



# Individualising weight loss prescription

## A management tool for clinicians

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#### BACKGROUND

Obesity is a global epidemic and a growing cause of comorbidities seen by clinicians. Yet apart from recent guidelines developed by the National Health and Medical Research Council there are few clinical tools available to tackle this problem.

#### OBJECTIVE

This article describes a tool for detecting aspects of both diet and lifestyle likely to adversely affect the body weight of an individual.

#### DISCUSSION

The Diet, Activity and Behaviour Questionnaire (DAB-Q) is designed to identify the nutrition, physical activity and eating behaviours likely to lead to energy imbalance and increased body weight in an individual. This tool can be used in clinical practice to help individualise appropriate behavioural prescriptions for successful weight management.

**Obesity (and overweight) is a major clinical and public health problem. Based on national figures, more than one in 2 patients presenting to general practice in Australia could be expected to be overweight or obese.<sup>1</sup> A number of serious chronic diseases are attributable to this, ranging from metabolic problems such as type 2 diabetes, to endpoint diseases including heart disease and some cancers.<sup>2</sup>**

The clinician is at the forefront of this 'epidemic', usually required to treat comorbidities instead of the cause of the problem. Permanent weight loss is notoriously difficult to effect in a modern 'obesogenic' environment<sup>3</sup> and the problem is exacerbated through a number of self-perpetuating, vicious cycles.<sup>4</sup> Although a number of treatment strategies are available, few have published data supporting their effectiveness.<sup>2</sup> Furthermore, clinicians have been given little guidance about customising treatments to individual idiosyncrasies.

Detecting aspects of both diet and lifestyle likely to be adversely affecting the body weight of an individual supports a recent trend toward individualising treatment strategies.<sup>5</sup>

### Identifying causes

It is well known that body weight is gained when an individual consumes more energy than he or she expends. In its simplest form (considering only volitional changes) this comes down to the amount of energy on both sides of the energy balance equation where:

$$\text{Energy intake (food/drink in kcal or kj)} = \text{energy density} \times \text{portion size} \times \text{frequency of intake}$$

(how 'rich') (how much) (how often)

$$\text{Energy expenditure (physical activity in kcal or kj)} = \text{frequency} \times \text{intensity} \times \text{duration}$$

(how often) (how hard) (how long)

Acute variations in energy balance are tolerated, but a chronic positive imbalance can lead to long term weight gain. Genetic, behavioural and environmental factors can influence both intake and expenditure (including nonvolitional energy expenditure factors such as metabolic rate and thermogenesis), however the rules of thermodynamics suggest the imbalance must come from either excessive energy intake, inadequate energy expenditure, or both.

From a clinical perspective, it is common to find that while some overweight individuals have problems with

both sides of the energy balance equation, some have particular problems with either one or the other. Also, a number of factors within both diet and exercise contribute to weight gain in an individual. For example, excessive portion size, or energy dense foods may contribute most to the energy intake, while lack of time, laziness or injury may be reasons for insufficient energy expenditure. *Table 1* lists some components of intake and expenditure that intuitively would be candidates for such attention.

Within these broad factors, there are a number of specific factors that may influence an individual. Within food types for example, some people are more likely to overeat particular foods such as sweets, chips, ice-cream or savouries; or consume too much high energy dense soft drink or fruit juice. Lack of physical activity may be due to too much sedentary time, having a sedentary occupation, or spending too much leisure time watching television.

If these specific factors could be identified early in the consultation, the clinician could customise a lifestyle prescription for the individual, potentially increasing the chances of successful weight loss. Evidence suggests that individual approaches targeted in this way offer more prospect for successful weight loss than broader generic prescriptions.<sup>5</sup> Behaviourally, there is also logic in selecting a limited number of manageable changes early in a behaviour change program. Concentrating on changing consumption of one, two or three foods and/or activities might lead to a weight loss sufficient to then motivate the patient to proceed with other, more potentially difficult, dietary changes.

### Customising diagnosis

The Diet, Activity and Behaviour Questionnaire (DAB-Q) is a management tool developed to assist clinicians identify and deal with the food, physical activity, and behavioural factors most likely to be influencing weight gain in an individual. It also seeks to identify those aspects most amenable to change. The DAB-Q process was adapted from new findings and a number of existing tests relating to obesity.<sup>6</sup> The DAB-Q incorporates four questionnaires to identify foods and activities

**Table 1. Selected aspects of nutrition and physical activity that might encourage overweight and obesity**

#### Components of nutrition influencing overweight and obesity

Too much fat  
 Too much food  
 Too high energy density  
 Too much high GI food  
 Binge eating  
 'Overly restrained' eating  
 Social eating/holiday eating/feasting  
 Too much alcohol/food with alcohol  
 Too much soft drink  
 Too little fibre  
 Too little variety  
 The 'eye-mouth' gap\*  
 The 'exception rule'\*\*

#### Components of physical activity influencing overweight and obesity

Discomfort/injury/incapacity  
 Lack of time  
 Sedentary job  
 Inactive transport to/from work  
 Lack of planned activity  
 Lack of 'incidental' activity  
 Lack of awareness of inactivity  
 Wrong type of activity  
 Fatigue or laziness  
 Fear of crime  
 Environment/weather  
 The 'foot-brain' gap#  
 Childhood experiences  
 Self consciousness  
 Lack of time

\* Term applied to the fact that individuals underestimate food intake

\*\* Used to denote notion that individuals often claim a day's intake is 'an exception'

# Term applied to the fact that individuals overestimate energy expenditure

contributing to weight gain and loss, and a fifth questionnaire designed to flag any behavioural practices such as binge eating or night eating that might require more detailed psychological attention.

Unlike other dietary or physical activity questionnaires, the DAB-Q involves a measure of 'changeability' for each food and activity item ranging from 0 (impossible to change)

to 5 (easy to change). 'Potency' scores from 1–4 are also given for each item (although not visible to the patient), based on energy density (in the case of food or drink) or energy (use) expenditure (in the case of activities). Food/drink consumption and activity frequencies are scored on a 5 point Likert scale from frequent to infrequent. A total maximum score of 100 is possible for each item when multiplied

**Table 2. Sample DAB-Q questions**

**Nutrition: Part A**

Select one option in each of the categories F (frequency) and C (changeability) according to the key below

**Key**

- |   |  |
|---|--|
| <b>F</b> How often do you eat or drink? | <b>C</b> If you ever consume that food or drink (ie. your answer to 'F' is 1 or more), how difficult would you find it to significantly reduce eating or drinking it (eg. by at least 25%) |
| 0 Rarely or never                       | 0 Extremely difficult  |
| 1 Occasionally (2–3 times/month)        | 1 Very difficult   |
| 2 Sometimes (1–3 times/week)            | 2 Difficult  |
| 3 Moderately (4–6 times/week)           | 3 In between   |
| 4 Daily                                 | 4 Easy   |
| 5 More than once a day                  | 5 Very easy  |

	<b>F</b>						<b>C</b>					
	0	1	2	3	4	5	0	1	2	3	4	5
Pastries, croissants, muffins or doughnuts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cake – 1 or more medium piece(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweet biscuits – 3 or more biscuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular (nondiet) soft drink or cordial – 1 can soft drink or 2 small glasses cordial or more	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fast food or take-away meals (eg. McDonald's, KFC, pizza, Thai, Indian)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

across scales, enabling a quantitative difference to be calculated between items. An example of questions and scaled items is shown in *Table 2*.

Questions for different tests in the DAB-Q were initially derived from a review of existing measures<sup>7</sup> and tools such as the Short-Fat Questionnaire,<sup>8</sup> national food databases and existing activity questionnaires.<sup>9</sup> Questionnaires and items were piloted and validated for internal validity with a small group of expert obesity clinicians and a larger group of overweight women enrolling in a commercial weight loss program. External validation of the final tool will involve assessing the long term results of prescriptions based on diagnostic outcomes.

**Applying prescription**

An example of a DAB-Q test outcome is shown in *Table 3*. Scores for all items

above an arbitrary cut-off of 25 are shown for each questionnaire within the test battery. Test 1 (Nutrition part A) quantifies scores for nutritional items consumed in excess by this patient. In consultation with the clinician, the patient might select the top 2–3 of these (sausages, butter or margarine, and fruit juices) to initially try to reduce (by at least a set amount, eg. 25%). Eliminating these items from the diet altogether might be the ultimate goal, but this is more likely to be effected slowly, hence a suggested decrease of 25%. From test 2 (Nutrition part B), the patient might be encouraged to increase consumption of low energy dense fruit, beans or lentils and water to increase satiety and reduce total energy volume (while perhaps increasing food volume). Similarly with tests 3 and 4 (Physical

activity parts A and B), the patient could be encouraged to decrease television viewing time and getting other people to do things for them, and increase daily walking or playing active games.

Because all tests have been scored on potential changeability (as rated by the patient), as well as potency (as rated by objective scores of energy density or energy use), those items scoring highest are likely to be easiest to change, but also likely to yield the most benefit from change.

Scoring on the behaviour test (test 5) provides a flag for the clinician to determine whether more detailed intervention may be required. In the case presented here, binge eating, stress eating and social eating are identified as possible influencing factors in encouraging over consumption of energy. Referral to an eating disorder or stress specialist might be appropriate for the first two, while education on food selection in social situations might be useful for the third. Treatment of these behaviours can occur concurrently with prescription to modify energy consumption and expenditure factors identified from nutrition and activity components of the questionnaire.

**Conclusion**

The DAB-Q provides a tool for clinicians to quickly diagnose the most potent, yet changeable aspects of nutrition and physical activity in an individual activity likely to contribute to, or support weight loss in that person. This then satisfies a key component of behaviour change for weight loss prescription; limited and manageable initial change aimed at increasing motivation to proceed to more permanent lifestyle change.

A URL for a website is provided to the patient to complete a DAB-Q test battery in computerised form on the internet in his or her own time, with print-out results then brought back to a second consultation with the doctor. This represents a first stage toward objectifying individualised treatment prescription in an otherwise difficult area of lifestyle medicine.

**Table 3. Sample DAB-Q output**

Recommendations	Score (0–100)
<b>Nutrition: Part A</b>	
Try to eat/drink less of those foods with the highest scores shown here:	
Sausages, devon, salami, meat pies, hamburgers or bacon	64
Butter or margarine	48
Fruit juice	48
Chocolate, chocolate biscuits, sweet snack bars, jelly lollies	36
<b>Nutrition: Part B</b>	
Try to eat more of those foods with the highest scores shown here:	
2–3 different pieces of fruit	60
Beans/peas/lentils (at least half a cup)	27
Water or diet soft drinks	24
<b>Physical activity: Part A</b>	
Try to do less of those activities with the highest scores shown here:	
Watch television or videos for at least 3 hours a day	48
Get other people to do active things for you when you could realistically do them yourself	24
Use a computer (not work related) for at least 2 hours a day on weekdays and 4 hours a day on weekends	24
<b>Physical activity: Part B</b>	
Try to do more of those activities with the highest scores here:	
Walk for exercise (for a total of 60 minutes or 6500 steps)	32
Become involved in active play (ie. football, sport, active games) with your family or friends	30
Jog, swim, cycle, paddle or do something moderately vigorous to make you puff or sweat for a total of 30 minutes	28
<b>Eating behaviour flags</b>	
	<b>Rank</b>
Binge eating	1
Stress eating	2
Social eating	3

obesity management. Canberra: Commonwealth Department of Health and Ageing, 2002.

3. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritising environmental interventions for obesity. *Prev Med* 1999;29:563–70.
4. Egger G, Swinburn B. The runaway weight gain train: too many accelerators, not enough brakes. *BMJ* 2004;329:736–9.
5. Hill JO. Obesity treatment: does one size fit all? *Am J Clin Nutr* 2005;81:1253–4.
6. Sachiko T, editor. Obesity assessment: tools, methods, interpretations. A reference case: the RENO Diet-Heart Study. Chapman & Hall, 1997.
7. NUTTAB. Canberra: Commonwealth Department of Health, 2005.
8. Dobson AJ, Blijlevens R, Alexander HM, et al. Short fat questionnaire: a self administered measure of fat intake behaviour. *Aust J Public Health* 1993;17:144–9.
9. Ainsworth BE, Haskell WL, Whitt MC, et al. Compendium of physical activities: an update of activity codes and MET intensities. *Med Sci Sport Exerc* 2000;32(Suppl 9):S498–504.

### Summary of important points

- Obesity (and overweight) is a major epidemic facing clinicians.
- Professionals are currently handicapped by a lack of tools to assist in customising weight loss prescription.
- A validated questionnaire (the DAB-Q) designed to identify dietary and activity habits specific to each patient, supports successful weight loss and maintenance.

### Resource

The DAB-Q questionnaire is available free to patients of doctors who have registered at [www.professortrim.com/DAB-Q](http://www.professortrim.com/DAB-Q)

Conflict of interest: none declared.

### References

1. AusDiab Report. Diabetes and associated disorders in Australia 2000. International Diabetes Institute Melbourne, 2001.
2. National Health and Medical Research Council. National clinical guidelines for weight control and

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