Hypertension
The New “Guidelines”

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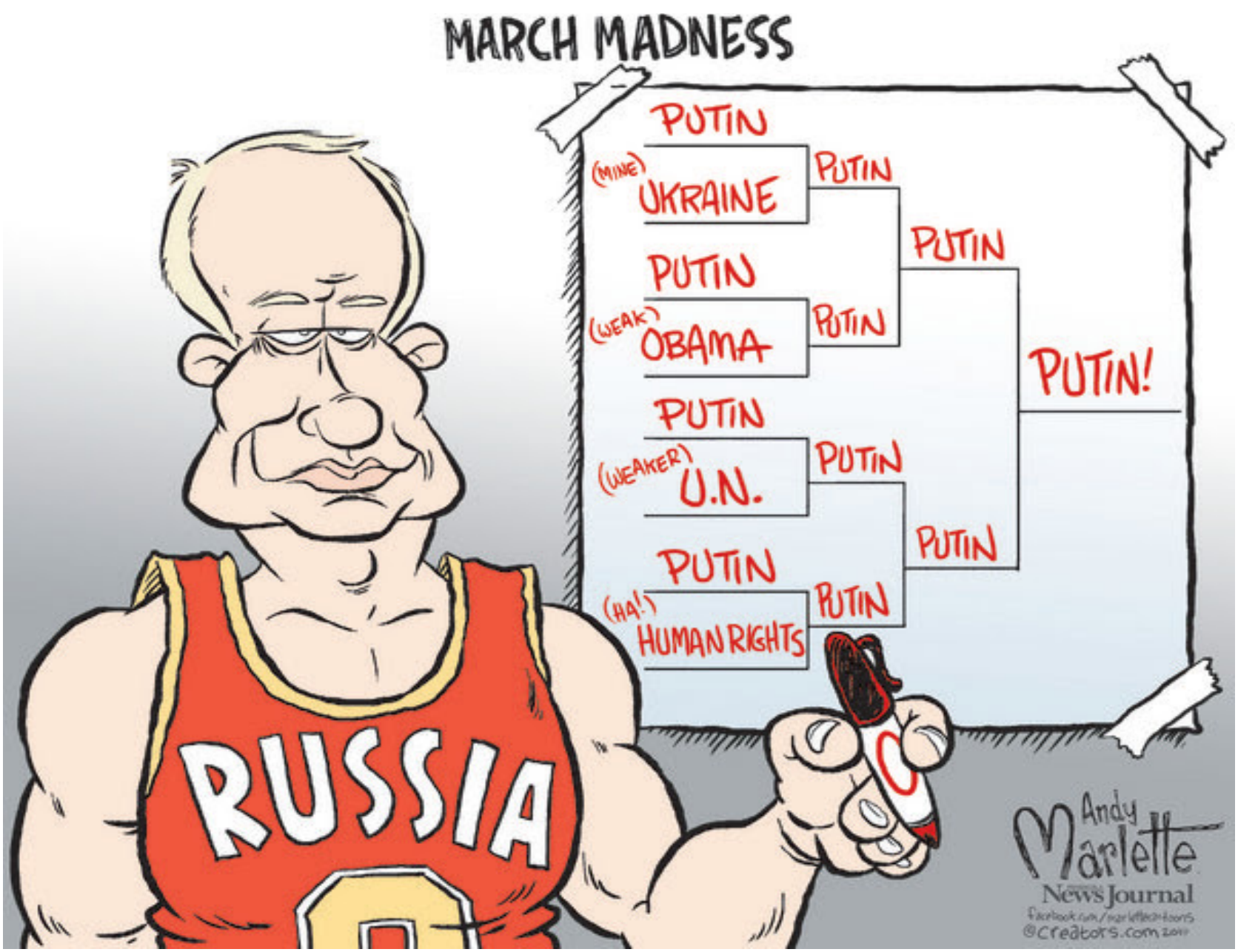
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Clinical Case

- 44 year old AA gentleman referred for hypertension
  - Discovered on routine PE with BP 164/102
  - History of obesity, THC usage, GERD
  - + FH for hypertension in father and brother
    - Kidney transplant in brother 25 years ago – patient was the donor and he had a full medical evaluation at that time
- PE : BMI 33.2; BP 168/106; P 82
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Hypertension – The New "Guidelines"

- "The greatest danger to a man with high blood pressure lies in its discovery, because some fool is certain to try and reduce it" – J.H. Hay 1931
- "Hypertension may be an important compensatory mechanism which should not be tampered with, even were it certain that we could control it" Paul Dudley White 1937
- FDR – died of a CVA in 1945 recorded BP 300/190
- VA trial -1967 –Diastolic BP 115-129 mm Hg Placebo vs Active therapy

Guideline Confusion and Overload

- 2014 Evidence Based Guideline for the Management of High Blood Pressure in Adults
  - Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8): JAMA 311: 507 -520, 2014
- Clinical Practice Guidelines for the Management of Hypertension in the Community
  - A Statement by the American Society of Hypertension and the International Society of Hypertension: J of HTN 32: 3-15, 2014

NHLBI Cardiovascular Prevention Guidelines New Directions

- **Update clinical recommendations on BP, cholesterol, and obesity**
  - Use systematic evidence review process
  - Use evidence & recommendations grading
  - Standardize & coordinate approaches
  - Develop consistent recommendations for lifestyle & risk assessment
- **Create integrated CV risk reduction recommendations**
  - Individual risk factor guidelines + lifestyle and risk assessment + additional CVD risk reduction approaches
- **Develop comprehensive approach to implementation**
  - Write guidelines clearly so they are implementable
  - Address patient, clinician, and systems levels
  - Develop and disseminate materials & tools
  - Develop an evidence-based implementation plan
  - Establish a National Program to Reduce Cardiovascular Risk

After Months of Sifting – Three Questions

- At what level do I treat elevated BP?*
- To what level do I reduce elevated BP?
- How do I get to goal BP in the general population as well as patients with Diabetes or Chronic Kidney Disease?

* The panel decided that although some trials had higher thresholds for eligibility than treatment goals, translation into practice would be clearer if the threshold for initiating antihypertensive treatment was the same as the BP treatment goal

“JNC 8” - Decreasing Levels of Evidence

- Randomized controlled clinical trials
- Less rigorous cohort or case control studies, post hoc analysis
- Epidemiological observational studies
- Meta-analysis*

* Based on quality of underlying studies

NHLBI Evidence Quality Rating and Recommendation Strength

Evidence Quality

- High
  - Well-designed and conducted RCTs
- Moderate
  - RCTs with minor limitations
  - Well-conducted observational studies
- Low
  - RCTs with major limitations
  - Observational studies with major limitations

Recommendation Strength

A – Strong

B – Moderate

C – Weak

D – Against

E – Expert Opinion

N – No Recommendation

“JNC 8” – 2014 Evidence Based Guidelines
Nine Recommendations

1. If age > 60, target < 150/90; Corollary if doing well at < 140/90, continue current RX
2. If age < 60, target DBP < 90
3. If age < 60, target SBP < 140
4. If CKD, target SBP < 140, DBP < 90
5. If DM, target SBP < 140, DBP < 90

“JNC 8” – 2014 Evidence Based Guidelines
Nine Recommendations

6. First agent of choice, if non-black: thiazide type diuretic, CCB, ACEI, ARB

7. First agent of choice, if black: thiazide type diuretic, CCB

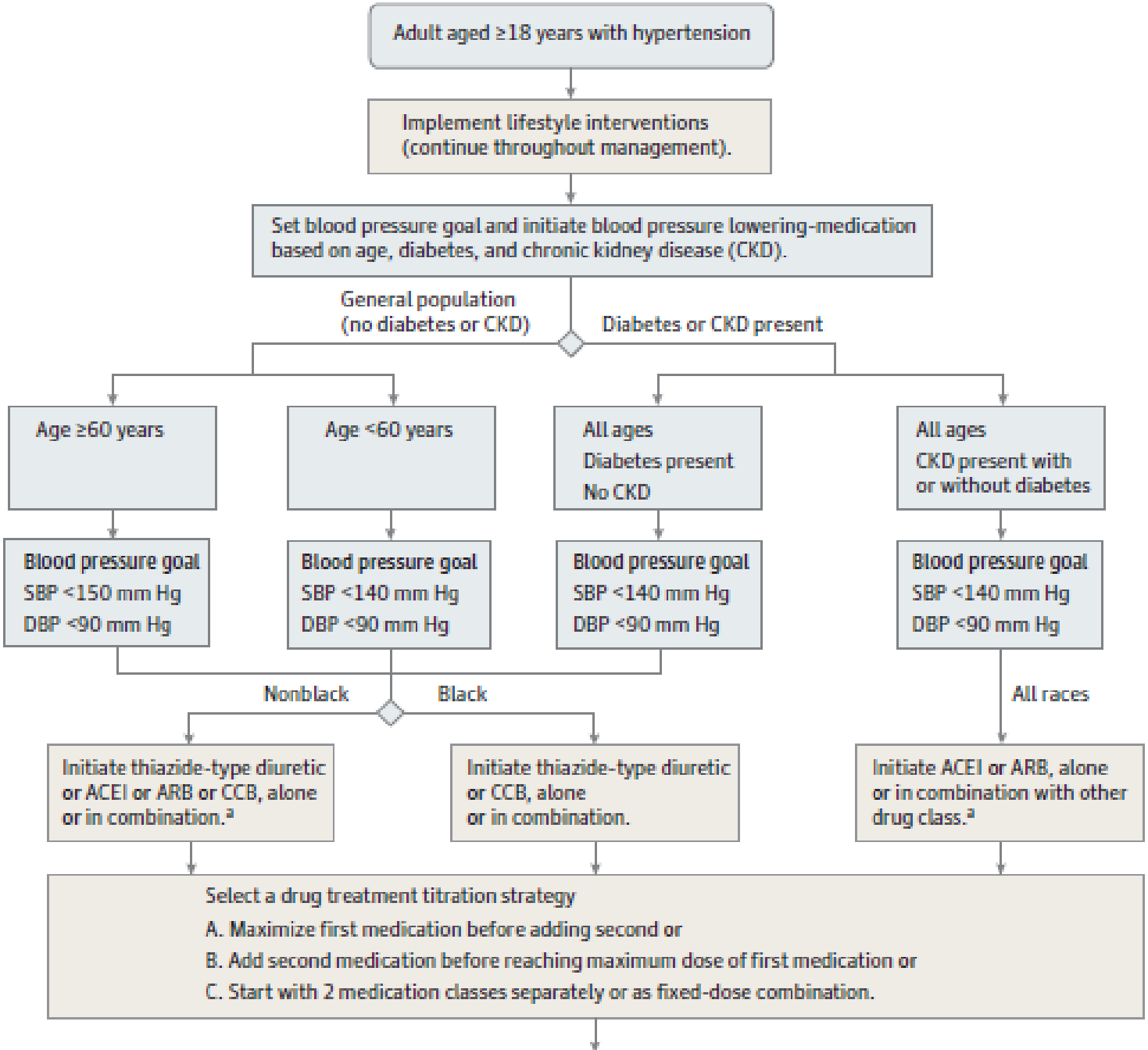
8. First agent of choice, if CKD: ACEI, ARB

9.Medication titration options

9 Recommendations

- 2 Level A Strong (# 1,2)
- 2 Level B Moderate (# 6,7)
- 1 Level C Weak (# 8)
- 4 Level E Expert Opinion (# 3,4,5,9)

Figure. 2014 Hypertension Guideline Management Algorithm



Drugs to Add to Initial 2-3 Drug Combination

- Spironolactone or amiloride: especially if potassium is low or primary hyperaldosteronism
- Alpha blocker: especially if lower urinary tract symptoms
- Alternative CCB: do not combine non-DHP CCB with BB
- Beta-blocker: safe to combine (except with non-DHP CCB)
- Vasodilator: Hydralazine or minoxidil
- Alpha-beta blocker: labetalol or carvedilol
- Central agonist: most frequent side effects

BP Targets in CKD

- 3 RCTs comparing a target BP of < 130/80 to <140/90 mm Hg, 8 reports (N=2272)
  - MDRD (Modification of Diet in Renal Disease) Study
  - AASK (African American Study of Kidney Disease and Hypertension)
  - REIN-2 (Ramipril Efficacy in Nephropathy 2) Trial

BP Targets in CKD

- All three were negative, failing to show benefit of the lower BP target in reducing
  - CV events
  - Doubling of serum creatinine
  - ESRD
  - Death

  No conclusive evidence favoring a BP target of <125/75 to 130/80 rather than < 140/90 *

  * Proteinuria may be an exception

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Impact of Proteinuria in CKD – BP Lowering

- 3 RCTs comparing a target BP of < 130/80 to <140/90 mm Hg, 8 reports (N=2272)
  - MDRD proteinuria* (post hoc)
  - AASK proteinuira* (prespecified)
  - REIN-2 negative (prespecified)

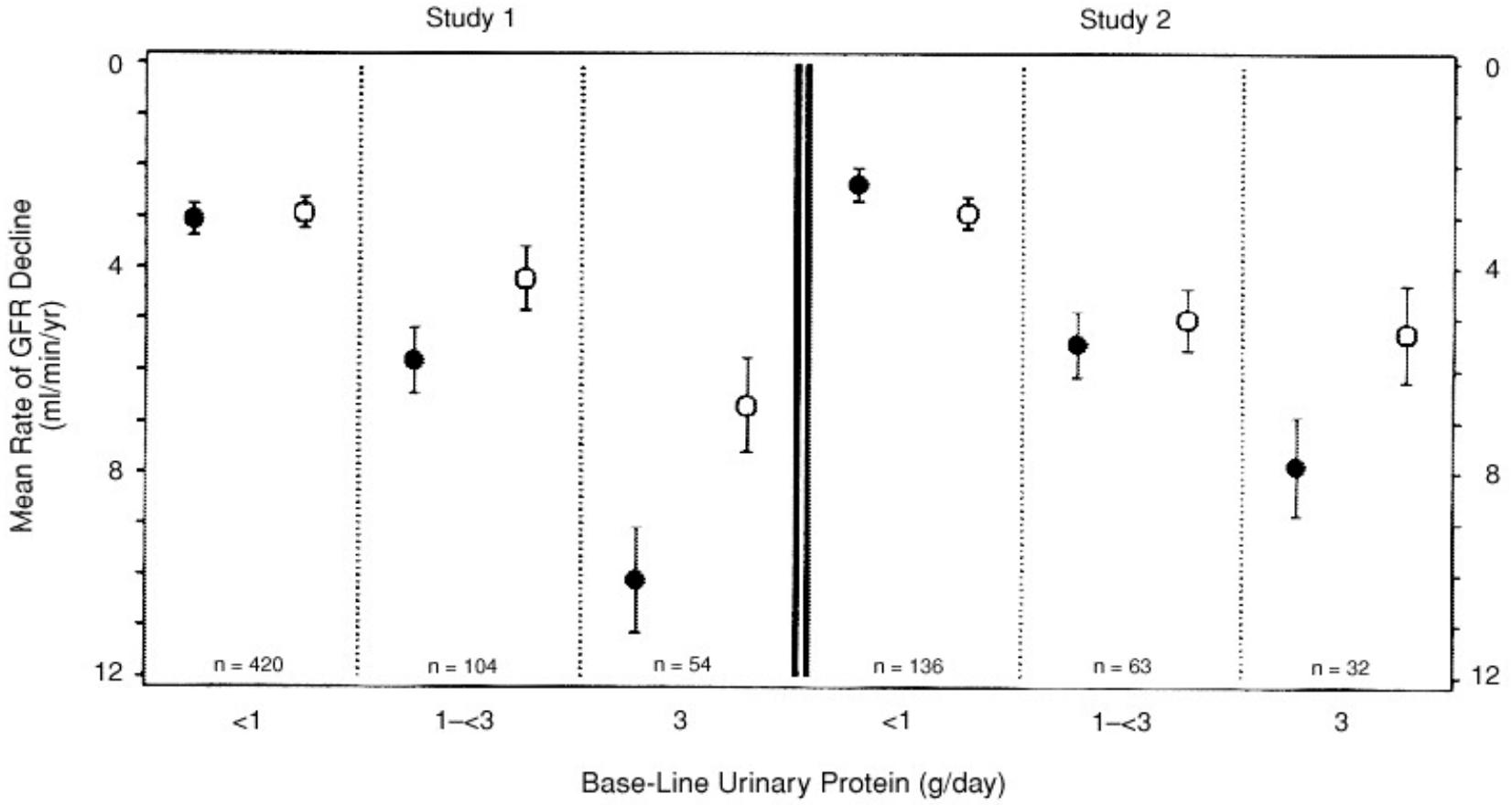
* Slower progression of CKD with lower BP targets for patients with proteinuria

Modification of Diet in Renal Disease (MDRD)

- 585 patients with GFR 25-55 ml/min/1.73m2
- 255 patients with GFR 13-25 ml/min/1.73m2
  - Usual protein — Usual BP (MAP 107)
  - Low protein — Low BP (MAP 92)
  - Very low protein

  Slower decline in GFR for the low BP group in proteinuria present

  Post hoc analysis



Klahr S et al. N Engl J Med 1994;330:877-884.

African American Study of Kidney Disease (AASK)

- Randomized control trial of three agents (Ramipril, Metoprolol and Amlodipine) in 1194 patients with GFR 20-65 and DBP > 95 mm Hg
- Two BP targets
- Reduced end points in Ramipril group
- No incremental benefit to lower BP but a trend favoring lower BP with greater proteinuria

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ASH-ISH Guideline Philosophy

- " The authors of this statement acknowledge that there are insufficient published data from clinical trials in hypertension to create recommendations that are completely evidence-based, and so inevitably some of our recommendations reflect expert opinion and experience"
- Curriculum and set of recommendations
- Designed for primary care physicians, students, hands on practitioners in the developed and developing world
- Hypertension as a high priority disease
- Simple empiric care is better than no care

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ASH-ISH Guideline: Outline

- General introduction
- Epidemiology
- Special issue with patients of African ancestry
- How is hypertension defined?
- How is hypertension classified?
- Causes of hypertension
- Making the diagnosis of hypertension
- Evaluating the patient
- Physical examination
- Tests
- Goals of treating hypertension
- Non pharmacological treatment of hypertension
- Drug treatment of hypertension
- Brief comment on drug classes

JNC 8 vs ASH - ISH
Definitions

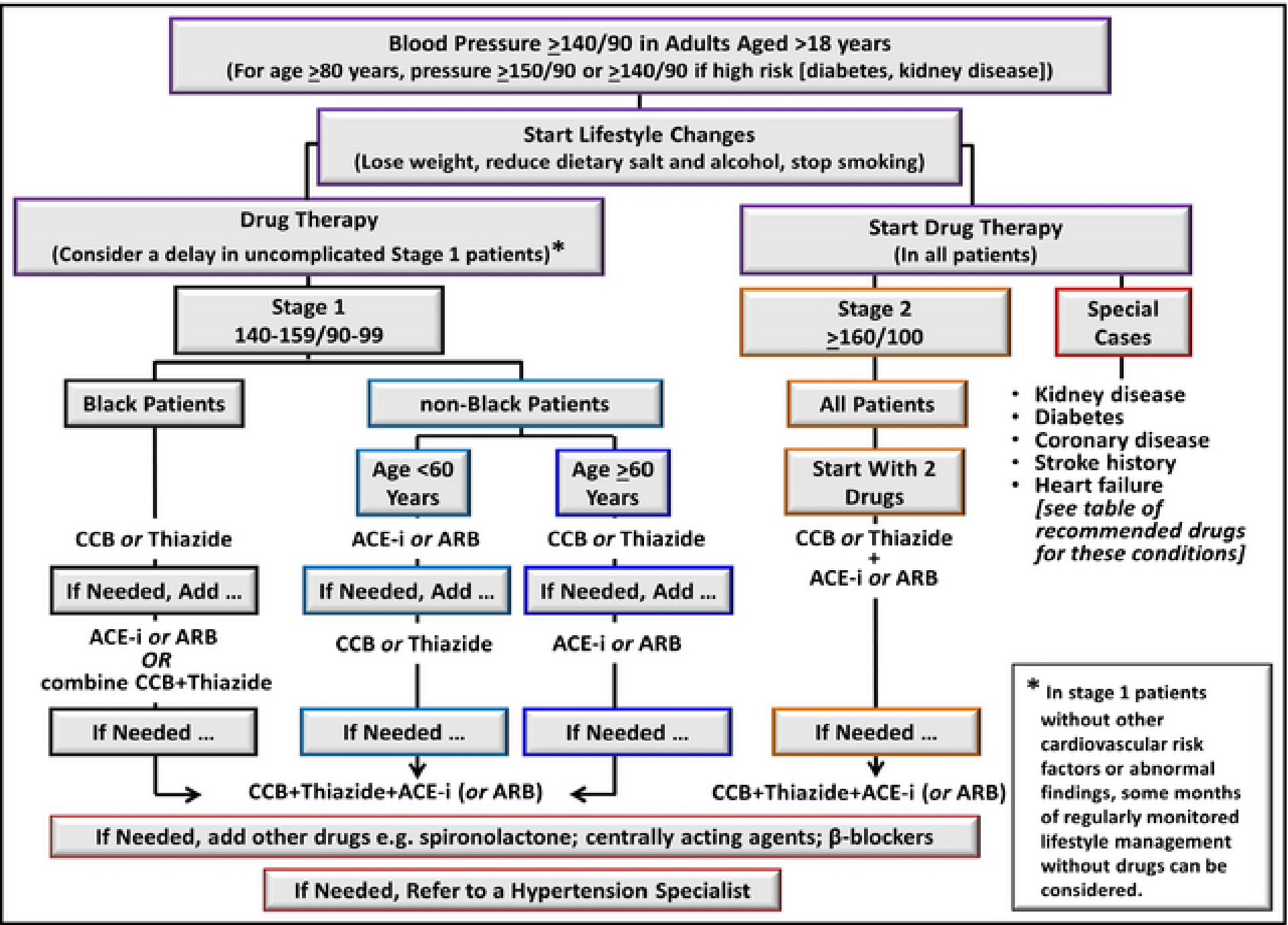
- Prehypertension – 120-139/80-89 in ASH – ISH only
- Hypertension
  - >18 and < 60 years 140/90 JNC
  - >18 and < 80 years 140/90 ASH - ISH
  - >80 150/90 years or 140/90 with CKD/DM ASH -ISH
- Lifestyle changes only for 6- 12 months in patients with Stage I (140-159/90-99) hypertension without other CV risk in ASH - ISH

JNC 8 vs ASH - ISH

- BP <130/80 not recommended in JNC but accepted in ASH - ISH
  - CKD with proteinuria
  - Young patients with no side effects and good tolerance
- Target Blood Pressure
  - BP < 140/90 in patients < 60 years JNC
  - BP < 150/90 in patients > 60 years JNC

  - BP < 140/90 in patients < 80 years ASH - ISH
  - BP < 150/90 in patients > 80 years ASH - ISH
  - BP < 140/90 in all patients with CKD or DM ASH - ISH
- Stage II Hypertension – Initiate 2 drugs ASH - ISH
- Drug resistant hypertension not mentioned in JNC defined as not controlled on 3 drugs ASH - ISH

Clinical Practice Guidelines for the Management of Hypertension in the Community



JNC 8 vs ASH – ISH

- Similarities
  - General agreement on targets and treatment, both have algorithms
  - Recommendations for drug selection by race
  - Targets for CKD, DM
- Differences
  - Evidence based limited scope vs expert opinion comprehensive
  - Referenced document vs suggested reading
  - Targets for elderly 60-79
  - Intended guideline vs compendium
  - ASH-ISH recommends ACEI or ARB for all diabetics (even without CKD), ACEI or ARB for non-blacks < 60, CCB or thiazide for >60

Table 1.

Summary of national and international recommendations for target BP

Guideline	Younger Target (mmHg)	Older Target (mmHg)	Diabetes Target (mmHg)	CKD Target (mmHg)
2014 Evidence-Based Guidelines for the Management of High Blood Pressure[1]	<140/90	>60 years of age: <150/90	<140/90	<140/90
2013 Canadian Hypertension Education Program[6]	<140/90	SBP=150	<130/80	<140/90
2013 ESH/ESC Guidelines[13]	<140/90	<80 years of age: 140–150; consider <140 if tolerated; >80 years of age: 140–150	<140/85	<140/90
American Society of Hypertension and the International Society of Hypertension[10]	<140/90	>80 years of age: <150/90	<140/90	<140/90; consider <130/80 if albuminuria
American Diabetes Association[17]			<140/80	
KDIGO Blood Pressure Work Group[11]				ACR<30: 140/90; ACR>30: 130/80

- ACR, albumin/creatinine ratio.

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New “Guidelines” for Hypertension
Clinical Pearls

- All medications are “relatively” identical in efficacy
- The higher the starting BP the more efficacious
- Remember special considerations – CKD, DM, Coronary artery disease, Heart failure, Stroke
- If a patient does not respond appropriately to therapy – think!!!!

New “Guidelines” for Hypertension
Clinical Pearls – Lack of Appropriate Response to Rx

- Non compliance with therapy
- Drug interactions, medications (estrogens, CNI, etc)
- OTC (NSAID, decongestants), herbal medications, illicit medications
- Office BP not reflecting home BP or incorrect BP cuff size
- Cuff inflation hypertension
- Extracellular fluid volume expansion – dietary sodium excess
- Obstructive sleep apnea
- Secondary hypertension
  - Chronic kidney disease
  - RVH (note recent Coral Trial)
  - Endocrine hypertension (pheochromocytoma, primary mineralocorticoid, etc)
  - Central hypertension
  - Hereditary (Liddle’s Syndrome, CAH, Familial Hyperaldosteronism I and II, ect)

No guideline is a substitute for one's own judgment based on knowledge, experience, and clinical characteristics of the patient