

W68: Clinical management of hypertension (MM HYP1 HYP2)

Name: **ANSWERS**

Learning Outcomes

By the end of this workshop you will be able to:

- Apply the **NICE 2019 NG136 Hypertension in adults: diagnosis and management** to recommend appropriate management for an individual patient
- Identify potential pharmaceutical care issues for a patient with hypertension
- List therapeutic and toxic drug monitoring parameters for the drugs used to treat hypertension

Tasks

- Answer questions relating to 3 case studies for patients diagnosed with hypertension
- Resources => to answer the questions use:
 - **Screencasts weeks 1 and 3** (Hypertension - Epidemiology, aetiology, diagnosis, threshold & targets and Introduction to the Management of Hypertension)
 - **Hypertension drug info pack 2021-22** (includes summary of NICE 2019 guidelines on last page) – on Bb with workshop + on Bb with Introduction to the Management of Hypertension screencast)
 - **NICE 2019 NG136 Hypertension in adults: diagnosis and management** – on Bb with workshop
 - **BNF**

CASE 1

Mr GB, a 75-year-old Black African Caribbean man, is found to have elevated blood pressure when having his bp checked by the practice nurse, his lowest reading being 140/95 and highest being 150/98

1. What are the first- line measures for the treatment of Mr GB's hypertension according to the NICE 2019 NG136 Hypertension in adults: diagnosis and management guidelines?

- Offer ABPM (or HBPM)
- Assess CV risk (will be covered in detail in year 3) & end organ damage (check kidney function, glucose, cholesterol, eyes, heart – ECG)
- Non-pharmacological /life-style measures:
 - Weight loss (if appropriate)
 - Limit alcohol
 - Regular exercise
 - Diet:
 - ↓ salt intake, 5 fruit/veg, ↓ total/saturated fat
 - Stop smoking (if appropriate)
- Only treat if target organ damage, established CVD, renal disease, DM or assessed CV risk >10%

2. What is the target blood pressure for Mr GB according to the NICE 2019 NG136 Hypertension in adults: diagnosis and management guidelines?

< 140/90

- After 3 months, Mr GB's bp has risen to 165/105, confirmed by ABPM.

He presents to your pharmacy with the following prescription:

Pharmacy Stamp	Age D.o.B	Title, Forename, Surname & Address Mr GB 12a Primrose Road Flatplace
Please don't stamp over age box Number of days' treatment N.B. Ensure dose is stated		NHS Number:
Endorsements Please Supply 28 Ramipril 2.5mg Tablets 1 ON		
Signature of Prescriber A. Thompson		Date Today
For dispenser No. of Prescs. on form	Dr A Thompson 898776 Flatplace Surgery Flatplace	
NHS 51778520559		FP10SS0406

3. Does the prescription meet the current NICE 2019 NG136 Hypertension in adults: diagnosis and management guidelines? Explain your answer.

The patient has stage 2 hypertension (BP higher than 160/100 mmHg).

Antihypertensive drug treatment should be offered to anyone with stage 2 hypertension.

No, the prescription does not meet NICE 2019 NG136 Hypertension in adults: diagnosis and management. Step 1 antihypertensive treatment with a calcium channel blocker (CCB) to people aged over 55 years and to black people or Caribbean family origin of any age.

Mr GB is 75 years and Black African Caribbean, therefore a CCB would be the appropriate drug choice, for example, amlodipine 5mg OD.

4. For the recommended drug therapy for Mr GB, what are the therapeutic and toxic monitoring parameters and consider how often you think these should be monitored?

Chosen drug: Amlodipine			
Therapeutic monitoring parameters	Frequency of monitoring	Toxic monitoring parameters	Frequency of monitoring
BP	1 month	BP	1 month
		S/E – Abdominal pain, nausea, swelling of ankles (SOA) – oedema, Dizziness/light headedness	Patient self-monitoring

CASE 2

You are a clinical pharmacist working on the ward. You review the medical notes and drug chart for Mrs Allison Bailey, a 52 year old, white Caucasian.

Medical notes entry:

Surname: *Bailey*
First names: *Allison*
Date of birth: 30/06/1968
Hospital no: 212465
Male/Female: *female*

Previous evening

Presenting complaint (PC): Uncontrolled blood pressure

History of presenting complaint (HPC): Patient admitted following appointment with her GP that afternoon when blood pressure was measured as 190/120

Previous Medical History (PMH): Hypertension (18 months)
Gout (2 years)

Drug History (DH): Amlodipine 10mg od
Perindopril 8mg od
Allopurinol 300mg od

On examination (OE): BP: 185/115
Pulse: 85

Renal function: NAD
Hepatic function: NAD

Diagnosis (Δ): Severe hypertension

Plan: Adjust drug therapy

****Patients inpatient drug chart and blood pressure chart can be found on the following pages****

NAD = Nothing abnormal detected

UEA Training Prescription Chart

 Number of drug charts in use: **1**

Date	Surname	Forename	Sex	D/O/B	Hospital No.	Weight (kg)	Height (cm)	Surface Area (m ²)	SAM?
Day 1	B	A	F	30/06/1968	212465	74 <small>Estimate / Actual</small>			Yes / No

Ward/ward change:	Admissions	Patient address:
Consultant(s)	Dr P Sven	

DRUG SENSITIVITIES/ALLERGIES MUST BE ENTERED. If no allergies/sensitivities you must write 'NKDA' and sign and date.

Medicine/Substance	Description of allergy/sensitivity	Signature	Date
	NKDA	<i>S. Smith Pharmacist</i>	Day 1

PRE-MEDICATION AND ONCE ONLY DRUGS

Pharm	Date	Drug (approved name)	Dose	Directions/ route/ other	Time to be given	Signature	Administered by	
							Initials	Date

Thromboprophylaxis Risk Assessment

Drug thromboprophylaxis recommended				
Drug thromboprophylaxis NOT recommended	X			

Prescribing	Drug omissions	Prescribers																
<ul style="list-style-type: none"> • Write clearly in black, indelible ink. • Use approved drug names. • All prescriptions must be signed and dated. • If a drug is to be intentionally omitted by a prescriber or pharmacist, indicate this with an 'X' in the drug administration box. • If a drug is being stopped, or a dose altered, draw a line through the whole prescription, sign and date. • Doctors to re-write charts as required. Start dates should be transferred to new chart. Include cross-reference to drugs on other charts. 	If a drug is omitted, one of the below codes must be entered into the drug administration box. <table style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 50%;">1. Nil by mouth</td> <td style="width: 50%;">6. Patient off ward</td> </tr> <tr> <td>2. Not required</td> <td>7. No IV access</td> </tr> <tr> <td>3. Patient refused</td> <td>9. Contra-indicated</td> </tr> <tr> <td>4. Drug unavailable</td> <td>8. Other - reason must be recorded in notes</td> </tr> <tr> <td>5. Vomiting/nausea</td> <td></td> </tr> </table>	1. Nil by mouth	6. Patient off ward	2. Not required	7. No IV access	3. Patient refused	9. Contra-indicated	4. Drug unavailable	8. Other - reason must be recorded in notes	5. Vomiting/nausea		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Signature</td> <td><i>Dr P Sven</i></td> </tr> <tr> <td>Bleep no.</td> <td>5893</td> </tr> <tr> <td>Print name</td> <td>Doctor P Sven</td> </tr> </table>	Signature	<i>Dr P Sven</i>	Bleep no.	5893	Print name	Doctor P Sven
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Pharmacy codes	
Pharm: Signature confirms checked/date	Signature
TTO ✓ = from locker; H = at home; R = relabel; ★ = new supply at discharge	Bleep no.
Supply: S = ward stock; T = dispensing, see date and quantity; P = POD, see date and quantity	Print name
	Version 001-19

REGULAR MEDICINES 1

CHECK PAGE 1 FOR ALLERGY STATUS

				Date →	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Tick box to indicate time of admission or add other times ↓														
1. Drug (approved name)		Start date	End date	06.00										
Amlodipine		Day 1		08.00	✓	RA								
Dose	Route	Frequency		12.00										
10mg	PO	OD		14.00										
Indication		Pharm check		18.00										
				22.00										
Prescriber's signature		Supply		00.00										
P Sven														
2. Drug (approved name)		Start date	End date	06.00										
Perindopril		Day 1		08.00	✓	RA								
Dose	Route	Frequency		12.00										
8mg	PO	OD		14.00										
Indication		Pharm check		18.00										
				22.00										
Prescriber's signature		Supply		00.00										
P Sven														
3. Drug (approved name)		Start date	End date	06.00										
Allopurinol		Day 1		08.00	✓	RA								
Dose	Route	Frequency		12.00										
300mg	PO	OM		14.00										
Indication		Pharm check		18.00										
				22.00										
Prescriber's signature		Supply		00.00										
P Sven														
4. Drug (approved name)		Start date	End date	06.00										
				08.00										
Dose	Route	Frequency		12.00										
				14.00										
Indication		Pharm check		18.00										
				22.00										
Prescriber's signature		Supply		00.00										
5. Drug (approved name)		Start date	End date	06.00										
				08.00										
Dose	Route	Frequency		12.00										
				14.00										
Indication		Pharm check		18.00										
				22.00										
Prescriber's signature		Supply		00.00										

CHECK PAGE 1 FOR ALLERGY STATUS

AS REQUIRED DRUGS

CHECK PAGE 1 FOR ALLERGY STATUS

1. Drug (approved name)		Start date	Date															
Dose	Route	Max Frequency	Time															
Indication		Pharm check	Dose															
			Route															
Prescriber's signature		Supply	Given by															
2. Drug (approved name)		Start date	Date															
Dose	Route	Max Frequency	Time															
Indication		Pharm check	Dose															
			Route															
Prescriber's signature		Supply	Given by															
3. Drug (approved name)		Start date	Date															
Dose	Route	Max Frequency	Time															
Indication		Pharm check	Dose															
			Route															
Prescriber's signature		Supply	Given by															
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Dose	Route	Max Frequency	Time															
Indication		Pharm check	Dose															
			Route															
Prescriber's signature		Supply	Given by															
5. Drug (approved name)		Start date	Date															
Dose	Route	Max Frequency	Time															
Indication		Pharm check	Dose															
			Route															
Prescriber's signature		Supply	Given by															

CHECK PAGE 1 FOR ALLERGY STATUS

Observations Frequency:

O₂ Code:
N = Nasal cannulae } **Inspired O₂:**
SM = Simple Mask } **Record flow rate in**
RM = Reservoir Mask } **Litres (L)**

V = Venturi } **Record %**
H = Humidified }
A = Air }

Target Oxygen Saturations;

WARD:

OBSERVATION CHART

Name: ALLISON BAILEY
Registration No: 212465
NHS Number: 1234567
Date of Birth: 30/6/68

DATE	1	2	3	4														DATE
TIME	12 ³⁰	13 ³⁰	14 ⁰⁰	15 ⁰⁰														TIME
B P A N D P U L S E	240																	40 °C T
	230																	39.5 E
	220																	39 M
	210																	38.5 P
	200																	38 E
	190																	37.5 R
	180																	37 A
	170																	36.5 T
	160																	36 U
	150																	
140																		35 E
130																		34.5
120																		
110																		
100																		
90																		
80																		
70																		
60																		
50																		
40																		
RESPS	18	20	17	18														
SATS %	A	A	A	A														SATS %
O₂ Code																		O₂ Code
Inspired O₂																		Inspired O₂
Weight	74																	Weight
Urine pH:																		Urine pH:
Glucose																		Glucose
Ketones																		Ketones
Sp. Gravity																		Sp. Gravity
Blood Protein																		Blood Protein
Nitrite																		Nitrite
Leucocytes																		Leucocytes
Bowels	BO																	Bowels
Type stool																		Type stool
ENTER EARLY WARNING SCORE BELOW & IF EWS TRIGGER 4 OR MORE DOCUMENT ACTIONS OVER PAGE																		
TEMP																		TEMP
Systolic BP																		Systolic BP
PULSE																		PULSE
RESPS																		RESPS
AVPU																		AVPU
URINE																		URINE
TOTAL																		TOTAL
Sign initials																		Sign initials

1. Does Mrs Bailey's drug history meet current NICE 2019 NG136 Hypertension in adults: diagnosis and management guidelines?

As Mrs Bailey is under 55 years, white Caucasian:

Step 1 – The treatment recommendation is for the use of an Angiotensin Converting Enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) – she is on perindopril (ACEI)

If blood pressure is not controlled on step 1, offer step 2.

Step 2 – The treatment recommendation is for the use of a calcium channel blocker (CCB) in combination with an ACE inhibitor (ACEI), or thiazide-like diuretic in combination with an ACE inhibitor – she is on amlodipine (CCB) with the perindopril.

Yes, her treatment is appropriate based on the guidance.

2. What is the target blood pressure according to the NICE 2019 NG136 Hypertension in adults: diagnosis and management for Mrs Bailey?

<140/90

3. What are the therapeutic and toxic monitoring parameters for perindopril?

Therapeutic monitoring parameters	Frequency of monitoring	Toxic monitoring parameters	Frequency of monitoring
BP	4 hours	BP	4 hours
		Dry cough	Patient self-monitoring
		Urea and Electrolytes (U&E's) esp. potassium (K ⁺)	Baseline on admission & up to daily with as appropriate
		Renal function	

4. What advice would you give to the junior doctor about how to adjust the Mrs Bailey's medication according to the NICE 2019 NG136 Hypertension in adults: diagnosis and management?

Before considering step 3, the patients' medication should be reviewed to ensure current therapy is at optimal or best tolerated doses. (=> both perindopril & amlodipine are at max. doses)

Check patient has been adherent to medication prior to admission

If blood pressure is still not controlled, addition of a further antihypertensive is required (step 3) – a thiazide like diuretic. This should be used in combination with the ACE inhibitor and CCB.

e.g. indapamide, chlortalidone (bendroflumethiazide commonly prescribed but not EBM)

5. Identify and document any actual or potential pharmaceutical care issues and actions that should be taken (HINT: look at the side-effect profiles in BNF/HT drug info pack)

Mrs Bailey is already taking allopurinol for prevention of gout. One of the side effects of thiazide-like diuretics is hyperuricaemia and gout so therefore contraindicated for this patient.

This patient should be move to step 4 so depending on potassium levels have low dose spironolactone (25mg OD) if $K^+ < 4.5 \text{ mmol/L}$ or alpha-blocker/beta-blocker if $K^+ > 4.5 \text{ mmol/L}$ added to their ACE inhibitor and CCB

(BNF: Perindopril is predicted to increase the risk of hypersensitivity and haematological reactions when given with allopurinol. Manufacturer advises caution. – include in toxic monitoring parameters)

CASE 3

Mrs Rina Patel enters your pharmacy with the following prescription:

Pharmacy Stamp	Age D.o.B 1/3/62	Title, Forename, Surname & Address Rina Patel 2 White Road Flatplace
Please don't stamp over age box Number of days' treatment N.B. Ensure dose is stated		NHS Number:
Endorsements Please Supply 28 Amlodipine 5mg Tablets 1 OD		
Signature of Prescriber A. Thompson		Date Today
For dispenser No. of Prescns. on form	Dr A Thompson 898776 Flatplace Surgery Flatplace	
NHS 51778520559		FP10SS0406

This is your PMR for Mrs Patel:

Date	Quantity	Item
07/02/22	84	Metformin 500mg TDS
	28	Atorvastatin 20mg OD
05/03/22	84	Metformin 500mg TDS
	28	Atorvastatin 20mg OD
010/04/22	84	Metformin 500mg TDS
	28	Atorvastatin 20mg OD

Whilst waiting for her prescription, Mrs Patel asks whether she can buy bigger packets of ibuprofen than are on the shelf, packs of 28, as she is having to buy them every week. Upon investigation you find out that she has badly twisted her 'weak' right ankle and it is swollen and painful again so she is using ibuprofen 400mg TDS to help with the pain.

1. Does Mrs Patel's prescription meet the NICE 2019 NG136 Hypertension in adults: diagnosis and management?

No, she has Type 2 DM and therefore should be on an ACEI (or ARB) first line (provides protection against diabetic nephropathy (kidney failure due to diabetes – see year 2))

2. What is the target blood pressure according to the 2019 NG136 Hypertension in adults: diagnosis and management for Mrs Patel?

<140/90 (Type 2 DM has same targets as non-diabetics – Type 1 DM are different – see year 2)

3. Identify and document any actual or potential pharmaceutical care issues

Ibuprofen use is cautioned in patients with uncontrolled hypertension – this therefore may or may not be appropriate for you patient (you would have to investigate their BP control – ibuprofen associated with increased bp (sodium and water retention) as well as increased risk of CVD and renal impairment.