Diabetes Technology

Eric L. Johnson, M.D

Department of Family and Community Medicine
UNDSMHS
Diabetes Technology

• Many changes in Diabetes Technology

• Two main categories of Diabetes Technology
  – Self-monitoring glucose meters
  – Insulin and other injectable medicine delivery (pens and pumps)

• Reflects changes in technology in other everyday use (i.e., computers, cell phones)

• Better technology can mean more effective diabetes management
Self Blood Glucose Monitors*

*Meters shown are not an endorsement, for illustration purposes only
Self Blood Glucose Monitors

• Modern Meters
  – Fast (5-7 seconds), accurate
  – Comfort
  – Display
  – Data collected and stored

• Adjustable lancet force

• Alternate site testing (forearm, palm)
Self Blood Glucose Monitors

• Most Third Party Payers (Insurance, Medicaid, Medicare) cover Monitors

• Computer Interface
Medication Delivery Devices
Pen Delivery Devices*

- Insulin and Non-insulin injectable products
  - Exenatide (Byetta)
  - Amylin (Symlin)
- Easy to use
- Replace vial and syringe
- Accurate, comfortable delivery

*Models show are not an endorsement, for illustration purposes only
Insulin

Please note:
When prescribing KwikPen, prefilled with the Humalog Brand of Insulins, you will need to write a separate prescription for BD needles.

- Easy to set the dose
- Easy to see numbers
- Easy to dispense maximum dose of 60 units
- Easy to dial up and back down for dose correction
- Short thumb-reach at high doses
Exenatide (Byetta)

Amylin (Symlin)
Continuous Subcutaneous Insulin Infusion (Insulin Pumps)*

• External device, delivers insulin through a port to subcutaneous tissue

• Uses a single type of insulin (rapid acting)
  – Small amount delivered continuously (basal)
  – Larger amounts delivered with meals (bolus)

• User controls all insulin delivery

• “Small computers” that assist with insulin delivery

*Models shown are not an endorsement, for illustration purposes only
Basal / Bolus Therapy

Insulin Pump

Variable basals (not fixed)
Bolus-Immediate, Square, Dual Wave

- Insulin Needs
- Basal Insulin
- Bolus Insulin

Time of Day
Prototype Pump 1960’s
Model AS*6G-U100
Portable Insulin Pump

1. New, significant increases in portability, ease-of-use and
   protection.
2. The physical design of the pump is updated, but still
   meets the same basic requirements as the previous
   model.

Model 9100
INSULIN INFUSION PUMP
PATIENT MANUAL
Modern Pump Technology
Pump with continuous glucose sensor

Continuous glucose sensor

Modern Pump/Sensor Technology
Sensor Data-Blood Glucose

Sensor Data (mg/dL)

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<th>Thu Mar 16</th>
<th>Fri Mar 17</th>
<th>Sat Mar 18</th>
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<th>Mon Mar 20</th>
<th>Tue Mar 21</th>
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<td>High SG (mg/dL)</td>
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<td>Low SG (mg/dL)</td>
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<td>Average SG (mg/dL)</td>
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<td>MAD %</td>
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Proposed Future Technologies

• Pump/Sensor interface with Bluetooth, PDA, Smart Phones

• “Closed Loop Systems”
  – Monitor blood glucose
  – Insulin from pump automatically regulated
  – “Artificial Pancreas”
Summary

• Tremendous gains in diabetes technology
• Practical blood glucose monitoring
• Medication delivery
  – Insulin pumps
  – Pens for insulin and non-insulin injectable medications
• Future Technology: “Artificial Pancreas”