

# RESISTANT HYPERTENSION

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# RESISTANT HYPERTENSION

Blood pressure not controlled on three anti-hypertensive agents of different classes, one of which should normally be a properly dosed diuretic.

# Patient Characteristics Associated With Treatment-Resistant Hypertension

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## Predictors of Treatment-Resistant Hypertension

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Old age

High baseline blood pressure

Obesity

Excessive dietary salt ingestion

Chronic kidney disease

Diabetes

Left ventricular hypertrophy

Black race

Female sex

Sleep Apnea

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# The VA Cooperative Study, 1967

<b>Cohort</b>	<b>143 men</b>
<b>Mean age</b>	<b>51 years</b>
<b>Eligibility</b>	<b>Diastolic BP 115-129 mmHg</b>
<b>Design</b>	<b>Double blind; placebo control</b>
<b>Therapy</b>	<b>HCTZ, reserpine, hydralazine</b>
<b>Duration</b>	<b>1.5 years</b>
<b>BP change</b>	<b>-43/30 mmHg</b>

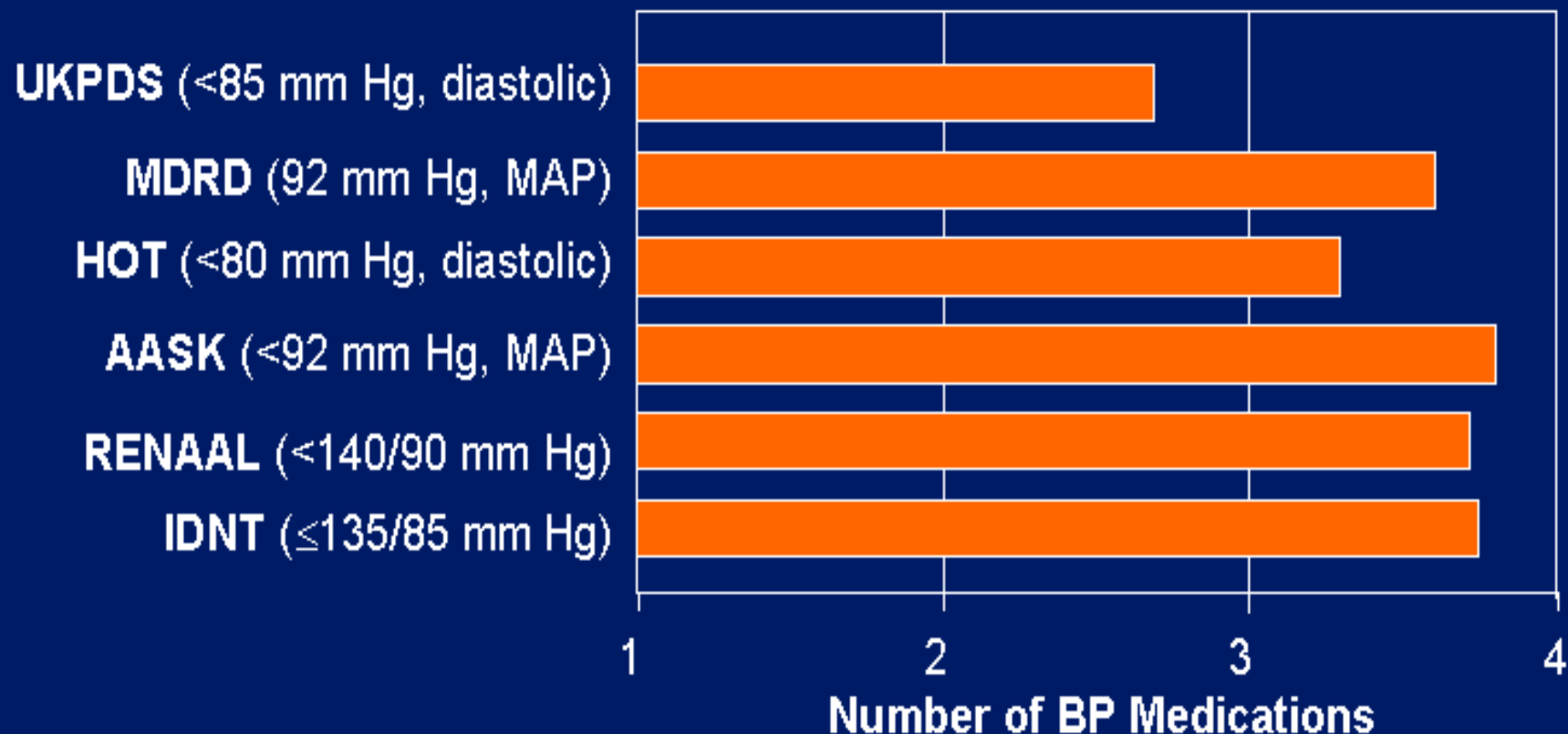
HCTZ=hydrochlorothiazide

VA Cooperative Study Group. JAMA. 1967;202:1028-1034.

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



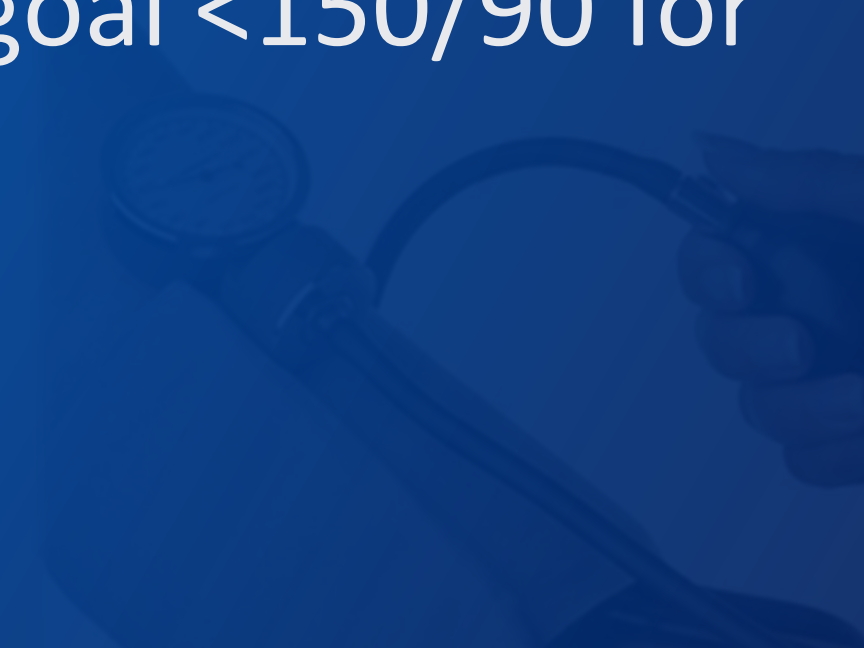
# Hypertension in High-Risk Patients: Number of Agents Used to Treat BP




UKPDS=United Kingdom Prospective Diabetes Study; MDRD=Modification of Diet in Renal Disease; HOT=Hypertension Optimal Treatment; AASK=African American Study of Kidney Disease; RENAAL=Reduction of Endpoints in NIDDM with the Angiotensin II Antagonist Losartan; IDNT=Irbesartan Diabetic Nephropathy Trial; MAP=mean arterial pressure.

Bakris et al. *Am J Kidney Dis.* 2000;36:646-661; Brenner et al. *N Engl J Med.* 2001;345:861-869; Lewis et al. *N Engl J Med.* 2001;345:851-860.

# JNC 8 Committee Members

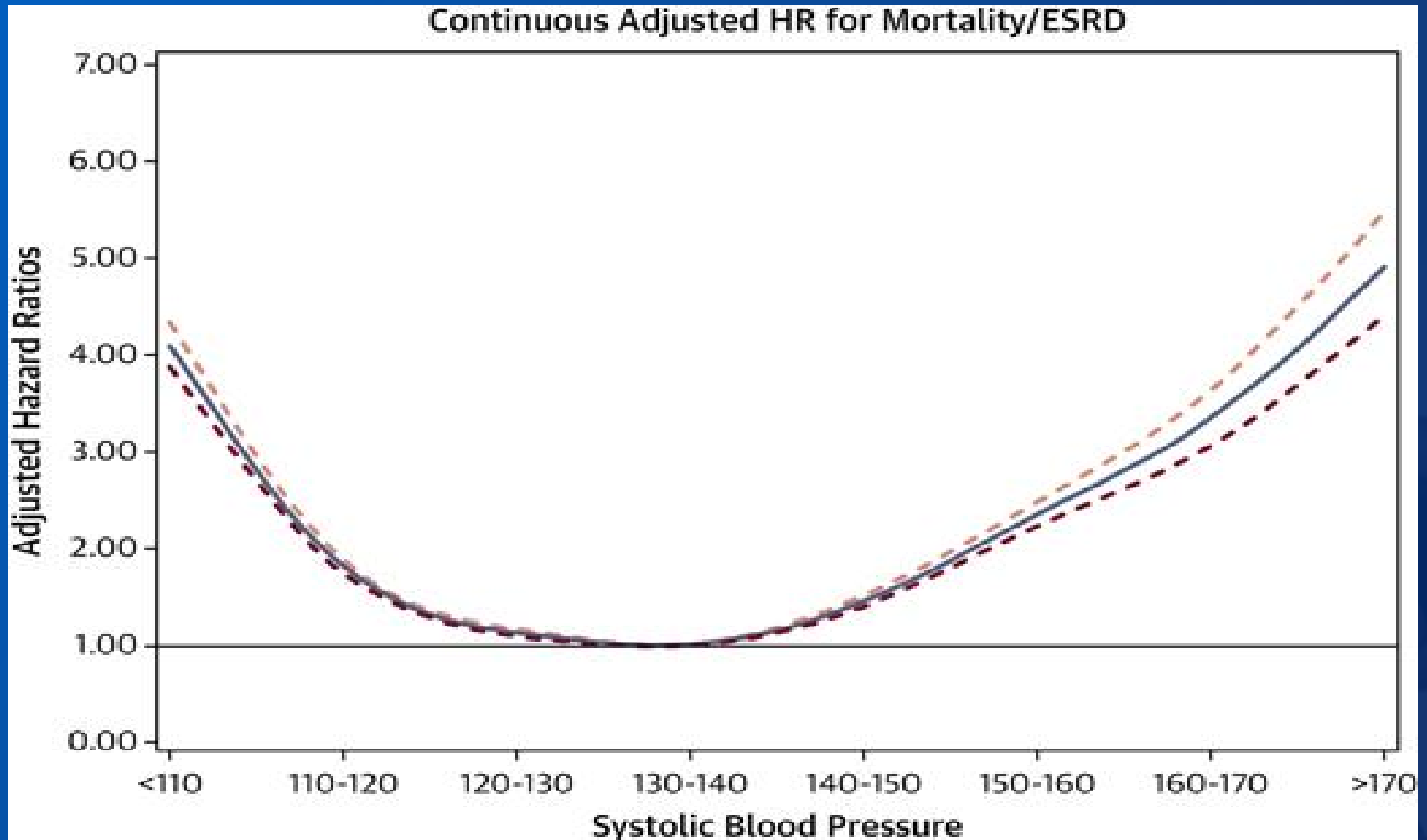
- Blood pressure goal  $<140/90$  for young people
  - Blood pressure goal  $<150/90$  for folks over 60
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# JNC 8 Committee Members

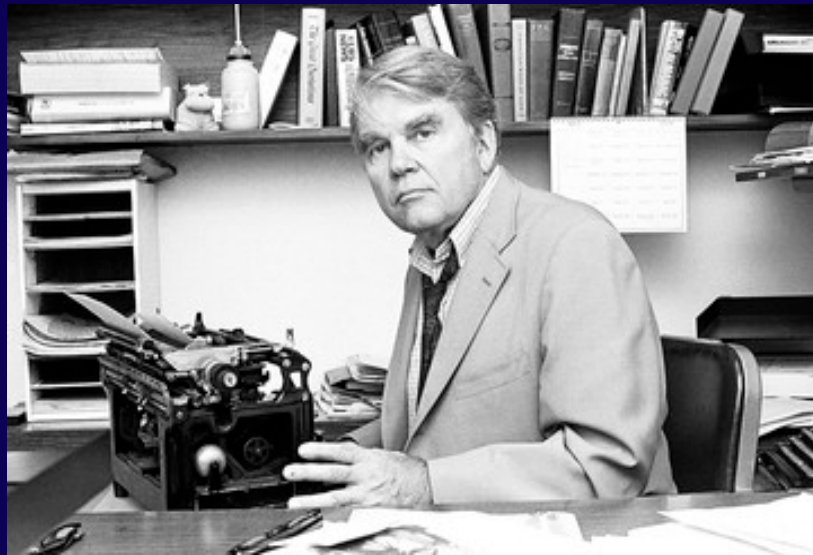
- Diabetics over 18: 140/90
  - Renal Insufficiency over 18:  
140/90
- 

# Best BP in ESRD is 137/71

## Kaiser Permanente 398,419 folks







People will generally accept facts as truth only if the facts agree with what they already believe.

*Andy Rooney*

meetville.com

**CBS** 

# ***THE SPRINT TRIAL: : Stopped September 5, 2015***

## ***Presentation: Next Monday at AHA***

- ***9,300 NON-Diabetics over 50\*\*\*\****
- ***120 mm Hg is far better than 140 mm Hg***
- ***Average one more medication***
- ***Death down by 25%, CV events 35%***

*\*\*\*\*Needed to have one of these:*

- *Presence of clinical or subclinical cardiovascular disease other than stroke*
- *CKD, defined as eGFR 20 - 59 ml/min/1.73m<sup>2</sup>*
- *A Framingham Risk Score for 10-year CVD risk  $\geq$  15%*
- *Age greater than 75 years -- 25% of patients!*

Would you prevent their stroke?



# ICD 10

- Benign Hypertension
- Essential Hypertension



## ICD 10

- Benign Hypertension
- Essential Hypertension
- Essential Stroke
- Benign Renal Failure
- Essential Heart Attack
- Benign Heart Failure




# Benefits of Lowering BP



	<b>Average Percent Reduction</b>
Stroke incidence	35–40%
Myocardial infarction	20–25%
Heart failure	50%

# ICD 11 ?

- Benign Syphilis
  - Essential Pancreatitis
  - Benign Hematemesis
  - Essential Sepsis
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# URMC Hypertension Clinic

- $175.4 \pm 23.5 / 87.5 \pm 14.6$  mmHg on Entrance
- $145.3 \pm 27.7 / 73.9 \pm 13.6$  mmHg after 14 months
- $4.1 \pm 1.2$  to  $4.2 \pm 1.0$  drugs
- Combo's 14% to 68%
- Chlorthalidone, spironolactone, increase dosages, more CCB, more diuretic



# Key Pearls

- Use Chlorthalidone and Torsemide
- Use Spironolactone
- Increase doses and risk side-effects
- Explore Motivation (Cost, Goals, dislike of urination)
- Provide Support, be Encouraging
- Don't insult your medications
- It doesn't have to be easy




*The USPSTF recommends screening for high blood pressure in adults age 18 years and older. Ambulatory blood pressure monitoring is recommended to confirm high blood pressure before the diagnosis of hypertension, except in cases for which immediate initiation of therapy is necessary. - December 2014*

# ABPM Data

- 15-30% of “white coat hypertensives” are correctly identified as not being hypertensive and spared therapy
- Some patients on 3-drug regimen are found to be adequately treated
- “Masked Hypertension” are found – and they have risk of LVH, and other risks and deserve treatment
- AJMed, 2015

# Conclusions

- ABPM's are of great use. HBPM's are close.
  - Medicare only reimburses \$51-80 so USPSTF was premature in recommending it
  - Unit costs \$3,500
  - Patients don't always like them
  - But benefit might be worthwhile
- 



WATER 1.00

POP 1.00

FRIED DOUGH 5.00

FUNNEL CAKES 5.00

FRIED OREOS 4.00

NACHOS 3.00

FRIED PB & J SANDWICH 3.00

FRIED REESE'S 4.00

FRIED SNICKERS 3.00

FRIED STRAWBERRIES 5.00

MOZZARELLA STICKS 4.00

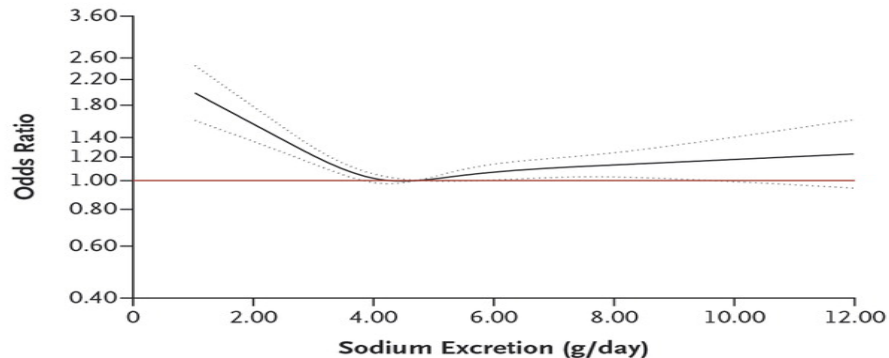
Fried  
MAC & Cheese  
\$5.00



## ***2013 ESH/ESC Hypertension Guidelines***

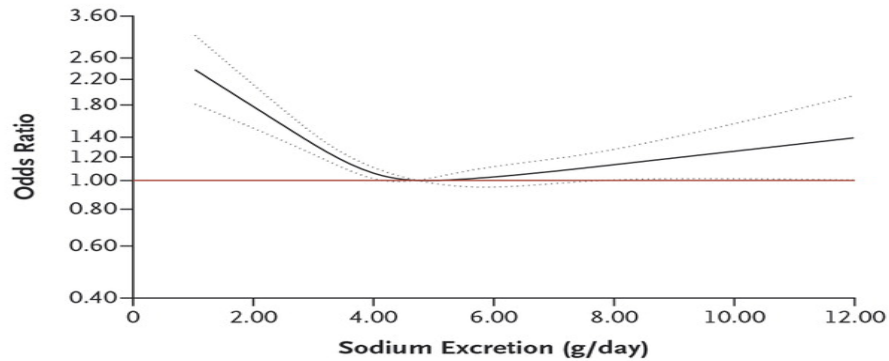
- *Salt intake should be limited to approximately 5-6 g per day*

**A Estimated Sodium Excretion and Risk of Death or Cardiovascular Events**



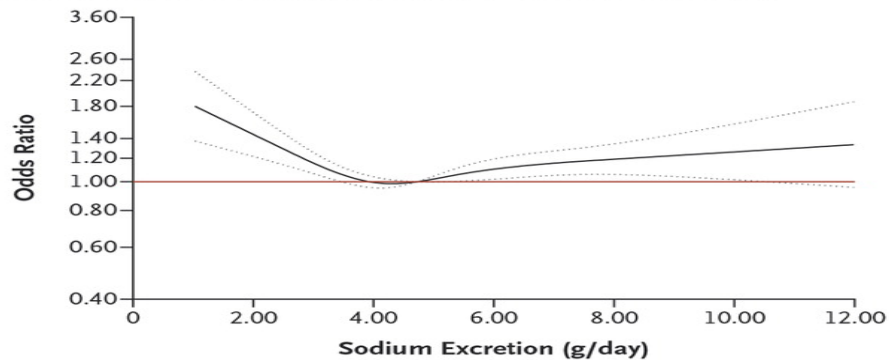
<b>No. of Events</b>	101	1,023	1,437	597	126	25
<b>No. at Risk</b>	1817	30,124	46,663	18,395	3885	756

**B Estimated Sodium Excretion and Risk of Death from Any Cause**



<b>No. of Events</b>	68	642	826	340	79	16
<b>No. at Risk</b>	1817	30,124	46,663	18,395	3885	756

**C Estimated Sodium Excretion and Risk of Major Cardiovascular Events**



<b>No. of Events</b>	57	602	869	369	75	13
<b>No. at Risk</b>	1817	30,124	46,663	18,395	3885	756



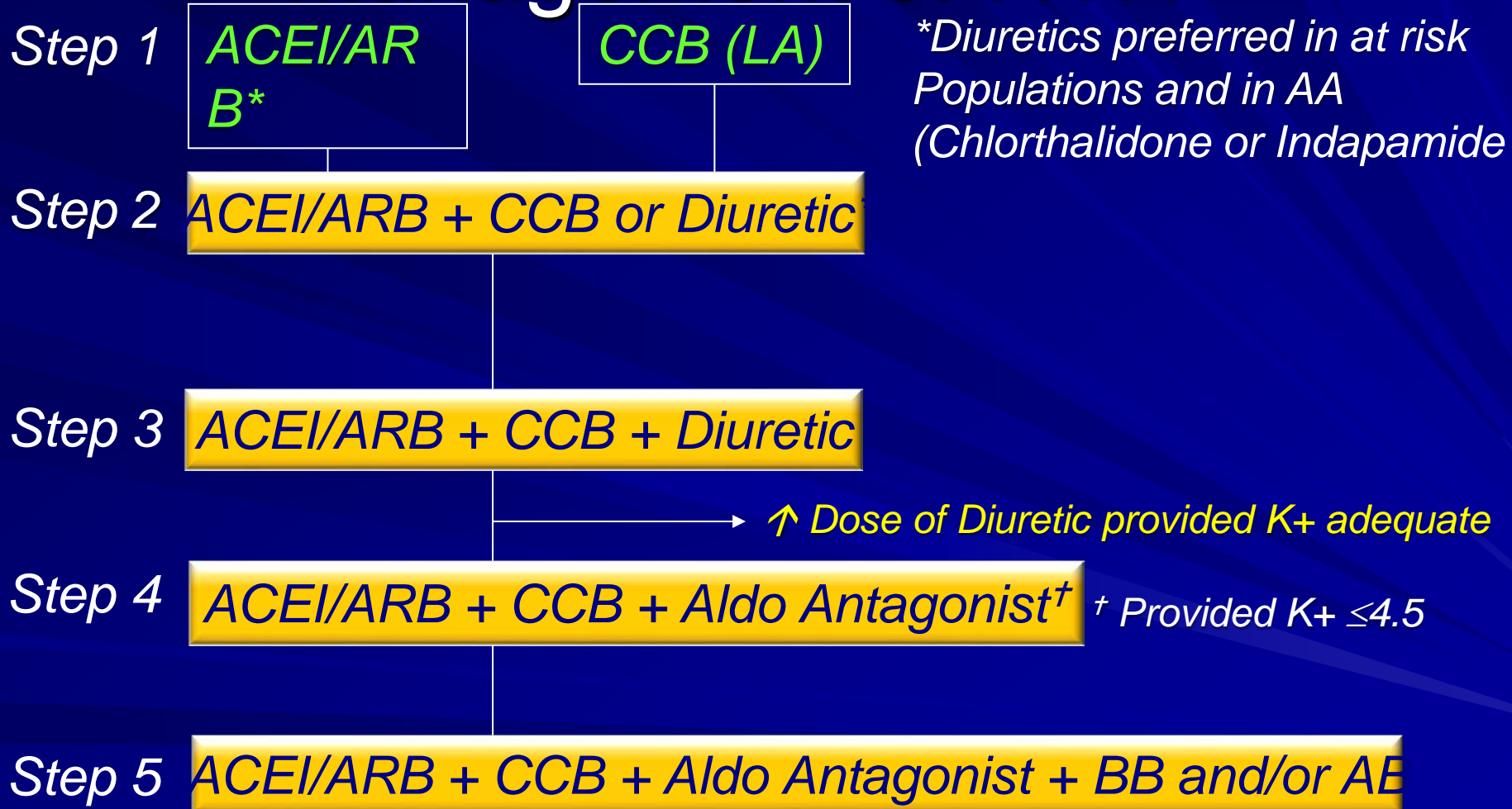
# Secondary Work-up

- Chase things that jump out at you clinically
- Low Potassium - hyperaldosteronism
- Abnormal TSH
- Pheo is likely panic disorder. Rule out with Plasma Metanephrines
- Finding atherosclerotic Renal Artery Stenosis is not helpful
- Lots of renal insufficiency – needs ACE/ARB; 20% increase in creatinine okay, but watch potassium
- Avoid stopping ACE/ARB due to creatinine unless increase is >20%. Consider dose reduction.

# Secondary Work-up

- Sleep Apnea
- Fibromuscular dysplasia in young and female
- Oral contraceptives
- Steroid Use
- Excessive Sodium Intake -  $>6$  g, County Fairs, or Buffets
- Heavy – consider bariatric surgery
- Not enough diuretic

# NICE Approach for the Management of HTN



# SPRINT TRIAL – November 9

- Keep an open mind; let the data talk to you
- Goals in non-diabetics may be lower and cause you more work
- It may be worth it.
- Sure, more probability for side effects. Act accordingly.