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Medicines Management in Type 1 Diabetes

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Endocrinologist, Campbelltown Hospital

WESTERN SYDNEY UNIVERSITY

diabetes australia

Ingham Institute Applied Medical Research

Australian Commission on Safety and Quality in Health Care

NSW GOVERNMENT South Western Sydney Local Health District

Maridulu Budyari Gumal Working together for good health and wellbeing

DOMTRU

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Presenter Disclosure

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Equipment - AMSL (loan)

Associate Editor - Diabetes Care

NB - None related to this presentation

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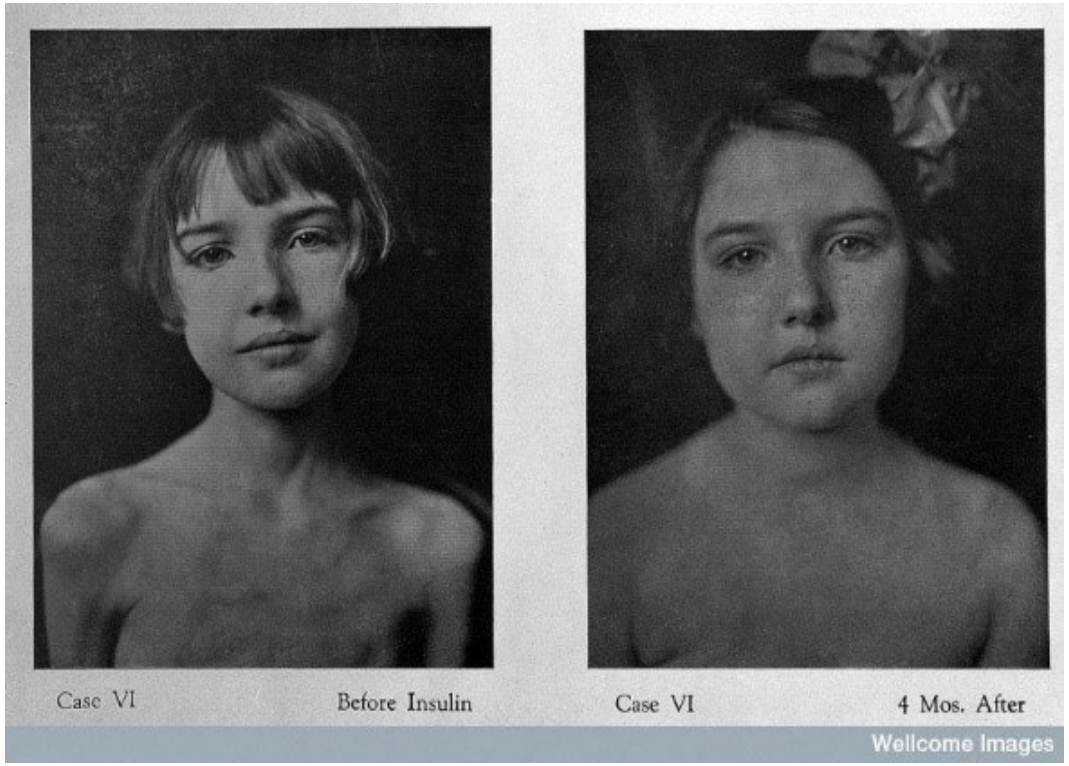
Medicines Management in Type 1 Diabetes

- Principles of Insulin management
- Hypoglycaemia
- Avoiding Hypoglycaemia and Hyperglycaemia
- Emerging issues

Discovery of insulin - 1921



Management of insulin

- Longer acting insulins allowed twice and then once/day insulin regimens

- More concern over hypoglycaemia than long term complications

- Did not think it was necessary to change insulin doses
- -> Fixed insulin, fixed carbohydrate regimen
- -> ”Diabetic Diet”

- Make it easy for people with diabetes
- -> Once/day long acting
- -> Twice per day mixed quick and medium acting

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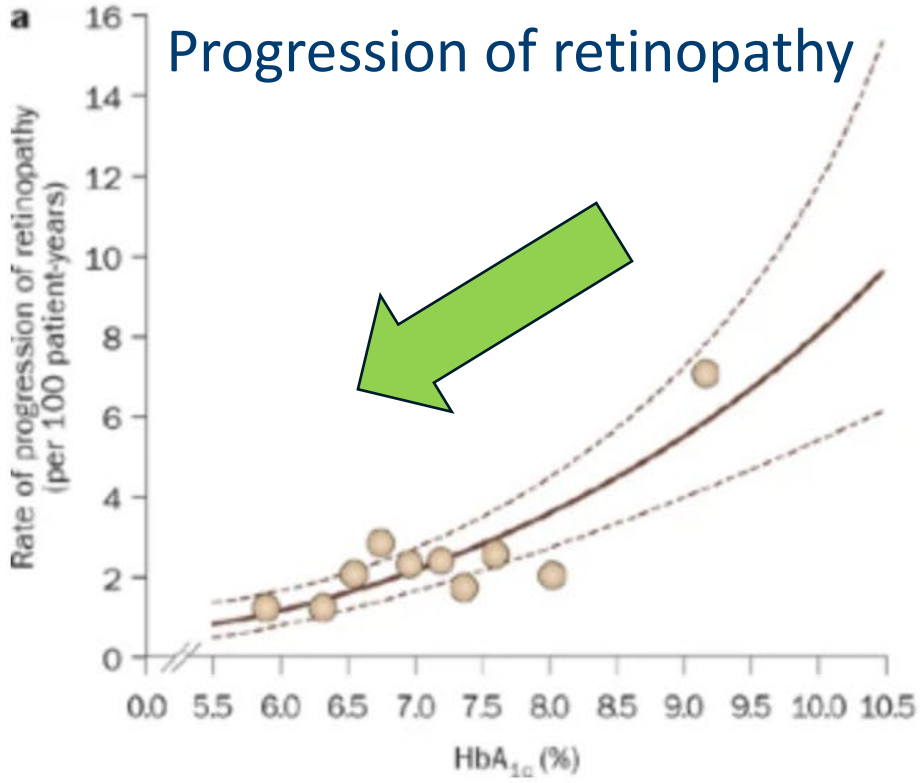
1983 – 1993: The Diabetes Control and Complications Trial

Diabetes Control and Complications Trial

EDIC EPIDEMIOLOGY OF DIABETES INTERVENTIONS AND COMPLICATIONS



- 1441 people with T1D randomised to intensified insulin therapy or usual care

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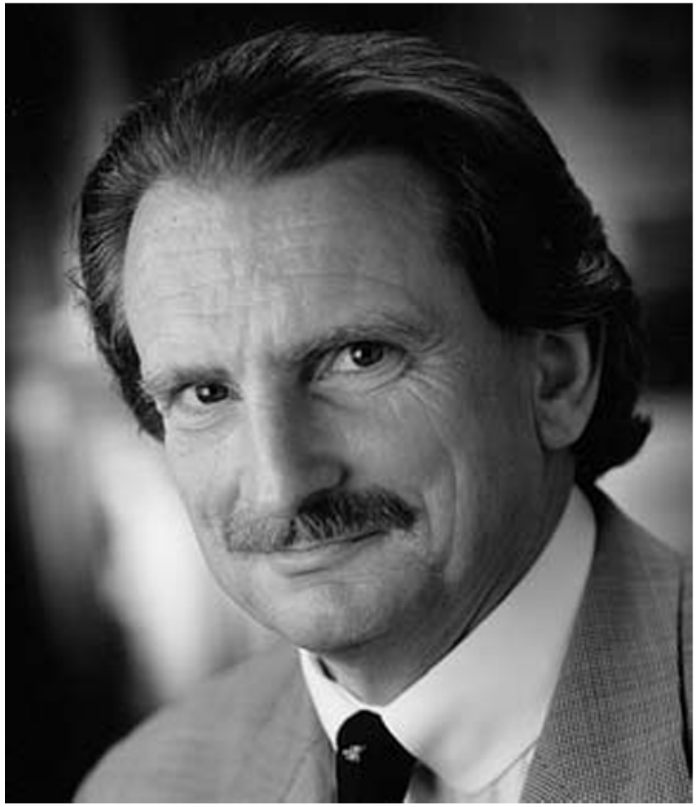
New Engl J 1993; 329:927-986

- Type 1 diabetes is a disease of insulin deficiency
- The treatment of type 1 diabetes is insulin replacement – not diet



Prof Michael Berger

02.06.1944 – 18.08.2002

researcher, physician, educator, visionary

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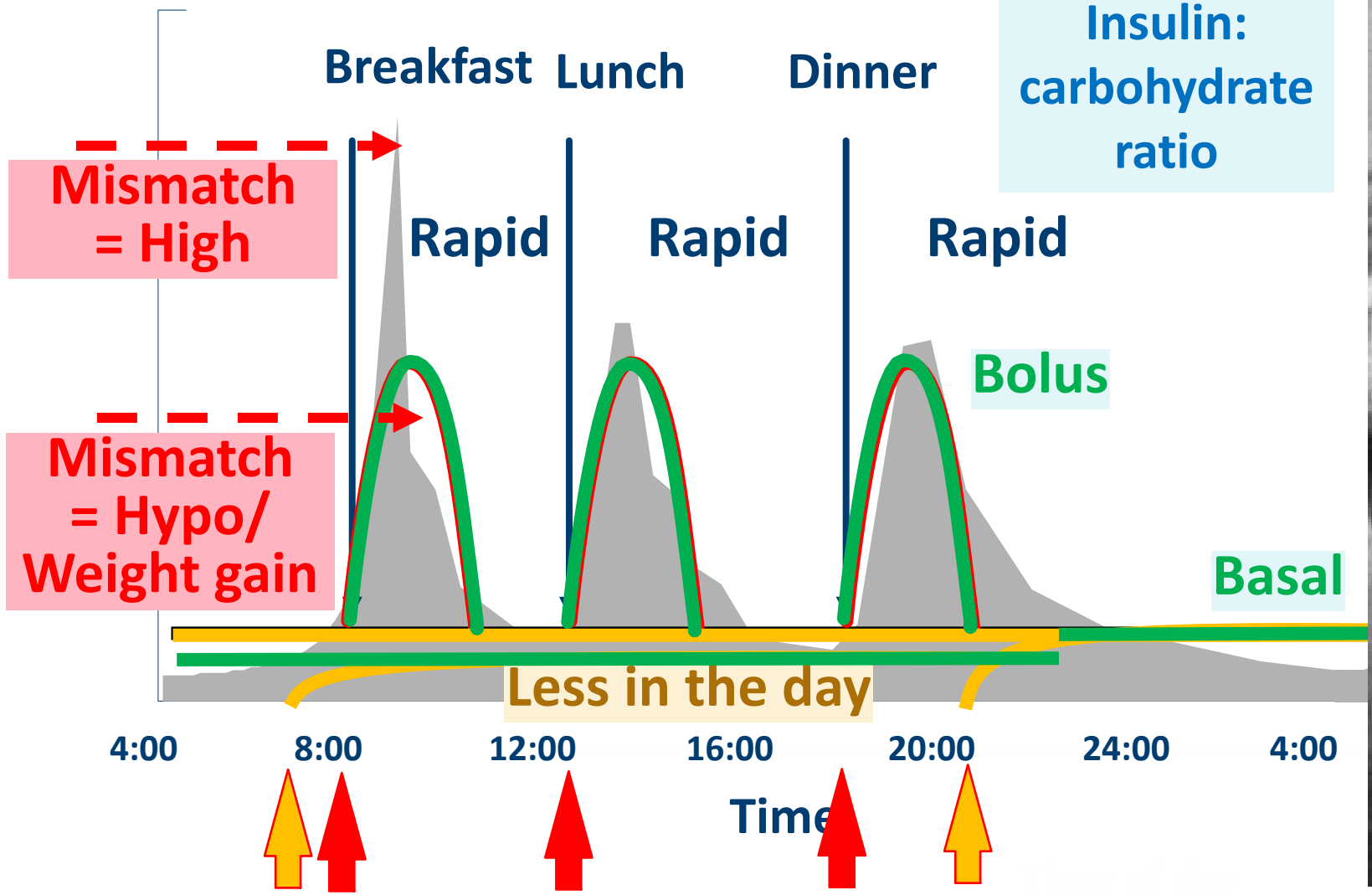
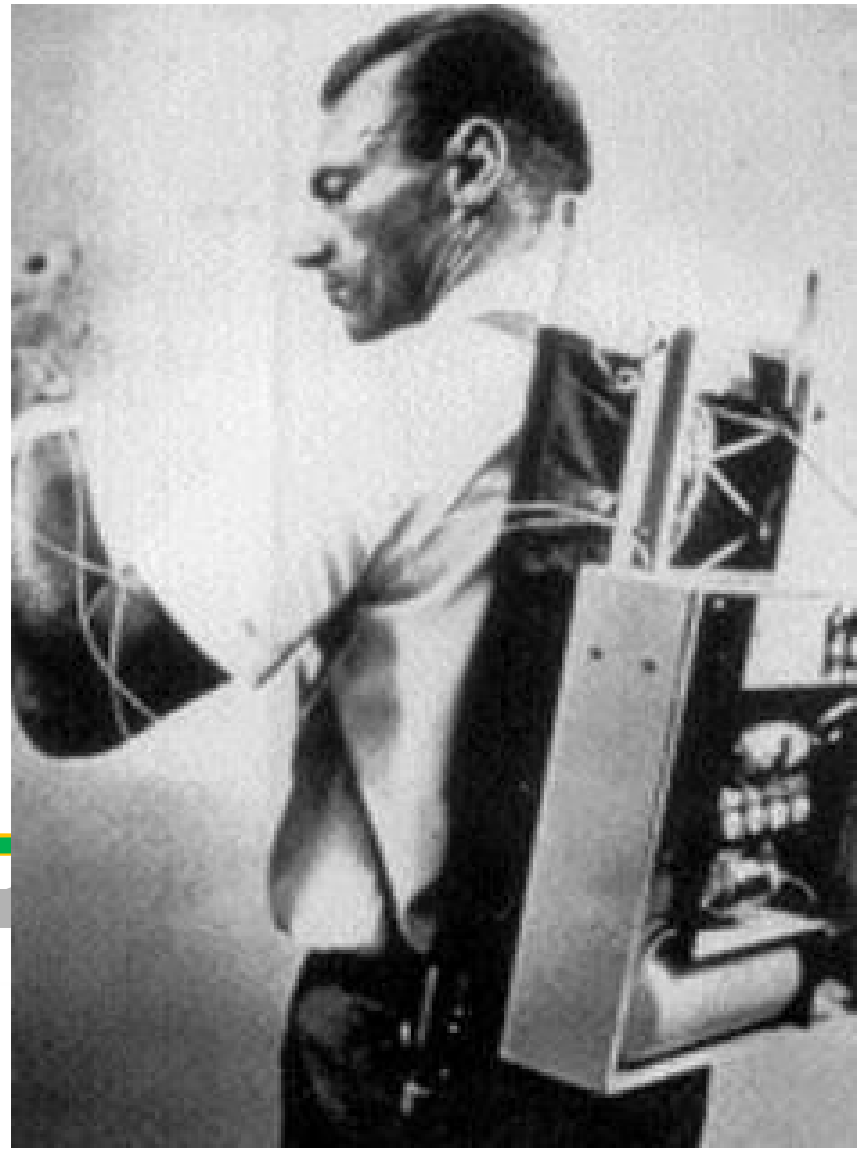
Carb Type, Amount?

Insulin: carbohydrate ratio





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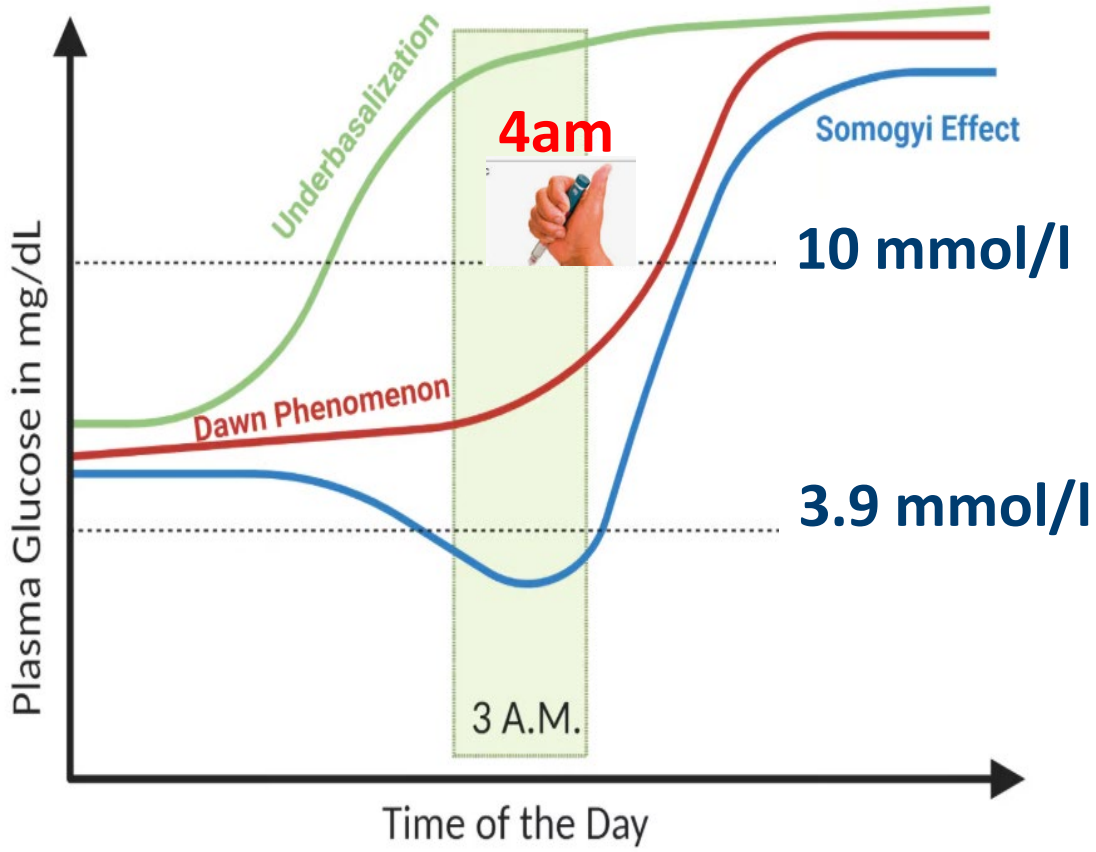
If High->correction/Insulin Sensitivity Factor-Needs a target

Everyone is different!



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Hypoglycaemia - Implications

- Hypos disrupt everyday activities, provokes unpleasant symptoms
- Severe hypoglycaemia can cause coma, seizures, strokes, arrhythmias and even death

- Negative effects on mood and emotions
- Impairs cognitive function; can affect performance of many activities; falls
- Long term effects, weight gain

Frier, B. M. Nat. Rev. Endocrinol. 10, 711–722

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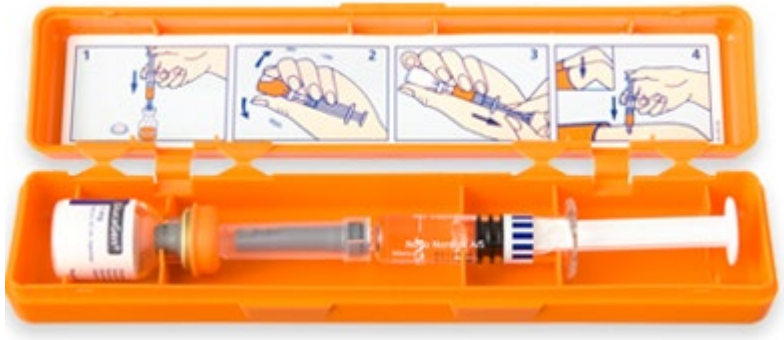
Hypoglycaemia Assessment, Prevention, and Treatment (continued)

6.16 Glucagon should be prescribed for all individuals taking insulin. **A** Family, caregivers, school personnel, and others providing support to these individuals should know its location and be educated on how to administer it. Glucagon preparations that do not have to be reconstituted are preferred. **B**

6.17 All individuals taking insulin **A** should receive structured education for hypoglycemia prevention and treatment, with ongoing education for those who experience hypoglycemic events.

6.18 One or more episodes of level 2 or 3 hypoglycemia should prompt reevaluation of the treatment plan, including deintensifying or switching diabetes medications if appropriate. **E**



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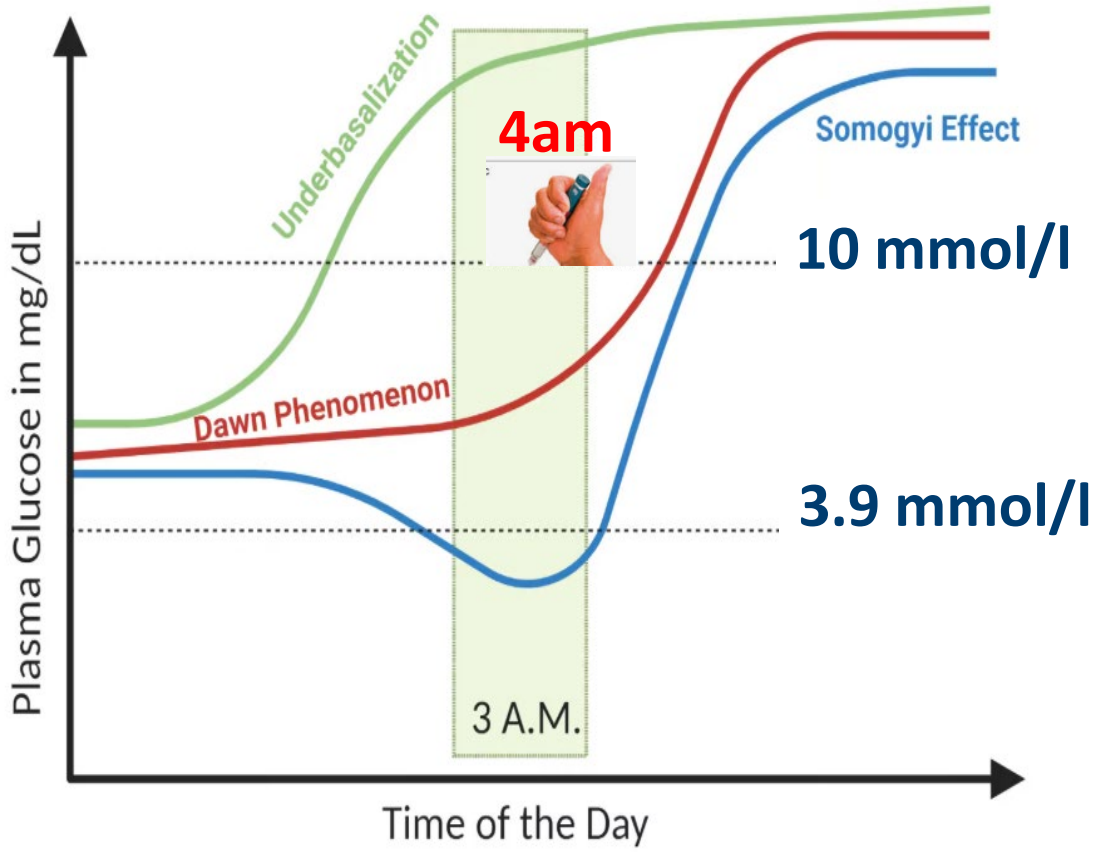
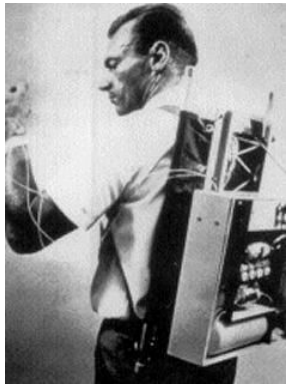
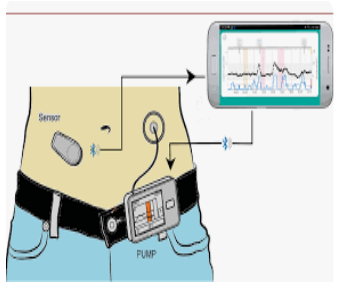
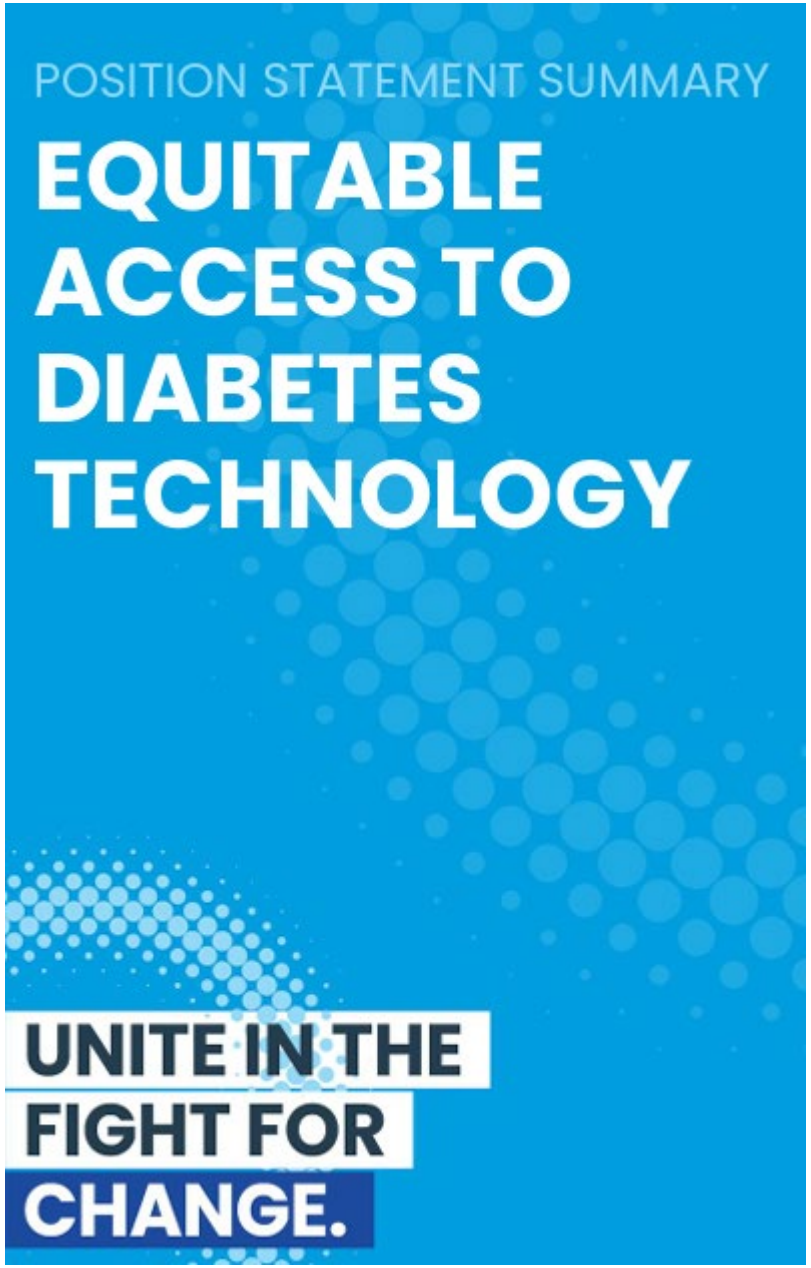
Everyone is different!







Automated Insulin Delivery $$



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Avoiding Hypoglycaemia and Hyperglycaemia in Type 1 Diabetes

If it weren't for hypoglycaemia, we could give as much insulin as we want!

1. Better Insulin Regimen

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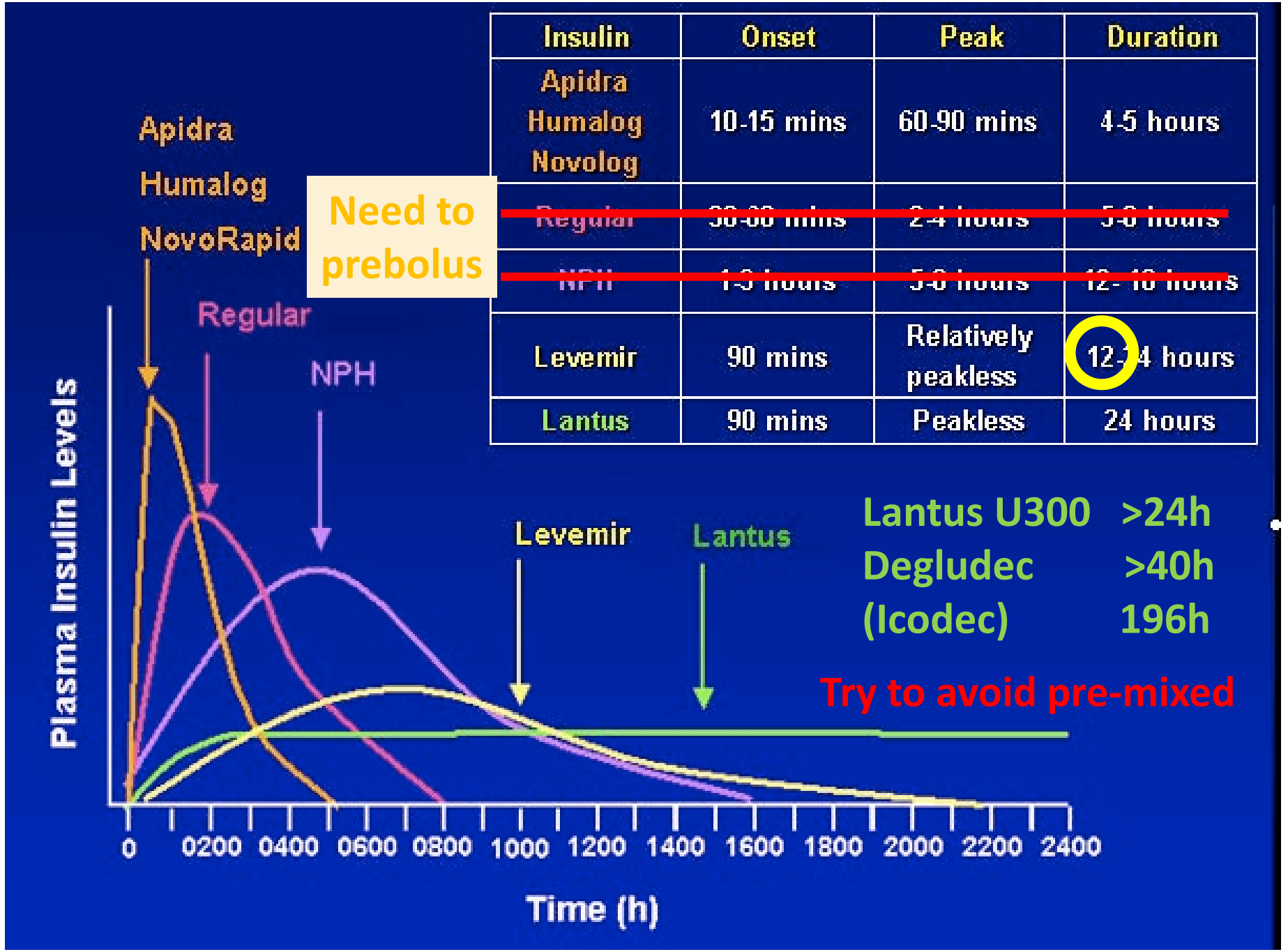
Insulin regimens

Insulin	Onset	Peak	Duration
Apidra Humalog Novolog	10-15 mins	60-90 mins	4-5 hours
~~Regular~~	~~30-60 mins~~	~~2-4 hours~~	~~5-8 hours~~
~~NPH~~	~~1-3 hours~~	~~5-8 hours~~	~~12-18 hours~~
Levemir	90 mins	Relatively peakless	12-24 hours
Lantus	90 mins	Peakless	24 hours

Need to prebolus



Lantus U300 >24h
Degludec >40h
(Icodec) 196h

Try to avoid pre-mixed

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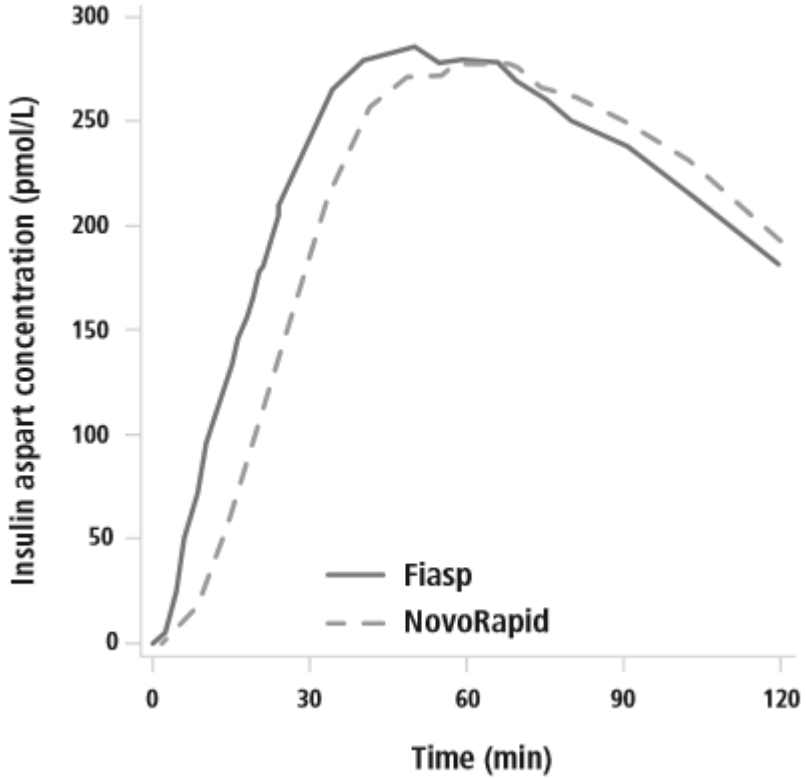
Everyone is different: Ultra rapid Insulins

Fiasp = Ultra fast aspart (5m)

Lyumjev = Ultra fast lispro (11m)



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Make it easy- use a pen!

Devices

Non-disposable - 0.5 – 1 unit increments

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NSW TAG NSW Therapeutic Advisory Group Inc.

Know your insulins

Approved for use at:

Duration of action	Appearance	Insulin brand name (active ingredient name) 100 units/mL unless otherwise stated	When to administer
Ultra short acting	Clear	NovoRapid® (insulin aspart)#^ · Fiasp® (faster-acting insulin aspart)#^ · Humalog® U200 (insulin lispro) 200 units/mL (high concentration) · Apidra® (insulin glulisine)*^ · Humalog® (insulin lispro)*^	(immediately before meals)
Short acting	Clear	Actrapid® (insulin neutral)^ · Humulin® R (insulin neutral)^ · Insuman® Infusat (insulin neutral): available via SAS	(up to 30 minutes before meals)
Intermediate acting	Cloudy	Humulin® NPH (insulin isophane)^ · Protaphane® (insulin isophane)^ · Protaphane® Innolet® (insulin isophane)	ONCE or TWICE daily (with/without food)
Mixed long and short acting	Cloudy	Humulin® 30/70 (insulin neutral 30% + insulin isophane 70%)^ · Mixtard® 30/70 (insulin neutral 30% + insulin isophane 70%) · Mixtard® 30/70 Innolet® (insulin neutral 30% + insulin isophane 70%) · Other less commonly used product: Mixtard 50/50® (insulin neutral 50% + insulin isophane 50%) cartridge	ONCE or TWICE daily (up to 30 minutes before meals)
Mixed long acting with ultra short acting	Cloudy	NovoMix® 30 (insulin aspart 30% + insulin aspart protamine 70%)* · Humalog® Mix25 (insulin lispro 25% + insulin lispro protamine 75%)* · (Less commonly used) Humalog Mix50® (insulin lispro 50% + insulin lispro protamine 50%)*	ONCE or TWICE daily (immediately before meals)
Mixed ultra long acting with ultra short acting	Clear	Ryzodeg® 70/30 (insulin aspart 30% + insulin degludec 70%)*	ONCE or TWICE daily (immediately before meals)
Long acting	Clear	Levemir® (insulin detemir)* · Optisulin® (insulin glargine)* · Semglee® (insulin glargine) · Different concentrations of insulin glargine are NOT directly interchangeable. Continue the patient's usual insulin glargine product whilst in hospital, whenever possible. · Toujeo® (insulin glargine) 300 units/mL (high concentration)	Usually ONCE daily‡ (sometimes large doses prescribed TWICE daily) ‡(with/without food)

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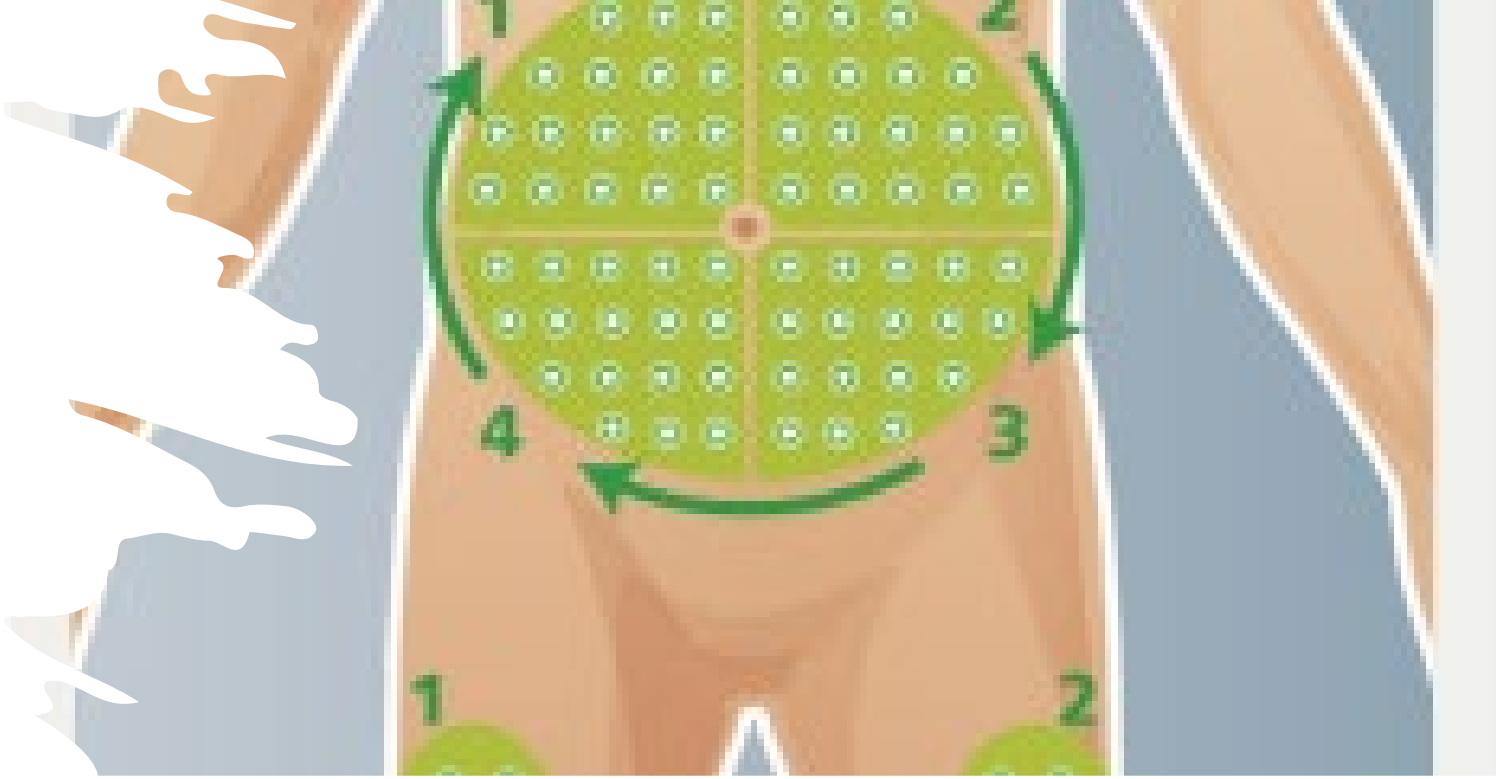
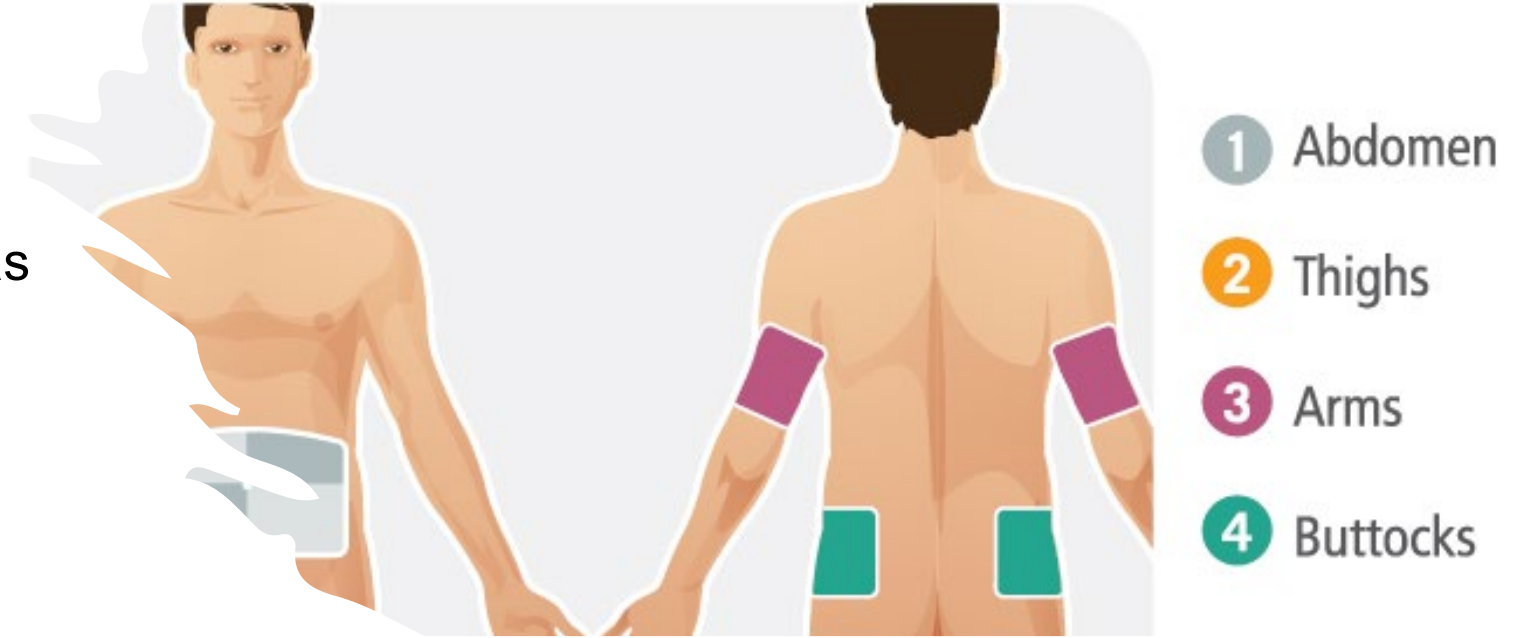
Injection sites

- Children
- Adults

- Absorption can be affected by:
- Needle length
- Technique
- Injecting rapid insulin into areas of muscle





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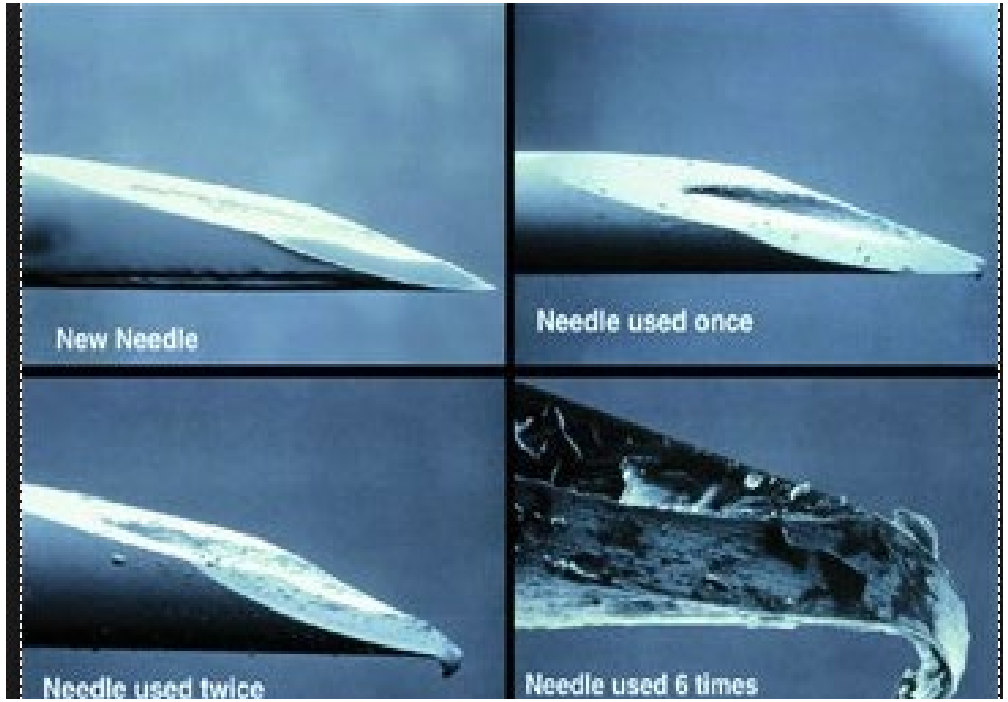
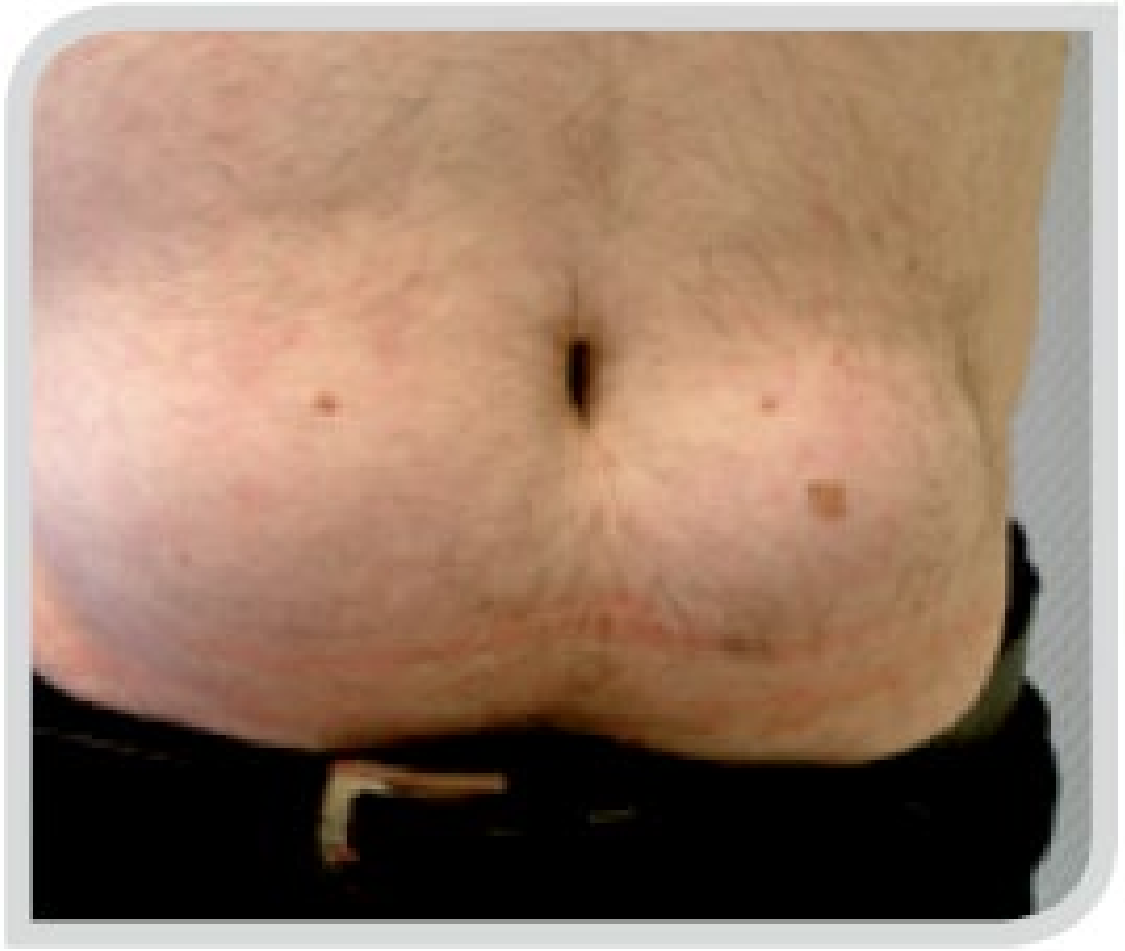
How many times should a pen needle be used?

- All pen needles are SINGLE use only
- FREE under the National Diabetes Services Scheme (NDSS)



Lipohypertrophy



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Avoiding Hypoglycaemia and Hyperglycaemia in Type 1 Diabetes

If it weren't for hypoglycaemia, we could give as much insulin as we want!

2. Technology can help!

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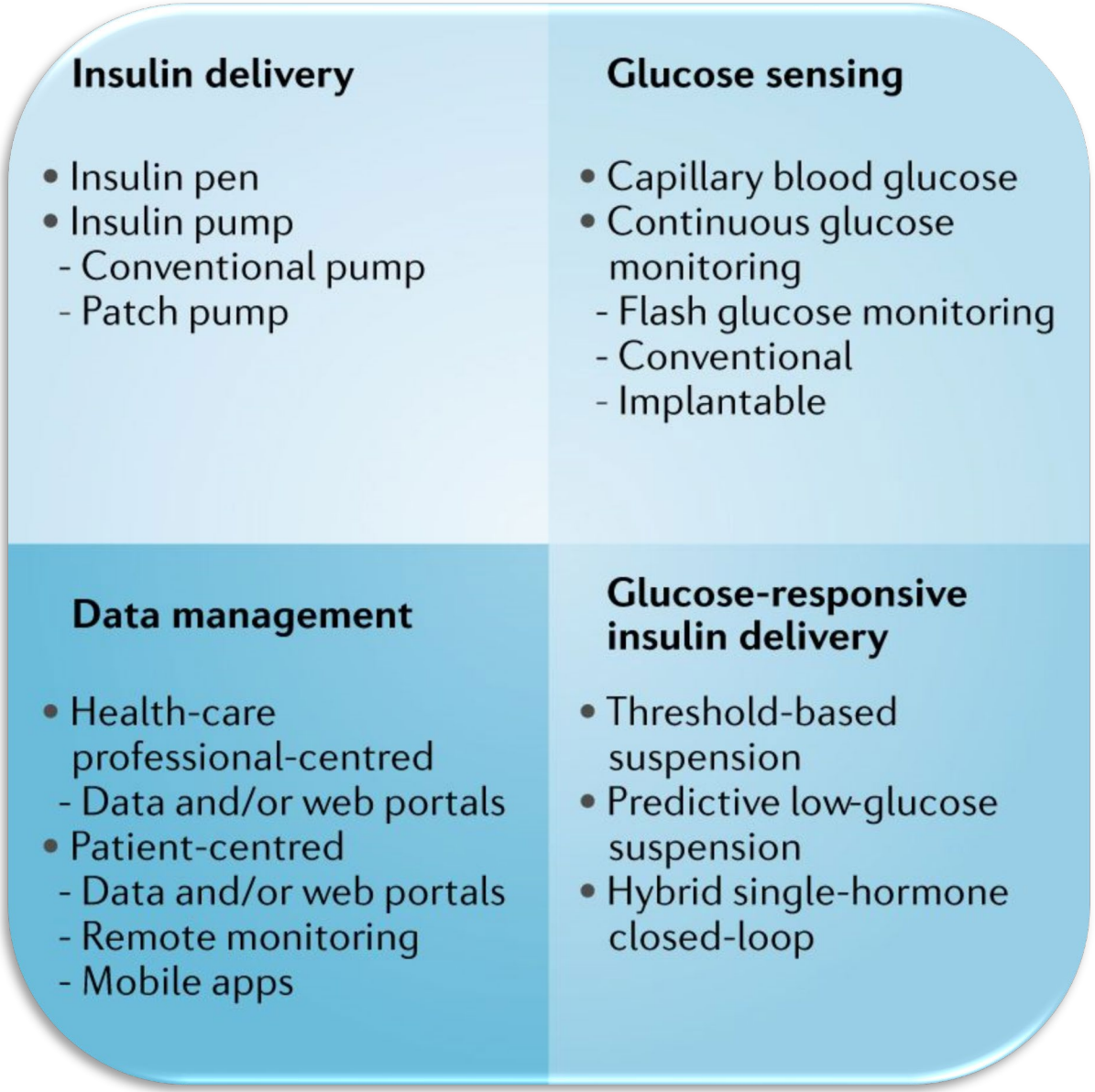
Current technology in type 1 diabetes



If High-> correction/Insulin Sensitivity Factor- Needs a target

Insulin: carbohydrate ratio

Tauschmann and Hovorka. Nature Reviews Endocrinology, 2018 August

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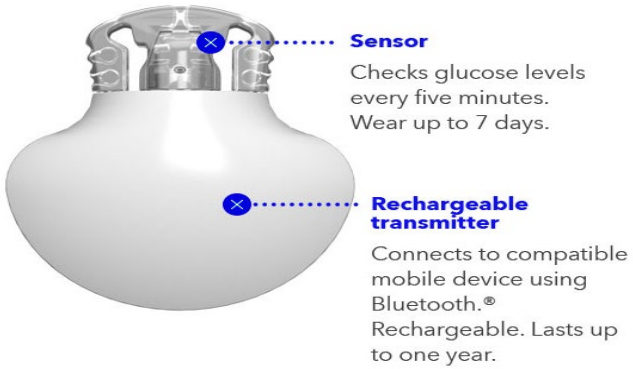
Continuous Glucose Sensors

DexcomG7 and G6

Guardian 4
smart CGM



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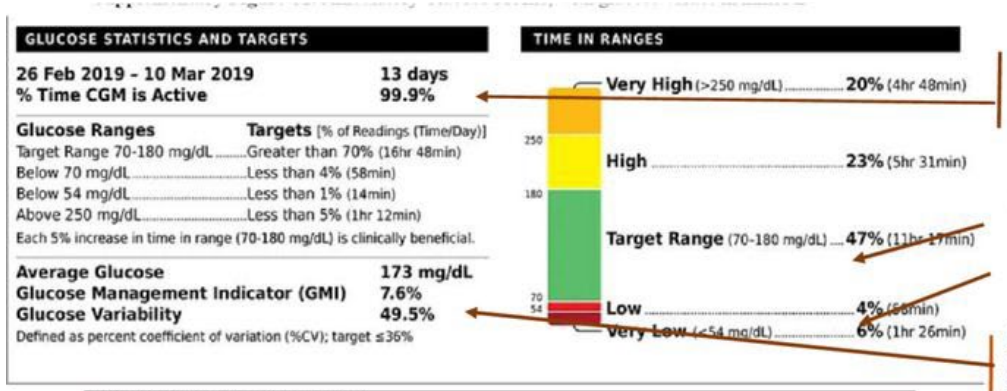
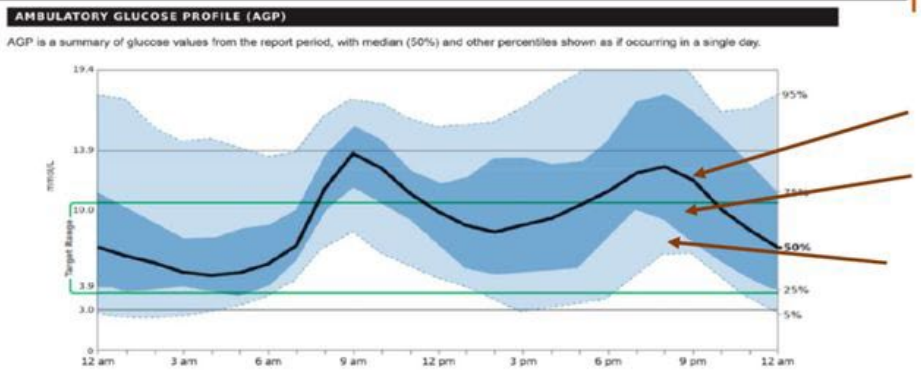
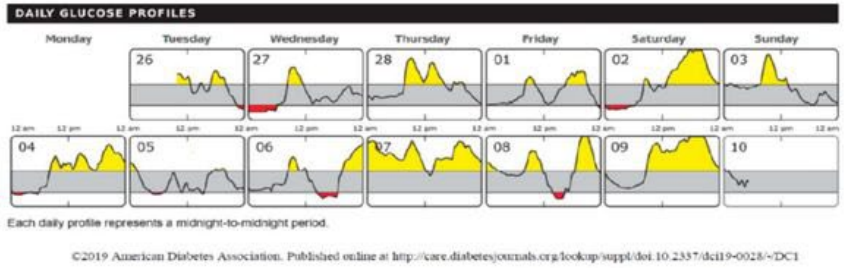
Example of an AGP (ambulatory glucose profile)







Ambulatory Glucose profile (AGP) report is displayed for 14 days of sensor wear. It correlates well to 3 months of *CGM data
CGM is active 99.9%% of time. Recommendation is for min 70% usage (10 days) for reliable data

Time in range (TIR)- aim is to slowly increase time spent in range. TIR (3.9-10mmol/l) of 70% correlates to HbA1c of 53 mmol/mol
Aim for low (<3.9 mmol/l) to be limited to < 5% and very low (<3.0mmol/l) to be <1%

Glucose Management Indicator (GMI)- Provides with estimated HbA1c

Glucose variability (GV)- refers to how much the glucose readings varies from mean or median glucose. Low GV indicates stable glucose profile

Ambulatory glucose profile: The **solid line** is the median or 50% line; half of all glucose values are above and half are below this value.
The 25th and 75th percentile curves shaded in **dark blue** represent the interquartile range or 50% of all values and are a good visual indicator of the degree of GV.
The dashed outer lines (the 10th to 90th percentile curves) in **light blue** indicate that only 10% of glucose readings were above or below these value

Graph showing daily data. Each daily profile represents midnight to midnight data

Astha Soni et al. Arch Dis Child Educ Pract Ed 2022;107:188-193

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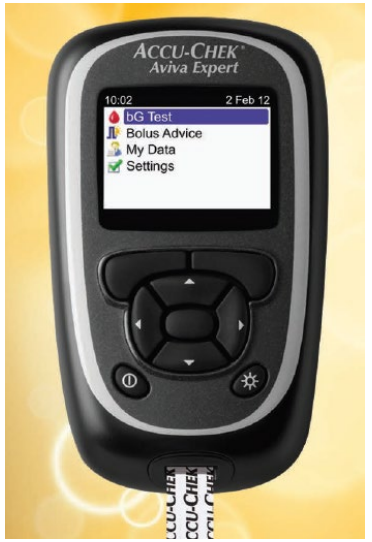
Smart glucose meters (Bolus Calculators)

- Majority of patients either do not correct for high glucose at all or get the calculations wrong
- Meter programmed with insulin:carb ratio and correction factor. Each bolus consists of insulin for carbs and insulin for correcting high glucose
- Studies have shown improved HbA1c, reduced hypos and improved QOL



Diabetes Ther (2013) 4:1–11
DOI 10.1007/s13300-012-0017-4

REVIEW

Glucose Meters with Built-In Automated Bolus Calculator: Gadget or Real Value for Insulin-Treated Diabetic Patients?

Ides M. Colin · Isabelle Paris

Use of an Automated Bolus Calculator in MDI treated type 1 diabetes: Signe S et. al. Diabetes Care 2012,35: 984-990

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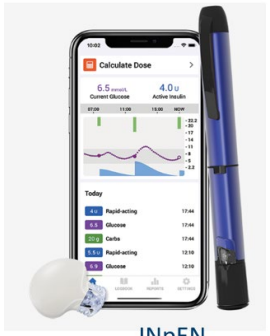
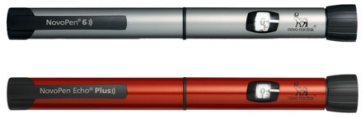
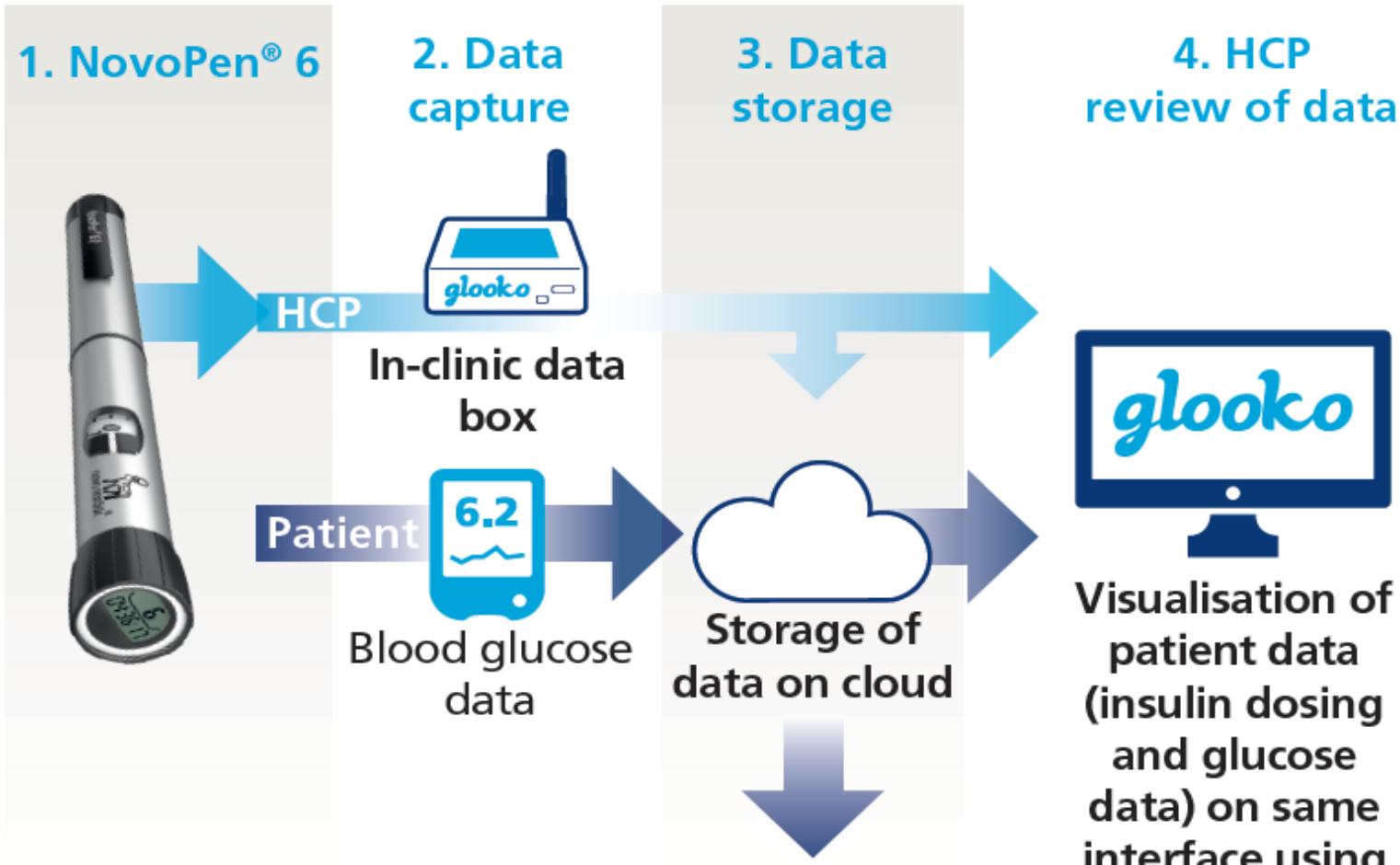
Smart Insulin Pens



INpEN

NovoPen 6 and NovoPen Echo





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Adolfsson et. al. Diabetes Technology and Therapeutics 2020

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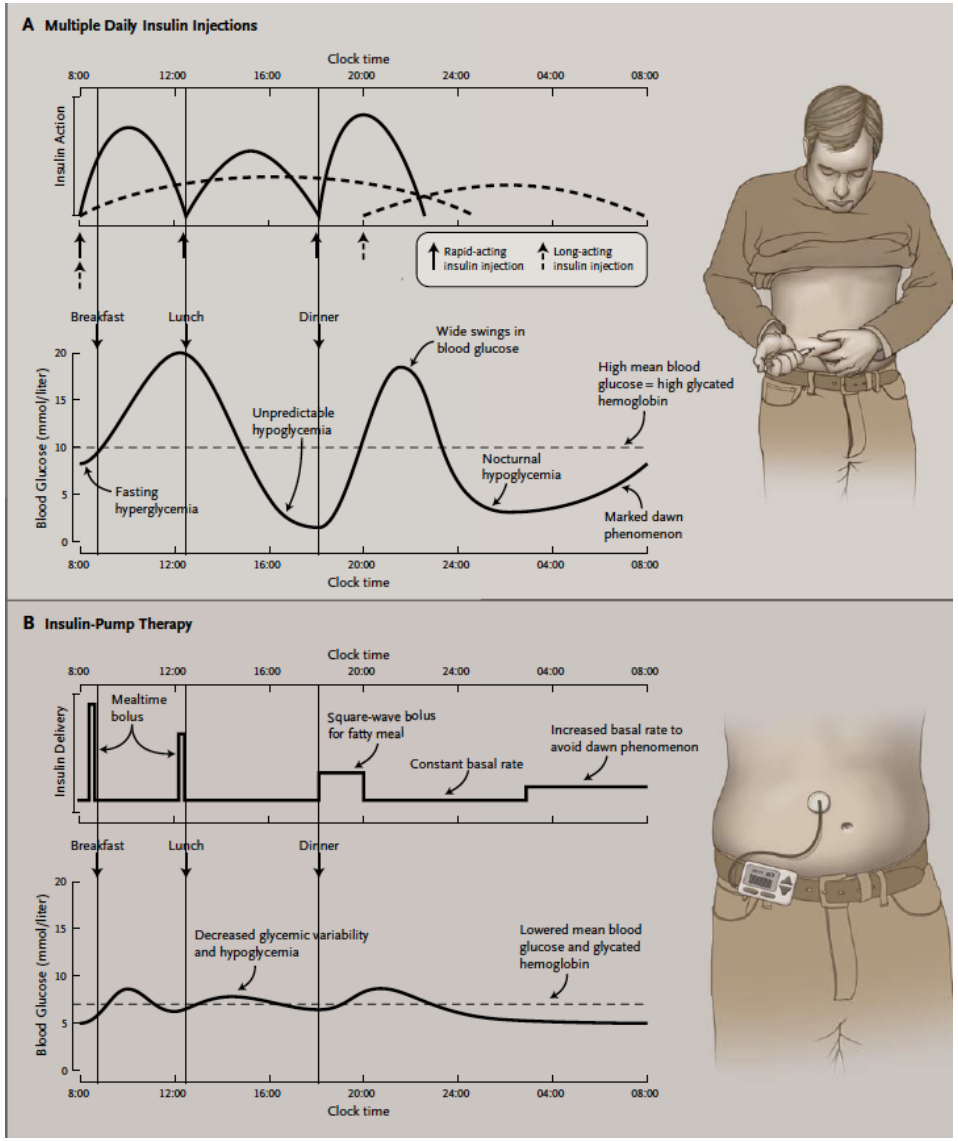
Benefits of insulin pumps

- CSII allows more physiological replacement of basal insulin requirements
- Lower variability of absorption of basal insulin
- On demand modulation of basal insulin to match individual needs; e.g. exercise or stress
- With CGM - Predictive low glucose suspend technology



N ENGL J MED 366;17 NEJM.ORG APRIL 26, 2012

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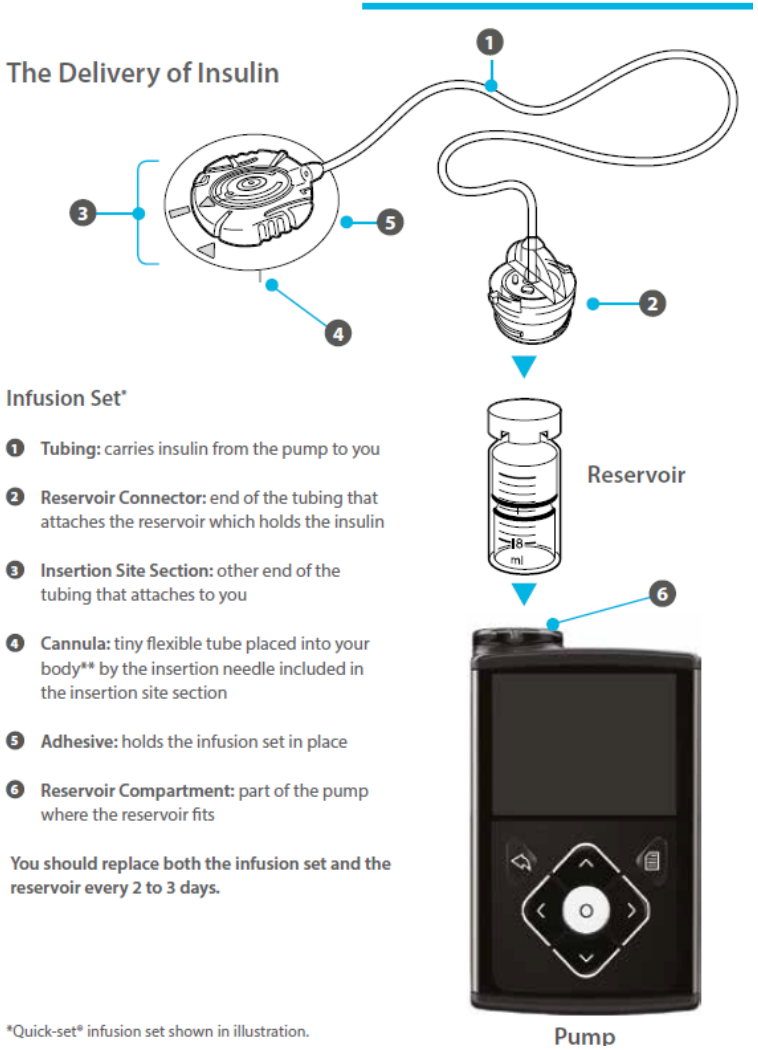
Tube vs patch pumps

No Fiasp



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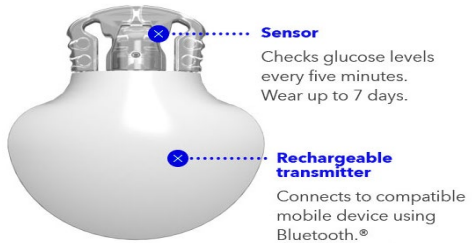
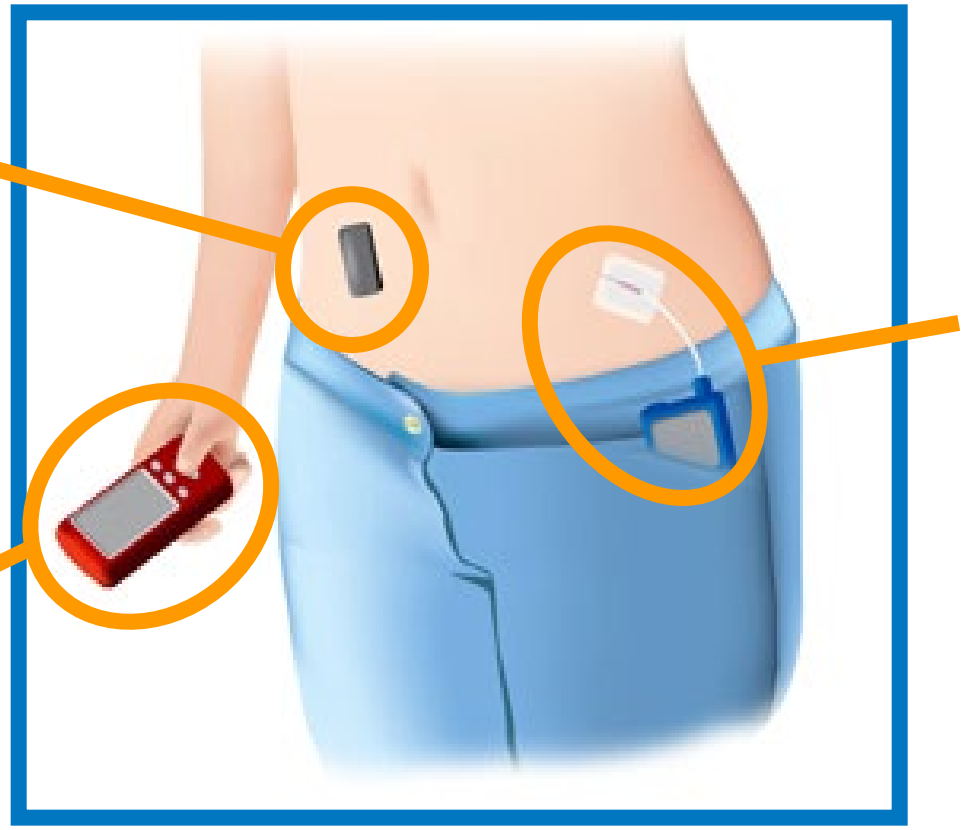
Closed-loop system components

DexcomG7 and G6

Guardian 4 smart CGM





↑TIR 12+%
↓ HbA1c 0.5+%

- Autonomous, graduated modulation of insulin delivery to achieve target glucose

- Hybrid = Meal bolus still required

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Closed Loop-Automated Insulin Delivery ”AID”

DIY = Loopers

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Avoiding Hypoglycaemia and Hyperglycaemia in Type 1 Diabetes

If it weren't for hypoglycaemia, we could give as much insulin as we want!

3. Self Management Barriers

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Type 1 diabetes (T1DM)

- No condition that demands more of the individual than T1DM, Requires life-long insulin therapy, impose a heavy burden on the individual, family and healthcare systems
- Current treatment multiple daily injections or insulin pump therapy. Requires multiple finger-prick measurements/CGMS, carbohydrate counting and dynamic dose adjustments
- Many have “poor control”, glycaemic variability frustrates many; Depression, anxiety and reduced quality of life very common
- Impaired awareness of hypoglycaemia (IAH) affects 20-40% of T1DM, Severe hypoglycaemia (SH) affects up to 30% of individuals with T1D

Foster et. al. Diabetes Technology and Therapeutics, 2019, (21) 66-72
https://digital.nhs.uk/data-and-information/publications/statistical/national-diabetes-audit/report-1

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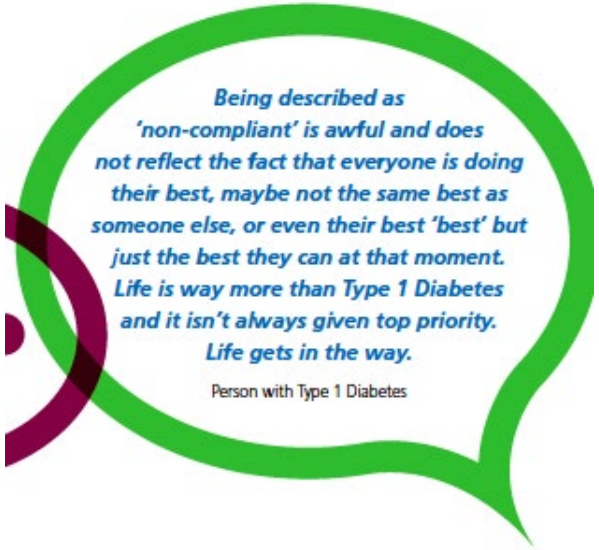
Language and Diabetes-stigma

Poor control => U R
Not controlling it!



Bringing an end to diabetes stigma and discrimination: an international consensus statement on evidence and recommendations

Jane Speight*, Elizabeth Holmes-Truscott*, Matthew Garza, Renza Scibilia, Sabina Wagner, Asuka Kato, Victor Pedrero, Sonya Deschênes, Susan J Guzman, Kevin L Joiner, Shengxin Liu, Ingrid Willaing, Katie M Babbott, Bryan Cleal, Jane K Dickinson, Jennifer A Halliday, Eimear C Morrissey, Giesje Nefs, Shane O'Donnell, Anna Serlachius, Per Winterdijk, Hamzah Alzubaidi, Bustanul Arifin, Liz Cambron-Kopca, Corinna Santa Ana, Emma Davidsen, Mary de Groot, Maartje de Wit, Phyllisa Deraze, Stephanie Haack, Richard J G Holt, Walther Jensen, Kamlesh Khunti, Karoline Kragelund Nielsen, Tejal Lathia, Christopher J Lee, Bridget McNulty, Diana Naranjo, Rebecca L Pearl, Suman Prinjha, Rebecca M Puhl, Anita Sabidi, Chitra Selvan, Jazz Sethi, Mohammed Seyam, Jackie Sturt, Mythily Subramaniam, Helle Terkildsen Maindal, Virginia Valentine, Michael Vallis, Timothy C Skinner

- The language used by healthcare professionals can have a profound impact on people living with diabetes

The Use of Language in Diabetes Care and Education
https://doi.org/10.2337/dci17-0041

Jane K. Dickinson,[1] Susan J. Guzman,[2] Melinda D. Maryniuk,[3] Catherine A. O'Brian,[4] Jane K. Kadohiro,[5] Richard A. Jackson,[6] Nancy D'Hondt,[7] Brenda Montgomery,[8] Kelly L. Close,[9] and Martha M. Funnell[10]

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Factors contributing to high HbA1c sub-optimal glycaemia (T1DM)

- Physiology! Imperfect Technology
- Variable insulin absorption & problems with insulin injection sites
- Fear of hypoglycaemia; Needle Phobia; Diabulimia
- Relentless Burden; Depression, anxiety and lack of motivation
- Not monitoring glucose
- Clinical inertia
- Lack of access to technology / HCP
- Lack of access / non-engagement with high quality structured education (self-management skills)

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42 Factors *that affect* Blood Glucose

FOOD

1 Carbohydrate quantity
2 Carbohydrate type
3 Fat
4 Protein
5 Caffeine
6 Alcohol
7 Meal timing
8 Dehydration
9 Personal microbiome

MEDICATION

10 Medication dose
11 Medication timing
12 Medication interactions
13 Steroid administration
14 Niacin (Vitamin B3)

ACTIVITY

15 Light exercise
16 High-intensity & moderate exercise
17 Level of fitness/training
18 Time of day
19 Food and insulin timing

BIOLOGICAL

20 Too little sleep
21 Stress and illness
22 Recent hypoglycemia
23 During-sleep blood sugars
24 Dawn phenomenon
25 Infusion set issues
26 Scar tissue / lipodystrophy
27 Intramuscular insulin delivery
28 Allergies
29 A higher BG level (glucotoxicity)
30 Periods (menstruation)
31 Puberty
32 Celiac disease
33 Smoking

ENVIRONMENTAL

34 Expired insulin
35 Inaccurate BG reading
36 Outside temperature
37 Sunburn
38 Altitude

BEHAVIOR & DECISIONS

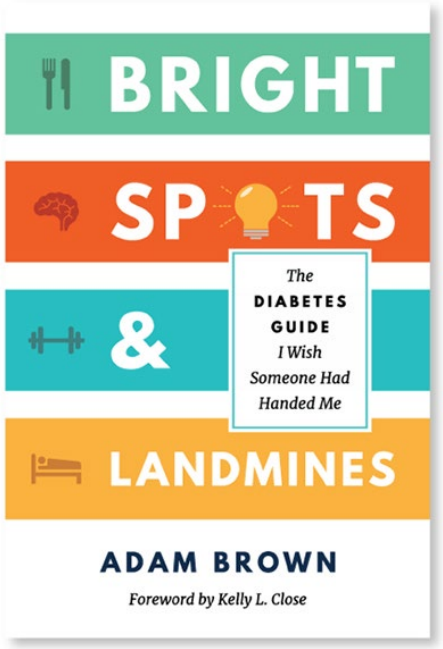
39 More frequent BG checks
40 Default options and choices
41 Decision-making biases
42 Family and social pressures

diaTribe

42 Factors *that affect* Blood Glucose

As a person with diabetes, I always fall into the trap of thinking I'm at fault for out-of-range blood sugars.

But after 18 years living with diabetes and 70,000 hours wearing continuous glucose monitoring (CGM), I've learned that there are all kinds of factors that affect blood glucose (BG), many of which are impossible to control, remember, or even measure.



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Avoiding Hypoglycaemia and Hyperglycaemia in Type 1 Diabetes

If it weren't for hypoglycaemia, we could give as much insulin as we want!

4. Self Management Skills

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OzDAFNE?

Dose Adjustment for Normal Eating

OzDAFNE Dose Adjustment For Normal Eating in Australia

- 5 day group program for 6-8 adults with type 1 diabetes using insulin pens (also OzDAFNE Pump)
- Structured, comprehensive self-management education
  - Insulin assessment and adjustment
  - Counting carbohydrates
  - Managing challenging situations such as illness, hypoglycaemia, physical activity, alcohol and eating out
  - Sick day rules
- Run by OzDAFNE CDE (RN) and dietitian (APD)
- Follow up 6 weeks, 6 months and 12 months

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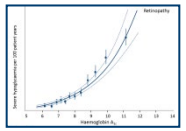
DAFNE

Type 1 Diabetes: Less guesswork.
More freedom. Better health.

Outcomes of DAFNE

64 %

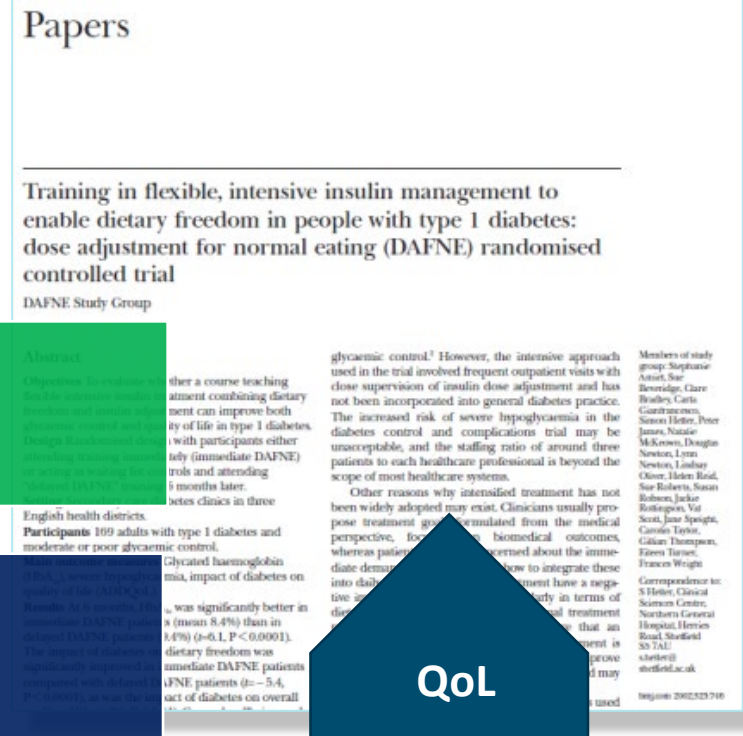


HbA1c lowered 0.4%

Risk of DKA reduced by 61%

Risk of severe hypoglycaemia reduced by 72%

Anxiety & depression reduced to background



Papers

Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial

DAFNE Study Group

QoL
Treatment satisfaction

insulin doses
Need for CSII

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DAFNE Study Group, Oct 2002, BMJ

Hopkins et al, Diabetes Care, 2012
Elliott et al., Diab Med 2014

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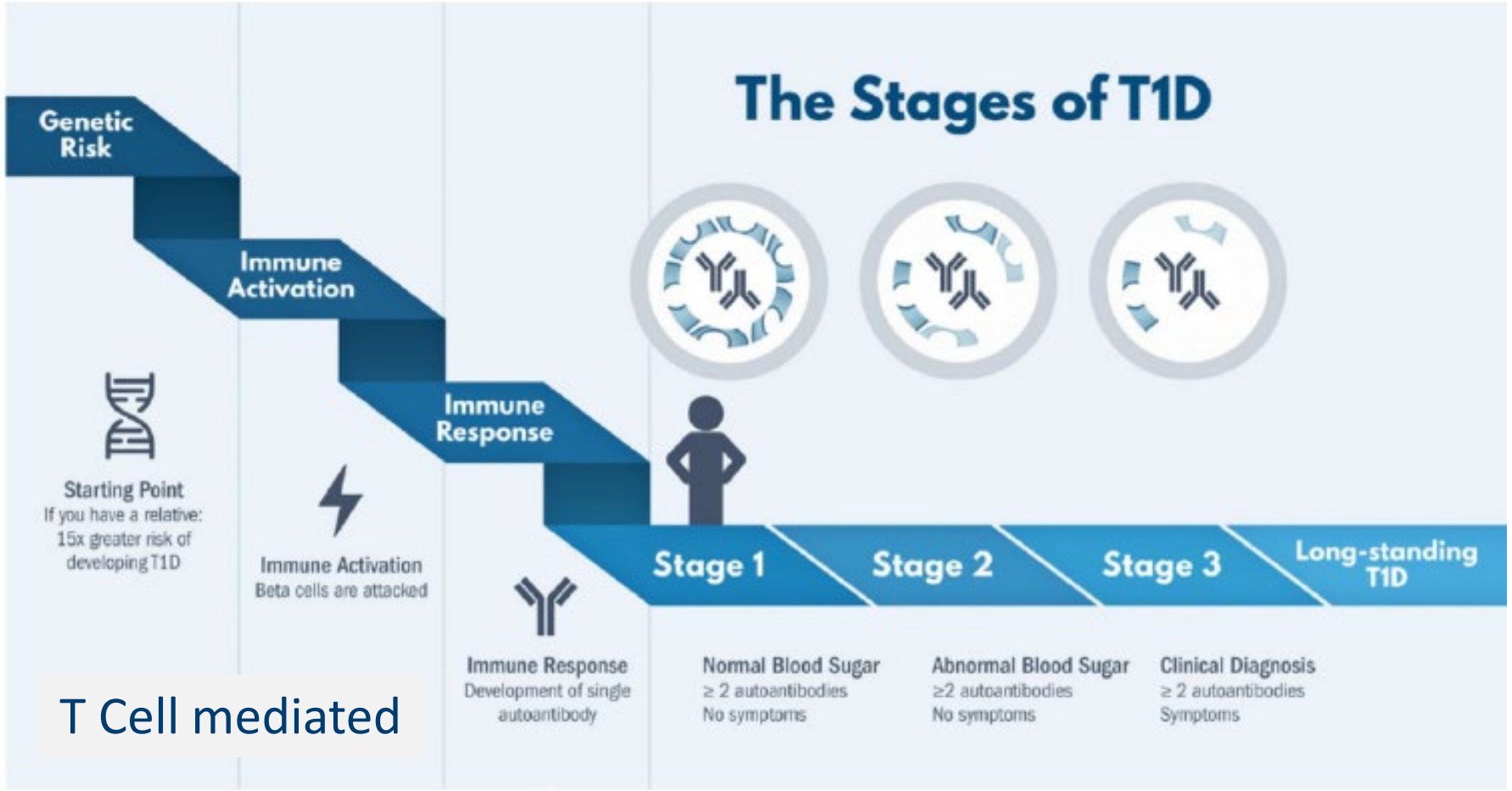
Emerging issues in Type 1 Diabetes

Stages of Type 1a diabetes in children and adolescents



T Cell mediated

ISPAD clinical practice consensus guidelines 2022:

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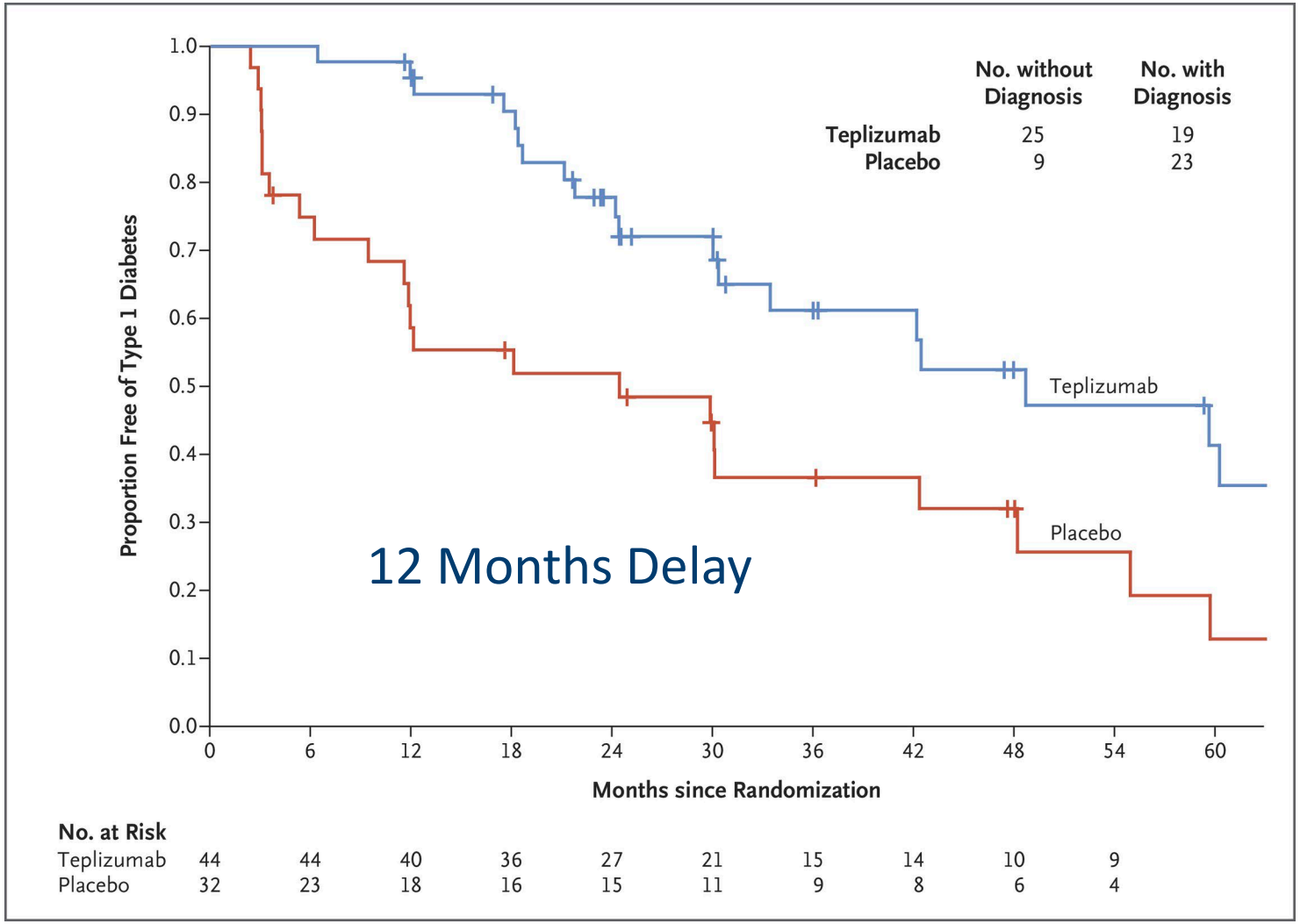
Disease Modifying Agents in Type 1 Diabetes



Effects of Teplizumab on Development of Stage 3 Type 1 Diabetes

Teplizumab approval for type 1 diabetes in the USA

On Nov 17, 2022, the US Food and Drug Administration (FDA) approved teplizumab as the first disease-modifying therapy in type 1 diabetes. The approval of teplizumab to delay the onset of stage 3 type 1 diabetes in adults and children aged 8 years and older is the culmination of nearly 20 years of investigation and clinical trials of anti-CD3-based therapies. The

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Herold KC et al. N Engl J Med2019;381:603-613

The NEW ENGLAND JOURNAL of MEDICINE

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The loss of Levemir-when no CSII

Important information
from Novo Nordisk

novo nordisk®

Important Advance Notice: Upcoming Changes to Novo Nordisk® Insulin Portfolio

ACTIVE SUBSTANCE	BRAND NAME	PRESENTATIONS TO BE DISCONTINUED	ANTICIPATED END DATE OF PRODUCT SUPPLY AVAILABILITY IN MARKET*	NOVO NORDISK® PRESENTATIONS REMAINING AVAILABLE
Insulin detemir	Levemir®	FlexPen® & Penfill® (PBS listed)	December 2026	No other product presentation of Levemir® will be available.

DIABETICMedicine
DOI: 10.1111/dme.12806

Research: Educational and Psychological Issues

Twice- rather than once-daily basal insulin is associated with better glycaemic control in Type 1 diabetes mellitus 12 months after skills-based structured education in insulin self-management

H. E. Hopkinson[1], R. M. Jacques[2], K. J. Gardner[3], S. A. Amiel[4] and P. Mansell[5]

[1]New Victoria Hospital, Glasgow, [2]University of Sheffield, [3]University of Dundee, [4]King's College London and [5]Nottingham University Hospitals NHS Trust, UK

- Some individuals:
- Moving to once/day from bd Levemir, different day and night doses either:
- More insulin in the day->hypos
- Less insulin at night->hyperglycaemia

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Double Diabetes

Obesity in Adults with T1D

3.3% 1985-1990

22.2% 2015-2020

Combined insulin deficiency (type 1) and insulin resistance (type 2).

Features of adult-onset T1DM can overlap with T2DM, given their slow metabolic progression and risk of metabolic syndrome (which occurs in about 40%), so that the distinction between the types of diabetes may be blurred.

Previous clinical criteria e.g. lower age and lower BMI can be poor discriminators as rates of obesity in the overall population increases.

In the previous decade: Obesity rates seem to have stabilised among younger people but have increased over time in adults with T1DM.

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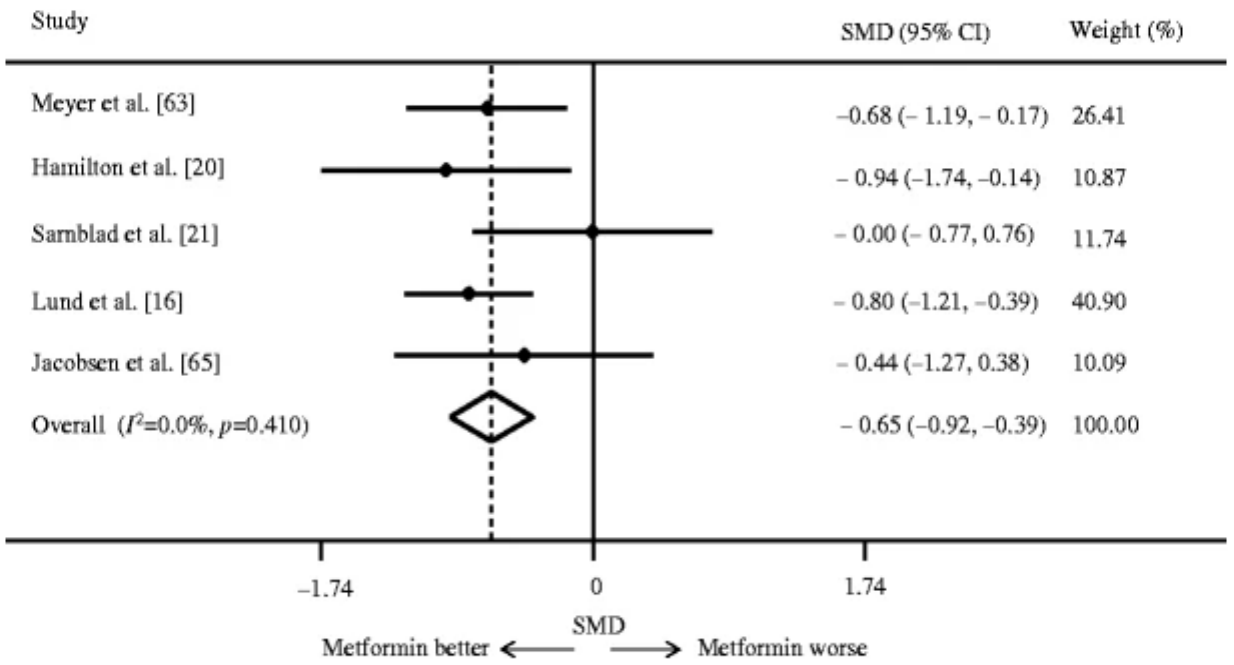
The use of metformin in type 1 diabetes: a systematic review of efficacy

S. Vella · L. Buetow · P. Royle · S. Livingstone · H. M. Colhoun · J. R. Petrie

From: The use of metformin in type 1 diabetes: a systematic review of efficacy



2020 review
19 RCTs
N = 1540
-2.24 kg

Standardised mean difference of insulin dose between metformin-treated and metformin-free type 1 diabetes patients from five randomised controlled studies, including the largest study to date [16] (see text for equivalent insulin dose units)

Diabetologia (2010) 53:809–820
DOI 10.1007/s00125-009-1636-9

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RCT SGLT2i and Type 1 diabetes

	Pooled analysis of DEPICT-1 and DEPICT-2 studies[78]			Phase 3 trial[79] (n=175)	Pooled analysis of Tandem1[80] and Tandem2[81] (n=1575)		
	Dapagliflozin 5 mg/day (n=548)*	Dapagliflozin 10 mg/day (n=566)	Placebo	Ipragliflozin 50 mg/day	Sotagliflozin 200 mg/day	Sotagliflozin 400 mg/day	Placebo
Effect on bodyweight	−3·11% (−3·61 to −2·62)	−3·71% (−4·20 to −3·22)	NA	−2·87 kg (−3·58 to −2·16)	−2·17% (−2·54 to −1·80)	−3·02% (−3·39 to −2·65)	NA
Effect on HbA_{1c}	−0·41% (−0·48 to −0·31)	−0·43% (−0·52 to 0·34)	NA	−0·36% (−0·57 to −0·14)	−0·36% (−0·44 to −0·29)	−0·38% (−0·45 to −0·31)	NA
Effect on insulin dosage	−9·57% (−12·01 to −7·07)	−11·75% (−14·13 to −9·30)	NA	−7·35 IU (−9·09 to −5·61)	7·10 % (SE 1·30); p<0·001 *vs* placebo at 52 weeks	−10·33 % (SE 1·30); p<0·001 *vs* placebo at 52 weeks	NA
Adverse events: diabetic ketoacidosis†	2·00%	1·90%	0·60%	No diabetic ketoacidosis reported in either group	2·90 %	3·80 %	0·20 %

Data are mean (95% CI) for comparison with placebo at 24 weeks, unless otherwise stated. Dapagliflozin is an SGLT2 inhibitor approved for use in Europe and Japan. Ipragliflozin is an SGLT2 inhibitor approved for use in Japan. Sotagliflozin is a dual SGLT1/2 inhibitor approved by the European Medicines Agency. NA=not applicable. IU=international units. *p<0·0001. †Other adverse events were not reported consistently between studies.

Table 2: **Approved SGLT inhibitors as adjunct therapy in people living with type 1 diabetes**

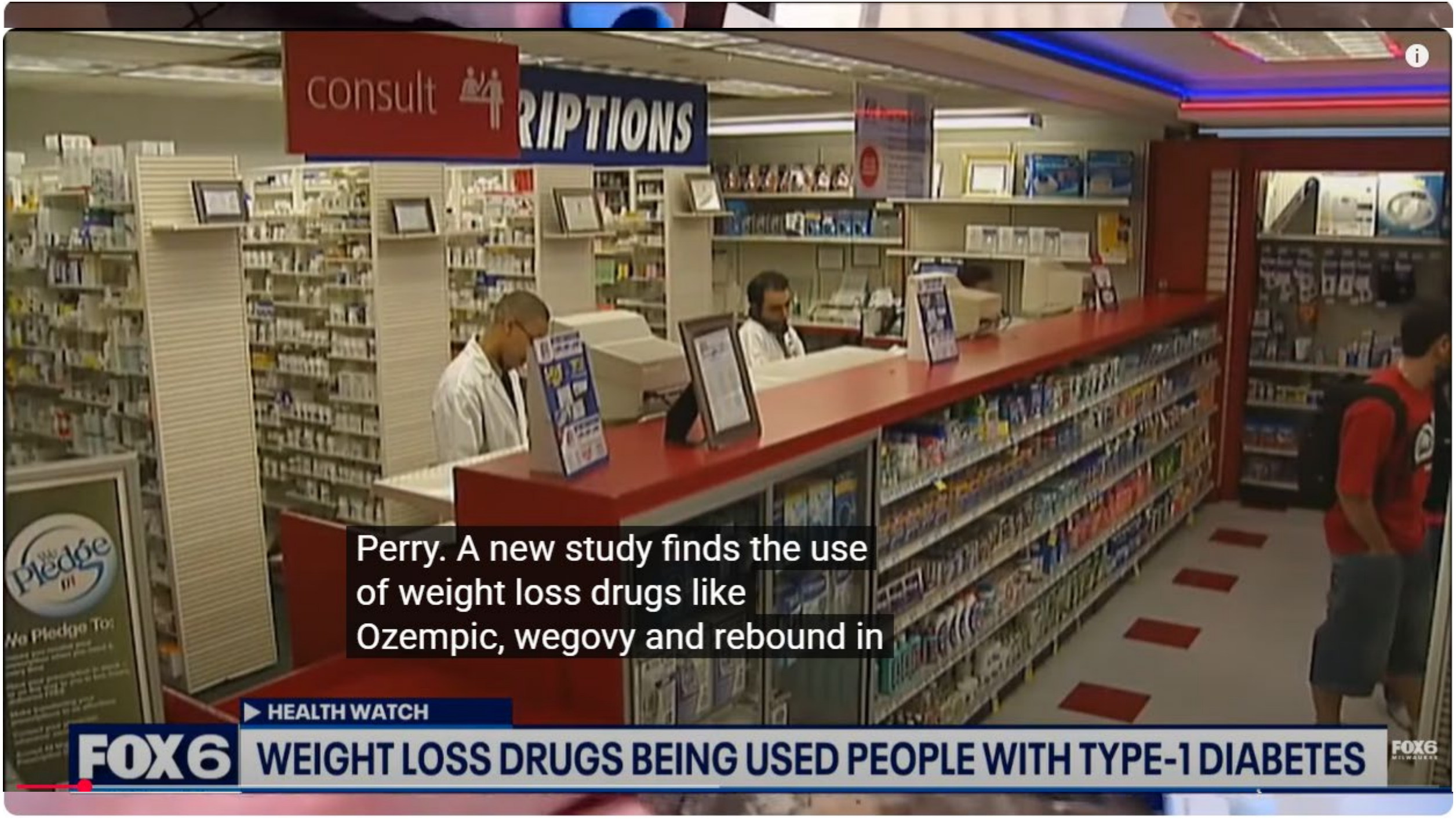
78 Phillip M, Mathieu C, Lind M, et al. Long-term efficacy and safety of dapagliflozin in patients with inadequately controlled type 1 diabetes: pooled 52-week outcomes from the DEPICT-1 and -2 studies. *Diabetes Obes Metab* 2021; **23**: 549–60.

79 Kaku K, Isaka H, Sakatani T, Toyoshima J. Efficacy and safety of ipragliflozin add-on therapy to insulin in Japanese patients with type 1 diabetes mellitus: a randomized, double-blind, phase 3 trial. *Diabetes Obes Metab* 2019; **21**: 2284–93.

80 Rodbard HW, Giaccari A, Lajara R, et al. Sotagliflozin added to optimized insulin therapy leads to HbA1c reduction without weight gain in adults with type 1 diabetes: a pooled analysis of inTandem1 and inTandem2. *Diabetes Obes Metab* 2020; **22**: 2089–96.

81 Pettus J, Weinzimer SA, McCrimmon RJ, et al. Sotagliflozin in combination with optimized insulin therapy reduced HbA1c levels with a decreased daily insulin requirement after 52 weeks in adults with T1D. *Diabetes* 2018; **67** (suppl 1): 5 (poster).

Lancet Diabetes Endocrinol 2021; 9: 776–85


consult
RIPTIONS
Pledge
Perry. A new study finds the use
of weight loss drugs like
Ozempic, wegovy and rebound in
HEALTH WATCH
FOX6
WEIGHT LOSS DRUGS BEING USED PEOPLE WITH TYPE-1 DIABETES
FOX6

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ENDOCRINE SOCIETY

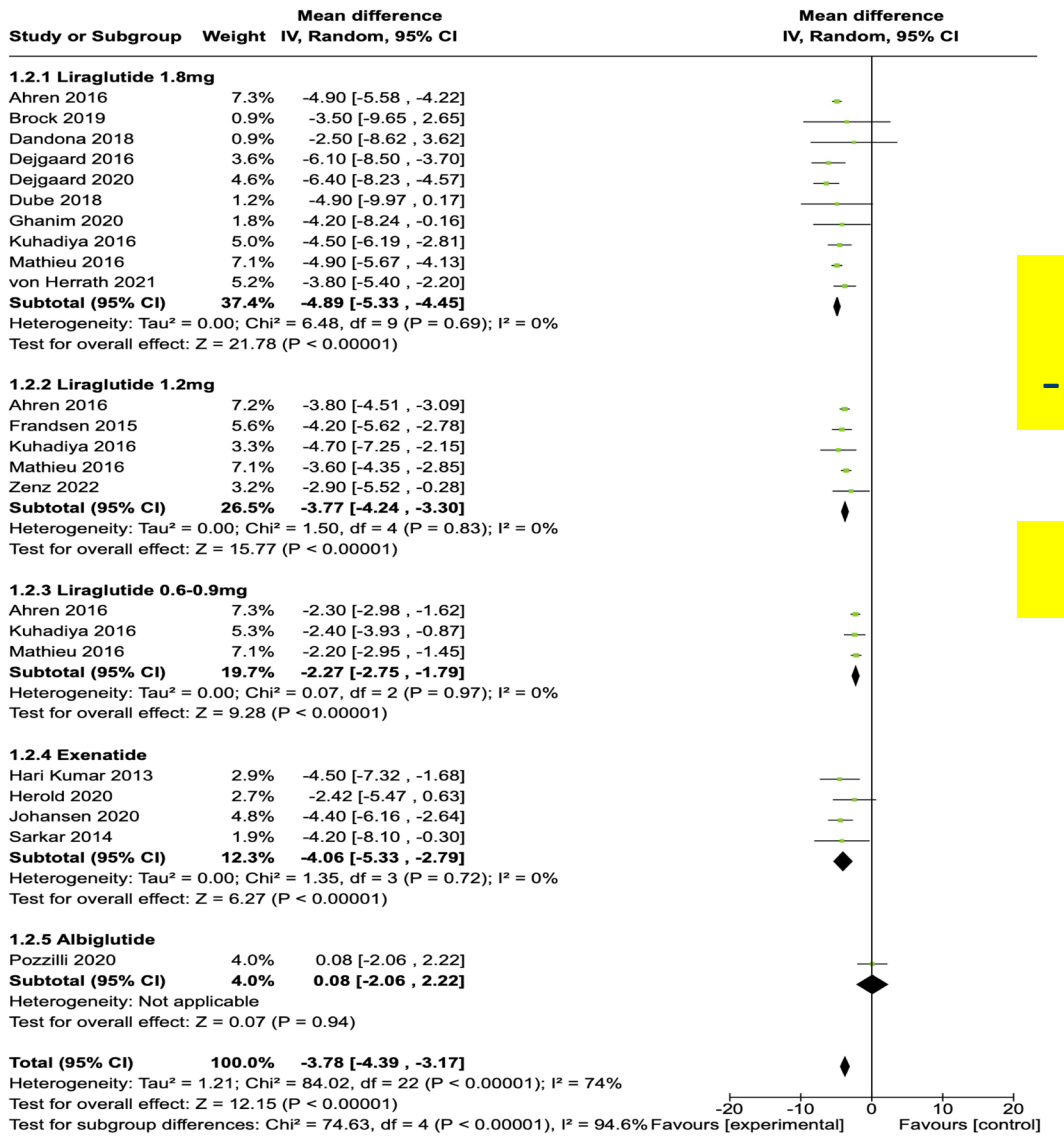

Figure 4. Forest plot for changes in body weight after use of glucagon-like peptide 1 (GLP-1) analogues in patients with T1D

Total daily Insulin
-5.84 (-7.51 to -4.16) units

-3.78 (-4.39 to -3.17) kg

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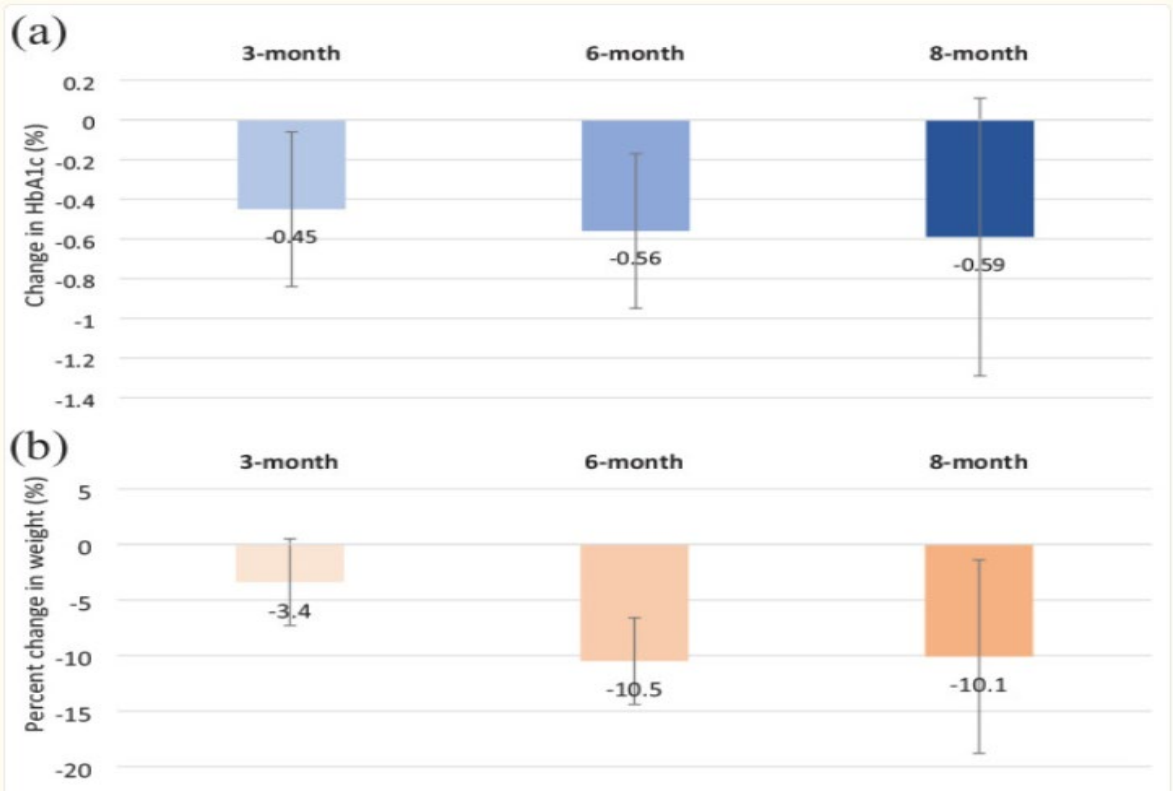
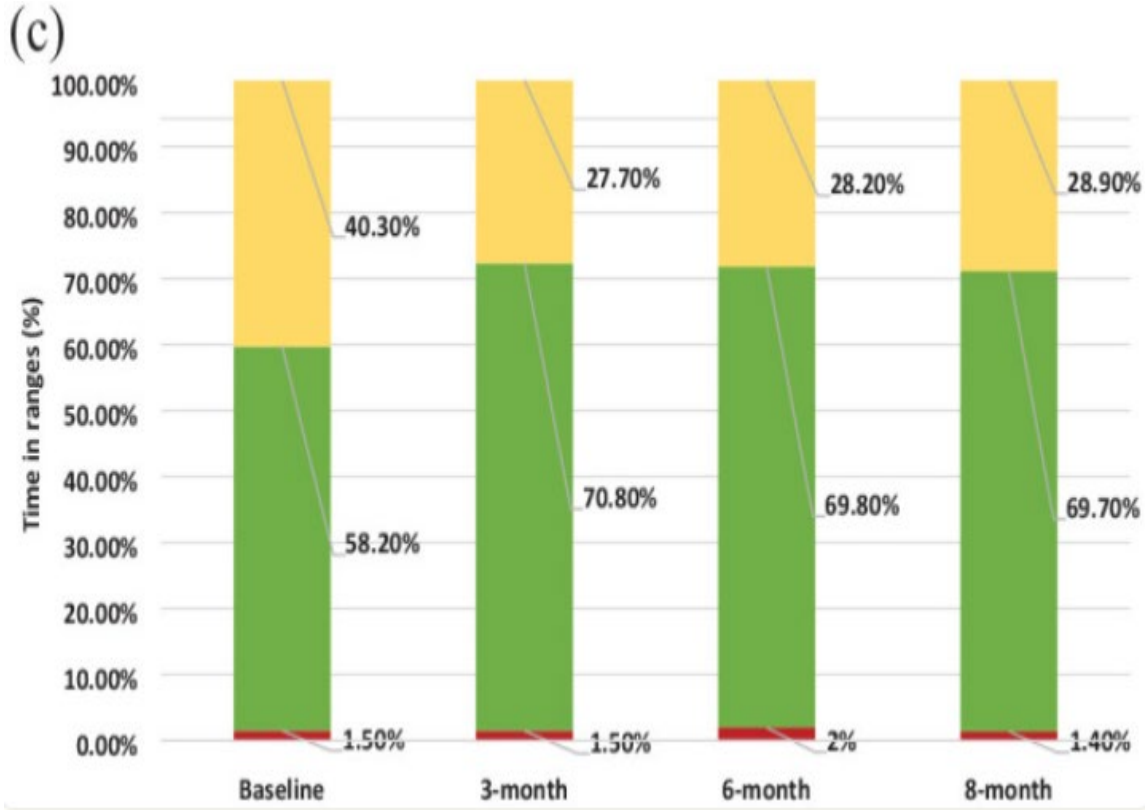
GLP1/GIP Agonist (Tirzepatide) and T1DM

USA-N=26 BMI 36.7 kg/m^2 42y HbA1c 7.3% TDD 83.9 IU 73% CSII 96% CGM





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Akturk et al Journal of Diabetes Science and Technology 2025, Vol. 19(2) 292–296

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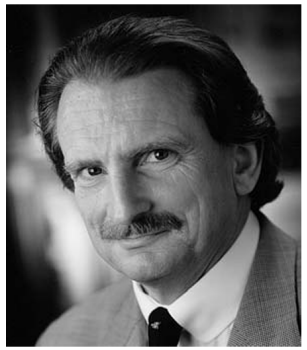
Conclusions



- Type 1 diabetes requires insulin treatment - has 3 jobs
  - Background, cover food, bring glucose down if high
- Unpredictability of glucose makes life hard
- Hypoglycaemia remains a key barrier for achieving near normal glucose levels
- Self management skills crucial - Empowered with hope - OzDAFNE has RCT evidence of benefit
- Much development in insulins, devices to help management
- Ability to monitor glucose continuously with no or limited finger-sticks is life changing. Everybody with type 1 DM has access to CGM technology through the NDSS
- Automated / Closed-loop insulin delivery is now a reality
  - Pump cost is the main barrier vs other HIC
- Emerging issues: T1D prevention, Obesity, Loss of Levemir

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Thank you!

Many thanks to CDEs Cathy Wilson and Therese Fletcher
And Lala Leelarathna for slides etc