Discussant: Blood Pressure Measurement in SPRINT

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• **ACCEPTED:** Intensive BP target significantly reduces the risk of cardiovascular events when compared with standard BP target

• **DEBATED:** What should this intensive BP target be in clinical practice?
  - <120 mm Hg
  - <130 mm Hg
  - Others
Fundamental Question Post-SPRINT

Were BP Measurements “Attended” or “Unattended”?
Taking the Seated Blood Pressure

HEM-907XL

The BP monitor should be programmed to allow a 5 minute rest before the first BP measurement, to take 3 readings at 1 minute intervals, and to display the average. See specific instructions provided by OMRON at the end of this chapter.

During the 5 minute rest period, participants should be resting and should not be completing questionnaires or speaking with study staff. The staff member should leave the room during this 5 minute rest period. The following script can be used at this time.

SCRIPT: “I would like you to rest for 5 minutes before I begin taking your blood pressure. I will leave the room. When I return, I will not speak to you but will immediately begin to take your blood pressures. Do you understand?” With their agreement, leave the room and return in 5 minutes.
Does Manual BP vs. Automated BP Measurements Matter?

353 patients with BP measured by BpTRU and by manual auscultatory method

131/85 mm HG AOBP = 140/90 Manual

Filipovsky et al. Blood Pressure, 2016; 25:4, 228-234

Wohlfahrt et al. J Hyperten 2016, 34:2180–2186
Does Attended vs. Unattended BP Measurements Matter?

Alerting Reaction to BP cuff measurement


Myers M et al. BMJ. 2011 Feb 7;342:d286.
### SPRINT ABP/Clinic BP Discordance

<table>
<thead>
<tr>
<th>Study</th>
<th>Group</th>
<th>Age</th>
<th>N</th>
<th>Clinic SBP</th>
<th>Clinic DBP</th>
<th>Daytime SBP</th>
<th>Daytime DBP</th>
<th>Clinic-Daytime SBP/DBP Difference</th>
<th>Clinic BP Measurement Method</th>
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SPRINT BP Measurement: Site Classification

Survey based on presence or absence of personnel in the examination room during BP measurement

- AA = Always Alone
- NA = Never Alone
- AR = Alone for Rest
- ABM = Alone for BP measurement

Average randomizations of 98 patients/site
Misclassification Bias

Classification Level: Center 1 (90% AA; 10% NA) → Classified as AA

Analysis Level: All patients categorized as AA

Classification Level: Center 2 (60% AA; 40% NA) → Classified as AA

Analysis Level: All patients categorized as AA
SPRINT BP Measurement: Results

- **Blood Pressure:** Average SBP, DBP, SBP delta and mean number of medications similar across the different BP technique groups

- **Clinical Outcomes:** Primary and all-cause mortality outcomes similar across BP technique groups

- **Adverse Effects:** More importantly, the absolute SAE rates in the intensive arm were largely similar across the BP technique groups
**SPRINT BP Measurement: Results**

- **Blood Pressure:** Average SBP, DBP, SBP delta and mean number of medications similar across the different BP technique groups
  - *Not surprising since the protocol mandated achieving a BP target*
  - *To conclude that absolute systolic BP values will not change whether attended or not attended based on indirect comparison is counter to many direct studies showing clear difference*

- **Clinical Outcomes:** Primary and all-cause mortality outcomes similar across BP technique groups
  - *Not surprising since the HR depends on the BP difference between intensive and standard treatments, rather than on the absolute BP values that are the matter of debate*

- **Adverse Effects:** More importantly, the absolute SAE rates in the intensive arm were largely similar across the BP technique groups
  - *Reassuring but can be confounded by misclassification bias*
Conclusions

• Significant heterogeneity in BP techniques within SPRINT sites despite instructions and training
  - 72% sites used “unattended” BP measurement at some part of the BP measurement process

• Although results are somewhat re-assuring, significant limitations and unanswered questions remain:
  - Recall bias/Misclassification bias and bias towards null
  - Extrapolation of center level data to patient-level analysis

• Given that the BP values from manual auscultatory measurement ≠ AOBP ≠ ABP, it is likely not prudent to have the same BP target for different BP measurement techniques