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Low energy diets

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We are going to discuss

1. What low energy diets are
2. Mechanisms underpinning T2DM remission
3. Reasons for rise in popularity
4. Current use in the NHS (United Kingdom)

What are low energy diets?

Diets that restrict energy intake to 800-900kcal/day

Achieves negative energy balance for rapid weight loss

Useful for:

- Weight loss and liver volume reduction (e.g pre-bariatric surgery)
- Normalisation of blood glucose, pressure and cholesterol levels

What do LED look like?

Meal replacement products

~200kcal, 20g protein per product

~25% of daily vitamin, mineral and EFA RNI

Can be food based

+ multivitamin supplement

+ essential fatty acid supplement

+ closer monitoring

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Duration of LED?

Usually up to 12 weeks

80% of weight loss achieved by 8 weeks

Expected weight loss with good adherence is 10-15%

Novel approaches include intermittent or cycles of LED (e.g 4 weeks on 4 weeks off or 5 days on 2 days off)

Safety and acceptability of LED?

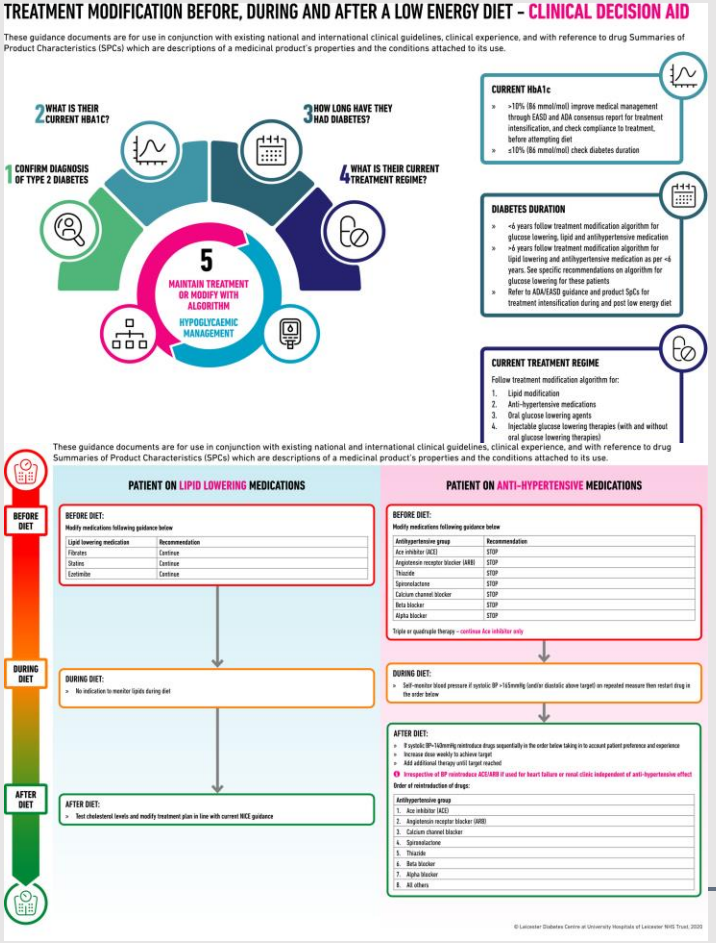
Evidence of efficacy in primary and secondary care

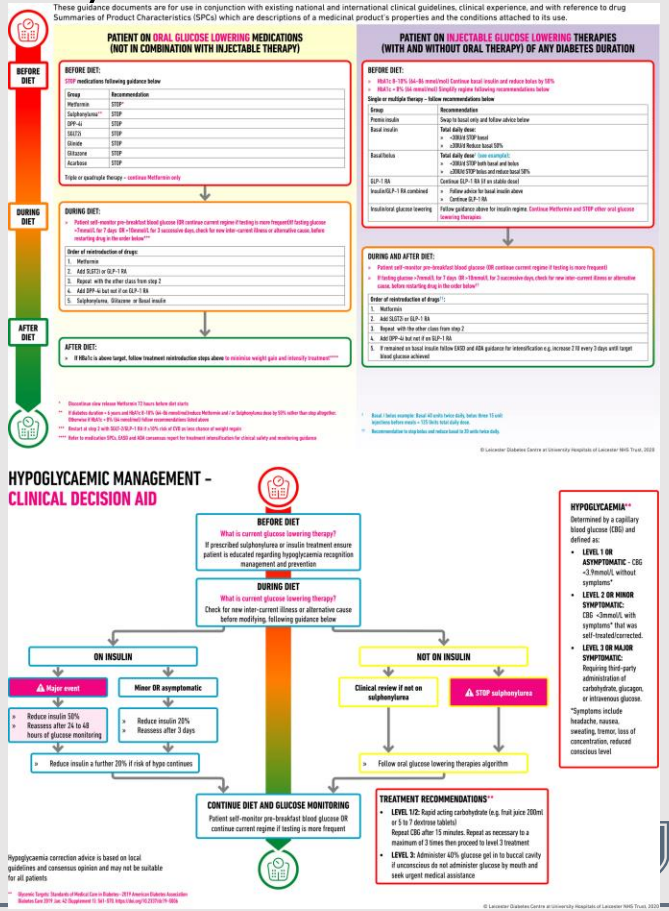
Works through one to one counselling, group or digital intervention

Common symptoms are mostly transient:

- Constipation, fatigue, nausea, diarrhoea, indigestion, hair loss
- Some risk with timing cessation of blood glucose lowering and antihypertensive medication

Medication withdrawal algorithm (decision aid) for LED





https://pubmed.ncbi.nlm.nih.gov/32020691/

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T2DM remission

Intervention ***Note: Documentation of remission should include a measurement of HbA_{1c} just prior to intervention***	**Interval before testing of HbA_{1c} can reliably evaluate the response**	**Subsequent measurements of HbA_{1c} to document continuation of a remission**
Pharmacotherapy	At least 3 months after cessation of this intervention	Not more often than every 3 months nor less frequent than yearly
Surgery	At least 3 months after the procedure *and* 3 months after cessation of any pharmacotherapy	
Lifestyle	At least 6 months after beginning this intervention *and* 3 months after cessation of any pharmacotherapy	

Mechanism for T2DM remission?

Personal fat threshold hypothesis

Individuals have specific limits to how much fat can be deposited subcutaneously before ectopic fat build-up around the liver and pancreas begins to actively inhibit beta cell function

Insulin secretion starts to fall as beta-cells die out forcing remaining ones to work harder

Process can be reversed and beta cell function rescued through acute energy restriction and ectopic fat loss…if done early in T2DM diagnosis

LED criteria for eligibility in primary care (general practice)

These are aligned to the evidence-base but have been adapted pragmatically. Individuals who satisfy all the following eligibility criteria may be referred to the Service:

- Aged 18 to 65 years (inclusive)
- Diagnosed with Type 2 diabetes within the last 6 years
- BMI ≥ 27kg/m² in people from White ethnic groups (adjusted to ≥ 25kg/m² in people from Black, Asian and other ethnic groups)
    - BMI obtained from self-measured weight is acceptable for referral. If this cannot be obtained, a clinic-measured value within the last 12 months may be used, provided there is no concern that weight may have reduced since last measured such that the individual would not be eligible for the T2DR programme at present
- HbA1c measurement taken within the last 12 months, in line with the following:
    - If on diabetes medication (HbA1c result reflects the effect of glucose-lowering medications), HbA1c 43-87 mmol/mol
    - If not on diabetes medication (HbA1c result does not reflect the effect of glucose-lowering medications), HbA1c 48-87 mmol/mol
    - If there is any concern that HbA1c may have changed since last measured, such that repeat testing may indicate that the individual would not be eligible for the T2DR programme at present, HbA1c should be rechecked before referral is considered
- Must have attended for monitoring and diabetes review when last offered, including retinal screening, and commit to continue attending annual reviews, even if remission is achieved (no need to wait for retinal screening to take place if newly diagnosed)
- Does not meet any exclusion criteria (see next slide)

LED criteria for eligibility in primary care (general practice)

If any of the following apply, the individual is unsuitable for the NHS T2DR Programme and referral will not be accepted (exclusions):

- Has been on the NHS T2DR Programme (or NHS LCD Programme) in the last 12 months, unless referred but did not start TDR
- Current insulin user
- Pregnant or planning to become pregnant within the next 6 months
- Currently breastfeeding
- Has at least one of the following significant co-morbidities;
    - active cancer
    - heart attack or stroke in last 6 months
    - severe heart failure (defined as New York Heart Association grade 3 or 4)
    - severe renal impairment (most recent eGFR less than 30mls/min/1.73m2)
    - active liver disease other than non-alcoholic fatty liver disease (i.e. NAFLD is not an exclusion)
    - active substance use disorder
    - active eating disorder
    - porphyria
    - known proliferative retinopathy that has not been treated (no need to wait for retinal screening before referral if newly diagnosed)
- Previously had bariatric surgery
- Health professional assessment that the person is unable to understand or meet the demands or monitoring requirements of the programme

If ineligible for the T2DR Programme, consider whether the individual would benefit from other weight management support

Type 2 diabetes remission through Low Energy Diet (LED)

LED: 800 to 900kcal per day for 8-12 weeks (usually through meal replacement products)

Popularised by **DiRECT** trial findings:

- **Year 1: 68 out 149 achieving remission (46%)**
- **Year 2: 53 out of 68 sustaining remission (36% out of those who undertook LED)**
- **Year 5: 11 out of 53 sustaining remission (7% out of those who undertook LED)**

Type 2 diabetes remission through Low Energy Diet (LED)

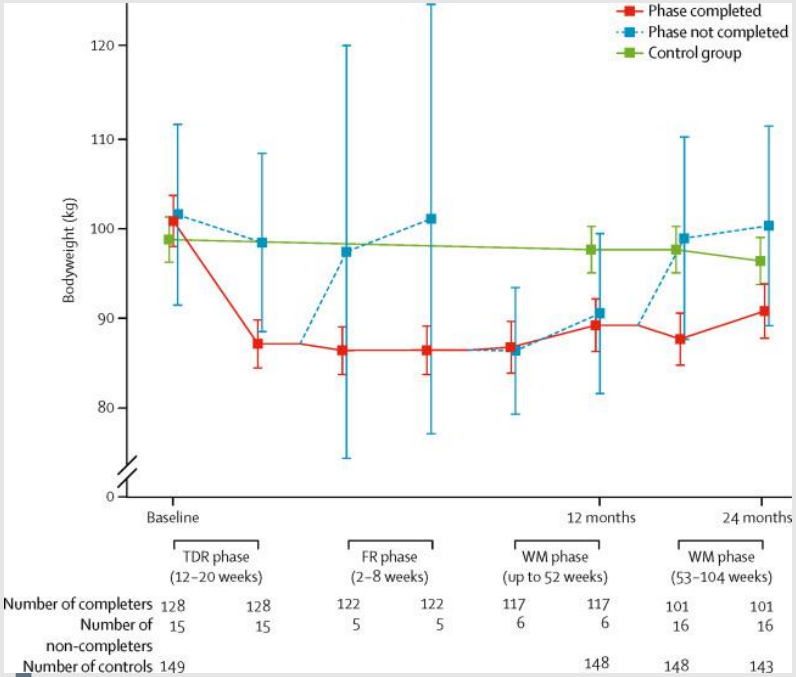
Mechanism works for those without overt obesity as defined by BMI (<27kg/m^2)

RETUNE trial findings:

- 14 out 20 achieving remission (70%)
- Less weight loss was needed (6.5%)

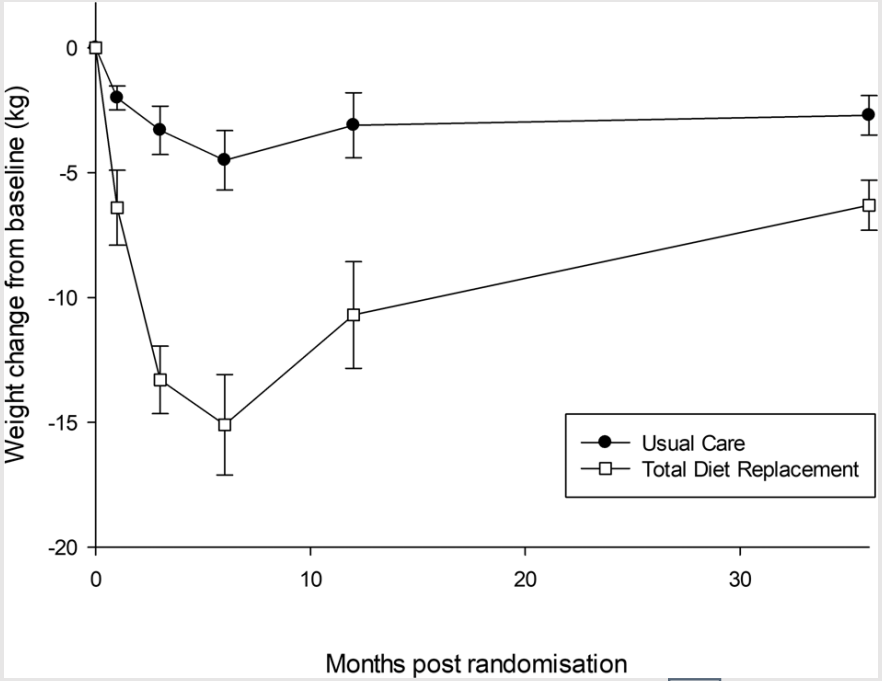
Weight loss post LED is regained despite support

DiRECT – 2 year weight outcomes



(Lean et al. 2019)

DROPLET – 3 year weight outcomes



(Astbury et al. 2021)

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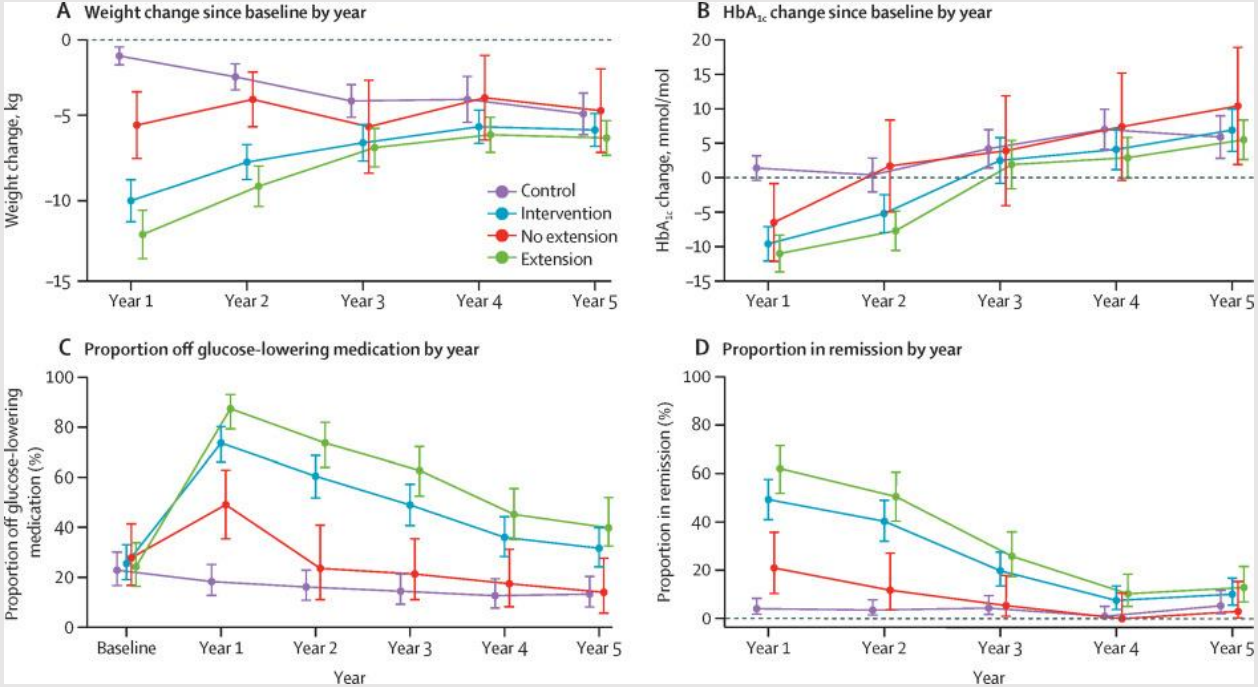
Weight loss post LED is regained despite support

DiRECT – 5 year weight outcomes



(Lean et al. 2024)

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Why the weight regain post LED?

Driven by biological changes

Compensatory increase to hunger linked to increased ghrelin and reduced PYY, leptin, amylin and CCK

Reduction in basal metabolic rate

Personal circumstances change

If the new adopted diet is not adhered to post-LED the weight regain will naturally follow

Positive lifestyle changes are hard to maintain and disrupted through adverse life events

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Where does this leave us

Big rise in LED popularity following DIRECT trial results

NHS LED pilot of 5,000 now morphed into national Remission Programme

LED now actively offered in primary care nationally and in secondary care where services have been set up to facilitate this

REMEMBER: Whether it's a clinical trial or routine care, you must offer safe food reintroduction to patients and support them with long term weight loss maintenance

Where does this leave us

- A safe and tested option especially for those who do not want to opt for medication
- Suitable for a wide BMI range
- Caution with >65yrs age as weight loss (even sustained) does not present without risks and the evidence is weaker

Very popular (just like GLP1s…) but careful with messaging

Culture

Katie Price low calorie diet advert for Skinny Food banned

32 minutes ago

Katie Price was seen eating porridge, a wrap and a low calorie curry

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https://www.bbc.co.uk/news/entertainment-arts-68713464 (03.04.2024)