

Obesity and its management

OBESITY and its Management

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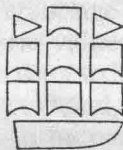
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Foreword

THIS volume should be welcomed by general practitioners and by hospital physicians as the first comprehensive monograph on obesity to be published in Britain or America for twelve years. The author, a well-known family doctor, bases his opinions on the results of his own follow-up of overweight patients over a long period; he compares fat patients with normal controls and he discusses a large series of weight recordings during normal pregnancy. For some of this work he was awarded, in 1968, the Hawthorne Clinical Prize of the British Medical Association.

After pointing out the size of this problem and its importance to family medicine, he discusses fully the complications and hazards of obesity, and its treatment by diet, drugs and exercise, each of which is given a separate chapter. Other parts of the book cover the aetiology and physiological aspects of obesity and its classification into clinical types. Long-term prognosis with and without treatment is examined carefully. Special interest is shown in decompensated and intractable gain in weight, and in weight control in childhood, pregnancy and in diabetes.

The Appendices should be useful for reference to many practising doctors. The first covers desirable weights (in pounds and in kilograms) for different age groups of men and women. The second lists the calorie values of common foods—something which many patients want to know but which their doctors may not always have easily to hand.

Dr Denis Craddock is to be congratulated on writing such a valuable book from general practice.

1969.

JOHN H. HUNT

Preface to Second Edition

DURING the four years since the first edition, continuing research into the causes and treatment of obesity and my own increasing experience in dealing with overweight people have resulted in the need for alterations in every chapter, and indeed, in almost every page of the text. The increase, probably permanent, in the total number of fat cells caused by over feeding in the first year of the life, the official replacement of the calorie by the Joule and the likely incrimination of a high sugar low residue diet as a major causative factor in a host of diseases all tend to modify our attitude to this problem. The treatment of resistant or intractable cases of obesity has been improved by the rapid growth of slimming groups in this country and continuing experience in the use of fasting and of by-pass operations for long-standing gross obesity have clarified the indications for the occasional use of these two procedures. The chapter on drug therapy has been pruned drastically as diethylpropion and fenfluramine are now the only drugs which are considered generally safe and effective. New sections concerning the rate of weight loss when slimming, smoking and overweight, and some details of slimming foods have been added.

From among the thousands of new articles written on the subject in the last four years, material from between one and two hundred have been incorporated in the text and almost a similar number of older references have been deleted.

I have to thank Professor Christakis of New York, Dr Gaston Pawan of the Middlesex Hospital, London and Mr Derek Miller of the Department of Nutrition, Queen Elizabeth College, London, for further help, and I am indeed grateful to my reception and office staff for their help, particularly to my secretary, Mrs Sheila Warburg, for her unfailingly cheerful and efficient help especially in dealing with my handwritten alterations to the manuscript.

1973.

DENIS CRADDOCK

Preface to First Edition

SO far as I am aware this is the first time a general practitioner has written a monograph on obesity in the English language, and yet it appears to me that the physician in general practice has two advantages over the physician practising mainly in hospital, when surveying the treatment of obesity. Directly or indirectly the general practitioner sees almost every case of obesity in the community, while the hospital physician sees merely patients who are obese in addition to other medical conditions for which he is asked to give an opinion, or if especially interested in obesity he sees a small proportion of the severe or resistant cases from the catchment area of his hospital or hospitals. The general practitioner also sees his women patients during each of their pregnancies and has the opportunity, which is denied to the hospital physician, of influencing the eating habits of their families. Because of my position as a family doctor I have been able to survey all my treated obese patients over periods of up to ten years, and I have compared a consecutive group of 78, followed up for at least five years, with a control group. I have also recorded the weight gains in 100 consecutive ante-natal patients whom I have seen over long enough intervals to obtain adequate records, and have drawn conclusions as to the results of the dietary advice I gave to 60 of them.

Books on obesity can be divided into two main groups—those for the medical reader, and those for the lay reader. Books for the medical reader have in the main confined themselves to purely clinical aspects, whilst those for the lay reader have included considerable dietetic and nutritional advice. My aim in this book is to produce a comprehensive text book on obesity and, in addition to full clinical coverage, I have included calorie tables and various types of diet. I hope that physicians both in hospital and outside will find within its covers all they need to know for the practical management of their obese patients.

I wish to thank all those who helped me in the preparation of this book. Dr W. J. H. Lord of Alford, Norfolk, provided

valuable constructive criticism of the thesis on which the book is based, and gave me ready access to his extensive bibliography on the subject. Mr D. Miller, Miss P. Mumford and Mr M. Stocks of the Department of Nutrition, Queen Elizabeth's College, London, gave detailed advice and constructive criticism on Chapters 5 and 8, and Dr D. A. Pyke of King's College Hospital, London, advised concerning Chapter 16. Reg Finbow has kindly drawn the illustrations.

Others who assisted me in various ways were my partner Dr B. Barnes and my secretarial and office staff, Dr W. G. Christakis of New York, Professor C. A. Clarke of Liverpool, Dr C. Floyd and Miss J. Otway of Croydon, Mr J. C. Miller of Mayday Hospital, Croydon, Dr G. L. S. Pawan of The Middlesex Hospital, London, Dr W. G. Shipman of Chicago, Dr J. T. Silverstone of St. Bartholomew's Hospital, London, Dr A. J. Robertson of Liverpool and Professor J. Yudkin of Queen Elizabeth's College, London.

DENIS CRADDOCK

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CHAPTER 1

The Size of the Problem

WHILE millions of human beings in the eastern hemisphere die from inadequate food intake, millions of their western counterparts eat too much, exercise too little and risk an earlier death than they need because of the ills produced directly or indirectly by obesity.

Before discussing the prevalence of obesity in this country it is essential to make some definitions. Firstly, what do we mean by 'weight' and secondly what do we regard as 'normal weight'?

What is body weight?

Physiologically the body weight is constantly changing, as intake of food and drink during the day is balanced approximately by loss of urine, faeces and of 'insensible perspiration' at the rate of 30-60 g. (1-2 oz.) per hour. Under experimental conditions 'standard' weight observations should exclude variables as far as possible, i.e. they should take place at a fixed time, preferably early morning, after urination and before food. In hospital practice weighing is usually carried out at a fixed time in a minimum of clothing, but in general practice, although the time can be arranged, routine undressing for obese patients is usually impracticable and the same type of clothing is usually specified for each weighing; normal indoor clothing for the time of the year is usual. Patients are not normally asked whether urine or faeces have been passed recently. As variables have not been ruled out, weight should always be thought of as ± 500 g. (1 lb.). Daily swings of water balance to that amount are to be expected and 1.4 kg. (3 lb.) variations are not abnormal. Over a period of years these variables cancel out and are unimportant.

What is normal weight?

Many of the older weight tables have been based on average weights for certain ages and have shown an increase in weight for each decade, whereas in fact the healthy non-obese adult should not vary in weight from the age of 30 onwards and probably from the age of 25. This theory has been confirmed by Slome *et al.* (1960) who have shown that Zulus living in rural areas and eating mainly cereals, fruit and milk maintain the same weight until the age of about 60 when the weight begins to decline.

In urban society, food intake does not usually diminish with increasing age, but physical activity lessens and weight is added. Even when weight remains stationary fat can be added at the expense of muscle (Krzywici *et al.*, 1970). The Metropolitan Life Insurance Company of New York published a series of tables in 1959 giving the desirable weights for men and women over the age of 25 of small, medium and large frames (Appendix I) and these have now become generally accepted as the best yardstick for normal or desirable weights, although some research workers still use the Ponderal Index which is the height in inches, divided by the cube root of the weight in pounds. (11.20 is a low reading signifying obesity.)

There is as yet no simple method for measuring an individual's frame to decide whether it is small, medium or large, although there is a fair correlation with size of hands and feet. Anthropologists take the bi-acromial diameter and the bi-iliac diameter as indications of the laterality of the skeletal frame, but even these require calipers to judge accurately (Montague, 1960) and 17 measurements are required for accurate somatotyping (Sheldon, 1954). Clinical judgment must therefore suffice.

What is obesity?

Most authorities define *obesity* as occurring when a patient's weight is at least 10 per cent in excess of the normal or desirable weight, although some take 15 or 20 per cent as the figure. Those who feel that 10 per cent is too low a figure should reflect that even this figure allows a 12 stone (168 lb.) man to accumulate 15 lb. of fat without being obese!

Clinical obesity is shown by an excess of subcutaneous fat, 20 or 30 lb. of which can easily be masked by normal indoor clothing. Except for short-term research projects there is no need to measure the thickness of skin folds by instruments and the diagnosis can best be made by estimating the thickness of the subcutaneous fat by pinching a skinfold in the mid triceps area, or below the scapulæ, on the lower part of the chest wall, the abdomen, the buttocks or thighs. Up to 1 in. is usually regarded as normal. In men, large amounts of fat may be stored in the greater omentum and the only obvious clinical evidence of excess weight is sometimes therefore an expanding waist-line. Seltzer & Mayer (1965) have demonstrated that the triceps skinfold thickness is the best single criterion of obesity, although Montoye *et al.* (1965) regard the subscapular as better in men. They state that 'when hydrostatic weighing has been used as a criterion the skin fold thickness has been shown to give a fair estimate of total body fat'. Where the weight is 10 per cent above the desirable weight as shown by the Metropolitan Life Insurance Tables, the clinical diagnosis of obesity is rarely in doubt. The experienced clinician will not be misled by the increase in weight due to œdema fluid or excessive muscular hypertrophy.

Excessive obesity can be said to be present when the weight is 20 per cent above the desirable weight, but some take 30 per cent as the figure. The United States Society of Actuaries (Metropolitan Life Insurance Company, 1960), taking the statistics of 26 large Life Insurance Companies in the United States and Canada, found the frequency of overweight and underweight to be as shown in Table I.

THE PREVALENCE OF OBESITY IN GREAT BRITAIN

There are no figures available for the prevalence in the country, as a whole, but several local surveys have been done.

Montegriffo (1968) using the Metropolitan Life Assurance Society Tables found the prevalence of overweight in 7,385 men and 2,884 women employed by the British Petroleum Company in London to be very similar to that in the U.S.A. (Table II). 71 per cent of the individuals were office workers, 20 per cent seagoing and the remaining 9 per cent in the artisan class.

Silverstone (1968), weighed and measured 77 per cent of a one fifth sample of adults in two London practices, and found that 52 per cent of the men were 15 per cent overweight and 56 per cent of the women. Baird (1972) found in a survey of 1,334 individuals in Richmond (Surrey) that 37 per cent of the males and 36 per cent of the females were overweight.

TABLE I
*Percentage Deviation from 'Best' Weight
in U.S.A. and Canada*

Age	Men				Women			
	Above average			Below average 10%	Above average			Below average 10%
	10% +	10-19%	20% +		10% +	10-19%	20% +	
20-29	31	19	12	13	23	11	12	22
30-39	53	28	25	6	41	16	25	13
40-49	60	28	32	4	59	19	40	6
50-59	63	29	34	4	67	21	46	4
60-69	57	28	29	5	68	23	45	4

TABLE II
*Percentage Deviation from 'Best'
Weight in London, England*

Age	Men 10% +	Women 10% +
25-29	32.8	21.0
30-39	47.2	32.5
40-49	59.6	52.6
50-59	50.3	64.4
60-69	51.1	59.6

The prevalence of obesity in women

In a survey of obesity in the author's general practice (p. 129) 14 of the women in the original control series were

already under treatment for obesity, and of the remaining 56, 20 were found to be at least 10 per cent overweight. Thus 34 out of 70 original controls selected randomly were overweight. These controls are not a true sample of the practice population as they are weighted towards the age groups where obesity is most prevalent (Table XII), but it is nevertheless likely that somewhere between a third and a half of the women over 30 in the practice are overweight. Taking into consideration Baird's and Silverstone's figures, it is likely that up to one half the women over 30 in Great Britain are at least 10 per cent overweight.

The prevalence of obesity in men

In the U.S.A. the incidence of obesity in men is almost as high as in women (Table I) but in this country it is considerably lower than in women. The author has treated about 50 men and 250 women in the past fourteen years. A proportion of about one male to six females was found in the morbidity statistics from 100 practices published by the General Register Office (1958) so that it is likely that about 10 per cent of adult males are overweight. Nevertheless in certain groups of men obesity can constitute a major health problem. See Table II. In business executives, for instance, the incidence is high. Pincherle & Wright (1967) found that 567 (28 per cent) of the first 2,000 company directors examined at the Institute of Directors Medical Centre were at least 10 per cent overweight, the proportion overweight being almost identical in each of the age-groups, under 40, 40-49, 50-59 and 60 and over.

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CHAPTER 2

The Complications and Hazards of Obesity

THE statistics of the New York Metropolitan Life Insurance Company give the best approximation to the risks to life of obesity and its various complications. They show that the general mortality in the United States of America among obese men and women increases with each 10 per cent above best weight until, at 30 per cent above, in the age groups 40-69, it averages 42 per cent over average for men, and 36 per cent over average for women.

INCREASED MORTALITY

The increased mortality is brought about mainly by the increased incidence of hypertension and coronary artery disease (pp. 42-43). The Framingham heart study (Kannel *et al.*, 1967) showed a dramatic increase in sudden death among men more than 20 per cent overweight as compared with those of normal weight and a lesser degree of overweight, and the mortality was reduced in those previously obese individuals of both sexes who had managed to lose weight. Abrahams *et al.* (1971) followed up nearly 2,000 schoolboys of Hagerstown 30 to 40 years later and located 94 per cent of them. Of a representative sample examined, those who had become obese since childhood had a markedly higher incidence of hypertension and cardiovascular disease than the rest of the group. Marks (1960) quotes six sources from Germany, India, Norway and U.S.A. to show that obesity is associated with an increased incidence of hypertension and in this country Pincherle & Wright (1967) of the Institute of Directors found a diastolic pressure of over 100 in 84 (15 per cent) of 567 overweight men and in only 70 (6 per cent) of 1,225 men of average weight. The extra load on the heart and lungs of moving a fat thorax and pushing the diaphragm down against fat in the abdomen may also bring about cardio-respiratory failure (Berlyne, 1958). A hypertensive tendency can be present as early as the second

decade, as Christakis *et al.* (1968) showed that in New York school children aged 10 to 13, 19.7 per cent of 74 obese children had a diastolic pressure of 85 mm. or over, as against only 9.2 per cent of 556 non-obese children. This suggests an association between the hereditary tendencies to obesity and hypertension.

The greatly increased incidence of diabetes in long standing obesity is another important factor. At Joslin's clinic (Joslin, 1971) they believe that 'the overall prevalence of maturity onset diabetes in a country is largely determined by the prevalence of obesity' (Chap. 16).

TABLE III

Cause of Death in Men and Women Rated for Overweight

New York Metropolitan Life Insurance Company (Marks, 1960)

Based on 50,000 individuals who paid higher premiums on account of overweight 1925/34.

Condition	Men	Women
	Percentage Actual Mortality compared with expected	Percentage Actual Mortality compared with expected
Cardio-vascular and Renal disease	149	177
Diabetes	383	372
Cirrhosis of Liver	249	177
Appendicitis	223	195
Gall stones	206	284
Cancer	97	100
Leukæmia and Hodgkin's Disease	100	110
Pneumonia	102	129
Ulcers of Stomach and Duodenum	67	-
Suicide	78	73
Accidents	(111)	135

Gall stones occur more commonly due to high blood cholesterol in most obese subjects. Liver damage leading to cirrhosis is more marked in men than women owing to their greater average intake of alcohol and consequent dietary neglect. The increased risk from surgery is due to greater technical difficulty and the increased risk of anaesthesia consequent upon an impaired action of the diaphragm. This increased surgical risk helps to double the mortality from appendicitis and gall stones (Table III).

Slower physical reactions help to increase the risk to life from accidents.

Other surgical conditions which occur more commonly in obese persons include umbilical and incisional hernias, carcinoma of the colon (Burkitt, 1971), diverticulitis (Painter, 1969), arterial disease, haemorrhoids, varicose veins, thrombophlebitis (Burkitt, 1972) and carcinoma of the body of the uterus.

Obesity of marked degree leads to an increase in the complications of pregnancy and a higher perinatal mortality, (Chap. 14), and deters surgeons from treating varicose veins and many other non-urgent conditions.

Pre-operative fasting

This is dangerous as most of the weight loss is of protein and not of fat. A minimum of 800 calories daily should be taken when endeavouring to lose weight before an operation (see p. 143).

THE BENEFITS OF WEIGHT REDUCTION

Reduced mortality

With established physical disease the benefits of weight reduction are obvious. Following up employees of the New York Metropolitan Life Insurance Company for five years, 15 out of 17 individuals with established disease who had lost weight had improved whereas only 1 out of 8 who had not lost weight improved (Fellowes, 1931).

Men and women who lost weight and became accepted at standard rates by insurance companies achieved mortality rates approximating to those of people of normal weight (Marks, 1960). Statistics, as is well known, can give wrong