

The **19**th International Congress of Nephrology, Dialysis and Transplantation (ICNDT)

12-15 December 2023 Homa Hotel, Tehran

## Goal Blood Pressure in Chronic Kidney Disease

Ali Monfared,Nephrologist Guilan university of medical sciences

## Introduction

- ✓ Well-controlled BP is an essential factor in inhibiting the progression of renal failure and also in controlling CV mortality and morbidity.
- ✓ Different target BP have been defined leading to ongoing *debate on target BP goals* in the general population and special groups such as patients with CKD.

Clin J Am Soc Nephrol 14: ccc–ccc, January, 2019 Curr Opin Nephrol Hypertens 2023 Nov 1;32(6):497-501



### The major hypertension trials from 1960-2018



. Eur Heart J 39: 3021–3104, 2018

#### proposed BP targets depend on the measurement method

### ✓ Routine office ;

- A single, manual measurement with a stethoscope
- Oscillometric device

## ✓ Non-routine methods:

- Automatic oscillometric blood pressure monitoring in the office
- Home blood pressure monitoring
- Ambulatory blood pressure monitoring .
- On average, systolic pressure is 5 to 10 mmHg lower with non-routine than routine measurement sbecause the ''white coat'' effect is absent



#### BP pattern in CKD patients based on office and ABPM



### Method of BP measurement

An increasing emphasis should be given to the preferred method for recording BP and the usefulness of the Home Blood Pressure Self-monitoring (HBPM) and 24-h **Ambulatory Blood Pressure Monitoring** (ABPM)



#### proposed BP targets depend to the Patient's risk for having a future CV event

- ✓ For patients with one or more of the following risks :
  - Patients with established atherosclerotic cardiovascular disease
  - Heart failure
  - Diabetes mellitus

• Patients with chronic kidney disease

<u>A More intensive goal is indicated</u>

Circulation 2017; 135:1617.



#### Goal blood pressure in CKD

- ✓ 85% of patients with CKD have hypertension
- $\checkmark BP control is the cornerstone in the management of CKD.$
- ✓ BP targets in CKD are not known
- ✓ The interrelation between HTN and CKD is bidirectional.
  - Persistent hypertension can accelerate the progression of CKD
  - progressive decline in GFR can conversely interfere with the achievement of adequate BP control .
- ✓ The coexistence of uncontrolled HTN and CKD :
  - Substantially magnifies the risk of CVD.

Nephrol Dial Transplant, 2023, 0, 1–10





Hypertension Volume 70, Issue 4, October 2017; Pages 687-694



#### Pathophysiology of HTN in CKD





# Pathophysiology of HTN in CKD

#### ✓ Complications unique to CKD, such as:

- Secondary hyperparathyroidism and
- Increased calcium-phosphate products leading to arterial stiffness
- Increased prevalence of OSA
- Use of specific drugs such as:
  - Erythropoietin
  - Glucocorticoids
  - Calcineurin inhibitors

may also be involved in the BP elevation in later CKD stages



## According to the mentioned contents what should be the target BP in CKD ?





#### The blood pressure target for chronic kidney disease patients recommended by

#### contemporary major international guidelines.



The **19**<sup>th</sup> International Congress of Nephrology, Dialysis and Transplantation (ICNDT) 12-15 December 2023 . Homa Hotel, Tehran



Hypertension. 2022;79:4–11. DOI: 10.1161/HYPERTENSIONAHA.121.1 8434

### **KDIGO 2021**

✓ KDIGO suggests that adults with high BP and CKD be treated with target systolic blood pressure (SBP) of <120 mm Hg, as determined by the standardized office measurement, if tolerated.



#### ESH Guidelines

# 2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA)

Authors/Task	Force Members: Giuseppe Mancia (	(Chairperson) <sup>a,+</sup> , Reinhold Kreutz (C	o-Chair) <sup>b,+</sup> ,
Mattias Brunström <sup>c</sup> , Michel Bumier <sup>d</sup> , Guido Grassi <sup>e</sup> , Andrzej Januszewicz <sup>f</sup> ,			
Maria Lorenza Muiocan <sup>g</sup> Konstantinos Tsioufic <sup>h</sup> Enrice Agabiti-Rosei <sup>1</sup> ,			
Engi Abd Elh	Journal of Hypertension Volume 41 Number 12 December 2023	netos <sup>1</sup> , Claudio Borghi <sup>m</sup> ,	
Jana Brgulja		onique Cornelissen <sup>r</sup> ,	
J. Kennedy C		r 2023 er <sup>v</sup> , Rosa Maria de Pinho <sup>v</sup>	×,
Christian Del		Michalis Doumas <sup>aa</sup> ,	
Christian Del		Michalis Doumas <sup>aa</sup> ,	



#### ✓ There is a common perception that BP-lowering is renoprotective

- This concept is likely true if SBP is lowered to <140 mm Hg. and
- Target SBP < 120 in the KDIGO 2021 is based on its:
  - Cardioprotective,
  - Survival,
  - and potential cognitive benefits as shown in the SPRINT trial

# ✓ The overall evidence suggests that there is no renoprotective effect at this SBP level and the recommendation is weak

Kidney International (2021) 99, 559–569



What Is Wrong with the Blood Pressure Target Recommendation of KDIGO 2021 for Hypertension in Chronic Kidney Disease?

Abstract

Context: Eighty-five percent of patients with chronic kidney disease (CKD) have hypertension, and blood pressure (BP) control is the cornerstone in the management of CKD. Although it is widely accepted that BP should be optimized, BP targets in CKD are not known. Subject of Review: Kidney Disease Improving Global Outcomes (KDIGO) clinical practice guideline for the management of BP in CKD (Kidney Int. 2021 Mar 1;99(3S):S1–87) recommends targeting BP to less than 120 mm Hg systolic for patients with CKD. Second Opinion: KDIGO BP target differs from all other hypertension guidelines. This is also a major change from the previous recommendation which was <140 systolic to all patients with CKD and <130 systolic for those with proteinuria. Targeting systolic BP to less than 120 mm Hg is hard to substantiate based on available data and is based primarily on subgroup analysis of a randomized control trial. Intensive BP lowering as suggested by the guidelines may lead to polypharmacy, added cost burden, and risk of serious harms.

Nephron (2023) 147 (10): 616-620



✓ In most CKD patients with high BP, including the frail and elderly, the cardiovascular benefits of a target SBP <120 versus <140 appears to outweigh the risks of harm, such as:

- Acute kidney injury and
- Electrolyte abnormalities, and the
- Risk of cognitive impairment

Kidney International (2021) 99, 559–569





 ✓ However the evidence supporting the SBP target of <120 is less certain in some subpopulations, including:

- Those with diabetes,
- Advanced CKD (G4 and G5),
- Significant proteinuria (>1 g/d),
- Baseline SBP 120–129
- The young (age <50 years) or
- Very old (age >90 years), and
- Those with "white coat" or severe hypertension

Randomized trials targeting these subpopulations are necessary

Kidney International (2021) 99, 559–569



#### **Hypertension**

#### REVIEW

#### Is the KDIGO Systolic Blood Pressure Target <120 mm Hg for Chronic Kidney Disease Appropriate in Routine Clinical Practice?

Indranil Dasgupta<sup>®</sup>, Carmine Zoccali<sup>®</sup>

ABSTRACT: Meticulous management of hypertension is important in chronic kidney disease (CKD) to reduce the risk of cardiovascular disease, mortality, and progression of CKD. The recently published Kidney Disease Improving Global Outcomes (KDIGO) guideline on blood pressure (BP) management in CKD stresses the importance of standardized BP measurement and strict control of BP. This is a useful document that will help to improve the management of hypertension in CKD globally. However, the recommendation of systolic BP target of <120 mm Hg by KDIGO is controversial. It is based on weak evidence derived mainly from a single randomized controlled trial and its CKD subgroup analysis. Here, we review the current evidence surrounding BP target in CKD. We argue that the target recommended by KDIGO is not generalizable to the majority of people with CKD. Standardized BP measurements are challenging to implement outside specialist hypertension and research clinics, and the target of <120 mm Hg BP systolic cannot be extrapolated to routine clinic BP measurements. If applied to routine BP measurement, this target will expose the multimorbid and frail CKD patients to the risk of adverse events



### The KDIGO targeted systolic BP less than 120

- ✓ Is refers to standardized BP and not to routine office BP
- ✓ Standardized BP measurement is important for initiating and monitoring treatment of hypertension , but it is challenging to implement outside specialist hypertension or research clinics
- ✓ Is based on CKD sub group analysis of a single RCT means sprint study
- The target is not generalizable as sprint excluded people with diabetes, ADPKD, GN on immunosuppression, proteinuria>1gr /day, and CKD stage 4 and 5

Hypertension. 2022;79:4–11. DOI: 10.1161/HYPERTENSIONAHA.121.18434



- ✓ The target will increase the risk of adverse events in the multimorbid, frail and elderly CKD populations especially if applied to routine BP measurement
- ✓ The target will be difficult to achieve in majority of CKD patients based on current evidence
- ✓ The recommended target by KDIGO is an outlier among the contemporary international hypertension guidelines and will preplex the clinicians

Hypertension. 2022;79:4–11. DOI: 10.1161/HYPERTENSIONAHA.121.18434



The only trial that compared the low BP target (SBP, <120 mm Hg) with standard BP (<140 mm Hg) in diabetic patients was the ACCORD trial (Action to Control Cardiovascular Risk in Diabetes).

This trial failed to show any benefit of intensive BP control except a reduction in the risk of nonfatal stroke

N Engl J Med. 2015;373:2103–2116. doi:10.1056/NEJMoa1511939



#### Systematic reviews and meta-analyses looked at the benefit of intensive BP control in CKD

- ✓ The first one compared intensive BP control <130/80 with standard control <140/90 on major renal outcomes in patients with CKD without diabetes.
  - It included 9 major hypertension trials with 8127 participants, including SPRINT, which looked at the progression of CKD.
  - Over a median of 3.3 years of follow-up,

there was no additional benefit of intensive BP control on renal outcomes

JAMA Intern Med. 2017;177:792-799.



The second carried out a meta-analysis of 18 randomized clinical trials (including SPRINT and ACCORD)
Comprising 15 924 patients with CKD,

✓ more intensive BP lowering (SBP, 132 versus 140 mm Hg) was associated with significantly lower (HR, 0.86 [95% CI, 0.63-0.99]) risk of mortality compared with less intensive BP control

JAMA Intern Med. 2017;177:1498-1505





Original Article







✓ A network meta-analysis of 26 hypertension trials (including SPRINT, ACCORD, and all major CKD BP trials) evaluated:

- The efficacy outcomes of:
  - Stroke, myocardial infarction, death, cardiovascular death, heart failure
- Safety outcomes of serious adverse effects including:
  - Angioedema, hypotension, syncope, bradycardia/arrhythmia, or hypo/hyperkalemia.

#### ✓ Trial arms were grouped into 5 SBP target categories:

• <160, <150, <140, <130, and <120 mm Hg.

There was no difference in death, cardiovascular death, or heart failure when comparing any of the BP targets

JAMA Intern Med. 2017;177:1498–1505



# ✓ The point estimates favored lower BP targets <120 and <130 when compared with higher BP targets <140 or <150.</p>

• 125 -130 in routine and 120-125 in standard measurement method

✓ However, there were significantly higher incidence rates of serious adverse effects with lower BP targets such as AKI and fracture

Adv Chronic Kidney Dis. 2019;26(2):110-116

Am J Med. 2017;130:707–719.



#### Conclusion

✓ Clinicians should reach a consensus that a systolic BP level <120-130 in CKD improves all-cause mortality rates and achieve optimal balance between efficacy and safety despite the variations between the reported data.

 ✓ However, further studies are required to assess the link between the early detection and control of high BP levels and CKD development and progression patterns.

Hypertension. 2022;79:4–11. DOI: 10.1161/HYPERTENSIONAHA.121.18434



# Thank you for attention

TEHRAN 2023

