

Improving the physical health of long-stay psychiatric in-patients

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Abstract Research evidence has shown that morbidity and mortality rates are higher in psychiatric patients than in the general population. This article describes factors that affect the physical health of psychiatric patients living in institutions and the steps that can be taken to review, monitor and improve their physical health. The physical health care of long-stay patients should reach the same standards as those expected in the general population.

Many psychiatric patients continue to need long-term care in institutions in the public and private sector, despite the development of community facilities. Long-stay psychiatric institutions vary in size, level of security, facilities and type of care provided. Patients are usually regarded as long-stay if they are in an institution for more than a year. Inevitably, many long-stay in-patients experience limitations to their freedom, personal choice and activity, usually compounded by a low income and relative isolation from the community.

Psychiatrists caring for long-stay in-patients have a duty to care for all aspects of their patients' health, whether psychological, physical or social. Yet few psychiatrists have up-to-date skills in primary care or health promotion. This article addresses the deficit, documenting the major areas where improvements can be made, highlighting some of the most successful practice and providing references for further reading and research.

The principles outlined here may also be relevant to psychiatric patients living in other settings, who receive physical health care from general practitioners and other specialists. Whatever the setting, mental health professionals should recognise their responsibility for ensuring that their more vulnerable patients receive adequate physical health care.

Physical health

Epidemiological studies have consistently shown increased standardised mortality ratios in people with mental disorders. In a review of 152 studies,

Harris & Barraclough (1998) found that over 27 forms of mental disorder were associated with an increased risk of premature death, with 60% of deaths due to natural causes. They attributed the causes for increased mortality to the effects of the mental disorder and to the patient's altered lifestyle.

The excess mortality in schizophrenia is well known. Brown *et al* (2000) found that the standardised mortality ratios, compared with the general population, were increased three-fold for all causes, particularly for diseases of the circulatory, respiratory, digestive, endocrine and nervous systems. The excess mortality of schizophrenia could be lessened by reduction in smoking rates, reduced environmental risk factors and improved management of medical diseases. Mood disorders are associated with increased mortality due to cardiovascular disorders in men and respiratory disorders in women (Joukamaa *et al*, 2001). Patients with learning disabilities have been found to have a rate of health problems more than twice that of the general population (van Schroyenstein Lantman-De Valk *et al*, 2000).

In Australia, new long-stay patients, who had been in hospital for over a year and less than 3 years, were found to have significant problems from their psychiatric illnesses, together with concomitant physical illnesses and disabilities (Richards *et al*, 1997). In the USA, a study of 330 long-stay psychiatric patients found an array of medical problems and nursing needs in 84% of patients (Fisher *et al*, 2001). They concluded that the presence of significant medical problems is one of the barriers to the discharge of these patients.

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Government policies in England

The Government has produced a number of policies and targets for improving the health of the population of England and Wales. These include the National Service Frameworks (NSFs) for Mental Health (Department of Health, 1999a), Coronary Heart Disease (Department of Health, 2000b), Cancer Services (Department of Health, 2000c), Diabetes (Department of Health, 2001a) and Older People (Department of Health, 2001b). In 1997, the Government introduced the concept of clinical governance, by which National Health Service (NHS) organisations are accountable for continuous improvement in the quality of services (Department of Health, 1997). The National Institute for Clinical Excellence (NICE) has produced guidance on the most cost-effective forms of treatment for certain conditions, some of which is relevant to the care of long-term in-patients (for website see Box 1). Local strategies for health services are implemented by primary care trusts, and staff are expected to deliver services according to predetermined performance indicators.

The Government has also produced a resource pack for improving the quality of a patient's experience of care. Developed primarily as a nursing initiative, the 'essence of care' (Department of Health, 2001c; for website see Box 1) takes a structured approach to identifying standards of care and practice, using 'benchmarks'. After best standards of care have been identified, action plans

Box 2 The essence of care: benchmark topics

Principles of self-care
 Personal and oral hygiene
 Food and nutrition
 Continence, bladder and bowel care
 Pressure ulcers
 Safety of people with mental illness
 Record-keeping
 Privacy and dignity

are developed to remedy poor practice. The system is applied to eight areas affecting patient care (Box 2). Benchmarking can be used in conjunction with the NSFs, NICE guidance, audit and clinical governance to improve the quality of care and the physical health of long-stay in-patients.

Clinicians and management have realised that this is an important area to get right, both for the benefit of patients and to avoid repercussions later. However, it may be necessary to focus attention on physical health, for example by making an audit of risk factors for coronary heart disease.

Any project on health improvement will be more likely to succeed if it has leadership, sufficient resources and the support of decision-makers. A multiprofessional health promotion group can coordinate and organise developments in health promotion, particularly in smoking cessation, physical activity, diet and weight management.

Box 1 Useful web addresses

ASH (Action on Smoking and Health)	http://www.ash.org.uk
Cancer screening	http://www.cancerscreening.nhs.uk
Department of Health	http://www.doh.gov.uk
Department of Health's 'essence of care'	http://www.doh.gov.uk/essenceofcare
Department of Health's Expert Patient Programme	http://www.ohn.gov.uk/ohn/people/expert.htm
Food Standards Agency	http://www.foodstandards.gov.uk
Health Development Agency	http://www.hda-online.org.uk
Maudsley guidelines	http://www.iop.kcl.ac.uk/main/publications/prescribing_guidelines.html
National electronic Library for Health	http://www.nelh.nhs.uk
NHS Recipe Book	http://www.betterhospitalfood.com/downloads/recipe_book.pdf
NHS screening	http://www.nelh.nhs.uk/screening
NICE guidance	http://www.nice.org.uk
Tobacco control policies	http://www.hda-online.org.uk/wheredowego.pdf
US National Heart, Lung and Blood Institute	http://www.nhlbi.nih.gov

Health promotion

The major causes of death in England and Wales are cardiovascular disease, cancer and respiratory disease. Modifiable lifestyle behaviours associated with these health risks are tobacco smoking, physical inactivity, poor diet and nutrition (Department of Health, 2000b). Smoking causes 17% of deaths as a result of coronary heart disease, respiratory disease and many forms of cancer (Callum, 1998). The risks of smoking increase with the number of years of smoking and with the amount of tobacco consumed. Physical activity is important to maintain fitness and reduce the risk of coronary heart disease. It also reduces risks associated with conditions such as obesity, hypertension and diabetes. Obesity contributes to excess morbidity and premature mortality, being associated with type 2 diabetes, coronary heart disease, hypertension and some forms of cancer. Research into nutrition has shown that a healthy diet promotes substantial health gains (James *et al.*, 1997). Although long-stay patients receive benefits from care in an institution, there is no room for complacency over the need to tackle modifiable health risk factors. Health promotion has an important role to play in reducing these risk factors and should be available to all long-stay psychiatric patients as part of their routine care.

Smoking

Tobacco smoking is often part of the culture of long-stay institutions. Over 70% of long-stay patients smoke. The highest prevalence (74%) is in those with psychotic disorders, 52% of whom are heavy smokers, consuming over 20 cigarettes per day (Meltzer *et al.*, 1996). The Government has made smoking reduction a high priority for health improvement. A target has been set to reduce the rate of smoking in the general population of England and Wales from 28% to 26% by 2005 (Department of Health, 1999b).

In long-stay institutions, preparations for making changes to influence smoking behaviour might include surveying smoking facilities, smoking behaviour and the attitudes of staff and patients towards smoking (NHS Executive, 1999) (Box 3). This information would form a basis for the development of a strategy for smoking cessation, with appropriate resources, policies and procedures. Guidance about smoking facilities and policies has been published by both the NHS Executive (1999) and the Health Development Agency (2001). Priority should be given to providing smoke-free areas for non-smoking patients. Tobacco must not be used as a reward or incentive for patients.

Box 3 Survey of smoking in a long-stay institution

Patients

- Number of smokers/ non-smokers
- Amount and type of tobacco
- Number of those who wish to quit

Facilities

- Separate room for smoking on each ward
- Size of room and ventilation
- Health and safety standards
- Number allowed in room
- Compliance with use of room
- Smoke drift into non-smoking areas

Policies

- Patient
- Staff

Treatment

- Availability of guidance on smoking risks and cessation
- Availability of nicotine replacement therapy
- Support for patients
- Smoking cessation groups/other activities

Attitudes

- Staff
- Patients

West *et al.* (2000) have prepared smoking cessation guidelines for use by health professionals, based on a meta-analysis of research evidence. The researchers conclude that smoking cessation interventions are a cost-effective way of preserving life and reducing ill health. They found that brief advice from a general practitioner led 1–3% of patients to stop smoking for 6 months. Clinicians should therefore give advice about smoking cessation and document this in the records.

In trials, nicotine replacement therapy increased the chances of smoking cessation by 18%, compared with controls, whatever the setting and regardless of the type of nicotine replacement therapy used (Anonymous, 1999). All trials included some form of psychological support. Bupropion is an effective aid to smoking cessation, but it may interact with some forms of psychotropic medication. It is contraindicated for patients with epilepsy and with bipolar affective disorder (Anonymous, 2000).

Specialist smoking cessation clinics increase the success rate of smoking cessation by combining behavioural and pharmacological therapies (West *et al.*, 2000). Most success is achieved by specialist clinics, run by specially trained staff employed solely for this purpose. Clinics should offer individual and group treatments. Groups are most

effective when there are 15–30 participants, meeting weekly for at least 6 weeks, and when patients take nicotine replacement therapy or bupropion (West *et al*, 2000). At the beginning of sessions, abstinence should be monitored by checking for expired carbon monoxide.

There is a paucity of research evidence on smoking cessation in psychiatric patients. In the USA, one non-controlled trial of 50 out-patients with schizophrenia found that 42 patients achieved smoking cessation and 12 were abstinent at 6 months follow-up (Addington *et al*, 1998).

The ingested products of tobacco combustion may induce liver enzymes, which return to normal after smoking cessation. There is a risk that patients who stop smoking may develop side-effects to their psychotropic medication (e.g. clozapine), so that the dose has to be reduced. Smoking is a serious risk to the health of long-stay patients, so consideration should be given to supporting multiple attempts at smoking cessation.

Diet and nutrition

Diet plays a fundamental role in the development of many diseases, including coronary heart disease, obesity, diabetes and some forms of cancer. The Committee on the Medical Aspects of Food and Nutrition (Department of Health, 1994) has recommended a reduction in dietary fat and salt and an increase in complex carbohydrates. The Food Standards Agency recommends that at least five portions of fruit or vegetables should be consumed per day and at least two portions of oily fish should be eaten per week (Food Standards Agency, 2001). Patients should be given advice on healthy eating and be provided with healthy dishes on the menu.

The NHS Plan has set standards for food in NHS hospitals (Department of Health, 2000a). These standards, together with approved recipes, appear in the NHS Recipe Book (Department of Health, 2001d; for website see Box 1). All long-stay NHS institutions must provide the recommended nutritional intake in food and a range of popular dishes that are likely to be eaten. Menus should include clearly marked 'healthy options', i.e. main-course dishes with <15 g of fat, desserts with <5 g of fat and <10 g of added sugar, and a daily salt intake of 4–6 g. The menu cycle should be varied and be longer than 2 weeks, to reduce 'menu fatigue'.

Nutritional needs vary with gender, age and level of activity, and are an important consideration in menu planning, timing of meals and portion size. Patients may have special dietary requirements (which should be included in care plans) such as the need for texture-modified meals for patients with chewing or swallowing problems. The dietician and

other health professionals should work closely with the catering department to review the diet and to make improvements. Further information can be obtained from <http://www.betterhospitalfood.com>.

Confectionery is the most common addition to the diet of long-stay patients, and may substantially increase energy intake. We recommend that the range of goods available from the patients' shop and at social functions should include healthy options. Thirst is a problem for many patients taking psychotropic medication. Patients may consume large quantities of carbonated and caffeine-containing drinks. Patients should have access to drinking water throughout the day, unless there are risks such as polydipsia.

Physical activity

Physical activity has many beneficial effects on health. It can improve cardiorespiratory fitness, body strength, flexibility, balance, body shape and posture. Regular exercise will alter body composition by increasing muscle and reducing body fat. The elderly benefit from exercise with improved fitness, muscle strength and bone conservation, which contribute to the prevention of falls (Forwood & Larsen, 2000). Other beneficial effects of exercise are improved self-esteem, socialisation and sleep (Honeybourne *et al*, 2000: pp. 199–233). Daley (2002) described some beneficial effects of exercise therapy on the mental state of patients with depression and schizophrenia.

Exercise limits the proportion of lean tissue lost during dieting and assists with maintaining weight loss. It reduces the risk of cardiovascular disease and decreases the mortality rate in coronary heart disease. Regular exercise delays the onset of hypertension and reduces blood pressure. Physical activity has a beneficial effect on the control of diabetes and reduces the risk of colon cancer.

The current recommended guideline for physical activity is 30 minutes of moderate-intensity activity such as brisk walking, heavy gardening and heavy housework on at least 5 days per week (Department of Health, 1996). Opportunities for exercise may be limited for some long-stay patients and for others exercise may not be a realistic option. A survey of physical activity and exercise facilities might aid the future planning of services (Box 4).

Staff enthusiasm plays a major role in encouraging patients to be more active. It is usual practice for fitness instructors to assess individuals before starting them on an exercise programme. The assessment might include measurements of resting pulse rate, blood pressure, body fat, and calculation of the body mass index (BMI), defined as weight divided by height squared, kg/m². Tests are also

Box 4 Survey of physical activity and exercise facilities

Physical activity levels of patients
 Physical problems/risk factors
 Patients' views on exercise
 Availability of sportswear
 Sports facilities and equipment
 Availability of trained fitness instructors
 Choice of activities available
 Attendance rates at exercise sessions
 Policies and procedures
 Safety and risk assessments

available for flexibility, strength and cardio-respiratory fitness. The fitness instructor may provide progress reports to the clinical team and for care programme approach meetings. Plans for physical activity could be incorporated into care plans.

Many long-stay patients have been inactive for years. A pre-exercise group or individual sessions can give them the confidence, skills and knowledge to begin gentle exercise. Appropriate sportswear may be needed. A systematic review of strategies to promote physical activity found that interventions encouraging walking and not requiring attendance at exercise facilities were more likely to lead to increases in physical activity (Hillsdon *et al*, 1999). Physical activity may take place during occupational therapy and some forms of employment. An imaginative approach to exercise, with a range of available options, is most likely to be successful.

Weight management

Obesity is defined as having a BMI >30 (Table 1) and it has reached epidemic proportions in the UK. Some people have a genetic predisposition to obesity, but the fundamental cause is excessive calorie intake. Obesity is a major risk to health, and mortality rises with increasing weight. Excess weight is associated with an increased incidence of cardiovascular, respiratory, gastrointestinal and metabolic disorders, as well as certain forms of cancer. The health risks of obesity are increased with

Table 1 Weight classification

Classification	Body mass index (kg/m ²)
Underweight	< 18.5
Normal	18.5–24.9
Overweight	25.0–29.9
Obese	30.0–39.9
Severely obese	>40

Table 2 Waist sizes as a measure of health risk

	Waist size (cm)	
	Male	Female
Increased health risk	>94	>80
Intervention needed to reduce risk to health	>102	>88

Figures obtained from Lean *et al* (1995).

central deposition of adipose tissue, and waist size is a measure of the risk to health (Lean *et al*, 1995) (Table 2).

An intentional weight loss of 10 kg in obese people can confer significant health benefits. According to Jung (1997) these include a 20% fall in total premature mortality, a 30% fall in deaths due to diabetes, a 40–50% fall in cancers due to obesity and up to a 30% reduction in triglycerides.

Obesity is prevalent in many long-stay patients, and it is exacerbated by physical inactivity and sometimes by medications with the side-effect of weight gain (Allison *et al*, 1999). Monthly monitoring of weight and waist size should alert staff to significant changes and the need for investigations (Box 5). More frequent monitoring is advisable when medication that carries a high risk of weight gain is given (e.g. clozapine, olanzapine, lithium carbonate and sodium valproate). The Maudsley Prescribing Guidelines, which are about to appear in their seventh edition (Taylor *et al*, 2003; for website see Box 1) contain useful information on psychotropic medication with the potential for causing weight gain.

Box 5 Investigation of weight change**History**

- Current complaints
- Past medical history
- Dietary changes
- Medication

Physical examination

- All systems
- Blood pressure
- Waist measurement
- Calculate body mass index

Laboratory investigations, for example:

- Renal function
- Liver function
- Thyroid function
- Fasting lipids
- Fasting glucose
- HbA_{1c} (glycosylated haemoglobin, type 1c)
- Urine analysis

Effective strategies for weight management include a combination of dietary restriction, increased physical activity, behavioural modification and psychological support. Guidelines for weight loss recommend a reduction of 0.5–1.0 kg per week to preserve muscle. The most reliable way of achieving weight loss is with a hypocaloric diet of 500–600 kcal/day (2090–2510 kJ/day) less than the person's estimated energy requirements, together with a modest increase in exercise (Anonymous, 1998). A reduction in energy intake may be achieved by reducing total dietary fat content and by increasing complex carbohydrates in the diet. The aim should be to change long-term eating habits. Support from others and weekly weighing are important factors in successful weight management.

Pharmacological treatments with sibutramine or orlistat should be considered for those who meet the criteria set by NICE (National Institute for Clinical Excellence, 2001a,b). Very low calorie dietary products can be used as substitutes for meals, but as a safeguard, they should be used only under the supervision of a physician, on selected patients with a BMI >30. High-protein diets restrict the consumption of healthy foods and generally do not meet nutritional requirements. Behavioural methods used by certain slimming clubs may not be suitable for vulnerable patients. Surgery is available for severe obesity, but only as a last resort.

Weight loss or being underweight may be the first sign of an underlying serious illness that requires investigation. Patients who are underweight should be given nutritional advice and support when needed.

Physical health care

It is important that psychiatrists retain their basic medical skills. Nursing staff working in long-stay institutions must have competencies in physical health care. Clinical staff should be alert to the possibility that medical disorders can present as psychiatric disorders. Furthermore, psychiatric patients with physical disorders may not complain of symptoms or may have atypical symptoms.

Although some psychiatric patients have identified health care needs, they are not always referred to specialists and even when referred, they may receive suboptimal treatment. Long-stay patients should receive the same quality of physical health care as the general population and it should meet the standards set in the relevant NSFs. The quality of care can be improved by using systems with agreed aims, procedures and a preset timetable, including the timing of reviews at care programme approach meetings. Information on the patient's

physical health should be stored in the same place in each medical record and should be readily accessible to the care team. Standard forms are useful for recording the physical examination, weight, height, BMI and waist size, and the smoking, substance misuse and past medical histories. Important information can be recorded on a medical alert card for use in an emergency. A rolling record of health events should be kept. Computer health records might improve data management.

Many long-stay patients receive an annual physical health check to monitor the progress of existing conditions and to identify previously undiagnosed disorders. Again, the quality of data collection is improved by the use of semi-structured or structured questionnaires such as the Cardiff Health Check for patients with learning disabilities (Department of Health, 2002). A history should be taken of current complaints, past medical history and family medical history, which will focus the doctor's attention on relevant areas of the physical examination. Routine haematological investigations and urine analysis should be undertaken. Infectious diseases such as hepatitis B and C and sexually transmitted diseases such as syphilis should be identified. Immunisations should be provided, for example for hepatitis B, tetanus and influenza. There should be properly equipped facilities for physical examinations, with adequate lighting, heating, furnishings and privacy. Equipment should include accurate weighing scales and a height measure.

Primary care

Most long-stay patients receive physical health care from psychiatrists, who are not usually trained as general practitioners. Primary care services delivering acute and chronic disease management according to NSF standards should be arranged for long-stay patients (Fisher & Roberts, 1998). Initially, the focus should be on patients with a high risk of coronary heart disease, for example men over 50, with a BMI >30, who are smokers. Patients with a history of myocardial infarction, stroke, diabetes mellitus, hypertension and raised cholesterol should be identified. Comorbid substance misuse should be assessed and managed according to locally agreed procedures and policies.

Screening

Long-stay patients should be given relevant information about screening, be encouraged to take part and be given the opportunity to attend a screening facility. It is important to recognise the sensitivity of some patients to the gender of the

medical practitioner or nurse carrying out the screening procedure. The NHS has screening programmes for cervical, breast, colon and prostate cancer, glaucoma and type 2 diabetic retinopathy. Details are available at <http://www.nelh.nhs.uk/screening>. It is important that patients are offered screening at the appropriate intervals and, whenever possible, are registered for automatic recall for screening. Patients may be taught self-examination techniques for the detection of breast or testicular masses.

Other specialist services

Oral health affects comfort, eating, speech and appearance (Cormac & Jenkins, 1999). The dental status (decayed, missing and filled teeth) of long-stay patients was found to be similar to that of the general population, but oral hygiene was not as good (Lewis *et al*, 2002). Oral hygiene should be part of routine care, along with regular visits to the hygienist and dentist.

Eyes should be assessed regularly by an optician, for visual acuity and ocular problems such as glaucoma. Specialist tests are available for those with learning disabilities (McCulloch *et al*, 1996). Hearing should be tested using audiometry, and hearing aids should be provided if needed.

The pharmacist has an important role in advising about medication, side-effects and monitoring, especially with complex regimens. A dietician should be available to assess dietary needs and advise on the management of those who are under- or overweight. Speech and language therapists have expertise in the assessment and management of swallowing problems. Chiropodists should see patients with foot conditions, and special care should be taken with the feet of diabetic patients. Physiotherapy may be needed.

Vulnerable patients

Patients with learning disabilities may need help to access care. Sensory impairments are common (Wilson & Haire, 1990), as are epilepsy, dental problems and skin problems. Women with learning disabilities tend to have an early menopause and menstrual problems (Martin *et al*, 2001). Physical disabilities may occur in association with underlying genetic disorders such as Down's syndrome. All patients with learning disabilities in residential care must have an annual health check and a health action plan in place by June 2005 (Department of Health, 2002). Health action plans are designed to meet the patient's health care needs and are prepared by patients, with help from staff when necessary.

Health action plans could be useful to all patients in the planning of their physical health care.

Elderly long-stay patients have the same spectrum of health problems as other long-stay patients and elderly people in the general population. The NSF for Older People (Department of Health, 2001*b*) addresses specific issues in relation to prevention of falls and strokes. Advice from the pharmacist will be particularly useful, as pharmacokinetics change with age and drug interactions and side-effects are more likely.

For patients with schizophrenia, the NICE guidance (National Institute for Clinical Excellence, 2002) sets standards for health promotion, regular health checks and screening for side-effects of medication. Of particular concern are the adverse effects of antipsychotic medication, notably extrapyramidal side-effects, hyperprolactinaemia, hyperglycaemia and weight gain.

Psychotropic medication

Psychotropic medication may increase health risks by direct or indirect pharmacological action. Some side-effects may have serious consequences, for example the prolongation of the QTc interval, which necessitates regular monitoring of the electrocardiogram. Women are at risk from antipsychotic-induced hyperprolactinaemia, which causes menstrual irregularities, galactorrhoea and sexual dysfunction. A significant proportion of premenopausal women taking antipsychotic medication may be at risk of premature bone loss and osteoporosis (Wieck & Haddad, 2003). Men with hyperprolactinaemia may experience sexual dysfunction. Box 6 contains a list of the types of psychotropic medication for which protocols might be useful to enable effective monitoring and minimisation of health risks.

Box 6 Medications for which protocols might be useful for monitoring physical risks

Lithium carbonate

Anti-epileptic medication, e.g.

- carbamazepine
- sodium valproate

Antipsychotic medication (particularly in high dosage), e.g.

- clozapine
- olanzapine

Tricyclic antidepressants

All medication in doses exceeding British National Formulary (BNF) limits

Liaison

It is an advantage to develop good working relationships with staff from the local general hospital, especially if patients deliberately harm themselves and frequently use accident and emergency services. Sometimes there is a tendency to discharge psychiatric patients too quickly from hospital to long-stay institutions that are not staffed or equipped to deal with physically ill patients.

Conclusions

Every effort should be made by psychiatrists to raise standards of physical health care. Improving the physical health care of long-stay patients is a multi-professional task. This article has documented the major areas where improvements can be made, highlighted some of the most successful practice and provided references for further reading and research. The recommendations that we have discussed here will have both short- and long-term benefits.

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*indicates works of particular interest.

Multiple choice questions

1 Compared with the general population, long-stay patients:

- a are more likely to die prematurely
- b have more decayed, missing and filled teeth
- c have a lower incidence of medical disorders
- d are more than twice as likely to smoke
- e take less exercise.

2 Treatment for obesity:

- a is indicated for those with a BMI <25
- b is indicated for men with a waist size >102 cm
- c with high-protein diets may cause sexual dysfunction
- d should induce a weekly weight loss of more than 1.5 kg
- e is more likely to succeed if the patient is weighed weekly.

3 In smokers:

- a nicotine replacement therapy is contraindicated in patients with schizophrenia
- b brief advice from a GP increases the chance of smoking cessation
- c the ingested products of tobacco-smoking induce liver enzymes
- d treatment with bupropion causes hyperprolactinaemia
- e smoking cessation groups are most effective if run by ex-smokers.

4 As regards physical activity:

- a it reduces the risk of colon cancer
- b swimming is the most effective long-term activity
- c it delays the onset of hypertension
- d it reduces the risk of muscle loss in patients on calorie-restricted diets
- e it should be undertaken for 30 minutes twice a week.

5 According to current government guidelines, a healthy diet contains:

- a complex carbohydrates
- b a portion of indehiscent fruit (nuts) per day
- c a daily intake of 5 portions of fruit or vegetables
- d two portions of white fish every week
- e less than 10 g of added sugar in desserts.

MCQ answers

1	2	3	4	5
a T	a F	a F	a T	a T
b F	b T	b T	b F	b F
c F	c F	c T	c T	c T
d T	d F	d F	d T	d F
e T	e T	e F	e F	e T