance-based tests of functional independence, self-reported disability, morale, depressive symptoms and energy intake. Balance training may be incorporated as part of the resistance training (for example, progressive decrease in hand support and visual cues during standing resistive exercises with free weights) or undertaken as a separate modality if time and functional status permit (Table 1).

The psychosocial factors related to frailty and functional decline include depressive symptoms, low self-efficacy, low self-esteem, isolation, loneliness and inadequate social support networks. These may exert as powerful an influence as physiological decline on functioning in some individuals. Exercise in healthy, depressed and clinical populations of older adults has been shown to significantly improve depressive symptoms, morale, self-efficacy and social integration.

Anorexia and undernutrition are commonly seen in frail sedentary elders. Exercise is a way of boosting energy requirements, and thus appetite and voluntary food intake in such individuals, reducing the risk of malnutrition as a contributor to frailty.

Treating specific diseases, disease clusters and geriatric syndromes

Exercise has substantial benefits in the management of many of the common established diseases and several of the common geriatric syndromes that are difficult, if not impossible, to treat with medications (Table 2).

In some cases exercise may provide quantitatively similar benefits to standard pharmacotherapy (for example, major depression), while in others it may act through an entirely different complementary pathway (for example, arthritis or diabetes). In depression, resistive or aerobic exercise appears to have about the same potency as pharmacological management (about 60 to 70% of clinically depressed older people will respond in a meaningful way to both treatments), and thus provides a significant therapeutic alternative.[4,5]

In type 2 diabetes, oral hypoglycaemics can enhance insulin release or sensitivity or reduce hepatic glucose production, and insulin can replace the missing endogenous hormone, whereas resistive or aerobic exercise decrease abdominal fat stores and increase sensitivity to insulin and the ability to transport glucose into cells and store it as glycogen. The two treatments are, therefore, complementary, and it is possible that exercise can delay the need for insulin injections or reduce the dosages of medications required.

In congestive heart failure, medical therapies improve fluid balance and cardiac contractility, prevent ischaemia and arrhythmias and decrease afterload, while exercise improves exercise tolerance by targeting the peripheral abnormalities in muscle (decreased capillary density, decreased mitochondrial density and oxidative enzyme capacity and myopathy). These different forms of treatment in combination may offer a far superior approach to disease management than either one alone.

Treatment in the very elderly with many chronic diseases may be streamlined by using exercise in clusters of diseases that are responsive in some way to appropriate levels of physical activity. For example, a woman with central and generalised obesity presenting at the age of 70 years with osteoarthritis, type 2 diabetes, hypertension, coronary artery disease, peripheral vascular disease, varicose veins, hyperlipidaemia, mobility impairment, insomnia and depression may require at least eight to 10 different medications. Although exercise is unlikely to eliminate the need for all medications, it has the potential to replace some and reduce the dosages of others, and will also provide conditioning effects and other benefits previously unrealised with drug therapy alone.

Therefore, a thorough review of all diagnoses and medications is warranted in all older patients to see where substitutions and alterations can be made to reduce the burden of treatment and suffering and increase quality of life and functioning. Prescribed medications should be reviewed every two to three months to see whether clinical disease control and risk factors are improved with the introduction of exercise and to assess current needs.

Treatment of disuse associated with disease

For many diseases, gradual reduction in activity levels is an accompaniment to the chronic illness. This may be due to pain, as in arthritis or osteoporosis, or exercise intolerance, as in peripheral vascular disease, chronic airways disease, stroke or congestive heart failure. In these cases, there is inevitable atrophy and disuse of many physiological systems which

Table 1. The exercise prescription for older patients

	Resistance training	Cardiovascular endurance training	Flexibility training	Balance training
Frequency	2 to 3 days per week	3 to 7 days per week	2 to 7 days per week	1 to 7 days per week
Volume	1 to 3 sets per day of 8 to 12 repetitions, 6 to 10 major muscle groups	At least 30 minutes per day may be accumulated in 5-to 10-minute sessions.	4 repetitions per day, 30 seconds per stretch, 6 to 10 major muscle groups	1 set per day of 4 to 10 different exercises including static and dynamic postures* Progressive difficulty as tolerated†
Intensity	15 to 17 on Borg Scale‡ (80% 1RM§), 10 seconds per repetition	12 to 13 on Borg Scale (45 to 80% maximal heart rate reserve)	Stretch to maximal pain-free distance and hold	
Requirements	Slow speed Good form No breath holding Progressive increase in weight	Low impact activity Weight bearing if possible	Nonballistic movements	Safe environment or monitoring Gradual increase in difficulty

* Examples of balance enhancing activities include Tai Chi movements, standing yoga postures, heel-to-toe standing and walking, standing on one leg, stepping over objects, climbing up and down steps, turning, standing on heels and toes.

† Intensity is increased by decreasing the base of support (e.g. progressing from standing on two feet while holding onto the back of a chair to standing on one foot with no hand support), by decreasing other sensory input (e.g. closing eyes or standing on a foam pillow), or by perturbing the centre of mass (e.g. holding a heavy object out to one side while maintaining balance, standing on one leg while lifting other leg out behind body, or leaning forward as far as possible without falling or moving feet).

‡ Scale of Perceived Exertion, rated from 6 (very, very light) to 20 (very, very hard), correlates well with measured exercise intensity.[10]

§ 1RM = One repetition maximum – the maximal weight that can be lifted once only in good form.

Table 2. Exercise prescriptions for specific disease states and common geriatric syndromes

Anorexia
- Resistance training

Arthritis
- Resistance training across affected joints, or
- Endurance training if tolerable

Cardiovascular disease and risk factors
- Endurance training
- Resistance training

Chronic airways disease
- Endurance training

Constipation
- Endurance or resistance exercise

Depression, anxiety, low self-efficacy, low morale or loneliness
- Individual or group exercises including endurance or resistive exercises at moderate to high intensity

Diabetes
- Endurance training, or
- Resistance training
- Training combined with caloric restriction
- Avoidance of high impact activities, foot trauma

Fatigue
- Endurance training in the morning hours, increase duration and intensity as tolerated
- Muscle endurance training

Functional dependency
- Stair climbing for endurance
- Resistance training of upper and lower extremities
- Power training
- Balance training

Hypertension
- Endurance training

Incontinence (stress)
- Pelvic muscle strengthening (Kegel exercises)
- Endurance, balance and resistance training as needed to improve mobility

Insomnia
- Endurance or resistance exercise in early to mid-afternoon

Low back pain or spinal stenosis
- Resistance training to strengthen the back extensor muscles, rectus abdominus, and hip and knee extensor muscle groups

Obesity
- Endurance training (moderate intensity), or
- Resistance training
- Training combined with hypocaloric diet

Osteoporosis
- Weight bearing endurance exercise
- Resistance training of back, hip, knee, and ankle muscles
- Balance exercises

Peripheral vascular disease
- Endurance training, progressively walking 30 seconds into claudication pain

Recurrent falls, gait and balance disorders
- Lower extremity resistance training for hip, knee and ankle, including lateral movements
- Balance training, Tai Chi, yoga, ballet
- Training in use of ambulatory devices and functional mobility (e.g. stairs, obstacles) as needed

Stroke
- Resistance training to minimise residual weakness of affected muscle groups, compensate with strengthening of nonaffected muscles
- Endurance training for cardiovascular risk factor reduction

Weakness and sarcopenia
- Moderate to high intensity resistance training for all major muscle groups

will exacerbate age-related changes in these areas and thus markedly accelerate functional decline. Cardiovascular deconditioning, muscle atrophy and weakness, postural hypotension due to loss of baroreceptor sensitivity, venous stasis, insulin insensitivity or glucose intolerance and immune dysfunction may result.

Standard medical treatments unfortunately do not address these syndromes of disuse. However, resistive and aerobic exercise can prevent or treat much of the disuse in these systems, just as they do in the healthy aged individual. Overall, such prevention and treatment of disuse may be one of the most powerful and underutilised capacities of exercise in the health care of older individuals.

Combating side effects of dietary or pharmacological treatment

Exercise may also be a specific intervention to offset adverse side effects of standard medical therapies (Table 3). Multiple medications may cause loss of appetite, with resultant weight loss and depletion of lean tissue stores. Progressive resistance training has been shown to improve caloric intake in frail elders, and active older adults have a significantly better nutritional profile than their inactive peers. Chronic corticosteroid therapy causes large losses of muscle and bone mass, as well as a proximal myopathy, which are reversible with progressive resistance training, even in heart transplant recipients on high dose steroids. This finding has very significant implications for patients with rheumatoid arthritis, chronic lung disease, other organ transplantation and other illnesses where long periods of immunosuppressive therapy are indicated.

Restriction of energy intake in obesity and protein intake in chronic renal failure results in losses of muscle mass and strength which can be offset completely by the concurrent prescription of progressive resistance training in the elderly. In other older patients, protein intake

may be low, not due to iatrogenic prescriptions but simply because of small volumes of food being consumed, avoidance of certain food groups for financial reasons or preferences, and so on. In these situations also, the tendency to waste skeletal muscle to preserve visceral protein stores for metabolism and immune function may be offset by the addition of an anabolic influence such as progressive resistance training.

Role of GPs in exercise prescription

GPs can help patients start and continue exercise training programs in many ways. They can, for example:

- serve as a personal role model for healthy behaviours
- screen for exercise needs and precautions
- provide specific exercise instructions
- integrate the activity prescription into the overall healthcare plan
- give individual feedback on progress and provide behavioural incentives
- involve family members and other social supports
- support institutional, government and community level changes in policies that promote exercise programming for the elderly.

The most important goal should be to make discussion of physical activity prominent in the office setting so that patients begin to see it as an integral part of their healthcare plan.[6] Exact exercise instructions are beyond the scope of this article, but guidelines on frequency, amount and intensity of the various types of exercise are summarised in Table 1. The implementation of the exercise prescription should follow a logical stepwise process (see box on page 28).

Who should exercise?

Both the frail and the fit elderly should be given advice about frequency, amount, intensity and types of exercise that are appropriate for their lifestyle and health

IMAGE BANK

Balance training using Tai Chi movements, yoga or dance helps elderly patients who have gait or balance disorders, reducing the frequency of falling.

Table 3. Counteracting adverse consequences of chronic disease treatment with exercise

Disease treatment	Adverse consequence	Effective exercise modalities
Anorexia secondary to drug therapy (digoxin, serotonin reuptake inhibitors, theophylline, multiple drug regimens)	Weight loss, loss of muscle mass	Progressive resistance exercise
Corticosteroid treatment for chronic pulmonary disease or inflammatory arthritis	Myopathy	Progressive resistance exercise
	Osteopenia, osteoporotic fracture	Progressive resistance exercise and endurance exercise
Hypocaloric dieting for obesity	Loss of lean body mass (muscle and bone)	Progressive resistance exercise
Low protein diet for chronic renal failure or liver failure	Weight loss, loss of muscle mass	Progressive resistance exercise
Postural hypotension secondary to drug therapy (diuretics, antihypertensives, parkinsonian drugs, antidepressants)	Postural symptoms, falls, fractures	Endurance exercise

How to implement an exercise prescription

1. Assess exercise needs and goals based on history and physical and individual preferences
2. Identify behavioural readiness to change; provide appropriate counselling for current stage
3. Identify potential risk factors for exercise-related adverse events
4. Prioritise physical activity needs in relation to risks
5. Prescribe the specific exercise modality and dose desired
6. Provide or refer for specific training, equipment advice, facility options, safety precautions
7. Set up a behavioural program for adoption, adherence, relapse prevention
8. Monitor compliance, benefits, adverse events over time
9. Modify exercise prescription as health status, goals, behavioural stage change

Table 4. Potential risks of exercise in the older patient

Musculoskeletal

- Falls
- Foot ulceration or laceration
- Fracture (osteoporotic or traumatic)
- Haemorrhoids
- Hernia
- Joint or bursa inflammation, exacerbation of arthritis
- Ligament or tendon strain or rupture
- Muscle soreness or tear

Cardiovascular

- Arrhythmia
- Cardiac failure
- Hypertension
- Hypotension
- Ischaemia (cardiac or peripheral vascular)
- Pulmonary embolism
- Retinal haemorrhage or detachment, lens detachment
- Ruptured aneurysm
- Syncope or postural symptoms

Metabolic

- Dehydration
- Electrolyte imbalance
- Heat stroke
- Hyperglycaemia
- Hypoglycaemia
- Hypothermia
- Seizures
- Weight loss

status. Individualised prescription should allow almost all individuals with multiple chronic illnesses to exercise safely. Many misconceptions exist, such as: only healthy older adults should exercise, lifting any heavy weights should be avoided, and those with any gait disorders or ambulatory assistive devices cannot exercise. The GP's advice and encouragement is listed by patients as one of the most powerful stimulants to exercise,

Table 5. The pre-exercise medical history

- Cardiovascular risk factors present
- Past and current musculoskeletal injuries or abnormalities
- Previous activity patterns
- Chronic diseases potentially responsive to appropriate exercise
- Drugs with potential for interaction with the exercise prescription, including:
  - insulin, oral hypoglycaemics
  - beta blockers, including eye drops
  - diuretics
  - CNS active medications
  - sympathomimetics
  - antiparkinsonian medications
  - prednisone
  - anticoagulants
- Social support network, access to exercise facilities, likelihood of compliance with prescription

and this should not be underestimated as a behavioural tool.

Safety

Exercise imposes certain risks (Table 4), but in general these are avoidable with careful pre-exercise screening and monitoring of technique, progress, compliance and health status.

The literature on exercise training in the frail elderly (those aged between 80 and 100 years) includes no reports to date of serious cardiovascular incidents, sudden death, myocardial infarction, exacerbation of metabolic problems, or loss of control of hypertension or other chronic diseases. Resistive exercise-related events that have been described include exacerbation of a pre-existing hernia and underlying arthritis or other joint abnormalities, requiring modification of the exercises prescribed. Aerobic exercise at low-to-moderate intensities or weight lifting at moderate-to-high intensities, if begun gradually and progressed, is unlikely to cause cardiovascular symptoms in patients with stable disease.[7]

Musculoskeletal injuries are usually due to falls or exacerbations of arthritis in patients who probably should have done weight lifting and balance exercises before a walking prescription. Based on the available literature, inactivity is far more likely than exercise to be the lethal or morbid condition.[8]

Situations in which a new exercise prescription should not be commenced before further medical evaluation include :

- new onset angina or unstable angina pectoris
- unresolved gait disorder or hip pain after a fall which may represent an undiagnosed fracture
- uncontrolled diabetes
- uncontrolled hypertension, arrhythmias or congestive heart failure
- an expanding or inoperable abdominal aortic aneurysm
- acute viral syndrome, systemic infection or fever of any cause

Table 6. The pre-exercise physical examination

Vital signs
- Blood pressure
- Presence of orthostasis
- Resting pulse

Cardiovascular system
- Chronic cardiac failure
- Abdominal aortic aneurysm
- Valvular heart disease
- Chronic airways limitation
- Arrhythmias
- Oedema
- Varicosities
- Peripheral vascular disease

Musculoskeletal system
- Ligament laxity
- Contractures
- Deformities
- Joint or muscle pain
- Asymmetry of strength or range of motion
- Thoracic kyphosis
- Joint effusions or inflammation
- Podiatric problems

Neurological exam
- Gait and balance
- Co-ordination
- Balance
- Strength
- Tone
- Peripheral sensation
- Mental status
- Special senses

Cardiopulmonary and neuromuscular response to submaximal exercise
- Walking one flight of stairs
- Distance walked in six minutes
- Chair rise time
- Ability to stand heel-to-toe

Other features
- Presence of inguinal hernia, haemorrhoids, retinal disease (all may be affected by resistance training)

Special suggestions for problems faced by rural GPs

Lack of access to exercise classes and trainers
- Distribute guidelines for home-based programs
- Train home care workers or family members in exercise training techniques to teach and monitor exercises in the home setting

Lack of social support and exercise partners
- Keep exercise participation going with fitness newsletters, office promotional materials, use of exercise prescription forms and exercise calendars to track participation*

Financial constraints to purchase of exercise equipment
- Promote lifestyle exercises (stairs, walking, etc)
- Provide weights in the surgery to loan out and exchange as needed for progressive weight lifting exercises

Remoteness from medical centre
- Screen patients prior to prescribing exercise
- Establish clear guidelines for safety and progression of exercise
- Install medical alert systems in homes
- Institute buddy systems for frail patients initiating walking programs

*Available from the Fit For Your Life Foundation, Ltd. Contact Dr Singh (telephone 02 9351 9755) for ordering information.

- an acutely inflamed or unstable weight bearing joint or vertebral column
- healing ophthalmic surgery or active retinopathy.

Pre-exercise assessment of the very old patient

The history and physical examination are the basic elements of pre-exercise screening. The medical history should include at least the elements shown in Table 5. A targeted physical examination (Table 6) will help to:
- detect problems which may be exacerbated during exercise
- determine the need for specific tailoring of the exercise modality or dose
- identify deficits which may benefit by physical activity.

Although some position statements suggest otherwise, cardiovascular stress testing is not usually done before initiating moderate levels of exercise, unless unstable clinical symptoms warrant such testing regardless of the intent to exercise.[9] However, a resting ECG is recommended before new exercise in all older patients to look for unrecognised arrhythmias and silent ischaemia. Stress testing (with thallium due to the high rates of false negative and positive tests in the elderly) is recommended in patients starting cardiac rehabilitation after myocardial infarction or surgery, in those with non-classic chest pain and when the exercise prescription needs refining because of the development of symptomatic or silent ischaemia.

Behavioural interventions

Despite the best intentions of GPs and patients alike, exercise prescriptions often fail in clinical practice because insufficient attention is paid to the substantial barriers which may be present and the reinforcements needed to sustain this novel behaviour. The most common barriers to physical activity in the elderly are:
- acute and chronic medical problems and disabilities
- caregiving role for a sick spouse or family member
- disinterest in exercise

- exaggerated perception of risk of exercise
- financial limitations
- distance constraints, environmental factors and building design features
- institutional or residential policies
- lack of advocacy by family and healthcare community
- lack of appropriately designed exercise equipment
- lack of healthcare professional, caregiver or family education about exercise
- perceived or real lack of time
- psychological issues (depression, dementia, bereavement, self-efficacy, fear of falling, low self-esteem, social isolation)
- reduced appreciation of benefits of exercise
- societal expectations of sedentariness and dependency in elders
- transportation difficulties.

Additional barriers may arise in rural practice which are unique to that environment. Problems encountered by rural GPs and suggested solutions are presented in the box on page 30.

Conclusion

All exercise, and especially weight lifting exercise, used to be considered inappropriate for frail or very aged individuals, because of both low expectations of benefit and exaggerated fears of exercise-related injury. The past decade has seen an accumulation of data that dispels myths of futility and provides reassurance as to the safety of exercise in the oldest old (those aged over 85 years).

Exercise has a wide range of benefits. The physiological, metabolic, psychological and functional adaptations to resistance training substantially contribute to quality of life in older adults with disabilities. Goals of exercise appropriate to younger adults, such as prevention of cardiovascular disease, cancer or diabetes or increases in longevity itself, are replaced in the oldest old with a set of goals that include minimising biological changes of ageing, reversing disuse syndromes, contributing to the control of chronic diseases, maximising psychological health, mobility and function, and assisting with rehabilitation from acute and chronic illnesses.

In fact, a targeted exercise prescription offers benefit that cannot be achieved with any other therapeutic modality for many of the geriatric syndromes common to this vulnerable population. Frailty, rather than being seen as a contra-indication to exercise, is clearly one of the most important reasons to prescribe exercise in the elderly. MT

A list of references is available on request to the editorial office.

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