Strategies for Effective Discharge Planning for Hospitalized Patients With Diabetes
Gaps in US Hospital Discharge Planning and Transitional Care

Base: Adults with any chronic condition hospitalized in past 2 years

- Know who to contact for questions about condition or treatment (8%)
- Receive written plan for care after discharge (9%)
- Receive instructions about symptoms and when to seek further care (12%)
- Have arrangements made for follow-up visits with any doctor (28%)
- Have any discharge gap (38%)

Data collection: Harris Interactive, Inc.
Source: 2008 Commonwealth Fund International Health Policy Survey of Sicker Adults. EL3, survey.
Discharge Planning Challenges

- Pressures to discharge patient early
- Shorter hospital stays
- Competing priorities
- Lack of primary care physician
- Nursing workload
- Lack of diabetes specialist educator
- Weekend discharges
Care Coordination for Patients With Hyperglycemia/Diabetes

- Create a collaborative team
- Identify patients with hyperglycemia/diabetes
- Develop an individualized treatment plan for each patient
- Determine transition and discharge strategy
- Monitor progress

Transition From Hospital to Outpatient Care

• Preparation for transition to the outpatient setting should begin at the time of hospital admission

• Multidisciplinary team
  – Bedside nurse
  – Clinical pharmacist
  – Registered dietitian
  – Case manager

• Clear communication with outpatient providers is critical for ensuring safe and successful transition to outpatient management
Discharge Considerations

• What are your discharge plans for this patient?
• Will they be discharged on insulin therapy?
• When and where will follow-up take place?
• What education do they need prior to discharge?
Preadmission Factors to Be Considered in Discharge Planning

- Physical/self-care limitations: blindness, stroke, amputation, dexterity
- Socioeconomic factors: insurance coverage, family support
- Access to follow-up care: PCP, other HCPs
- Degree of glycemic control prior to admission and severity of hyperglycemia
- Learning issues: language, cognition, competence related to diabetes self-management
Functional Health Literacy and Understanding of Medications at Discharge

172 patients discharged from community-based teaching hospital with prescriptions for 1 or more new medications

Recalled being told of ANY possible adverse effects: 11%
Could name ≥1 possible adverse effect: 22%
Knew dose: 56%
Knew medication purpose: 64%
Knew medication name: 64%
Knew dosing schedule: 68%
Aware that new medications had been prescribed: 86%
Relationship Between Inpatient and Outpatient Diabetes Management

Inpatient
Compliance with glycemic goals depends on physicians, nursing, and hospital staff

Outpatient
Compliance with glycemic goals depends on the patient

Lessons learned in the hospital can impact patient self-care behavior at home

Care received in the outpatient setting can affect need for hospitalization
Predischarge Checklist

- Diet information
- Monitor/strip and prescription
- Prescription for/supplies of medications, insulin, needles
- Treatment goals
- Contact phone numbers
- Medi-alert bracelet
- Survival skills training
Nursing + Care Coordination: Survival Skills to Be Taught Before Discharge

- How and when to take medication/insulin
  - Effects of medication
- How/when to test blood glucose (SMBG)
  - Target glucose levels
- Meal planning basics
- How to treat hypoglycemia

- Sick-day management plan
- Date/time of follow-up visits
  - Including diabetes education
- When and whom to call on the healthcare team
  - Available community resources

AACE Inpatient Glycemic Control Resource Center
Discharge Planning Depending on Etiology of Hyperglycemia

Temporary Hyperglycemia
- Resolves in hospital
- Requires follow-up testing

Previously Diagnosed Diabetes
- Assess level of control
- Adjust therapy as needed
- Assess for complications
- Outpatient follow-up

Previously Undiagnosed Diabetes
- Plan to confirm diagnosis, implement therapy and education

AACE Inpatient Glycemic Control Resource Center
A1C Is Helpful in Determining Post-discharge Treatment

Patients Without Previously Diagnosed Diabetes

<table>
<thead>
<tr>
<th>A1C</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥6.5%</td>
<td>• Incipient diabetes</td>
</tr>
<tr>
<td></td>
<td>• Refer to diabetes educator to begin self-management education prior to discharge</td>
</tr>
<tr>
<td>5.5%-6.4%</td>
<td>• Increased risk for diabetes</td>
</tr>
<tr>
<td></td>
<td>• Prior to discharge, address implementation of lifestyle interventions that promote weight loss and increased activity</td>
</tr>
</tbody>
</table>

*Differentiation between hospital-related hyperglycemia and undiagnosed diabetes requires follow-up testing (FPG, 2-h OGGT) once patient is metabolically stable using established criteria*

Patients Newly Diagnosed With Diabetes During Hospitalization

- Develop a diabetes education plan prior to hospital discharge that addresses the following:
  - Understanding of the diagnosis of diabetes
  - SMBG and explanation of home blood glucose goals
  - Definition, recognition, treatment, and prevention of hyperglycemia and hypoglycemia
  - Identification of healthcare provider who will provide diabetes care after discharge
  - Information on consistent eating patterns
  - When and how to take medication, including proper disposal of needles and syringes
  - Sick-day management
Discharging Patients With Previously Diagnosed Diabetes

- Resume preadmission diabetes regimen at time of discharge for patients with acceptable preadmission glycemic control and no contraindication to prior therapy
- Modify preadmission therapy for patients identified as being in poor control
- Provide patient and family members/caregivers with written and oral instructions regarding glycemic management regimen at time of hospital discharge
### A1C Is Helpful in Determining Post-discharge Treatment

#### Patients With Previously Diagnosed Diabetes

<table>
<thead>
<tr>
<th>A1C</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5%-7.5%</td>
<td>Options:&lt;br&gt;• Increase dose of home noninsulin agents&lt;br&gt;• Add third agent&lt;br&gt;• Add basal insulin at bedtime</td>
</tr>
<tr>
<td>7.6%-9.0%</td>
<td>• If already on 2 noninsulin agents, add once daily basal insulin at bedtime</td>
</tr>
<tr>
<td>≥9%</td>
<td>• Discharge home on basal and bolus insulin regimen&lt;br&gt;  • May use amount of basal insulin required in hospital as once daily glargine/detemir or twice daily NPH dose&lt;br&gt;  • Continue multiple daily doses as started in the hospital if appropriate&lt;br&gt;  • Twice daily premixed insulin may be considered for less complex insulin regimens, particularly in elderly patients</td>
</tr>
</tbody>
</table>

GLYCEMIC CONTROL ALGORITHM

LIFESTYLE THERAPY
(Including Medically Assisted Weight Loss)

Entry A1C < 7.5%
- Metformin
- GLP-1 RA
- SGLT-2i
- DPP-4i
- TZD
- AGi
- SU/GLN

If not at goal in 3 months proceed to Dual Therapy

Entry A1C ≥ 7.5%
- GLP-1 RA
- SGLT-2i
- DPP-4i
- TZD
- Basal Insulin
- Colesevelam
- Bromocriptine QR
- AGi
- SU/GLN

If not at goal in 3 months proceed to Triple Therapy

Entry A1C > 9.0%

SYMPTOMS
(No) NO
(Dual Therapy OR Other Agents)
(Yes) YES
(Insulin ± Other Agents)

MONOTHERAPY*

DUAL THERAPY*

TRIPLE THERAPY*

* Order of medications represents a suggested hierarchy of usage; length of line reflects strength of recommendation

P R O G R E S S I O N O F D I S E A S E

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**Algorithm for Adding/Intensifying Insulin**

### Start Basal (Long-Acting Insulin)

- **A1C < 8%**
  - TDD 0.1–0.2 U/kg
- **A1C > 8%**
  - TDD 0.2–0.3 U/kg

**Insulin titration every 2–3 days to reach glycemic goal:**

- **Fixed regimen:** Increase TDD by 2 U
- **Adjustable regimen:**
  - FBG > 180 mg/dL: add 20% of TDD
  - FBG 140–180 mg/dL: add 10% of TDD
  - FBG 110–139 mg/dL: add 1 unit
  - If hypoglycemia, reduce TDD by:
    - BG < 70 mg/dL: 10% – 20%
    - BG < 40 mg/dL: 20% – 40%

Consider discontinuing or reducing sulfonylurea after starting basal insulin (basal analogs preferred to NPH)

### Intensify (Prandial Control)

- **Add GLP-1 RA**
  - Or SGLT-2i
  - Or DPP-4i

- **Add Prandial Insulin**
  - **Basal Plus 1, Plus 2, Plus 3**
    - Begin prandial insulin before largest meal
    - If not at goal, progress to injections before 2 or 3 meals
    - Start: 10% of basal dose or 5 units

- **Basal Bolus**
  - Begin prandial insulin before each meal
  - 50% Basal / 50% Prandial TDD 0.3–0.5 U/kg
  - Start: 50% of TDD in three doses before meals

**Insulin titration every 2–3 days to reach glycemic goal:**

- Increase prandial dose by 10% or 1-2 units if 2-h postprandial or next premeal glucose consistently > 140 mg/dL
- If hypoglycemia, reduce TDD basal and/or prandial insulin by:
  - BG consistently < 70 mg/dL: 10% – 20%
  - Severe hypoglycemia (requiring assistance from another person) or BG < 40 mg/dL: 20% – 40%

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*Glycemic Goal:

- <7% for most patients with T2D; fasting and premeal BG < 110 mg/dL; absence of hypoglycemia
- A1C and FBG targets may be adjusted based on patient’s age, duration of diabetes, presence of comorbidities, diabetic complications, and hypoglycemia risk
### Profiles of Antidiabetic Medications

<table>
<thead>
<tr>
<th></th>
<th>MET</th>
<th>GLP-1 RA</th>
<th>SGLT-2i</th>
<th>DPP-4i</th>
<th>AGi</th>
<th>TZD (moderate dose)</th>
<th>SU</th>
<th>GLN</th>
<th>COLSVL</th>
<th>BCR-QR</th>
<th>INSULIN</th>
<th>PRAML</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYPO</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate/Severe</td>
<td>Mild</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate to Severe</td>
<td>Neutral</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
<td>Slight Loss</td>
<td>Loss</td>
<td>Loss</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Gain</td>
<td>Gain</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Gain</td>
<td>Loss</td>
<td></td>
</tr>
<tr>
<td><strong>RENA/ GU</strong></td>
<td>Contraindicated CKD Stage 3B,4,5</td>
<td>Exenatide Not Effective with eGFR &lt; 45</td>
<td>Genital Mycotic Infections</td>
<td>Dose Adjustment Necessary (Except Linagliptin)</td>
<td>Neutral</td>
<td>Neutral</td>
<td>More Hypo Risk</td>
<td>Neutral</td>
<td>Neutral</td>
<td>More Hypo Risk</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td><strong>GI Sx</strong></td>
<td>Moderate</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Mild</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>CHF CARDIAC</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Possible Benefit</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td><strong>ASCVD</strong></td>
<td>Benefit</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Safe</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td></td>
</tr>
<tr>
<td><strong>BONE</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate Fracture Risk</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td></td>
</tr>
</tbody>
</table>

- **Few adverse events or possible benefits**
- **Use with caution**
- **Likelihood of adverse effects**
- **? Uncertain effect**

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Recommended Educational Strategies for Inpatients Prior to and at Discharge

- Begin education on day 1 or as soon as the patient is able to participate
- Initiate inpatient diabetes educator consult as early as possible
- Nursing to reinforce the education as many times as possible utilizing every opportunity (medications, BG result, diet, etc.)
- Involve family members whenever appropriate
- Provide education materials to reinforce teachings and provide community and Web resource lists
- Continue education on an outpatient basis if needed by referring through appropriate channels
Continuum of Care: Patients New to Insulin

• Refer to an outpatient diabetes education program shortly after discharge to discuss ongoing diabetes control.

• Provide discharge information
  – When to check BG
  – Timing of insulin administration
  – When to call PCP (e.g., symptoms of hypoglycemia)

• Communicate with patient’s PCP
  – Changes made to patient’s treatment regimen during hospitalization
  – Complete medication list

• Assess need for home health care
Timely Discharge Information Required by the Receiving PCP

- Primary and secondary diagnoses and diagnostic findings
- Dates of hospitalization, treatment provided, and a summary of hospital course
- Discharge medications
- Patient or family counseling
- Tests pending at discharge
- Details of follow-up arrangements
- Name and contact information of the responsible hospital physician
Failure to Restart Diabetes Medications and Outcomes in Older Patients After Acute MI

8751 Medicare beneficiaries with diabetes and AMI admitted on antihyperglycemic therapy

7581 discharged **ON** antihyperglycemic therapy

1170 discharged **OFF** antihyperglycemic therapy

### Mortality at 1 year

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted</th>
<th>Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HR</strong></td>
<td>1.47 (1.32-1.64)</td>
<td>1.29 (1.15-1.45)</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Patients discharged **OFF** vs. discharged **ON** antihyperglycemic therapy

### Cox Proportional Hazards Regression

- **Diabetes drugs at discharge**
  - YES
  - NO

**Survival**

**Days from Discharge**


AACE Inpatient Glycemic Control Resource Center
Summary

Discharge Checklist for Patients with Inpatient Hyperglycemia

- Patient’s need for diabetes education has been assessed (preferably upon admission)
- Patient has received the necessary skills and training
- Patient is provided with post-discharge plan for diabetes
- Patient has received clear instructions about medications
  - Name
  - Dosage
  - When to take them
- Patient has a scheduled follow-up appointment at time of discharge
- Written documentation for PCP is completed at time of discharge