

# The Tshwane Insulin Project

Prof Paul Rheeder, Dept of Internal  
Medicine on behalf of the TIP  
investigators



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of  
Health Sciences

Fakulteit Gesondheidswetenskappe  
Lefapha la Disaense tša Maphelo

 **TSHWANE  
INSULIN  
PROJECT**

*Developing TIPS for an optimal glucose control.*

# Disclosure

Funder

LILLY **GLOBAL HEALTH**  
PARTNERSHIP



Partners



**TSHWANE  
INSULIN  
PROJECT**

*Developing TIPS for an optimal glucose control.*



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

# TIP collaborators

- ▶ TIP team
- ▶ Project manager, Nurse coordinator, 3 Nurses and 1 Clinical Associate
- ▶ School of Health Systems and Public Health
- ▶ Department of Internal Medicine
- ▶ Department of Family Medicine
- ▶ Department of Human Nutrition
- ▶ Department of Sports Science
- ▶ Department of Nursing Science



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

# Key facts and assumptions

- Most people living with diabetes (PLD) are cared for in Primary Care Clinics in the Public Sector
- The majority of these clinics are managed by dedicated nurses often without doctors available
- The majority of people living with diabetes are uncontrolled in terms of metabolic control and complication screening
- Specifically so in the Tshwane Municipal District (Webb et al. 2015) (70% plus are uncontrolled)



# Key facts and assumptions

- This despite the fact that pathways and drugs prescribed by EDL are essentially the same as at any Academic clinic
- Data from the UK and Germany indicate that after 5 years half of the PLD on oral agents will require insulin
- Starting a patient on insulin requires skills and resources often lacking in Primary Care
- The TIP was initiated to address this gap with the aim of improving overall diabetes control and initiating patients safely and effectively on insulin.



# Strategy

- Provide regular training to all health care providers on NCD management.
- Create simplified pathways to care
- Identify those PLD with suboptimal control
- Link them to an integrated care pathway



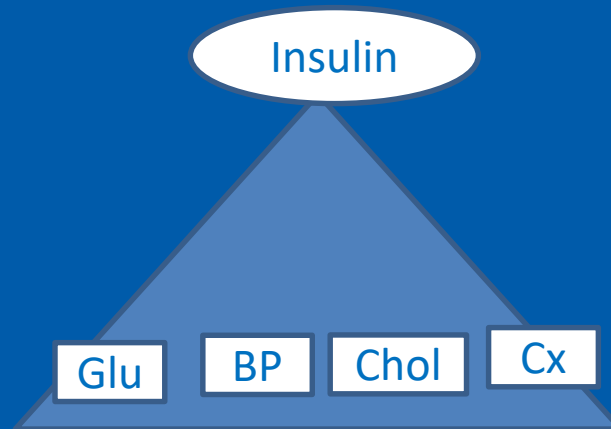
# The challenge

- Nurse led initiation and titration of insulin when a doctor is not available on site
- Solution: linked care with the help of telemedicine



# The Bigger Picture

Start Insulin when appropriate within the larger scope of general improvement of total diabetes care



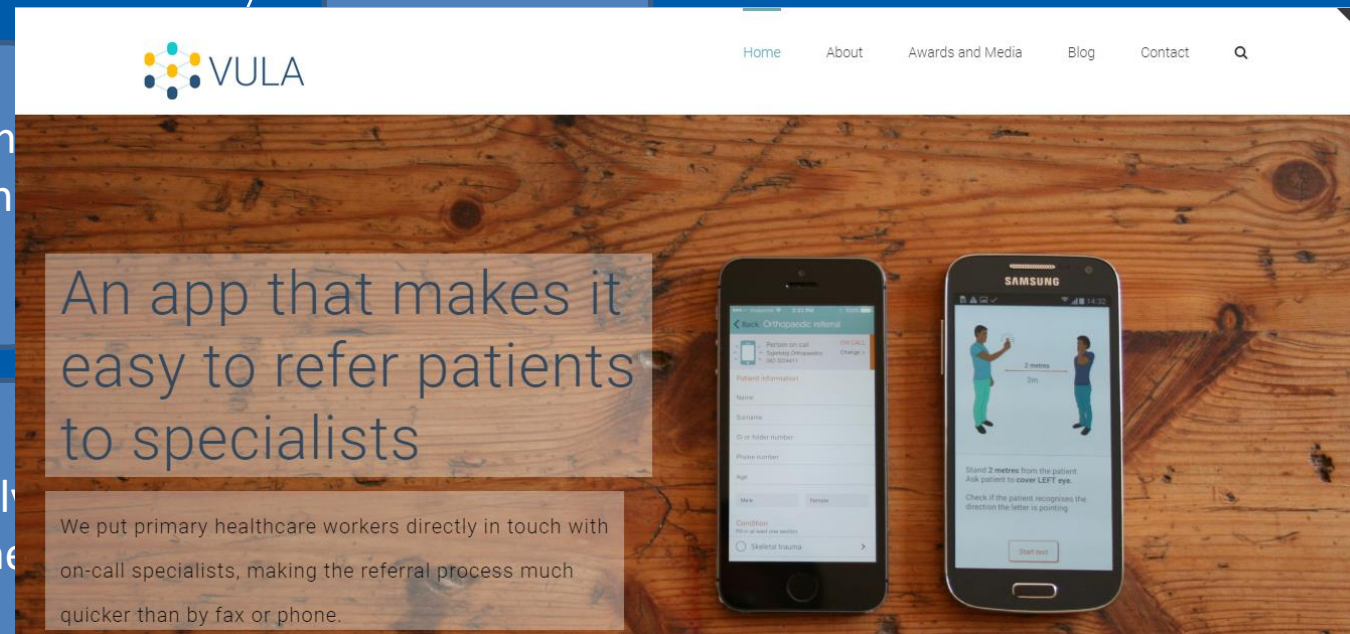
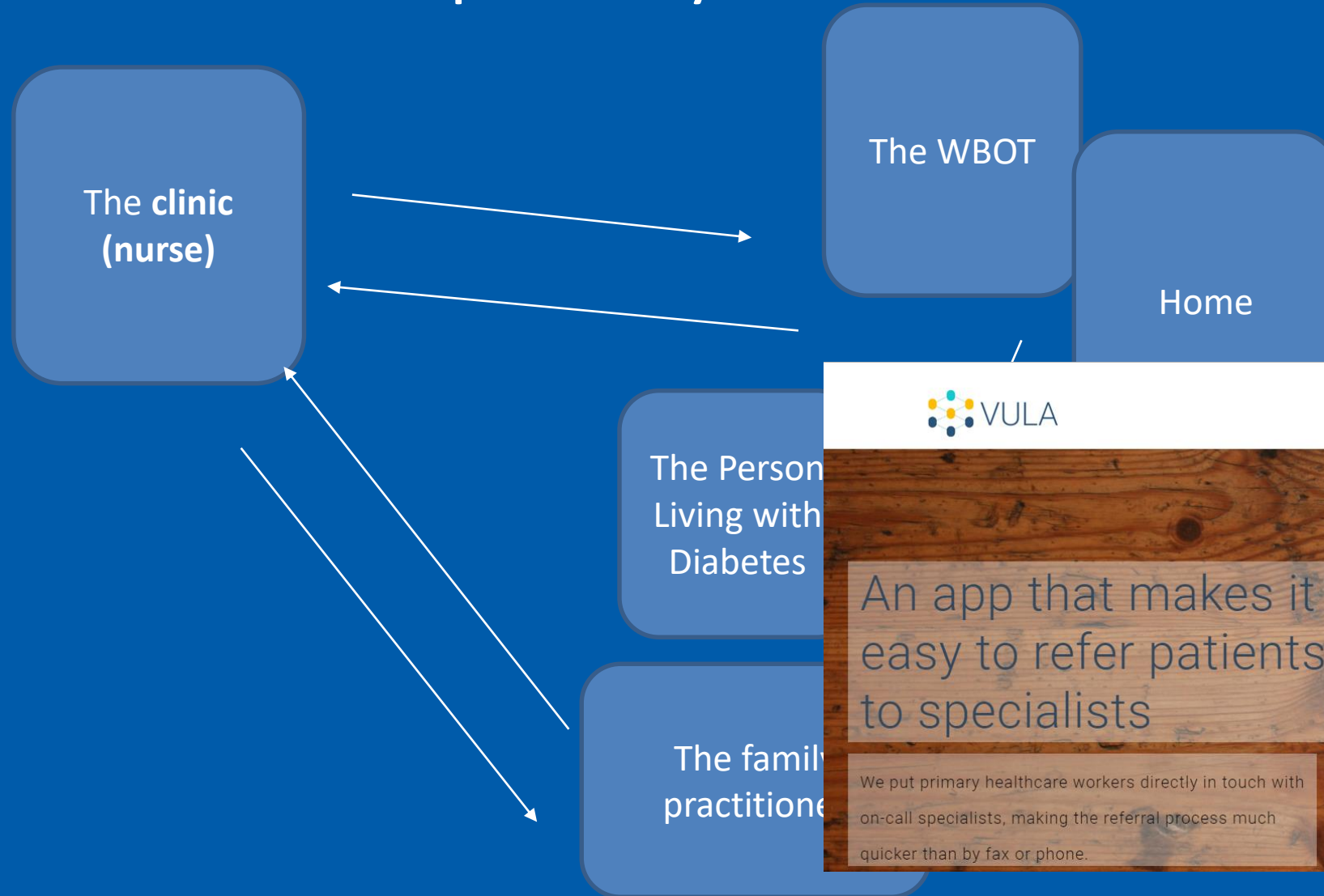
The 4B (blood glucose/BP/Chol and breathe air not smoke!)

The 4C (check annually eyes/mouth/kidneys/feet) programme





# The TIP pathway



# Pilot Study A feasibility and safety study with a 14-week follow-up period

- A feasibility and safety study with a 14-week follow-up period
- Aim: To start 30 patients on insulin at 6 primary care clinics
- Primary care nurses, doctors and CHWs trained
- Patients identified >>> prescreened >>> motivated >>> screened
- Initiated



# Pilot Study A feasibility and safety study with a 14-week follow-up period

- **Inclusion Criteria: YES**

- Patient is type 2 diabetes mellitus,
- AND HbA1c >9% and <12% (above 9% and below 12%),
- AND patient on at least 2000mg Metformin per day and Glimepiride 4mg per day or Glibenclamide 15mg per day for 3 months or more,
- AND between 30 to 70 years of age,
- AND willing to start insulin,
- AND has signed informed consent.

- **Exclusion Criteria: NONE** of the following:

eGFR  $\leq$ 30, OR BMI  $\geq$ 40 and <25, OR Age >70, OR other chronic conditions eg heart failure, liver disease that would complicate control or potentiate hypoglycaemia, OR history of non compliance, OR illiterate or unable to add or subtract numbers, OR any episodes of hypoglycaemia before, OR taken more than 2 drinks on any day of the week, OR unable to secure 2 meals a day.

- Type: Protophane or Humulin N (NPH)
- Dose: 10 units between 20:00 and 22:00 (bedtime)
- STOP: Sulphonylureas: Glibenclamide or Glimepiride, (continue Metformin)



# Pilot Study A feasibility and safety study with a 14-week follow-up period

Weekly home visits by CHWs, an Outreach Team Leader  
(and a TIP team member)

Monthly Clinic visits, seen by clinic nurse

Adjustment of insulin dose done weekly after initial 2 weeks

By CHWs or clinic nurse via VULA and the physician



# Pilot Study A feasibility and safety study with a 14-week follow-up period



Extra feature



# Pilot Study A feasibility and safety study with a 14-week follow-up period

Use average of last 2 morning fasting glucose values

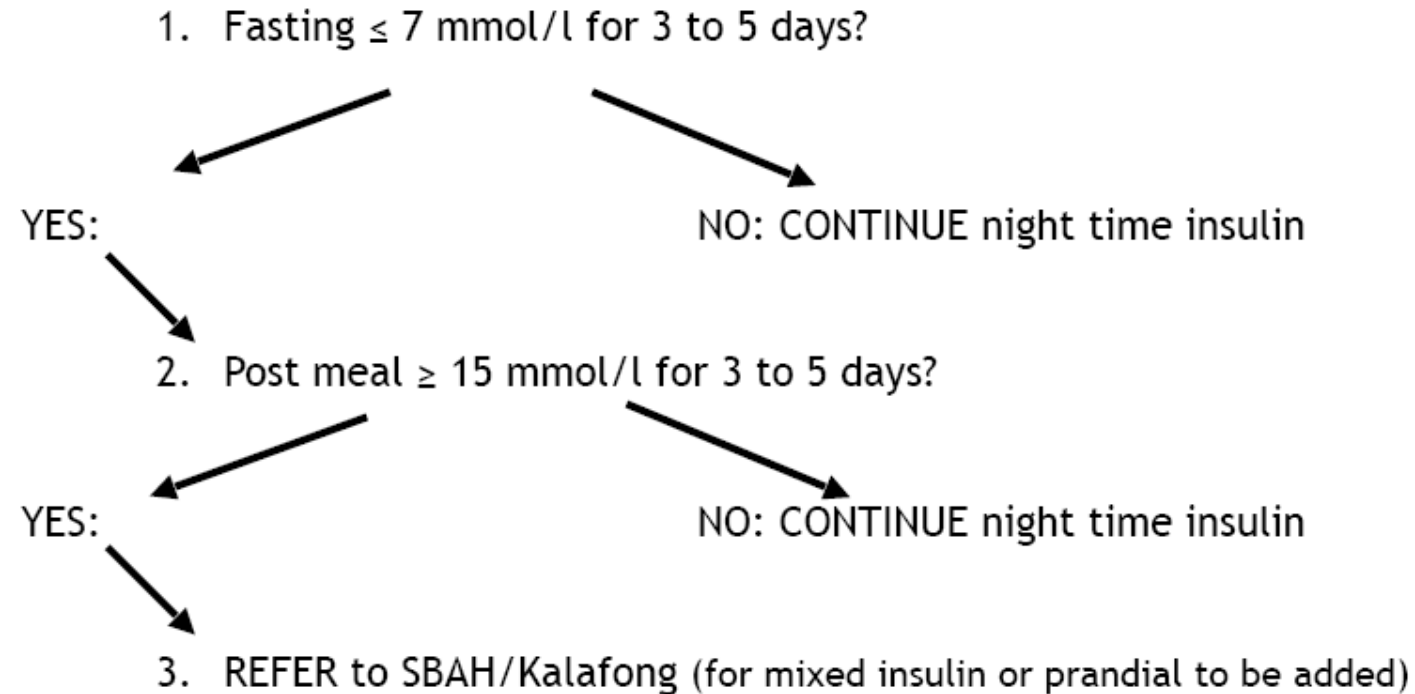
< 4.0 mmol/l	REDUCE dose by 2 units, reinforce night snack
4.0 - 7.0 mmol/l	KEEP dose
> 7.0 mmol/l	INCREASE dose by 2 units



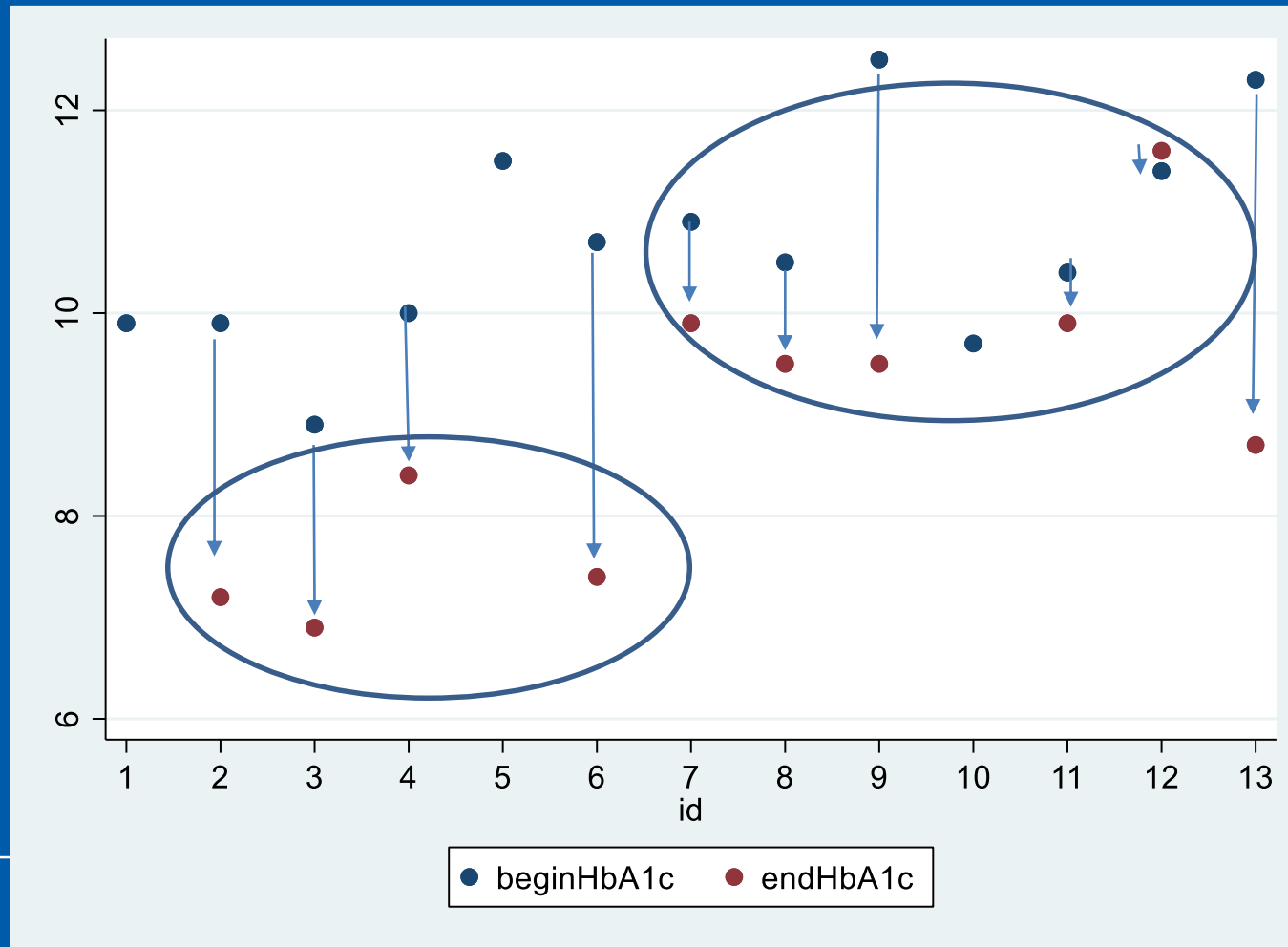
# Pilot Study A feasibility and safety study with a 14-week follow-up period

## 3. POST PRANDIAL ASSESSMENT

At weeks 10 and 14 (values after meal assessment)



# Pilot Study A feasibility and safety study with a 14-week follow-up period



Initial 13 patients

1 male, 12 females

Age 50.6(10.3) years

Begin HbA1c 10.7 (1.0)

End HbA1c 8.9 (1.5)

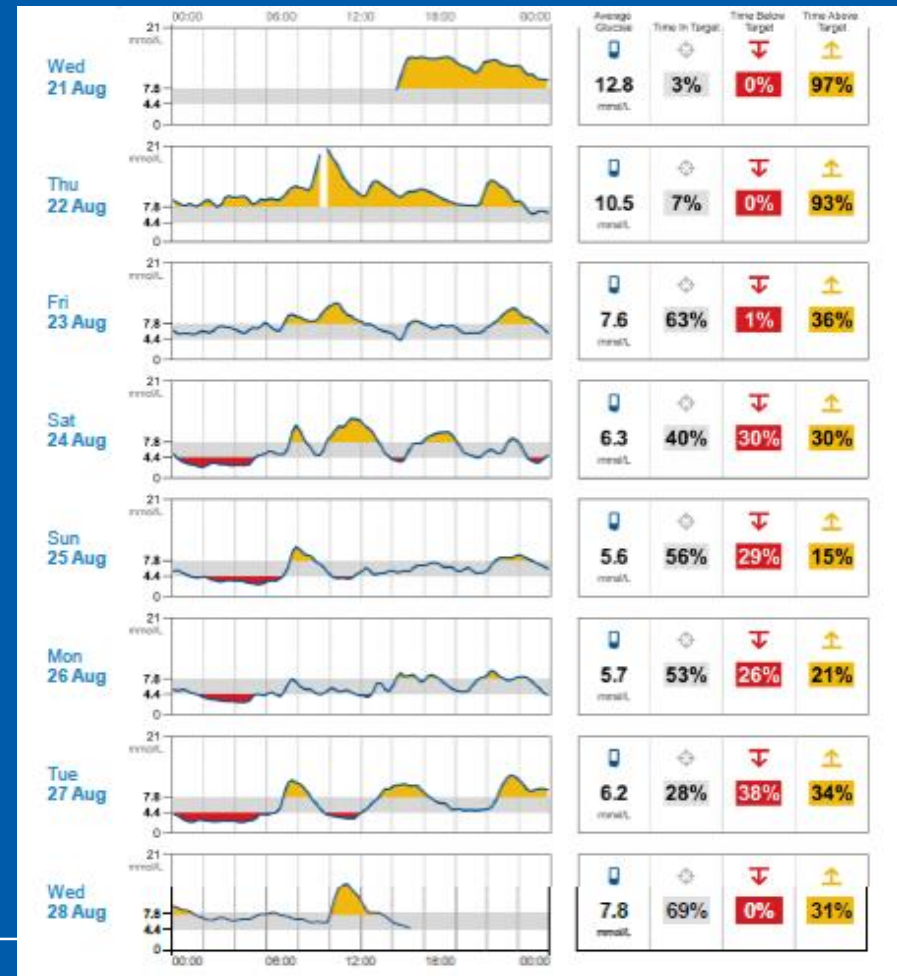
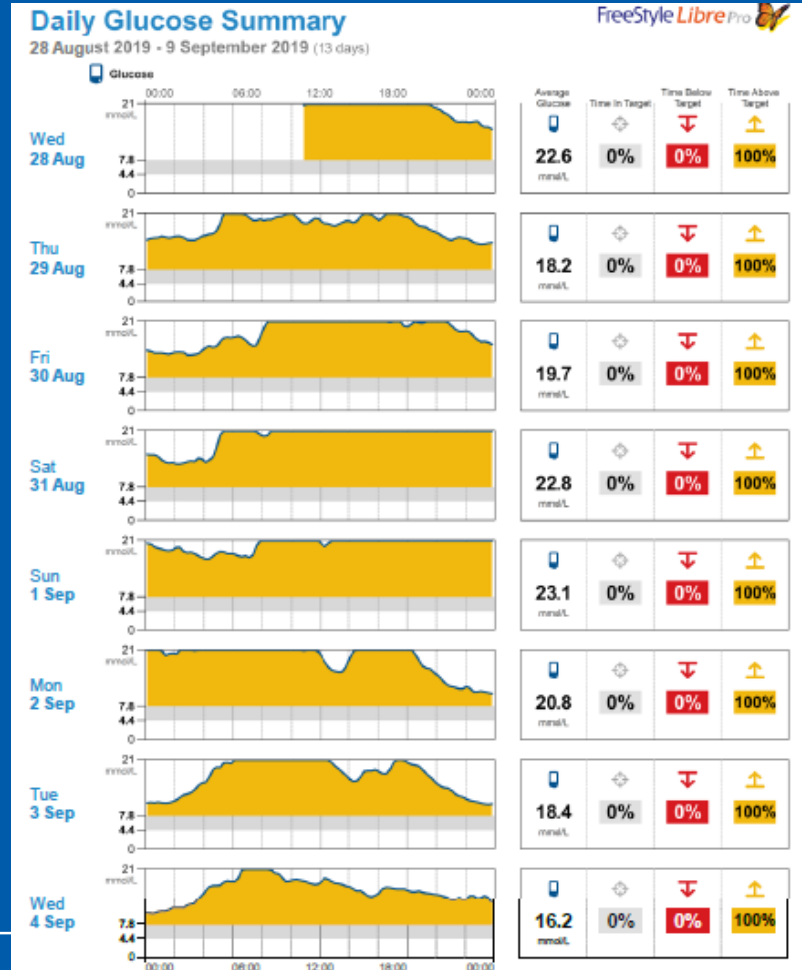
One patient fell pregnant (referred)

Two patients were referred  
before end of study and 2  
at end of study





# Sensor data: heterogeneity of patients



# Sensor data: Same Patient Pre and Post

Fri  
30 Aug  
HbA1c

9.9

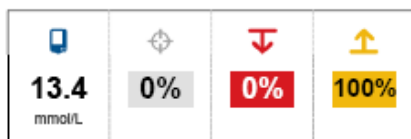
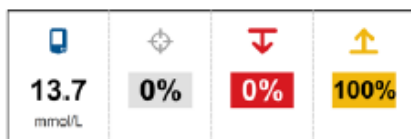
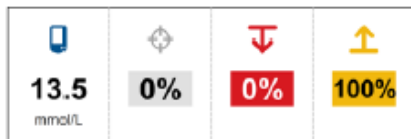
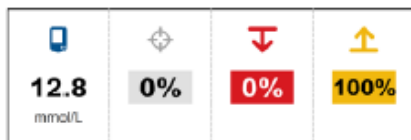
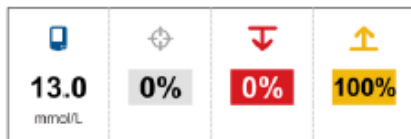
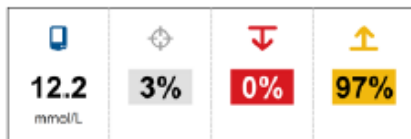
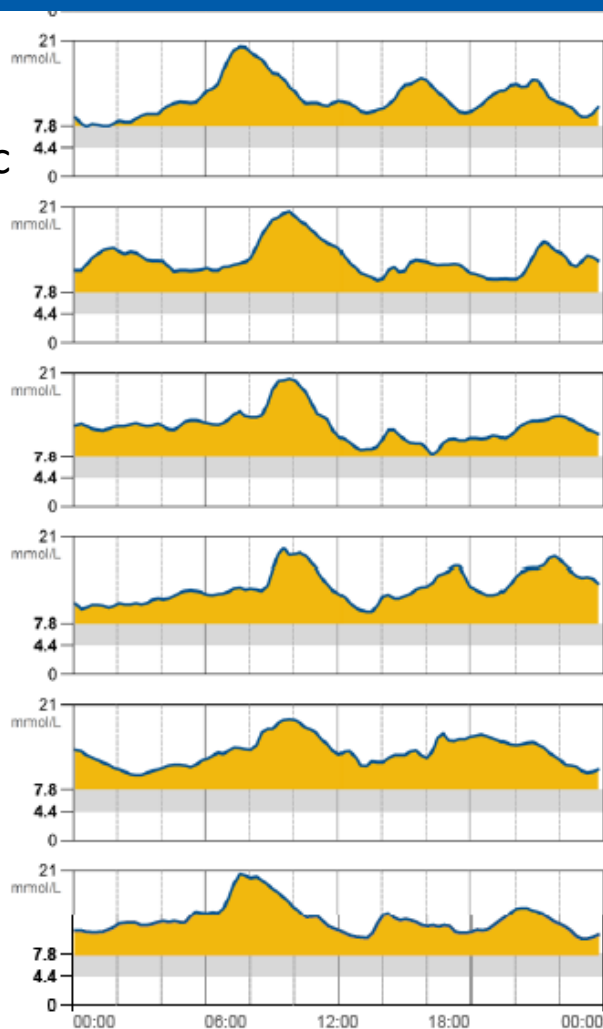
Sat  
31 Aug

Sun  
1 Sep

Mon  
2 Sep

Tue  
3 Sep

Wed  
4 Sep



Wed  
6 Nov  
HbA1c

7.2

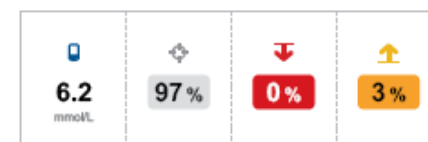
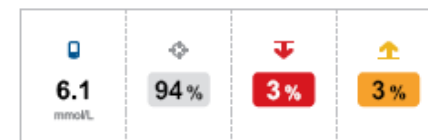
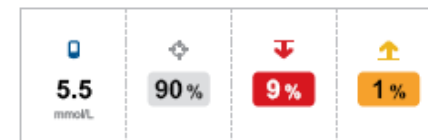
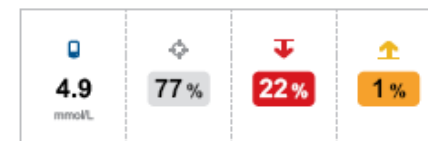
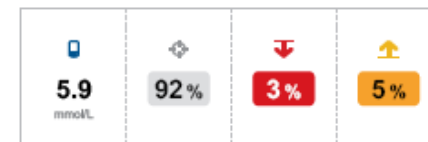
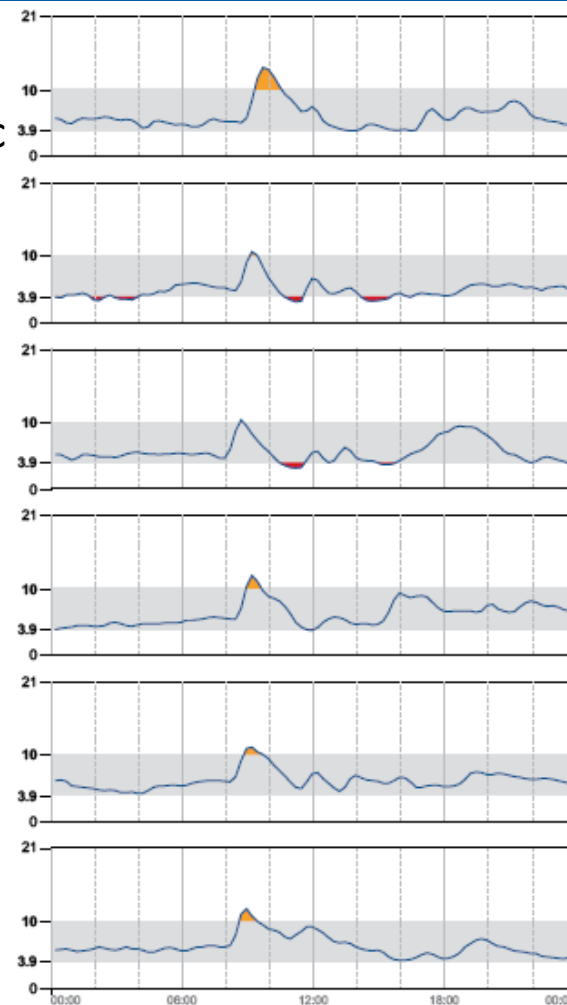
Thu  
7 Nov

Fri  
8 Nov

Sat  
9 Nov

Sun  
10 Nov

Mon  
11 Nov



# Pilot Study: preliminary data

- The pathway linking clinic/nurse with WBOT/home and family practice physician/remotely via VULA is feasible
- Patients vary and a one size fits all strategy is unlikely to work
- Careful monitoring and timeous referral is mandatory
- Once the pilot study has been completed we will roll out in the district (June 2020)



# Thank you !

