Overweight and obesity: The efficacy of diets for weight maintenance after weight loss
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Background
Overweight and obesity are typical phenomena of affluent societies and are one of the most serious public health problems as obesity has a high morbidity and mortality risk. Previous study results show that dietary and behavioural as well as extensive lifestyle programmes have a long-term effect only for a few affected persons in terms of a permanent weight maintenance after weight reduction.

Objectives
The health technology assessment (HTA) report examines which diets are effective for a sustainable weight maintenance. Further questions are the economic and ethical-social implications.

Methods
A systematic electronic database search has been conducted in April 2012, complemented by a hand research by the authors. Important key words were among others overweight, obesity, diet, weight reduction.

Results
33 medical and one study with ethical/social questions were considered. The studies are mainly from Anglo-American countries, particularly from the USA (14 studies), only one study is from Germany. Almost all studies show a high evidence (evidence level 1A to 2C) due to their study design (meta-analysis, randomised controlled trials [RCT]), only two studies have low evidence (evidence level 4).

On the whole the study results prove that all examined diets are effective, also with regard to weight maintenance. However, the results show a large range of deviation due to their different intervention and follow-up-periods. It is not apparent that one specific diet is superior to other diets. That means that moderate low-fat, low-calorie, high-protein and high-carbohydrate diets show almost the same effect. The effectiveness of a vegan diet for weight maintenance seems to be weaker as well as formula-diets. For the success of weight maintenance measures it is essential that nutritional counseling considers the individual needs, abilities and resources of a patient as well as the specific risk factors and sets realistic goals.

Irrespective of the type of diet, the following factors show effectiveness for weight maintenance: a daily calorie deficit of 400 to 600 kcal, regular physical activity (2,000 kcal/week), low-fat intake, generous consumption of fruits and vegetables, regular use of formula-diets and/or fortified food, self-
monitoring and ongoing coaching or behaviour therapy support, especially in terms of a multi-component programme. Diet combined with physical activity is more effective than an intervention which is only based on diet. The support of a group and the regular attendance of group meetings are connected to further significant weight losses in the weight maintenance period. Obesogenic living conditions have as well an influence on the effectiveness of diets.

Discussion
Although the studies have a overall high level of evidence, the usually high drop-out rate and a substantial loss to follow-up in a longer intervention period have to be considered when analysing the results. Further limitations are the main use of self-reported protocols to record the actual nutritional status as well as the inadequate consideration of physical activity on weight loss. Furthermore, several studies record only a small number of cases, in- and exclusion criteria are not precisely defined and the comparability of the groups or studies is limited.

Conclusion
Taking into account the identified effective factors a successful weight maintenance can be achieved with the use of diets. Due to the numerous intervening external factors of an obesogenic living condition weight maintenance after weight loss is difficult, especially for obese persons with socially disadvantaged background. Here is a public health need for action. There is a lack of knowledge regarding direct and indirect costs which can be saved from obesity therapies.