



## “HOUSTON, WE HAVE A PROBLEM.” DIABETES MANAGEMENT

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## Objectives

- Review Diabetes and why we treat it!
- Understand why frequent sliding scale insulin use is ineffective and potentially dangerous.
- Discuss the “Basal Bolus” or “Physiologic” approach.
- Discuss recommended A1C goals in the elderly and recommended Accu-check frequency.
- Discuss a practical way to reduce Sliding Scale insulin usage

## Insulin and Diabetes

- Insulin is a hormone that enables the cells of the body to use glucose.
- The body’s cells can then transform the glucose into energy or store it for later use in a modified form.



## Where does insulin come from?

- Insulin is secreted by Beta cells in the Pancreas.
- Insulin is released in response to glucose ingestion.
- Insulin helps the glucose that is circulating in the blood stream (after we eat) enter into the cells to be broken down into energy.



## What happens in Diabetes?

- The glucose that is circulating in the blood stream is unable to enter the cells.
- “High blood glucose” levels result.
- Too much glucose in the blood stream can “muck” up the blood vessels...prevents blood flow.
- Lack of blood flow means lack of oxygen.
- Small vessels affected first...eyes, feet, kidneys...then larger organs



## Why do we treat Diabetes?

- **Problems associated with Diabetes in the Elderly**
  - Eye problems (blurry vision, vision loss)
  - Foot ulcers, gangrene...loss of limbs
  - Frequent infections: UTIs, skin, delayed wound healing
  - Falls
  - Risk of Dehydration (frequent urination)
  - Incontinence! Associated with BG > 180 mg/dl
  - Depression
  - Acceleration of cognitive impairment/confusion
  - Decline in ability to perform ADL

## What does Hyperglycemia look like in the elderly?

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- Blurred vision
- New or increasing confusion
- Lethargy
- Polydipsia, polyphagia (increased thirst/hunger)
- Weight Loss
- Worsening incontinence
- Fruity breath odor

## AMDA 2008

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- Expected Outcomes with improved Diabetes Management in the Elderly
  - Decline in the rate of hypoglycemia
  - Decline in the rate of infection, electrolyte imbalance and dehydration
  - Decline in progression of complications
  - Reduction in ER visits
  - Reduction in patient costs
  - Enhanced quality of life.

## Related F-tag 329 with SSI therapy

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- SOM states: "Continued or long-term need for sliding-scale insulin for non-emergency coverage may indicate inadequate blood sugar control."

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## Treating diabetes

What we see a lot of and what we should see less of in long term care...

## SLIDING SCALE INSULIN

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## Statements on Sliding Scale Usage

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- AMDA: Although "sliding-scale" insulin is widely used in long-term care facilities, its use is not recommended. No standards are available for SSI and it is not considered acceptable due to lack of evidence related to efficacy.

American Medical Directors Association. *Diabetes Management in the Long-Term Care Setting Clinical Practice Guideline*. Columbia, MD: AMDA 2008, revised 2010.

## Excessive Reliance of Sliding Scale Insulin

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- Use of SSI is now on the Beers list 2012
- AMDA recommends that any patient on SSI be re-evaluated within 1 week and converted to fixed daily insulin doses that minimize the need for correction doses
- Data suggests that about 70% of BG results done by finger stick have no action taken in individuals on SSI
- Clinical judgment and ongoing clinical assessment are important for making day to day decisions regarding the treatment of hyperglycemia

Per AMDA Diabetes CPG 2010.

## Sliding scale insulin

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What goes up...



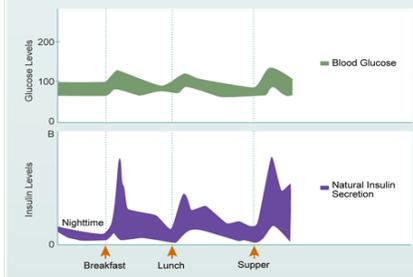
Must come down...



## Normal insulin secretion

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Normal (Non-diabetic) Blood Glucose and Insulin Levels over 24 Hours



## Limitations of Sliding-Scale

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- Does not match physiological insulin needs (basal and bolus needs)
- Does not provide **BASAL** insulin coverage
- Wider fluctuation in Blood Glucose levels (very high and very low)
- Seldom individualized to reflect a patient's insulin sensitivity.
- Reactive to a single BG measurement in time. "Chasing Blood Sugars."

## "Basal-Bolus" Insulin secretion

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- AKA: Basal and Mealtime insulin, Physiologic Insulin
- Basal insulin secretion
  - Occurs continuously
  - Keeps liver glucose production in "check"
  - Liver produces glucose as a safety net in normal functioning
  - Liver overproduces glucose in diabetic resident
  - Our bodies produce a nearly constant level of "basal" insulin throughout the day...but it is not able to handle large glucose intake after a meal.

## "Basal-Bolus" Insulin secretion

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- Bolus/Mealtime Insulin secretion
  - Occurs in response to food intake or a meal
  - Helps control hyperglycemia after meals...doesn't allow the sugar to hang around in the blood too long.

## “Basal-Bolus” Insulin regimens

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- Basal Insulin
  - ▣ **Lantus or Levemir (preferred)**
  - ▣ NPH insulin (more variation/not recommended)
  
- Bolus/Mealtime Insulin
  - ▣ **Novolog/Humalog (preferred)**
  - ▣ Novolin R/Humulin R (more variation/not recommended)

## Resistance to Change

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- “We’ve always done it this way.”
  - ▣ Nothing is forever
  
- This resident is too unstable...or “brittle.”
  - ▣ Studies show better control, fewer highs and lows.

Slide adapted from Crecelius, Charles, *A Pragmatic Approach to Diabetic Care for Nursing Home Residents*, 2012.

## 2012 Beers Criteria Endocrine

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Therapeutic Category	Rationale	Recommendation	Quality of Evidence	Strength
Insulin, Sliding Scale	Higher risk of hypoglycemia without improvement in hyperglycemia management regardless of care setting	Avoid	Moderate	Strong

C. Campanelli et al., JAGS Feb. 2012

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## Treatment Goals

In older adults

“Don’t be lazy, but don’t be crazy...”

Per Dr. Crecelius, *A Pragmatic Approach to Diabetic Care for Nursing Home Residents*, 2012.

## Diabetic Goals in Older Adults with Diabetes

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Health Status	Rationale	Reasonable A1C goal	FBG/Preprandial	HS
Healthy*	Longer remaining life expectancy	< 7.5%	90-130	90-150
Complex/Intermediate**	Intermediate remaining life expectancy, High treatment burden, Hypoglycemia, falls	< 8%	90-150	100-180
Very Complex/Poor health***	Limited remaining life expectancy makes benefit uncertain	< 8.5%	100-180	110-220

\*Few coexisting chronic illnesses, intact cognitive and functional status.

\*\*Multiple coexisting chronic illnesses or 2+ADL impairment, mild to mod. cognitive impairment

\*\*\*End-stage chronic illnesses, mod to severe cognitive impairment, 2+ ADL dependence

Adapted from AMDA 2012

25 Other AMDA recommendations

### Hypoglycemic Protocol: "Able to swallow"

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- **BG < 70 and Able to swallow: Give 15 GM of glucose or carbohydrate equivalent:**
  - 4 ounces (1/2 cup) juice
  - 1/2 cup apple sauce
  - 1 cup of milk
  - 3 glucose tablets
  - 3 packets sugar (dissolved in water)
  - 15 GM Glucose Gel (typically 1 tube)
- **Wait 15 minutes**
- **Recheck blood glucose. If still below target, give another 15 GM of glucose.**

Adapted from AMDA Diabetes CPG, 2010.

### Hypoglycemic Protocol "UNABLE to swallow"

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- **BG < 70 and UNABLE to swallow:**
  - Give 1 mg glucagon sq
  - Turn resident to side (glucagon can cause emesis)
  - Record VS/pulse ox
  - Contact Provider
- **Repeat blood sugar in 15 minutes**
  - **Still UNABLE to swallow-repeat glucagon.**
    - Recheck BS in 10 min-still <60-call 911.
  - **If ABLE to swallow, follow protocol #1 and be sure to follow up with meal/snack (for sustained glucose recovery).**

Adapted from: A Pragmatic Approach to Diabetic Care for Nursing Home Residents; Crecellus, Charles MD and AMDA Diabetes CPG 2010.

### Avoid Overtreatment

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- Excessive amount of glucose may result in significant hyperglycemia within the next 4-6 hours.




### What Hypoglycemia looks like in the Frail Elderly

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□ Altered behavior and mental function.	□ Hunger
□ Altered level of consciousness (e.g., drowsiness, lethargy)	□ Irritability
□ Confusion or disorientation	□ Pallor
□ Falls	□ Poor concentration and coordination
□ Generalized Weakness	□ Seizures
□ Hallucinations	□ Stroke
	□ Sweating

### When to Call Practitioner? **Hypoglycemia**

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- **Call immediately:**
  - Blood sugar less than 70 AND unresponsive
  - Blood sugar less than 60 AND responsive
  - Two consecutive blood sugars less than 70
    - "back to back" or same time of day

Adapted from AMDA Diabetes CPG, 2010.

## When to call Practitioner?

### Hyperglycemia

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- Call as soon as possible:
  - Two or more blood glucose values > 250 mg/dl
    - **WITH CHANGE OF CONDITION**
    - **NO TREATMENT** (no oral diabetes meds or insulin)
  - Blood glucose values > 300mg/dl during all or part of 2 consecutive days

Adapted from AMDA Diabetes CPG 2010.

## Suggested Blood Glucose Monitoring

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- Oral Agents only
  - Twice Daily, at least 2-3 times a week
- Simple Insulin Regimen (1-2 shots a day)
  - Twice Daily, at least 3-4 times a week
- Complex Insulin Regimen (3-4 shots a day)
  - Four Times a day initially
  - Consider decreasing if stable for several weeks

Adapted from: A Pragmatic Approach to Diabetic Care for Nursing Home Residents; Crecelius, Charles MD and AMDA Diabetes CPG 2010.

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## Reducing your SSI usage

And improving glycemc control

## How we reduced SSI use and improved A1C

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- Get a list of all of your diabetic residents!
  - Find out their most recent A1C value.
  - Look at their Sliding Scale Usage.
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- Focus on those residents with A1C > 8%
  - Focus on those with lots of sliding scale usage.

**It's not rocket science!**



## How we reduced SSI use and improved A1C

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### Pharmacy led program

- The consultant pharmacist evaluated monthly:
  - Do they have basal insulin on board?
  - Do they need therapy intensified? (start low and go slow).
  - As control improves, can we reduce Accu-checks?
- The consultant pharmacist provided Quarterly reports tracking A1C progress, SSI usage and Accu-check orders.

## How we reduced SSI use and improved A1C

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- Involved an Interdisciplinary Team (IDT): medical director, consultant pharmacist, director of nursing, etc. to stay on top of it.
- Evaluated reports Quarterly

## Controlled diabetes at your facility

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- Can result in:
  - ▣ Fewer Doctor calls
  - ▣ Reduced wound care time
  - ▣ Reduced accu-check time
  - ▣ Increased resident quality of life

## Take home

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- By shining a light of these residents and reviewing them regularly, diabetes can take center stage instead of being the background noise...which causes a lot of noise if un-treated or undertreated.

## References:

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- AMDA. *Diabetes Management in the Long-Term Care Setting Clinical Practice Guideline*. Columbia, MD: AMDA 2008, revised 2010.
- ACE/ACE Task Force on *Inpatient Diabetes*. *Diabetes Care*, Vol 29, Num 8. August 2006.
- Crecelius, Charles, MD. *A Pragmatic Approach to Diabetic Care for Nursing Home Residents* Slide Presentation. 2012.
- Sanofi-Aventis US. *LTC Diabetes Quick Cases Slide presentation*. 2011.

## Questions

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