New Guidelines for Hypertension and Lipids: Application to Care Transitions
JNC 8: Treatment of Hypertension

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Learning Objectives

1. Highlight the differences between the newest hypertension (JNC 8) and lipid (ACC/AHA) guidelines and the previous guidelines.
2. Discuss how to apply recommendations from the hypertension and lipid guidelines to a specific patient.
3. Identify appropriate drug therapy recommendations for a patient with hypertension and dyslipidemia being discharged from the hospital.
4. Describe how adherence to hypertension and lipid guidelines could decrease hospitalizations.

“Hypertension is the most common condition seen in primary care and leads to myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately.”

- JNC 8
Hypertension Diagnosis

Properly Measured BP on ≥2 visits + BP ≥140/90 = Hypertension

What is next?

• Recheck in 1-2 weeks
• Consider therapy initiation

Prevent Clinical Inertia!

JNC 8
The New Evidence-Based Approach to Management of Hypertension
JNC 8: Approach to the Evidence

- Panel members selected from >400 nominees, based on expertise
- "Rigorous, evidence-based methods" used to develop evidence statements for blood pressure treatment based on a systematic review of the literature.
- Evidence from randomized controlled trials = gold standard for efficacy and effectiveness.
- Only included trials with intervention affecting health outcomes of:
- Evidence quality and recommendations were graded based on their effect on important outcomes.


JNC 8 vs. JNC 7

JNC 8
- Systematic, evidence-based review.
- Not a comprehensive guideline; includes 9 specific recommendations.
- No official sponsorship

JNC 7
- Non-systematic review including a variety of study designs.
- Comprehensive guideline including evaluation, diagnosis, compelling indications, diet and lifestyle interventions, and other special considerations such as minorities, older adults, women, children, etc.
- Sponsored by NHLBI

Treatment Resistant Hypertension
- Common, but…. Not discussed in JNC 8


Treatment Goals from Recent Clinical Guidelines

<table>
<thead>
<tr>
<th>Guideline</th>
<th>General Population</th>
<th>Older Population</th>
<th>Diabetes</th>
<th>CKD (non-dialysis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC 8</td>
<td>&lt;60 years: &lt;140/90</td>
<td>60 years: &lt;150/90</td>
<td>&lt;140/90</td>
<td>&lt;140/90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;70yo + GFR &lt;60 OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Any age + albuminuria*</td>
</tr>
<tr>
<td>JNC 7</td>
<td>&lt;140/90</td>
<td>&lt;140/90</td>
<td>&lt;130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>ASH-ISH</td>
<td>&lt;80 years: &lt;140/90</td>
<td>80 years: &lt;150/90</td>
<td>&lt;140/90</td>
<td>&lt;140/90</td>
</tr>
<tr>
<td>AHA/ACC</td>
<td>&lt;80 years: &lt;140/90</td>
<td>80 years: &lt;150/90</td>
<td>&lt;140/90</td>
<td>&lt;140/90</td>
</tr>
<tr>
<td>CDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KDIGO</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*albuminuria defined as: >30 mg albumin/g creatinine

JNC 8: Controversy 1: How Old is Old? and What is the Goal?

Corollary Recommendation: In General Population ≥ 60 years, if treatment results in SBP < 140 and is well tolerated, treatment does not need to be adjusted.

Consideration in Choosing an Antihypertensive Agent

- Patient characteristics: age, race
- Comorbid disease states
- Contraindications to drug therapies
- Allergies/adverse drug reactions
- Current or past drug therapies used
- Clinical evidence support drug choice

First Line Therapies: JNC7 vs. JNC8

<table>
<thead>
<tr>
<th>JNC 7</th>
<th>JNC8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiazide Diuretics (Preferred)</td>
<td>Thiazide Diuretics</td>
</tr>
<tr>
<td>ACE-Inhibitors, Angiotensin Receptor Blockers</td>
<td>ACE-Inhibitors, Angiotensin Receptor Blockers</td>
</tr>
<tr>
<td>Calcium Channel Blockers</td>
<td>Calcium Channel Blockers</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>Beta-Blockers</td>
</tr>
</tbody>
</table>

### JNC 8 Therapeutic Recommendations

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General, NONBlack ± DM</td>
<td>Initial Tx: Thiazide, CCB, ACEi, or ARB</td>
</tr>
<tr>
<td>Black ± DM</td>
<td>Initial Tx: Thiazide or CCB</td>
</tr>
<tr>
<td>CKD (GFR&lt;60 ml/min/1.73 m²) regardless of race, DM, or proteinuria</td>
<td>ACEi or ARB</td>
</tr>
</tbody>
</table>

**Additional Recommendations**
- Beta-blockers should not be used as a first line agent
- ACEi and ARBs should not be used in the same patient simultaneously
- CCB and thiazide diuretics should be used instead of ACEi and ARBs in patients >75 years with impaired kidney function due to risk of hyperkalemia, increased creatinine and further renal impairment


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### Clinical Controversies and Conundrums

**ACE-I and ARBs for Patients with Diabetes?**

- ACE-I/ARB traditionally first line therapy for patients with diabetes.
- Renal protection
- JNC8 gives no preference to ACE-I or ARB in patients with diabetes.
  - Presented as an option, amongst others
- JNC8 does not recommend ACE-I/ARB for black patients with diabetes (without CKD).
  - CCB and thiazides recommended
- ADA 2014 Guidelines still recommend ACE-I in all patients with diabetes and HTN.


Controversies: Beta-Blockers

- Most recent published guidelines (JNC8 and others) exclude Beta-blockers as first line therapy.
- Is data for atenolol responsible?
  - Many trials included once-daily dose atenolol
  - t1/2 of 6-7 hours
- In practice Beta-blockers are often used when 4 drug therapy is required or a compelling indication exists.

Ernst M E et al. Hypertension. 2006;47:352-358

Chlorthalidone vs. HCTZ

Attain and Maintain Goal Blood Pressure

- If goal BP is not reached within a month of treatment:
  - Increase dose of the initial drug
  OR
  - Add a second drug from one another class (thiazide, CCB, ACEI, or ARB)
- Reassess BP and adjust treatment regimen until goal BP is reached
- If goal BP cannot be reached with classes above, drugs from other classes may be added
- Consider referral to HTN specialist

Treatment Resistant HTN: Diagnosis

**Definition:** BP above goal despite treatment with 3 agents of different classes as optimal doses

**Rule out:**
- Pseudoresistance
- Poor blood pressure technique
- Poor adherence
- White coat hypertension
- Drug related causes of HTN
- Secondary disease related causes of HTN

- Obstructive sleep apnea (83%)
- Primary aldosteronism (20%)
- Pheochromocytoma (unknown)
- Cushing’s syndrome (unknown)
- CKD, CrCl <30ml/min (unknown)
- Renal artery stenosis (unknown)

Hypertension 2008;51:1403-1419

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Treatment Resistant HTN: Treatment

- Treat secondary cause!
- Maximize diuretic therapy (consider chlorthalidone)
- Add aldosterone antagonist if appropriate
- Combine agents with different mechanisms of action
- Use loop diuretics in patients with CKD
- Use loop diuretics in patients taking potent vasodilator (ie minoxidil)
- Refer to specialist if BP remains uncontrolled after 6 months of treatment

Hypertension 2008;51:1403-1419

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Targets of Hypertension Treatment

- BP control
- Safety
- Availability
- Tolerability
Transitions of Care Issues

- Urgent care: went home without a follow up plan
- Fragmented information between urgent care/PCP
  - Clinical inertia
  - No communication between providers
- Patient factors: Told to get a doctor after he had a “cold.” Does not mention blood pressure.
  - Lack of understanding by patient
- He was asymptomatic and received 1 dose of clonidine without follow up instructions

Factors Contributing to Poor Care Transitions

Common causes include:

- Fragmented and incomplete information
- Poor communication between providers
- Lack of patient/family/caregiver knowledge, skills and confidence.
- Medication errors:
  - misunderstanding instructions
  - medication adherence
  - drug-drug interactions
  - duplicate prescriptions
- Poor follow up with primary care provider

Plugging into Care Transitions

www.healthy-transitions-Colorado.org
Monitoring

- Attain and maintain blood pressure goal within 1 month of therapy initiation.

- How does this apply to hospitalized patients?
  - When discharged from hospital, do not want to necessarily titrate to goal and discharge...this can occur with PCP follow up in the month following
  - Titration to BP goals in the hospital may lead to over medication and increased adverse effects.

Targets of Hypertension Treatment

- BP control
- Safety
- Availability
- Tolerability

Transitions of Care

- Pharmacists can offer particular expertise in medication reconciliation, medication access, and patient education at care transitions.
New Guidelines for Hypertension and Lipids: Application to Care Transitions

ACC/AHA Guideline on Treatment of Blood Cholesterol

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KEEP CALM
This requires a PARADIGM SHIFT
Out with the Old:

Risk Category

- High
  - CHD or risk equivalents
  - 10-year risk >20%
- Moderately high
  - ≥ 2 risk factors
  - 10-year risk 10-20%
- Moderate
  - ≥ 2 risk factors
  - 10-year risk <10%
- Lower
  - 0-1 Risk factor

In with the New: There’s an APP for that!

American Heart Association
American College of Cardiology

2013 Prevention Guidelines Tool
CV Risk Calculator

Accessed 10/20/2014

ASCVD Risk Estimator

- All fields are required to compute ASCVD risk.
- Gender: M, F
- Age: 20-79
- Total Cholesterol (mg/dL): 100-200
- HDL Cholesterol (mg/dL): 30-100
- Systolic Blood Pressure: 90-200
- Diabetes: Y, N
- Race: White, African American, Other
- Treatment for Hypertension: Y, N
- Smoker: Y, N


Accessed 10/20/2014
Assessing Risk:

<table>
<thead>
<tr>
<th>Category</th>
<th>Risk Assessed</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Age 20-79</td>
<td>Traditional Risk Factors</td>
<td>Every 4-6 years</td>
</tr>
<tr>
<td>Age 20-59</td>
<td>Lifetime ASCVD Risk</td>
<td>Every 4-6 years</td>
</tr>
<tr>
<td>Age 40-79</td>
<td>10 year ASCVD Risk</td>
<td>Every 4-6 years</td>
</tr>
</tbody>
</table>

Other Risk Markers may be considered to form treatment decisions:
- Family history
- C-Reactive Protein
- Coronary Artery Calcium
- Ankle Brachial Index


Out with the Old: CHD or Risk Equivalents

<table>
<thead>
<tr>
<th>Clinical ASCVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angina (stable or unstable)</td>
</tr>
<tr>
<td>Myocardial infarction (MI)</td>
</tr>
<tr>
<td>Coronary or other arterial revascularization</td>
</tr>
<tr>
<td>Transient ischemic attack (TIA)</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Peripheral artery disease (PAD)</td>
</tr>
<tr>
<td>Carotid artery disease</td>
</tr>
<tr>
<td>Abdominal aortic aneurysm (AAA)</td>
</tr>
</tbody>
</table>
Summary of Risk Assessment:

Case

- Back at clinic 6 months later
- He has been adherent
- Add details and calculate risk
- Treatment?

Out with the Old

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>LDL-C Goal</th>
<th>Initiates TLC Therapy</th>
<th>Initiates Drug Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>&lt;100 mg/dL (optional &lt;70 mg/dL)</td>
<td>&gt;100 mg/dL</td>
<td>&gt;100 mg/dL (consider &lt;100 mg/dL)</td>
</tr>
<tr>
<td>Moderately high</td>
<td>100–189 mg/dL (optional &lt;100 mg/dL)</td>
<td>&gt;100 mg/dL</td>
<td>&gt;100–129 mg/dL (consider &lt;100 mg/dL)</td>
</tr>
<tr>
<td>Moderate</td>
<td>189–220 mg/dL</td>
<td>&gt;189 mg/dL</td>
<td>&gt;189 mg/dL</td>
</tr>
<tr>
<td>Lower</td>
<td>&gt;220 mg/dL</td>
<td>&gt;220 mg/dL</td>
<td>&gt;220 mg/dL</td>
</tr>
</tbody>
</table>

Evidence supporting the new guidelines

New Treatment Algorithms (Primary Prevention)

No more Goals – Focus on Intensity

<table>
<thead>
<tr>
<th></th>
<th>Low Intensity</th>
<th>Moderate Intensity</th>
<th>High Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;25%</td>
<td>25-30%</td>
<td>30-40%</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>-</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Fluvastatin</td>
<td>20</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Lovastatin</td>
<td>10</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Pravastatin</td>
<td>10</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Simvastatin</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Pitavastatin</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Shared Decision Making

• “Before initiating statin therapy for the primary prevention of ASCVD in adults it is reasonable for clinicians and patients to engage in a discussion of the proposed therapy.”
• This discussion should include:
  • Potential for ASCVD benefit
  • Potential for adverse effects
  • Potential for drug-drug interactions
  • Patient preferences for treatment.

New Treatment Algorithms – Secondary Prevention

ClinicalASCVD
Age ≤75 years Age >75 years
• Initiate high-intensity statin therapy
• Initiate moderate-intensity statin therapy

Lifestyle Modification for all

• Lifestyle modification
  • Heart healthy diet
  • Regular exercise habits
  • Avoidance of tobacco products
  • Maintenance of a healthy weight

Common issues with Statin in care transitions

- Inpatient changes due to hospital formulary
- Inpatient changes due to indication change
- Multiple statins and doses in the home
- Discharge statin not covered by insurance
- Statin adherence – < 50% obtain refills at 1 and 2 years.
  - Associated with lack of understanding and shared decision making

STATIN Safety recommendations

- Select the appropriate dose
- Baseline labs: Lipid panel, ALT
- Keep potential side effects and drug-drug interaction in mind

STATIN Safety recommendations

- Patients who may be predisposed to hepatic adverse effects:
  - Impaired renal or hepatic function
  - History of previous statin intolerance or muscle disorder
  - Age >75
  - Unexplained ALT elevation > 3x ULN
  - History of hemorrhagic stroke
  - Asian ancestry
- Statins modestly increase the risk of type 2 diabetes in individuals with risk factors for diabetes

STATIN Monitoring
• Lipid panel to monitor adherence
  • 4-12 weeks after initiation
  • Every 3-12 months thereafter
• If 2 consecutive LDL <40
   Consider decreasing the statin dose
• If effect on lipids is less than anticipated
   Evaluate adherence
   Consider increasing statin dose

STATIN Monitoring
• Check LFTs if patient develops Symptoms of hepatic dysfunction
• Check CK’s if patient develops symptoms of myalgia
• Screen for diabetes in those at risk and treat per current screening guidelines.
• If high or moderate intensity statin not tolerated, use the maximum tolerated dose instead

Fibrates, Niacin, Ezetimibe
No data supporting use of nonstatin drugs added to statin or in statin-intolerant patients
May consider if:
  - Less-than-anticipated response to statin
  - Unable to tolerate less-than-recommended intensity statin
Heart Failure and Hemodialysis

- Insufficient evidence to make a recommendation
- 4 RCT in these populations
  - Included patients with and without ASCVD
  - Did not demonstrate a benefit
  - Not enough information to draw adequate conclusions
- Further research recommended in these populations.

Caveats:

- These guidelines should not replace clinical judgment, particularly in patients who are not in a specific category (i.e. family history of early ASCVD)
- Patients with complex hyperlipidemias should be referred to a lipid specialist for evaluation and treatment.

What about Triglycerides and HDL?

- Guideline is largely silent
- High triglycerides and low HDL
  - There is a potential role for niacin or fibrates
Limitations of the Guideline

- “Truth is not simply the sum of published randomized clinical trials.”
- Narrow entry criteria
- Do not always address questions of broad interest
- Bias to publish positive trials
- Time frame usually limited (usually 4-5 years in statin trials)

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<td>≥130 mg/dL</td>
<td>≥160 mg/dL</td>
</tr>
<tr>
<td>Lower</td>
<td>&lt;160 mg/dL</td>
<td>≥160 mg/dL</td>
<td>≥190 mg/dL</td>
</tr>
</tbody>
</table>

Controversies from the Guideline

- Non-HDL-C level as a criteria for initiation of therapy.
- Statin intensity and primary prevention in patients with diabetes.
  - DM with no other risk factors may be overtreated.
  - Role of mixed hyperlipidemia in DM is not addressed
- Primary prevention when LDL-C < 100 mg/dl
- Secondary prevention when LDL-C < 70 mg/dl
- Other areas not addressed: Rheumatologic Inflammatory Disease, HIV, Solid Organ Transplant

5 Points to Remember!

1. Four Statin Benefit Groups
2. Lifestyle modification
3. Lipid panels
4. New PADL-C treatment targets
5. Role of mixed hyperlipidemia in DM.

Transitional Care Management Codes

- Medications adverse drug events are a leading cause for readmissions.

- Transitional care management codes went into effect January 1, 2013.


How to Implement?

To Begin:
- Determine organization’s needs
- Pick an intervention
- Measure baseline data

Implementation:
- Measure
- Evaluate
- Act

Share Your Success!