# Glucose monitoring

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# Not a new concept

- *Urine chart for diagnosis, 1506 AD – the urine wheel*

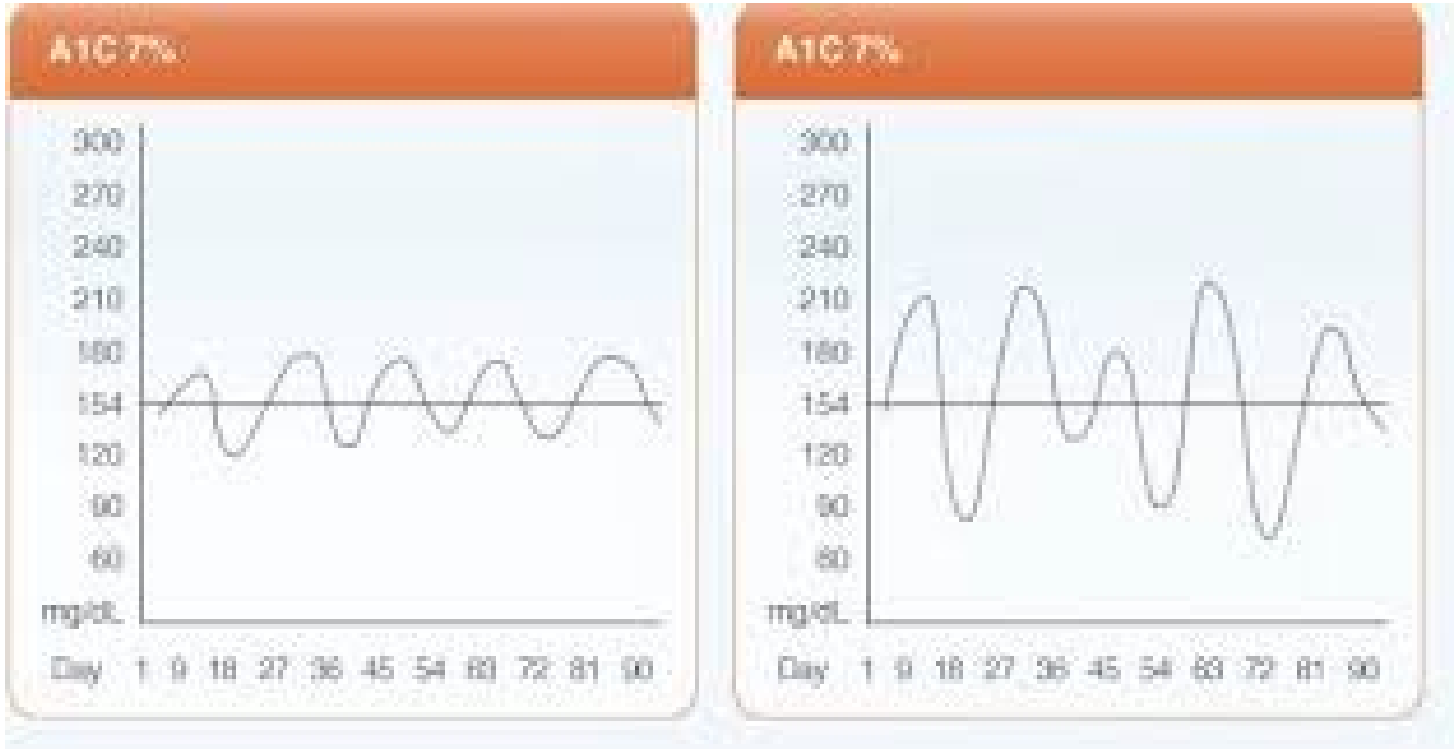
- The examination of urine (‘uroscopy’) as a method of medical diagnosis can be traced back to ancient Greece and Rome, but during the Middle Ages the examination of samples by physicians became widespread.

- 17th century English physician Thomas Willis noted that the urine of a diabetic patient tasted “wonderfully sweet as if it were imbued with honey or sugar.” It was Willis who coined the term ‘mellitus’ (meaning ‘sweetened with honey’) in diabetes mellitus, and this disorder was once known as ‘Willis’s disease’.

# Why test?

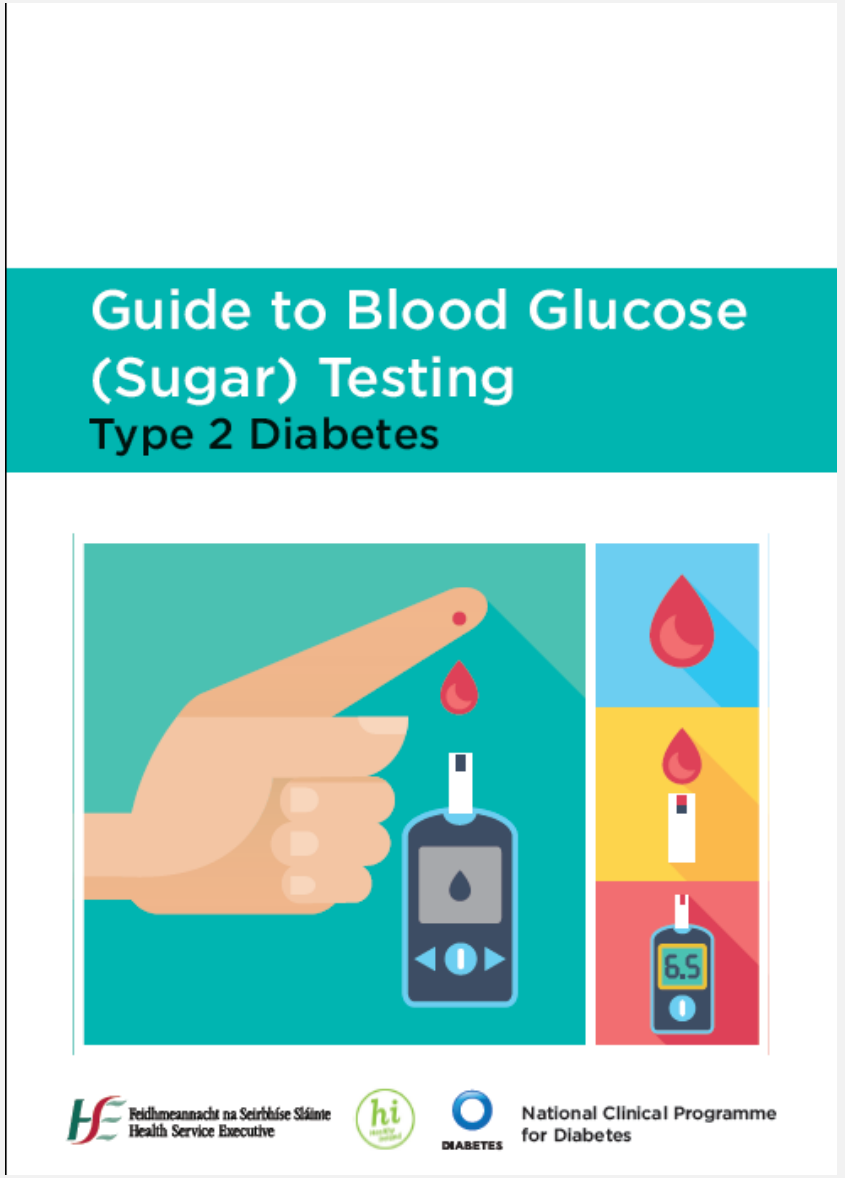
- To empower people with diabetes in their own care and education.
- Targets for glucose levels should always be individual and reviewed frequently.
- To identify changes from agreed glucose targets so that appropriate measures can be put in place; this may include following a weight, medication or lifestyle change
- To allow  people to adjust their medication to suit changing needs this may include activities such as driving or exercise
- To detect or confirm hypoglycaemia
- To increase safety levels during acute illness
- To enable early detection of emergency situations such as DKA or HHS

# Glycaemic Variation




- Both have a hba1c of 53mmols
- Hba1c doesn't demonstrate glycaemic variation
- GV = Reduced patient psychological well-being and quality of life and increased risk of cardiovascular disease and mortality in patients with T2D https://drc.bmj.com/content/9/1/e002032

# Guidelines


Guide to Blood Glucose (Sugar) Testing
Type 2 Diabetes
6.5
Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive
DIABETES
National Clinical Programme for Diabetes

| Diabetes Treatment | Testing Guidelines |
| --- | --- |
| Diet alone | No need to self test |
| Metformin **or** in combination with DPP1v, GLP-1, TZD or SGTL2 | Test up to 3 times per week |
| Sulphonylurea or Glinides **or** in combination with DPP1v, GLP-1, TZD, SGLT2 or Metformin | Test 1 – 2 times per day ( more if required*) |
| Insulin alone **or** insulin with other diabetes meds | Test up to 4 times per day (more if required*) |
| Planning pregnancy **or** pregnant | Test up to 7 times per day |
| * driving, increased exercise, feeling hypo, illness, stress or consuming alcohol | |

# Three questions to encourage self care

- Why did you do that test?
- What did the result tell you?
- What did you do with the result?

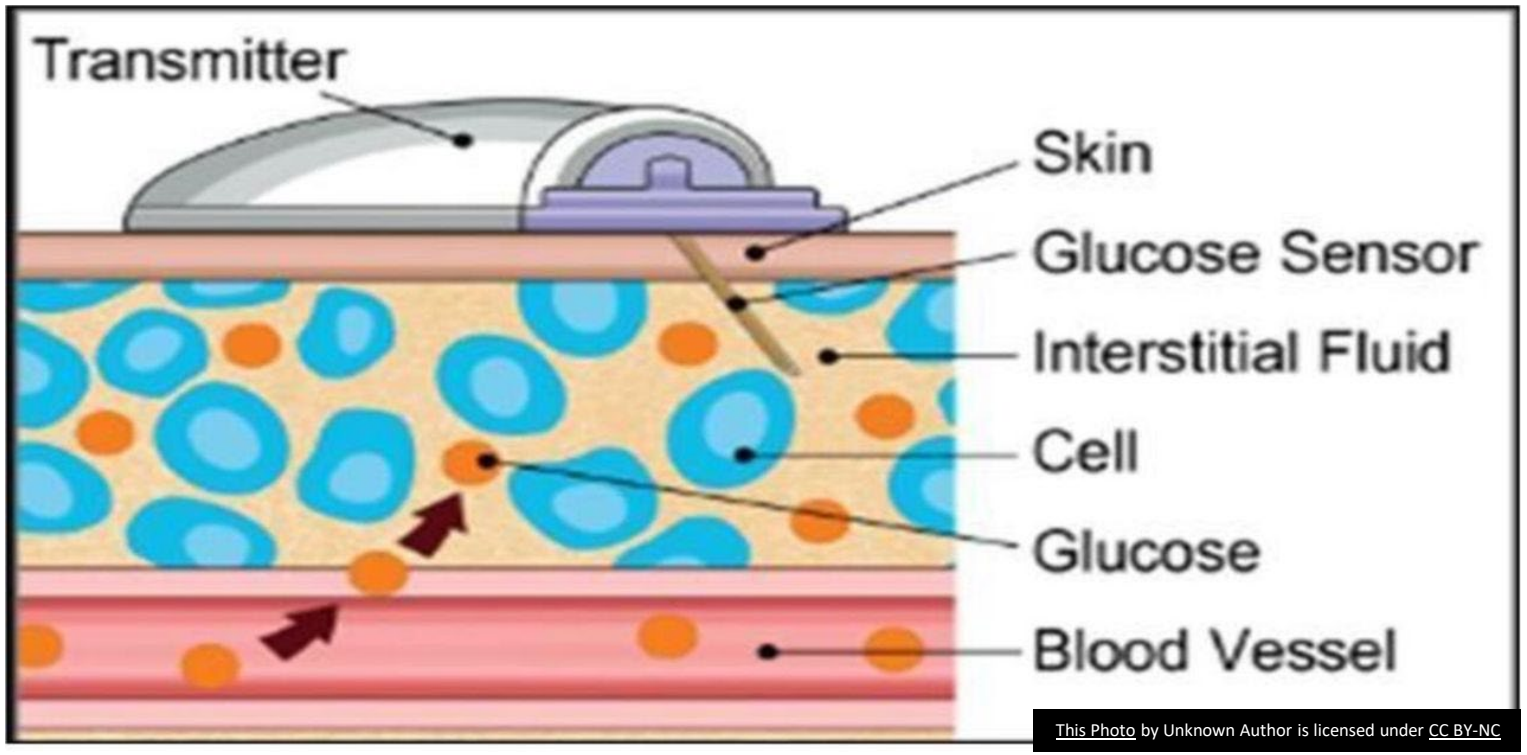
# Is technology the future?

March 2022 NICE recommended access to technology for all with type 1 diabetes & some people with type 2

Current HIQA HTA in to type 1 diabetes

HIQA HTA to follow for type 2

# Interstitial glucose monitoring



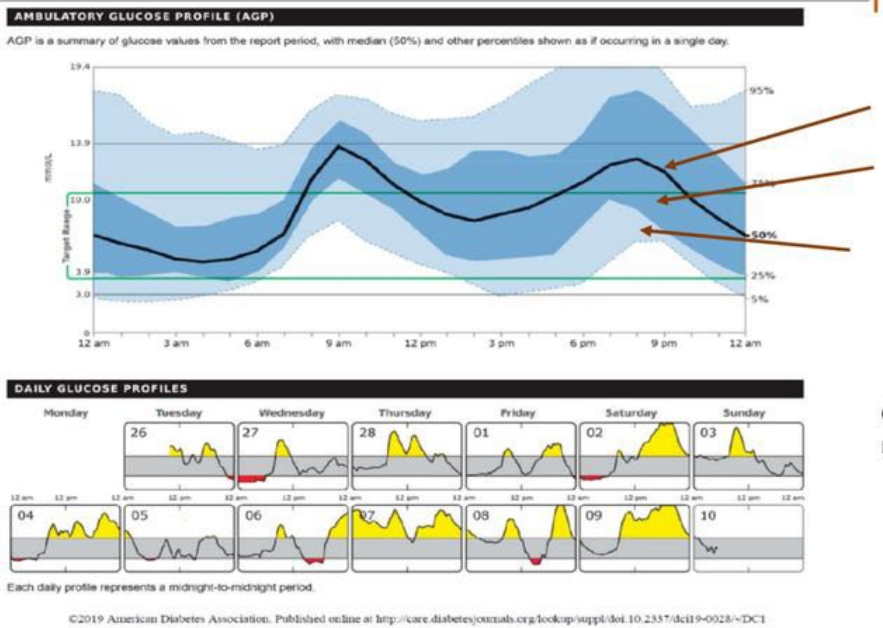
# Freestyle Libre

- Flash glucose monitoring
- Sensor inserted into arm
- Sensor lasts for 2 weeks
- Swipe reader or mobile phone over sensor to get a reading
- Currently reimbursement only available for peeople type 1 < 21years (exemption can be applied for )

# Dexcom G7


- Sensor inserted into arm
- Sensor lasts for 10 days
- Continual readings transmitted to smart phone
- Currently available on prescription. Should only come from specialist diabetes team

# 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


RECORD KEEPING


Thank you