St Mary's NHS
NHS Trust

INTERNATIONAL CENTRE FOR CIRCULATORY HEALTH

Hypertension
Blood Pressure Management

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Guidelines

British Hypertension Society Guidelines for hypertension management (BHS-IV): summary (2004) Bryan Williams, Neil R Poulter, Morris J Brown, Mark Davies, Gordon T McInnes, John F Potter, Peter S Sever, Simon McG Thom; the BHS guidelines working party, for the British Hypertension Society. BMJ 328 634-640.

Joint British Societies' Guidelines on Prevention of Cardiovascular Disease in Clinical Practice (2006) British Cardiac Society, British Hypertension Society, Diabetes UK. HEART UK, Primary Care Cardiovascular Society, The Stroke Association. 91 Supl. V

Hypertension-management of hypertension in adults in primary care (2004 and 2006). NICE. Clinical guideline 18 and 34 www.nice.org.uk

Topics to be covered

- **Definition**
- Measurement
- Evaluation of hypertensive patients
- Thresholds for intervention
- Treatment goals
- Lifestyle measures
- Choice of therapy
- ABPM and home monitoring

Classification of blood pressure levels of the British Hypertension Society

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Blood Pressure		
Optimal	<120	<80
Normal	<130	<85
High normal	130-139	85-89
Hypertension		
Grade 1 (mild)	140-159	90-99
Grade 2 (moderate)	160-179	100-109
Grade 3 (severe)	≥180	≥110
Isolated systolic hypertension		
Grade 1	140-159	<90
Grade 2	≥160	≤90

BHS Guidelines

- **Definitions**
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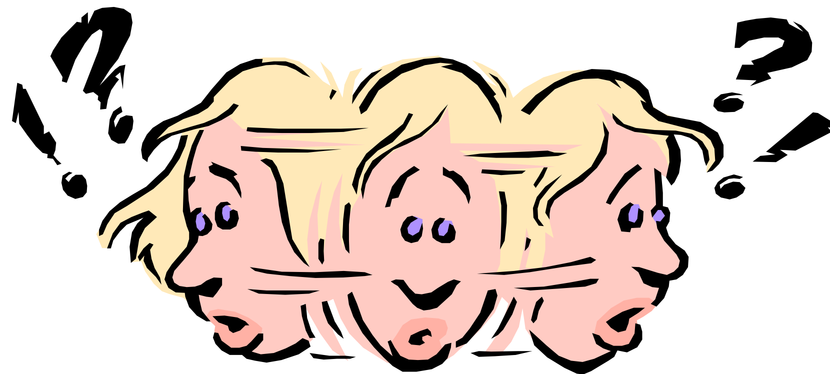
- **ABPM and home monitoring**

Types of blood pressure monitors.

What’s happened

to mercury?



Blood pressure measurement in clinical practice

(MHRA recommendations June 2005)

1. Auscultation method: e.g Greenlight; mercury

- Should be available in all clinical areas
- Taught to healthcare workers as appropriate
- Auscultation method used to check oscillometric (automatic) monitors
- Always used in certain clinical conditions: arrhythmias; pre-eclampsia; certain vascular disorders (e.g wide pulse pressure)

2. Non-mercury auscultation method:

- Available in all clinical areas (e.g. Accoson Greenlight 300)

3. Mercury Spillage kits:

Available in all clinical areas if using mercury

Blood pressure measurement in clinical practice

(MHRA recommendations June 2005)

4. Oscillometric monitors (automatic):

- Don’t assume it’s suitable for use in diagnosis of hypertension

5. Oscillometric (automatic) method not suitable for all:

- Arrythmias; pre-eclampsia; certain vascular diseases (wide pulse pressure)

6. Aneroid monitors:

- Aneroid dial gauges easily prone to damage from dropping, causing significant errors in zero & calibration
- Calibrate annually or as per manufacturers instructions (e.g. Welch Allyn Maxi-Stabl 3 – possibly 3 monthly?)

Types of monitors for recording blood pressure.
Summary

Recommended

- Mercury sphygmomanometers – (gold standard).
- Greenlight 300 (accoson)
- Independently validated automated upper arm devices

Not recommended

- Aneroids: Maxi-stabl 3 only recommended with caution -frequent calibrations will be required
- wrist monitors
- finger monitors

www.bhsoc.org.uk

Types of Monitors-Conclusion

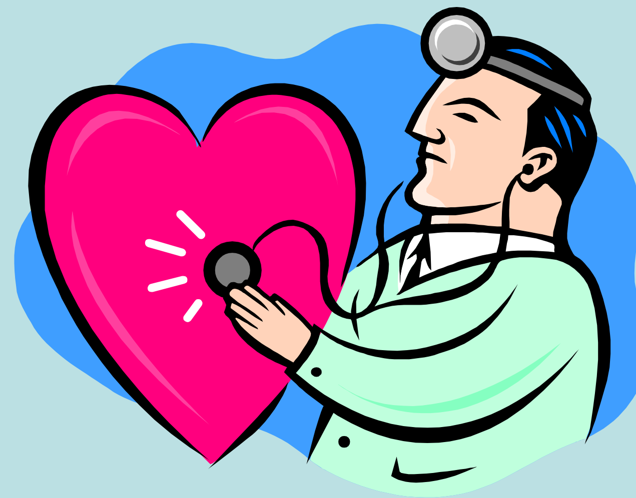
- Use independently validated monitors: review list on British Hypertension Society website eg UA767 or 779 monitor, Omron M7
- Calibrate/service your monitors regularly
- For cuff size follow manufacturer's recommendations

Words of Caution

- Oscillometric (automatic) devices not suitable for all patients
- Aneroids prone to inaccuracy
- Growing obesity problem-cuffs may not be big enough especially automatic monitors-max large cuff tends to be 42 –45cm depending on monitor. Patients arm circ can be 65cm

Requirements for taking blood pressure

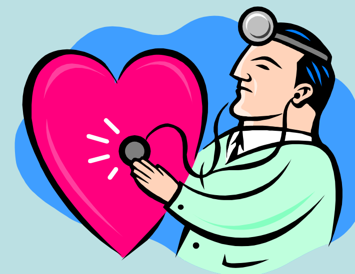
A brief update



Requirements for taking blood pressure

THE PATIENT

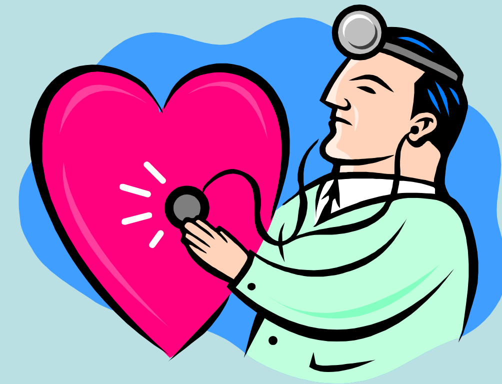
- The patient to be seated for at least 5 minutes
- explain the procedure. Ask patient not to talk during it.
- remove tight or bulky clothing



- apply cuff to upper arm
- arm circumference-the bladder to encircle arm by 80% (manual) or according to manufacturers instructions (automatic)
- arm supported and level with <u>patient's</u> heart

Requirements for taking blood pressure using auscultation

EQUIPMENT

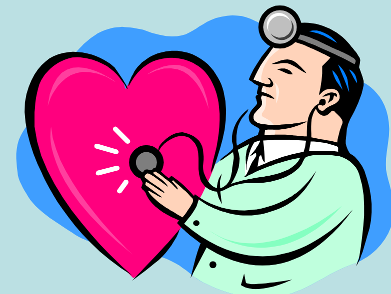


<u>The manometer (manual)</u>

- bulb and tubing shouldn’t leak
- air-tight connections
- If using mercury;
  column-vertical clean, at eye level

Requirements for taking blood pressure using auscultation

- Estimate systolic pressure
- Inflate cuff 20-30 mmHg. above systolic
- Deflate 2-3 mmHg. per second or pulse beat
- Record systolic pressure-when repetitive tapping sounds are heard
- Diastolic pressure-when sounds disappear (phase 5)



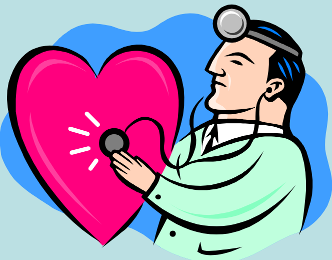
Requirements for taking blood pressure using auscultation

- Record to nearest 2 mmHg.
- Phase 4 now only used if sounds continue to zero
- Atrial fibrillation-multiple readings recommended
- Measure in both arms on 1st visit, always record in the highest arm thereafter.

Manual & Automatic

- At least 2 measurements (1-2 minutes apart)
- More readings if >10mmHg difference in systolic

  If > 5mmHg difference in diastolic



Assessment of hypertension

BHS

- Measure every 5 years all adults up to 80 years
- Measure annually those high normal (130-139 **or** 85-89)

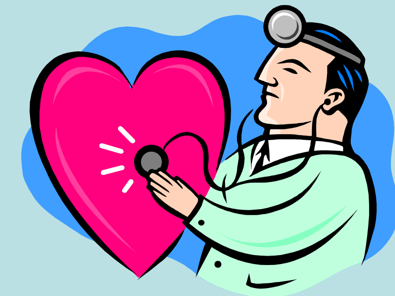
  and anyone noted to have high readings at any time

Confirmation of hypertension

- If BP high –repeat monthly over 4-6 months.
  (Unless BP very high, then measure more frequently)

- Do not treat on the basis of an isolated reading

NICE BP confirmation
If Initial BP > 140/90 repeat monthly for 2 months



BHS Guidelines

- Definitions
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- **Evaluation of hypertensive patients**
- Thresholds for intervention
- Treatment goals
- Lifestyle measures
- Choice of therapy
- ABCD rule
- Aspirin and statins
- ABPM and home monitoring

Routine investigations

- Urine strip test for protein and blood
- Serum creatinine and electrolytes
- Blood glucose – ideally fasted
- Blood lipid profile ideally fasted for consideration of triglycerides
- Electrocardiogram

Evaluation of hypertensive patients

Causes of hypertension

- **Drugs** (NSAIDS, oral contraceptions, steroids, liquorice, some cold cures)
- **Renal disease** (present, past or family history, proteinuria or haematuria: palpable kidney(s) – polycystic, hydronephrosis, or neoplasm)
- **Renovascular disease** (abdominal or loin bruit**)**
- **Phaeochromocytoma** (paroxysmal symptoms)
- **Conn's syndrome** (tetany, muscle weakness, polyuria, hypokalaemia)
- **Coarctation** (radio-femoral delay or weak femoral pulses**)**
- **Cushing's** (general appearance)

Contributory factors

- Overweight
- Excess alcohol
  (> 3 units/day for men; > 2 units/days for women)
- Excess salt intake
- Lack of exercise
- Environmental stress

Suggested indications for specialist referral
(part 1)

Urgent treatment needed

- Accelerated hypertension (severe hypertension and grade III-IV retinopathy)
- Particularly severe hypertension (>220/120mmHg)
- Impending complications (e.g. TIA, LVF)

Suggested indications for specialist referral (continued)

Possible underlying cause

- Any clue in history or examination of a secondary cause, eg. low potassium with increased or high normal plasma sodium (Conn's syndrome)
- Elevated serum creatinine
- Proteinuria or haematuria
- Sudden onset or worsening of hypertension
- Resistant to multi-drug regimen ($\geq$ 3 drugs)
- Young age
  (any hypertension <20 years; needing treatment <30 years)

Suggested indications for specialist referral (continued)

Therapeutic problems

- Multiple drug intolerance
- Multiple drug contraindications
- Persistent non-adherence or non-compliance

Special situations

- Unusual blood pressure variability
- Possible ‘white coat’ hypertension
- Hypertension in pregnancy

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When to treat?

Hypertension is

BP $\geq$ 140 systolic and/or $\geq$ 90 mmHg diastolic.

Sustained raised BP

$\geq$ 160 systolic and/or $\geq$ 100 mmHg diastolic

requires medication (despite non-pharmacological treatment)

Treat BP $\geq$ 140 systolic and/or $\geq$ 90 diastolic

…if patient has Target Organ Damage, CVD, Diabetes or 10 year CVD risk $\geq$ **20%**

Suggested target blood pressures during antihypertensive treatment.

	Clinic BP (mmHg)	
	No diabetes	Diabetes
Optimal treated BP	**<140/85**	**<130/80**
Audit Standard	<150/90	<140/80

Systolic and diastolic blood pressures should *both* be attained Target = <140/85 mmHg

This means systolic BP is *less than* 140 **and** diastolic BP

is less than 85 (BHS & JBS Guidelines)

- NICE- treat to 140/90

Lipid targets (BHS)

Targets for lipid lowering on treatment

Ideal TC <4.0 mmol/l

or

- LDL <2.0 mmol/l

or

- 25% ↓ in TC

or

- 30% ↓ in LDL-C

whichever is the greater

Audit

- TC <5.0 mmol/l

or

- LDL <3.0 mmol/l

or

- 25% ↓ in TC

or

- 30% ↓ in LDL-C

whichever is the greater

Statin: prescribed if 10 year CVD risk of ≥20% (measured by using the Joint British Societies risk chart) and with T. cholesterol ≥3.5mmol/l

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Lifestyle intervention for blood pressure reduction

Intervention	Recommendation	Expected systolic BP reduction (range)
Weight reduction	Maintain ideal body mass index (20-25kg/M²)	**5-10 mmHg per 10kg weight loss**
DASH eating plan	Eat diet rich in fruit, vegetables, low-fat dairy products. Eat less saturated and total fat	**8 -14 mmHg**
Dietary sodium restriction	Reduce dietary sodium intake to <100mmol/day <2.4g sodium or <6 g salt (sodium chloride)	**2 - 8mmHg**
Physical activity	Regular aerobic physical activity, e.g. brisk walking for at least 30 min most days	**4 - 9 mmHg**
Alcohol moderation	Men ≤ 21 units per week Women ≤ 14 units per week	**2-4 mmHg**

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Classes of drugs for treatment of hypertension

Diuretic
eg. bendrofluazide

ACE-inhibitor
eg. perindopril

Calcium-channel blocker – eg.
Amlodipine/Diltiazem

Angiotensin receptor Blocker eg candesartan

Beta-blocker
eg. atenolol

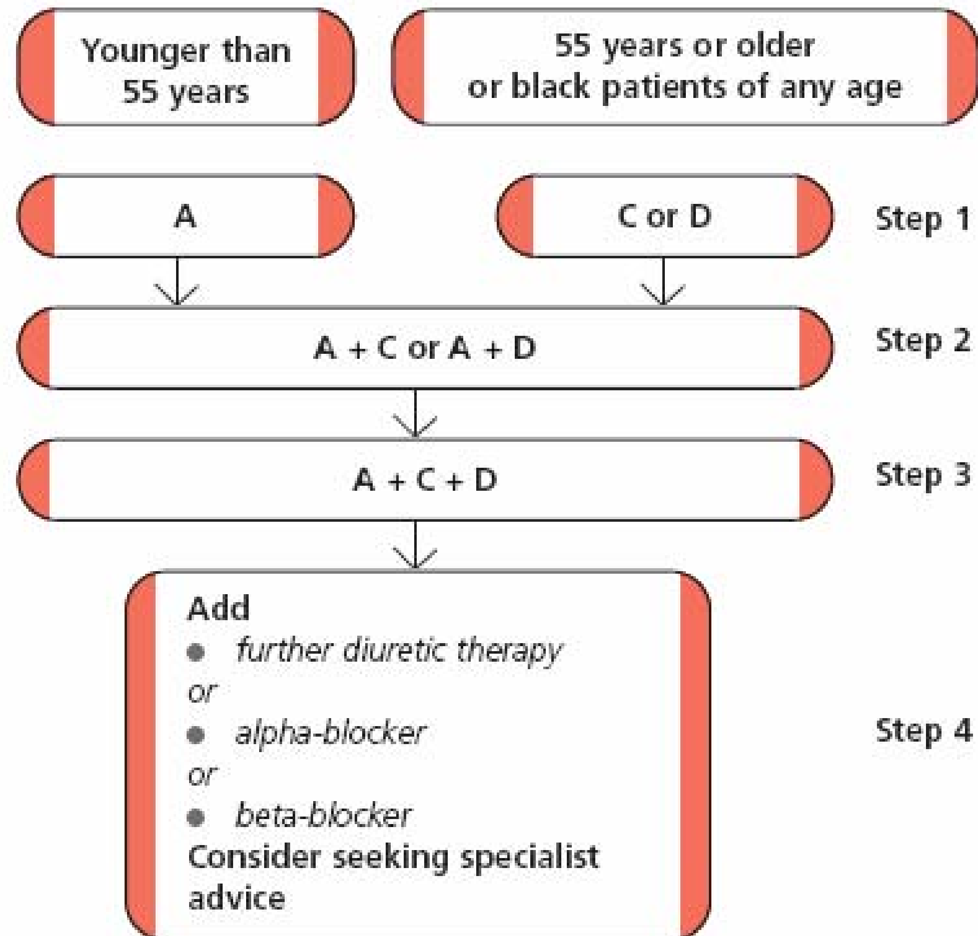
Alpha-blocker
eg Doxazosin

- **Most hypertensives will need ≥ 2 drugs to control BP**
- **Drug combinations may be synergistic**

Choosing drugs for patients newly diagnosed with hypertension

Abbreviations:
A = ACE inhibitor
(consider angiotensin-II receptor antagonist if ACE intolerant)
C = calcium-channel blocker
D = thiazide-type diuretic

Black patients are those of African or Caribbean descent, and not mixed-race, Asian or Chinese patients



NICE/BHS algorithm: June 2006

Other medication for hypertensive patients

Primary prevention

Aspirin 75mg daily

age >50 with controlled BP <150/90mmHg and;

target organ damage and/or diabetes, and/or 10 year CVD risk of ≥20%

(measured using the new Joint British Societies CVD risk chart)

Statin:

prescribed if 10 year CVD risk of ≥20% (measured by using the new Joint British Societies risk chart) and with

T. cholesterol ≥3.5mmol/l

Vitamins - no benefit shown, do not prescribe

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Home/self BP monitoring

- Advise patients on accurate, independently validated, well maintained monitors
- Advise use of appropriate cuff size
- Wrist monitors are not recommended

Suggested measurement routine for patients

- Measure BP for 7 days prior to appointment
- Record BP twice a day. Morning and evening
- Discard first 24 hours of readings
- Take an average of at least 12 of these readings

24 hour BP monitoring (ABPM)

Indications for ABPM

- Possible ‘white coat’ hypertension
- Informing equivocal treatment decisions
- Evaluation of nocturnal hypertension
- Determining efficacy of drug treatment over 24 hours
- Evaluation of symptomatic hypotension
- Unusual BP variability
- Diagnosis & treatment of hypertension in pregnancy
- Evaluation of drug resistant hypertension

Interpreting results

For both 24 hour Ambulatory BP monitoring and Home monitor readings

Add 10/5 mmHg to average daytime pressure.

e.g. day-time average pressure = 158/89
add 10/5
adjusted reading = 168/94

Home BP <130/85 probably considered normal.

For information on…

Hypertension Management Guidelines,
Recommendations for combining blood pressure lowering drugs,
BP measuring recommendations,
Validated BP monitors,
CVD risk prediction chart
CHD risk calculator

www.bhsoc.org.uk

To view N.I.C.E. guidelines go to

www.nice.org.uk