CLINICAL PRACTICE GUIDELINES
FOR RESIDENTS WITH DIABETES IN LONG TERM CARE

Revised
January 2013
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**Alberta Health Services, Edmonton Zone, Facility Living Clinical Practice Guidelines for Residents with Diabetes**

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The Revised Clinical Practice Guidelines for Residents with Diabetes Quality Council Working Group was tasked in March, 2012 to revise the Alberta Health Services, Community Care Services, Facility Living Clinical Practice Guidelines for Residents with Diabetes, May 2010. We would like to acknowledge all the hard work of the Community Care Services, Best Practice Committee, Diabetes Working Group of 2010 and of 2005 as this version is based largely on work done by those previous groups.

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These revised guidelines include a review of the recent literature, based largely on the Canadian Diabetes Association Clinical Practice Guidelines (2008) and Nova Scotia’s Diabetes Guidelines for Elderly Residents in Long Term Care Facilities (2010). Changes are minimal in light of the anticipated release of the revised Canadian Diabetes Guidelines in 2013.

Also, upcoming changes are anticipated to the provincial Continuing Care formulary. Components of the guidelines impacted by anticipated changes to the provincial Continuing Care formulary will be revised and communicated at a later date. A summary of the current revisions to the Clinical Practice Guidelines are included in Appendix F of this document.
INTRODUCTION

PURPOSE
To promote consistent, interdisciplinary team, evidence-based practices in the management of Diabetes for elderly continuing care residents living in Facility Living centers in the Edmonton Zone.

The Clinical Practice Guideline (CPG) is intended as a tool to guide and direct clinical practice and support the interdisciplinary team in providing holistic resident care. The CPG does not preclude the critical thinking and clinical judgment required of the continuing care interdisciplinary team, or resident specific physician orders.

When implementing the CPG, the particular circumstances of the resident must be taken into consideration as well as any new/emerging information. The CPG should be reviewed and applied, based on the specific needs of the continuing care centre, as well as the needs and wishes of the resident. The CPG will be reviewed and revised every three years or as evidence indicates.

GOALS
To develop baseline assessment and monitoring parameters for diabetic residents in the continuing care setting.

To individualize treatment goals and 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 recommendations from the Interdisciplinary Team (IDT).

DEFINITIONS

Diabetes
Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia due to defective insulin secretion, insulin action, or both.

Hypoglycemia
Hypoglycemia is defined as a low blood glucose of < 4 mmol/L.

Hyperglycemia
Hyperglycemia is defined as a fasting blood glucose > 7 mmol/L or a random blood glucose of > 11.1 mmol/L. The chronic hyperglycemia of diabetes is associated with significant long term sequelae, particularly damage, dysfunction and failure of various organs-especially the kidneys, eyes, nerves, heart and blood vessels.

Interdisciplinary Team (IDT)
Interdisciplinary implies a degree of collaboration among team members. It implies an integration of the knowledge and expertise of several disciplines to develop solutions to complex problems in a flexible and open-minded way. This type of team is characterized by ownership of common goals, and a shared decision making process. Members of interdisciplinary teams must open territorial boundaries to provide more flexibility in professional responsibilities in order to meet client’s needs.

eGFR
Serum testing for Glomerular Filtration Rate.

ACR
Urine testing for Albumin to Creatinine ratio.

CLASSIFICATION OF DIABETES
Type 1 diabetes is primarily a result of pancreatic beta cell destruction and is prone to ketoacidosis. This form includes cases due to an autoimmune process and those for which the etiology of beta cell destruction is unknown.

Type 2 diabetes may range from predominant insulin resistance with relative insulin deficiency to a predominant secretory defect with insulin resistance.

Other specific types include a wide variety of relatively uncommon conditions, primarily specific genetically defined forms of diabetes or diabetes associated with other diseases or drug use (latent autoimmune diabetes in adults (LADA)).
DIABETES MANAGEMENT ALGORITHM FOR CONTINUING CARE RESIDENTS

Admission, Assessment, and Ongoing Monitoring
The IDT will establish, maintain and document individualized treatment goals for residents with diabetes which may include the following assessment and monitoring parameters:
- A targeted history and physical exam on admission and at least annually
- Weight - monthly and prn
- Laboratory tests – A1C, lipid profile, creatinine level and a fasting blood glucose on admission
  A1C, lipid profile, serum creatinine for eGFR, urine for ACR and a fasting blood glucose annually or at the discretion of the Physician or Nurse practitioner.
- Blood pressure – monthly and/ or with changes in medication profile or health status
- Blood glucose monitoring as per Table 1 (page 8)
- Medication review – every 3 months or with changes in status
- Daily foot inspection by Health Care Aides
- Daily skin inspection by Health Care Aides
- Special considerations – resident choices, co-morbidities, infections

RAI/MDS 2.0 assessments are completed on admission, quarterly, annually, and prn, which includes the following data elements:
- Nutritional screening – (refer to dietitian with changes in weight, intake and blood glucose monitoring)
- Physical functioning
- Skin assessment (include the assessment of the feet)
- Pain assessment
- Cardiovascular, cerebrovascular, and behavioral assessments that may contribute to cognitive status
- Depression screening

Annual Interdisciplinary Conference & Assessment of Complications
A. Review treatment plan, monitoring data and medication profile
B. Physical exam
C. Diagnostic tests as required
D. Foot exam including peripheral sensation
E. Review tobacco use annually when appropriate
F. Cardiovascular and cerebrovascular complication assessment (includes cognitive testing)
G. Consider specialist dilated eye exam if clinical status indicates
H. Other considerations – resident choices, co-morbidities, infections

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

Are treatment goals met?

YES

NO

Treatment Goals Not Met
A. Review glycemic control, lipid management and blood pressure control and/or,
B. Assess the resident’s adherence to the treatment plan,
C. Modify treatment plans based on the guideline, including resident/family choices,
D. Consider referral to the Regional Diabetes Program, Central Access, phone number (780) 401-2665

STANDARD 1: BLOOD GLUCOSE MONITORING

Blood glucose monitoring is recommended as an essential part of diabetes management. **Blood glucose targets should be individualized** with the aim of preventing hypoglycemia and avoiding frequent episodes of hyperglycemia. This will assist in maintaining adequate glycemic control thereby minimizing unnecessary symptoms and acute complications associated with diabetes.

**GOAL:** To establish a standardized process for blood glucose monitoring for residents with diabetes through:

- establishing individual baseline values for blood glucose in residents with diabetes taking into account how the resident managed their diabetic care prior to entering continuing care e.g. diet control, blood glucose monitoring.
- monitoring the resident’s blood glucose (as per Table 1):
  - on admission;
  - following a change in diabetic medication profile;
  - following a change in health status;
  - following a hyperglycemic or hypoglycemic event;
  - routine monitoring of blood glucose values.
- establishing parameters for residents with unstable blood glucose.

Documentation of blood glucose values is in accordance with the facility policy on the diabetic record.

A review by the IDT (i.e. regulated nurse, physician, NP, dietitian, pharmacist, and rehabilitation staff) of the resident’s blood glucose trends and health status related to diabetes is recommended:

- at the admission conference;
- annually (annual conference); and
- if the resident has frequent hypoglycemic and/or hyperglycemic events.
**TABLE 1 - BLOOD GLUCOSE MONITORING**

<table>
<thead>
<tr>
<th>1) Establish Individualized Baseline</th>
<th>Non-medication management</th>
<th>Fasting* + 2 hours after each meal for four days</th>
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<tr>
<td></td>
<td>OR</td>
<td>Oral anti-hyperglycemic agent</td>
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<td></td>
<td>OR</td>
<td>Insulin plus oral anti-hyperglycemic agent</td>
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<td></td>
<td>OR</td>
<td>Insulin</td>
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<td></td>
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<tr>
<td>2) Routine Monitoring</td>
<td>2 times per month</td>
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<tr>
<td>(May require adjustment based on the resident’s stability.)</td>
<td>Oral anti-hyperglycemic agent</td>
<td>Fasting* + 2 hours after each meal</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>Insulin plus oral anti-hyperglycemic agent</td>
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<td>Insulin</td>
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<td></td>
<td></td>
<td>Non-medication management</td>
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<td>3) Residents with Unstable Blood Glucose</td>
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<td></td>
<td>Consider Sliding Scale Insulin in an unstable diabetic for short durations only</td>
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</table>

**RECOMMENDED BLOOD GLUCOSE TARGET LEVELS FOR ELDERLY RESIDENTS IN THIS POPULATION ARE BETWEEN 7-15 MMOL/L.**

- Establish Individualized Baseline
  - Monitor blood glucose QID daily for a minimum of 4 days or longer until stable.
  - (This monitoring schedule is recommended for an initial assessment, a change in health status or diabetic medication profile, or after a hyper/hypoglycemic event)

- Routine Monitoring
  - Non-medication management
  - Fasting* + 2 hours after each meal for four days

- Residents with Unstable Blood Glucose
  - Notify the Physician/Nurse Practitioner (NP) if the blood glucose is:
    1) < 4 mmol/L and resident does not respond to treatment for hypoglycemia;
    2) > 20 mmol/L;
    3) > 15 mmol/L on two tests on the same day.
  - Consider Sliding Scale Insulin in an unstable diabetic for short durations only
  - More frequent blood glucose monitoring may be required for residents who have fluctuating glucose values for undetermined reasons or in response to medications/or medical conditions e.g. infection.

* Fasting is defined as no caloric intake for at least 8 hours (CDA, 2008, S10)
**BLOOD GLUCOSE MONITORING FLOW CHART**

To be used to establish individual baselines and monitoring regime.

- New Admission *with* diagnosis of Diabetes
- or
- Resident has had a *change* in health status or diabetic medication
- or
- Resident has had a significant Hypo or Hyperglycemic event

Start blood glucose testing to establish baseline:
- Fasting + 2 hours after each meal for 4 days

Review the results:
- Are results within resident specific acceptable range?

If YES:
Continue with BG monitoring:

**Non-medication management (Diet Controlled)**
- Fasting + 2 hours after each meal **MONTHLY**.

**All types of Medication management (Oral / Insulin / or Both)**
- Fasting + 2 hours after each meal **on 2 days per month** (e.g. on the 1st and 15th of the month).

If resident is *diet controlled* and BG results after 3 consecutive months of testing remain within acceptable range, consider discontinuing testing, and reassessing diagnosis.

If during course of testing, BG results are *not* within acceptable range, consult with the IDT. Consider starting 4 day monitoring again.

If NO:
- Consult with IDT team to review diabetic medication.
- Consider 4 more days of BG testing.
STANDARD 2: HYPOGLYCEMIA MANAGEMENT

GOAL: The prevention of hypoglycemia for all diabetic residents to minimize the complications associated with low blood glucose.

Hypoglycemia is defined as a blood glucose of < 4 mmol/L.

NOTE: Hypoglycemia severity may also be defined by the individual’s clinical manifestations. Some residents may exhibit clinical manifestations with blood glucose values > 4 mmol/L so it is very important to assess the resident for hypoglycemia even if the B.G. value is > 4 mmol/L.

- Older adults may have a reduced physiological response to hypoglycemia. 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.
- The only indicator of hypoglycemia in an older adult may be the blood glucose reading.
- Treatment for hypoglycemia is required even if the resident is asymptomatic.
- The resident may be symptomatic at blood glucose levels outside the boundaries noted above; treat accordingly.

TABLE 3 - POSSIBLE SIGNS & SYMPTOMS OF HYPOGLYCEMIA

<table>
<thead>
<tr>
<th>Physical</th>
<th>Neurological</th>
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<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>
STANDARD 3: HYPERGLYCEMIA MANAGEMENT

GOAL: The prevention of hyperglycemia for all diabetic residents to minimize the complications associated with high blood glucose.

Hyperglycemia is defined as a fasting blood glucose > 7 mmol/L or a random blood glucose of > 11.1 mmol/L although recommended blood glucose target levels for elderly residents in this population are between 7-15 mmol/L.

NOTE: Hyperglycemia severity may also be defined by the individual's clinical manifestations. Some residents may not exhibit clinical manifestations with blood glucose values > 11.1 mmol/L so it is very important to keep in mind the resident specific acceptable range when assessing for the signs and symptoms of hyperglycemia.

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
- drugs
- new diagnosis of diabetes

Consult the IDT team and notify the Physician or Nurse Practitioner (NP) non-urgently for further investigation, including potential medication adjustment, if the blood glucose is:

- > 20 mmol/L;
- >15 mmol/L on two testings on the same day

There may not be definitive symptoms of hyperglycemia in our elderly population. Signs & symptoms may develop over hours or days.

A hyperglycemic emergency may be considered if the following signs and symptoms are present. This may require clinical management in an emergency setting:

<table>
<thead>
<tr>
<th>Hyperosmolar State*</th>
<th>Diabetic Ketoacidosis**</th>
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<tbody>
<tr>
<td>Agitation, confusion</td>
<td>Agitation, confusion</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Fatigue</td>
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<tr>
<td>Glucose and ketones positive in urine</td>
<td>Glucose and ketones positive in urine</td>
</tr>
<tr>
<td>Polydypsia (Increased thirst)</td>
<td>Polydypsia (Increased thirst)</td>
</tr>
<tr>
<td>Polyuria (Increased urine)</td>
<td>Polyuria (Increased urine)</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Weight loss</td>
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<tr>
<td>Grossly elevated blood glucose &gt;34 mmol/L</td>
<td>Elevated blood glucose &gt;12 mmol/L</td>
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<td>Sweet odor to the breath</td>
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</tbody>
</table>

*more common in Type 2 Diabetes
**more common in Type 1 Diabetes
TREATMENT of HYPOGLYCEMIA (blood glucose < 4mmol/L)
CONSCIOUS RESIDENT

NOTE: Treatment for hypoglycemia should not be delayed. Resident treatment precedes informing the physician and documentation.

Does the resident have dysphagia?

- No: Administer 20g fast acting glucose (carbohydrate).
  - Examples: 4x5 gram Dextrose tablets or 4 tsp of honey or 4 packets (4 tsp) of sugar.
  - Wait 15 minutes and then retest blood glucose.
  - If symptoms are relieved and blood glucose remains >4 mmol/L: Give the next scheduled snack or meal. If meal is more than one hour away give one starch (15 grams carbohydrate) and one protein supplement (see snack suggestions, Appendix C).
  - **Note:** DO NOT subtract food from the next snack or meal following a fast-acting glucose supplement and/or extra snack/supplement.

- Yes: Administer (½ cup) 120 ml of thickened juice or 4 tsp of honey or 4 packets (4 tsp) of sugar mixed in 120 ml (½ cup) thickened water.
  - Does blood glucose remain <4mmol/L?
    - No: Treat with 15g fast acting glucose (carbohydrate).
      - Examples: 3x5 gram Dextrose tablets or 15 ml (3 tsp) of honey or 3 packages (3 tsp) sugar.
      - **Note:** If the resident has dysphagia, mix with ½ cup thickened water.
    - Yes: Wait 15 minutes and then retest blood glucose.
      - If resident is symptomatic, continue to treat with another 15g fast acting glucose (carbohydrate). Consider resident’s advanced directive and if indicated, call 911 for paramedics. Notify physician once resident is stable.

Document and Communicate hypoglycemic event to interdisciplinary team for further assessment and follow up.

Re-establish individualized baseline (Table 1) pg. 7

**Note:** Use Dextrose tablets or honey to treat hypoglycemia in residents taking Acarbose (Prandase) as this medication interferes with the absorption of sucrose.
TREATMENT of HYPOGLYCEMIA (blood glucose < 4mmol/L) UNCONSCIOUS RESIDENT

NOTE: Treatment for hypoglycemia should not be delayed. Resident treatment precedes informing the physician and documentation.

Call for assistance using the most appropriate method at your facility

Turn resident onto his/her side to prevent aspiration

Obtain blood glucose level and vital signs

If indicated by blood glucose value, call 911 requesting help for unconscious diabetic resident (consider resident’s advanced directive)

Administer Glucagon 1mg subcutaneously and monitor vital signs.

Notify physician of the resident’s condition

Wait 15 minutes Re-Test blood glucose level and continue to monitor vital signs

Re-administer Glucagon 1mg subcutaneously

Has the resident’s condition changed?

No

Consider: the resident may be transferred to emergency for assessment and stabilization.

Yes

Document and Communicate hypoglycemic event to interdisciplinary team for further assessment and follow up.

Re-establish individual baseline once resident has been stabilized (Table 1 pg7)

NOTE: After the initial Glucagon treatment for hypoglycemia induced by sulfonylureas (Glyburide [Diabeta], Gliclazide [Diamicron]), intravenous glucose may be required to prevent further hypoglycemia.
TREATMENT of HYPOGLYCEMIA (blood glucose < 4 mmol/L) CONCIous or UNCONCIous RESIDENT WITH Enteral Feeds

NOTE: Treatment for hypoglycemia should not be delayed. Resident treatment precedes informing the physician and documentation.

Administer:
4x5 gram crushed Dextrose enterally or
Glucagon 1 mg subcutaneously due to delay in absorption

If resident is unconscious, consider resident's advanced directive and, if indicated by blood glucose value, call 911 for assistance at this time.

Wait 15 minutes then retest.

Does blood glucose remain < 4 mmol/L?

Yes

Administer another 15 g fast acting glucose enterally.
Example: 3 x 5 gram crushed Dextrose tablets or Glucagon 1 mg subcutaneously

Consider calling 911 for assistance if you have not already done so. The resident may need to be transferred to emergency for assessment and stabilization if indicated.

No

Document and Communicate hypoglycemic event to interdisciplinary team for further assessment and follow up.

Once blood glucose has been stabilized, if the next scheduled tube feeding is more than 1 hour away, give an additional 1/3 can (125mL) of formula to prevent re-occurrence prior to next feed.

Re-establish individualized baseline (Table 1) pg. 7

Note:
Diabetics on enteral feeds require special IDT attention.

Documentation for Hypoglycemic Events:
Documentation on resident’s Health Record should include the following:

- Time of the hypoglycemic reaction
- Symptoms of hypoglycemia
- Blood glucose monitoring results and times
- Treatment(s) provided, including the amount of glucose, times of administration, any other snacks given
- Resident’s response(s) to treatment
- Physician notification
- Necessary revisions/additions to the care plan
STANDARD 4: BLOOD GLUCOSE METER QUALITY ASSURANCE

GOAL: To ensure accuracy in glucose monitoring in continuing care centres.

1. High and low quality control tests are to be performed to check the performance of blood glucose meters in accordance with manufacturer's guidelines and facility specific policy:
   • for resident testing on a daily basis, a minimum of once every 24 hours;
   • for resident testing done less frequently than on a daily basis, prior to resident testing for the day;
   • when a new lot number/vial of test strips is opened;
   • if the vial of test strips is left uncapped;
   • if test results do not agree with clinical symptoms;
   • after cleaning the meter;
   • after the meter battery is changed;
   • prior to using a new meter; and
   • if test strips have been exposed to temperatures exceeding manufacturer's specifications.

2. Blood glucose meters are to be cleaned in accordance with the manufacturer's guidelines.

3. The blood glucose meter(s) will undergo regularly scheduled equipment maintenance or replacement as per facility policy.

### APPENDIX A: INSULINS

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

**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.

Ref.: Canadian Diabetes Association, Clinical Practice Guidelines. (2008)

**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 medication 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.
### APPENDIX B: ANTI-HYPERGLYCEMIC AGENTS

<table>
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<th>Anti-hyperglycemic Agents for Use in Type 2 Diabetes</th>
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<td><strong>Class</strong></td>
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<tr>
<td>Alpha-glucosidase inhibitor</td>
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<tr>
<td>Acarbose (Prandase, Glucobay)</td>
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<td>Biguanide</td>
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<td>Metformin (Glucophage)</td>
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<td>Insulin</td>
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<tr>
<td>Insulin Rapid-acting analogues</td>
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<td>Aspart (NovoRapid)</td>
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<td>Glulisine (Apidra)</td>
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<tr>
<td>Lispro (Humalog)</td>
</tr>
<tr>
<td><strong>Short-acting</strong></td>
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<tr>
<td>Regular (Humulin-R, Novolin ge Toronto)</td>
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<tr>
<td>Intermediate-acting</td>
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<tr>
<td>NPH (Humulin-N, Novolin ge NPH)</td>
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<tr>
<td>Long-acting basal analogues</td>
</tr>
<tr>
<td>Detemir (Levemir)</td>
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<tr>
<td>Glargine (Lantus)</td>
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<tr>
<td><strong>Premixed</strong></td>
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<tr>
<td>Premixed Regular-NPH (Humulin 30/70; Novolin ge 30/70, 40/60, 50/50)</td>
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<tr>
<td>Biphasic insulin aspart (NovoMix 30)</td>
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<tr>
<td>Insulin lispro/lispro protamine (Humalog Mix 25, Mix 50)</td>
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<tr>
<td><strong>Insulin secretagogues Sulfonylureas:</strong></td>
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<tr>
<td>Gliclazide (Diamicron, Diamicron MR, generic brands)</td>
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<tr>
<td>Glimepiride (Amaryl)</td>
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<tr>
<td>Glyburide (Diabeta, Euglucon, generic brands)</td>
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<tr>
<td>(Note: chlorpropamide and tolbutamide are still available in Canada but rarely used.)</td>
</tr>
<tr>
<td><strong>Meglitinides</strong></td>
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<tr>
<td>Nateglinide (Starlix)</td>
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<tr>
<td>Repaglinide (GlucoNorm)</td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>------------------------------</td>
</tr>
<tr>
<td>TZDs</td>
</tr>
<tr>
<td>Plieglitazone (Actos®)*</td>
</tr>
<tr>
<td>Rosiglitazone (Avandia®)*</td>
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<tr>
<td>Antiobesity agents</td>
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<tr>
<td>Orlistat (Xenical)</td>
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<td></td>
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<tr>
<td>Sibutramine (Meridia)</td>
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<tr>
<td>Combined formulations</td>
</tr>
<tr>
<td>Avandamet (metformin + rosiglitazone)</td>
</tr>
<tr>
<td>Avandaryl (glimepiride + rosiglitazone)</td>
</tr>
</tbody>
</table>

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

↓ : < 1.0% reduction in A1C  
↓↓ : 1.0 – 2.0% reduction in A1C  
↓↓↓ : > 2.0% reduction in A1C
APPENDIX C: ILLNESS AND NUTRITION MANAGEMENT

Nutrition during periods of illness can be challenging. Any of the following may affect the interaction between proper nutrition and illness:

1. Level of glycemia and hydration:
   - The body’s response to illness is to raise glucose levels through the release of stress hormones which can render medications less effective or ineffective.
   - Loss of appetite may require meal replacements to maintain a balance between medications for diabetes and blood glucose targets.
2. Clear fluid diets.
3. Inability to ingest a carbohydrate source when hypoglycemic.
4. Medications which mask hypoglycemic symptoms such as analgesics, psychotropics or sedatives.

Since the digestion of carbohydrates contributes 90% of the glucose load, it is this nutrient which we are most concerned with in terms of management during an illness. To ensure consistent carbohydrate intake, 15-20 grams should be given **hourly**. The following list provides examples of some liquid or soft carbohydrate containing fluids/foods that can be given during periods of illness:

- ½ cup (125ml) Juice
- 200ml Regular pop (non-diet)
- ½ cup (125ml) Regular Jello (non-diet)
- 150ml Clear Broth + ½ cup (125ml) Juice
- 1 cup (250ml) Cream Soup (if tolerated)
- 1 cup (250ml) Milk (if tolerated)
- ½ cup (125ml) Chocolate Milk (if tolerated)
- ½ cup (125ml) Flavoured Soy beverage
- ½ cup (125ml) Ice Cream
- 75ml Sherbet
- ½ cup (125ml) Pudding (if tolerated)
- ½ can or ½ cup (125ml) of Liquid Nutritional Supplement (Ensure®, Glucerna®)
- 100mls of Resource 2.0® or TwoCal HN® (if tolerated)

If the resident receives thickened fluids (Nectar, Honey or Pudding consistency) provide:

- ½ cup (125ml) Thickened Juice (thickened to prescribed level)
- 1 cup (250ml) Thickened Milk (if tolerated and thickened to prescribed level)
- ½ cup (125ml) Thickened Chocolate Milk (if tolerated and thickened to prescribed level)
- ½ cup (125ml) Thickened Flavoured Soy Beverage (if tolerated and thickened to prescribed level)
- ½ cup (125ml) Pudding (if tolerated)
- ½ can or ½ cup (125ml) of Liquid Nutritional Supplement (Boost®, Ensure®, Glucerna®; if tolerated and thickened to prescribed level)
- 100mls of Resource 2.0® or TwoCal HN® (if tolerated and thickened to prescribed level)

**Important Notice:** Clear tea, coffee or water may be added as desired but CANNOT substitute for items containing carbohydrates.

Any of the above suggestions may be switched for preferences or tolerance, as desired, as long as the hourly 15-20 grams of carbohydrate is maintained during this period of illness.

Vomiting or diarrhea two or more times in the person with diabetes is a danger sign! Depletion of electrolytes can quickly affect fluid balance leading to a hyperosmolar or ketotic state. Notify the Physician/ Nurse Practitioner (NP)

Consult with the clinical dietitian for the development of an appropriate dietary plan for all ill diabetics.

Appropriate snacks include a carbohydrate and a protein source. Examples are: half (1/2) sandwich with a protein source (meat, cheese or peanut butter), yogurt, crackers and cheese, etc. Please refer below for specific snack examples with appropriate serving sizes:

**SNACK SUGGESTIONS:** Carbohydrate + Protein

- 3-4 Crackers and 30g (1 ounce) Cheese
- 3-4 Crackers and 2 Tablespoons (30ml) Peanut Butter
- 1 slice of Bread and 1 Boiled Egg
- ½ cup (125ml) Cold Cereal and 1 cup (250ml) Milk
- ½ Sandwich made with 1 slice of bread and 30g (1 ounce) of lean meat / chicken or ¼ cup (60mls) of canned fish
- ½ cup (125ml) Chocolate Milk
- ½ cup (125ml) Flavoured Soy Beverage
- ½ cup (125ml) Pudding
- ½ can or ½ cup (125ml) of Liquid Nutritional Supplement (Boost®, Ensure®, Glucerna®)
- 100ml of Resource 2.0® or TwoCal HN®
- ½ can or ½ cup (125ml) of Enteral Tube Feed

Additional snacks may be required during periods of illness, disease, irregular intake or skipping meals and/or with changes in Diabetic medication:

- **Snacks for Diabetics on Oral Diabetic Medications:** Individuals on oral medication often only require a snack at HS (in the evening before bed) to reduce the risk of a hypoglycemic episode. (2008 Canadian Diabetic Association Guidelines)

- **Snacks for Diabetics Taking Insulin:** Individuals on insulin often require additional snacks throughout the day based on the type of insulin and associated peak action time. Examples are:
  - NPH (Humulin-N, Novolin ge NPH) or Regular (Humulin-R, Novolin ge Toronto) Insulin require an AM (10am) and PM (2pm) snack.
  - Aspart (NovoRapid) or Lispro (Humalog) do NOT require an AM or PM snack as their peak action time is mealtimes.

**Important Notice:** The time course of insulin may vary considerably in different people. The time periods indicated above should be considered as a general guideline.
APPENDIX D: PROCEDURE FOR BLOOD GLUCOSE TESTING

1. Review the resident’s individualized protocol for glucose monitoring.

2. Explain procedure to resident, if appropriate.

3. Check all supplies and equipment to ensure quality assurance checks have been performed and that equipment and test strips meet performance standards.

4. Ensure the residents’ hands are clean and dry.

5. Ask resident to hold arm downward for at least 30 seconds to allow the blood to flow to the fingertips.

6. Wash your hands and put on gloves.

7. Remove test strip from vial. Recap vial immediately to prevent moisture from getting into the vial and altering the accuracy of the remaining test strips.

8. Follow manufacturer’s instructions for use of lancing device.

9. Prick the side of the fingertip with a lancing device (approved for single use with no needle stick injury risk).
   **Note:** Avoid areas of bruising and open lesions.

10. Position the hand so the puncture site faces down allowing a large hanging drop of blood to form naturally.

11. Apply blood to test strip and complete test according to manufacturer’s instructions.

12. Dispose of lancet in sharps container.

13. Document on health record:
    Date and time of test results, in accordance with the facility policy, on the Diabetic Record.
APPENDIX E: GERIATRIC SYNDROMES ASSOCIATED WITH DIABETES

There is epidemiological evidence identifying an association between increased prevalence of multiple geriatric symptoms and diabetes. It is important to recognize and manage the following syndromes as they can significantly impair the resident’s quality of life.

Depression
Major depression is more prevalent in residents with diabetes and health outcomes are worse when depression is unrecognized.

Action: Screen for depression utilizing the MDS Depression Rating Scale or the Geriatric Depression Scale.

Cognitive Impairment
Residents with diabetes are at greater risk of cognitive impairment. Hyperglycemia has been associated with declining mental function which may be improved with normalization of blood glucose.

Action: Assess cognition utilizing the Cognitive Performance Scale (CPS) from the MDS. Identify reversible causes of cognitive decline i.e. elevated blood glucose. Consult Occupational Therapy to assess executive function.

Urinary Incontinence
Residents with diabetes, especially women, are predisposed to urinary tract dysfunction.

Action: Screen for urinary incontinence. Identify treatable causes such as neurogenic bladder, infection, uterine prolapse, cystocele, atrophic vaginitis and fecal impaction. Consider assessment of post-void residual.

Falls
Residents with diabetes are at high risk for injurious falls.

Action: Screen all residents on admission for fall risk. Identify fall risk factors. Implement harm reduction strategies to minimize fall risks and incorporate strategies on the care plan.

Pain
Residents with diabetes have an increased risk for chronic pain syndromes as a result of peripheral neuropathy.

Action: Assess for pain systemically with the use of a pain assessment tool. Implement and document pain intervention(s).
Appendix F: Clinical Practice Guidelines for Residents with Diabetes 2013
Changes Overview

The Clinical Practice Guidelines for Residents with Diabetes was initially implemented in 2006 and was revised in 2010. A working group was put together again in 2012 to review and revise the guidelines in light of new available research and work done by other provinces in relation to diabetic management in the elderly population.

The latest version of the Clinical Practice Guidelines for Resident with Diabetes in Long Term Care was revised after extensive discussion and thorough literature reviews by the working group. Revisions were made not only in an attempt to guide more appropriate diabetic management for the elderly population living in Long Term Care, but also allow for resident choice and quality of life, balancing that with safe clinical diabetes management in this elderly population.

Overview of Changes in the 2013 version of the Guidelines:

<table>
<thead>
<tr>
<th>Current Guidelines</th>
<th>Revised Guideline</th>
<th>Supportive Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1C: On admission and Q6 months</td>
<td>HbA1C: <strong>On admission</strong> and <strong>annually</strong> or at the discretion of the physician or practitioner.</td>
<td>With the broadening of BG range, HbA1C could be less applicable in the elderly population. HbA1C targets for this elderly population has been changed from 7% to 7-10% to keep in line with the broadening of acceptable BG values.</td>
</tr>
<tr>
<td><strong>Target Levels for Residents with Diabetes (Table 1)</strong></td>
<td><strong>Target Levels for Elderly Long Term Residents with Diabetes (Table 1)</strong></td>
<td>Based on most current research, target levels for this population should not be as stringent as that of the younger populations who generally have a greater life expectancy.</td>
</tr>
<tr>
<td>Baseline blood glucose monitoring X7 days</td>
<td>Baseline blood glucose monitoring changed to X4 days</td>
<td>Residents are often established diabetics upon admission with established routines so 4 days is felt to be sufficient time to assess for any concerns.</td>
</tr>
<tr>
<td>Routine Monitoring:</td>
<td>Diet controlled diabetic:</td>
<td>Monitoring prior to meals was eliminated as this sometimes leads to staff holding insulin inappropriately. Routine monitoring for diet controlled diabetics was eliminated if stable as symptoms and routine blood work should be the indicator of diabetes progression.</td>
</tr>
<tr>
<td><strong>Oral Hypoglycemics:</strong> Fasting and 2 hrs after each meal QID weekly</td>
<td>Once /month fasting plus 2 hrs after each meal. If BG is within normal range X 3 months, then discontinue monitoring.</td>
<td></td>
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<tr>
<td><strong>Insulin Dependent:</strong> 1 hr before each meal and at HS weekly PLUS fasting 3X week</td>
<td>All other diabetics: Fasting plus 2 hrs after each meal, 2 days per month (eg. 1st and 15th).</td>
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<tr>
<td>Severe hypoglycemia of 2.8 mmol/l</td>
<td>Severe Hypoglycemia was removed from the definitions. Hypoglycemia is defined as a blood glucose of &lt; 4.0mmol/L.</td>
<td>Hypoglycemia treatment will be initiated whether it is severe or not so no need to have this in the definitions.</td>
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<tr>
<td>Hyperglycemia is a fasting BG &gt;7.0 mmol/L or a random BG of &gt;11.1mmol/L</td>
<td>Although hyperglycemia is defined as a fasting BG &gt;7.0 mmol/L or a random BG of &gt;11.1mmol/L, for this population, acceptable range could be 7-15mmol/L.</td>
<td>In addressing quality of life and choice in this population, acceptable parameters have been broadened.</td>
</tr>
<tr>
<td>Hypoglycemic Treatments: glucose tablets, juice, pop, honey, jam, syrup, sugar</td>
<td>Hypoglycemia treatments include: Dextrose tablets, honey and sugar.</td>
<td>The list of acceptable treatments was shortened to only include items that are readily available in most Long Term Care centers. Juice was removed as it could be difficult to ensure that the juice being given in a hypoglycemic event was made from fruit crystals instead of real fruit juice which is less effective.</td>
</tr>
<tr>
<td>Hyperglycemia Treatment: &gt; 20 mmol/L or &gt; 15 mmol/L on 2 tests contact physician immediately.</td>
<td>Hyperglycemia Treatment: &gt;20 mmol/L call physician non-urgently</td>
<td>If BG is between 15 mmol/L and 20 mmol/L, discussion with the interdisciplinary team would be in order but you would not need to contact physician unless resident is symptomatic.</td>
</tr>
<tr>
<td></td>
<td>Addition of Appendix H: a standardized diabetic record which includes a resident specific acceptable range area.</td>
<td>Every physician should be writing a specific order as to what they consider a resident specific acceptable range.</td>
</tr>
<tr>
<td></td>
<td>Addition of Appendix G: Suggested roles and Responsibilities in Diabetes Management.</td>
<td>This document was added to help clarify/standardize roles in diabetes management within continuing care.</td>
</tr>
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</table>
# Appendix G: Suggested Roles and Responsibilities in Diabetes Management

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
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</table>
| **Care Manager/ RN** | - Ensures resident diabetic management processes are implemented in accordance with the Clinical Practice Guidelines for Residents with Diabetes in Long Term Care.  
- Maintains an overall awareness of diabetes management issues on the unit through regular consultation with the RN, LPN and/or GN.  
- Assists in developing interventions and strategies for unstable diabetics.  
- Provides mentoring and coaching to unregulated staff on the units as they manage resident with diabetes. |
| **LPN** | - Assists with admission baseline glucose monitoring and report findings to the RN.  
- Manages regular blood glucose monitoring in collaboration with the RN.  
- Communicates unusual blood glucose results to the RN.  
- Collaborates with RN and review care plan and treatment goals for the residents who are assessed as unstable, have complex needs and/or unpredictable outcomes.  
- Administers insulin to residents.  
- Assesses, monitors, evaluates, documents and communicates intervention results to RN. |
| **Regulated Non-Nursing Staff (O.T., P.T., R.D., Pharmacist)** | - Assists with diabetes management problem solving as needed and assists staff in developing interventions and strategies for unstable diabetics.  
- Assesses, monitors, evaluates, documents and communicates intervention results. |
| **Unregulated Staff (Health Care Aids)** | - Have a general awareness of who on the unit is diabetic.  
- Obtain knowledge with regards to signs and symptoms of both Hyperglycemia and Hypoglycemia (please refer to Standard 2 and Standard 3).  
- Report immediately to the RN, GN, or LPN:  
  - Observed or reported pain, tingling or numbness in the resident’s extremities  
  - Changes to skin condition as noted during baths, a.m. and h.s. care  
  - Changes in eating patterns during meals and snacks  
  - Unexpected or sudden changes in behavior  
  - Illness  
  - Excess urination  
  - Noted weight loss or gain  
  - Sweet odor to the breath  
  - Trembling, sweating, fatigue  
- Read resident’s Kardex/ Visual care plan especially related to resident specific diabetes interventions.  
- Provide snacks as indicated in the diabetic care plan.  
- Document applicable items on the Daily Care Record. |
### Appendix H: Diabetic Record

Resident Specific Acceptable Range: _____________ to ____________
(as ordered by physician)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Blood Glucose Result</th>
<th>Insulin Type and Dose</th>
<th>Injection Time</th>
<th>Injection Site</th>
<th>Hypoglycemia/ Hyperglycemia Treatment (if applicable)</th>
<th>Initials</th>
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</table>

September 11, 2012
REFERENCES for 2013 Revisions:


CapitalCare Edmonton, Edmonton, AB, (2011) CapitalCare Clinical Standards For Elderly Residents with Diabetes in Long Term Care.


REFERENCES:


Evans Diabetes Manager, (for Laboratory values).


