Don’t Stroke Out: Hypertension and Cardiovascular Risk Reduction

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Disclosure

► We do not have any potential conflicts of interest in relation to this presentation.
► We will not be discussing off label use and/or investigational use during this presentation.

Objectives

► Classify antihypertensive medications as first, second, or third line agents
► Design an appropriate antihypertensive regimen based on patient specific factors
► Evaluate a patient’s cardiovascular risk and recommend starting, stopping, or continuing statin or aspirin therapy
Why is CVD risk reduction important?

1.2-3 deaths in disability per 100,000 people.

Health care costs for heart attack and stroke: $313.6Billion

2 Million+ preventable death in people 65-74 years of age.


How do we reduce CVD?

- Aspirin when appropriate
- Blood pressure control
- Cholesterol management
- Smoking cessation
- Glycemic control

Defining Hypertension

<table>
<thead>
<tr>
<th>Stage of Hypertension</th>
<th>Systolic Blood Pressure (mmHg)</th>
<th>Diastolic Blood Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Hypertension</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2 Hypertension</td>
<td>≥ 160</td>
<td>≥ 100</td>
</tr>
<tr>
<td>Hypertensive Crisis</td>
<td>≥ 180</td>
<td>≥ 120</td>
</tr>
</tbody>
</table>
**JNC8 Guideline Overview**

- General population
  - Blood pressure of 130/80 is desirable
  - Blood pressure of 120/80 in older adults
- Individuals with diabetes
  - Blood pressure of 130/80 is desirable
  - Blood pressure of 120/80 in older adults
- Blood pressure of 140/90 in older adults

**Goals for Hypertension**

- **Goal of < 140/90**
  - Most guidelines: ACC/AHA, JNC8, A3SH/ISH, CHF, ESH/ESC

- **Goal of < 130/80**
  - KDIGO Guideline for CKD with proteinuria

- **Goal of < 150/90**
  - For patients older than 60 per JNC8
  - For patients older than 80 per all other guidelines

**JATOS**

- Patients 65-85 yo with SBP > 140
  - Treated to target SBP < 140 or < 160 with CCB
  - Significantly lower SBP that did not correlate to a reduction in cardiovascular events

**VAISH**

- Patients 70-84 with SBP > 140
  - Treated to target SBP < 140 or < 150 with ARB, CCB, and Thiazide
  - Significantly lower SBP that did not correlate to a reduction in cardiovascular events
Goals for Hypertension

- HYVET
  - Patients > 80 yo with SBP > 160 mmHg
  - Treated to target SBP < 150 mmHg with thiazide and ACEi
  - Decreased stroke, mortality from stroke and all-cause mortality

- SPRINT
  - Intensive BP control vs standard control
  - Decreased cardiovascular death with intensive BP control
  - 25% of patients were over 75 years old

Goals for Hypertension

- Individualize for each patient
  - Age
  - Comorbid diseases
  - Side effects

JNC8 Guideline Overview

- General population: treatment of 150
- Diabetes or 150 patients
- Age <40
- Age 40-59
- Age 60-69
- Age 70-79
- Age 80+
- Ospositem with 70+:

  - Blood pressure: 150/90
  - Drug therapy: add ACEi
  - Drug therapy: add ARB
  - Drug therapy: add calcium channel blocker
  - Drug therapy: add thiazide
  - Drug therapy: add beta-blocker
  - Drug therapy: add CCB and ARB
  - Drug therapy: add CCB and ACEi
  - Drug therapy: add CCB and thiazide
  - Drug therapy: add ACEi and ARB
  - Drug therapy: add ACEi and thiazide
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  - Drug therapy: add CCB and ACEi and thiazide
  - Drug therapy: add CCB and ARB and thiazide
  - Drug therapy: add CCB and ACEi and ARB and thiazide

- Diabetes:
  - Blood pressure: 150/90
  - Drug therapy: add ACEi
  - Drug therapy: add ARB
  - Drug therapy: add calcium channel blocker
  - Drug therapy: add thiazide
  - Drug therapy: add beta-blocker
  - Drug therapy: add CCB and ARB
  - Drug therapy: add CCB and ACEi
  - Drug therapy: add CCB and thiazide
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- Ospositem with 70+:
  - Blood pressure: 150/90
  - Drug therapy: add ACEi
  - Drug therapy: add ARB
  - Drug therapy: add calcium channel blocker
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  - Drug therapy: add beta-blocker
  - Drug therapy: add CCB and ARB
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  - Drug therapy: add CCB and thiazide
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  - Drug therapy: add CCB and ACEi and thiazide
  - Drug therapy: add CCB and ARB and thiazide
  - Drug therapy: add CCB and ACEi and ARB and thiazide

- Drug therapy:
  - Add a thiazide diuretic
  - Add an ACEi
  - Add an ARB
  - Add a calcium channel blocker
  - Add a beta-blocker
  - Add a CCB
  - Add an ACEi and ARB
  - Add an ACEi and thiazide
  - Add an ARB and thiazide
  - Add a CCB and ACEi
  - Add a CCB and ARB
  - Add a CCB and thiazide

- Final choice is based on side effects

- JNC8 Guideline Overview
Antihypertensives in African American Patients

- Subgroup analysis of ALLHAT Trial
- Patients 55 yo and older with SBP > 140 or DBP > 90
- Treated with chlorthalidone, amlodipine, or lisinopril

### Table 2: Blood Pressure and Other Clinical Variables at Baseline and Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP mean (mmHg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JNC-16 Categorical Risk Group:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Low Risk</td>
<td></td>
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<tr>
<td>Moderate Risk</td>
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<tr>
<td>High Risk</td>
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<tr>
<td>Very High Risk</td>
<td></td>
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</tbody>
</table>

### Table 3: Clinical Characteristics at Baseline and Follow-up

<table>
<thead>
<tr>
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</tr>
<tr>
<td>Very High Risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Clinical Characteristics at Baseline and Follow-up

<table>
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<tr>
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<th>Baseline</th>
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<td>SBP mean (mmHg)</td>
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<td>JNC-16 Categorical Risk Group:</td>
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<tr>
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<tr>
<td>Very High Risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
JNC8 Guideline Overview

Medication Review

- First Line Antihypertensives
  - Angiotensin Converting Enzyme Inhibitors
  - Angiotensin Receptor Blockers
  - Thiazide Diuretics
  - Dihydropyridine Calcium Channel Blockers

Interactive Medication Review

- Angiotensin Converting Enzyme Inhibitors
- What are our monitoring parameters?
- What education should we provide our patients?
- Which patients would we consider using as first line?
- Which patients would we avoid using?
Interactive Medication Review

- Angiotensin Receptor Blocker
  - What are our monitoring parameters?
  - What education should we provide our patients?
  - Which patients would we consider using as first line?
  - Which patients would we avoid using?

Interactive Medication Review

- Thiazide Diuretic
  - What are our monitoring parameters?
  - What education should we provide our patients?
  - Which patients would we consider using as first line?
  - Which patients would we avoid using?

Hydrochlorothiazide vs Chlorthalidone

- Chlorthalidone is more potent with a longer half life
- Chlorthalidone has been shown to reduce cardiovascular events
- No head-to-head randomized trials comparing hydrochlorothiazide to chlorthalidone
- Conflicting evidence in smaller trials
Interactive Medication Review

- Dihydropyridine Calcium Channel Blocker
- What are our monitoring parameters?
- What education should we provide our patients?
- Which patients would we consider using as first line?
- Which patients would we avoid using?

Beta Blocker Not First Line?!?

- LIFE study
  - Design:
    - Atenolol vs Losartan
    - Time to cardiovascular event (death, myocardial infarction, stroke)
  - Findings:
    - Similar reductions in blood pressure
    - Higher rate of cardiovascular events in atenolol group
    - Outcome influenced primarily by reduction in stroke

Beta Blocker Meta-Analysis
Medication Review

- Second Line Antihypertensives
  - Nonselective Beta Blockers
  - Aldosterone Receptor Antagonists
  - Direct Renin Inhibitors
  - Selective Beta Blockers
  - Alpha2 Receptor Agonists
  - Direct Vasodilators
  - Alpha1 Receptor Blockers

- Third Line Antihypertensives
  - Loop Diuretics
  - Potassium Sparing Diuretics
  - Non-Dihydropyridine Calcium Channel Blockers
Timing of Antihypertensives

MAPEC Study

- Patients > 18 yo with SBP > 140
- Treated with antihypertensive of physician’s choice
- Randomized to take all antihypertensives in the morning vs at least one antihypertensive at night
- Evaluating the effect on cardiovascular outcomes as well as blood pressure lowering

<table>
<thead>
<tr>
<th>Variable</th>
<th>Awakening</th>
<th>Bedtime</th>
<th>p between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in daytime ambulatory BP from baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBP, mm Hg</td>
<td>-10.0 ± 17.7</td>
<td>-13.1 ± 19.3</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SBP, mm Hg</td>
<td>-5.5 ± 10.4</td>
<td>-7.4 ± 10.8</td>
<td>.004</td>
</tr>
<tr>
<td>Change HR, beats/min</td>
<td>-1.6 ± 10.0</td>
<td>-1.9 ± 11.5</td>
<td>.410</td>
</tr>
<tr>
<td>Awake SBP mean, mm Hg</td>
<td>-9.4 ± 15.3</td>
<td>-10.9 ± 15.4</td>
<td>.410</td>
</tr>
<tr>
<td>Awake SBP mean, mm Hg</td>
<td>-6.6 ± 12.5</td>
<td>-6.8 ± 15.2</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>4% SBP mean, mm Hg</td>
<td>-6.9 ± 12.3</td>
<td>-5.7 ± 12.5</td>
<td>.028</td>
</tr>
<tr>
<td>Sleep-time relative SBP decline, %</td>
<td>-1.4 ± 6.7</td>
<td>2.9 ± 7.4</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Awake DBP mean, mm Hg</td>
<td>-7.2 ± 8.5</td>
<td>-6.5 ± 8.9</td>
<td>.035</td>
</tr>
</tbody>
</table>

Timing of Antihypertensives

Table showing changes in BP and HR from baseline, comparisons between awakening and bedtime, and p-values for differences between groups.
Estimating cardiovascular risk

<table>
<thead>
<tr>
<th>What it calculates</th>
<th>Pooled Cohort Equations (2013 ACC/AHA)</th>
<th>Framingham Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-year risk of ASCVD (MI or stroke)</td>
<td>10-year risk of CVD</td>
</tr>
<tr>
<td>Data used</td>
<td>White and African American Men and women 40-79 years of age +/- Diabetes</td>
<td>White (non-Hispanic) Men and women 30-74 years of age</td>
</tr>
<tr>
<td>Possible limitations</td>
<td>Overestimates in Mexican Americans, some Asian Americans Underestimates in American Indians, Puerto Ricans, some Asian Americans</td>
<td>Validated in African Americans and Hispanic women Less precise in &lt;30 or &gt;65 years of age Less precise in diabetes, severe HTN</td>
</tr>
</tbody>
</table>

Two Major Lipid Guidelines

<table>
<thead>
<tr>
<th>ACC/AHA 2013</th>
<th>NLA 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence base</td>
<td>RCTs (of statin therapy) Meta-analysis of RCTs</td>
</tr>
<tr>
<td>Central focus</td>
<td>Four statin benefit groups ASCVD risk assessment + treatment goals</td>
</tr>
<tr>
<td>Drugs recommended</td>
<td>Statin therapy Statin and non-statin therapy</td>
</tr>
<tr>
<td>Lipid goals</td>
<td>None targeted “Lower is better” Based on ASCVD risk</td>
</tr>
<tr>
<td>Risk calculator</td>
<td>Pooled cohort risk calculator</td>
</tr>
<tr>
<td>Special populations</td>
<td>Limited discussion “Part II”</td>
</tr>
</tbody>
</table>
**ACC/AHA Guidelines**

Four groups should receive statin therapy:

1. **Clinical ASCVD**
   - Moderate- to high-intensity depending on age and safety concerns

2. **Primary prevention – primary LDL-C ≥ 190 mg/dL**
   - High-intensity statin and nonstatin therapy considered

3. **Primary prevention – diabetes 40-75 years of age and LDL-C 70-189 mg/dL**
   - Moderate-intensity unless 10-y ASCVD risk ≥ 7.5%

4. **Primary prevention – no diabetes 40-75 years of age and LDL-C 70-189 mg/dL**
   - Estimate 10-y ASCVD risk and consider patient-specific factors

---

**NLA Guidelines**

1. Identify high- and very high-risk conditions, if present.
2. If none, count major ASCVD risk factors and categorize risk.
   - Risk category determines LDL-C treatment threshold and goal
3. Consider quantitative risk scoring, especially for moderate-risk patients.

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**Special populations—DM (ADA)**

- ASCVD = high-intensity statin (A)
- Age <40 years + ASCVD risk factors = moderate- or high-intensity statin (C)
- Age 40 – 75 years = moderate-intensity statin [A]
- Age 40 – 75 years + ASCVD risk factors = high-intensity statin (B)
- Age >75 years = moderate-intensity statin (B)
- Age >75 years + ASCVD risk factors = moderate- or high-intensity statin (B)
Special populations—CKD (KDIGO)

- Age ≥ 50 y + eGFR < 60 mL/min/1.73 m² = statin +/- ezetimibe (1A)
- Age ≥ 50 y + eGFR > 60 mL/min/1.73 m² = statin (1B)
- Age 18-49 y + CKD + DM, coronary disease, prior ischemic stroke, or 10-y risk of coronary death or non-fatal MI > 10% = statin (2A)
- Dialysis-dependent CKD = do not initiate statins +/- ezetimibe (2A), but may continue if already started (2C)
- Kidney transplant recipients = statin (2B)


Which guidelines should I use?

- ACC/AHA
  - Based on high-quality evidence
  - Straightforward approach
  - May overtreat
- NLA
  - More detailed guidance for gray areas
  - Numeric lipid goals may be useful for some patients
  - Detailed discussion of special populations
- Patient-centered approach, with shared decision-making

Statins for primary prevention in an intermediate-risk population

HOPE-3
- > 12,000 participations without cardiovascular disease and with intermediate-risk
- Rosuvastatin 10 mg daily vs placebo

Table 2. Primary, Secondary, and Other Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Rosuvastatin Group (N=6242)</th>
<th>Placebo Group (N=6495)</th>
<th>Hazard Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary outcome — any (%)</td>
<td>23 (1.7)</td>
<td>25 (1.8)</td>
<td>0.97 (0.64-1.41)</td>
<td>0.902</td>
</tr>
<tr>
<td>First coronary event</td>
<td>21 (1.6)</td>
<td>26 (1.2)</td>
<td>0.87 (0.54-1.40)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Secondary outcome — any (%)</td>
<td>31 (1.5)</td>
<td>39 (1.2)</td>
<td>0.77 (0.54-1.10)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Secondary outcome — any (%)</td>
<td>31 (1.5)</td>
<td>39 (1.2)</td>
<td>0.77 (0.54-1.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Pearls: Not all statins are created equal

<table>
<thead>
<tr>
<th>High Intensity (↓ LDL-C by ≥50%)</th>
<th>Moderate Intensity (↓ LDL-C by 30-50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin 40-80 mg</td>
<td>Atorvastatin 10-20 mg</td>
</tr>
<tr>
<td>Rosuvastatin 20-40 mg</td>
<td>Simvastatin 20-40 mg</td>
</tr>
<tr>
<td>Pravastatin 40-80 mg</td>
<td>Fluvastatin 40 mg BID (or XL 80 mg QD)</td>
</tr>
<tr>
<td>Pitavastatin 2-4 mg</td>
<td></td>
</tr>
</tbody>
</table>


Pearls: Not all statins are created equal (cont.)

<table>
<thead>
<tr>
<th>Agent(s)</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible dosing</td>
<td>Atorvastatin, rosuvastatin, pravastatin ↑ adherence</td>
</tr>
<tr>
<td>Hydrophilic</td>
<td>Pravastatin, rosuvastatin, and fluvastatin ↑ hepatoselectivity ↓ influence on smooth muscle proliferation</td>
</tr>
<tr>
<td>Minimal CYP450 metabolism</td>
<td>Pravastatin, rosuvastatin ↓ drug-drug interactions</td>
</tr>
<tr>
<td>No renal dose adjustments</td>
<td>Atorvastatin</td>
</tr>
<tr>
<td>Generic available</td>
<td>Atorvastatin, rosuvastatin, lovastatin, pravastatin, and simvastatin ↓ cost</td>
</tr>
</tbody>
</table>


Pearls: Overcoming barriers to statin use

- Myalgias and statin “allergies”
- Hydrophilic vs lipophilic statin
- Alternative dosing frequencies
- Patient education
  - Many options
  - Mayo decision tool
Pearls: Statin based on LDL-C ≥190 mg/dL and back-calculating

You see a 27 yo M with diabetes (A1c 6.7%), obesity (BMI 36), and hypertension (140/80s). Patient was started on simvastatin 40 mg nightly last year. His last (and only) lipid panel was one month ago:

<table>
<thead>
<tr>
<th>TC</th>
<th>LDL-C</th>
<th>HDL-C</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>194</td>
<td>87</td>
<td>27</td>
<td>399</td>
</tr>
</tbody>
</table>

Should this patient be on a statin?
A. No, because his LDL-C is only 87 mg/dL.
B. Yes, because he has hypertriglyceridemia.
C. Yes, because he has diabetes and his 10-y ASCVD risk is ≥7.5%.
D. I'm not sure.
E. This is a trick question.

LDL-C reduction by statin

<table>
<thead>
<tr>
<th>Statin</th>
<th>Daily dose (mg)</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>40</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin</td>
<td></td>
<td>31%</td>
<td>37%</td>
<td>43%</td>
<td>49%</td>
<td>55%</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td></td>
<td>38%</td>
<td>43%</td>
<td>48%</td>
<td>53%</td>
<td>58%</td>
</tr>
<tr>
<td>Pravastatin</td>
<td></td>
<td>15%</td>
<td>20%</td>
<td>24%</td>
<td>29%</td>
<td>33%</td>
</tr>
<tr>
<td>Simvastatin</td>
<td></td>
<td>23%</td>
<td>27%</td>
<td>32%</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>Fluvastatin</td>
<td></td>
<td>10%</td>
<td>15%</td>
<td>21%</td>
<td>27%</td>
<td>33%</td>
</tr>
<tr>
<td>Lovastatin</td>
<td></td>
<td>--</td>
<td>18%</td>
<td>21%</td>
<td>27%</td>
<td>33%</td>
</tr>
</tbody>
</table>
Ezetimibe

IMPROVE-IT (simvastatin + ezetimibe vs simvastatin + placebo)
- Patients ≥50 yo with hospitalization for ACS in the preceding 10 days
- >18,000 patients in 39 countries randomized
- Further LDL-C lowering (24%) with simvastatin + ezetimibe
- Primary end point: composite of death from CV disease, a major coronary event, or nonfatal stroke


PCSK-9 inhibitors: alirocumab

ODYSSEY LONG TERM (alirocumab vs placebo)
- Patients ≥18 yo with heterozygous familial hypercholesterolemia OR with established CHD or a CHD risk equivalent
- >2300 patients in 27 countries randomized

### PCSK-9 inhibitors: evolocumab

**OSLER (evolocumab vs placebo)**
- Combination of two extension studies, OSLER-1 and OSLER-2
- >4,400 patients included

<table>
<thead>
<tr>
<th>Variable</th>
<th>Evolocumab Group (n=256)</th>
<th>Standard Therapy Group (n=256)</th>
<th>p (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>258 (93.1)</td>
<td>253 (98.4)</td>
<td></td>
</tr>
<tr>
<td>Serious</td>
<td>207 (79.9)</td>
<td>141 (55.1)</td>
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<tr>
<td>Leading to discontinuation of evolocumab</td>
<td>2 (0.8)</td>
<td>7 (2.7)</td>
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<tr>
<td>Death-related</td>
<td>56 (21.9)</td>
<td>80 (31.1)</td>
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<tr>
<td>Inpatient stay</td>
<td>139 (54.6)</td>
<td>76 (31.1)</td>
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</tr>
<tr>
<td>Neurologic event</td>
<td>37 (14.5)</td>
<td>4 (1.5)</td>
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</table>


### Lipid Wrap-Up

- Two major guidelines with different approaches
- New, recent data (HOPE-3) to clarify gray area of primary prevention
- Not all statins are created equal
- New studies for ezetimibe and PCSK9 inhibitors
Aspirin

Guidelines for primary prevention with low-dose aspirin

CHEST guidelines recommend low-dose aspirin for primary prevention

CHEST guidelines recommend low-dose aspirin for primary prevention
The FDA does not support use of low-dose aspirin for primary prevention

- Primary prevention:
  "The FDA...does NOT believe the evidence supports the general use of aspirin for primary prevention of a heart attack or stroke"

- Secondary prevention:
  "The available evidence supports the use of aspirin for preventing another heart attack or stroke in patients who have already had a heart attack or stroke..."

The USPSTF recommends low-dose aspirin in specific populations

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Adults 50–59 yo with ≥10% 10-yr CVD risk*</td>
<td>Start low-dose aspirin for primary prevention of CVD - Not of increased risk of bleeding - Life expectancy ≥10 yrs - Willing to take low-dose aspirin daily for ≥10 yrs</td>
<td>B</td>
</tr>
<tr>
<td>Adults 60–69 yo with ≥10% 10-yr CVD risk*</td>
<td>Individualized decision</td>
<td>C</td>
</tr>
<tr>
<td>Adults &lt;50 yo</td>
<td>Insufficient to assess the balance of benefits and harms of initiation</td>
<td>I</td>
</tr>
<tr>
<td>Adults &gt;70 yo</td>
<td>Insufficient to assess the balance of benefits and harms of initiation</td>
<td>I</td>
</tr>
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</table>

*Using the Pooled Cohort Equations

USPSTF Lifetime Events Data

**Table**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Male/Female</th>
<th>Aged 50–59</th>
<th>Aged 60–69</th>
<th>Aged &lt;50</th>
<th>Aged &gt;70</th>
<th>Male/Female</th>
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<th>Aged 60–69</th>
<th>Aged &lt;50</th>
<th>Aged &gt;70</th>
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<td>39%</td>
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</tbody>
</table>

*ZC = cardiovascular disease, MI = myocardial infarction, CI = confidence interval, NNT = number needed to treat, QALY = quality-adjusted life year

A complete set of results are available in the decision analysis report (28).
ADA recommendations for low-dose aspirin

- Consider in type 1 or type 2 diabetes patients who are at increased cardiovascular risk (≥10% 10-yr CVD risk)
- ≥50 years of age + ≥1 additional risk factor
- Not for those at low ASCVD risk (<5%)
- Clinical judgement required for <50 yo with 5-10% risk
- Recommended for secondary prevention

How to apply the guidelines

- Bleeding risk (specifically, GI and intracranial bleeding)
- Patient preferences regarding taking aspirin
- Baseline CVD risk
- Age
- Consider using a calculator as a decision aid:
  Aspirin Risk Calculator (www.asariskcalculator.com)

Aspirin Risk Calculator

www.asariskcalculator.com
Patient Case

A 60 year old patient asks about taking a daily baby aspirin to prevent heart attacks and strokes (she has never had either). What information do you need before making a recommendation?

A. Who is the PCP? It is his or her decision.
B. What risk factors for bleeding does this patient have?
C. What risk factors for CVD does this patient have?
D. Is the patient willing to take aspirin at least once weekly?
E. I don’t need any additional information.

Patient Case (cont.)

The patient tells you that she does not have diabetes, but she does have high blood pressure and osteoarthritis, for which she takes amlodipine and Celebrex. She doesn’t think she has any bleeding problems, but one of her neighbors just had a stroke, and she is very worried it will happen to her. What do you say?

A. Aspirin IS absolutely recommended due to her age.
B. Aspirin NOT recommended since she does not have diabetes.
C. Aspirin MAY be recommended if her ASCVD risk is ≥10%.
D. Aspirin MAY be recommended if she is willing to stop taking Celebrex.
E. This is a trick question; go ask another pharmacist.