

Type 2 Diabetes: Low Energy Diet (VLED)

→ Summary

Obesity is a major risk factor for type 2 diabetes. Short-term dietary energy restriction that results in meaningful weight loss has been shown to improve glycaemic control, and in some cases, 'reverse' type 2 diabetes. Very low energy diet (VLED) or meal replacement products used to reduce dietary energy intake. VLEDs typically provide less than 3300 kJ (800 kcal) per day.

→ Indication & Benefits

Overweight (Body Mass Index (BMI) 27-30 kg/m²) or obese (BMI >30 kg/m²) adults with type 2 diabetes. VLEDs have been shown to be equally effective as bariatric surgery for weight loss, glycaemic control and reduction in triglycerides, in a meta-analysis of trials with a follow-up of 1-5 years.¹ Therefore, VLEDs are an option to consider for individuals with type 2 diabetes who are considering bariatric surgery.

→ Contraindication and Adverse Effects

Precautions

Consider effects on blood glucose level and blood pressure. The individual's use of antihyperglycaemic and antihypertensive medications may need to be modified. Monitor for long-term use (beyond 12 weeks as a total diet replacement).

Adverse effects

Common adverse effects of total diet replacement with VLED are constipation, increased sensitivity to cold, headache and dizziness. These are usually mild to moderate and resolve over time.

→ Practical Description

Intervention

One trial of overweight or obese individuals not on insulin used VLED products to replace all usual meals for 12 weeks or until BMI fell to <23 kg/m². Oral hypoglycaemic agents and antihypertensive medications were withdrawn and gradually restarted if type 2 diabetes or hypertension returned. The total diet replacement phase was followed by a phase where food was reintroduced to replace VLED products over 2-8 weeks before the return to a food-based diet.^{2,3}

VLEDs are viewed as acceptable to most people, with low drop-out rates observed in trials. Rapid weight

loss reportedly increases participants' confidence and motivation. Participants may experience less hunger with rapid weight loss compared with a more liberal diet.

Tips and challenges

- Consider close (e.g. one week after commencement and then 2-weekly) monitoring of the individual in the total diet replacement phase.
- Involve an Accredited Practising Dietitian for individualised dietary support, particularly when reintroducing food.
- Advise the individual on fluid intake and a soluble fibre supplement to prevent constipation.
- Advise the individual to continue their usual daily activities or even increase physical activity.
- Recognise the need for flexibility, e.g. eating in social situations.
- Incorporate behavioural change methods, including elements of cognitive behavioural therapy, to maintain weight loss.

→ Availability

Many brands of VLEDs are available from pharmacies and through resellers. Costs range from \$7.50 to \$10.50 a day for pharmacy brands though brands offered by resellers can be much more expensive.

→ Resources

Baker Heart and Diabetes Institute: [VLED program for health professionals \(baker.edu.au\)](https://www.baker.edu.au/health-professionals/vled-program)

→ Evidence

Grading

Moderate

References

1. [Huang YS, Zheng Q, Yang H, et al. Efficacy of intermittent or continuous very low-energy diets in overweight and obese individuals with type 2 diabetes mellitus: a systematic review and meta-analyses. J Diabetes Res 2020;4851671.](#)
1. [Lean MEJ, Leslie WS, Barnes AC, et al. Primary care-led weight management for remission of type 2 diabetes \(DiRECT\): an open-label, cluster-randomised trial. Lancet 2018;391:541-51.](#)
1. [Leslie WS, Ford I, Sattar N, et al. The Diabetes Remission Clinical Trial \(DiRECT\)/ protocol for a cluster randomised trial. BM Fam Pract 2016;17:20.](#)

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