“Ancora imparo”
(I am still learning.)
— Michelangelo
SPRINT

Getting beyond the hype?

J.C. Marek
Dec 3, 2016
The recently published SPRINT study shows a clear clinical advantage to treating BP to <120/70 in the study group?

True_______
False_______
Overview

• Overview of SPRINT study
• Results in perspective
• Concerns regarding clinical applicability
• Implications for the future
• Conclusions
Recent history of BP targets

• Pre 2014 target:
  – <140/90 (130/ if DM or CKD)

• 2014 JNC 8 controversy:
  – <150/90 if over age 60

• Sept 2015 –
  – halting of SPRINT study announced with a lot of hype and fanfare.
Overview of SPRINT study

The Hype
“The study's independent data safety and monitoring board called for the study to be halted because of the significant benefit, which clearly outweighed any harm.”
“This study provides potentially lifesaving information...”

Gary H. Gibbons, M.D., director of NHLBI, the primary sponsor of SPRINT.
Aggressively Lowering Blood Pressure Saves Lives, Study Finds

by Rob Stein
September 11, 2015 11:09 AM

The findings come from the largest study ever conducted to.....
Declaring they had “potentially lifesaving information,” federal health officials said on Friday that they were ending a major study more than a year early because it has already conclusively answered a question cardiologists have puzzled over for decades: How low should blood pressure go?
The words "legendary," "miraculous" and "unique" are so overused in common conversation they’ve almost lost their meaning. Describing a health study as "landmark" falls into the same category. Except for last week, when the initial results of a clinical trial sponsored by the National Institutes of Health (NIH) proved so impressive about the benefits of managing blood pressure intensively that the study was stopped early.

As reported by NPR, the findings resulted from the largest study ever conducted to examine whether reducing systolic blood pressure (the top number in a blood pressure reading) below the level currently recommended would be beneficial.

Oh yeah. So much so that even the usually staid scientists at the NIH described it as “landmark.”
...and they went on and on on...

The study was then published in Nov 2015 simultaneous with presentation at the AHA
A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group*

ABSTRACT

BACKGROUND
The most appropriate targets for systolic blood pressure to reduce cardiovascular morbidity and mortality among persons without diabetes remain uncertain.

METHODS
We randomly assigned 9361 persons with a systolic blood pressure of 130 mm Hg or higher and an increased cardiovascular risk, but without diabetes, to a systolic blood-pressure target of less than 120 mm Hg (intensive treatment) or a target of less than 140 mm Hg (standard treatment). The primary composite outcome was myocardial infarction, other acute coronary syndromes, stroke, heart failure, or death from cardiovascular causes.
Overview of SPRINT study

The Facts
SPRINT Research Question

Examine effect of more intensive BP treatment than is currently recommended

Randomized Controlled Trial

Target Systolic BP

Intensive Treatment
Goal SBP < 120

Standard Treatment
Goal SBP < 140
Major Inclusion Criteria

- ≥50 years old
- Systolic BP: 130 – 180 mm Hg (treated or untreated)
- Additional cardiovascular disease (CVD) risk
  - Clinical or subclinical CVD (excluding stroke)
  - Chronic kidney disease (CKD), defined as eGFR 20 – 60
  - Framingham Risk Score for 10-year CVD risk ≥ 15%
  - Age ≥ 75 years
Major Exclusion Criteria

- Stroke
- Diabetes mellitus
- Polycystic kidney disease
- Congestive heart failure (symptoms or EF < 35%)
- Proteinuria >1g/d
- CKD with eGFR < 20 (MDRD)
- Adherence concerns
SPRINT: Enrollment and Follow-up Experience

Screened  
(N=14,692)

Randomized  
(N=9,361)

Intensive Treatment  
(N=4,678)

- Consent withdrawn: 154
- Discontinued intervention: 224
- Lost to follow-up: 111

Standard Treatment  
(N=4,683)

- Consent withdrawn: 121
- Discontinued intervention: 242
- Lost to follow-up: 134

Analyzed  
(Intention to treat)  
4,678 (Vital status assessment: entire cohort)
## Demographic and Baseline Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Total N=9361</th>
<th>Intensive N=4678</th>
<th>Standard N=4683</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD) age, years</strong></td>
<td>67.9 (9.4)</td>
<td>67.9 (9.4)</td>
<td>67.9 (9.5)</td>
</tr>
<tr>
<td>% ≥75 years</td>
<td>28.2%</td>
<td>28.2%</td>
<td>28.2%</td>
</tr>
<tr>
<td>Female, %</td>
<td>35.6%</td>
<td>36.0%</td>
<td>35.2%</td>
</tr>
<tr>
<td>White, %</td>
<td>57.7%</td>
<td>57.7%</td>
<td>57.7%</td>
</tr>
<tr>
<td>African-American, %</td>
<td>29.9%</td>
<td>29.5%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Hispanic, %</td>
<td>10.5%</td>
<td>10.5%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Prior CVD, %</td>
<td>20.1%</td>
<td>20.1%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Mean 10-year Framingham CVD risk, %</td>
<td>10.1%</td>
<td>20.1%</td>
<td>20.1%</td>
</tr>
<tr>
<td>Taking antihypertensive meds, %</td>
<td>90.6%</td>
<td>90.8%</td>
<td>90.4%</td>
</tr>
<tr>
<td><strong>Mean (SD) number of antihypertensive meds</strong></td>
<td>1.8 (1.0)</td>
<td>1.8 (1.0)</td>
<td>1.8 (1.0)</td>
</tr>
<tr>
<td><strong>Mean (SD) Baseline BP, mm Hg</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>139.7 (15.6)</td>
<td>139.7 (15.8)</td>
<td>139.7 (15.4)</td>
</tr>
<tr>
<td>Diastolic</td>
<td>78.1 (11.9)</td>
<td>78.2 (11.9)</td>
<td>78.0 (12.0)</td>
</tr>
</tbody>
</table>
Primary Outcome and Primary Hypothesis

- **Primary outcome**
  - **CVD composite**: first occurrence of
    - Myocardial infarction (MI)
    - Acute coronary syndrome (non-MI ACS)
    - Stroke
    - Acute decompensated heart failure (HF)
    - Cardiovascular disease death

- **Primary hypothesis**
  - CVD composite event rate will be lower in intensive compared to standard Rx
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
Systolic BP During Follow-up

Year 1
Mean SBP
136.2 mm Hg

Mean SBP
121.4 mm Hg

Standard

Intensive

<table>
<thead>
<tr>
<th>Years</th>
<th>Standard N</th>
<th>Intensive N</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4883</td>
<td>4678</td>
</tr>
<tr>
<td>1</td>
<td>4345</td>
<td>4375</td>
</tr>
<tr>
<td>2</td>
<td>4222</td>
<td>4231</td>
</tr>
<tr>
<td>3</td>
<td>4092</td>
<td>4091</td>
</tr>
<tr>
<td>4</td>
<td>3997</td>
<td>4029</td>
</tr>
<tr>
<td>5</td>
<td>3904</td>
<td>3920</td>
</tr>
<tr>
<td>6</td>
<td>3115</td>
<td>3204</td>
</tr>
<tr>
<td>7</td>
<td>1974</td>
<td>2035</td>
</tr>
<tr>
<td>8</td>
<td>1000</td>
<td>1048</td>
</tr>
<tr>
<td>9</td>
<td>274</td>
<td>286</td>
</tr>
</tbody>
</table>
Hazard Ratio = 0.75 (95% CI: 0.64 to 0.89)

SPRINT Primary Outcome

Standard (319 events)

Intensive (243 events)

During Trial median follow-up = 3.26 years
### SPRINT Primary Outcome and its Components

<table>
<thead>
<tr>
<th></th>
<th>Intensive</th>
<th>Standard</th>
<th>HR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Outcome</strong></td>
<td>243</td>
<td>319</td>
<td>0.75 (0.64, 0.89)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>All MI</strong></td>
<td>97</td>
<td>116</td>
<td>0.83 (0.64, 1.09)</td>
<td>0.19</td>
</tr>
<tr>
<td><strong>Non-MI ACS</strong></td>
<td>40</td>
<td>40</td>
<td>1.00 (0.64, 1.55)</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>All Stroke</strong></td>
<td>62</td>
<td>70</td>
<td>0.89 (0.63, 1.25)</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>All HF</strong></td>
<td>62</td>
<td>100</td>
<td>0.62 (0.45, 0.84)</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>CVD Death</strong></td>
<td>37</td>
<td>65</td>
<td>0.57 (0.38, 0.85)</td>
<td>0.005</td>
</tr>
</tbody>
</table>
## 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><strong>Hypotension</strong></td>
<td></td>
<td>110 (2.4)</td>
<td>66 (1.4)</td>
<td>1.67 (0.001)</td>
</tr>
<tr>
<td><strong>Syncope</strong></td>
<td></td>
<td>107 (2.3)</td>
<td>80 (1.7)</td>
<td>1.33 (0.05)</td>
</tr>
<tr>
<td><strong>Injurious fall</strong></td>
<td></td>
<td>105 (2.2)</td>
<td>110 (2.3)</td>
<td>0.95 (0.71)</td>
</tr>
<tr>
<td><strong>Bradycardia</strong></td>
<td></td>
<td>87 (1.9)</td>
<td>73 (1.6)</td>
<td>1.19 (0.28)</td>
</tr>
<tr>
<td><strong>Electrolyte abnormality</strong></td>
<td></td>
<td>144 (3.1)</td>
<td>107 (2.3)</td>
<td>1.35 (0.020)</td>
</tr>
<tr>
<td><strong>Acute kidney injury or acute renal failure</strong></td>
<td></td>
<td>193 (4.1)</td>
<td>117 (2.5)</td>
<td>1.66 (&lt;0.001)</td>
</tr>
</tbody>
</table>
Overview

• Why should we care about HTN?
• Overview of SPRINT study
• Results in perspective
• Concerns regarding clinical applicability
• Implications for the future
• Conclusions
CV events*
(secondary endpoint)

- Intensive Rx – 5.19%
- Standard Rx - 6.81%
- relative risk reduction ~25%
- absolute risk reduction - 1.62%
- NNT for preventing one CV event = 62
- % “same results” with or without intensive Rx = 98.4%

* Over 3.2 yrs
Deaths

- Intensive Rx - 3.30%
- Standard Rx – 4.48%
- relative risk reduction ~ 25%
- absolute risk reduction ~ 1.18%
- NNT = 85
- % “same results” = 98.8%

* Over 3.2 yrs
CV deaths

- Intensive Rx - 0.79%
- Standard Rx - 1.39%
- Relative risk reduction ~ 43%
- Absolute risk reduction ~ 0.6%
- NNT = 167
- % “same results” = 99.4%

* Over 3.2 yrs
Consider also…

- No significant differences in:
  - MI
  - ACS
  - stroke

- Benefit in the primary outcome was driven mostly by:
  - heart failure
  - CV death
Serious adverse events

- Intensive Rx – 4.7%
- Standard Rx – 2.5%
- Relative risk increase – 88%
- Absolute risk increase - 2.2%
- NNH – 45.5
2 possible pt messages..

..that by taking 3 drugs every day for more than 3 yrs might..
Message #1

...that by..blah, blah, blah,..might...

- reduce the risk of CV events by 25% and
- risk of death by 27%
- while increasing the risk of adverse events merely from 2.5% to 4.7%

OR..
Message #2

...that by..blah, blah, blah,..might...

• reduce CV events from 7 out of 100 to 5 out of 100
• or by a mere 0.54% per year
• with no benefit at preventing stroke or heart attack
• while increasing the risk of hypotension, syncope, electrolyte abnormalities, and acute kidney injury by as much as 88%
Study Finds Some Patients With High Blood Pressure May Increase Risk of Dying By Lowering It Too Much.

HealthDay (11/14, Preidt, 21K) reports on a study finding that medications that led to “too-steep drops in blood pressure” may increase the risk of premature death for some patients with high blood pressure. The study was based on data from “nearly 8,000 non-diabetic adults who had high blood pressure.” For patients whose systolic blood pressure was 164 mm Hg or higher, those that reduced that to less than 142 mm Hg “were 32 percent more likely to die” than were patients “who lowered it to 152 mm Hg or more.” For those patients with systolic blood pressure below 164 mm Hg, lowering it to less than 142 mm Hg reduced their risk of dying by 40 percent compared to those who reduced it to 152 mm Hg or higher. The study was presented at the American Heart Association annual meeting in New Orleans. Get full ACC coverage of AHA 2016 at ACC.org/AHA2016.

Trial Finds No Long-Term Benefit Of Ularitide For Patients With Heart Failure.

MedPage Today (11/14, Susman, 97K) reports on the TRUE-HF trial finding that “treating patients in early stage of acute heart failure events with the natriuretic peptide ularitide provided the expected short-term improvement in biomarkers but had no impact on subsequent clinical outcomes.” The trial included 1,066 patients on ularitide and 1,069 patients assigned to placebo for 30 months. Over that period, 236 patients in the ularitide group “died of cardiovascular related causes” compared to 225 deaths in the placebo group. The trial also found “non-significant” differences for time in intensive care, time in hospital during the first 30 days, worsening
Let’s look at the results graphically
SPRINT: Deaths

looked at another way...

...additional number of people who did not die in a year among 1000
additional number of people who developed serious side effects in a year among 1000 people
Lest you think that HTN is more important to your patients than the SAEs consider this...
..among community dwelling people aged 75 years and older without risk factors, approximately 10% fall during any given year
Age-adjusted death rates for stroke.
United States, 2014-Quarter 3, 2015

- Blue line: 3-month period
- Green line: 12 months ending with quarter

Deaths per 100,000

Quarter

Age-adjusted death rates for falls, ages 65 and over:
United States, 2014-Quarter 3, 2015

- Blue line: 3-month period
- Green line: 12 months ending with quarter

Deaths per 100,000

Quarter

Age-adjusted death rates for hypertension:
United States, 2014-Quarter 3, 2015

Age-adjusted death rates for stroke:
United States, 2014-Quarter 3, 2015

Age-adjusted death rates for falls, ages 65 and over:
United States, 2014-Quarter 3, 2015
Overview

• Why do we care about HTN anyway?
• Overview of SPRINT study
• Results in perspective
• Concerns regarding clinical applicability
• Implications for the future
• Conclusions
Practical but overlooked issues

• Drugs were free.
• Pts seen every 3 months
• Adherence was high and not typical of clinical practice
• Pts with BP <110 syst after 1 min of standing were excluded.
  – Despite this there was a significant incidence of hypotension
• Remember also, no diabetics
How were the BP’s measured?
Unattended Blood Pressure Measurements in the Systolic Blood Pressure Intervention Trial

Implications for Entry and Achieved Blood Pressure Values Compared With Other Trials

Sverre E. Kjeldsen, Per Lund-Johansen, Peter M. Nilsson, Giuseppe Mancia

The Systolic Blood Pressure Intervention Trial (SPRINT) enrolled 9361 participants aged ≥50 years in ~100 expert medical centers and clinical practices throughout the United States. SPRINT excluded patients with diabetes mellitus and stroke survivors since previous clinical trials included those populations. Between 2010 and 2013, the SPRINT investigators randomly allocated the study participants into a standard treatment group receiving an average of 2 different blood pressure (BP) medications to achieve a systolic BP (SBP) target <140 mmHg and into an intensive treatment group receiving an average of 3 BP medications to achieve a SBP target <120 mmHg. The Director of the National Heart, Lung, and Blood Institute stopped SPRINT early because of a positive effect. The significant preliminary results of SPRINT were announced on September 11, 2015 and the study results were quickly and favorably commented on by the New York Times and the Washington Post. The target SBP <120 mmHg had reduced rates of the composite primary outcome that included yet not been settled. In this article, we aimed to review the measurement techniques for BP that was used in SPRINT and assess whether it is representative and applicable for practice outside the specific study. The reason for why we focus on the BP measurement technique in SPRINT is that if it varies substantially from other trials of similar design and aims, the results of SPRINT can only be included into hypertension guidelines and clinical practice with considerable reservation and utmost care. Similarities and differences with the Action to Control Cardiovascular Risk in Diabetes (ACCORD), Secondary Prevention of Small Subcortical Strokes (SPS3), and Hypertension Optimal Treatment (HOT) studies, the other large outcome trials investigating BP targets, are therefore needed to discuss. At present, there are no data from randomized outcome-based trials on home and ambulatory blood pressure targets or BP variability. Therefore, a discussion on target blood pressure values in different trials and guidelines can only refer to office blood pressure.
BPs in SPRINT

• Measured with:
  – pts seated
  – in a quiet room
  – without talking
  – taken as an average of 3 measurements with an automated device
  – preset to wait 5 minutes before measurements.

• Is that the way you do it??
BPs in SPRINT

• “One essential detail missing in the main SPRINT publication is the fact that measurements of BPs were done unattended or unobserved—that is, without an observer being present in the room”

Hypertension. 67:808-812, 2016
### Automated/Semiautomated Devices Used for Measurements of Blood Pressure in Large Outcome Trials That Have Used the Automated Office Blood Pressure Measurement Technique

<table>
<thead>
<tr>
<th>Trial</th>
<th>Device</th>
<th>Status of Observation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCORD</td>
<td>Model 907, Omron Healthcare, Lake Forest, IL</td>
<td>Attended</td>
<td>The ACCORD Study Group²</td>
</tr>
<tr>
<td>SPS3</td>
<td>Colin BP–8800C, Press Mate, Meena Medical Inc, Bedford, TX</td>
<td>Attended</td>
<td>The SPS3 Study Group³</td>
</tr>
<tr>
<td>SPRINT</td>
<td>Model 907, Omron Healthcare, Lake Forest, IL</td>
<td>Unattended</td>
<td>The SPRINT Research Group⁷</td>
</tr>
<tr>
<td>HOT</td>
<td>Visomat OZ, D2 International, Hestia Pharma GmbH, Germany</td>
<td>Attended</td>
<td>Hansson et al⁹</td>
</tr>
<tr>
<td>TROPHY</td>
<td>HEM–705CP, Omron Healthcare, Lake Forest, IL</td>
<td>Attended</td>
<td>Julius et al¹⁹</td>
</tr>
<tr>
<td>ONTARGET</td>
<td>HEM–757, Omron Corporation, Tokyo, Japan</td>
<td>Attended</td>
<td>Verdecchia et al²⁰</td>
</tr>
<tr>
<td>TRANSCE</td>
<td>HEM–757, Omron Corporation, Tokyo, Japan</td>
<td>Attended</td>
<td>Verdecchia et al²⁰</td>
</tr>
</tbody>
</table>
BPs in SPRINT

• One essential detail missing in the main SPRINT publication is the fact that measurements of BPs were done unattended or unobserved—that is, without an observer being present in the room.

• “Thus in community practice, lowering SBP to 120 mm Hg may mean that, if not done according to the correct protocol of automated office BP, SBPs could actually be far lower than 120 mm Hg, with unknown consequences.”

Hypertension. 67:808-812, 2016
BPs in SPRINT

• The authors state that:
  • “BP measurements taken without observing these conditions are likely to **overestimate** BP and result in **overtreatment**, with the potential for higher rates of serious adverse effects and greater utilization of resources.
  • WOW! Didn’t see that one coming.
Consider if you will...*

• What if we were to do a study on the effects of antibiotics in pneumonia and didn’t bother to determine if the patients had bacterial or viral pneumonia?
• What if we repeated the study and only selected pts who had documented bacterial pneumonia?
• Now what if we did a HTN study and if the population included 20-40% without hypertension?

* Apologies to Rod Serling
Factors involved in 24 hour blood pressure (BP) variability.

Humoral ?
(endothelial etc)
factors

Vasomotion ?

Mechanical factors

Ventilation

Behavioral factors

BP variability

Rhythmic influences
(probably largely central)

Environmental stimuli

Arterial stiffness ?

Other reflexes ?

Genetic factors ?

Baroreflexes

Giuseppe Mancia Hypertension. 2012;60:512-517
Consider if you will…

• ..how BP varies day to day, minute to minute
• ..the prevalence of white coat effect of 20 - 40%
• Should we really be so focused on a single BP assessment every 3 months?
Overview

• Why do we care about HTN anyway?
• Overview of SPRINT study
• Results in perspective
• Concerns regarding clinical applicability
• **Implications for the future**
• Conclusions
Were the results significant?

Hang on. We’re almost done.
The recently published SPRINT study shows a clear clinical advantage to treating BP to <120/70 in the study group?

True_______
False_______
..clinical advantage?

Statistical or Clinical?
Question

The recently published SPRINT study shows a clear clinical advantage to treating BP to <120/70 in the study group?

True______
False______

Considering the NNT, it’s a matter of opinion. ie what’s clinically significant? Should the patient have a vote?
“It’s 2015, we are long past the era where doctors simply prescribe what they feel is best for people. When it comes to treating risk factors, not diseases, people are the experts in what is best for them.

Some older patients may be willing to accept the risk of more aggressive treatment to get the benefits.

Others, when told of the absolute benefits and risks, may not want the extra burden of therapy.”

-John Mandrola; Fast and Slow Thinking on the SPRINT Trial; Nov 2015
“..we should remember a simple but inescapable truth in medicine: patients are genetically, physiologically, metabolically, pathologically, psychologically, and culturally different. Accordingly, there never will be only one way to diagnose and treat. To lower BP of all hypertensive patients uniformly to 120 mm Hg is clearly absurd, regardless of the SPRINT results. We can only hope that despite (or even because of) SPRINT, physicians will continue to treat patients and not blood pressure numbers alone.”

-Messerli and Bangalore
Questions for the future

- Will we have to change the way we measure BP?
- Will our office protocols have to change?
- Should we do home BP monitoring instead?
Questions for the future

• How will this be translated into guidelines?
  – There is a potential for a clash between what the patients may want and what the guidelines recommend.

• How will the physician manage this conflict when his / her compensation may be determined by “following the guidelines”?

• A “size 9 hat” for everyone???
Conclusions

• An important study but not consistent with the hype
• Role in clinical practice - unknown
• Translation into guidelines - unknown (but likely imminent)
• Home BPs correlate better with SPRINT BP methods and should be considered if applying SPRINT results to clinical practice
• Results apply to only a segment of your patient population, not all of them. eg no DM
• There’s still room for clinical judgment
Conclusions

• There should also be a role for pt input (shared decision making).
  – Risk vs benefits eg NNT vs risk of more meds, more visits, renal issues, cost etc
• Don’t take, at face value, heavily promoted results of studies or guidelines
• If it’s important to your patients you should investigate further.
• As Reagan said: “trust but verify”
Thanks for your kind attention

E mail:

joseph.marek@advocatehealth.com
Appendix:
Some illustrative cases...
Cases

• There are no easy answers.
• But that’s good news
  – The patients still need thoughtful physicians and not an automaton following cook book medicine.
• Remember the immortal words of Dr. Stead....
“What This Patient Needs Is A Doctor.”

-E. A. Stead, MD
1908-2005
Case #1

- 72 y/o female
- C/O fatigue, mild DOE, occasional dizziness ?postural
- BP 138/60; P 60; BMI 36
- On exam:
  - Obese
  - Unremarkable cardiopulm exam
  - Trace – 1+ pedal edema
Case #1

• **PH:**
  - **CAD** – s/p PTCA 3 yrs ago; asympt
  - DJD of back
  - S/P hip fx / replacement
  - A fib
  - Sleep apnea on Rx

• **SH:**
  - Lives with husband
  - No exercise due to DJD; walks with cane
  - Doesn’t use salt shaker; No EtOH
Case # 1

• Meds:
  ✓ Irbesartan 300 mg daily
  ✓ Chlorthalidone 25 mg daily
  ✓ Carvedilol 25 BID
  ✓ Amlodipine 10 mg daily
  ✓ Atorvostatin 40 mg qhs
  ✓ Warfarin
  ✓ ASA 81 mg
  ✓ Tylenol
Case #1

• Labs:
  • eGFR – 50
  • Lytes normal
  • FBS 108
First question to ask: how were the BPs measured?

Home or office?
Case #1 - Answer

• I would not increase Rx
• Why?
  – She sounds frail and prone to falling
  – She’s on 4 drugs already at max doses
    • Poorer compliance
    • More adverse reactions
  – Her diastolic pressure is low also
  – Concern for hypotension is greater than her risk of death from HTN.
Case #2

- 82 y/o male
- No complaints
- BP 138/70; P 60; BMI 25
- On exam:
  - Unremarkable cardio-pulm exam
- PH:
  - CAD s/p PTCA 3 yrs ago; asympt
Case #2

• SH:
  – Widowed; lives alone
  – Bikes 40 miles per week
  – 5 glasses of red wine weekly
Case #2

- Meds:
  - Irbesartan 300 mg daily
  - HCTZ 12.5 mg daily
  - Atorvostatin 40 mg qhs
  - ASA 81 mg daily

- Labs:
  - eGFR – 70
  - Lytes normal
  - FBS - 82
Case #2 - Answer

• Leave him alone
• He’s 82 and active
• Current guidelines - if over 80 <150/90
• Although he’s physiologically younger I’d still be hesitant
• In light of SPRINT, I may involve him in the decision.
• The future may change this approach with new guidelines?
Case #3

- 57 y/o female
- Complains of occasional headaches; and occasional post prandial chest pain relieved with antacids
- BP 138/80; P 80; BMI 31
- PE: Obese otherwise unremarkable
- PH:
  - CAC score 187; neg Thallium 6 mos ago
  - Fibromyalgia
Case #3

- SH:
  - Married with 4 children – one still in high school
  - Works in billing in a medical practice
  - Does Zumba and yoga once a week
  - Watches Na⁺ religiously and aims to keep under 2,200 mg daily
  - No EtOH
Case #3

• Meds:
  – Irbesartan 75 mg daily
  – HCTZ 25 mg daily
  – Carvedilol 12.5 mg BID
  – Advil prn
  – Xanax prn
  – Prevacid 30 mg qhs
Case #3

- Labs:
  - eGFR 78
  - Lytes normal
  - FBS 102
Case #3 - Answer

• I would increase Rx

• She’s young with a fair amount of risk factors already i.e. higher risk → greater benefit

• She’s also only on minimal Rx
  – Raise ARB first
  – Change diuretic to chlorthalidone if needed