

MASKED HTN

WHAT IS CLINICAL RELEVANCE

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 - **CARDIOLOGIST. KIMS, HYD.**

MASKED HTN

- **Thomas Pickering :2002**

Office BP

Out of office BP

- Home BP monitor

- ABPM

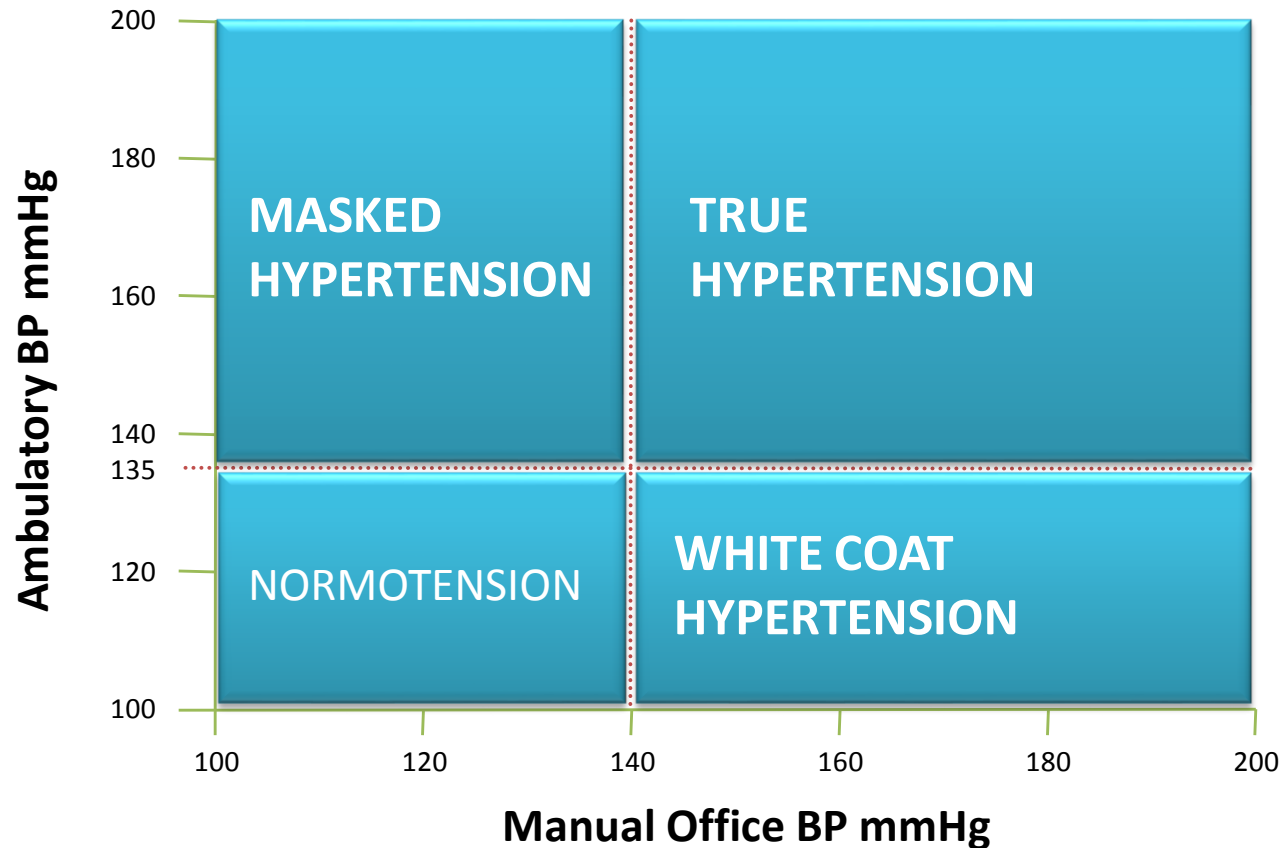
NORMO TENSION

WHITE COAT HTN

MASKED HTN

SUSTAINED

White Coat and Masked Hypertension



HYPERTENSION

- Office BP
> 140/90

ABPM

Out of office

Day time >135/85

Night time >120/70

Average 130/80

HOME BP

- Rest
- Day time

NOCTURNAL BP - Patterns

- Dipper : Fall 10-20% SBP
- Non dipper - $< 10\%$
- Extreme dipper $> 20\%$
- Riser - SBP increases

DAYTIME

130/80

NIGHT TIME

120/70

(110/65 ACC/AHA)

MASKED HTN

- **Prevalence**
- **Untreated = 8 – 20%**
- **Treated HTN 20-30%**

Average Prevalence 16.8%

(CI .13.0 – 20.5%)

Children Adolescents : 7.4% - 11%

(Type of Population , method of evaluation therapy of HTN , Nocturnal BP Measurement)

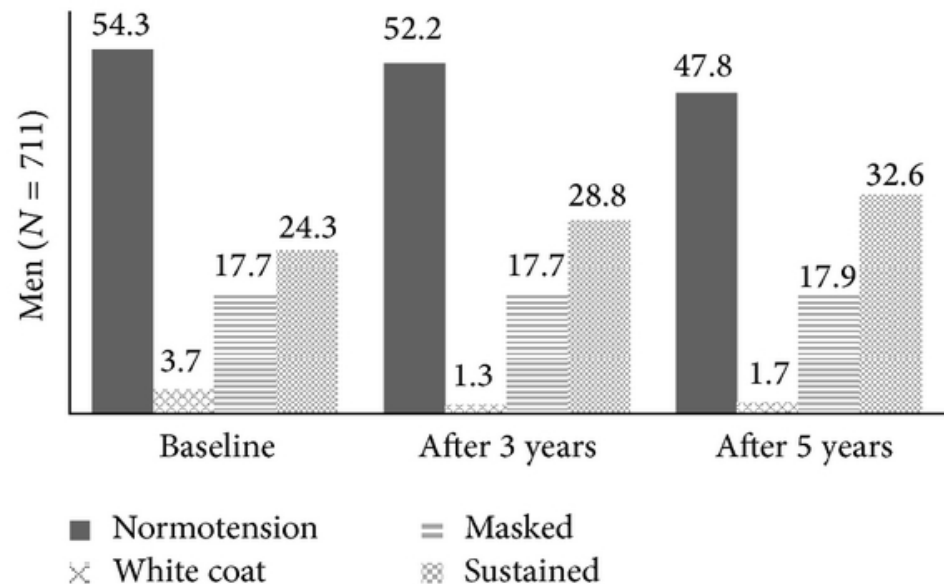
Masked Hypertension (Natural History)

Precursor of sustained HTN

more so in People – Pre hypertension

Qubee (canada)

5yr follow up study



FINN – Home study

- **Risk of Progressive of Blood Pressure to sustained HTN**

- **944** – Participants - 2000 – 2011
- **528** – Normotensive at Baseline
- **142** – White coat HTN
- **63** – masked HTN

11 yrs follow up:

- Normotensive – **18%** **SHT**
- WCHT - **52%** **SHT**
- Masked HTN - **73%** **SHT**

Hypertension
January 2016
siven sam etal

SPANISH ABPM registry

- Short term reproducibility (< one month) was moderate (68%)
- Long term reproducibility (36%) with most developing sustained HTN

Jackson Heart study

- **90% Adults African American mean age 59.1 yrs**
- Prevalence MHTN **20.6%**
- Normotensive (120/80) **12.9 %**
- Pre HTN **36.3%**
- Prevalence increase with advance age

IN CHRONIC KIDNEY DISEASE

- LVH is four times more frequent in the presence of MH.
- Nearly 60% of treated patients with CKD had masked uncontrolled hypertension.
- The prevalence of masked uncontrolled hypertension is present in-
 - 66% in patients with high-normal clinic systolic BP (SBP),
 - 33% in normal clinic SBP, and
 - 17% with optimal clinic SBP
- Thus, patients with CKD and pre-hypertension warrant ABPM screening to identify masked uncontrolled hypertension.

Population – High Prevalence of masked HTN

- **African Inheritance**
- **DM**
- **CKD**

Prevalence

- Optimal BP 120/80 7.5% masked HTN
- Pre –HTN 29.3% masked HTN
- Treated HTN >30% MUCH

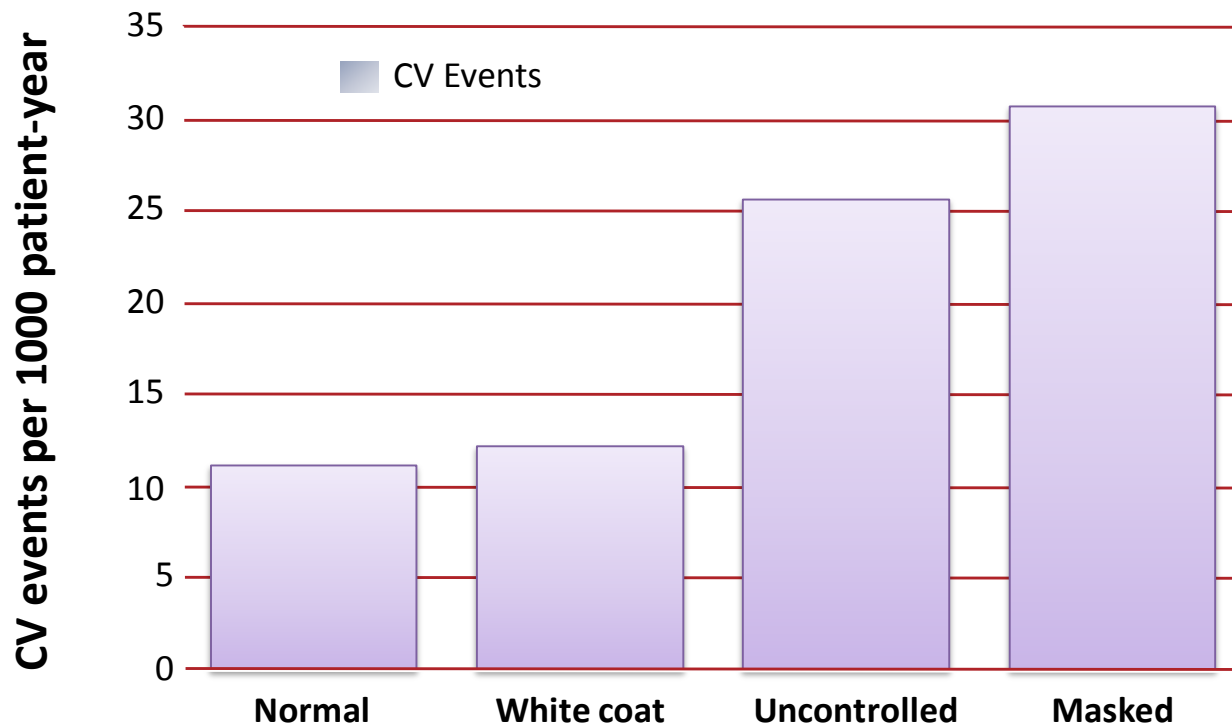
PREVALENCE OF MASKED HYPERTENSION BY TREATMENT STATUS IN DIABETICS AND NON-DIABETICS

Treatment status	Prevalence (%)	
	Non-diabetics	Diabetics
Untreated	18.8% (1031/5486)	29.3% (67/229)
Treated	30.5% (192/630)	42.5% (37/87)

WHY IS THE PREVALENCE OF MASKED UNCONTROLLED HYPERTENSION HIGHER IN TREATED VS. UNTREATED PERSONS?

- Patient non-compliance with medication.
- Treatment aimed at normalizing conventional office BP, while ignoring out-of-office BP.

The Prognosis of *White Coat* and *Masked* Hypertension



Masked HTN - TOD

- **LVH - LVMI Higher masked HTN**

> 13g / m² (normotensive)

PAMELA study

longitudinal epidemiology

Italian men + women

HIGHER LV mass Index (Normotensive)

lesser than sustained HTN

- PWV - index of HIGHER than Normotensive
comparable to sustained HTN

Masked HTN

cardiovascular morbidities & mortality

- **NYPEAP** (New York) **HR= 2.26**
(compared to normotensive)
- **PIUMA** (Italy)
- **OHSAMA** study
- **JMS – ABPM** (Japan)

Figure 1 Hazard ratios (HRs) for cardiovascular events and strokes associated with masked hypertension in subjects ...

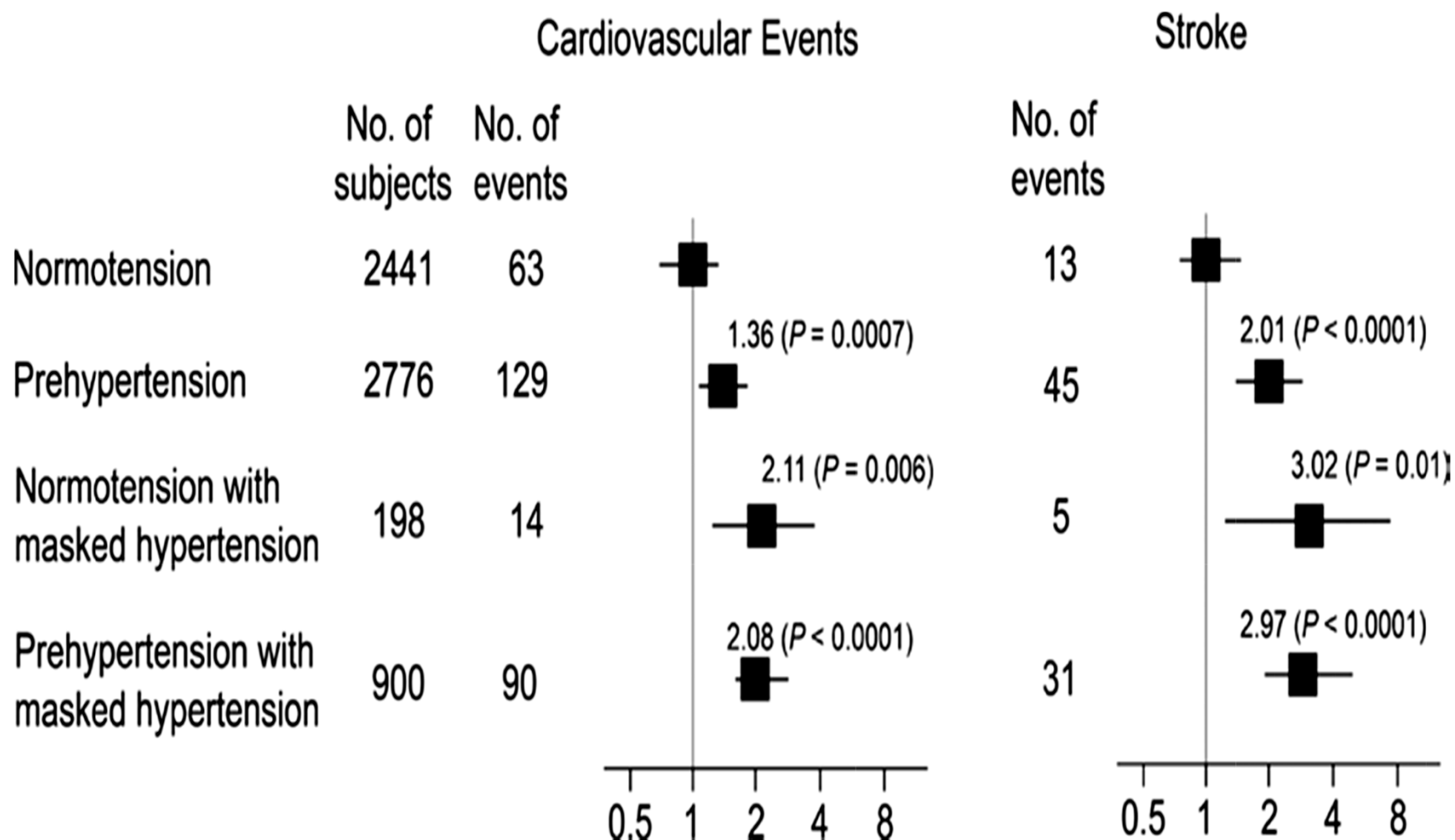
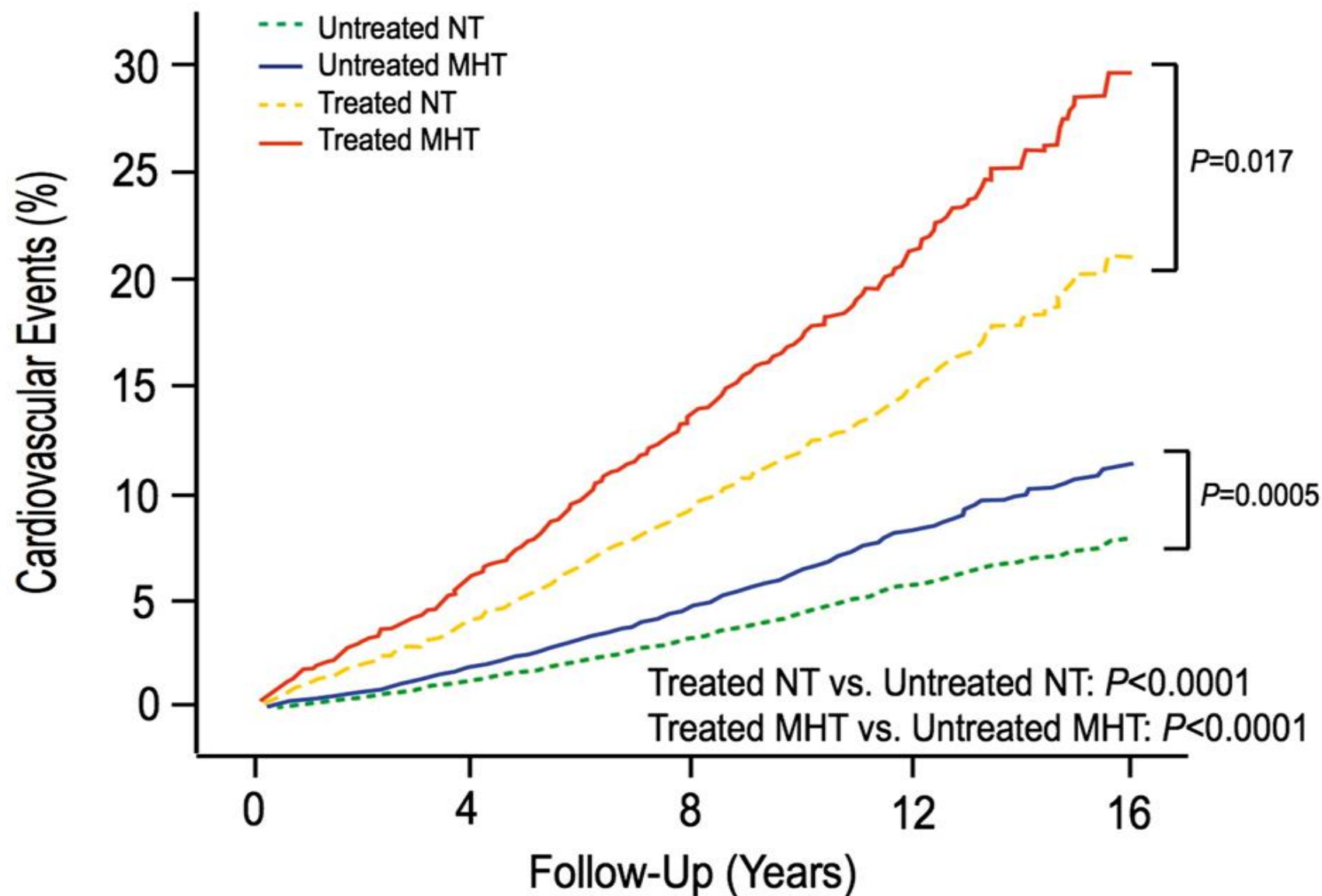


Figure 1 Hazard ratios (HRs) for cardiovascular events and strokes associated with masked hypertension in subjects ...



MASKED HTN (mechanism)

- **Environmental factors**

Masked HTN

Day time

Job stress

smoking

Ethanol abuse

Poor exercise

tolercies

Nocturnal HTN

sleep deprivation

OSA

metabolic syndrome

DM

CKD

WHO should be screened for masked HTN

- All pts with office HTN ($> 140/90$)
- Patients with Pre HTN (130-139-/80-89)
have masked HTN before developing sustained HTN
- Patients – multiple risk factors - ABPM sustained HTN
 - HBPM
 - DM
 - Hyperlipidemia
 - smoking
- Unexplained TOD
- Treated HTN with drugs (office controlled BP 000-BP uncontrolled)
MUCH (masked uncontrolled Hypertension)
- **Certain Ethnic groups have Higher risk of masked HTN**

Diagnostic strategies

- **ABPM** Chinese study
- **HBPM** 25% masked HTN was masked by HBPM
(Nocturnal HTN)
(Rest BP at Home ABPM – work / stress)
- **NICE : ABPM**
 - Before therapy
 - effectiveness of therapy

US Preventive services ABPM – diagnosis

Task force :

MASKED HYPERTENSION

- The prevalence of masked hypertension in patients with treated and well-controlled clinic BP is high.
- MH is more common in patients with CKD and associated with lower eGFR, proteinuria, and cardiovascular target organ damage.
- Nocturnal BP is increasingly recognized as a strong predictor of risk in many studies of ABPM.
- Clinic BP monitoring alone is not adequate to optimize BP control because many patients have an elevated nocturnal BP.
- The US Preventive Services Task Force concluded that ABPM is the diagnostic method of choice for detecting both outliers of white coat and masked hypertension.



**Thank
You!!!**