

WHITE COAT HYPERTENSION ..STILL INNOCENT ?

BY
DR. MARWA GAD, MD
A. PROFESSOR OF CARDIOLOGY
ZAGAZIG UNVIRSTY

WHITE COAT SYNDROM

- ✘ White coat effect
- ✘ White coat hypertension
- ✘ Masked hyperyension

White coat effect

- ❖ The Treated hypertensive patients may have elevated office BP levels ,when compared to out-of-office measurements of ABPM or HBP.
- ❖ 30% or more of these patients are actually well controlled or even over-controlled.
- ❖ They don't need more medication, and they may even need less
- ❖ This condition should be well evaluated as it may give the false impression of uncontrolled hypertension.

Non-dipping of nocturnal BP
(fail in decrease of 10% of
BP on nocturnal levels)

↑SNS

**THIS PHENOMENON
WAS ASSOCIATED**

Higher heart rate

High prevalence in patients with
resistant hypertension
and closely related to ischemia
silent myocardium

WHITE COAT HYPERTENSION



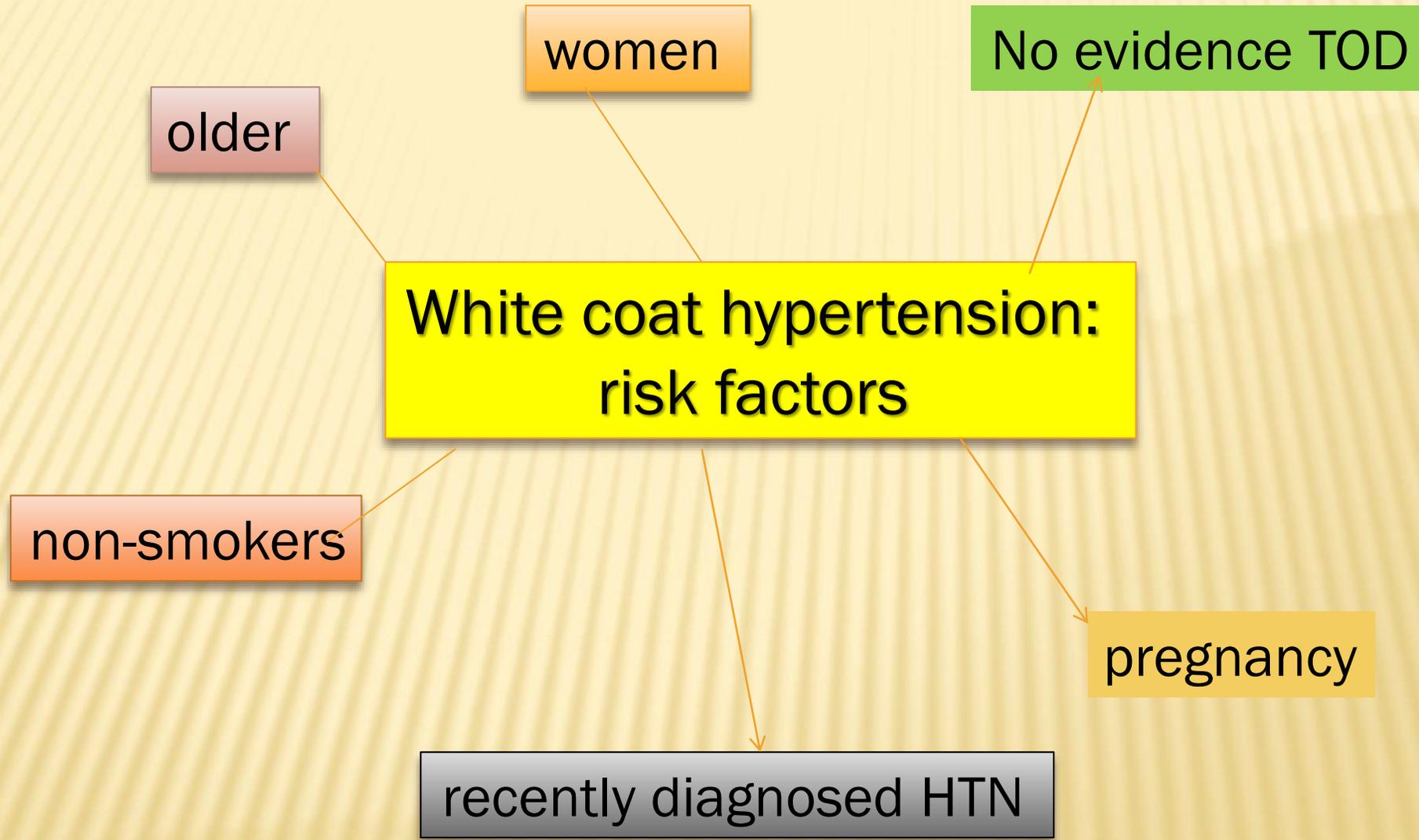
WHITE COAT HYPERTENSION

- ❖ The discrepancy ≥ 20 mm Hg SBP or 10 mm Hg DBP between office BP and ABPM or HBPM,
- ❖ It is diagnosed after at least three occasions when office BP is $\geq 140/90$ mmHg when the mean 24-hour ABPM is $< 135/85$ mmHg.
- ❖ 30% of subjects attending outpatient hypertension centers.



WHITE COAT HYPERTENSION

- ❖ While *white coat HTN* is well-known, it's unclear why such patients might be at higher risk even when their BP at home seem normal.
- ❖ "It may tell us something about the reaction of their body to stress, and conceivably, people who have more stress in their lives could sustain higher BP than others.



older

women

No evidence TOD

White coat hypertension:
risk factors

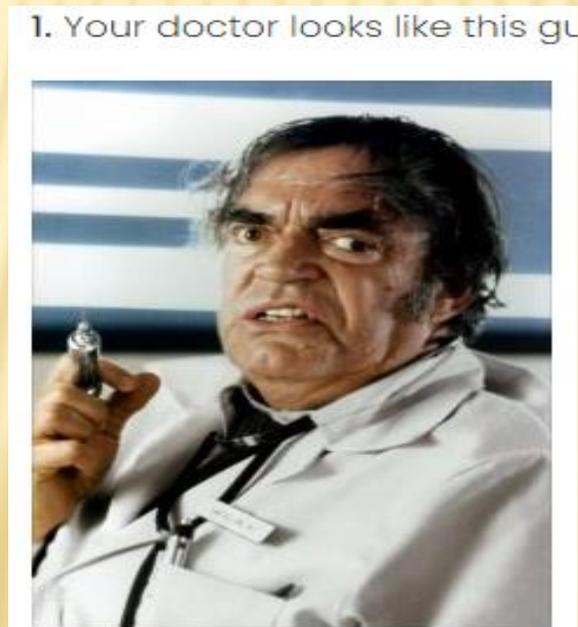
non-smokers

pregnancy

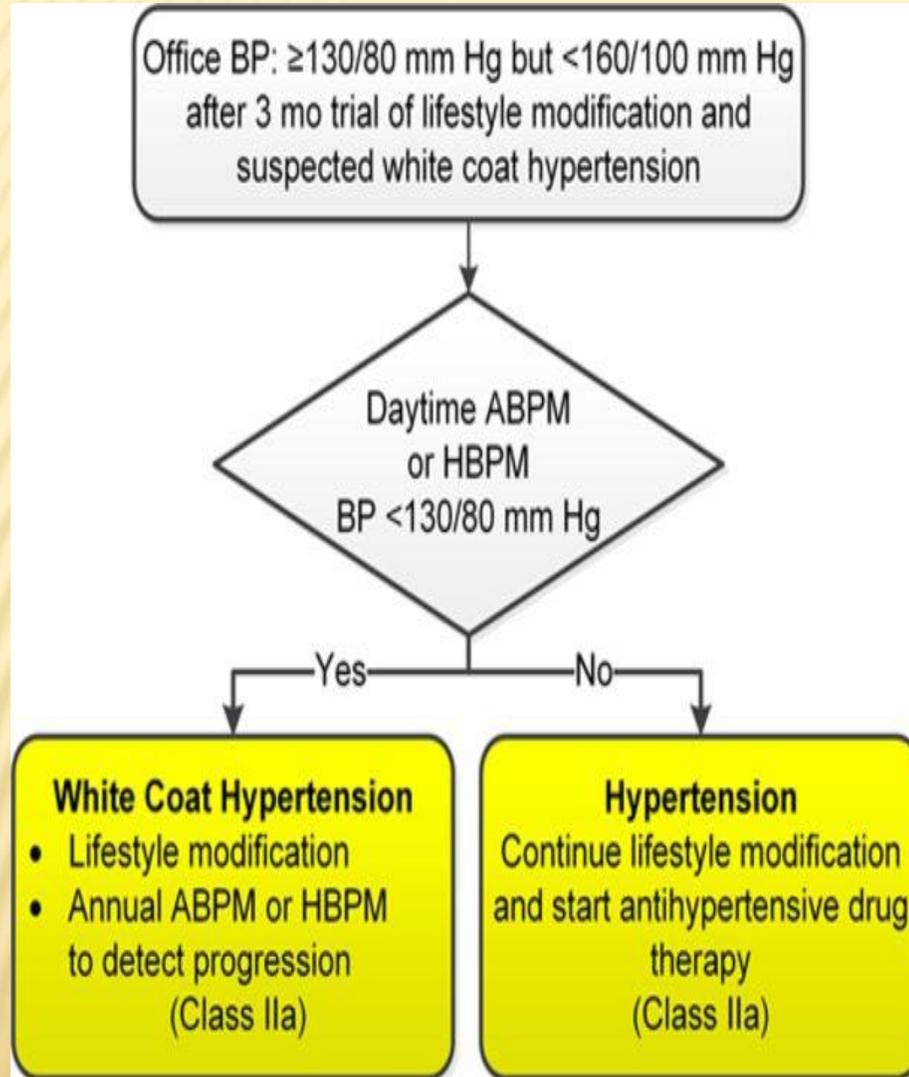
recently diagnosed HTN

DOES IT MAKE A DIFFERENCE WHO MEASURES THE BP?

- ✱ Nurse or the physician
- ✱ nurse-administered BP measurement showed only about half the degree of WCE as physicians, *both in BP elevation and heart rate*



Detection of white coat hypertension or masked hypertension in patients not on drug therapy



**DOES WCH PUT PATIENTS AT INCREASED
RISK?**

@ THE MICROSCOPIC VIEW

- ✱ Endothelial damage and angiogenesis, which indicate an increased risk for a poor prognosis in MHTN and WCH patients.
- ✱ They are associated with **significantly higher endothelin-1 and vascular endothelial growth factor levels**

Clinical trials which provide presence of WCH may be involved in increased CV risks and cardiac and vascular lesions.



CURE FOR
WHITE COAT HYPERTENSION

summary of the associated characteristics of normotension, a phenomenon related to white coat syndrome and hypertension.

Features	Normotension	White coat effect	White coat hypertension	Masked hypertension	Hypertension	
					Within normal BP limits	Exceeding normal BP limits
Office BP levels	≤120/80 mmHg ¹⁶	>20/10 mmHg when compared to home measurements ¹⁴	≥140/90 mmHg ³⁸	<140/90 mmHg ³⁸	<140/90 mmHg ¹⁶	≥140/90 mmHg ¹⁵
24 hours ABPM levels	<130/80 mmHg ¹⁶	<130/80 mmHg ¹⁴	<130/80 mmHg ³⁸	≥130/80 mmHg ³⁸	<130/80 mmHg ¹⁶	≥130/80 mmHg ¹⁵
HBPM levels	<135/85 mmHg ¹⁶	≤135/85 mmHg ¹⁴	<135/85 mmHg ³⁸	≥135/85 mmHg ³⁸	<135/85 mmHg ¹⁶	≥135/85 mmHg ¹⁵
Clinical characteristics	–	Higher heart rate levels and BP non-dipping condition ¹⁷	Higher in female sex, obese, and it seems to increase with respect to age ²⁴	Increased risk of atherosclerotic CVD, ⁴¹ morbidity, and mortality for CVD ^{43,44}	Sustained elevated BP levels are related to the development of TOD and, consequently, increased CV risk ²⁵	
Target organ damage	–	Low relationship with TOD development; ²² correlation with arterial stiffness ^{20,21}	Correlation with arterial stiffness ²⁸ and LVH ³⁴	Presents a higher risk of developing TOD than other phenomena but less risk than hypertensive ¹¹	LVH, diastolic dysfunction, carotid intima-media thickening or plaque, renal damage, and micro- as well as macro-vascular alterations ²⁴	

White coat syndrome and its variations: differences and clinical impact

Mariana R Pioli, Alessandra MV Ritter, Ana Paula de Faria, Rodrigo Modolo
 Integr Blood Press Control. 2018; 11: 73–79. Published online 2018 Nov 8. doi: 10.2147/IBPC.S152761

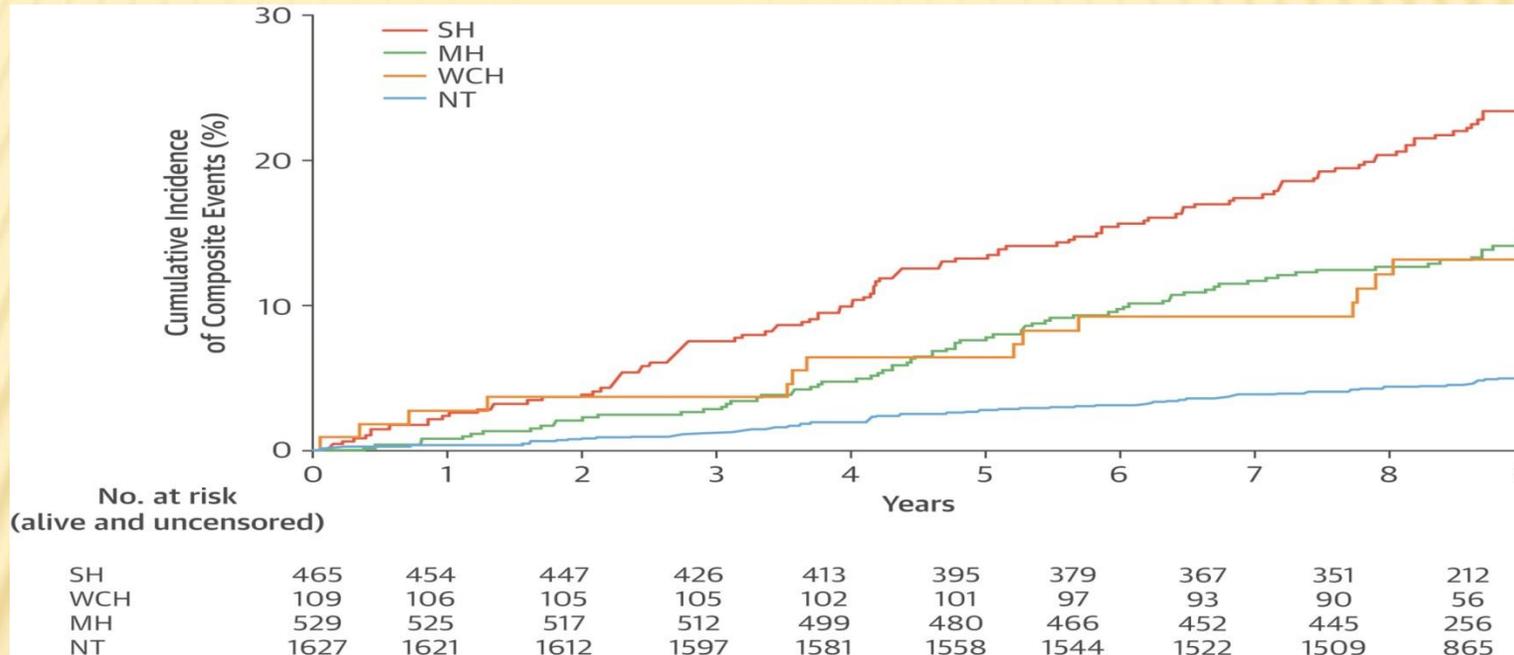
- ❖ WCH, but not WCE, : ↑ risk for cardiovascular events and all-cause mortality. So Out-of-office BP monitoring is critical in the diagnosis and management of hypertension.
- ❖ WCH should be closely monitored for **transition** to sustained hypertension .
- ❖ Treated individuals could be harmed by overly aggressive management

Cohen JB, Lotito MJ, Trivedi UK, Denker MG, Cohen DL, Townsend RR. **Cardiovascular Events and Mortality in White Coat Hypertension: A Systematic Review and Meta-analysis.** Ann Intern Med. 2019 Jun 18;170(12):853-862. doi: 10.7326/M19-0223. Epub 2019 Jun 11. PMID: 31181575; PMCID: PMC6736754.

WCH is associated with a greater risk for renal events in non-dialysis dependent Chinese patients with CKD.

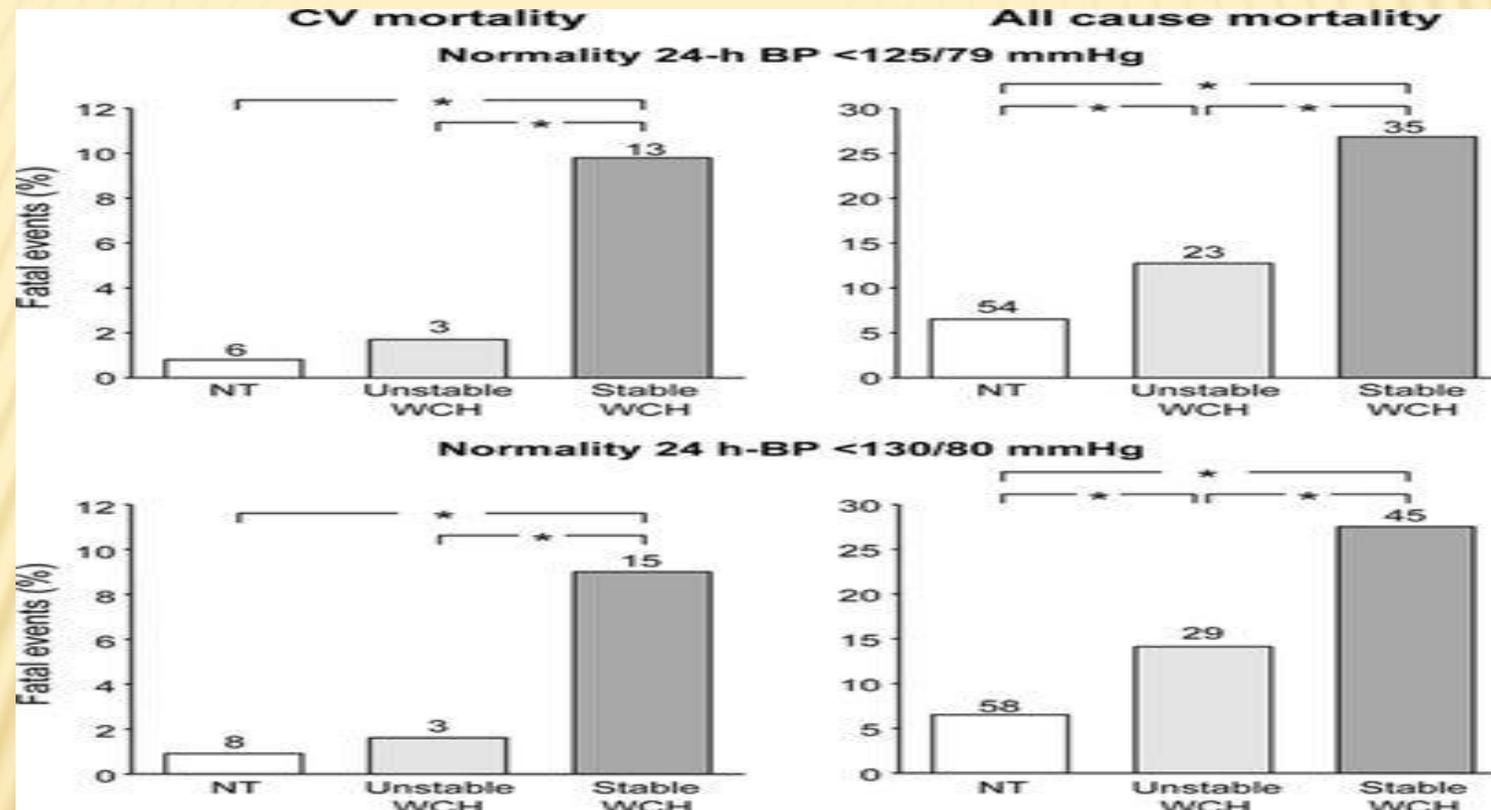
Wang, Q., Wang, Y., Wang, J. et al. **White-coat hypertension and incident end-stage renal disease in patients with non-dialysis chronic kidney disease: results from the C-STRIDE Study.** J Transl Med 18, 238 (2020).
<https://doi.org/10.1186/s12967-020-02413-w>

WCH and MHTN , suffer more heart attacks, heart failure, strokes and a higher incidence of organ damage, including aortic stiffness and kidney damage.



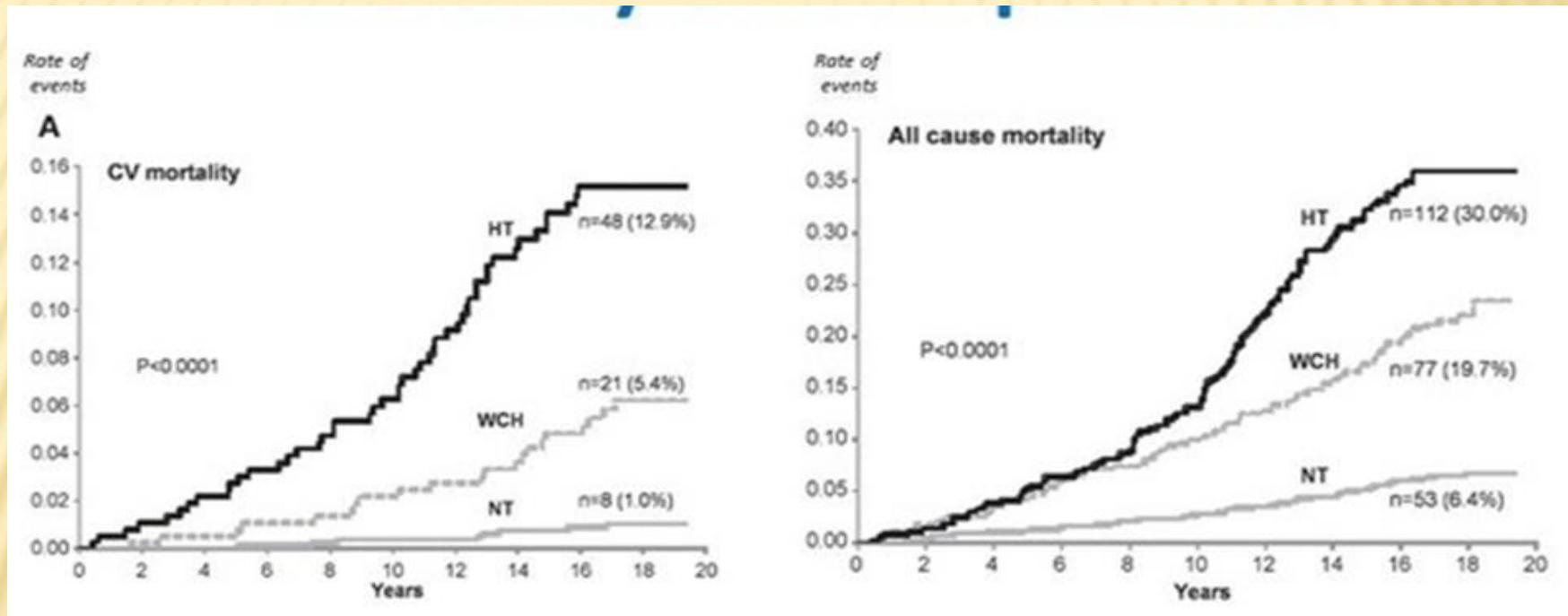
Tientcheu D, Ayers C, Das SR, McGuire DK, de Lemos JA, Khera A, Kaplan N, Victor R, Vongpatanasin W. **Target Organ Complications and Cardiovascular Events Associated With Masked Hypertension and White-Coat Hypertension: Analysis From the Dallas Heart Study.** J Am Coll Cardiol. 2015 Nov 17;66(20):2159-2169. doi: 10.1016/j.jacc.2015.09.007. PMID: 26564592; PMCID: PMC4644495.

the risk of cardiovascular and all-cause death was not significantly different in unstable WCH, whereas in stable WCH the risk was increased than normotensives.



Mancia G, Facchetti R, Grassi G, Bombelli M. Adverse prognostic value of persistent office blood pressure elevation in white coat hypertension. Hypertension. 2015 Aug;66(2):437-44. doi: 10.1161/HYPERTENSIONAHA.115.05367. Epub 2015 Jun 8. PMID: 26056342.

- ✚ WCH have 3 times developing sustained HTN > Normotensive
- ✚ They found that patients with WCH have twice the risk of a heart attack, stroke or other CV events compared to normotensives



, [White-coat hypertension: not so innocent](#), Prof. Guido Grassi, [European Society of Cardiology Journals e-Journal of Cardiology Practice E-Journal of Cardiology Practice - Volume 14](#) Vol. 14, N° 26 - 21 Oct 2016

- The incidence of atrial arrhythmias (APBs) and Heart rate variability changes (important indicator of cardiac autonomic nervous function), → higher in the WCH and SHT groups than in the NT group.

- ❖WCH was related to the aggravation of CAS and the occurrence of cardiac arrhythmia. **So, WCHT cannot be treated as a benign hypertension phenotype**

Cai, P., Zhong, W., Wang, Y. *et al.* **Effects of white-coat, masked and sustained hypertension on coronary artery stenosis and cardiac arrhythmia.** *Hypertens Res* **43**, 121–131 (2020).

TREATMENT FOR MASKED AND WHITE-COAT HTN

Recommendations

Maked hypertension

- Consider both lifestyle measures and antihypertensive drug treatment

White-coat hypertension

- No additional risk factors: lifestyle changes only with close follow-up
- High CV risk*: consider drug treatment in addition to lifesyle changes

Our messages.....

KNOW THE MASK BEFORE IT UNCOVER YOU!



WHICH PATIENTS TO SCREEN?

1. Family history of hypertension
2. Readings on the upper normal in OBP
3. Obesity & sedentary lifestyle
4. Use of oral contraception in women
5. Alcohol abuse,
6. Non steroidal anti inflammatory
7. Sleep apnea.
8. Abdominal obesity

THE DEEP-BREATH TEST

- ④ Deep-breath test could be a useful office test to rule in white-coat effect in hypertensive patients.
- ④ If SBP drop is 20 mm Hg or more, the post-test odds of disease almost quadruples

What Can Help....



PRACTICE YOGA



**WALK OR RUN
DAILY**



**LOWER YOUR
SALT INTAKE**



SLEEP WELL!



**CURE FOR
WHITE COAT HYPERTENSION**

HIGH BP IS REALLY TRICKY DISEASE TO TREAT.

- It's up and down moment to moment during the day.
- It's up with salt; It's up with stress.
- It's down with caffeine; It's down with sleep...
- *What does that one point in time really mean ?"*

✘ "If we don't measure blood pressure in different situations, at home and otherwise, we're really completely **in the dark** and may leave people for thieves at night.

-
- ④ "I think the message is clear that home BP monitoring or ABPM are definitely a worthwhile investment."

Thank

you

