Changing Diabetes Management in Long Term Care in Edmonton

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Ontario Long Term Care Physicians

Toronto          October 26, 2013

I have no relevant disclosures of any kind.

CREDENTIALS

- I was 26 years in community practice, and in the last 16 years my practice has evolved to be in long term care, SubAcute care, Transitional Care, and Fractured Hip Care.
- Since 2006 I am the Medical Director for CapitalCare Edmonton.

LEARNING OBJECTIVES

1. To review and understand current evidence based practice regarding diabetes in the frail elderly.
2. To be aware of the importance of avoiding hypoglycemia in the frail elderly.
3. You should leave this workshop with a resolve to liberalize the management of diabetes in your Long Term Care residents.
This presentation is based on the development and rollout of a new practice standard in a large continuing care corporation, from inception in early 2010 to completion in early 2012. Specifically, the CapitalCare Clinical Practice Standards for Elderly Residents with Diabetes in Long Term Care, with its related policies and forms.

OUTLINE

• INTRODUCTION
• INCEPTION
• EVIDENCE
• DEVELOPMENT
• PRODUCT
• ROLLOUT
• OUTCOMES

What is CapitalCare?

CapitalCare is a wholly owned subsidiary of Alberta Health Services. As such, it operates the publicly owned continuing care beds in the Greater Edmonton area. Now in its 50th year CapitalCare is the largest public continuing care organization in Canada. With over 2700 staff members it cares for over 1400 residents and patients in 11 centres on 6 campuses.

www.capitalcare.net

The scope of care in CapitalCare encompasses:

• Traditional long-term care
• Complex long-term care (Brain Injury Unit, Ventilator Unit, Mental Health Unit)
• Palliative Care
• SubAcute Care
• Transition Units
• Supportive Living Care
• CHOICE Day Program (Community dwelling NH eligible)
• Day Programs
The impetus to undertake the development of a new standard arose out of a conjunction of some key factors in early 2010:

**Local factors**
- Increased scope of LPN’s and HCA’s relating to care of diabetic residents
- Increased number of medication incidents relating to Insulin, and to hypoglycemic events
- New AHS Diabetic Guidelines for Continuing Care Edmonton Zone were found to be lacking in relevancy

**General factors**
- A realization by myself and others that existing guidelines (Canadian Diabetes Association 2008, AHS Edmonton Zone 2010) did not address the specific needs of the frail elderly, especially those in long term care.
- Evidence that stringent glycemic control was not beneficial, and even dangerous; and more evidence on the risks of hypoglycemia.
- Furthermore, perhaps due to existing guidelines, diabetes was being over treated in the frail elderly in long term care.

### The prevalence of Diabetes in Long Term Care

- Of 1197 traditional Long Term Care and Supportive Living residents in CapitalCare we identified 248 with a diagnosis of diabetes, a prevalence of 20.7%.
- After a focused audit and diagnosis correction the prevalence was 15.0%.
- Two recent surveys of chronic conditions in U.S. nursing homes found the prevalence of diabetes to be 32.8%; and 26% (males) / 23% (females).


### The prevalence of Diabetes in community elderly

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### Conclusions

- "In elderly adults with diabetes mellitus, comorbidity appears to be the rule rather than the exception."
- "...a patient-centered approach to manage comorbidity...

The Evidence for liberalized Type 2 Diabetes Management

- Randomized Controlled Trials
- Observational Studies
- Scientific Research

ACCORD
10,251 patients age 40-79
Intensive (HbA1c 6.4%) vs. Standard (HbA1c 7.5%)
22% excess mortality – stopped after 3.5 years
Follow up - HbA1c 7.4% vs. 7.8% - equal mortality

ADVANCE
11,140 Type 2 Diabetes over age 55
Intensive (HbA1c 6.5%) vs. Standard (HbA1c 7.3%)
5 years – No difference in major CV events, CV deaths, or overall deaths
Hypoglycemia very strongly correlated with mortality in both groups.

VADT
1791 Type 2 Diabetes, mostly men, average age 60 years
Intensive (HbA1c 6.9%) vs. Standard (HbA1c 8.4%)
5 years – No difference in major CV events or overall deaths
Hypoglycemia strongly correlated with mortality in both groups.
10-Year Follow-up of Intensive Glucose Control in Type 2 Diabetes

**UKPDS**

4200 new Type 2 Diabetes, average age 60 years

Diet vs. sulfonylurea/insulin (lean patients)

Diet vs. metformin/sulfonylurea/insulin (overweight)

10 years – No difference in CV death or overall deaths, except in overweight patients on Metformin alone

15 years – Benefit from Metformin persists, and benefit from Sulfonylurea/insulin now apparent, despite same HbA1c in all groups


Over 5 years at one hospital there were 932 patients with diabetes and a fractured hip. Each case was closely matched with a control patient from the hospital diabetes clinic.

- patients with a HbA1c between 6.1 – 7.0 mmol/L were more than twice as likely to have a hip fracture than those patients with a HbA1c > 8.0 mmol/L (OR=2.34)
- those with a HbA1c < 6.0 mmol/L had a three times risk (OR=3.01)

“The present study found an association between tight glycemic control (when HbA1c < 7%) and greater risk of hip fracture in individuals being treated for type 2 diabetes mellitus. Greater caution needs to be exercised in treating older patients with diabetes mellitus.”


387 Community-dwelling, nursing home eligible, mean age 80 years, predominantly Asian

2 years – Higher HbA1c associated with less death, and less functional decline

“...the current AGS HbA1c target of 8.0% or less for frail elderly adults may be lower than necessary to maintain function and delay death for this vulnerable population.”

Older Patients have Less Perception of Hypoglycemia


Continuous glucose monitoring was done for 36 hours on 40 adults 69 years or older with a HbA1c of 8% or greater. Fingertip glucose testing was done QID, and symptoms of hypoglycemia recorded.

• 26 of the 40 (65%) had at least one episode of hypoglycemia less than 3.9 mmol/L, and 12 of 40 a level below 2.8 mmol/L.

• 93% (95/102) of hypoglycemic episodes were not recognized by symptoms or on QID fingertip glucose testing.

“Our findings raise caution for relying on HbA1c as the sole measure of “good diabetes management” in elderly patients with diabetes, and we recommend careful and in-depth assessment for hypoglycemia by both patients and providers.”

Hypoglycemia vs. the frail elderly:

- Hypoglycemia is dangerous
- Hypoglycemia will not be recognized
- Avoidance of hypoglycemia is the first goal of diabetes treatment
- If you are worrying about hypoglycemia you are overtreating

CURRENT GUIDELINES

American Diabetes Association / European Association for the Study of Diabetes 2012
Canadian Diabetes Association 2013
Clinical Practice Guidelines

“... type 2 diabetes cardiovascular trials suggest that not everyone benefits from aggressive glucose management. It follows that it is important to individualize treatment targets.”

A construct is provided to help guide clinical decisions.

*Management of Hyperglycemia in Type 2 Diabetes: A Patient-Centered Approach*

*Position Statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)*

*Diabetes Care* 2012;35:1364–1379

*Diabetes Care* 2012;35:1364–1379

*Diabetes Care* 2012;35:1364–1379
Diabetes in the Elderly Checklist

- ASSESS for level of functional dependency (frailty)
- INDIVIDUALIZE glycemic targets based on the above (A1C ≤8.5% for frail elderly) but if otherwise healthy, use the same targets as younger people
- AVOID hypoglycemia in cognitive impairment
- SELECT antihyperglycemic therapy carefully
  - Caution with sulfonylureas or thiazolidinediones
  - Basal analogues instead of NPH or human 30/70 insulin
  - Premixed insulins instead of mixing insulins separately
- GIVE regular diets instead of “diabetic diets” or nutritional formulas in nursing homes

Individualizing A1C Targets

A target A1C ≤6.5% may be considered in some patients with type 2 diabetes to further lower the risk of nephropathy and retinopathy which must be balanced against the risk of hypoglycemia.

Consider 7.1-8.5% if:
- Limited life expectancy
- High level of functional dependency
- Extensive coronary artery disease at high risk of ischemic events
- Multiple co-morbidities
- History of recurrent severe hypoglycemia
- Hypoglycemia unawareness
- Longstanding diabetes for whom it is difficult to achieve an A1C ≤7%
- Dependence on multiple antihyperglycemic agents, including intensified basal-bolus insulin therapy
Among Frail Elderly

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>≤8.5%</td>
</tr>
<tr>
<td>FPG or preprandial glucose</td>
<td>5.0-12.0 mmol/L (depending on level of frailty)</td>
</tr>
</tbody>
</table>

**AVOID HYPOGLYCEMIA**

FPG= Fasting Plasma Glucose

Diabetes in Nursing Homes

- Under nutrition is a problem in people with diabetes living in nursing homes
- “Regular diets” may be used in nursing homes instead of “diabetic diets” or “diabetic nutritional formulas”


Recommendation 1

1. **Healthy**, elderly people with diabetes should be treated to achieve the **same** glycemic, blood pressure, and lipid targets as **younger** people with diabetes (Grade D, Consensus).

Recommendation 2

2. In the **frail elderly**, while avoiding symptomatic hyperglycemia, glycemic targets should be an **A1C of ≤8.5%** and **FPG or pre-prandial PG of 5.0-12.0 mmol/L**, depending on the level of frailty.

Avoidance of hypoglycemia should take priority over attainment of glycemic targets because the risks of hypoglycemia are magnified in this patient population (Grade D, Consensus).
Recommendation 3

3. In elderly people with cognitive impairment, strategies should be employed to strictly avoid hypoglycemia, which include the choice of antihyperglycemic therapy and less stringent A1C target [Grade D, Consensus].

CDA Clinical Practice Guidelines

www.guidelines.diabetes.ca – for professionals

1-800-BANTING (226-8464)

www.diabetes.ca – for patients

DEVELOPMENT

Ultimately the Diabetes Practice Standards Committee consisted of myself, the CapitalCare Corporate Best Practice Coordinator, and two site Best Practice Leaders.

The goals of the project were:

• To provide diabetic management regimes that are appropriate for the frail elderly population living in long term care.
• To balance resident quality of life with the safe clinical management of diabetes.
• To reflect recent research and literature.

PRODUCT

A suite of items was created by mid-2011:

1. A new Diabetes Policy
2. A Diabetic Roles, Responsibilities and Accountabilities document
3. An improved Diabetic Record
4. An Insulin site rotation form
5. A Glucometer Quality Control testing form
6. CapitalCare Diabetic Practice Standards
A new Diabetes Policy

- The interdisciplinary team will individualize diabetic treatment goals and management strategies by addressing individual resident preferences, medical condition, level of comfort, co-morbidities, functional status, and overall prognosis.
- The interdisciplinary team will refer to the ‘CapitalCare Clinical Practice Standards for Elderly Residents with Diabetes in Long Term Care’ to assess and manage elderly residents with diabetes.

CapitalCare Diabetic Practice Standards

CAPITALCARE CLINICAL PRACTICE STANDARDS FOR ELDERLY RESIDENTS WITH DIABETES IN LONG TERM CARE

November 2011

CapitalCare Clinical Practice Standards for Elderly Residents with Diabetes in Long Term Care

This is the core document of the whole project. It has 2 stated and equal goals:

- Individualize the goals of care and treatment strategies.
- Prevent the occurrence of hypoglycemia and symptomatic hyperglycemia.

Standard 1) Blood Glucose Targets and Monitoring

Our literature search found the Diabetic Guidelines for Elderly Residents in Long-term Care Facilities (2010), developed by the Diabetic Care Program of Nova Scotia. This seminal document is one of the first to specifically address the management of a chronic disease in a typical long-term care resident. The Nova Scotia Guidelines strongly influenced our own guidelines, particularly with regard to a liberalized approach to glycemic control.

Diabetescare.nshealth.ca
TABLE 1 – Blood Glucose Level Guidelines for elderly residents in long term care

<table>
<thead>
<tr>
<th>Blood Glucose Level</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4.0 mmol/L</td>
<td>Refer to the treatment of hypoglycemia (Standard 2) in a conscious/unconscious resident</td>
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<tr>
<td>4.0 - 6.9 mmol/L</td>
<td>Assess symptoms (review chart for trends, history, resident status), notify physician, pharmacist or nurse practitioner</td>
</tr>
<tr>
<td>7.0 - 9.9 mmol/L</td>
<td>This range may be acceptable. There is a risk for hypoglycemia. If it occurs more than once a month notify physician non-urgently and consult with IDT.</td>
</tr>
<tr>
<td>10.0 - 20.0 mmol/L</td>
<td>This range is acceptable. However, if symptomatic notify the IDT to assess treatment.</td>
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<tr>
<td>Greater than 20 mmol/L</td>
<td>Refer to hyperglycemic management (Standard 3) Communicate with physician non-urgently to assess treatment if symptomatic and consult with IDT.</td>
</tr>
<tr>
<td>Greater than 33 mmol/L / “HI” reading</td>
<td>Notify physician immediately</td>
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CapitalCare Clinical Practice Standards for Elderly Residents with Diabetes in Long Term Care

Standard 1) Blood Glucose Targets and Monitoring

Other important parts of this section are a requirement for baseline glucose monitoring QID for 4 days on admission, and with any change in treatment or condition; and routine monitoring QID on one day every 2 weeks at a minimum.

Standard 2) Hypoglycemia Management

Clear definitions and standard treatments for conscious and unconscious residents were incorporated. Again, based on the Nova Scotia Guidelines there is only one definition of hypoglycemia (less than 4.0 mmol/L), and treatment is with easily accessible sugars (table sugar, juice or honey). The documentation required in the Progress Record, in the Diabetic Record, and in the Medication Incident report were outlined.

Standard 3) Hyperglycemia Management

Reiterated what is in the guidelines table regarding actions required for a glucose over 20 mmol/L, and over 33 mmol/L or “HI” reading.

Standard 4) Nutrition

Dietary restriction is to be avoided. Appropriate snacks are listed.
IMPLEMENTATION

Implementation was done one campus at a time, at monthly intervals, over a 6 month period from November 2011 to April 2012.

1. Informing the Attending Physicians

Key physicians had been informed at the campus Medical Liaison Committee meetings.

Just prior to the rollout at each campus I sent an E-mail to the attending physicians at the site informing them of the upcoming introduction of the new practice standards. The Practice Standards document was attached to the E-mail, and in the E-mail itself was a short explanation and embedded links to the Nova Scotia Guidelines and Pocket Reference.

2. Staff Education

The Best Practice members on the committee developed a timetable of information sessions at each site, and advertised in the month prior.

As an example, at our Lynnwood campus there were a total of 50 separate sessions provided to the 8 units, with over 200 staff attending. This consisted of 14 sessions to regulated professionals (RN’s, LPN’s, OT’s, PT’s, Pharm), 35 sessions to Health Care Aides, and one session to Care managers only. To reach all shifts the sessions were held as early as 0600 hr, and as late as 1900 hr, depending on the unit. Handouts were also left in every shift book.

IMPLEMENTATION

At each campus dedicated nurses carried out an audit of the chart of every resident with diabetes that they could identify. One result was a resolution of diagnoses, and another the informal teaching of the staff on each unit via conversations while on the unit doing the audits. Every chart audited had a written recommendation left for the attending physician regarding the diagnosis, the treatment, or the monitoring.
IMPLEMENTATION

Some particular concerns noted with the chart audits:

- HbA1c ordered too frequently
- Glucometer monitoring too frequently, up to QID on three days a week for months or years, despite normal or low readings
- Inappropriate insulin use – sliding scales, short acting insulins without basal insulin
- Chronic diarrhea from Metformin leading to a therapeutic cascade
- Residents on Avandia or Actos along with Insulin
- Poor documentation of hypoglycemic episodes, and inadequate treatment

OUTCOMES

- The chart audit allowed the diagnosis of diabetes to be removed in 68 cases, of 248 charts audited. That is, the resident was on no diabetic treatment, a regular diet, and normal glucose tests and/or HbA1c for some time.
- The post resolution prevalence of diabetes was 15.0%, down from 20.7%.
- Both staff and physicians have noticed that care has been individualized and less monitoring is required.
- Physicians have cooperated and a change in practice is evident.

OUTCOMES

- Oral hypoglycemics are being used less
- More appropriate insulin use, both the types and the amounts.
- For new residents staff are seeking input to individualize care.

Formulating an Evidence-based Practice for Diabetes in the Elderly in Long Term Care

An Evidence Based Practice is the integration of:

- The best available evidence and guidelines
- The Clinician’s experience and expertise
- The Resident’s values, preferences and goals of care
Formulating an Evidence-based Practice for Diabetes in the Elderly in Long Term Care

I am suggesting that you should:

- favour liberal glycemic control and medication reduction.
- focus on hypoglycemia avoidance.
- actively try to reduce diabetic medications.
- set individual goal glucose ranges (e.g., 9 – 15) and record it in the chart.

Formulating an Evidence-based Practice for Diabetes in the Elderly in Long Term Care

I am suggesting that you should:

- not use Avandia or Actos.
- not use sliding scale insulin regimes.
- take it easy with short acting insulins.
- if glucose measurements are normal on Metformin, try to reduce or even stop it.
- not use diabetic diets.

More Reading

- Lee SJ, Eng C. Goals of Glycemic Control in Frail Older Patients With Diabetes. JAMA 2011;305:1350

Thank You!

Questions?

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CAPITALCARE
CLINICAL PRACTICE
STANDARDS FOR ELDERLY RESIDENTS
WITH DIABETES IN LONG TERM CARE

November
2011
# CapitalCare Clinical Practice Standards for Elderly Residents with Diabetes in Long Term Care

## Table of Contents

- Introductions and Definitions .......................................................................................................................... 3
- Diabetes Assessment for Residents in Long Term Care .................................................................................. 4
- Standard 1- Blood Glucose Monitoring .......................................................................................................... 5
- Standard 2- Hypoglycemia ............................................................................................................................... 6
- Standard 3- Hyperglycemia ............................................................................................................................... 8
- Standard 4- Nutrition ........................................................................................................................................ 9
- Standard 5- Diabetes Management and the role of the Health Care Aide ...................................................... 10
- Attachments .................................................................................................................................................... 12
- Forms ............................................................................................................................................................... 12
- Related Policies ............................................................................................................................................... 13
- Links ............................................................................................................................................................... 13
- References ...................................................................................................................................................... 13
- Attachment A - Insulin (Tip Sheet) .................................................................................................................. 15
- Attachment B - Anti-hyperglycemia Agents (Tip Sheet) .................................................................................. 16
INTRODUCTION

PURPOSE

This Clinical Practice Standard is a tool to guide and direct consistent clinical practice and support the interdisciplinary (IDT) team in providing resident centered care for the elderly population residing in long term care. These standards do not preclude the critical thinking and clinical judgement required of the interdisciplinary team.

Frail residents living in long term care suffer from multiple chronic illnesses and associated vulnerabilities. Residents who are frail commonly have dementia, functional decline, and geriatric syndromes such as falls, impaired mobility, and polypharmacy (Diabetes Care Program of Nova Scotia).

When implementing the standards, the particular circumstances of the resident must be taken into consideration as well as any emerging information. The standards should be reviewed and applied, based on the specific needs and wishes of the resident.

GOALS

To individualize goals of care and treatment strategies which address the preferences of the resident and family, and reflect the resident’s current medical condition, level of comfort, co-morbidities, functional status, overall prognosis and Interdisciplinary Team (IDT) recommendations specifically to prevent the occurrence of hypoglycemia and the persistent symptoms of hyperglycemia.

DEFINITIONS

**Type 1 Diabetes:** A disease in which the pancreas does not produce insulin and glucose builds up in the blood instead of being used for energy. Some Type 1 diabetics in Long term Care will require very individualized treatment plans and monitoring schedules that are outside the scope of these standards.

**Type 2 Diabetes:** A disease in which the insulin that the body produces is less efficient at moving sugar out of the bloodstream

**Hypoglycemia in frail elderly residents in long term care:** Blood glucose < 4.0 mmol/L. Typically an iatrogenic complication of diabetes treatment.

**Hyperglycemia in frail elderly residents in long term care:** Blood glucose > 20.0 mmol/L.
DIABETES ASSESSMENT FOR RESIDENTS IN LONG TERM CARE

Admission Assessment and Ongoing Monitoring
The Interdisciplinary team will establish, maintain and document individualized treatment goals for residents with diabetes which will include the following:

A. **RAI/MDS 2.0 assessment** (admission, quarterly, annually, and upon significant change in the resident’s condition) which include the following data elements:
   - Nutritional screening – (refer to the dietitian with changes in weight, intake and blood glucose monitoring)
   - Physical functioning
   - Skin assessment including a foot assessment and a pressure ulcer risk assessment (Braden Scale)
   - Pain assessment
   - Cardiovascular, cerebrovascular, and behavioral assessments that may contribute to cognitive status
   - Depression screening

B. A targeted history and physical exam on admission and at least annually
C. Weight - monthly and prn
D. Laboratory tests – HbA1c (Target 8-9%, reduce treatment if less than 7%) and creatinine clearance level upon admission
E. Blood pressure – monthly and/or with changes in medication profile or health status
F. Blood glucose monitoring as per Table 2 (page 6)

*Practice Note: Sliding Scales should be avoided with elderly residents in long term care*
G. Medication review with IDT– every 3 months or with changes in status

Annual Interdisciplinary Conference & Assessment of Complications
A. Review treatment plan, monitoring data and medication profile
B. Physical exam
C. Diagnostic tests as required
D. Review need for annual eye exam with Resident/Substitute Decision Maker

Treatment and Referral for Complications if Clinical Status Indicates
A. Nephropathy
B. Neuropathy
C. Retinopathy
D. Cardiovascular and cerebrovascular disease
E. Peripheral vascular disease

STANDARD 1: BLOOD GLUCOSE MONITORING

Blood glucose targets should be individualized with the aim of preventing hypoglycemia and avoiding frequent episodes of hyperglycemia.

A. Determine individual baseline values and monitoring schedules for residents by:

- Monitoring the resident’s blood glucose (as per Table 2 (1)):
  - on admission;
  - routinely (as per Table 2(2)).
  - following a change in medication profile;
  - following a change in health status;
  - following a hypoglycemic event or persistent hyperglycemic events.

B. Document blood glucose values on the CapitalCare Diabetic Record.

C. Review of the resident’s blood glucose trends and health status:

- At the admission conference;
- Annually (annual conference); or
- If the resident experiences frequent hypoglycemic and/or hyperglycemic events.

Practice Note: It is essential that monitoring parameters are established, documented and communicated to the IDT team for residents with unstable blood glucose levels.

<table>
<thead>
<tr>
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<td>Assess symptoms (review chart for trends, history, resident status), notify physician, pharmacist or nurse practitioner</td>
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<td>Greater than 33 mmol/L / “HI” reading</td>
<td>Notify physician immediately</td>
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</tbody>
</table>

*Practice note: When the health care team discusses an individual’s overall health status and prognosis with either the patient or the family, a review of glycemic targets and the importance of avoiding hypoglycemia would be beneficial. If glycemic targets are different from the above guidelines, the rationale must be clearly documented in the progress records.

For residents with a higher level of functioning or longer life expectancy tighter glycemic targets may be deemed appropriate by the interdisciplinary team. In this case it is suggested that the 2008 Canadian Diabetes Association Clinical Practice Guidelines are referenced. See http://www.diabetes.ca.
TABLE 2 - BLOOD GLUCOSE MONITORING

1. Establish Individualized Baseline Values
   See Perry & Potter, 2010 pages 1153-1155 for procedural information on how to monitor blood glucose:
   • at initial assessment,
   • upon a change in health status,
   • upon a change in the resident’s medication profile,
   • after a hypoglycemic event
   • when experiencing persistent hyperglycemic events

   All Diabetic residents on any combination of oral anti-hyperglycemic agents OR Insulin should have their blood glucose monitored;
   • QID daily for a minimum of 4 days or longer, until stable.
   • Prior to Breakfast + 2 hours after each meal

2. Routine Monitoring
   All diabetic residents on any combination of oral anti-hyperglycemic agents OR Insulin should have their blood glucose monitored;
   • QID once every 2 weeks (prior to Breakfast + 2 hours after each meal)
   • May require individualized adjustment based on the resident’s stability

STANDARD 2: HYPOGLYCEMIA MANAGEMENT

Hypoglycemia is defined as a blood glucose < 4 mmol/L.
   • Older adults may have fewer physical symptoms with hypoglycemia therefore the only indicator may be blood glucose reading.
   • The usual clinical manifestations of hypoglycemia may be difficult to ascertain in the presence of other co-morbidities such as dementia, depression, sleep dysfunction, seizures, myocardial infarction, cerebrovascular accident, or pain.
   • Treatment for hypoglycemia is required even if the resident is asymptomatic.
   • The resident may be symptomatic with blood glucose levels > 4mmol and may require treatment.

Practice note: Hypoglycemia severity may also be defined by the individual’s clinical manifestations.

TABLE 3 – Possible Signs & Symptoms of Hypoglycemia

<table>
<thead>
<tr>
<th>Physical</th>
<th>Neurological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trembling</td>
<td>Difficulty concentrating</td>
</tr>
<tr>
<td>Palpitations</td>
<td>Confusion</td>
</tr>
<tr>
<td>Sweating</td>
<td>Delirium</td>
</tr>
<tr>
<td>Anxiety, Irritability</td>
<td>Weakness (falls, decreased transfer ability, position in chair)</td>
</tr>
<tr>
<td>Hunger</td>
<td>Drowsiness</td>
</tr>
<tr>
<td>Nausea</td>
<td>Difficulty speaking</td>
</tr>
<tr>
<td>Tingling</td>
<td>Headaches</td>
</tr>
<tr>
<td>Pallor</td>
<td>Vision changes</td>
</tr>
<tr>
<td></td>
<td>Dizziness – falls</td>
</tr>
<tr>
<td></td>
<td>Tiredness – falls</td>
</tr>
</tbody>
</table>
### A. Assessment and Treatment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Hypoglycemia Treatment</th>
</tr>
</thead>
</table>
| Blood Glucose is less than 4.0 mmol/L | 1. Assess symptoms (review chart for trends, history, resident status)  
2. Notify Prescriber (Physician, Nurse Practitioner) or pharmacist |
| Resident is conscious or semi-conscious and able to take foods and liquids by mouth. | 1. Test blood glucose.  
2. If blood glucose is less than 4.0 mmol/L, give:  
   - 1 package of liquid honey  
   - 3x5g glucose tabs  
   - ¾ cup of juice crystals (see practice note below chart)  
3. Wait 15 minutes and retest.  
4. If blood glucose remains less than 4.0 mmol/L, give:  
   - another package of liquid honey  
   - 3X 5g glucose tabs  
   - ¾ cup of fruit juice (see practice point below chart)  
5. Wait 15 minutes and retest.  
6. Continue to treat/test until blood glucose is greater than 4.0mmol/L.  
7. Contact prescriber.  
8. If a meal is more than 1 hour away, a snack containing carbohydrate and protein should be provided (e.g. 1 slice of bread and 1 oz. cheese or meat) Do not subtract food from upcoming meal or snack. |
| Resident is conscious and **not** able to take food or liquids by mouth. | Residents on Enteral Feeding:  
1. Give:  
   - 3X 5g crushed glucose tablets in water via feeding tube  
   - 1mg Glucagon (SC/IM) as per physician standing orders.  
2. If blood glucose is less than 4.0mmol/l and their next scheduled tube feeding is more than 1 hour away, give an additional 125ml (half can) formula.  
*Practice note: Residents on Prandase: use glucose tablets only, do not use sugar packets.* |
| Resident is semi-conscious and not able to take food or liquids by mouth | 1. Check blood glucose level and vital signs.  
2. If indicated by blood glucose level:  
   - Administer glucagon 1mg (IM/SC).  
   - Notify the Physician  
   - Wait 15 minutes post glucagon administration  
   - Retest blood glucose |
If condition remains unchanged, re-administer glucagon 1mg (IM/SC).
• In consultation with the Physician consider transfer to emergency.
• Once stabilized, re-establish baseline (refer to page 5)

*Practice Note: Consider Advanced Healthcare directives.

Resident is unconscious and not able to take food or liquids by mouth.
1. Call for assistance, turn resident onto side to prevent aspiration.
2. Check blood glucose level and vital signs.
3. Administer Glucagon 1mg (IM/SC).
4. Call 911
5. Notify the physician.

Practice Note: The fructose in fruit juice will slow down absorption and blood glucose will not rise as quickly, it is essential that juice is made from juice crystals.

B. Documentation of Hypoglycemic Events
1. Progress note documentation should include:
   • Time of the hypoglycemic reaction.
   • Symptoms of hypoglycemia.
   • Resident’s response(s) to treatment.
   • Physician notification.
   • Necessary revisions/additions to the care plan.

2. Diabetic Record documentation should include:
   • Required blood glucose monitoring times
   • Blood glucose monitoring results
   • Treatment(s) provided, including the amount of glucose, times of administration, snacks and the outcomes.

3. Medication Incident Report (F005): Required if a hypoglycemic event occurs that requires treatment.

STANDARD 3: HYPERGLYCEMIA MANAGEMENT
Hyperglycemia is defined as a blood glucose > 20.0 mmol/L.
The severity of hyperglycemia may be defined by the resident’s clinical manifestations.
Potential causes of hyperglycemia include:
• variation in diet
• insulin omission
• infection
• myocardial infarction
• medications
There are no definitive symptoms of hyperglycemia in our elderly population. Signs & symptoms may develop over hours or days. A hyperglycemic emergency known as a hyperosmolar state should be considered if the following signs and symptoms are present. This may require clinical management in an emergency setting:

### Hyperosmolar State *(more common in Type 2 Diabetes)*

<table>
<thead>
<tr>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agitation, confusion (or a noticeable increase)</td>
</tr>
<tr>
<td>Fatigue (or a noticeable increase)</td>
</tr>
<tr>
<td>Polydypsia (Increased thirst)</td>
</tr>
<tr>
<td>Polyuria (Increased urine)</td>
</tr>
<tr>
<td>Tachycardia</td>
</tr>
<tr>
<td>Weight loss</td>
</tr>
</tbody>
</table>

#### Assessment and Treatment

1. **Blood Glucose > 20 mmol/L**
   
   Notify the Prescriber **non-urgently** for further investigation, including potential medication adjustment.

2. **Blood Glucose > 33 mmol/l or a “HI” reading on the glucometer** *(Determine what a “HI” reading means based on current equipment)*:
   
   Notify the Prescriber **urgently** for further investigation, including potential medication adjustment.

#### STANDARD 4: NUTRITION

Appropriate snacks include a carbohydrate and a protein source. Examples are: half a sandwich with a protein source (meat, cheese, or peanut butter), yogurt, crackers and cheese, muffin with a glass of milk etc.

<table>
<thead>
<tr>
<th>Snack Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crackers and cheese</td>
</tr>
<tr>
<td>Crackers and peanut butter</td>
</tr>
<tr>
<td>A sandwich</td>
</tr>
<tr>
<td>Cereal and milk</td>
</tr>
<tr>
<td>½ can or 125 ml Boost/Ensure/Enteral feeding formula</td>
</tr>
<tr>
<td>1 serving of pudding</td>
</tr>
</tbody>
</table>

The standard diabetic diet in long-term care is very similar to the regular diet. Meals are offered in standard portions at regular times with adequate meal spacing. Many diabetics in long-term care can maintain good blood sugar control without snacks during the day.

Food variety and the dining experience are important to the quality of life of residents living in long term care. Dietary restriction should be avoided as undernourishment can be of a concern with the long term care population.

Snacks may be required during periods of illness, disease, irregular intake or skipped meals.
A. **Snack for Diabetics on Oral Medications**

In order to prevent hypoglycemia from the medications, residents on oral medications only require a snack HS (2008 Canadian Diabetic Association Guidelines).

Snacks may also be required during periods of illness, disease, irregular intake or skipped meals.

B. **Snacks for Diabetics Taking Insulin**

NPH, N, Toronto or Regular Insulin: AM and PM snacks are required.

Humalog or Novorapid: do **NOT** require an AM or PM snack as they peak at mealtimes.

*Practice Note:* AM or PM nourishments and low-sugar substitutes for items such as sugar packages for tea and coffee, jam and syrup are available by request. They may be recommended if that is the individual’s normal pattern of management.

*Practice Note:* For residents with a higher level of functioning or longer life expectancy, a more restricted diabetic meal plan may be appropriate. In this case it is suggested that the 2008 Canadian Diabetes Association Clinical Practice Guidelines are referenced. See [http://www.diabetes.ca](http://www.diabetes.ca).

**STANDARD 5: DIABETES MANAGEMENT AND THE ROLE OF THE HEALTH CARE AIDE**

The Health Care Aide’s role is to **OBSERVE** and **REPORT** physical changes as well as changes in behavior. When caring for dementia residents it is necessary to continuously look for anything that is **UNUSUAL** for that individual resident.

A. **Observations that Should be Reported to the RN, RPN, CGN or LPN Immediately:**

<table>
<thead>
<tr>
<th>Unexpected changes in behavior</th>
<th>Illness (i.e. lethargy, nausea, vomiting, diarrhea).</th>
<th>Increased urine production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in weight</td>
<td>Changes in skin condition</td>
<td>Falls</td>
</tr>
<tr>
<td>Changes in eating patterns (i.e. eats less than 75% of usual intake, eats extra snacks, misses a scheduled snack)</td>
<td>Trembling</td>
<td>Sweating</td>
</tr>
<tr>
<td>Anxiety (shortness of breath or heart is “racing”)</td>
<td>Hunger</td>
<td>Pale skin</td>
</tr>
<tr>
<td>Increased confusion</td>
<td>Weakness</td>
<td>Drowsiness</td>
</tr>
<tr>
<td>Difficulty speaking</td>
<td>Headaches</td>
<td>Vision changes</td>
</tr>
<tr>
<td>Tiredness</td>
<td>Dizziness</td>
<td>Agitation (restlessness, irritability)</td>
</tr>
<tr>
<td>Increased thirst</td>
<td>Sweet odor to the breath</td>
<td>Tingling sensation</td>
</tr>
</tbody>
</table>
B. Diabetic Skin Care

When caring for a diabetic resident, special consideration must be given to skin care.

- Skin must be gently cleansed daily.
- Peri-care must be done after every episode of incontinence (both urine and feces).
- Skin must be moisturized to prevent dryness and cracking.

The skin must be observed each shift. Key things to observe and report include:

- bruises,
- lesions and boils,
- lacerations and skin tears,
- rashes and redness,
- hot areas
- swelling.

Diabetics have a higher risk of infection. Therefore, it is important that ANY CHANGE in skin condition be reported as soon as possible.

C. Diabetic Foot Care

When caring for a diabetic resident, special consideration must be given to foot care.

- Feet are to be washed daily, dried well (particularly between the toes) and moisturized.
- Do NOT apply lotion between the toes as this could lead to a fungal infection.
- Change socks daily. Socks should not be too tight or have seams.
- Inspect shoes for foreign objects and good fit.
- Health Care Aides are NEVER to cut nails on diabetic residents.

The feet must be observed each shift. Key things to observe and report include:

- Calluses, corns, and blisters,
- cracks,
- warts,
- bunions,
- swelling,
- lesions,
- ingrown toe nails,
- pressure areas,
- changes in skin temp (cold, hot or red),
- crusty / cheesy substances under toe nails.

Check to see if the resident has any loss of sensation to the feet (complains of numbness). Nerve damage to the extremities puts the resident at higher risk of infection, which can result in amputation.
D. Diabetic Oral Care

When caring for a diabetic resident, special consideration must be given to oral care.

- provide good oral care every morning and evening. Poor oral hygiene and high glucose levels could lead to infections, dry mouth, altered taste sensations, and even tooth loss.
- brush natural teeth with a soft toothbrush and toothpaste. Brush dentures with cool water using a denture brush and paste. NEVER use hot water on dentures as this could warp them and affect the denture fit. Ensure dentures fit properly.
- natural teeth can be flossed if the resident is willing.
- use only water based lubricants for lips.

The mouth must be observed each shift. Key things to observe and report include:

- mouth sores and ulcers,
- poor fitting dentures,
- reddened areas on gums,
- tooth decay.

If the resident is not eating well, check that dentures are fitting well and are in good condition. Tell the R.N. or L.P.N. if the resident complains of mouth pain.

E. Hydration

The RN, RPN, CGN or LPN needs to be notified if the resident isn’t drinking, voiding less than normal or has dry skin or a dry mouth (more so than what is normal for that resident).

*It is important to document all of your observations related to skin, foot and oral care on the Daily Care Record. DO NOT WAIT to report important signs, symptoms and behaviors until the end of your shift. Report all concerns IMMEDIATELY!*
RELATED POLICIES

ADM-c-35 Medication Incident Reporting System
PC.D2 - Diabetes Management for Elderly Residents in Long Term Care
PC.P1 - Processing Prescribers’ Orders
Pharmacy Policy H2 - High Alert Medications
Pharmacy Policy M1 - Medication Administration

LINKS

Novolin Insulin Pen 4
Novofine Autocover Needle
BD Auto shield Pen Needle

REFERENCES


American Medical Directors Association (2009). the Accord trial and Control of Blood Glucose Level in Type 2 Diabetes Mellitus.


Diabetic Care Program of Nova Scotia, Diabetes Guidelines for Elderly Residents in Long-Term Care Facilities (April 2010). www.diabetescareprogram.ns.ca


Due Quarterly, Drug Use in the Elderly, Strategies for diagnosing and managing Type 2 diabetes in seniors, April 2011.


Somes, Grant W., Kritcheusky, Stephen B., Shorr, Ronald I., Pahor, Marco, & Applegate, William B.. Body Mass Index, Weight Change, and Death in Older Adults.


**Insulin Tip Sheet**

<table>
<thead>
<tr>
<th>Insulin Type</th>
<th>Drug (Brand Name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid-acting analogues (Clear)</strong></td>
<td>Aspart (NovoRapid)</td>
</tr>
<tr>
<td>Onset: 10-15 min</td>
<td>Glulisine (Apidra)</td>
</tr>
<tr>
<td>Peak: 1-2 hours</td>
<td>Lispro (Humalog)</td>
</tr>
<tr>
<td>Duration: 3-5 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Short –acting (Clear)</strong></td>
<td>Regular (Humulin-R, Novolin ge Toronto)</td>
</tr>
<tr>
<td>Onset: 0.5-1 hour</td>
<td></td>
</tr>
<tr>
<td>Peak: 2-4 hours</td>
<td></td>
</tr>
<tr>
<td>Duration: 5-8 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate-acting (Cloudy)</strong></td>
<td>NPH (Humulin-N, Novolin ge NPH)</td>
</tr>
<tr>
<td>Onset: 1-3 hours</td>
<td></td>
</tr>
<tr>
<td>Peak: 5-8 hours</td>
<td></td>
</tr>
<tr>
<td>Duration: up to 18 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Long-acting basal analogues</strong></td>
<td>Detemir (Levemir)</td>
</tr>
<tr>
<td>Onset: 90 minutes</td>
<td>Glargine (Lantus)</td>
</tr>
<tr>
<td>Peak: Detemir-3 to 14 hours</td>
<td></td>
</tr>
<tr>
<td>Glargine-no pronounced peak</td>
<td></td>
</tr>
<tr>
<td>Duration: 24 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Premixed (Cloudy)</strong></td>
<td>Premixed Regular-NPH (Humulin 30/70, Novolin ge 30/70, 40/60, 50/50)</td>
</tr>
<tr>
<td></td>
<td>Biphasic insulin aspart (NovoMix 30)</td>
</tr>
<tr>
<td></td>
<td>Insulin lispro/lispro protamine (Humalog Mix25, Humalog Mix50)</td>
</tr>
</tbody>
</table>

**Important Notice:** The time course on any insulin may vary considerably in different people. The time periods indicated above should be considered as general guidelines only. The action time for premixed insulin depends on the ratio of the premixed solution.

**Insulin Storage Tips**

- Always date and initial the vial when open.
- Insulin vials in use are generally stable at room temperature for one month (check company monograph for temperature range).
- Insulin pens and cartridges may have specific storage recommendations, check manufacturer specific recommendations in package inserts.
- Store insulin away from direct heat and sunlight.
- Keep extra cartridges of vials of insulin in the fridge. When refrigerated as recommended by specific manufacturer criteria, unopened insulin is good until the specified expiry date.
- Never freeze insulin. Frozen insulin should be thrown away.
- Always check the expiry dates. Never use insulin beyond the expiration date indicated on the vial, pen or cartridge that is supplied from the drug manufacturer.
- Inspect insulin prior to each use. Do not use if:
  - Clear insulin is NOT clear.
  - There are clumps of solid white particles and/or does not mix properly.
- Syringes containing insulin suspensions should be stored in a vertical position with the needle pointing upward to prevent the suspended insulin particles from clogging the needle.
- Pre-drawn and mixed insulins may react differently, consult pharmacist regarding stability and storage conditions.
### Anti-Hyperglycemic Agents for Use in Type 2 Diabetes

<table>
<thead>
<tr>
<th>Class</th>
<th>Other Therapeutic Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alpha-glucosidase inhibitor</strong></td>
<td>• Does not cause Hypoglycemia</td>
</tr>
<tr>
<td>acarbose (Prandase, Glucobay)</td>
<td></td>
</tr>
<tr>
<td><strong>Biguanide</strong></td>
<td>• Very low risk of Hypoglycemia</td>
</tr>
<tr>
<td>metformin (Glucophage)</td>
<td>• Preferred oral therapy for Type 2 diabetes</td>
</tr>
<tr>
<td><strong>Insulin</strong></td>
<td>• Hypoglycemia risk highest with regular and NPH insulin</td>
</tr>
<tr>
<td><strong>Rapid-acting analogues</strong></td>
<td>• Long-acting basal analogues are preferred to NPH in most cases</td>
</tr>
<tr>
<td>Aspart (NovoRapid)</td>
<td>• Avoid using Premixed Insulin with elderly in long term care</td>
</tr>
<tr>
<td>Glulisine (Apidra)</td>
<td></td>
</tr>
<tr>
<td>Lispro (Humalog)</td>
<td></td>
</tr>
<tr>
<td><strong>Short-acting</strong></td>
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</tr>
<tr>
<td><strong>Premixed</strong></td>
<td></td>
</tr>
<tr>
<td>Premixed Regular-NPH (Humulin 30/70;</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Mix25, Mix50)</td>
<td></td>
</tr>
<tr>
<td><strong>Insulin Secretagogues</strong></td>
<td></td>
</tr>
<tr>
<td>Sulfonylureas:</td>
<td>• High risk of Hypoglycemia</td>
</tr>
<tr>
<td>gliclazide (Diamicron, Diamicron MR,</td>
<td></td>
</tr>
<tr>
<td>generic brands)</td>
<td></td>
</tr>
<tr>
<td>glimepiride (Amaryl)</td>
<td></td>
</tr>
<tr>
<td>glyburide (Diabeta, Euglucon, generic</td>
<td></td>
</tr>
<tr>
<td>brands)</td>
<td></td>
</tr>
<tr>
<td>(Note: chlorpropamide and tolbutamide are</td>
<td></td>
</tr>
<tr>
<td>still available in Canada but rarely used.)</td>
<td></td>
</tr>
<tr>
<td><strong>Meglitinides</strong></td>
<td>• Can cause Hypoglycemia</td>
</tr>
<tr>
<td>nateglinide (Starlix)</td>
<td></td>
</tr>
<tr>
<td>repaglinide (GlucoNorm)</td>
<td></td>
</tr>
</tbody>
</table>

A1C = glycated hemoglobin  
eGFR = estimated glomerular filtration rate  
BG = blood glucose  
CrCl = creatinine clearance