GOALS OF ANTIHYPERTENSIVE TREATMENT IN THE FRAIL – IS SPRINT APPLICABLE? CONTRA

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Characteristics of frail patients:

- low body mass index
- impaired cognition
- limited mobility
- history of falls
- ....

High prevalence of frailty in patients with:

- diabetes
- history of stroke
- heart failure
- CKD
- dementia
- resident in nursing homes
- .....
CONTRA

1. SPRINT is not applicable to frail patients, as frail patients were excluded in the study.
Is a lower blood pressure the better in frail patients?
CONTRA arguments

Newer/other studies

Meta-analyses 2016/2017

Studies addressing frail patients excluded in the SPRINT study

Post hoc analyses 2016/2017

Subgroup analyses 2016/2017
BP targets and BP values: Which BP is “low“?

- systolic BP target in the intensive treatment group: < 120 mm Hg
n = 302

BPM in office  142/82 mmHg
BPM at home   136/77 mmHg
24-h- ABPM    124/76 mmHg

„Supervised“ BP measurements in studies:

Usually 10-15 mmHg higher than at home or in offices,


SPRINT monitoring was not a “real-world“ setting
**SPRINT Ambulatory Blood Pressure**


<table>
<thead>
<tr>
<th></th>
<th>Intensive Treatment &lt; 120 mmHg</th>
<th>Standard Treatment &lt; 140 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>n in SPRINT</td>
<td>4678</td>
<td>4683</td>
</tr>
<tr>
<td>n office BP vs. 24-h-ABPM</td>
<td>453</td>
<td>444</td>
</tr>
<tr>
<td>office BP</td>
<td>119.7 ± 12.8 mmHg</td>
<td>135.4 ± 13.7 mmHg</td>
</tr>
<tr>
<td>daytime 24-h-ABPM</td>
<td>126.5 ± 12.3 mmHg</td>
<td>138.8 ± 12.5 mmHg</td>
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<td>24-h-ABPM</td>
<td>122.7 ± 11.9 mmHg</td>
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**SPRINT Ambulatory Blood Pressure**


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*SPRINT’s BP values are not comparable to values in other previous studies*
CONTRA

1. SPRINT is not applicable to frail patients, as frail patients were excluded in the study.

2. Values < 120 mmHg in SPRINT don’t correspond to a “real-world“ setting. They correspond even to higher daytime 24-h-ABPM and to higher values in BPM at home or in medical offices.
patients with diabetes

lower | BP | higher

better |

worse


### Study

<table>
<thead>
<tr>
<th>Study</th>
<th>BP goals mmHg sys</th>
<th>Outcome</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action to Control Cardiovascular Risk in Diabetes Study, NEJM 2008</td>
<td>&lt; 120 vs. &lt; 140</td>
<td>No reduction of cardiovascular events, RR of stroke</td>
<td>Significant higher rate of SAE</td>
</tr>
<tr>
<td>Brunström M et al., Meta-analysis, MBJ 2016</td>
<td>&lt; 130 vs. 130-140</td>
<td>No reduction of CV-events</td>
<td>Significant higher rate of SAE</td>
</tr>
</tbody>
</table>
Blood pressure lowering for prevention of cardiovascular disease and death: a systematic review and meta-analysis


123 studies, 613 815 patients

patients with diabetes:

BP syst. < 140 mmHg:

RR: cardiovascular events

BP syst. < 130 mmHg:

no RR: cardiovascular events, SAE ↑
CONTRA

1. SPRINT is not applicable to frail patients, as frail patients were excluded in the study.

2. Lower values < 120 mmHg in SPRINT correspond even to higher daytime 24-h-ABPM and to higher values in BPM at home or in medical offices.

3. Patients with diabetes:
   - < 130 mmHg or < 120 mmHg: No RR in CV events, higher rates of SAE
Of all older adults ≥ 75 years with hypertension (U.S.A) …only 64% would have met the inclusion criteria of SPRINT

Hypertension in older adults

**Study goals:**
- Mortality ↓
- Macro- and microvascular events ↓
- …..

**Patient goals:**
- functional decline ↓
- functional impairment ↓
- mobility ↔

- Worsening of mental functions
- Orthostatic hypotension und dizziness
- Elektrolyte abnormalities
- Acute renal failure
- Too many controls at doctor's office
n = 2629, 79,9 years

< 120 mmHg:

→ No effect on changes in gait speed (4-m walk test) or mobility limitation
SPRINT subgroup analysis of the fit ≥75 years

Intensive BP: syncope 3.0 % vs. 2.4 % n.s.

without CKD: Acute renal failure ↑
Potential Deaths Averted and Serious Adverse Events Incurred From Adoption of the SPRINT (Systolic Blood Pressure Intervention Trial) Intensive Blood Pressure Regimen in the United States

Projections From NHANES (National Health and Nutrition Examination Survey)

Bress AD, Kramer H, Khatib R et al.
Figure 2. Potential number of serious adverse events (SAEs) per year with standard and intensive systolic blood pressure (SBP) control among NHANES (National Health and Nutrition Examination Survey) participants who meet the SPRINT (Systolic Blood Pressure Intervention Trial) eligibility criteria.
HYVET- Studie (HYpertension in the Very Elderly Trial)

## Studies in older adults

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Age (Mean)</th>
<th>Follow-up</th>
<th>BP sys.</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>JATOS</td>
<td>4400</td>
<td>73 years</td>
<td>2 years</td>
<td>145 vs 136 mmHg</td>
<td>JATOS Study Group, Hypertens Res 2008; 31:2115–2127</td>
</tr>
<tr>
<td>VALISH</td>
<td>3260</td>
<td>76 years</td>
<td>3 years</td>
<td>142 vs. 137 mmHg</td>
<td>Ogihara T et al., Hypertension 2010; 56:196–202</td>
</tr>
<tr>
<td>FEVER</td>
<td>3179</td>
<td>69 years</td>
<td>5 years</td>
<td>145 vs. 139 mmHg</td>
<td>Zhang Y et al., Eur Heart J 2011;32(12):1500-8</td>
</tr>
</tbody>
</table>
Outcomes of Intensive Blood Pressure Lowering in Older Hypertensive Patients

Chirag Bavishi, MD, MPH, Sripal Bangalore, MD, MHA, Franz H. Messerli, MD

Metaanalysis

10857 older patients
Outcomes of Intensive Blood Pressure Lowering in Older Hypertensive Patients

Chirag Bavishi, MD, MPH, a Sripal Bangalore, MD, MHA, b Franz H. Messerli, MD c,d

### TABLE 2 Characteristics of Patients in the Included Trials

<table>
<thead>
<tr>
<th></th>
<th>JATOS (13)</th>
<th>SPRINT-SENIOR (6)</th>
<th>VALISH (14)</th>
<th>Wei et al. (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intensive</td>
<td>Standard</td>
<td>Intensive</td>
<td>Standard</td>
</tr>
<tr>
<td>Age, yrs</td>
<td>NR</td>
<td>NR</td>
<td>80 ± 4</td>
<td>80 ± 4</td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>38</td>
<td>62.1</td>
<td>62</td>
</tr>
<tr>
<td>Diabetes</td>
<td>11.9</td>
<td>11.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>History of CVD</td>
<td>7.6</td>
<td>7.2</td>
<td>25.7</td>
<td>23.4</td>
</tr>
<tr>
<td>Baseline SBP, mm Hg</td>
<td>171.6 ± 9.7</td>
<td>171.5 ± 9.8</td>
<td>141.6 ± 15.7</td>
<td>141.6 ± 15.8</td>
</tr>
<tr>
<td>Baseline DBP, mm Hg</td>
<td>89.1 ± 9.5</td>
<td>89.10 ± 9.54</td>
<td>71.5 ± 11</td>
<td>70.9 ± 11</td>
</tr>
<tr>
<td>Final systolic BP, mm Hg</td>
<td>135.9 ± 11.7</td>
<td>145.6 ± 11.1</td>
<td>123.4 ± 8.3</td>
<td>134.8 ± 8.3</td>
</tr>
<tr>
<td>Final diastolic BP, mm Hg</td>
<td>74.8 ± 9.1</td>
<td>78.1 ± 8.9</td>
<td>62 ± 5.6</td>
<td>67.2 ± 6.5</td>
</tr>
</tbody>
</table>

HOFFMANN UTE: CONTRA
RR < 140 mm Hg:

Outcomes of Intensive Blood Pressure Lowering in Older Hypertensive Patients

Chirag Bavishi, MD, MPH, a Sripal Bangalore, MD, MHA, a Franz H. Messerli, MD b

central illustration

Intensive BP Lowering and Cardiovascular and Safety Outcomes in Older Hypertensive Patients

Effects of Intensive BP-lowering in Older (≥ 65 Years) Hypertensive Patients

**Beneficial effects**
- 29% reduction in major adverse cardiovascular
- 33% reduction in CV mortality
- 37% reduction in heart failure

**Drawbacks/concerns**
- Patients use an increased number of anti-hypertensive medications
- Possible increase in renal failure
- Possible increase in serious adverse events
- Possible increase in hypotension, syncope and other adverse effects

n.s. reduction of myocardial infarction and stroke


BP = blood pressure; CV = cardiovascular; MACE = major adverse cardiovascular event(s).
CONCLUSIONS: CONTRA

1. SPRINT is not applicable to frail patients, as frail patients were excluded in the study.

2. Values < 120 mmHg in SPRINT don't correspond to a “real-world“ setting. They correspond even to higher daytime 24-h-ABPM and to higher values in BPM at home or in medical offices.

3. Patients with diabetes:
   - < 130 mm Hg or < 120 mm Hg: No RR in CV events, higher rates of SAE

4. In older adults < 130 mm Hg (sys) should not be recommended. Data about BP targets in frail older patients are lacking.
THANK YOU