Heidelberg März 2023

 Sollen wir den Blutdruck bei allen CKD
 Patienten, VOR der Dialyse, in den KDIGO Zielbereich (SBD <120 mmHg) absenken?

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Sollen wir den Blutdruck bei allen CKD Patienten, VOR der Dialyse, in den KDIGO Zielbereich (SBD> <120 mmHg) absenken? JA UND DEN BLUTDRUCK KORREKT MESSEN!

KDIGO Guideline Co-Chairs:

Alfred K. Cheung, MD University of Utah, USA

Johannes Mann, MD KfH Kidney Center and Univ. of Erlangen, Germany I report the following potential duality/dualities of interest in the field covered by my lecture:

•Consultant: UpToDate Inc., AstraZeneca, Bayer, Boehringer, Novo Nordisk,

•Employee: KfH

•Research Support: European Union, Canadian Institutes of Health Research, AstraZeneca, Bayer, Boehringer, Idorsia, Novo Nordisk, Sanofi

•Speaker's Bureau: AstraZeneca, Bayer, Boehringer, Novartis, Novo Nordisk

GUIDELINE CHAPTERS

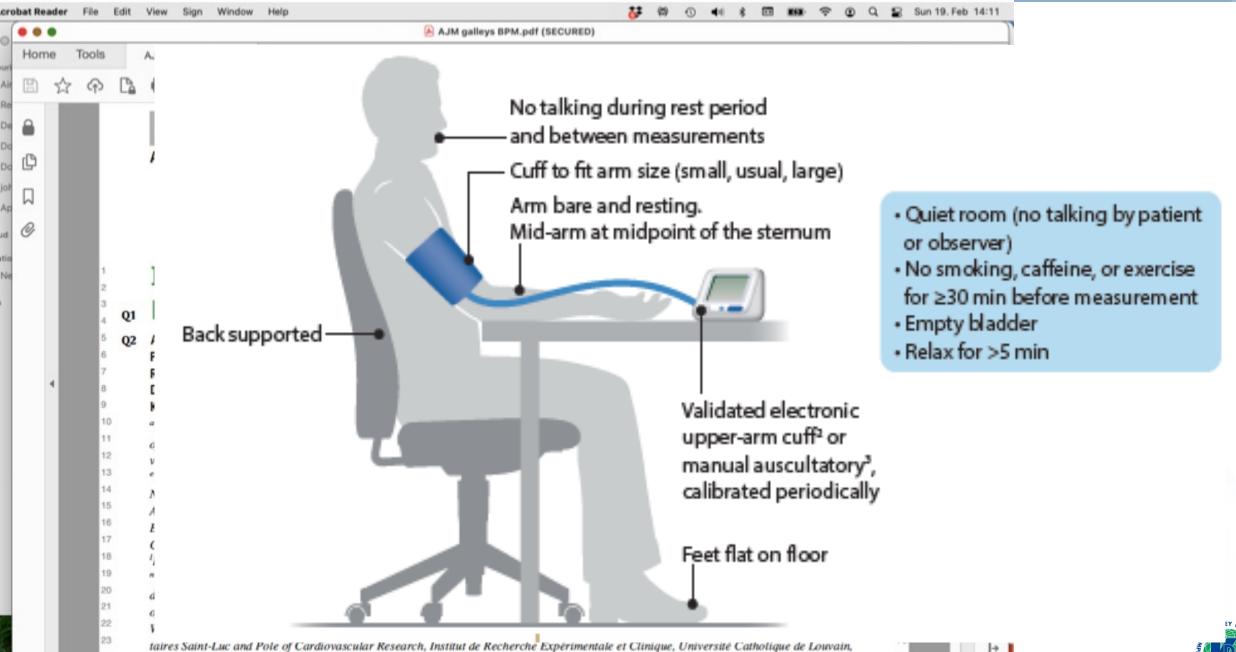
- Chapter 1. BP Measurement
- Chapter 2. Lifestyle Treatment for Lowering BP in CKD Patients
- Chapter 3. BP Management in CKD ND Patients with and without Diabetes: BP targets and treatments
- Chapter 4. BP Management in Kidney Transplant Recipients
- Chapter 5. BP Management in Children with CKD



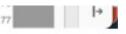
BP MEASUREMENT

Recommendation 1.1. We recommend standardized office BP (in preference to routine office) BP for the management of high BP in adults (1B).





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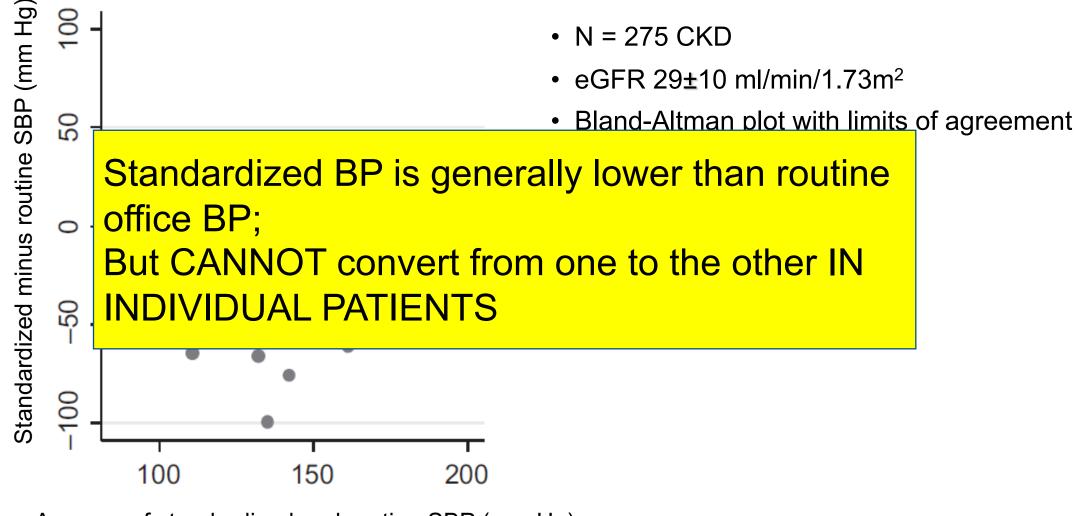
Measurement of BP in all major trials: standardized !

Study	Year	Type of Study	Method/Device	Wait/Rest, min	# Readings
Framingham ²³	1970s	Observational	Manual	5	2
SHEP ²⁴	1991	Clinical trial	Manual	5	2
MDRD ⁵	1994	Clinical trial	Manual	5	3
UKPDS ⁷	1998	Clinical trial	Manual	5	3
ALLHAT ⁸	2000	Clinical trial	Manual	5	2
HOPE ^{9,10}	2001	Clinical trial	Manual	15	2
HYVET ²⁵	2001	Clinical trial	Manual and automated	5	2
AASK ⁶	2002	Clinical trial	Manual	5	3
ADVANCE ¹¹	2007	Clinical trial	Automated/Omron	5	2
CRIC ²⁶	2009	Observational study	Manual	5	3
ACCORD ¹²	2010	Clinical trial	Automated/Omron	5	3
SPS327	2011	Clinical trial	Automated/Colin electronic device	15	3
ONTARGET ¹³	2012	Clinical trial	Automated/Omron	3	2
CKD-JAC ²⁸	2013	Observational study	Manual	5	3
SPRINT	2015	Clinical trial	Automated/Omron	5	3

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Poor Correlation Between Routine and Standardized Office BP in CKD



Average of standardized and routine SBP (mm Hg)

Agarwal, JAHA, 2017

GUIDELINE CHAPTERS

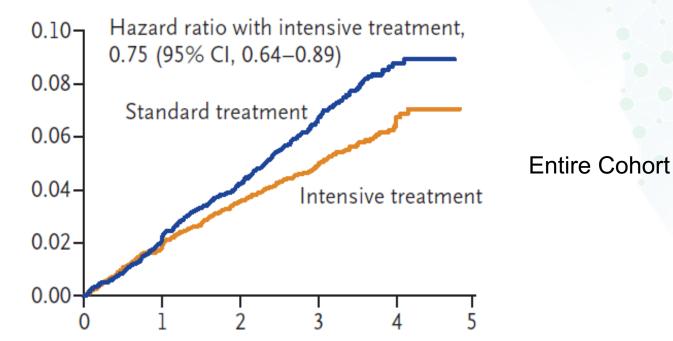
- Chapter 1. BP Measurement
- Chapter 2. Lifestyle Treatment for Lowering BP in CKD Patients
- Chapter 3. BP Management in CKD ND Patients with and without Diabetes: BP targets
- Chapter 4. BP Management in Kidney Transplant Recipients
- Chapter 5. BP Management in Children with CKD



BP MANAGEMENT IN CKD ND PATIENTS WITH AND WITHOUT DIABETES – BP TARGETS

Recommendation 3.1.1. We suggest that adults with high BP and CKD be treated with a target systolic blood pressure **(SBP) of less than 120 mm Hg, when tolerated**, using *standardized* office BP measurement (2B).

Based mainly on SPRINT study (SBP <120 vs <140mmHg, N=9361, CKD=2646)





Among a 1000 patients like you, on average with Low blood pressure target (\leq 120 mmHg)

All-cause	mortality	Cardiovascu	lar mortality	End-stage kide >50% los		Acute kidney injury			
🔮 🛛 14 fe	ewer	🔮 9 fe	wer	🔮 1 fe	wer	15 more			
Standard blood pressure target	Low blood pressure target (≤120 mmHg)	Standard blood pressure target	Low blood pressure target (≤120 mmHg)	Standard blood pressure target	Low blood pressure target (≤120 mmHg)	Standard blood pressure target	Low blood pressure target (≤120 mmHg)		
53 per 1000	39 per 1000	23 per 1000	14	12 per 1000	11 per 1000	33 per 1000	48 per 1000		
Certa @@ LO		ଡ଼ଡ଼	ainty QQ w	Certa @@ LO	QQ	ଡ୍ଡ	tainty 200 ow		

Hypokaler	nia	>30% loss	in eGFR	>40% loss i	0% loss in eGFR Mild cognitive impairment Cardiovascular e		cular events	M	vocardial infarction	Stroke		
	Hear	rt failure	Probabl	e dementia	Falls	Fatigue	Serious adve	rse events	Hyperkalemia		Practical issues	



Concerns about the applicability of SPRINT findings

- Discordant results of ACCORD-BP (type 2 diabetes)
- Cognitive function in elderly
- Kidney effects

ACCORD BP

- 4733 participants with type 2 diabetes
- Randomly assigned a 2 × 2 factorial design to
 - intensive glycemic control (HbA1c target <6 % or standard control (HbA1c target 7.0 to 7.9%)</p>
 - intensive SBP (goal <120 mm Hg) or standard
 SBP (goal < 140 mm Hg)

ACCORD BP Primary results (MI, stroke, CV death)

Α **Primary Outcome** 1.0 -0.2-Standard Proportion with Event 0.8-0.1ntensive 0.6-0.0 2 3 5 6 7 8 4 0 0.4-P = 0.200.2-0.0 7 8 2 3 5 6 0 Years

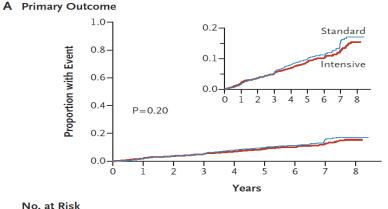
N Engl J Med 2010;362:1575-85.

No. at Risk

Intensive Standard

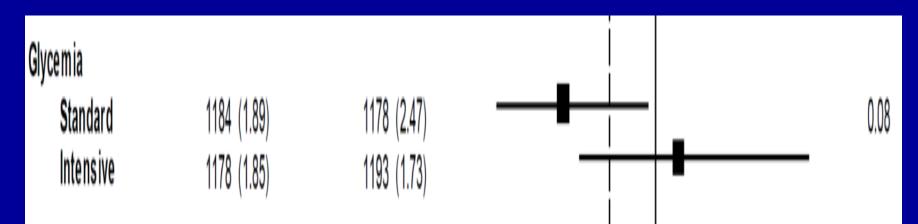
N									
	2362	2273	2182	2117	1770	1080	298	175	80
	2371	2274	2196	2120	1793	1127	358	195	108

ACCORD BP Primary results (MACE)



Intensive 2362 2273 2182 2117 1770 1080 298 175 80 Standard 2371 2274 2196 2120 1793 1127 358 195 108

N Engl J Med 2010;362:1575-85.



Supplementary Appendix 1

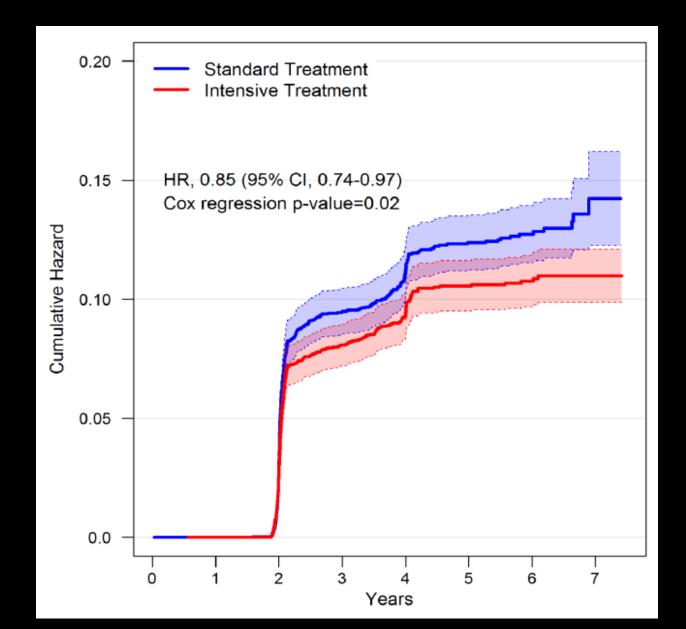
This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: The ACCORD Study Group. Effects of intensive blood-pressure control in type 2 diabetes mellitus. N Engl J Med 2010;362:1575-85. DOI: 10.1056/NEJMoa1001286.

Concerns about the applicability of SPRINT findings

- Discordant results of ACCORD-BP (type 2 diabetes)
- Cognitive function in elderly
- Kidney effects

SPRINT: Probable dementia or mild cognitive impairment



SPRINT, JAMA, 2019

Adverse Events in CKD Subgroup in SPRINT

(Cheung et al. JASN 2017)

	No. of Participa			
	Intensive BP	Standard BP	HR	Р
Hypotension	51 (3.8)	38 (2.9)	1.34	0.17
Syncope	54 (4.1)	42 (3.2)	1.28	0.22
Injurious fall	125 (9.4)	138 (10.5)	0.90	0.40
AKI/ARF	114 (8.6)	78 (5.9)	1.46	0.01
K <3.0 mmol/l	30 (2.2)	16 (1.2)	1.87	0.04
K >5.5 mmol/l	106 (8.0)	78 (5.9)	1.36	0.04
TOTAL SAE	627 (47.1)	640 (48.1)	0.98	0.67

Individualization is Key

But reasonable to have general BP target

GUIDELINE CHAPTERS

- Chapter 1. BP Measurement
- Chapter 2. Lifestyle Treatment for Lowering BP in CKD Patients
- Chapter 3. BP Management in CKD ND Patients with and without Diabetes: BP targets and treatments
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BLOOD PRESSURE MANAGEMENT IN PATIENTS WITH CKD, WITH OR WITHOUT DIABETES, NOT RECEIVING DIALYSIS

Recommendation 3.2.1: We recommend starting renin-angiotensin-system inhibitors (RASi) (angiotensin-converting enzyme inhibitor [ACEi] or angiotensin II receptor blocker [ARB]) for people with high BP, CKD, and severely increased albuminuria (G1-G4, A3) without diabetes (1B).

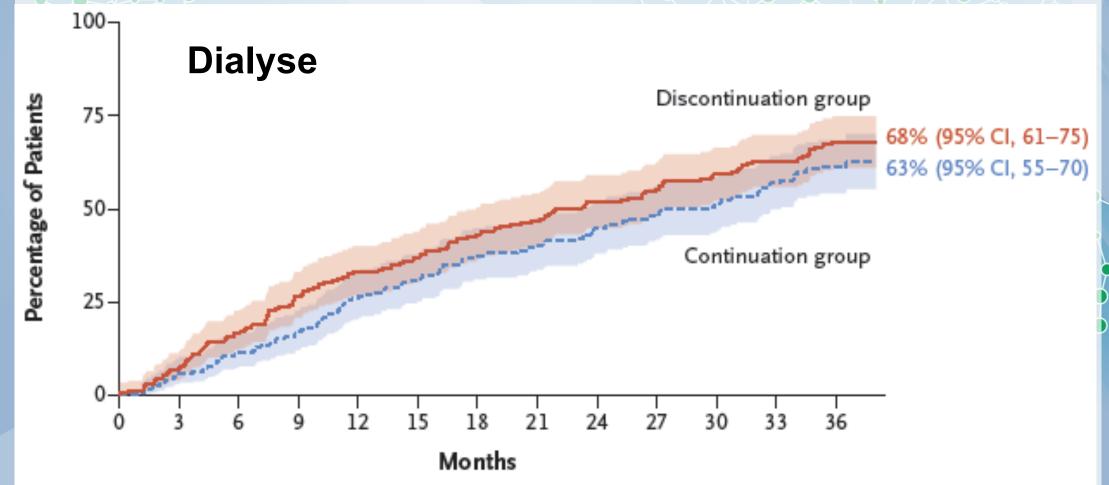
Cardiovascular events in patients with CKD G3-G4, A3 without diabetes

	ACEi		Place no trea			Risk ratio	Risk ratio
Study or subgroup	Events	Total	Events	Total	Weight	M–H, random, 95% Cl	M–H, random, 95% Cl
Albuminuria/prote	inuria						
AIPRI 1996	9	300	14	283	33.4%	0.61 [0.27, 1.38]	
GISEN 1997	4	78	3	88	10.5%	1.50 [0.35, 6.51]	
Hou 2006	14	216	16	112	48.8%	0.45 [0.23, 0.90]	-8-
REIN Stratum-1 199	92	99	3	87	7.3%	0.59 [0.10, 3.43]	
Subtotal (95% CI)		693		570	100.0%	0.58 [0.36, 0.93]	\diamond
Total events Heterogeneity: Tau ² = Test for overall effect:		-	-		0%	0.01	1 0.1 1 10 100 Favors ACEi Favors placebo



RASi weglassen, wenn GFR sinkt?

STOP ACEi trial: N= 411, 3 Jahre, eGFR 18 ml/min

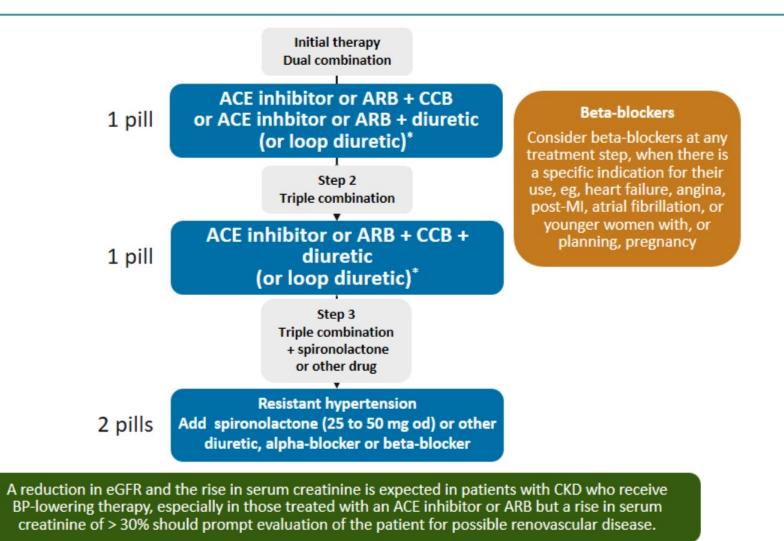


The talk in one slide

- SPRINT showed that 'targeting' a standardized office (=clinic)
 SBP < 120 mm Hg resulted in lower overall mortality, including in CKD.
- Very similar reduction in harm with SBP <120 was demonstrated in the standard glycaemic arm of ACCORD.
- Basing ANY clinical decisions on non-standardized clinic BP is indefensible.

- The KDIGO guideline explicitly requires a shared decisionmaking process. It is unreasonable not to offer CKD patients the choice.

Drug-Treatment Strategy for Hypertension and CKD



*Use loop diuretics when eGFR is < 30 mL/min/1.72 m², because thiazide/thiazide-like diuretics are much less effective/ineffective when eGFR is reduced to this level.