HTN 2017 Update

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Special Recognition to Barry Stults MD for information/slides contribution for part of lecture
HEDIS and NCQA

**HEDIS**- A tool used by health plans to measure performance.


A health plan with just 100,000 members: each quality measure = ~ $17 million in reimbursements from federal or state agencies.

20-25 measures ($340 million dollars)

Because of the financial importance our physician reimbursement is now being based on value and goals.
Objectives:

- Recognize interventions made to improve HTN care
- Outline clinical contribution of the SPRINT trial
- Report standards for the use of automated office blood pressure
High Blood pressure

How are we doing?

- 2% improvement this year.
- VRP goal = 0.5% improvement
- BP – Declines every Fall
Implemented Improvements

- High Blood pressure Hearts

- Rapid Cycling: referral to care manager to call every 2 weeks/ make adjustments in conjunction with clinician. Clinic BP when controlled.
Implemented Improvements (cont)

- **Pharmacy Services:** Pharm-D adjusts medication based on protocol every 2 weeks. Requires getting set up

- **Population Management:**
  Care-guides/ CM use the 2 or 3 consecutive elevated BP lists to get them in for an appointment.
  - To find reports: type into Internet Explorer network browser
  - Reports >> Clinical Reports>>Primary Care>> High Blood pressure>>
  - High BP patient management list >> apply filters
New Filters

2 and 3 consecutive elevated blood pressures

Filters out highest risk group

These are the high risk group

My total list has 116 patients

My 2 consecutive list has 25 patients

Care Management to get them an appointment
- A study comparing intensive sBP control versus standard sBP control
- Intensive arm: goal 120 / achieved 121
- Control arm: goal 140 / achieved 136
SPRINT - Major Inclusion Criteria (Higher Risk Population)

• ≥50 years old
• Systolic blood pressure: 130 – 180 mm Hg (treated or untreated)

At least one additional cardiovascular disease (CVD) risk
• Clinical or subclinical CVD (excluding stroke)
• Chronic kidney disease (CKD), defined as eGFR <60 ml/min/1.73m²
• Framingham Risk Score for 10-year CVD risk ≥ 15%
• Age ≥ 75 years
Major Exclusion Criteria

- Stroke
- Diabetes mellitus (Accord trial)
- Polycystic kidney disease
- Congestive heart failure (symptoms or EF < 35%)
- Proteinuria >1g/d
- CKD with eGFR < 20 mL/min/1.73m2 (MDRD)
- Adherence concerns
BP Intervention

- BP monitored monthly for 3 months and every 3 months thereafter (additional visits could be scheduled)
- Antihypertensive medication titration decisions based on mean BP (3 readings at each visit), using a structured stepped-care approach
- Agents from all major antihypertensive drug classes available free of charge
- Periodic assessment for orthostatic hypotension and related symptoms
SPRINT Primary Outcome – Cumulative Hazard

Early termination

Hazard Ratio = 0.75 (95% CI: 0.64 to 0.89)

Standard
(319 events)

Intensive
(243 events)

During Trial (median follow-up = 3.26 years)
Number Needed to Treat (NNT) to prevent a primary outcome = 61
# Serious Adverse Events* (SAE) During Follow-up

<table>
<thead>
<tr>
<th>All SAE reports</th>
<th>Number (% of Participants)</th>
<th>Intensive</th>
<th>Standard</th>
<th>HR (P Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1793 (38.3)</td>
<td>1736 (37.1)</td>
<td>1.04 (0.25)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAEs associated with Specific Conditions of Interest</th>
<th>Number (% of Participants)</th>
<th>Intensive</th>
<th>Standard</th>
<th>HR (P Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotension</td>
<td>110 (2.4)</td>
<td>66 (1.4)</td>
<td>1.67 (0.001)</td>
<td></td>
</tr>
<tr>
<td>Syncope</td>
<td>107 (2.3)</td>
<td>80 (1.7)</td>
<td>1.33 (0.05)</td>
<td></td>
</tr>
<tr>
<td>Injurious fall</td>
<td>105 (2.2)</td>
<td>110 (2.3)</td>
<td>0.95 (0.71)</td>
<td></td>
</tr>
<tr>
<td>Bradycardia</td>
<td>87 (1.9)</td>
<td>73 (1.6)</td>
<td>1.19 (0.28)</td>
<td></td>
</tr>
<tr>
<td>Electrolyte abnormality</td>
<td>144 (3.1)</td>
<td>107 (2.3)</td>
<td>1.35 (0.020)</td>
<td></td>
</tr>
<tr>
<td>Acute kidney injury or acute renal failure</td>
<td>193 (4.1)</td>
<td>117 (2.5)</td>
<td>1.66 (&lt;0.001)</td>
<td></td>
</tr>
</tbody>
</table>

*Fatal or life threatening event, resulting in significant or persistent disability, requiring or prolonging hospitalization, or judged important medical event.
SPRINT - Take Away Points

- Higher risk group with exclusions (No CVA, DM, GFR < 20)
- BP was taken by device measuring 3 BP’s and averaging
- Trial stopped early due to benefit.
- 25% lower CVD events / 27% lower mortality in intensive arm.
- Intensive arm: patients without CKD there was >= 30% more reduction of GFR (Not good)
- In intensive arm more hypotension, syncope, ‘lytes abnormal, acute renal injury
# BP Goal Recommendations

*(New Guidelines soon?)*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>JNC 8</th>
<th>ESH</th>
<th>KDIGO</th>
<th>Others</th>
<th>Intermountain</th>
<th>VRP / HEDIS</th>
<th>Sprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages 18-59</td>
<td>140/90</td>
<td>140/90</td>
<td>140/90</td>
<td>140/90</td>
<td>140/90</td>
<td>140/90</td>
<td>sBP 120 – 3BP’s</td>
</tr>
<tr>
<td>Ages 60-79</td>
<td>150/90</td>
<td>140/90 if fit</td>
<td>140/90</td>
<td>140/90</td>
<td>150/90</td>
<td></td>
<td>sBP 120 – 3BP’s</td>
</tr>
<tr>
<td>Ages 80 &amp; up</td>
<td>150/90</td>
<td>sBP 140-160</td>
<td>150/90</td>
<td>150/90</td>
<td>150/90</td>
<td></td>
<td>sBP 120 if able</td>
</tr>
<tr>
<td>Diabetes</td>
<td>140/90</td>
<td>140/85</td>
<td></td>
<td></td>
<td>140/90</td>
<td></td>
<td>Excluded</td>
</tr>
<tr>
<td>CKD with ACR &lt;30</td>
<td>140/90</td>
<td>140/90</td>
<td>140/90</td>
<td></td>
<td>140/90</td>
<td></td>
<td>Excluded</td>
</tr>
<tr>
<td>CKD with ACR 30-300</td>
<td>140/90</td>
<td>140/90</td>
<td>130/80</td>
<td></td>
<td>140/90</td>
<td></td>
<td>Excluded</td>
</tr>
<tr>
<td>CKD with ACR &gt; 300</td>
<td>140/90</td>
<td>sBP &lt; 130</td>
<td>130/80</td>
<td></td>
<td>130/80</td>
<td></td>
<td>Excluded</td>
</tr>
<tr>
<td>MI, CHF, CVA</td>
<td>140/90</td>
<td>140/90</td>
<td></td>
<td></td>
<td>140/90</td>
<td></td>
<td>Excluded CVA</td>
</tr>
</tbody>
</table>
AOBP
“Automated Office Blood Pressure”

- Used in SPRINT trial to more accurately measure blood pressure
- 3 BP’s averaged, 1 minute apart.

- Accuracy of BP measurement is the most difficult aspect of HTN management.
- “More often than not, the measurement of office BP is not only inaccurate but also downright misleading.” Editorial, J Clin Hypertension 2016; 18:616
Office versus Home BP’s

A. Routine office BP measurement by usual office staff averages 10/7 mm Hg higher than correct guideline quality BP measurement.

B. Guideline quality BP averaged 6/3 mm HG higher than gold standard out of office daytime ambulatory BP (White Coat Effect)

Routine office BP = A + B = 16/10 mm Hg higher than daytime ambulatory BP

Home BP Measurement

- Correct patient measurement technique: 17-33%

- USPSTF Guideline, Nov 2015
  Ambulatory BP measurement recommended for diagnosis but...
  - not readily available nor compensated
AOBP

- Devices take 3-6 automated BP’s. Patient must be RESTING ALONE

- 4 validated devices
  - BpTru SPRINT trial (Physician owned company/ buying conflicts) $1000-1400(stand)
  - Welch Allyn Pro BP 2400 $425 + 238(stand)
  - Omron Hem-907 $546 + 71(stand)
  - Microlife Watch BP Office $595 + 295(stand)
Omron 907

Note: Does not save BP if turns off

WA Bpro 2400
**CAMBO Trial**

Conventional versus automated measurement of BP in the office

- AOBP using BpTRU machine / 252 AOBP patients, 209 MOBP patients
- Compared “manual office BP (MOBP)” pre and post enrollment to AOBP and Ambulatory BP

### Results:

<table>
<thead>
<tr>
<th></th>
<th>1st visit</th>
<th>2 year visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOBP Manual Office BP</td>
<td>-8.0 lower than pre-enrollment</td>
<td>-12.4</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>-7.3 lower than MOBP</td>
<td>-5.2 lower than MOBP</td>
</tr>
<tr>
<td>AOBP Automated office BP</td>
<td>-14.3 lower than pre-enrollment</td>
<td>-16.3</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>-1.8 lower than AOBP</td>
<td>-2.8 lower than AOBP</td>
</tr>
</tbody>
</table>
Summary of CAMBO trial

- AOBP approximated Ambulatory BP much better than MOBP
- White Coat effect is much lower with AOBP
Example of White Coat HTN

<table>
<thead>
<tr>
<th>Reading No.</th>
<th>AOBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (observer present)</td>
<td>147/82</td>
</tr>
<tr>
<td>2 (observer absent)</td>
<td>140/79</td>
</tr>
<tr>
<td>3</td>
<td>136/78</td>
</tr>
<tr>
<td>4</td>
<td>134/77</td>
</tr>
<tr>
<td>5</td>
<td>132/76</td>
</tr>
<tr>
<td>6</td>
<td>133/77</td>
</tr>
<tr>
<td>Mean 2-6</td>
<td>136/78</td>
</tr>
</tbody>
</table>

- Meaning of this 11/4 ↓ BP? → ↓ white-coat effect!
AOBP versus Ambulatory daytime BP

AOBP (ISOLATION) vs DAYTIME AMBULATORY BP

Meta-analysis: 19 studies; 5993 pts.

- AOBP ≈ Daytime ambulatory BP
  Weighted mean difference:
  SBP = -1.52 (-3.29 – 0.25)
  DBP = 0.33 (-0.97 – 1.64)

- Heterogeneity $\propto$ SBP
  AOBP SBP $\geq$ 130 mm Hg: AOBP lower by 1-3 mm Hg
  AOBP SBP $<$ 130 mm Hg: AOBP lower by 7-9 mm Hg
  - Primarily in studies using 5 min rest period

- AOBP reduces - but not fully eliminates - white-coat HTN

Can J Cardiol 2017; Logantheswaran, in press
The Rules

- AOBP must have 3 or more measurements. Initial reading may be used.
- Patient must be resting alone in the room. No reading, phone etc.
- No waiting period prior to activating device. Press start and leave, BP starts immediately. Better correlation with ambulatory BP.
- BP goals are the same as ambulatory BP. (135/85; 5 points lower than typical goals)
- Decreases White Coat effect by 80% (not 100%)
New AOBP data field

The Automatic Office Blood Pressure (AOBP) field is only for blood pressure averages obtained by multiple blood pressure readings with an approved AOBP device.
The Benefits

- Accuracy
  - Less high BP’s to evaluate
  - Better accuracy = better management
- Time:
  - Decreases repeat BP checks (8 repeat checks a day x 3 min a BP = 24 minutes)
MA Workflow

Work Flow Process – AOBP / Intake

Call from waiting area

One Report
Care guide

Intake
1. Medication Review
2. Intake
   a. PHQ2
   b. Activity Level
3. Vital signs
4. CC with One report rec’s

DM
Yes
- DM self Hx
  - Eye exam date
  - Remove shoes/socks

PE
Yes
- Self Hx
  - MiniCog – Age > 65
  - Eye chart – welcome to Medicare

PHQ2
Positive
- PHQ 9

No
- AOBP/ re-check BP
  1. Alone in room
  2. Record AOBP / Repeat BP

Physician Review*

* Auto / Smart Text available: CC / Vitals / PHQ 2 and 9 / Activity / DM self Hx / Medicare wellness visit