
# CGM and Type 2 Diabetes A Brave New World

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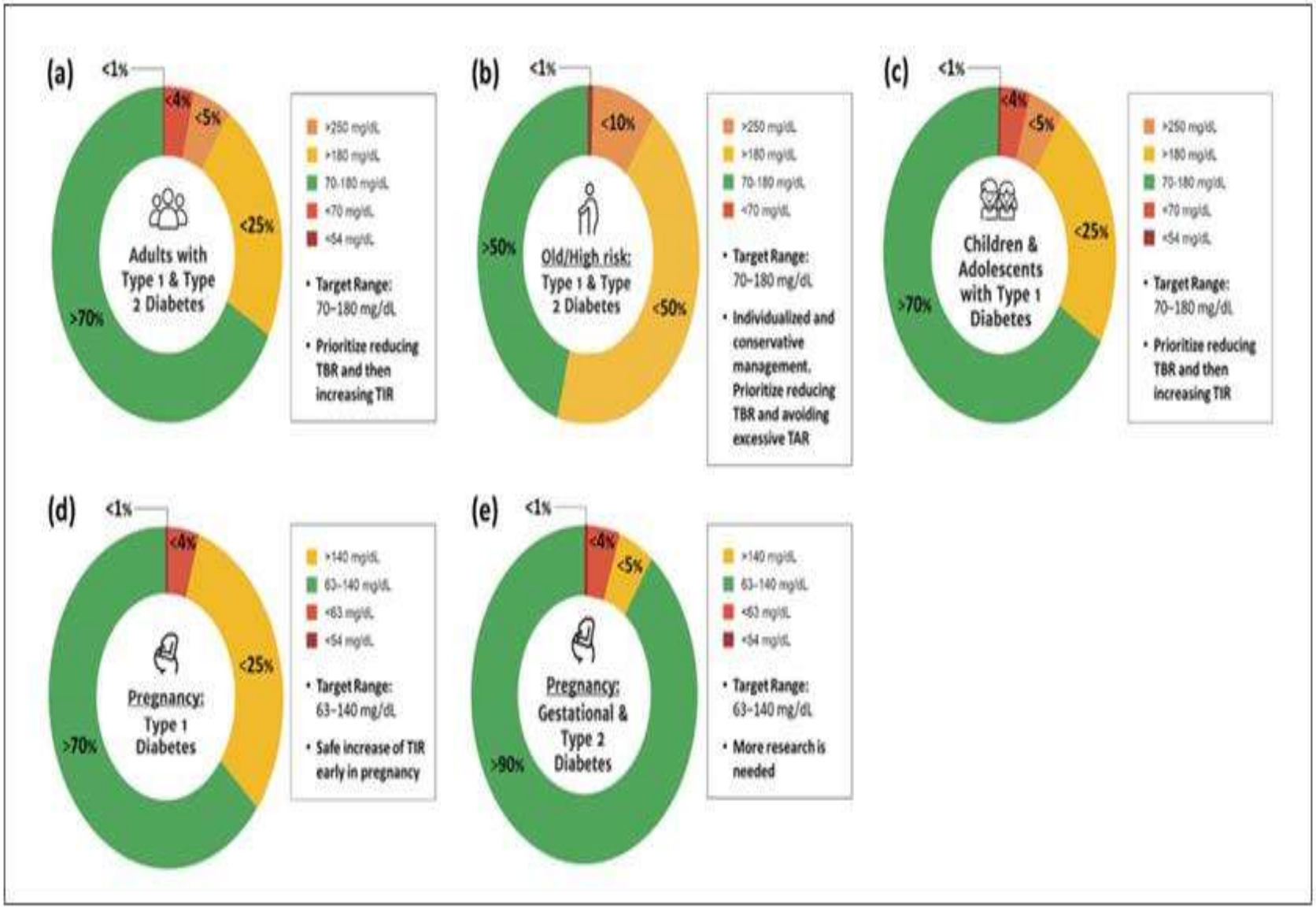
# STANDALONE VS INTEGRATED CGM

- STANDALONE


- INTEGRATED


# TARGETS


(a)
<1%
<4%
<5%
<25%
>70%
Adults with Type 1 & Type 2 Diabetes
>250 mg/dL
>180 mg/dL
70-180 mg/dL
<70 mg/dL
<54 mg/dL
• Target Range: 70–180 mg/dL
• Prioritize reducing TBR and then increasing TIR
(b)
<1%
<10%
<50%
>50%
Old/High risk: Type 1 & Type 2 Diabetes
>250 mg/dL
>180 mg/dL
70-180 mg/dL
<70 mg/dL
• Target Range: 70–180 mg/dL
• Individualized and conservative management. Prioritize reducing TBR and avoiding excessive TAR
(c)
<1%
<4%
<5%
<25%
>70%
Children & Adolescents with Type 1 Diabetes
>250 mg/dL
>180 mg/dL
70-180 mg/dL
<70 mg/dL
<54 mg/dL
• Target Range: 70–180 mg/dL
• Prioritize reducing TBR and then increasing TIR
(d)
<1%
<4%
<25%
>70%
Pregnancy: Type 1 Diabetes
>140 mg/dL
63-140 mg/dL
<63 mg/dL
<54 mg/dL
• Target Range: 63–140 mg/dL
• Safe increase of TIR early in pregnancy
(e)
<1%
<4%
<5%
>90%
Pregnancy: Gestational & Type 2 Diabetes
>140 mg/dL
63-140 mg/dL
<63 mg/dL
<54 mg/dL
• Target Range: 63–140 mg/dL
• More research is needed


# Overview

- Type 2 Diabetes

  -Principals of treatment
- CGM efficacy-Type 2 Diabetes
- The role of CGM in Gestational Diabetes
- Case Studies
- Discussion


**Use metformin unless contraindicated or not tolerated**

**If not at $HbA_{1c}$ target:**

- Continue metformin unless contraindicated (remember to adjust dose/stop metformin with declining eGFR)
- Add SGLT2i or GLP–1 RA with proven cardiovascular benefit[1] (see below)

**If at $HbA_{1c}$ target:**

- If already on dual therapy, or multiple glucose–lowering therapies and not on an SGLT2i or GLP–1 RA, consider switching to one of these agents with proven cardiovascular benefit[1] (see below)

**OR** reconsider/lower individualized target and introduce SGLT2i or GLP–1 RA

**OR** reassess $HbA_{1c}$ at 3–month intervals and add SGLT2i or GLP–1 RA if $HbA_{1c}$ goes above target

## ASCVD predominates

GLP–1 RA with proven CVD benefit[1]

**EITHER/ OR**

SGLT2i with proven CVD benefit[1], if eGFR adequate[2]

**If $HbA_{1c}$ above target**

If further intensification is required or patient is unable to tolerate GLP–1 RA and/or SGLT2i, choose agents demonstrating CV safety:

- Consider adding the other class (GLP–1 RA or SGLT2i) with proven CVD benefit[1]
- DPP–4i if not on GLP–1 RA
- Basal insulin[5]
- TZD[6]
- SU[7]

## HF or CKD predominates

**PREFERABLY**
SGLT2i with evidence of reducing HF and/or CKD progression in CVOTs if eGFR adequate[3]

**OR**

If SGLT2i not tolerated or contraindicated or if eGFR less than adequate[2] add GLP–1 RA with proven CVD benefit[1,4]

**If $HbA_{1c}$ above target**

- Avoid TZD in the setting of HF

Choose agents demonstrating CV safety:

- Consider adding the other class with proven CVD benefit[1]
- DPP–4i (not saxagliptin) in the setting of HF (if not on GLP–1 RA)
- Basal insulin[5]
- SU[7]

1. Proven CVD benefit means it has label indication of reducing CVD events. For GLP–1 RA strongest evidence for liraglutide > semaglutide > exenatide extended release. For SGLT2i evidence modestly stronger for empagliflozin > canagliflozin.
2. Be aware that SGLT2i vary by region and individual agent with regard to indicated level of eGFR for initiation and continued use
3. Both empagliflozin and canagliflozin have shown reduction in HF and to reduce CKD progression in CVOTs
4. Caution with GLP–1 RA in ESRD
5. Degludec or U100 glargine have demonstrated CVD safety
6. Low dose may be better tolerated though less well studied for CVD effects
7. Choose later generation SU to lower risk of hypoglycemia

# Special Authority Criteria –NZ SGLT-2

- HbA1c > 53 mmol/mol despite at least 3 months of regular use of metformin and/or other therapy
- Diabetic renal disease  (urinary albumin:creatinine ratio > 3 mg/mmol and/or eGFR < 60 mL/min)
- Known cardiovascular disease
- familial hypercholesterolaemia
- 5-year cardiovascular disease risk > 15%
- A high lifetime cardiovascular risk due to onset of diabetes in childhood or as a young adult
- Māori or Pacific ethnicity

# SPECIAL AUTHORITY CRITERIA GLP-1

- Patient has type 2 diabetes AND
- Target HbA1c of ≤ 53 mmol/mol has not been achieved despite the regular use of ALL the
- following funded glucose lowering agents for a period of at least 6 months, where clinically, appropriate, empagliflozin, metformin and vildagliptin AND EITHER

  - Māori and/or Pacific ethnicity OR
  - Pre-existing cardiovascular disease or equivalent cardiovascular risk OR
  - High lifetime cardiovascular risk due to being diagnosed with type 2 diabetes as a young adult OR
  - Diabetic renal disease (UACR > 3 mg/mmol and/or eGFR < 60 mL/min)


# CGM in T2DM

# CGM and Behaviour change


- 40- person survey
- 78% use an insulin pump
- Mean BMI 27.8
- ≫ Ninety percent of continuous glucose monitoring (CGM) users felt that its use contributed to a healthier lifestyle.
- ≫ Forty-seven percent of CGM users reported being more likely to go for a walk or do physical activity if they saw a rise in their blood glucose.
- ≫ Eighty-seven percent of CGM users felt that they modified their food choices based on CGM use

Ehrhardt N, Al Zaghal E. Continuous glucose monitoring as a behavior modification tool. Clinical diabetes: a publication of the American Diabetes Association. 2020 Apr;38(2):126.

# Meta-analysis- Jancev et al 2024

- 12 studies, 1248 participants
- Mean improvement in Hba1c-> -3.43mmol(P<0.00001)
- Improvement in HbA1C
- Insulin+/- Orals -3.27mmol/mol(p=0.03)
- Orals alone-3.22mmol/mol

- Hba1c improved in rtCGM (-3.79)> than isCGM(-1.79)
- No difference in rtCGM vs isCGM
- Severe Hypoglycemia –no change
- Macrovascular complications-no change

Jancev M, Vissers TA, Visseren FL, van Bon AC, Serné EH, DeVries JH, de Valk HW, van Sloten TT. Continuous glucose monitoring in adults with type 2 diabetes: a systematic review and meta-analysis. Diabetologia. 2024 May;67(5):798-810.