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Diabetes and Frailty in Long Term Care

The DCPNS Guideline

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CDA Targets

In order to achieve an A1C of 7.0%, aim for:

- Fasting or preprandial PG between 4.0 and 7
- Two-hour postprandial PG between 5.0 and 10.0

If A1C targets cannot be achieved with postprandial target of 5.0 to 10.0.

- Consider postprandial BG lowering to 5.0 to 8.0

CDA guidelines 2008

CDA Guidelines for the Elderly 2008

- The goals should be less stringent with frailty [Grade D, Consensus].
- Sulfonylureas should be used with caution because of the risk of hypoglycemia [Grade D, Level].
- Gliclazide and gliclazide MR [Grade B, Level 2] and glimepiride [Grade C, Level 3] are the preferred sulfonylureas: reduced hypoglycemia
- Meglitinides (repaglinide and nateglinide) should be considered in patients with irregular eating habits [Grade D, Consensus]
- The use of premixed insulins and pre-filled insulin pens as alternatives to mixing insulins should be considered to reduce dose errors, and to potentially improve glycemic control [Grade B, Level 2 .

Nova Scotia Crafts Guidelines for LTC

- Guidelines for diabetes management in LTC must consider the characteristics of the population
- Older residents in LTC are frail.

What is Frailty?

Accumulation of multiple chronic illnesses with associated vulnerabilities such as dementia, functional decline, and geriatric syndromes (falls, impaired mobility, and polypharmacy)

BACKGROUND: Frailty

Frailty and Care Guidelines

- Care is made complex by multiple interacting problems and vulnerability.
- Most guidelines are written for those with single illness: sees one-thing-wrong-at-once.
- Care needs to be organized in the context of frailty, where many things are wrong at once.

BACKGROUND: Frailty

Evidence may not be applicable to a frail population because

- Studies exclude the frail elderly
- Frailty limits life expectancy. Therefore, benefit may not be realized if it takes time to achieve
- The frail have more adverse effects from treatment
 - The risk of hypoglycemia is increased
 - Hypoglycemia can be hidden by lack of symptoms, inability to communicate, and atypical disease presentation
 - Hypoglycemia can cause falling

The Evidence: The Studies

- UKPDS:
 - Newly diagnosed diabetics
 - No difference in any outcome at 3 yrs
 - Decrease in microvascular surrogates at 6 – 7.5 years (retinal photocoagulation, albuminuria), but not clinical outcomes (vision, change in creatinine)
 - More hypoglycemic episodes in the intensive therapy group

Other studies: older patients, more chronic disease

ADVANCE

- Results at 5 Years
- Decreased surrogate microvascular outcomes (9.4 vs 10.9%), **with intensive treatment (mostly albuminuria)**
- No difference in creatinine endpoint, dialysis, retinopathy, death, CV disease
- Increased hypoglycemia and hospitalization with intensive treatment

ACCORD

- **Increased relative risk of death** from CV disease and death from any cause with intensive glycemic control
- Study stopped early

VADT

- Results at 6.25 years
- A1C 6.9% (intensive) vs 8.4% (control)
- No significant difference in **CVD** events or **microvascular disease**

Summary

- In frail elderly with preexisting diabetic complications and limited life expectancy, there is little evidence to support tight control of blood sugar.
- Benefit of glucose control takes years to achieve, longer than the expected life of an older individuals who are frail or in a nursing home.
- Risk of hypoglycemia is immediate and can cause serious adverse effects (falls, impairs quality of life)

Other Issues

- The cost and human resources needed to measure and maintain tight control in the nursing home is significant

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All facts considered, the guideline emerged



DCPNS Diabetes Guidelines for Elderly Residents in Long-Term Care Facilities

DIABETES
CARE PROGRAM
OF NOVA SCOTIA

NOVA SCOTIA
Health

DIABETES GUIDELINES
for Elderly Residents in
Long-Term Care (LTC)
Facilities

POCKET REFERENCE

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TARGETS FOR GLYCEMIC CONTROL

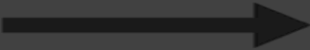



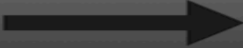
- The goal of managing diabetes in elderly residents admitted to a LTC facility are different than for people in younger age groups.
- Avoid the acute complications of poor glycemic control including hypoglycemia and prolonged, severe hyperglycemia.

TARGETS FOR GLYCEMIC CONTROL (cont)

RECOMMENDATIONS

If Random Blood Glucose (BG):

Treatment

Less than 7 mmol/L		<ul style="list-style-type: none">• Notify physician to decrease diabetes treatment.
7.0 - 9.9 mmol/L		<ul style="list-style-type: none">• This range may be acceptable. There is risk for hypoglycemia with Glyburide, Gliclazide, and Glimepiride or insulin therapy. If the resident has hypoglycemia (more than once a month), notify the physician to decrease treatment.
10.0 - 20.0 mmol/L		<ul style="list-style-type: none">• This range is acceptable if the resident has no reversible symptoms such as polyuria or nocturia.• If the resident has reversible symptoms, notify the dietitian to assess food intake. Notify physician to assess the diabetes treatment. Increased treatment may not improve symptoms if due to other causes.
Greater than 20.0 mmol/L		<ul style="list-style-type: none">• Notify physician to increase diabetes treatment.
Greater than 33.0 mmol/L with stupor or coma		<ul style="list-style-type: none">• Notify the physician.

Other issues brought up by CDA Guidelines

- Sulfonylureas should be used with caution because of the risk of hypoglycemia [Grade D, Level].
- Gliclazide and gliclazide MR [Grade B, Level 2] and glimepiride [Grade C, Level 3] are the preferred sulfonylureas: reduced hypoglycemia
- Meglitinides (repaglinide and nateglinide) should be considered in patients with irregular eating habits [Grade D, Consensus]
- The use of premixed insulins and pre-filled insulin pens as alternatives to mixing insulins should be considered to reduce dose errors, and to potentially improve glycemic control [Grade B, Level 2].

SUMMARY

POINTS TO REMEMBER:

- Elderly residents in LTC facilities are frail with limited life expectancy.
- Frail elderly residents are at risk for adverse outcomes, hospitalization, and death.
- Diabetes care guidelines for the frail elderly must be individualized, flexible, and consider quality of life.

Evidence – United Kingdom Prospective Diabetes Study (UKPDS)

- N = 3867 with newly diagnosed type 2 diabetes
- **Mean age 54**
- Intensive treatment:
 - Sulfonylurea (chlorpropamide, glibenclamide or glipizide)
 - Metformin added to SU if optimal control was not achieved;
 - insulin added if combination was not effective
 - Goal: FBS < 6 mmol/L; ac meals 4-7 mmol/L

Reference: *Lancet*. 1998;352(9131):837-53

Evidence – UKPDS (cont)

- Control group:
 - Diet restriction with drugs added if there were symptoms of hyperglycemia or if FBS was > 15 mmol/L
- If obese, there was also a metformin arm
- Followed over 10 years

Evidence – UKPDS Results

- At study end: A1C = 7 (intervention) vs 7.9% (control)
- Demonstrated benefits were surrogate outcomes
 - Decrease in microvascular disease
 - Retinopathy: 25 % decrease in retinal photocoagulation, **no difference in visual acuity or proportion blind in both eyes**
 - Kidney disease: Decreased urinary albuminuria, **no difference in renal failure with dialysis or plasma creatinine above 250**

Evidence – UKPDS Results (cont)

- No difference in any clinical outcome (visual acuity, renal failure, death, CV disease or stroke)
- More hypoglycemic episodes in the intensive therapy group

Resource: Lancet 1998

Evidence - UKPDS Time Frame

- No difference in any outcome at 3 yrs
- Decrease in microvascular surrogate at 6 – 7.5 years

Evidence – UKPDS Follow-up

After trial was over, participants were followed over 10 years:

- A1C difference lost in 1 year
- Sulfonylurea/insulin group maintained decrease in microvascular complications
- Also, now 15% decrease in MI and 13% decrease in mortality
- Metformin maintained decrease in MI (33%) and mortality (27%)
- Effect seen after decades had passed

Reference: NEJM 2008

Summary - UKPDS

- Microvascular benefit in 6 – 7.5 years, surrogate outcome
- Macrovascular benefit takes decades
- In obese metformin group, earlier benefit

Evidence – Action in Diabetes and Vascular Disease (ADVANCE)

- N = 11,140 participants with type 2 diabetes
- Population at study entry:
 - Mean age 66
 - Baseline A1C 7.5%
 - 32% cardio or cerebrovascular disease
 - More frail than those in UKPDS

Evidence – ADVANCE (cont)

- Intensive treatment
 - Sulfonylurea (gliclazide) and add other medication as necessary
 - Goal: A1C \leq 6.5%
- Control group
 - Any medication except gliclazide
 - Goal: standard A1C target

Evidence – ADVANCE (cont)

Results at 5 Years

- At study end: A1C 6.5 (intensive) vs 7.3 (control)
- Decreased microvascular outcomes (9.4 vs 10.9%), **mostly albuminuria with intensive treatment**
- No difference in creatinine endpoint or dialysis
- No difference in retinopathy
- No difference in death, CV disease
- Increased hypoglycemia and hospitalization with intensive treatment

Evidence – Action to Control Cardiovascular Risk in Diabetes (ACCORD)

- N =10,251 with type 2 diabetes and either CVD or at risk of developing CVD
- Population at study entry:
 - Mean age 62 years
 - Baseline A1C 8.4 %
 - 35% prior CV event

Resource: NEJM 2008

Evidence – ACCORD (cont)

- Intensive and control groups any drug combination
- Intensive group A1C goal: < 6%
- Control group A1C goal: 7.0 – 7.9%

Evidence – ACCORD (cont)

- Stopped after 3.5 years, 18 months early
- Results:
 - A1C 6.4% (intensive) vs 7.5% (control)
 - 24% reduction in non-fatal MI with intensive treatment
 - **Significantly increased relative risk of death** from CV disease and death from any cause with intensive glycemic control

Resource: NEJM 2008

Evidence – Veterans Affairs Diabetes Trial (VADT)

- N = 1792 with poorly controlled type 2 diabetes
- Primary outcome was time to cardiovascular event
- Study population at entry:
 - Mean age 60
 - Baseline A1C 8.5%
 - 40% prior CVD, diabetes of 12 years duration
 - Any drug combination could be used

Evidence – VADT (cont)

- Intensive Group
 - Goal: A1C < 6.0%
- Control Group
 - Goal: A1C 8.0 to 9.0%
- Results at 6.25 years
 - A1C 6.9% (intensive) vs 8.4% (control)
 - **No significant difference in CVD events or microvascular disease**

Case 1

- 83 year old female nursing home resident with 10 year history of DM, severe dementia, and CHF
- Rx'd with:
 - metformin 1000 mg BID,
 - glyburide 10 mg OD (maintenance dose 2.5 mg/day to 20 as single or divided dose), and
 - insulin NPH 14 U at bedtime
- Her blood sugars are as follows:

⌘

	Before Breakfast	Before Lunch	Before evening meal	Before bedtime
Mon	6.0	13.0		13.1
Tues	7.1		13.9	
Wed	8.2	13.1		14.8
Thurs	6.8			13.4
Fri	7.2			

VOTE

#	Before Breakfast	Before Lunch	Before evening meal	Before bedtime
Mon	6.0	13.0		13.1
Tues	7.1		13.9	
Wed	8.2	13.1		14.8
Thurs	6.8			13.4
Fri	7.2			

1. Add NPH in am
2. Add am NPH and regular insulin before evening meal
3. Change to glargine
4. Adjust diabetic medications in another way
5. Keep medications as they are