Managing BP to Goal in Adults with Diabetes

Patrick J. O’Connor MD MPH
Senior Clinical Investigator
HealthPartners Research Foundation

70% of type 2 diabetes die of a heart attack or stroke

Reduce heart attack and stroke mortality by:
--BP control
--LDL control
--Stop Smoking
--Aspirin Use if already have CHD

Intensive glucose control with multiple meds in older sicker people may INCREASE MORTALITY
Reality Check

- What % of those with type 2 diabetes die of a heart attack or a stroke?

Reality Check

- Name 4 strategies that reduce heart attack and stroke mortality in type 2 diabetes.

- Name one strategy that may increase mortality in older sicker patients with type 2 diabetes.
MN Diabetes Care (2007)

<table>
<thead>
<tr>
<th>GOAL</th>
<th>ACHIEVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1c &lt;8%</td>
<td>75%</td>
</tr>
<tr>
<td>LDL &lt; 100 mg/dl</td>
<td>58%</td>
</tr>
<tr>
<td>Aspirin Use</td>
<td>89%</td>
</tr>
<tr>
<td>Non-Smoker</td>
<td>84%</td>
</tr>
<tr>
<td>BP &lt; 130/80</td>
<td>53%</td>
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</table>

Obstacle to Better Care

Medication Non-Adherence

95% of Providers Agree: “My diabetes patients just won’t do the things I tell them to do.”
Adherence in HT Patients

- 20% had medication possession ratios of < 80%
- Another 25% never fill a first script, or get the first refill
- Keep a “sympathetic” (non-paternalistic) eye out for medication adherence issues

Obstacle to Better Care

**Clinical Inertia**

- When patients with DM have 2 consecutive visits with high BP, the likelihood of treatment intensification is ?????????
Rate of BP Clinical Inertia: 70-80%

Hypothesis: The Secret to Improved BP Control Is

Stop Blaming the Patient
Care Improvement Strategies

1. Understand the Patient (address non-adherence)

2. Take Clinically Indicated and Appropriate Actions (address clinical inertia)

Glucose Goals

- Older sicker patients A1c < 8%
- Young and healthy A1c < 7%
- Accountability Measure A1c < 8%
Risks of Glucose Control Meds

- Hypoglycemia
  - If skip a meal
  - If confused or demented
  - If take too much med inadvertently
- Weight Gain
- Polypharmacy
- Cost

Best Glucose-Control Medication

- Metformin
  max effective dose is 1000 mg po BID

- DO NOT USE METFORMIN IF:
  - Serum creatinine is >= 1.4 or 1.5 mg/dl
  - Patient has CHF or COPD
- May cause gastric upset or lethal “lactic acidosis”
LDL-Cholesterol Goals

- Most DM over 40 yrs old should use a statin (simvastatin, atorvastatin)
- LDL < 100 mg/dl (everybody)
- LDL < 70 mg/dl if have CHD
- Statins are pretty safe, but may make muscles hurt
- Generic simvastatin is very cheap

BP Goals In Adults with Diabetes

- BP < 130 / 80 mm Hg is the goal
- The SBP (first number) is the main item of interest
- BP < 140/90 is not SO bad
- BP >= 140/90 is pretty bad
Evidence for BP goal

- UKPDS: SBP 145 better than SBP 154 mm Hg
- ADVANCE: SBP 135 is better than 144
- Goal SBP < 130, but SBP < 140 OK for some, especially frail elderly
- BP < 90/50 or pulse < 50/min may be a cause for concern esp if patient is dizzy—check with doc or nurse

Evidence: ADVANCE

<table>
<thead>
<tr>
<th>Clinical Impact</th>
<th>SBP: 135 vs 144</th>
<th>A1c: 6.5% vs. 7.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Mortality</td>
<td>+++</td>
<td>0</td>
</tr>
<tr>
<td>CV Mortality</td>
<td>+++</td>
<td>0</td>
</tr>
<tr>
<td>CV Events</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Steno-2 Study: Gaede

- Achieved A1c 7.7%, LDL 78 mg/dl, BP 132/76
- 53% drop in CV events in trial
- 60% drop in Micro complications
- 20% drop in total mortality in f/u
- Mean gain of 1.66 QALY in intensive group
- Euro 2538/QALY gained (very good)
- Cost saving using generics in primary care

Steno-2 Implications

- Multifactorial care including only modest A1c control (7.7%) is setting of good BP and LDL control is a powerful and resource efficient diabetes care strategy
- This supports the notion of a comprehensive diabetes quality measure: A1c, BP, LDL, ASA, smoking
Step Care BP Dx in Diabetes

1. Lisinopril 10-20 mg QD (ACE, ARB)
2. HCTZ 12.5-25 mg QD (diuretic)
3. Amlodipine 2.5-10 mg QD
4. Metoprolol XL 50-100 mg QD
5. Adjust doses upward

Other Agents

- Reserpine 0.1 – 2.5 mg po QD
- Hydralazine 25-100 mg po QD
- Clonidine 0.1-0.4 mg po QD
Stage 2 Hypertension

- If patient is more than 20/10 mm Hg above goal (>= 150/90)
- Start drug therapy with 2 agents at the same time
- ACE + HCTZ

What Will It Take to Reach Goal

- Mid-range dose of most BP drugs will get you about 10 mm Hg drop in SBP
- DASH diet will get you about 10 mm Hg drop in SBP
- Often need 3+ drugs to control BP in DM patients
Safety Monitoring

- K+ : diuretics, ACE, ARB
- Creatinine : ACE, ARB
- BP < 90/50 or pulse < 50/min may be a cause for concern esp if patient is dizzy—check with doc or nurse

BP Drug Side Effects

- Dizzy (check pulse > 50, orthostatic BP drop)
- Edema in Feet (BB, CCB)
- Erectile Dysfunction
- Dry Persistent Cough (ACE, sometimes ARB)
Avoid Big Mistakes

- Do not give diuretics to patients taking lithium → death
- Avoid combo of non-dihydropyridone CCB (amlodipine, etc) with B-Blocker → bradycardia, heart block
- Do not abruptly stop B-Blockers if on high doses
- See handout for drug risks and side effects

Lifestyle and Hypertension

- Sodium (baked, fast food, canned)
- Alcohol
- NSAID Use (ibuprofen)
- DASH Diet
- Weight Management
- Physical Activity
- Stress Management (Kabat-Zinn)
Limits to Treatment Intensification

- It is a Free Country (< 10% refuse)
- Med Side Effects, Hypotension, Falls
  - BP Meds have Good Long-Term Safety
- Competing Demands are Legitimate
- “Not my Patient”
- Accurate BP Measurement is issue

Use Generic Meds

<table>
<thead>
<tr>
<th>Domain</th>
<th>Generic (Med Letter)</th>
<th>Branded (DC 31:1688)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>$360</td>
<td>$1,238</td>
</tr>
<tr>
<td>LDL (statin)</td>
<td>$120</td>
<td>$1,543</td>
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</table>
## Intensive BP Control in DM is Cost-Saving to Payer

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cost/QALY Gained</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1c &lt; 7%</td>
<td>$48,000 to $120,000</td>
</tr>
<tr>
<td>A1c &lt; 8%</td>
<td>Less</td>
</tr>
<tr>
<td>BP &lt; 130/80</td>
<td>Cost Saving</td>
</tr>
<tr>
<td>LDL &lt; 100</td>
<td>Cost Saving</td>
</tr>
<tr>
<td>Tobacco</td>
<td>Cost Saving</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Cost-Saving</td>
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</tbody>
</table>

## DM: Treatment Priorities in MN
By Importance, Start at Top
- Smoking
- BP
- Lipids
- A1c
- Aspirin
Adherence is a Problem

- Ask “Everybody misses their meds sometimes. How often do you miss your meds?”
- Over 25% of new meds stopped by pt within one year
- FIND OUT WHY: side effects, cost, not sure what med is for, not sure if it helps anything important, take too many pills (use combo tablets)

Minimize Non-Adherence

- Include patient in Rx decisions
- Name the drug
- Say what it is for & benefits
- Say how much & when to take
- Say what major side effects may be
- Monitor for failure to fill or first refill
- Stop useless meds, use combo tabs
New Approaches

- MTM Disease management for HT
- Point of Care Decision Support
- Home BP Monitoring (usually is about 5 mm Hg lower than at office)
- Pipe in Home BP data to EMR

More Information

Patrick.j.oconnor@healthpartners.com

Thank you for your time & attention

Good Luck to us all on this important shared journey towards better diabetes and hypertension care!