PATTERN & POLICY REFLECTIONS
on a 12-year utilization review of insulin & blood glucose test strip use in Manitoba

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Self-monitoring of blood glucose (SMBG) impact

- **Effect of SMBG on A1c (DM2 w/o insulin):**

  - Pooled A1C $\downarrow 0.25\%$
  - No evidence that SMBG affected patient satisfaction, general well-being, or general health-related QoL

**Cost-effectiveness of self-monitoring of blood glucose in patients with type 2 diabetes mellitus managed without insulin**

  - Simulation model of DM2 patients not using insulin $\rightarrow$ NNT to avert one diabetes-related complication over 40 years with SMBG = 228 to 1299

- @ 6 months, A1c $\downarrow 0.3\%$ $\rightarrow$ benefit subsided after 12 months
Total Spending in Manitoba Publicly Funded Drug Plans on Blood Glucose Test Strips Exceeded $7.8 Million in 2010

Patients with diabetes who are using insulin:
$2,854,800

Patients with diabetes who are not using insulin:
$4,945,200

If practice changes to reflect the evidence, $7 million to $19 million* could be freed up between 2012 and 2015 for spending on antidiabetes interventions that are proven effective. Patient health would not be affected negatively.

*The amount of actual savings depends on the limits placed on test strip reimbursement (e.g., max test strips per year = 0, 100, 180, or 360)

For project information, visit the CADTH website:
www.cadth.ca/smbg

These results were prepared using data from Brogan Inc., a unit of IMS, PharmaStat®, Public and Private Drug Plans Databases, 2000 to 2011, but the analyses, conclusions, opinions, and statements expressed are those of CADTH.
Impacts of policy change

In 2008, > 117 million strips dispensed in ON (≥ 65) with more focused policy scenarios, could ↓ by 9.5 – 74.5 million.

Did policy change work?
- Gomes et al. (CMAJ 2010;182(1):35-8)
  - BGTS use: ↓ 22.2%
  - Cost: ↓ 22.5%

Is it safe?

<table>
<thead>
<tr>
<th>Diabetes Treatment</th>
<th>Test strips allowed per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin</td>
<td>3,000</td>
</tr>
<tr>
<td>Meds with high risk of hypoglycemia (e.g. glyburide)</td>
<td>400</td>
</tr>
<tr>
<td>Meds with low risk of causing hypoglycemia (e.g. metformin)</td>
<td>200</td>
</tr>
<tr>
<td>Diet/Lifestyle alone</td>
<td>200</td>
</tr>
</tbody>
</table>

Ontario Drug Program 2013
The policy is safe

**Figure 1. Rates of Emergency Department Visits for Hyperglycemia and Hypoglycemia Among ODB-Eligible Patients With Diabetes in Ontario**

**Findings** In this population-based observational study, the introduction of reimbursement limits for BGTS had no impact on rates of emergency department visits for hypoglycemia or hyperglycemia or mean hemoglobin A1c levels.
If they’re doing it, why aren’t we?
SMBG in Manitoba: 2000-2013

Purpose:

- to assess overall utilization and cost associated with test strips & lancets for SMBG in MB and explore implications of the implementation of the test strip quantity limits in other provinces

Figure 3. Excess cost of blood glucose test strips exceeding policy limits by payer if implemented in Manitoba: 2000 to 2013.
SMBG in Manitoba: 2000-2013

- 2013 test strip costs = $17.2 million
  - 57% of utilization was by insulin users
- Based on the ODP policy, projected 5-year cost savings associated with implementing a test strip limit in Manitoba = $12.35 million
  * 95% of the savings would occur on those not using insulin

Figure 4. Projected 5-year cost and savings associated with blood glucose test strip limit policy implementation. Shaded area represents 95% CI of projected values.
BUT...

• With all of the (appropriate) focus on overutilization, is underutilization overshadowed?

→ What about test strip use in those at higher risk of hypoglycemia?

i.e. those using insulin

And, are all insulin users a homogenous group in this regard?
SMBG in Manitoba (insulin only): 2001-2013

• **Objective:** to conduct a utilization review of BGTS in insulins users and evaluate *use patterns against current insulin use patterns* and *BGTS policy*

• **Methods:** BGTS usage was examined in a cohort of insulin users with type 1 and type 2 diabetes over a 12-year period (2001-13) using the population-based administrative data from the Manitoba Centre for Health Policy

• **Defining diabetes:**

  Required to meet at least 1 of 3 criteria:
  
a) ≥ 1 hospitalizations with a diabetes code
b) ≥ 2 medical claims with diabetes codes within a 3-year window
c) 1 diabetes medical claim + a prescription for a diabetes drug

Then... classified by the insulin types they were prescribed within each study year

- had to receive at least 2 rx for insulin within the study period
- ≥ 1 prescriptions for a non-insulin hypoglycemic drug → DM2
The Over Under?

- Total BGTS strip usage ↑ >2-fold & costs ↑ from $4.3 to $9.5 million
- Test strip use driven in part by a 2-fold ↑ in insulin users

**OVER?**

- i.e. over the previous decade...
  - Stable BGTS use/person overall
  - Stable BGTS use/person for DM2
The insulin break down

Dramatic ↑ use of intensive insulin regimens (Basal – Bolus) (i.e. Long-acting Insulin + Rapid)
Ridiculously complicated graphs anyone?
The more concerning flip side

14% and 16% of insulin users with DM1 and DM2 did not test BG at all

49% of insulin users with DM2 test BG < 1x per day

Current MB BGTS limit of 4000/yr (~11/day)

Current BGTS limit in other provinces of 3000/year (~8/day)
Summary

DM overall with insulin

OVERUSE?

- Test strip use doubled during the study period
- Why?
  - More people using insulin
  - More intensive insulin regimens being used

UNDERUSE

- BGTS use/patient remained stable at 1.9 strips/day (<700 strips per year)
- Few (<1 - 3%) are using >8 BGTS/day
- > 1/8 not testing BG at all
- Nearly 1/2 of DM2 patients test < 1X/day
- Greater attention should be directed to ensure a safe level of testing in all insulin users

DM2 with no insulin

As expected, SMBG is excessive in MB → ++money could be saved with policy implementation
THANK YOU!

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