CKD & HT

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Hypertension definitions

- Persisting BP >140/90 and HBPM >135/85
- Stage 1 >140/90 (HBPM >135/85)
- Stage 2 >160/100 (HBPM >150/90)
- Severe >180/100
- White coat HT

Why treat?

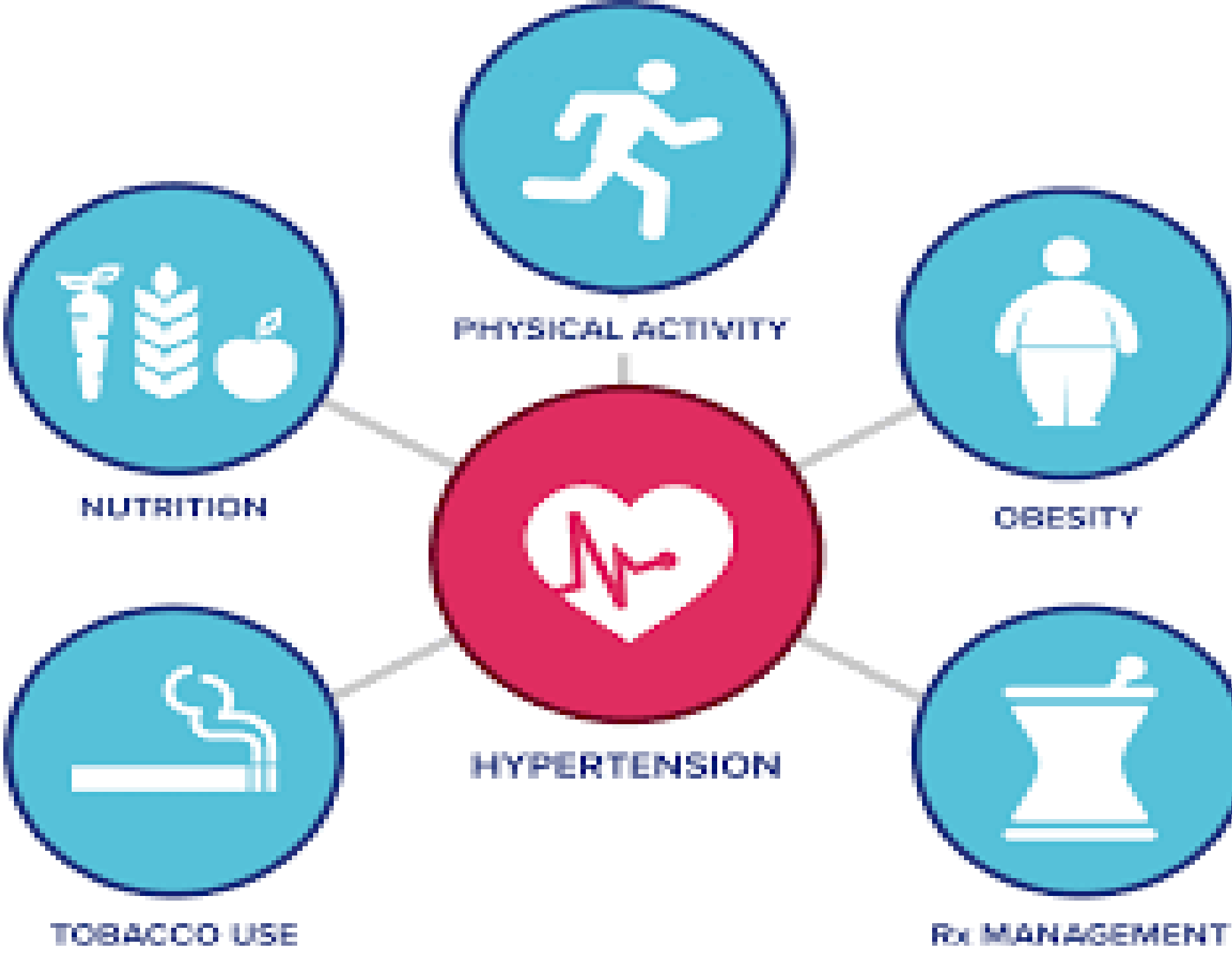
- A major systematic review found that, in the populations studied, every 10mmHg reduction in blood pressure resulted in:
- A 17% reduction in coronary heart disease.
- A 27% reduction in stroke.
- A 28% reduction in heart failure.
- A significant 13% reduction in all-cause mortality.

First steps

- NICE recommends treating straight away if severe (>180/100)
- Refer same day if severe + papilloedema/ retinal haemorrhage/ possible phaeochromcytoma
- Assess end organ damage – urine dip for haematuria, urine ACR, U&E & ecg
- Look in fundi or suggest optician r/v
- Look for other associations – lipids, Glu/HbA1c
- Refer for specialist assessment < 40yrs

Secondary causes

- Most HT is idiopathic
- Alcohol is probably biggest 2ndry cause
- Renal disease
- Endocrine disease
- Vascular disorders
- Drugs


PHYSICAL ACTIVITY
NUTRITION
OBESITY
HYPERTENSION
TOBACCO USE
Rx MANAGEMENT

Target BP

- Non DM <80 = 140/90 (HBPM 135/85)
- Non DM >80 =150/90 (HBPM 145/85)
- End organ damage – NICE does not specify but perhaps take DM values below
- DM 140/80 (130/80 if any of neuropathy retinopathy or cerebrovascular damage)

Medication

- Treat all <80 yrs with stage 1 disease + end organ damage or CKD or CVD or DM or CHD 10yr risk >20%
- Treat all with stage 2 disease
- Start with ACEI/ARB If <55yrs & not Afro-Caribbean
- If >55yrs or Afro-Caribbean give CCB (or indapamide if CCB unsuitable)
- β blockers

2nd & 3rd steps

- If on ACEI/ARB next step is CCB (unless CI)
- If >55yrs next step may be CCB or diruetic depending on co-morbidities.
- In Afro-Caribbeans ARB is more effective & better tolerated than ACEI
- Then add thiazide diureretic (indapamide or hydrochlorthiazide)

And……

- Aspirin?

Evidence is weak for 1ry prevention - benefit to harm ratio slightly in favour of aspirin

Need to have BP controlled to <150/90

- Statin?

Yes if QRISK2 >10%

Top Tips in HT

- Most people need 2 or more drugs – tell them that low dose of 2 drugs is often more effective with fewer side effects than large dose of 1
- Start with low doses
- Few people tolerate amlodipine 10mg very well
- Think about dosing times
- Optimise 3 drugs before reaching for a 4th
- Combined pills ^ compliance
- Measure standing BP in elderly *and use this measurement as the recorded BP if considerably lower than the sitting BP*

4th choice

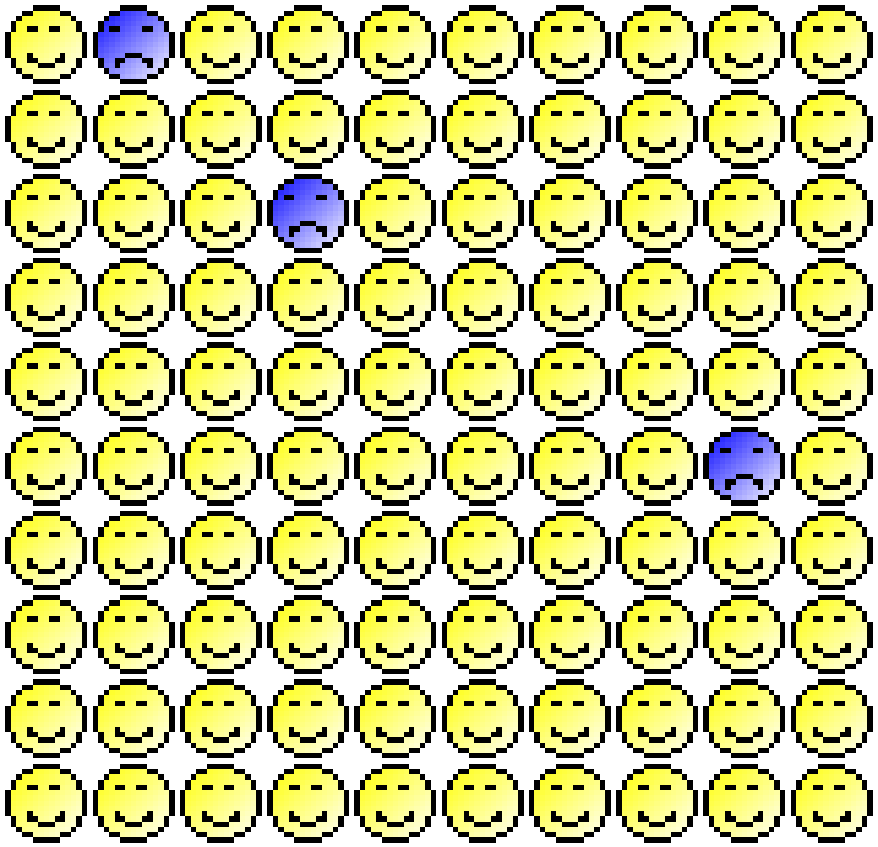
- If BP is not controlled with 3 drugs then some people would refer to cardiology
- Can consider spironolactone (if K+<4.5), βblocker, doxazosin, moxonidine or ^ the thiazide component (if K+>4.5)
- If 4 agents do not produce reasonable BP then refer cardiology for further advice / investigation

Annual review

- Check BP – if not to target consider home readings
- Encourage lifestyle changes
- U&E, Lipids
- Urine dip/ACR
- Remind to go for optician review

Case study 1

- Doreen age 48yrs
- Seen Nurse for well woman check – BP 160/90
- BMI 33
- No FHx of note.
- No meds



Case study 2

- Katie age 28
- T1DM comes for routine review
- BP 140/80 on ramipril 2.5 mg
- Hba1c 48 on insulin
- BMI 36

Case study 3

- John age 56
- Roofer
- Fhx MI <60
- Seen 3/52 ago viral illness BP 170/90 then
- Comes for r/v – headaches & a bit dizzy
- BP 203/101

- John comes back for r/v
- Has had renal USS & urine tests – nil found
- Hospital team have him on amlodipine 10mg, ramipril 5mg
- Ankles are swollen
- BP still 172/98
- ECG shows LVH
- What next?

Case 4

Tatbir age 78 Asian male

BP 154/88

On Nifedipine 90mg MR, bisoprolol 2.5mg & losartan 100/HCZ 25mg

Na 134, K 3.8 Cr 112 eGFR 58

CKD: why should we be bothered about it?

- ^ CVD risk
- HT, PVD & HF all more common in CKD
- Need for renal replacement
- Neuropathy
- Anaemia, bone abnormalities, malnutrition
- Late change in eGFR
- Number of patients affected

Causes

- Hypertension
- Diabetes
- Drugs (especially those DAMN drugs)
- Multi-system disease
- Structural kidney disease
- Obstructive disease

How should we find CKD?

- Regular review of other diseases
- Those on nephrotoxic drugs
- Opportunistic screening
- Proteinuria / haematuria
- Previous AKI

What about these results?

- 69 yr old male
- Na 131 K 6.5 Cr 285 eGFR 17

- 59 yr old female
- Na 135, K 4.2 Cr163 eGFR 27

AKI

- If bloods were routine & pt is well then lower risk of AKI with raised creatinine/lower GFR
- Sepsis
- Hypovolaemia
- HF
- Drugs
- Creatinine >3x baseline or >354 admit
- K+ >6.5 admit

AKI

- At risk groups: elderly with intercurrent illness especially gastroenteritis and co-morbidities DM, HF, nephrotoxic drugs (DAMN drugs)
- Consider AKI if renal fn deteriorates in those with CKD
- AKI → CKD in some cases
- Sick day rules ?check U&E

Medicine Sick Day Rules

When you are unwell with any of the following:

- Vomiting or diarrhoea (unless only minor)
- Fevers, sweats and shaking

Then STOP taking the medicines listed overleaf

Restart when you are well (after 24-48 hours of eating and drinking normally)

If you are in any doubt, contact your pharmacist, GP or nurse

Medicines to stop on sick days

- ☐ ACE inhibitors: medicine names ending in “pril”
  eg, lisinopril, perindopril, ramipril
- ☐ ARBs: medicine names ending in “sartan”
  eg, losartan, candesartan, valsartan
- ☐ NSAIDs: anti-inflammatory pain killers
  eg, ibuprofen, diclofenac, naproxen
- ☐ Diuretics: sometimes called “water pills”
  eg, furosemide, spironolactone, indapamide, bendroflumethiazide
- ☐ Metformin: a medicine for diabetes

Initially produced by NHS Highland

Classification

• CKD 2	eGFR 60-89	mild
• CKD 3a	eGFR 45-59	mild-moderate
• CKD 3b	eGFR 30-44	moderate
• CKD 4	eGFR 15-29	severe
• CKD 5	eGFR <15	end stage

+ proteinuria (>3mg/mmol) ^ CVD risk independently of eGFR

Referral

- Anyone with eGFR<30
- Sustained 25% change in eGFR & change in CKD category
- Sustained 15ml/min/1.73m² drop in eGFR over 12m
- ACR>70mg/mmol (or >30 if haematuria)
- Suspected RAS

Initial mangement

- Identify cause
- Refer if appropriate
- BP: CKD & ACR <70 aim for 140/90
  CKD & ACR >70 aim for 130/80
  Refer if uncontrolled on 4 agents
  NEVER ACEI+ARB
  optimum BP seems to be 120-140/60-80
- Statin 20mg atorva if eGFR<60 or ACR>3
- Antiplatelet?

Other advice

- Lifestyle advice: diet (low salt but not low protein), exercise, alcohol
- STOP SMOKING
- Avoid OTC NSAIDS
- Check with pharmacist before buying any medicines
- Sick day rules?

Routine review

- Annual U&E/eGFR/ACR for CKD 2 & 3a
- U&E/eGFR/ACR at least every 6/12 for CKD 3b
- Every 4/12 for CKD 4 (U&E/eGFR, ACR, FBC, Ca++, PO4-, Vit D, PTH)
- CKD 5 by renal team & according to need
- Anaemia (Hb <11g/dl) should be referred
- Care concurrent HF

ACEI & renal function

- Some ^ in creatinine &K+ expected after starting or increasing dose of ACEI
- If eGFR decreases < 25%, or ^ creatinine < 30% - keep same dose & recheck U&E 1-2/52
- If eGFR decreases >25% or ^ creatinine > 30% or K+ >5 think about hypovolaemia from other causes + interaction from other drugs. Consider correcting/stopping those rather than stopping ACEI
- If ^ Cr or ^K+ persists consider reducing ACEI & consider stopping ACEI (if K+>6 or eGFR<30) or seeking urgent specialist opinion

Other important drugs & when to stop them!

Metformin

- Review the dose if eGFR <45 mL/min/1.73 m2.
- Stop if eGFR < 30 mL/min/1.73 m2 or sudden deterioration in renal function

Spironolactone

- Consider stopping if creatinine ^ by 30%
- STOP if K+ >5.2 or creatinine >200 or 50% above baseline

Case studies

- Margaret 78yrs
- Known HT
- Routine r/v
- BP 168/85
- On amlodipine 5mg & indapamide 2.5mg
- Last U&E Creat 96 eGFR 45
- You decide to add ramipril 2.5mg
- 2 weeks later U&E creat 110 eGFR 40
- ACR 28

Extra drug for HT

- Winston age 62
- HT for a long time BP today 168/94
- On Ramipril 10, indapamide 2.5mg & amlodipine 10mg
- U&E Na 138 K 3.6 Cr 101 eGFR 58

- Next set of U&E at 2/52
- Na 137 K4.1 Cr 136 eGFR 51
- BP 142/86

In summary

- Think about impact on kidneys with all nephrotoxic drugs (DAMN) – multiplicative effect of several of these
- Need to do U&E more often than you might think
- Spironolactone is a useful 3rd/4th line but perhaps better tolerated in age 60 rather than age 80 age groups
- Always measure the standing BP in the elderly if you can