

NHF Oslo 05.11.21

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# Blodtrykksmåling – er det enkelt eller er det ikke enkelt?



Rune Mo  
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Første kjente  
blodtrykksmåling!

**År 1733**  
**Stephen Hales**  
(1677 –1761)

Prest,  
biolog,  
kjemiker,  
fysiolog.....



## **Scipione Riva-Rocci**

Barnelege, kliniker, patolog

\* 7. August 1863 i Almese †  
15. Mars 1937 i Torino



Gazzetta Medica di Torino 1896

# Hvorfor måler vi BT?

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- Generell vurdering av kardiovaskulær risiko
- Diagnostikk
  - Hypertensjon?
  - Hypotensjon?
- **MONITORERING**
  - Effekt av medikamentell behandling?
  - Mulighet for medikamentell behandling?

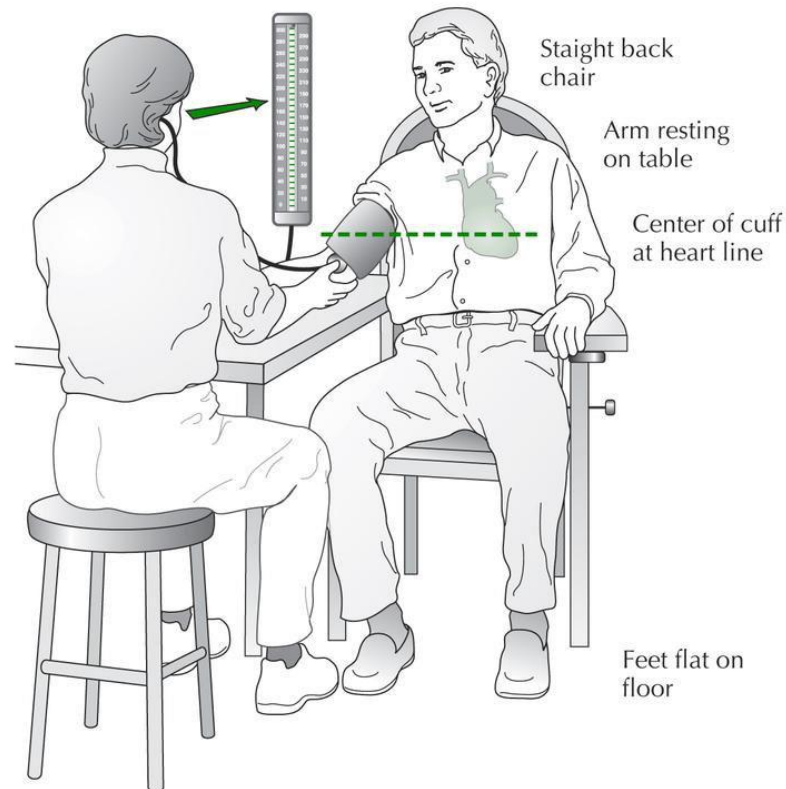
# BP measurement

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- *Of all the measurements in clinical medicine, **blood pressure** is one of the **most important and regularly performed**, But at the same time is one of the **most unreliable**.*

T. Pickering 1990

# Nøyaktig BT-måling krever standardisert prosedyre!



# Executive summary of the KDIGO 2021 Clinical Practice Guideline for the Management of Blood Pressure in Chronic Kidney Disease

## **«Standardized BP measurement»**

<b>1 Properly prepare the patient</b>	<ol style="list-style-type: none"> <li>1 Have the patient relax, sitting in a chair (feet on floor, back supported) for &gt; 5 min</li> <li>2 The patient should avoid caffeine, exercise, and smoking for at least 30 min before measurement</li> <li>3 Ensure patient has emptied his/her bladder</li> <li>4 Neither the patient nor the observer should talk during the rest period or during the measurement</li> <li>5 Remove all clothing covering the location of cuff placement</li> <li>6 Measurements made while the patient is sitting or lying on an examining table do not fulfill these criteria</li> </ol>
<b>2 Use proper technique for BP measurements</b>	<ol style="list-style-type: none"> <li>1 Use a BP measurement device that has been validated, and ensure that the device is calibrated periodically</li> <li>2 Support the patient's arm (e.g., resting on a desk)</li> <li>3 Position the middle of the cuff on the patient's upper arm at the level of the right atrium (the midpoint of the sternum)</li> <li>4 Use the correct cuff size, such that the bladder encircles 80% of the arm, and note if a larger- or smaller-than-normal cuff size is used</li> <li>5 Either the stethoscope diaphragm or bell may be used for auscultatory readings</li> </ol>
<b>3 Take the proper measurements needed for diagnosis and treatment of elevated BP</b>	<ol style="list-style-type: none"> <li>1 At the first visit, record BP in both arms. Use the arm that gives the higher reading for subsequent readings</li> <li>2 Separate repeated measurements by 1–2 min</li> <li>3 For auscultatory determinations, use a palpated estimate of radial pulse obliteration pressure to estimate SBP. Inflate the cuff 20–30 mm Hg above this level for an auscultatory determination of the BP level</li> <li>4 For auscultatory readings, deflate the cuff pressure 2 mm Hg per second, and listen for Korotkoff sounds</li> </ol>
<b>4 Properly document accurate BP readings</b>	<ol style="list-style-type: none"> <li>1 Record SBP and DBP. If using the auscultatory technique, record SBP and DBP as onset of the first Korotkoff sound and disappearance of all Korotkoff sounds, respectively, using the nearest even number</li> <li>2 Note the time of most recent BP medication taken before measurements</li> </ol>
<b>5 Average the readings</b>	<p>Use an average of <math>\geq 2</math> readings obtained on <math>\geq 2</math> occasions to estimate the individual's level of BP</p>
<b>6 Provide BP readings to patient</b>	<p>Provide patients with the SBP/DBP readings verbally and in writing</p>



1 Properly prepare the patient

1 Have the patient relax, sitting in a chair (feet on floor, back supported) for > 5 min  
2 The patient should avoid caffeine, exercise, and smoking for at least 30 min

# Blodtrykksmåling

## Noen sentrale momenter

2 Use proper technique

1 Use a BP measurement device that has been validated, and ensure that the

**Ro 5 min før og under måling**

3 Take the proper measurements needed for diagnosis and treatment of elevated BP

if a larger- or smaller-than-normal cuff size is used  
5 Either the stethoscope diaphragm or bell may be used for auscultatory readings

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Use an average of  $\geq 2$  readings obtained on  $\geq 2$  occasions to estimate the individual's level of BP

Provide patients with the SBP/DBP readings verbally and in writing

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## Validert BT-apparat

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# Manuelle og automatiske apparater



~~Kvikksølvmanometre~~



Auskultatoriske vs.  
oscillometriske manometre

~~Håndledd vs. overarm.~~

# Information on BP monitors



[www.dableducational.org](http://www.dableducational.org)

**dabl<sup>®</sup> Educational Trust**

Blood Pressure Monitors - Validations, Papers and Reviews



# STRIDE BP: an international initiative for accurate blood pressure measurement

George S. Stergiou<sup>a</sup>, Eoin O'Brien<sup>b</sup>, Martin Myers<sup>c</sup>, Paolo Palatini<sup>d</sup>, Gianfranco Parati<sup>e</sup>,  
the STRIDE BP Scientific Advisory Board

[www.stridebp.org](http://www.stridebp.org)

*Journal of Hypertension* 2020, 38:395–399

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### Mansjettbredde

For smal mansjett overestimerer BT  
For bred mansjett underestimerer BT

Bred mansjett ved overarmomkrets > 32 cm

listen for Korotkoff sounds

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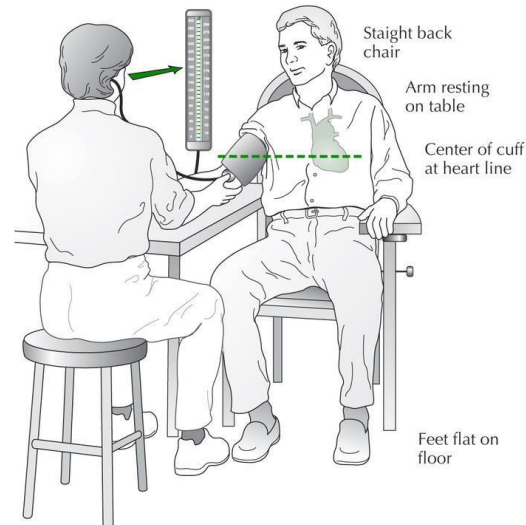
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### Armen skal hvile i hjertehøyde



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Mål 3 ganger  
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Pasientens BT er gjennomsnittet av de 2 siste målingene.

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mining table

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- Ro 5 min før og under måling
- Validert BT-apparat
- Mansjettbredde
- Armen skal hvile i hjertehøyde
- Mål 3 ganger
- 1-2 min pause mellom målingene
- Pasientens BT er gjennomsnittet av de 2 siste målingene.

6 Provide BP readings to patient

Provide patients with the SBP/DBP readings verbally and in writing

## Clinical indications for HBPM or ABPM

- Suspicion of white-coat hypertension
  - Grade I hypertension in the office
  - High office BP in individuals without asymptomatic organ damage and at low total CV risk
- Suspicion of masked hypertension
  - High normal BP in the office
  - Normal office BP in individuals with asymptomatic organ damage or at high total CV risk
- Identification of white-coat effect in hypertensive patients
- Considerable variability of office BP over the same or different visits
- Autonomic, postural, post-prandial, siesta- and drug-induced hypotension
- Elevated office BP or suspected pre-eclampsia in pregnant women
- Identification of true and false resistant hypertension

# Hjemmemålinger - anbefaling

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Mål BT morgen og kveld i minimum 3-4 dager, helst 7 dager på rad.

Mål BT i et stille rom, stittende med støtte til rygg og arm, etter 5 min hvile og 2 ganger med 1-2 minutters pauser.

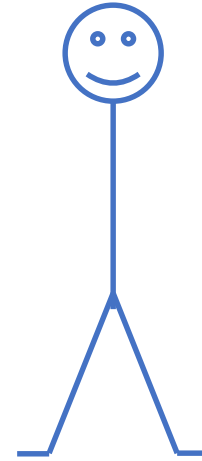
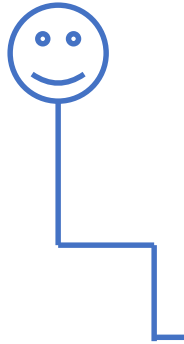
*Parati G et al . European Society of Hypertension practice guidelines for home blood pressure monitoring. J Hum Hypertens 2010;24:779–785.*

# Ortostatisk hypotensjon – når skal vi tenke på det?

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- Lave BT ved sittende (liggende) måling.
- Redusert allmenntilstand.
- Svimmelhet (ved stillingsendring)
- (Nær-)synkope

# Ortostatisk blodtrykksmåling

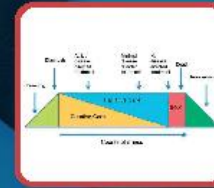


Måling      1    2    3                      1

**Gj.snitt av sittende måling 2 og 3    -    stående måling**

**Ortostatisk hypotensjon: Fall i systolisk BT  $\geq$  20 mmHg**

**Tema:**  
**Hypertensjon**  
side 24-59



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i et geriatrisk perspektiv  
s. 10



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