Innovations in Diabetes

Angela Blair
Channel Manager
RN Credentialled Diabetes Educator
Innovations – Time - $$$
Innovations & Technology

- Blood Testing
- Insulin delivery devices
- Insulin pumps
- Pills & Potions
- Apps for Smartphones
- Social Media
- Things that can help!
- Question Time
Blood Glucose Testing
2013 ISO Standards for Meters

- International standard = improved accuracy
- The maths (in the lab)
  - 2013: 99% of results must be within 15% (+ or -) of the true result
  - 2003: 95% of the results must be within 20% (+/-)

<table>
<thead>
<tr>
<th>+ 15%</th>
<th>True Value</th>
<th>-15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>+ 20%</td>
<td>True Value</td>
<td>-20%</td>
</tr>
<tr>
<td>7.0</td>
<td>5.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>
2013 ISO Standards for Meters

What does this really mean?

• Your meter may be 1 to 2 mmol/L higher or lower than your real BGL depending on your meter.

• Still doesn't account for user error or environmental factors like temperature.

• Meters for sale in Australia must have TGA approval.

• Use the same meter when looking for patterns in BGLs.

• Meter selection should include accuracy.
Current meters

- Talk to “someone” about your next meter
- Bells & whistles
- Improved strip technology, no coding
- Bluetooth to pumps
- Downloadable results
- Increased accuracy
Bolus Insulin Calculators

- Integrated into BG meter
- Ability to advise mealtime insulin doses
- Programmed with insulin to carb ratios + insulin sensitivities
- Commenced in conjunction with endocrinologist and diabetes educator
- Current meters: Accu-check Aviva or Abbott’s InsuLinx
Gluco-Wise Meter

Mediwise is a UK company developing the Gluco-Wise

1. a non-invasive, 100% pain-free technique using radio waves
2. test as often as you like and wherever you like
3. App and Smart Cloud technology delivers personalised advice and alerts
4. Unlimited testing without the need for costly consumables

Currently in development
Lens Technology

**Google’s smart contact lens:** monitor BGLs contained in human tears

Patented by Google in partnership with Novartis

1. Contact lens
2. Reader – sensor and chip & antenna
3. User Display/Device

Novartis hope to have full prototype for testing by early 2015

*Currently in development*
Saliva Glucose Meter

iQuickIt Saliva Analyzer

- Non-invasive wick
- Single use strips
- Use a smart device

Clinical Trials happening in America now

Currently in development
Glucose Sensor “Tattoo”

- In advanced development
- Printed electrodes on standard temporary tattoo paper, paired with a sensor
- Currently not available in real time. Team working on a user display.

Currently in development
Insulin Delivery Devices
Jet Stream ‘no pen needle’ pen

InsuJet

- $275 with ongoing consumables
- Transition period is required
- Not totally pain-free
- Quite noisy and heavy
- Limited dose (max 40 units)

Available in Australia now through Caresens
Inhalable Insulin

- Afrezza - uses a whistle-sized inhaler (Sanofi)
- Rapid insulin only
- Not suitable for everyone
- Available in USA
- Previous clinical trials in Australia of another types of inhaled insulin were unsuccessful
Timesulin

- A smart timer that fits onto your (disposable) insulin pen – Novo Nordisk, Lily and Sanofi
- Helps to avoid the accidental double dose
- Timer starts once cap removed for 8 seconds
- Great for those who can’t remember injecting
Insulin Pumps
Insulin Pump – Latest Model

Medtronic MiniMed 640G

- Newest pump to Australian market
- Predicts dropping BGL
- Automatically stops insulin delivery
- Resumes delivery when your levels recover
- Waterproof
Insulin Pump – Latest Model

Animas Vibe
• Full colour screen
• Waterproof to 3.6 metres
• Customisable food database
• Low basal rate increments – 0.025 units per hour
• Super low bolus dosing - 0.05 units bolus increments
• Small full feature pump with the largest screen available
Aviva Insight is coming to Australia in 2016

- Full color display
- Easy to navigate with zoom function
- AccuChek Fill assist - automated cartridge filling
- Not linked to CGM
- Modern look and smaller pump
Continuous Glucose Monitoring

Continual glucose monitoring systems

- Medtronic and Animas pumps
- Also stand alone devices
  - AMSL: Dexcom G4
  - Medtronic: Guardian REAL-time
Pills
Potions &
Insulin
Glucagon delivery devices

In development/awaiting approval

1. **Locemia**: a Glucagon nasal powder rescue currently in phase 3 clinical trials (Canada)

2. **GenPen, Gen Pen Mini**
   - Ready to inject glucagon like an Epi-pen
   - Different levels of treatment for different grades of hypos

3. Others include a liquid glucagon or freeze dried GlucaGo

Currently in development
New Insulins – Coming soon

**Toujeo - Sanofi**
- Next generation basal insulin
- Once-daily basal insulin based on insulin glargine (Lantus) but more stable with prolonged results
- Lower incidence of confirmed hypoglycaemia day or night in type 2

**Degludec – Novo Nordisk**
- Lasts 25 – 40 hours
- Slow release basal insulin
- Can be mixed

Currently in sold in US/Europe
Smart insulins in the pipeline

• “Smart” insulin can circulate in the bloodstream >10 hours
• Turns on when needed
• Responds rapidly to changes in BGLs
• Could eliminate need for repeated monitoring & insulin injections throughout day
• When blood-glucose levels are high – glucose binds to insulin & activates
• Once a day instead of long-acting insulin

Currently in development
Apps for Smartphones, tablets & watches
Smartphones

**Australia: Smartphone Usage**

- Smartphone penetration as a percentage of the total population: 65%
- Smartphone users searching for local information via their phone: 90%
- Smartphone users researching products via their phone: 78%
- Smartphone users who have made a purchase via their phone: 41%

*Source: Google’s “Our Mobile Planet” Report*
Smart phones & tablets

Many Uses in Diabetes Management

• Apps for blood glucose testing meters – iBGStar or Dario

• Apps that record foods, exercise, diabetes management, carb amounts, special dietary information, reminders for medications

• Emails & texts – family, health professionals

• Internet exploration – “Dr Google”
Apps – Apple & Andro

- Many apps now available
- Apple or Android
- Free or cost
- Note the country of origin – BGL measurement is mmol/L in Australia
- Top 5 Apps (not in order):
  - My Diabetes
  - Hypo Help
  - Traffic Light Guide to Food – Carb Counting
  - The Coeliac Society of Australia – Ingredient List
Apps for Apple & Android

- Diabetes Australia App
- Glucose Buddy - Diabetes Logbook
- CalorieKing Australia Food Search
Social Media
Diabetes related websites

- If you have a computer, tablet, smart watch or mobile phone then you can access lots of information and support in the world of diabetes
- Always look for a website from a known source
- Beware of sites offering cures!
- Remember to look where the product is made
- Look at where the information is from
- DO NOT order medications from overseas websites
Being a teen is difficult.
Being a teen with diabetes is devastating.
Help teens like Grace live an easier life.

READ HER STORY HERE
NDSS Website

NDSS
The National Diabetes Services Scheme (NDSS), which began in 1987, is an initiative of the Australian Government administered by Diabetes Australia. The

Online Services Directory
Search for NDSS Access Points and doctors, endocrinologists, credentialled diabetologists,

Australian Diabetes Map
Presents population data about Australians diagnosed with diabetes. It shows the number of
Facebook
Email

- Great communication tool for you and your health professional
- Link in to groups
- Contact with family and friends
• Please remember it is someone's opinion
• Depending on where they live, diabetes management tools, foods and medications may vary
• Can be motivating to hear about someone else's diabetes journey
What else?

- Wearable exercise devices
- Pen, paper & diary
- Accuchek 360 tool
- Books
- Reminders in phones
- Your health care team
Innovation at it best!

What does the VESSYL do?

- It can tell the difference between Coke and Pepsi

The Vessyl can also:

- Measures your hydration
- Count the sugar content
- Monitors your caffeine intake
- Track your goals.
- Sync with your phone and other gadgets

Developed through Crowd Funding
Questions & Discussion