NATIONAL CLINICAL GUIDELINES

THE DIAGNOSIS & MANAGEMENT OF HYPERTENSION IN ADULTS

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المبادئ الإرشادية السريرية لدولة قطر
NATIONAL CLINICAL GUIDELINES FOR QATAR

وزارة الصحـــــة العامـــــة
Ministry of Public Health
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Version History

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1.0	Initial Version	14th December 2016	Guidelines Team	Final version for publication.
1.1	Updated Version	19th March 2017	Guidelines Team	Minor updates to Section 2.
2.0	Updated Version	10th December 2019	Guidelines Team	Updated Final Version for publication

Citation

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Abbreviations

The abbreviations used in this guideline are as follows:

ABPM	Ambulatory Blood Pressure Monitoring
ACC/AHA	American College of Cardiology / American Heart Association
ACE	Angiotensin-Converting Enzyme
ARB	Angiotensin II Receptor Blocker
ASCVD	Atherosclerotic Cardiovascular Disease
BMI	Body Mass Index
BP	Blood Pressure
CCBs	Calcium Channel Blockers
CKD	Chronic Kidney Disease
CVD	Cardiovascular Disease
DBP	Diastolic Blood Pressure
eGFR	Estimated Glomerular Filtration Rate
ESC	European Society for Cardiology
HBPM	Home Blood Pressure Monitoring
MAOIs	Monoamine Oxidase Inhibitors
MOPH	Ministry of Public Health of Qatar
NSAID	Non-Steroidal Anti-Inflammatory Drug
QNF	Qatar National Formulary

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SBP	Systolic Blood Pressure
SNRIs	Serotonin Norepinephrine Reuptake Inhibitors
TIA	Transient Ischaemic Attack
WHO	World Health Organisation

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1 Information About This Guideline

1.1 Objective and Purpose of the Guideline

The purpose of this guideline is to define the appropriate diagnosis and management of hypertension in adults. The objective is to reduce inappropriate investigation, prescribing and referral of patients presenting to provider organisations in Qatar. It is intended that the guideline will be used primarily by physicians in primary care and outpatient settings.

1.2 Scope of the Guideline

Aspects of care covered within this guideline include:

- Diagnosis and management of hypertension in adults (aged 18 years and older).
- Aetiology and classification of hypertension.
- Assessment and referral criteria for hypertension.
- Emergency referral criteria for suspected hypertensive crisis.
- Appropriate BP measuring techniques.
- Assessment of atherosclerotic cardiovascular risk.
- Clinical conditions associated with hypertension.
- Assessment of end-organ damage.
- Management of hypertension in patients with type 1 and type 2 diabetes mellitus.

Aspects of care not covered within this guideline include:

- Hypertension in children (aged less than 18 years).
- Hypertension in pregnancy
- Specialist management of secondary hypertension.
- Specialist management of hypertensive crises.

1.3 Editorial Approach

This guideline document has been developed and issued by the Ministry of Public Health of Qatar (MOPH), through a process which aligns with international best practice in guideline development and localisation. The guideline will be reviewed on a regular basis and updated to incorporate comments and feedback from stakeholders across Qatar.

The editorial methodology, used to develop this guideline, has involved the following critical steps:

- Extensive literature search for well reputed published evidence relating to the topic.
- Critical appraisal of the literature.
- Development of a draft summary guideline.
- Review of the summary guideline with a Guideline Development Group, comprised of practising healthcare professionals, subject matter experts and patient representatives, from across Qatar.
- Independent review of the guideline by the National Clinical Guidelines & Pathways Committee, appointed by the MOPH, from amongst stakeholder organisations across Qatar.

Whilst the MOPH has sponsored the development of the guideline, the MOPH has not influenced the specific recommendations made within it.

1.4 Sources of Evidence

The professional literature published in the English language has been systematically queried using specially developed, customised, and tested search strings. Search strategies are developed to allow efficient yet comprehensive analysis of relevant publications for a given topic and to maximise retrieval of articles with certain desired characteristics pertinent to a guideline.

For each guideline, all retrieved publications have been individually reviewed by a clinical editor and assessed in terms of quality, utility, and relevance. Preference is given to publications that:

1. Are designed with rigorous scientific methodology.
2. Are published in higher-quality journals (i.e. journals that are read and cited most often within their field).
3. Address an aspect of specific importance to the guideline in question.

Further information about the literature search and appraisal process is included in the appendix.

1.5 Evidence Grading and Recommendations

Recommendations made within this guideline are supported by evidence from the medical literature and where possible the most authoritative sources have been used in the development of this guideline. In order to provide insight into the evidence basis for each recommendation, the following evidence hierarchy has been used to grade the level of authoritativeness of the evidence used, where recommendations have been made within this guideline.

Where the recommendations of international guidelines have been adopted, the evidence grading is assigned to the underlying evidence used by the international guideline. Where more than one source has been cited, the evidence grading relates to the highest level of evidence cited:

- **Level 1 (L1):**
  - Meta-analyses.
  - Randomised controlled trials with meta-analysis.
  - Randomised controlled trials.
  - Systematic reviews.

- **Level 2 (L2):**
  - Observational studies, examples include:
    - Cohort studies with statistical adjustment for potential confounders.
    - Cohort studies without adjustment.
    - Case series with historical or literature controls.
    - Uncontrolled case series.
  - Statements in published articles or textbooks.

- **Level 3 (L3):**
  - Expert opinion.
  - Unpublished data, examples include:
    - Large database analyses.
    - Written protocols or outcomes reports from large practices.

In order to give additional insight into the reasoning underlying certain recommendations and the strength of recommendation, the following recommendation grading has been used, where recommendations are made:

- **Recommendation Grade A (RGA):** Evidence demonstrates at least moderate certainty of at least moderate net benefit.
- **Recommendation Grade B (RGB):** Evidence is insufficient, conflicting, or poor and demonstrates an incomplete assessment of net benefit vs harm; additional research is recommended.
- **Recommendation Grade C (RGC):** Evidence demonstrates potential harm that outweighs benefit; additional research is recommended.
- **Recommendation of the GDG (R-GDG):** Recommended best practice on the basis of the clinical experience of the Guideline Development Group members.

1.6 Guideline Development Group Members

The following table lists members of the Guideline Development Group (GDG) nominated by their respective organisations and the Clinical Governance Group. The GDG members have reviewed and provided feedback on the draft guideline relating to the topic. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

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Ms Marvy Policarpio	Patient Representative	-
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[1] Mr Ahmed Babiker attended the MOPH in his capacity as a Clinical Pharmacist and advisor on the availability of medications in Qatar.

1.7 National Clinical Guidelines & Pathways Committee members

The following table lists members of the National Clinical Guidelines & Pathways Committee (NCGPC), appointed by the MOPH. The NCGPC members have reviewed and provided their feedback and approval of the guideline document. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
Name	**Title**	**Organisation**
Ms Huda Amer Al-Katheeri	Chair of the NCGPC, Director of Strategic Planning & Performance Department	Ministry of Public Health
Shk Dr Mohammed Hamad J. Al Thani	Co-Chair of the NCGPC, Director of Public Health	Ministry of Public Health
Prof Anthony Akobeng	Chair Clinical Practice Guidelines Committee	Sidra Medicine
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Dr Ghassan Youseph Hommos	Consultant Endocrinology	Al Emadi Hospital
Dr Chris Kenny	Executive Director Clinical and Service Development, Office of the Chief Medical Officer	Hamad Medical Corporation
Dr Egon Toft	VP and Dean of College of Medicine	College of Medicine, Qatar University

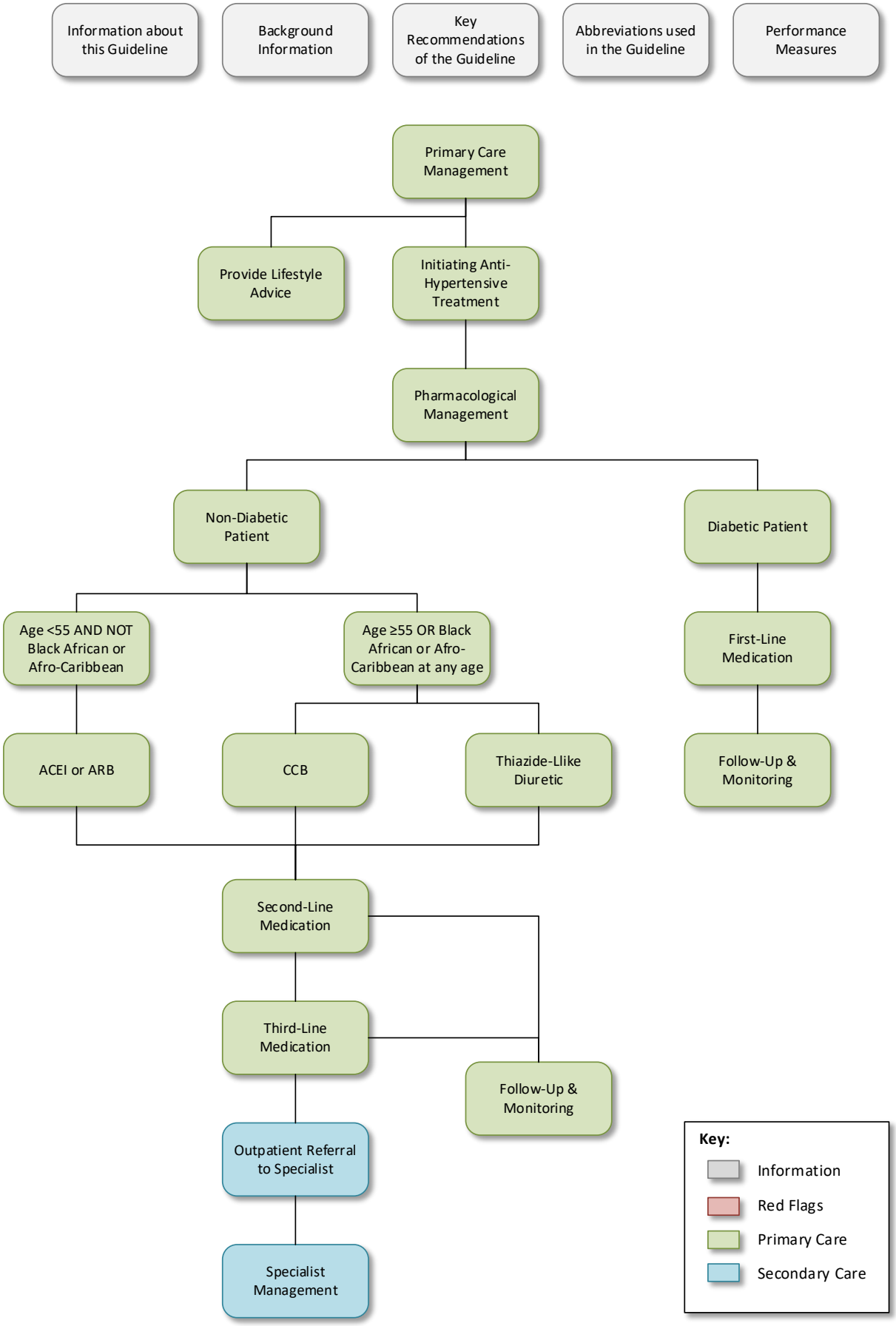
1.8 Responsibilities of Healthcare Professionals

This guideline has been issued by the MOPH to define how care should be provided in Qatar. It is based upon a comprehensive assessment of the evidence as well as its applicability to the national context of Qatar. Healthcare professionals are expected to take this guidance into account when exercising their clinical judgement in the care of patients presenting to them.

The guidance does not override individual professional responsibility to take decisions which are appropriate to the circumstances of the patient concerned. Such decisions should be made in consultation with the patient, their guardians, or carers and should consider the individual risks and benefits of any intervention that is contemplated in the patient's care.

2 Hypertension Pathway

Click on a box below to see the relevant page of the Pathway.


Information about this Guideline
Background Information
Key Recommendations of the Guideline
Abbreviations used in the Guideline
Performance Measures
Primary Care Management
Provide Lifestyle Advice
Initiating Anti-Hypertensive Treatment
Pharmacological Management
Non-Diabetic Patient
Diabetic Patient
Age <55 AND NOT Black African or Afro-Caribbean
Age ≥55 OR Black African or Afro-Caribbean at any age
First-Line Medication
ACEI or ARB
CCB
Thiazide-Llike Diuretic
Follow-Up & Monitoring
Second-Line Medication
Third-Line Medication
Follow-Up & Monitoring
Outpatient Referral to Specialist
Specialist Management
Key:
Information
Red Flags
Primary Care
Secondary Care

3 Key Recommendations of the Guideline

The key recommendations of this guideline are:

Confirming Blood Pressure Measurements (*Section 7.3*):

- If clinic BP is persistently 140/90 mmHg or higher, or masked hypertension is suspected, confirm the diagnosis with [1,2]:
    - Ambulatory BP monitoring (ABPM), where available [1][**L1, RGA**]:
        - ABPM is the preferred method of confirming a diagnosis of hypertension in primary care [**R-GDG**].
    - Offer home BP monitoring (HBPM) if ABPM is unlikely to be tolerated or is unavailable [1][**L1**, **RGA**].

Atherosclerotic Cardiovascular Disease Risk Assessment (*Section 8.2*):

- Atherosclerotic cardiovascular disease (ASCVD) risk assessment is important for patients with hypertension who have not yet developed clinical ASCVD (i.e. primary prevention) [3].
- Use the ACC/AHA ASCVD Pooled Cohort Equations to assess 10-year ASCVD risk.
- Initiate treatment in patients with >7.5% 10-year ASCVD risk [3].

Treatment and Target BP Thresholds (*Sections 10.1* and *10.2*):

- Carefully review recent treatment and target BP thresholds for regular patients and patients from specific subgroups.

Lifestyle Advice (*Section 10.3*):

- Should be offered initially and then periodically to all patients with hypertension [2,4]**[L1, RGA]**.

Pharmacological Therapy (*Section 10.4*):

- **First-line Medication** (*Section 10.4.1*):
    - For patients aged under 55 years and NOT of black African/Afro-Caribbean ethnic origin:
        - Offer an angiotensin-converting enzyme (ACE) inhibitor or a low-cost angiotensin II receptor blocker (ARB) [1][**L1, RGA**].
    - For patients aged over 55 years or of black African/Afro-Caribbean ethnic origin, at any age:
        - Offer a calcium-channel blocker (CCB) [1][**L1, RGA**].
        - Offer a thiazide-like diuretic if a CCB is unsuitable [1][**L1, RGA**].
- **Second-line Medication** (*Section 10.3.2*):
    - Offer a calcium-channel blocker (CCB) in combination with either an ACE inhibitor; or an ARB.
    - Offer a thiazide-like diuretic if a CCB is unsuitable [1].
    - For black people of African or Afro-Caribbean ethnic origin, consider an ARB in preference to an ACE inhibitor, in combination with a CCB [1].
- **Third-line Medication** (*Section 10.3.2*):
    - If treatment with three medications is required, use either an ACE inhibitor or an ARB; and a CCB; and a thiazide-like diuretic [1].
- **Fourth-line Medication** (*Section 10.3.3*):
    - If specialist expertise and experience exist in a primary care setting, patients can be started and managed on fourth line antihypertensive treatment without referral [**R-GDG**].

- In the absence of such expertise in a primary care setting, refer to secondary/specialist care [**R-GDG**].
- Consider further diuretic therapy with low-dose spironolactone if the blood potassium level is 4.5 mmol/L or lower [1].
- Consider a higher dose thiazide-like diuretic if the blood potassium level is higher than 4.5 mmol/L [1].
- If further diuretic therapy is not tolerated, is contraindicated or is ineffective; consider adding either an alpha blocker or a beta blocker [1].

Management in Patients with Either Type 1 or Type 2 Diabetes Mellitus (*Section 10.4.4*):

- First-line treatment:
  - A once daily ACE inhibitor [5]; or
  - For people of African or Afro-Caribbean descent use an ACE inhibitor; plus either a diuretic or CCB [5].
- Second line treatment:
  - With first-line therapy, add a CCB or a diuretic (usually thiazide or thiazide-like diuretic) [5].
- Third-line treatment:
  - With dual therapy, add the other drug, i.e. either a CCB; or a diuretic [5].
- Fourth-line treatment:
  - With triple therapy, add either an alpha-blocker; or a beta-blocker; or a potassium-sparing diuretic [5].
  - Refer to secondary/specialist care if BP remains above target levels following triple therapy including a diuretic [**R-GDG**].

Referral to Secondary/Specialist Care (*Section 11*):

- Refer on the same day to secondary care for urgent treatment if any of the following are present or are suspected [1,6,7]:
  - Accelerated hypertension.
  - Suspected pheochromocytoma.
  - Particularly severe hypertension (more than 220/120 mmHg).
  - Impending complications.
- Further indications for non-urgent referral to secondary/specialist care are as follows [7]:
  - Consider referral for all patients who are inadequately managed on triple antihypertensive therapy [**R-GDG**].
  - Possible secondary hypertension.
  - All patients with evidence of end-organ damage (for collaborative care) [**R-GDG**].
  - Therapeutic problems.
  - White-coat hypertension is suspected, and ambulatory BP monitoring or home monitoring is unavailable.

4 Background Information

4.1 Definition

Optimal clinic blood pressure (BP) is <120/80 mmHg [2].

Normal clinic BP is between 120/80 and 129/84 mmHg [2].

High normal clinic BP is between 130/85 and 139/89 mmHg [2].

Hypertension is defined as:

- Stage 1 hypertension [2,4]:
  - Clinic BP is between 140/90 and 159/99 mmHg; and
  - Subsequent daytime average of Ambulatory BP Monitoring (ABPM), or average of Home BP Monitoring (HBPM), is between 135/85 and 149/94 mmHg.
- Stage 2 hypertension [2,4]:
  - Clinic BP is between 160/100 and 179/109 mmHg; and
  - Subsequent ABPM daytime average or HBPM average is between 150/95 and 179/109 mmHg.
- Stage 3 hypertension (severe hypertension) [2,4]:
  - Clinic systolic BP (SBP) is 180 mmHg or higher; or
  - Clinic diastolic BP (DBP) is 110 mmHg or higher.

- *White-coat hypertension* is defined when a patient has a persistently elevated clinic BP and a normal home or ambulatory daytime average BP, i.e. <135/85 mmHg [4].

- *White-coat effect* can occur in people with true hypertension [4]:
  - It is defined as a discrepancy of more than 20/10 mmHg between clinic and average daytime ABPM or average HBPM BP measurements.
  - Such patients are at risk of receiving more BP medication than they need and will require out-of-clinic measurement to monitor the efficacy of their BP treatment.

- *Masked hypertension* occurs where clinic BP is normal but ABPM and/or HBPM measurements are elevated [4].

- *Resistant hypertension* is defined as hypertension that is resistant to a treatment strategy that includes: lifestyle measures, plus a diuretic and two other antihypertensive drugs that belong to different classes at adequate doses (but does not necessarily include a mineralocorticoid receptor antagonist), which fails to lower SBP and DBP below 140 and 90 mmHg respectively [2,8].

- *Accelerated/malignant hypertension* is defined as a BP higher than 180/110 mmHg with signs of papilloedema and/or retinal haemorrhage [4].

- *Isolated systolic hypertension* [2]:
  - CBP is 140 mmHg or higher; and DBP is <90 mmHg.

4.2 Aetiology

Primary (essential) hypertension [1]:

- Refers to the majority of people (approximately 90%) with sustained high BP encountered in clinical practice, for which there is no obvious, identifiable cause.

Secondary hypertension [1]:

- Refers to high BP from an identifiable underlying cause.
- It may occur in up to 10% of hypertension cases.
- The most common cause is chronic kidney disease (CKD).

4.3 Epidemiology

Hypertension is a major risk factor for atherosclerotic cardiovascular disease (CVD, ASCVD), which is the leading cause of morbidity and mortality worldwide [9]. In 2013 in Qatar, 12.9% of registered deaths were related to CVD [10].

Data on the incidence and prevalence in Qatar is limited, however:

- The Qatar STEPwise Survey (2012) found a prevalence of 32.9% of raised BP among respondents. The prevalence was higher among females at 37.7%; than males at 28% [11,12].
- The WHO-reported prevalence (2014) of raised BP among adults aged 18 years and older was 27.0% in males and 22.1% in females [13].

4.4 Risk Factors

The established risk factors for hypertension are as follows [1,2,14]:

Non-modifiable risk factors:

- Male sex.
- Increasing age – particularly aged ≥55 years in men; and aged ≥65 years in women.
- Ethnicity – higher risk in African, Afro-Caribbean, and South Asian populations.
- Family history.

Modifiable risk factors:

- Smoking or tobacco smoke exposure.
- Physical inactivity.
- Obesity – body mass index (BMI) of ≥30kg/m^2.
- Dyslipidaemia.
- Diabetes mellitus.
- Obstructive sleep apnoea.
- Psychosocial stress.
- Diet – high salt intake (more than 5g/day), however there is controversy over the role of salt in modifying blood pressure [6].

4.5 Complications

Hypertension contributes to more deaths and disease than any other biomedical risk factor worldwide [15]. It is a major risk factor for each of the following [1]:

- Stroke (ischaemic and haemorrhagic).
- Myocardial infarction.
- Heart failure.
- CKD.
- Peripheral vascular disease.

- Cognitive decline and premature death.
- Hypertensive retinopathy.

Untreated, hypertension is associated with a progressive rise in blood pressure, often culminating in a treatment-resistant state due to associated vascular and renal damage [1].

5 Presentation

Hypertension is usually an asymptomatic condition [1].

Patients may present [1]:

- During routine screening.
- After an event, such as a transient ischaemic attack (TIA).
- Following a consultation for a specific problem, such as dizziness or chest pain.

6 History

Obtain a comprehensive history, including the following points [2][**L2**]:

- BP measurements.
- Duration and severity.
- Antihypertensive therapy; including current and previous medications; efficacy, side-effects and adherence.
- Symptoms of postural hypotension.
- Comorbidities which may influence management (e.g., bronchial asthma, chronic obstructive pulmonary disease, benign prostatic hypertrophy).

Ask about other risk factors associated with CVD, including:

- Family and/or personal history of [2][**L2, RGA**]:
    - Hypertension.
    - Diabetes.
    - CVD.
    - Dyslipidaemia.
    - Smoking status.
    - Recent weight changes – obesity.
    - Dietary habits.
    - Physical exercise.
    - History of snoring or sleep apnoea.
    - Personal history of pre-eclampsia.

Ask about symptoms and consequences of end organ damage and CVD, affecting [2][**L2, RGA**]:

- The brain and eyes, e.g.:
    - Headache.
    - Vertigo.
    - Impaired vision.
    - Sensory or motor deficit.
    - Stroke/TIA and/or carotid revascularisation.
    - Cognitive dysfunction.

- The heart, e.g.:
  - Chest pain.
  - Shortness of breath.
  - Swollen ankles.
  - Myocardial infarction and/or revascularization.
  - Syncope.
  - Arrhythmias.
- The kidney, e.g.:
  - Thirst.
  - Polyuria.
  - Nocturia.
  - Haematuria.
- The peripheral arteries, e.g.:
  - Erectile dysfunction.
  - Cold extremities.
  - Intermittent claudication.
  - Pain-free walking distance.
  - Peripheral revascularization.

To assess for possible secondary hypertension, enquire about the following [1,2,16][**L2,RGA**]:

- Age at diagnosis.
- Symptoms suggestive of:
  - Pheochromocytoma - repetitive episodes of sweating, headache, anxiety and palpitations.
  - Hyperaldosteronism - episodes of muscle weakness and tetany.
  - Thyroid disease.
- Personal history of:
  - Renal disease.
  - Haematuria.
  - Analgesic abuse (parenchymal renal disease).
- Family history of:
  - CKD.
  - Polycystic kidney disease.
- Drugs/substances that may raise BP, such as:
  - Oral contraceptives.
  - Glucocorticoid and mineralocorticoid steroid therapy.
  - Non-steroidal anti-inflammatory drugs (NSAIDs).
  - Erythropoietin.
  - Cyclosporin.
  - Monoamine oxidase inhibitors (MAOIs).
  - Serotonin norepinephrine reuptake inhibitors (SNRIs).
  - Nasal decongestants.
  - Mirabegron.
  - Alcohol.
  - Cocaine.
  - Amphetamines.
  - Liquorice.

7 Examination

7.1 Measuring Blood Pressure

Ensure the following when measuring BP:

- Devices should be validated, maintained, and regularly recalibrated in accordance with clinic policy [1][**L1, RGA**].
- Standardise the environment. Patients should be [1,2][**L2**]:
    - Sitting for 3-5 minutes before measuring BP.
    - In a relaxed, temperate setting.
    - Remaining quiet.
- Patient's arm must be out-stretched and supported [1] [**L2**].
- Cuff should be [1,2] [**L2**]:
    - Appropriately sized.
    - Positioned at the level of the heart.
- Palpate the radial or brachial pulse to check for pulse irregularity. If the pulse is irregular [1] :
    - Do not use automated devices.
    - Measure BP manually using direct auscultation over the brachial artery.
- In patients with large arm circumference when standard cuff cannot be used, apply validated wrist devices [17] or large cuff arm device if available. [**R-GDG**]

When considering a diagnosis of hypertension:

- Measure BP on both arms [1][**L2**]:
    - Repeat if the difference between arms is greater than 20 mmHg.
    - If the difference remains greater than 20 mmHg, use the arm with the higher reading for subsequent measurements.

- If the BP measured in the clinic is 140/90 mmHg or higher [1]:
    - Take a second measurement.
    - Take a third measurement if the second is substantially different from the first.
    - Record the lower of the last two measurements as the clinic BP.
    - Measurements should be spaced 1-2 minutes apart [2].
    - Consistent inter-arm differences of over 20/10 mmHg may suggest pathology warranting specialist referral [1].

NB: Coffee intake and smoking has effect on BP so enquire when last cup of coffee and cigarette was taken [**R-GDG**].

7.2 Further Clinical Examination

Additional examination points to note include the following:

- Measure height, weight, BMI, and waist circumference [2][**L2**].
- Check for signs of secondary hypertension, including [2][**L2, RGA**]:
    - Features of Cushing's syndrome, e.g.:
        - Central obesity.
        - Moon face.
        - Buffalo hump.
        - Abdominal striae.
        - Hirsutism.
    - Skin stigmata of neurofibromatosis (indicative of pheochromocytoma).
    - Palpation of enlarged kidneys (indicative of polycystic kidney disease).

  - Auscultation of abdominal murmurs (indicative of renovascular hypertension).
  - Auscultation of precordial or heart murmurs (indicative of aortic disease, aortic coarctation or upper extremity arterial disease).
  - Diminished and delayed femoral pulses (indicative of aortic coarctation, aortic disease or upper extremity arterial disease).
  - Consistent inter-arm BP difference of greater than 20/10 mmHg (indicative of aortic coarctation or subclavian artery stenosis).
- Check for signs of end organ damage, including [1,2] [**L2, RGA**]:
  - Motor or sensory defects.
  - Fundoscopic abnormalities.
  - Cardiac abnormalities, such as:
    - Heart murmurs.
    - Arrhythmias.
    - Peripheral oedema.
  - Peripheral arterial disease, including:
    - Absence, reduction or asymmetry of peripheral pulses.
    - Cold extremities.
    - Ischaemic skin lesions.
  - Carotid murmur.
  - Abdominal bruits.

7.3 Confirming Blood Pressure Measurements

If clinic BP is persistently 140/90 mmHg or higher, or masked hypertension is suspected, confirm the diagnosis with [1,2]:

- ABPM, where available [1][**L1, RGA**]:
  - Ensure at least two measurements are taken every hour.
  - Use the average of at least 14 measurements taken during the person's usual waking hours to confirm the diagnosis.
  - ABPM is the preferred method of confirming a diagnosis of hypertension in primary care [**R-GDG**].
- Offer HBPM if ABPM is unlikely to be tolerated or is unavailable [1][**L1**, **RGA**]:
  - Record BP twice per day for at least 4 days, and ideally 7 days.
  - Take two consecutive readings at least 1 minute apart with the person seated.
  - Discard the measurements taken on the first day and use the average value of the remaining measurements.

7.4 Assessing for Postural Hypotension

Elderly patients (aged over 65 years) and those with diabetes are at increased risk of postural hypotension[2]. Assess for postural hypotension in patients who have a history of falls or symptoms of postural dizziness[1].

Examine for the following [1,2]:

- First, measure BP whilst in sitting or lying position. Have the patient stand up and measure BP after 1 and 3 minutes.
- If systolic BP falls by 20 mmHg or more, in the same arm, when standing:
  - Review medication.
  - Measure subsequent BPs with the patient standing.
  - Consider referral to a specialist if symptoms of postural hypotension persist.

8 Investigations

While waiting for confirmation of a diagnosis of hypertension, carry out investigations for end organ damage and assess cardiovascular risk [1][**L3**].

8.1 Initial Investigations

The following investigations are carried out to assess for [2]:

- Modifiable risk factors.
- Secondary hypertension.
- The presence of end organ damage.

For all people with hypertension [1][**L3**]:

- Send urine sample for estimation of the albumin-to-creatinine ratio.
- Test urine for haematuria (by dipstick or urinalysis).
- Measure:
    - Serum electrolytes.
    - Serum creatinine.
    - Estimated glomerular filtration rate (eGFR).
    - Fasting plasma glucose.
    - Fasting lipid profile (including total cholesterol, HDL, LDL, and triglycerides).
    - Thyroid function tests.
- Arrange a 12-lead electrocardiograph.
- Examine the fundi for hypertensive retinopathy.

Other investigations, based on history and examination, may include the following [2,17–19][**L2**]:

- Complete blood count.
- Serum uric acid.
- Urinary albumin excretion (in patients with diabetes).
- Glycated haemoglobin (HbA1c).
- Echocardiogram.
- Holter monitoring in case of arrhythmias.
- Exercise testing.
- Carotid ultrasound (carotid intima-media thickness).
- Peripheral artery/abdominal ultrasound.
- Ankle-brachial pressure index.
- Urinary free metanephrines, if considering pheochromocytoma.
- Pulse-wave velocity.
- Coronary artery calcium score.
- Echocardiography, or MRI.

8.2 Atherosclerotic Cardiovascular Disease Risk Assessment

ASCVD risk assessment is important for patients with hypertension who have not yet developed clinical ASCVD (i.e. primary prevention) [3].

ASCVD risk assessment [1,3]:

- May identify underlying causes and important modifiable risk factors.
- May help identify:
    - Diabetes.

        - Evidence of hypertensive damage to the heart and kidneys.
    - Underlying causes of hypertension, e.g. kidney disease.
- Provides a context to discuss BP lowering drugs alongside other treatments for raised cardiovascular risk.

In the absence of established ASCVD, consider starting antihypertensive therapy if the following apply [3,20]:

- Stage 1 hypertension is diagnosed; and:
    - 10-year ASCVD risk, using the ACC/AHA Pooled Cohort Equations is ≥7.5%.; or
    - Target organ damage, renal disease or diabetes mellitus are present.
- Stage 2 or Stage 3 hypertension is diagnosed.

9 Diagnosis

9.1 Diagnosing Hypertension

Diagnose hypertension if [1,2]:

- Clinic BP is 140/90 mmHg or higher; and
- After subsequent ABPM or HBPM the average BP is ≥135/85 mmHg.

Specify hypertension stage (1-3) if possible (see *Section 4.1* for details).

9.2 Secondary Hypertension

Approximately 10% of people with hypertension have a raised BP that is secondary to an underlying condition [1]:

Secondary hypertension is more likely when hypertension [1]:

- Occurs in younger patients – less than age 40 years.
- Worsens suddenly.
- Presents as accelerated or malignant hypertension.
- Responds poorly to treatment.

Secondary hypertension may be due to the following [1,2]:

- Renal disorders, e.g.:
    - Renal parenchymal disease.
    - Polycystic kidney disease.
- Vascular disorders, e.g.:
    - Aortic coarctation.
    - Renal artery stenosis.
- Endocrine disorders, e.g.:
    - Hyperthyroidism.
    - Hyperaldosteronism – isolated hypokalaemia.
    - Pheochromocytoma.
    - Cushing's syndrome.
    - Acromegaly.
- Drugs and other substances.
- Other conditions, e.g. obstructive sleep apnoea

10 Primary Care / Generalist Management

10.1 BP Treatment Target

The optimal BP goal remains to be determined [2,19,21]. However, new evidence on SBP and DBP treatment targets has emerged from recent *post hoc* analyses of large outcome trials, new RCTs and meta-analyses. Recent trials [22–25], including both SPRINT trials [26,27], suggest that hypertension treatment with tight BP control in the non-diabetic, non-heart failure and non-frail patient is optimal with a target SBP of 120 mmHg or lower. Although older guidelines do not recommend SBP <150-140 mmHg [1,4,19,28], the European Society of Cardiology (ESC) and European Society of Hypertension (ESH) has lowered the target SBP threshold from 130-139/80-85 mmHg (ESC) [23] to <130/80 mmHg (ESC/ESH) in patients who tolerate treatment well [2]. Other recent publications support the target SBP <130 mmHg [29,30].

Following recent evidence and recommendations from international guidelines, aim to achieve a clinic BP of:

- <140/90 mmHg in all patients [2,19] and further target <130/80 mmHg if treatment is well tolerated by the patient [2,19] [**L1, RGA**]:
    - SBP 120-129 mmHg in patients <65 years old.
    - SBP 130-139 mmHg in patients >65 years old.
    - DBP < 80 mmHg in patients who tolerate treatment well
- Treated SBP *should not* be targeted to <120 mmHg [2] and DBP – to <70 mmHg [24] [**L1, RGC**].

10.1.1 BP Target in Specific Subgroups

For **older patients** (>80 years old), aim to achieve SBP 130-139 mmHg and DBP <80 mmHg [2] [**L1, RGA**]. Additional attention should be paid to the consistency of BP, as BP variability increases risks of CVD and renal disease [2].

For patients with either type 1 or type 2 **diabetes mellitus** without known hypertension who receive BP-lowering drugs, aim to achieve:

- <140/90 mmHg in patients at lower risk for SVD [31][**L1, RGA**].
- <140/80 mmHg in patients at higher CVD risk [2,19][**L1, RGA**]:
    - SBP <130 in patients <65 years old.
    - SBP 130-140 in patients >65 years old.

In pregnant patients with diabetes and pre-existing hypertension who are on antihypertensive therapy, aim to achieve:

- 120–160/80–105 mmHg to optimise long-term maternal health and reduce foetal growth retardation [31][**L1, RGA**].
- SBP *should not* be targeted to <120 mmHg [2][**L1, RGC**].

For patients with **CKD**, **heart failure**, **stable ischemic heart disease**, **secondary stroke prevention** or **peripheral artery disease**, aim to achieve <130/80 mmHg [19][**L1, RGA**].

10.2 Initiating Antihypertensive Treatment

Lifestyle advice (see *Section 10.3*) should be offered initially and then periodically to patients with hypertension [2][**L1, RGA**]:

Stage 1 hypertension:

- For patients under the age of 40 years with no evidence of target organ damage, clinical ASCVD, renal disease or diabetes, consider the following:
  - Evaluation of secondary causes of hypertension.
  - A detailed assessment of potential target organ damage.
  - Referral to a specialist if initial investigation and management in primary care does not indicate an underlying cause for the hypertension [**R-GDG**].
- Offer antihypertensive treatment to patients aged 18-80 years with any of the following [1,2]**[L1, RGA]**:
  - High CVD risk (>7.5% 10-year ASCVD risk [3]).
  - High risk of hypertension-mediated organ damage.
  - Established clinical ASCVD.
  - Renal disease.
  - Diabetes mellitus.
- Consider antihypertensive treatment to patients with [2,19][**L1, RGB**]:
  - Low to moderate CVD risk.
  - High normal BP levels close to the hypertension diagnostic threshold of 140/90 mmHg and ineffective lifestyle interventions.

Stage 2 and Stage 3 (severe hypertension):

- Offer antihypertensive treatment alongside lifestyle interventions to patients of any age [1,2,22][**L1, RGA**].

10.3 Lifestyle Advice

Lifestyle advice [1]:

- Should be offered initially and then periodically to all patients with hypertension [1]**[L1, RGA]**.
- Trials have shown that the combination of lifestyle interventions, e.g. diet and exercise, cause a modest reduction (by approximately 5 mmHg) in both systolic and diastolic BP.
- By lowering BP and CVD risk, the need for long-term drug therapy may be reduced, delayed or removed altogether.

Advise patient on:

- Losing weight if needed [19,32][**L1, RGA**] – encourage reduction of :
  - BMI to 20-25kg/m^2 [2]at a rate of no more than 10% of body weight over 6 months [**R-GDG**], and;
  - Waist circumference to the following targets [2,33]:
    - <94 cm in men of European origin.
    - <90 cm in men of other ethnicities.
    - <80 cm in women of all ethnicities.
- Aerobic exercise, dynamic and isometric resistance as well as aquatic training preferably on prescription if available [19,32,34,35][**L1, RGA**]:
  - The European Society of Cardiology (ESC) recommends at least 30 minutes of moderate-intensity dynamic aerobic exercise (e.g. walking, jogging, cycling, or swimming) 5-7 days a week.
- Relaxation techniques [1,19][**L1, RGA**]:
  - Not routinely provided in primary care but patients may wish to pursue them as part of their treatment:
    - Stress management.
    - Meditation [36].
    - Cognitive therapies.

        - Muscle relaxation.
        - Biofeedback.
        - Shinrin-yoku (forest bathing) [37].
- Stop alcohol consumption [19] [**R-GDG**] or reduce consumption to [2][**L2, RGA2**]:
    - Less than 14 units per week for men.
    - Less than 8 units per week for women.
- Stop smoking [1,19,32][**L2, RGA**].
- Discourage excessive caffeine intake (e.g., more than 5 cups of coffee a day) [1][**L1, RGB**].
- Healthy eating (e.g., DASH or Mediterranean diet [2,38]):
    - Reducing salt intake [1,19][**L1, RGA**] – restrict to <5g per day [32]**[L1, RGA]**.
    - Enhanced intake of dietary potassium in patients not at risk of hyperkalemia [17,19].
    - Advise eating and drinking [7,32][**L1, RGA**]:
        - Vegetables, low-fat dairy products, dietary and soluble fibre, whole grains and protein from plant sources, reduced in saturated fat and cholesterol.
        - Fresh fruits – caution in those who are overweight as can cause weight gain.
        - Fish (preferably oily fish) at least twice a week.
        - Beetroot juice [39].
        - Green or black tea [2].

Offer appropriate guidance and written or audio-visual materials to promote lifestyle changes, where available [1][**L1, RGA**].

10.4 Pharmacological Management

Pharmacological interventions in the management of hypertension help reducing the incidence of stroke, coronary heart disease, heart failure, and overall mortality [1].

Interventions to support adherence to treatment include [1,32]:

- Providing appropriate guidance and materials about benefits and side effects of medication, to help the patient make an informed choice.
- Encouraging patients to monitor their condition.
- Simplifying the dosing regimen.
- Suggesting that patients record their medicine-taking.
- If available, combinations of two antihypertensive drugs at fixed doses in a single tablet may be used, as reducing the number of daily pills improves adherence.

General principles of antihypertensive drug treatment:

- Treatment should be initiated with different monotherapies and then sequentially complimented with other drugs until BP control is achieved [2].
- Use once-daily dosing where possible [4].
- Increasing the dose of monotherapy may increase the risk of adverse effects [2].
- Use non-proprietary medication where appropriate to minimise cost [4].
- Offer the same antihypertensive medication to patients age 80 years and older as to those age 55-80 years [4]:
    - Consider any co-morbidities.
- Refer to secondary/specialist care if BP remains above target levels following triple therapy including a diuretic [**R-GDG**].

10.4.1 First-Line Medication

Initiation of the first-line antihypertensive drug therapy with a single antihypertensive drug is reasonable in adult patients with stage 1 hypertension.

10.4.1.1 Patients Aged <55 years and NOT of Black African/Afro-Caribbean Ethnic Origin

For patients aged under 55 years who are not of black African or Afro-Caribbean ethnic origin, offer the following medications [1]:

- An angiotensin-converting enzyme (ACE) inhibitor or a low-cost angiotensin II receptor blocker (ARB)[**L1, RGA**].
- If an ACE inhibitor is prescribed and is not tolerated, offer a low-cost ARB.
- Beta-blockers are not preferred for first-line therapy, however, can be considered for young people particularly:
    - If ACE inhibitors and ARBs are contraindicated or not tolerated.
    - If there is evidence of increased sympathetic drive.
    - For women of child-bearing potential.

10.4.1.2 Patients aged ≥55 years or of Black African/Afro-Caribbean Ethnic Origin at Any Age

For patients aged over 55 years or for patients of black African or Afro-Caribbean ethnic origin of any age, offer the following medications [1][**L1, RGA**]:

- A calcium-channel blocker (CCB).
- A thiazide-like diuretic, if a CCB is unsuitable, e.g.:
    - Oedema.
    - Intolerance.
    - Evidence or high risk of heart failure.
- If treatment with a diuretic is being started or changed, offer a thiazide-like diuretic, e.g. chlortalidone or indapamide, in preference to a conventional thiazide diuretic, e.g. bendroflumethiazide or hydrochlorothiazide.
- However, continue treatment for patients already receiving bendroflumethiazide or hydrochlorothiazide and whose BP is stable and well controlled.
- Beta-blockers are not recommended in older adults as first-line medication [40] [**L1, RGB**].

10.4.2 Second-Line and Third-Line Medication

Initiation of second-line antihypertensive drug therapy is recommended in adult patients:

- With stage 2 hypertension and an average BP more than 20/10 mmHg above their BP target [19].
- If BP is not adequately controlled [1].

Second-Line treatment [1]:

- Offer a CCB in combination with either an:
    - ACE inhibitor; or
    - ARB.
- Offer a thiazide-like diuretic if a CCB is unsuitable, for example:
    - Oedema.
    - Intolerance.
    - Evidence or risk of heart failure.

- For black people of African or Afro-Caribbean ethnic origin, consider an ARB in preference to an ACE inhibitor, in combination with a CCB.

If BP is not adequately controlled with second-line therapy, review medication to optimise dosages of second-line therapy, before commencing third-line therapy [1].

Third-line treatment:

- If treatment with three medications is required, use [1]:
  - An ACE inhibitor or an ARB; and
  - A CCB; and
  - A thiazide-like diuretic.

When prescribing medication, avoid using [1,15,16,19] [**L1, RGC**]:

- Simultaneous use of an ACE inhibitors, ARB and/or renin inhibitor.
- Either ACE inhibitors or ARBs with potassium-sparing diuretics.
- A beta-blocker with verapamil.

If clinic BP remains ≥140/90 mmHg after optimal third-line therapy, suspect resistant hypertension. Consider [1]:

- Seeking secondary care/specialist advice (see *Section 11: Referral*).
- Fourth-line treatment [**R-GDG**].

10.4.3 Fourth-Line Medication

If specialist expertise and experience exist in a primary care setting, patients can be started and managed on fourth line antihypertensive treatment without referral. In the absence of such expertise in a primary care setting, refer to secondary/specialist care [**R-GDG**].

Fourth-line treatment:

- Consider further diuretic therapy with low-dose spironolactone if the blood potassium level is ≤4.5 mmol/L [1]:
  - Use caution in patients with a reduced eGFR as they have an increased risk of hyperkalaemia.
- Consider a higher dose thiazide-like diuretic if the blood potassium level is ≥4.5 mmol/L [1].
- If further diuretic therapy is used, monitor the patient [1]:
  - Monitor blood sodium and potassium, and renal function within 1 month.
  - Repeat as required thereafter.
- Mineralocorticoid receptor antagonists seem to be more effective than other fourth-line agents in resistant hypertension [41].
- If further diuretic therapy is not tolerated, is contraindicated or is ineffective; consider adding either of the following [1]:
  - An alpha blocker.
  - A beta blocker.

Other hypertensive medication considerations [16].

- These medications may be considered, where appropriate, depending the patient's medical history and results of investigations.
  - Aliskiren - not currently registered in Qatar.
  - Eplerenone.

10.4.4 Patients with Diabetes Mellitus

For patients with either type 1 or type 2 diabetes mellitus without known hypertension, review BP at every visit or at least annually [2,5]. Provide and emphasise lifestyle advice to all diabetic patients [5].

If BP remains above target levels following lifestyle improvement, add medication to reduce BP to target levels [5,42].

10.4.4.1 First-Line Medication

First-line BP lowering therapy for patients with diabetes mellitus should be [5]:

- An ACE inhibitor once daily; or
- For people of African or Afro-Caribbean descent use an ACE inhibitor plus either a diuretic or CCB.
- For women who may become pregnant, start with a CCB:
    - Avoid the use of ACE inhibitors and angiotensin II-receptor antagonists.
- If there is ongoing intolerance to an ACE inhibitor, other than renal deterioration or hyperkalaemia, an ARB may be used instead.

NB: Unless contraindicated, for diabetic patients with hypertension and renal impairment, an ACE inhibitor or ARB must be the first line drug [42].

Monitor BP every 1-2 months and intensify therapy until BP is consistently within target range. Continue to reinforce lifestyle advice [5]. If BP is consistently attained at the target level, continue to monitor the patient's BP at every clinic visit and check for adverse effects including risks of hypotension [42].

NB: Antihypertensive medications can increase the likelihood of side effects, e.g. orthostatic hypotension in a patient with autonomic neuropathy [5].

10.4.4.2 Second-Line, Third-Line and Fourth-line Medication

If BP is not adequately controlled to the agreed target level [5]:

- Second-line treatment:
    - With first-line therapy, add a CCB or a diuretic (usually thiazide or thiazide-like diuretic).
- Third-line treatment:
    - With dual therapy, add the other drug, i.e. either a CCB or a diuretic.
- Fourth-line treatment:
    - With triple therapy, add either an alpha-blocker, or a beta-blocker, or a potassium-sparing diuretic.

10.4.5 Characteristics of Hypertensive Medication

Refer to the Qatar National Formulary (QNF) for the most up-to-date information on particular medication.

ACE Inhibitors:

- Possible ACE inhibitors include [1]:
    - Perindopril.
    - Lisinopril.
    - Enalapril.
    - Ramipril.

    - Trandolapril - Registered as a combination medication with verapamil.
    - Fosinopril.
- Adverse effects may include [1,16]:
    - Deterioration in renal function.
    - Hyperkalaemia.
    - Cough.
    - Angioedema.
    - Dizziness and headaches.
- ACE inhibitors should be used with care (or avoided) in patients with [16,19]:
    - History of idiopathic or hereditary angioedema.
    - History of angioedema associated with previous exposure to an ACE inhibitor.
    - Bilateral renal artery stenosis.
- Pregnancy and breastfeeding [16,19]:
    - ACE inhibitors should be avoided in pregnancy unless essential.
    - Information on breastfeeding is limited.
- Concomitant use of ACE inhibitors and ARBs – increased risk of hyperkalaemia, hypotension, and impaired renal function.

ARBs:

- If an ACE inhibitor is prescribed and not tolerated, offer an ARB [1][**L1, RGA**].
- Typical ARBs include [16]:
    - Losartan.
    - Candesartan.
    - Valsartan.
    - Irbesartan.
- Adverse effects associated with ARBs include [16]:
    - Hyperkalaemia.
    - Dizziness, headaches, and hypotension.
- Contraindications to ARBs include [16,19]:
    - Bilateral renal artery stenosis.
    - Pregnancy – should be avoided unless essential.
    - Breastfeeding – not recommended due to lack of safety data.
- Concomitant use of ACE inhibitors and ARBs – increased risk of hyperkalaemia, hypotension, and impaired renal function.

CCBs [16][**L2**]**:**

- There are important differences between the negatively inotropic verapamil and diltiazem, and the dihydropyridine CCBs.
- Verapamil and diltiazem should usually be avoided in patients with heart failure.
- Dihydropyridine CCBs include:
    - Amlodipine.
    - Felodipine.
    - Nifedipine.
    - Lercanidipine.
- Rate-limiting CCBs include:
    - Diltiazem.
    - Verapamil.
- Adverse effects associated with CCBs include:
    - Vasodilatory adverse effects (e.g., flushing, headaches, ankle swelling).
    - Constipation.
    - Bradycardia.

- Contraindications to CCBs include:
  - Heart failure (amlodipine or felodipine may be used if required [19]).
  - Significant aortic stenosis.
  - Second degree atrioventricular block.
- Avoid routine use of diltiazem and verapamil with beta-blockers because of increased risk of bradycardia and heart block [19].

Thiazide-Like Diuretics:

- Thiazide-like diuretics, include [16]:
  - Chlortalidone.
  - Indapamide.
- Adverse effects associated with thiazide-like diuretics include [16]:
  - Hypokalaemia.
  - Gout.
  - Exacerbation of diabetes mellitus and risk of new-onset diabetes.
  - Impotence.
- Thiazide-like diuretics should be avoided in patients with [16]:
  - Gout.
  - Refractory hypokalaemia.
  - Hyperaldosteronism.
  - Hyponatraemia.
  - Hypercalcaemia.
  - Severe hepatic impairment.
  - Addison's disease.
  - eGFR less than 30 ml/min/1.73m^2.
  - During pregnancy.
- Regularly monitor for [19]:
  - Hyponatremia.
  - Hypokalaemia.
  - Uric acid.
  - Calcium levels.

When prescribing medication, avoid using [1,2,15,16]:

- ACE inhibitors and ARBs together [**L1, RGC**].
- Either ACE inhibitors or ARBs with potassium-sparing diuretics.
- A beta-blocker with verapamil.

10.5 Follow-Up and Monitoring

10.5.1 Follow-Up of Hypertensive Patients

After the initiation of antihypertensive drug therapy or adjusted drug regimen, it is important to see the patient at 2-4 week intervals to evaluate the effects on BP and to assess possible side effects [32][**L2**]:

- Some medications will have an effect within days or weeks, but a continued delayed response may occur during the first 2 months.
- Once the target is reached, a visit interval of a 3-6 months is reasonable [7].

If the BP remains elevated despite treatment, at a minimum, the following aspects of management should be reassessed [15]:

- Non-adherence to treatment of the use of other medications.
- Undiagnosed secondary hypertension.
- Treatment resistance due to sleep apnoea.
- Undisclosed use of alcohol or recreational drugs.
- Unrecognised high salt intake.
- 'White-coat' hypertension.
- Volume overload.
- Technical factors, e.g. inappropriate cuff size, uncalibrated equipment.

For all patients on antihypertensive medications including ACE inhibitors, ARBs, or diuretic; serum creatinine or estimated glomerular filtration rate and serum potassium levels should be monitored at least annually [31]. [**L1, RGA**].

NB: Most hypertensive patients require a combination of at least two drugs to achieve BP control. Monotherapy is only effective in a limited number of hypertensive patients [32].

10.5.2 Follow-up of Patients with High-Normal BP or White-Coat Hypertension

Schedule regular follow-up, at least annually, for [32]:

- Reinforcement of lifestyle change recommendations.
- Office and out-of-office (i.e. ABPM or HBPM) BP measurement.
- Review of the patient's cardiovascular risk profile.

NB:

- In adults not receiving statins or other lipid-lowering therapy, a lipid profile should be obtained at the time of diabetes diagnosis or at an initial medical evaluation, and every 5 years thereafter if under the age of 40 years, and more frequently if necessary[31, 32][**L1, RGC**].
- Order a lipid profile at initiation of statins or other lipid lowering therapy, 4–12 weeks [31] [**L1, RGC**].

10.5.3 Monitoring Blood Pressure

Blood pressure monitoring [1] [**L1, RGA**]:

- Use clinic BP measurements to monitor response to lifestyle modifications or medications.

Check and monitor renal function and serum electrolytes for patients on as per the hypertension follow-up schedule (see *Section 10.5.1*) [16]**[L2]**:

- ACE inhibitors.
- ARBs.
- Thiazide-type diuretics.
- Spironolactone.

View Pathway

11 Referral to Secondary / Specialist Care

11.1 Urgent Referral

Refer on the same day to secondary care for urgent treatment if any of the following are present or are suspected [1,6,7] (see also *Section 12.1*):

- Accelerated hypertension (BP usually >180/110 mmHg with signs of papilloedema and/or retinal haemorrhage).
- Suspected pheochromocytoma (labile or postural hypotension, headache, palpitations, pallor, and diaphoresis).
- Particularly severe hypertension (more than 220/120 mmHg).
- Impending complications (e.g. transient ischaemic attack or left ventricular failure).

11.2 Outpatient Referral

Further indications for non-urgent referral to secondary/specialist care are as follows [7]:

- Treatment resistance:
  - Consider referral for all patients who are inadequately managed on triple antihypertensive therapy [**R-GDG**].
- Possible secondary hypertension:
  - Any features on history or examination of a primary cause, e.g.:
    - Hypokalaemia with increased or high normal plasma sodium (Conn's syndrome).
    - There is a consistent difference in BP readings between arms of more than 20/10 mmHg, consider coarctation of the aorta and refer to secondary care/specialist [1].
  - Stage 3 CKD (eGFR < 60 ml/min/1.73m^2).
  - Proteinuria or haematuria.
  - Sudden onset or worsening of hypertension.
  - Young age (any hypertensive patient aged less than 30 years) [**R-GDG**].
- All patients with evidence of end-organ damage [**R-GDG**]:
  - All patients with end-organ damage should be referred to a specialist for collaborative care with their primary care physician.
- Therapeutic problems:
  - Multiple drug intolerance.
  - Multiple drug contraindications.
  - Persistent non-adherence or non-compliance.
- White-coat hypertension is suspected and ABPM or HPBM is unavailable.

12 Inpatient Admission

12.1 Criteria for Inpatient Admission to Hospital

Admission is indicated for one or more of the following [43–47]:

- Hypertensive emergency, with evidence of acute and progressing target organ disease as indicated by any of the following:
  - Hypertensive encephalopathy (e.g., confusion, altered mental status).
  - Cerebral infarction.
  - Intracranial haemorrhage.
  - Myocardial ischaemia or infarction.
  - Pulmonary oedema.
  - Aortic dissection.
  - Seizure.
  - Acute renal insufficiency.
  - Papilloedema.
  - Microangiopathic haemolytic anaemia.
- Adrenergic crisis (e.g., severe hypertension due to pheochromocytoma crisis, cocaine or amphetamine intoxication, or clonidine withdrawal).
- Symptomatic severe hypertension (SBP greater than 180 mmHg or DBP greater than 110 mmHg) that cannot be controlled by emergency department or observation care treatment (i.e., to SBP less than 160 mmHg and DBP less than 100 mmHg) [**R-GDG**].

12.2 Targeted Length of Stay

Patients should ideally be managed on an outpatient basis or in observation care. However if admission is indicated, the optimal length of stay for admission is 2 days [48][**L3**].

12.3 Extended Stay

Extended stay is classified below as:

- Minimal (a few hours to 1 day).
- Brief (1 to 3 days).
- Moderate (4 to 7 days).
- Prolonged (more than 7 days).

Extended stay beyond goal length of stay may be needed for [48,49]:

- Persistent hypertensive encephalopathy:
  - Anticipate brain imaging (e.g., CT scan) and laboratory testing.
  - Expect brief stay extension.
- Continuation of pulmonary oedema
  - Anticipate echocardiogram and possible right heart catheterisation.
  - Expect brief stay extension.
- Recurring or persistent severe hypertension (i.e., BP control needed to allow outpatient follow-up not achieved):
  - Anticipate intensification of medication regimen.
  - Expect brief stay extension if reinstitution of parenteral antihypertensives is necessary.
- Target organ damage (e.g., angina, stroke, aortic dissection)
  - Stay extension varies depending on condition.

13 Key Considerations for Patient Preferences

Patient preferences refer to patient perspectives, beliefs, expectations, and goals for health and life, and to the steps employed by individuals in assessing the potential benefits, harms, costs, and limitations of the management options in relation to one another. Patients may have preferences when it comes to defining their problems, identifying the range of management options and selecting or ranking the outcomes used to compare these options.

It is important for healthcare professionals to develop an understanding of the patient as an individual and the unique way in which each person experiences a condition and its impact on their life.

The following recommendations are therefore made for physicians and other healthcare professionals regarding general principles of patient care in Qatar:

- **Respect Patients:** Treat patients with respect, kindness, dignity, courtesy and honesty. Ensure that the environment is conducive to discussion and that the patient's privacy is respected, particularly when discussing sensitive, personal issues. Ask the patient how they wish to be addressed and ensure that their choice is respected and used.

- **Maintain Confidentiality:** Respect the patient's right to confidentiality and avoid disclosing or sharing patients' information without their informed consent. In this context, students and anyone not directly involved in the delivery of care should first be introduced to the patient before starting consultations or meetings, and let the patient decide if they want them to stay.

- **Clarify Third-Party Involvement:** Clarify with the patient at the first point of contact whether and how they like their partner, family members or carers to be involved in key decisions about their care or management and review this regularly. If the patient agrees, share information with their partner, family members or carers.

- **Obtain Informed Consent:** Obtain and document informed consent from patients, in accordance with MOPH policy and guidance.

- **Encourage Shared Decision Making:** Ensure that patients are involved in decision making about their own care, or their dependent's care, and that factors that could impact the patient's participation in their own consultation and care including physical or learning disabilities, sight, speech or hearing impairments and problems with understanding, reading or speaking English are addressed.

- **Disclose Medical Errors:** Disclose errors when they occur and show empathy to patients.

- **Ensure Effective Communication:** Explore ways to improve communication including using pictures, symbols or involving an interpreter or family members. Avoid using medical jargon. Use words the patient will understand and confirm understanding by asking questions.

- **Ensure Continuity of Care:** Provide clear and timely sharing of patient information between healthcare professionals especially at the point of any transitions in care.

14 Performance Measures

A list of performance measures is given in the table below. Healthcare organisations are encouraged to monitor service performance using the indicator definitions below.

Number	Numerator	Denominator
HTN01	The number of people in the denominator who receive ABPM to confirm a diagnosis of hypertension.	The number of people with suspected hypertension.
HTN02	The number of people in the denominator who receive all investigations for target organ damage within 1 month of diagnosis.	The number of people with newly diagnosed hypertension.
HTN03	The number of people in the denominator who are referred for specialist assessment.	The number of people with resistant hypertension who are receiving 4 antihypertensive drugs and whose blood pressure remains uncontrolled
HTN04	The number of people in the denominator who have had a review of risk factors for cardiovascular disease within the past 12 months.	The number of people who have had hypertension for 12 months or longer who do not have established cardiovascular disease.
HTN05	The number of people in the denominator in whom the last recorded blood pressure (measured in the preceding 9 months) is ≤140/90.	The number of people under 80 years old with hypertension.
HTN06	The number of people in the denominator who do not have evidence of established ASCVD.	The number of people aged 18 years and older who are diagnosed with hypertension and in whom a 10-year risk ASCVD is recorded using the ACC/AHA Pooled Cohort Equations.
HTN07	The number of people in the denominator whose target blood pressure is achieved.	The number of people with treated hypertension.
HTN08	The number of people in the denominator who are seen within 2-4 weeks for a follow up.	The number of people who initiated an antihypertensive therapy
HTN09	The number of people in the denominator with a length of stay of 2 days or less.	The number of admitted patients without comorbidities identified in the guidelines

Table 14.1: Performance Measures

15 References

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Appendix: Detailed Description of the Literature Search

A systematic search for existing literature on hypothyroidism was performed in the period June 24th - June 30th, 2019.

The search for clinical practice guidelines on dementia diagnosis and/or management was performed in the *PubMed* database and websites of relevant organisations and societies including the *Public Health England*, *American Diabetes Association (ADA)*, and *World Health Organization (WHO)*.

Peer-reviewed scientific publications were found in PubMed and via *Google Scholar* Internet search engine. Non-peer reviewed studies were identified in *bioRxiv*. Books were checked on PubMed. Information published on medical websites and drug prescribing information sheets were found via Google search engine.

The included publications were identified using the term "hypertension AND adult" and specified with the following terms in combinations:

Management, update, secondary, persistent, monitoring, investigation.

The date limit for the search was set up as March 19th, 2017 based on the last update of the present guideline.

Figure A.1 on the next page demonstrates graphically the results of the search and application of exclusion criteria.

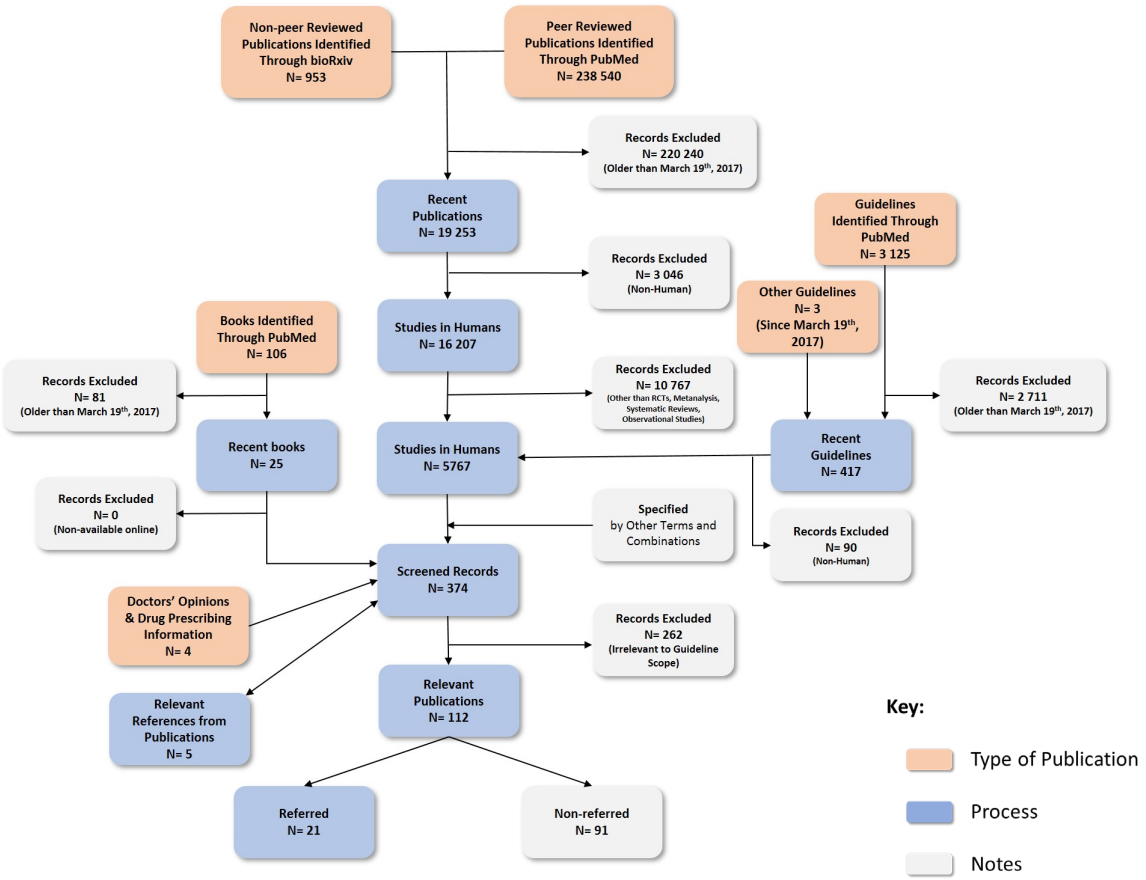

Fig A.1: Literature search results and application of exclusion criteria.

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