Glycemia Management In The Long Term Care Setting

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Objectives

- At the end of the session the learner will be able to
  - Tailor glycemia management to the goals of care
  - Address facility barriers to glycemic control
  - Consider team contributions to glycemic management

Management of Diabetes Multi-factorial

- Glycemic control
- Lipid management
- Blood pressure control
- Anti-thrombotic drug
- Monitor for end-organ disease
  - Vision loss
  - Risk of limb ischemia; foot care
  - Other

Framework of glycemic management in LTC

- Transitional
  - Hospital to SNF
- Long-term
  - Adapting the glycemic management as resident ages
- Not including:
  - SNF-> home
  - Respite
  - T1DM w/wo Insulin pump
  - Hospice

Can we get our framework from ADA Standards Medical Care in Diabetes- 2012?

IX: Specific settings
A. Hospital
B. Employment
C. Driving
D. Correctional institutions

Nursing home care not mentioned !!
Additional lack of attention to transitions of care?

- In diabetic literature
- Transitional care means:
  - A young DM I from pediatric to adult primary care or diabetologist!
- Research on transitions of care
  - Identifies high prevalence of SSRI
  - Interventions? Outcomes?
- In the meantime, more efforts ongoing in hospital care of T2DM

Hospital care of diabetic

- Rabbit-2 seminal study
  - Mean age 65, non-ICU, T2DM
- Comparison of:
  - basal/bolus (glargine & tid glulisine)
    - Plus 4 x/d sliding scale
  - Versus: Standard SSRI protocol qac, qhs
- Outcome: better glycemic control
  - Acceptable hypoglycemia
    - 0.4% BG < 60, none < 40 mg/dL either group

Outcomes after hospitalization?

- We don’t know from the studies
- Real world: > 25% d/c to SNF with
  - more basal/bolus orders
  - still too many SSRI orders
- Facilities need a rational approach to glycemic management

Target of Treatment?

- Fasting glucose less predictive
  - Less gluconeogenesis
  - Higher risk nocturnal hypoglycemia
- Short term: post-prandial
  - Cannot be accurate outside of a trial
- Longer-term: Hgb A1c

Hgb A1c on-treatment:
Poor outcome if too high, too low

SSRI = sliding scale regular insulin
T2DM = Type 2 Diabetes Mellitus

Umpierrez. Diabetes Care. 2007

Currie. Lancet. 2010
Recent Consensus Framework
Targets for the older diabetic

<table>
<thead>
<tr>
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<th>Hgb A1c</th>
<th>Pre-prandial</th>
<th>Bedtime</th>
<th>BP</th>
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<tr>
<td>Healthy</td>
<td>&lt; 7.5%</td>
<td>90-130</td>
<td>&lt;150</td>
<td>&lt; 140/80</td>
</tr>
<tr>
<td>Complex</td>
<td></td>
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<td>&lt; 8%</td>
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Living in community
Intact cognition
Intact function


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3+ co-existing chronic illnesses (OA, cancer, HF, depression, COPD, falls, HTN, incontinence, CKD3, MI, CVA)
OR
2+ instrumental ADL impairment
OR
Mild-mod cognitive impairment


Management also requires
Concept of “stage” of diabetes

• “Early” stage: “Diet,” sensitizer mgt
• Mid stage:
  - One-two oral hypoglycemics, or
  - Basal Insulin
• Late or “end” stage Type II
  - Similar to Type I DM
  - 1-2 daily basal insulin +
    - Pre- or post-prandial rapid-acting
    - Gastroparesis? metoclopramide


Strategies for chronic glycemia management

• Three major strategies-
  - ADA
  - ACE
  - EWDP
• Nuanced differences
• None specific for long-term care
• None proven best

### Comparison of Meds

<table>
<thead>
<tr>
<th></th>
<th>MET</th>
<th>SU</th>
<th>Glinide</th>
<th>TZD</th>
</tr>
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<tbody>
<tr>
<td>↓ PPG</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>↓ FPG</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Risk Hypoglycemia</td>
<td>N/A</td>
<td>++</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>Prevalence GI sx</td>
<td>++</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Risk w/CKD</td>
<td>+++</td>
<td>++</td>
<td>N/A</td>
<td>+</td>
</tr>
<tr>
<td>Risk w/Hepatic disease</td>
<td>+++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Heart failure/edema</td>
<td>?</td>
<td>N/A</td>
<td>N/A</td>
<td>++</td>
</tr>
<tr>
<td>Wgt gain</td>
<td>--</td>
<td>+</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Risk Fracture</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>++</td>
</tr>
<tr>
<td>Drug-Drug interaction</td>
<td>N/A</td>
<td>++</td>
<td>++</td>
<td>N/A</td>
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### Examples of drugs

- **SU**: glipizide
- **Glinides**: repaglinide, nateglinide
- **DPP4**: Inhibitors of dipeptidyl peptidase-4
  - Sitagliptin, vildagliptin
  - Saxagliptin, linagliptin
- **GLP1**: glucagon-like peptid-1
  - Injectables, very little experience in older population

### Comparison of insulins

- **Basal**:
  - Lantus (Glargine)
  - Levemir (Detemir)
- **Rapid acting**
  - Novolog (Aspart), Humalog (Lispro)
  - Apidra (Glulisine)
- **Premixed insulin/protamine**
  - Novolog Mix, Humalog mix
- **Less desired (ACE “not recommended”)**
  - Regular (humulin R or novolin R)
  - NPH (Humulin N, Novolin N)
NPH v. other basal
• More weight gain
• More nocturnal hypoglycemia
• More overall hypoglycemia
  - 50-90% less w/ detemir c/w NPH
  - Up to 50% less w/ glargine c/w NPH
• Detemir/ glargine comparable in glycemic control and adverse events

Optimal Insulin Regimen
Not Known!!
• 768 pts
• Mean 62(10) yrs
• 3 yr RCT
  - Biphasic aspart
  - Aspart
  - Detemir

Sliding scales of insulin
• Likely over-prescribed
  - Outpatient
  - Long-term care settings
• Useful if changing basal regimen based on trend
• Not useful if chasing hyperglycemia after the fact
• AMDA guidelines discourage
  - Particularly regular humulin scales

Case #1
• Frank:
  • 72 years old retired journalist
  • No known medical problems
  • Underwent TKR for OA
  • Diabetes diagnosed in hospital

Frank, Continued
• 5'10", 240#, 172/85
• Creatinine 1.0, Hgb A1C 9.0%
• Enjoys golf, tennis
• How do we manage the DM?

Optimal Insulin with Different Types of Insulin
Holman. NEJM. 2009
P < .001

Case #1
In the hospital
• During 3d stay?
• Discharge instructions to SNF?
1. SS RA insulin
2. SS regular insulin
3. Glipizide
4. NPH
5. Lantus
6. Metformin
7. 1+3
8. 1+5
9. 1+6
Case #1
In the SA/SNF

- Admission orders?
- At 2-week point?
- Discharge orders?

1. SS RA insulin
2. SS regular insulin
3. Glipizide
4. NPH
5. Lantus
6. Metformin
7. 1+3
8. 1+5
9. 1+6

Case #1 monitoring BG
In the hospital

- During hospital?
- Discharge instructions?

1. Qac & qhs
2. Fasting
3. Post-prandial
4. Combo 2+3
5. None

Case #1 Monitoring BG
In the SA/SNF

- Admission orders?
- At 2-week point?
- Discharge orders?

1. Qac & qhs
2. Fasting
3. Post-prandial
4. Combo 2+3
5. None

BG monitoring for many (not all, not daily) elderly diabetics

- Periodic
  - a.m. glucose useful: safety
  - Post-prandial CBG (1.5 – 2 hours) useful:
    - To verify CHO intake prior meal
    - To monitor ability to meet Hgb A1c targets

- Limitations
  - Post-prandial (pp) blood glucose (BG) can be difficult to time

End of Life Care

- One hypoglycemic agent daily
  - Oral or injectable
- Prepare to lower dose
  - Intake likely to decline
- Fasting CBG: > 100 mg/dL
  - R/o iatrogenic hypoglycemia
- Post-prandial CBG: < 350-400
  - Symptom management
  - Thirst, dehydration, falls, etc.

Challenges Unique to Institutional Frail Elders

- SNF: rapid change in condition
- ECF: slow disease progression
- Preconceptions by patients, staff, family
  - Sliding scale
  - Diet (Medical Nutrition Therapy)
- Facility challenges
  - Access to RA insulin during meal
  - Food consumption
    - Time for nursing to do it
    - Quantity v. CHO estimation
  - Exercise
  - Patient rights versus MNT
Performance problems in facilities

- Hyperglyemia, Hypoglycemia
- Infections, ulcers, amputations
- Diet orders; Malnutrition
- Eye, foot care
- Appropriate lab monitoring
- (Discharge planning teaching)

Suggested Performance Measures
AMDA Diabetes CPG Table 29

Engaging the team

- Physicians; mid-levels
- (Pharmacy consultants)
- “Starter Kit”
- Dietician
- STNA’s
- Nurses
- Patients/ families
- (IT techs) Electronic Health Record

Physicians, mid-levels

- **Eliminate SSRI immediately**
- **SNF:** assess sliding scale rapid acting (RA) early
  - Transition if possible to simpler regimen
  - 1-2 oral drugs or one basal injection
  - Fasting, post-prandial surveillance
- **NF:** Identify goals Hgb A1c
  - Complexity regimen appropriate for goals
- **Hypoglycemia** order set
  - Instaglucose
  - Glucagon

Role of pharmacy consultants

- Identify orders for SSRI- recommend removal
- Query clinician re: goal hgb a1c
  - And/or fasting, post-prandial goals
- Titrate drugs?
  - Basal, rapid acting
  - Service may not be available with your consultancy service
  - Fee?

Starter Kit

- Can help medical director guide appropriate prescribing
- Example of what you can remove:
  - Propoxyphene (darvocet; darvon)
  - Indocin
  - Amantadine
  - Regular Humulin
  - NPH
  - Glulisine (looks like glargine....)

Dietician

- **Dietary options**
  - Regular liberal
  - Controlled Carbohydrate
  - Customized
- **Develop/ inservice method consumption measurement**
  - Percent
  - Carbohydrate
- Don’t add supplements to reduce hypoglycemia
  - Communicate with clinician to reduce insulin
STNA

- Estimate proportion meal/snack consumed
  - Communicate to nursing

- Encourage walking to/from meals
  - Post-prandial may be best! (JAMDA 2010)

- Re-inforce dietary choices with “R”
  - Bring resident promptly when RA insulin provided
  - Before meal, bring “R” to dining room
  - After meal, bring “R” to nurse

Nursing

- Take advantage of their training
  - Taught count carbs
  - Recognition hypo/hyper glycemia
    - Assess “R”, provide VS

- Re-tool expectations
  - Elevated post-prandial BG do not necessarily need “immediate” treatment
  - Don’t overtreat hypoglycemia
  - Assess “R” including VS when calling clinician re: hyper/hypoglycemia
    - Provide 3d pattern of BG

Patients, families

- Educate on BG monitoring plan
- Partner on diet
  - If “R” not able partner, at least encourage honesty
- SNF discharge planning
  - Complexity regimen should meet patient goals, resources, level health literacy

Electronic Health Record

- Nurse, physician champion
- Tailor front end to physician needs
- Demand remote access

Summary of Approach

- **Ascertain, summarize** patient condition
  - Current DM control, complications
  - Impact DM on “R” function, QOL
  - Input staff, family, patient: goals
- Fine tune your E-Health Record
- Develop your team
  - Educate them on goals & approach
Summary of approach

- Negotiate/iterate on goals of care
  - Short-term, long-term
- Individualized diet?
  - Liberalize? Restrict? It depends!
- Medications and regimen complexity should match goals
- Minimize adverse outcomes
- Maximize quality of life

Extra Credit:
What is your target A1C for:

Robust 85 yo community
1. < 9
2. < 8.5
3. < 8
4. < 7.5
5. < 7

LTC 85 yo
1. < 9
2. < 8.5
3. < 8
4. < 7.5
5. < 7

Hospice patient
1. < 9
2. < 8.5
3. < 8
4. < 7.5
5. < 7

Thank you