2024

ESH MASTER Plan

For Hypertension Management

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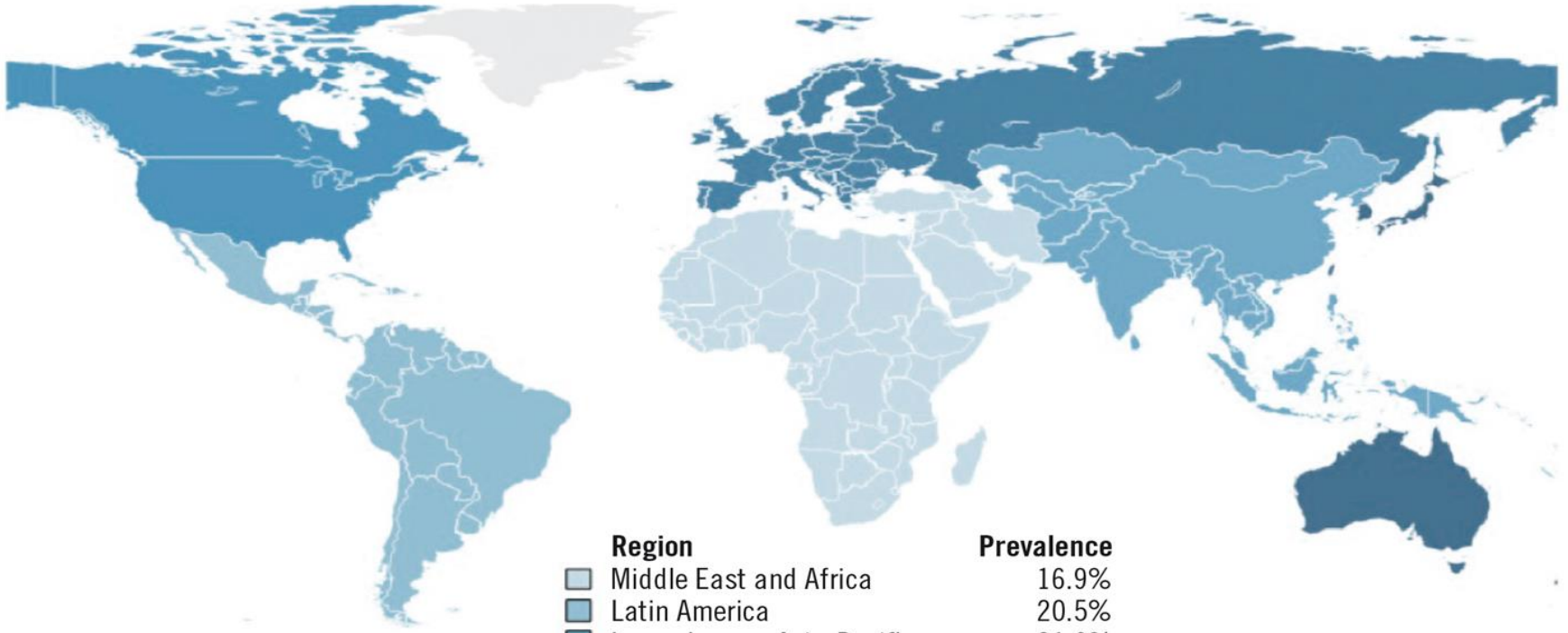
Towards Holistic & Comprehensive Cardiac Care

1.28 billion people live with Hypertension worldwide



Region	Prevalence
Middle East and Africa	16.9%
Latin America	20.5%
Lower-Income Asia-Pacific	21.6%
Northern America	23.4%
Europe	29.9%
High-Income Asia-Pacific	30.1%

Prevalence of Hypertension by world region

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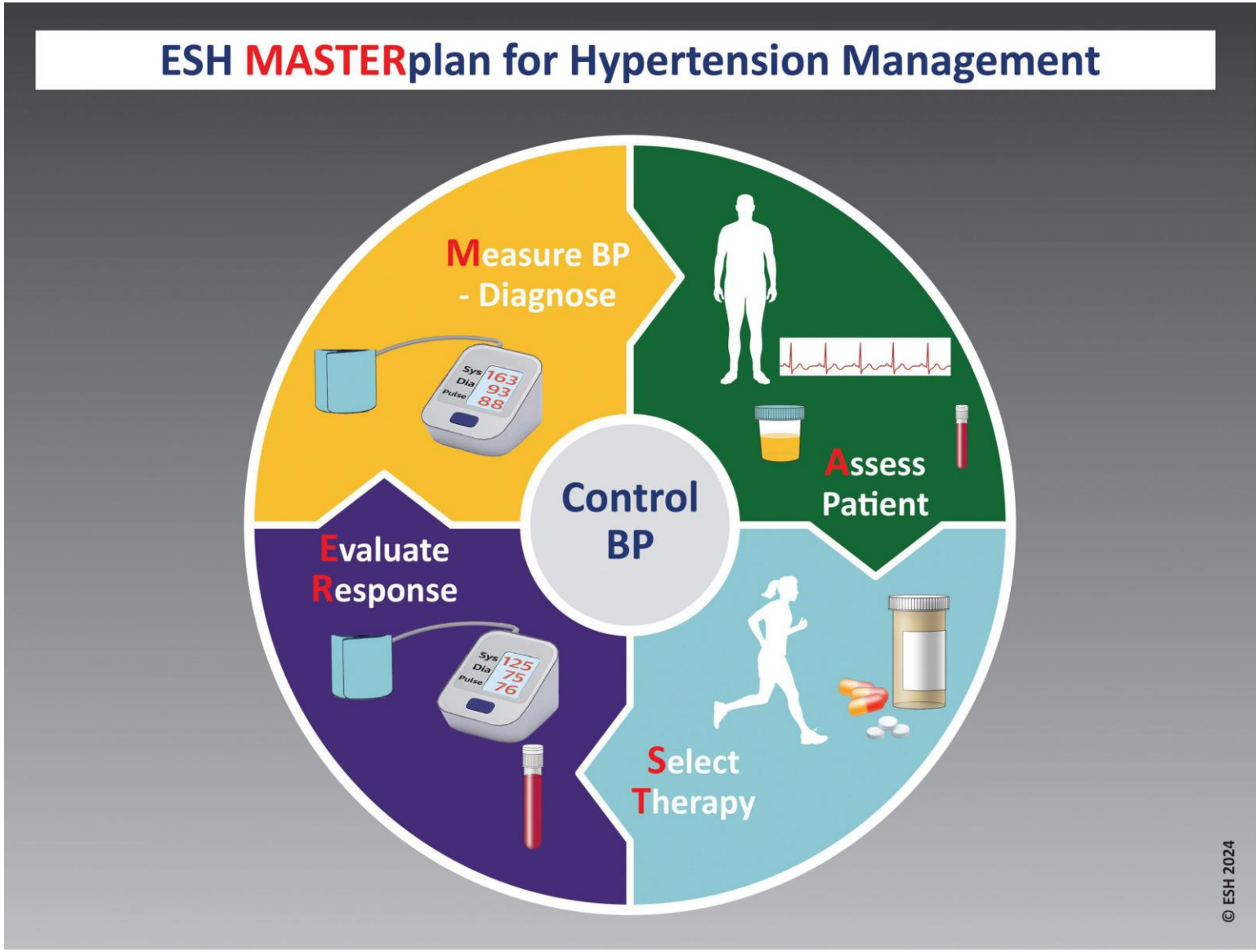
- 46% of adults with hypertension are unaware
- 42% with hypertension are diagnosed and treated.
- Approximately 1 in 5 adults with hypertension have it under control.
- In Myanmar, the prevalence of hypertension was 30.1% in males and 29.8% in females.



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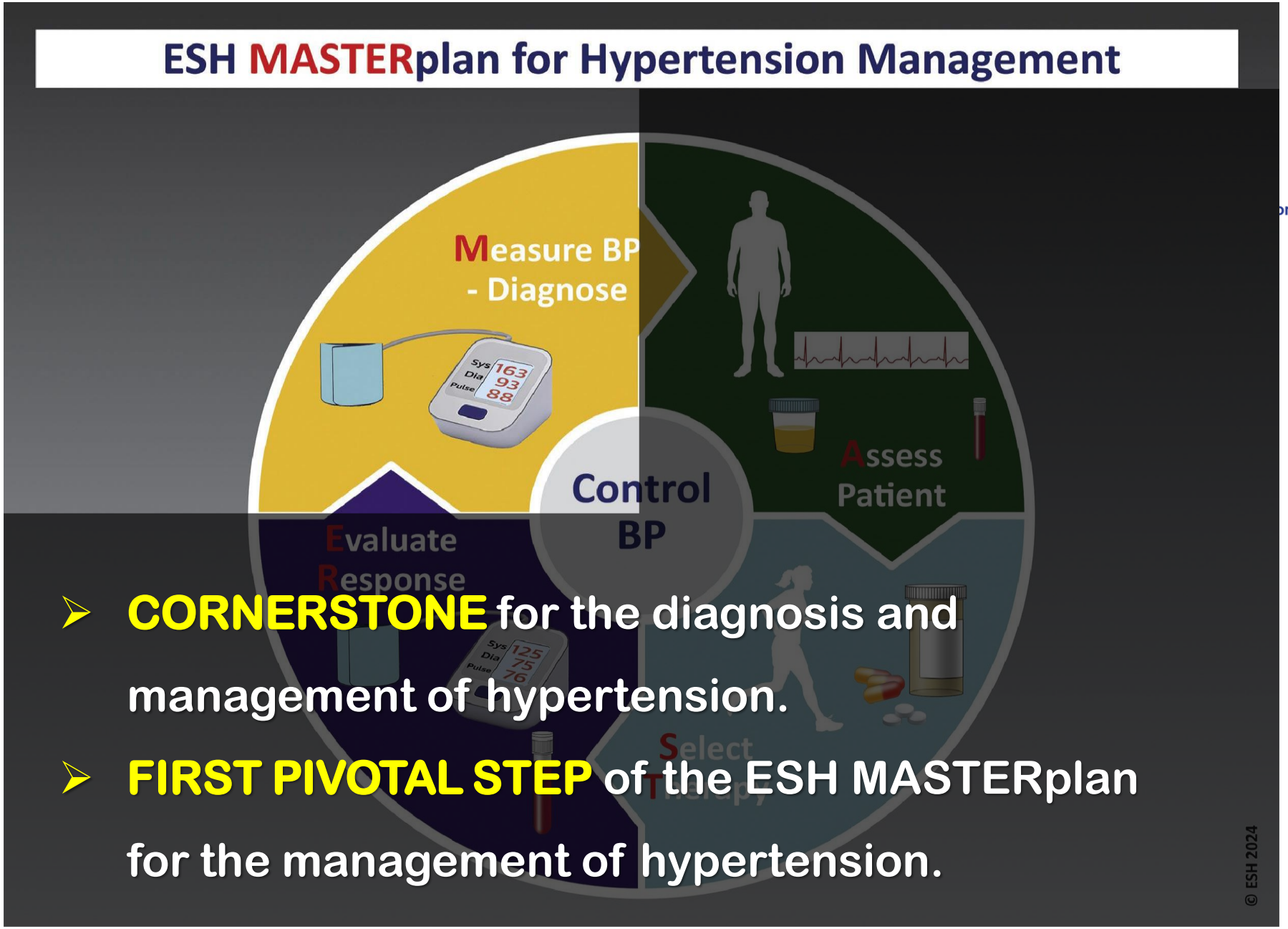
Kreutz R et al. Eur J Intern Med. doi: 10.1016/j.ejim.2024.05.033



- **CORNERSTONE** for the diagnosis and management of hypertension.
- **FIRST PIVOTAL STEP** of the ESH MASTERplan for the management of hypertension.

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Office BP measurement (OBPM)

Home BP monitorin

Always based on the average of several measurements

tor P monitoring (ABPM)

*Daytime (awake):	*Nighttime (asleep):
SBP ≥135 mmHg	SBP ≥120 mmHg
and/or	and/or
DBP t≥85	DBP ≥70

METHODOLOGY

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Office BP measurement (OBPM)

*SBP ≥140
and/or
DBP ≥90

Conditions

1. Validated automated electronic upper-arm cuff device (www.stridebp.org).
2. Appropriate cuff to fit arm size.
3. Quiet room – comfortable temperature.
4. No smoking, caffeine, food, exercise (30').
5. 3-5' seated and relaxed.
6. No talking during/ between measurements.

Relevance

- Used in **outcome trials.**
- Basis for **diagnosis - BP targets.**

Posture

7. Sitting - back supported on chair.
8. Legs un-crossed, feet flat on floor.
9. Bare arm resting on table – mid-arm at heart level.

Measurement

10. Take 3 readings at 1' intervals. Use average of last 2.

METHODOLOGY

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Home BP monitoring (HBPM)

*SBP ≥135
and/or
DBP ≥85

Conditions/Posture: As Office BP Measurement

Protocol

- Educate patient: validated device - report data. Standardized Protocol:
- 3-7 days before office visits.
- Morning and evening (before drug intake if treated).
- 2 readings – 1' min interval.
- Average all readings – Exclude 1st day.

Relevance

- Recommended for **long-term follow-up** of treated HTN.
- **Improves BP control**, especially when combined with education/counselling.
- Confirm HTN **diagnosis** - true resistant HTN – particularly if ABPM not available.

Long-term follow-up *(treated HTN)*

- Duplicate measurements.
- Once or twice per week, or per month.

METHODOLOGY

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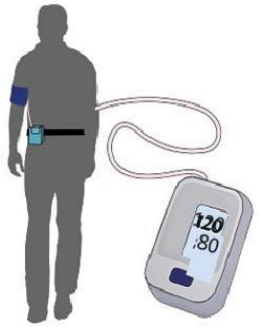
Ambulatory BP monitoring (ABPM)



*24-h mean BP:
SBP ≥130
and/or
DBP ≥80

*Daytime (awake):
SBP ≥135 mmHg
and/or
DBP t≥85

*Nighttime (asleep):
SBP ≥120 mmHg
and/or
DBP ≥70

Relevance

- Obtain **24h BP profile** including night (sleep) not captured by OBPM or HBPM.
- Confirm HTN **diagnosis** - true resistant HTN.

Validated device and cuff: As for Office BP.

Protocol

- Routine workday for 24h.
- 20’ intervals day (awake) and night (s leep).
- Diary: sleep times, drug intake times, symptoms, activities, unusual problems.

Home/Ambulatory BP Monitoring - Indications

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When White-Coat HTN is common

- Grade I hypertension
- High office BP without HMOD

When Masked HTN is common

- High-normal office BP
- Normal office BP with HMOD or high CV risk

In treated individuals

- Confirmation of uncontrolled/resistant HTN
- Evaluation of 24h BP control (especially high-risk)
- Symptoms of hypotension (especially older)

Other Conditions

- Suspected postural or postprandial hypotension (treated)
- Exaggerated BP response to exercise
- Considerable office BP variability

Specific Indications

ABPM

- **Nocturnal BP, dipping** (OSA, CKD, DM, endocrine HTN, autonomic dysfunction)
- **Patients incapable or unwilling** to perform HBPM, or anxious
- Considering **renal denervation**
- **Children – Pregnancy**

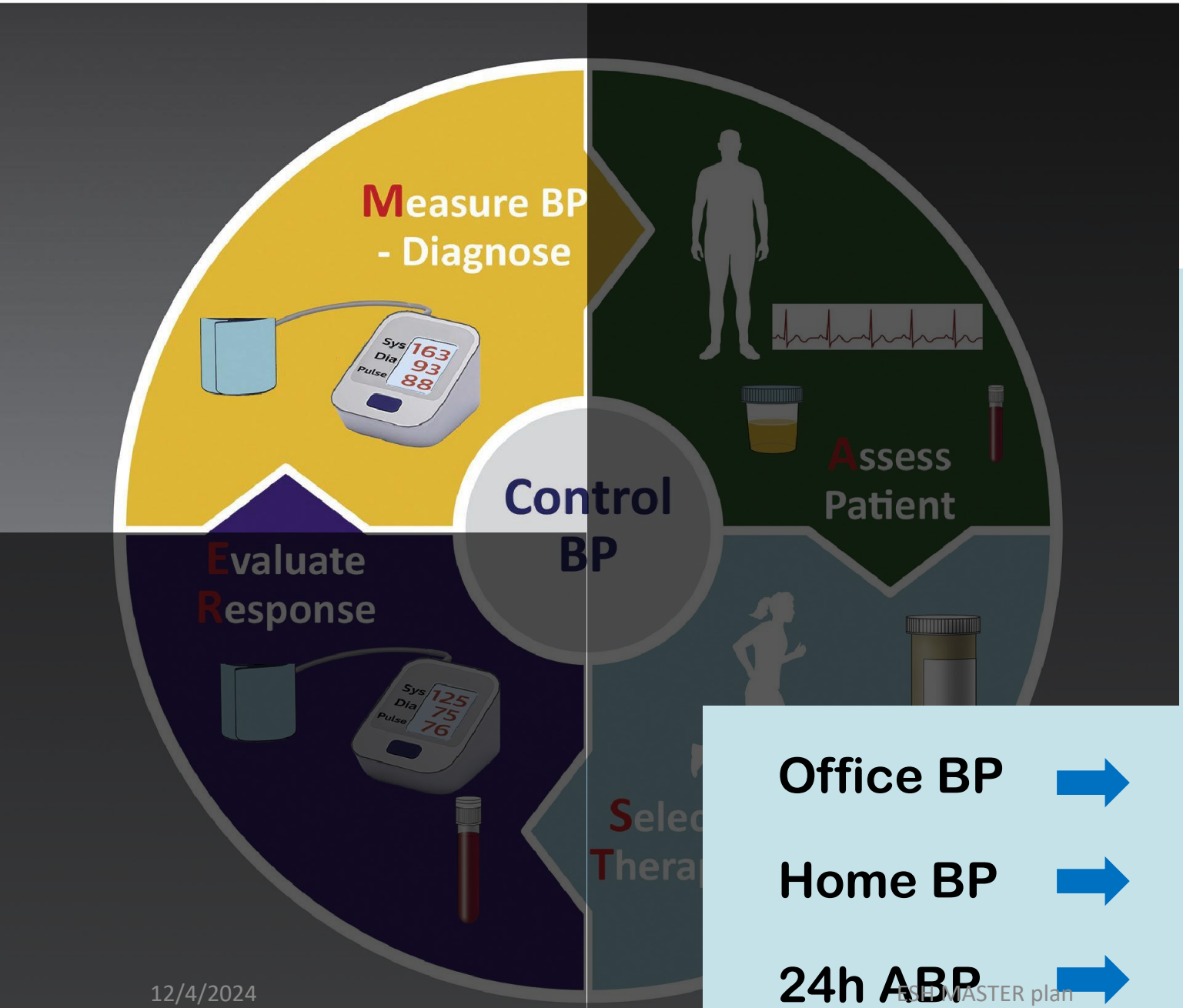
HBPM

- **Long-term follow-up** (adherence – BP control)
- **Patients unwilling** to perform ABPM

Repeat

- **Confirm White-Coat** and **Masked HTN** (untreated or treated)

ESH MASTERplan for Hypertension Management

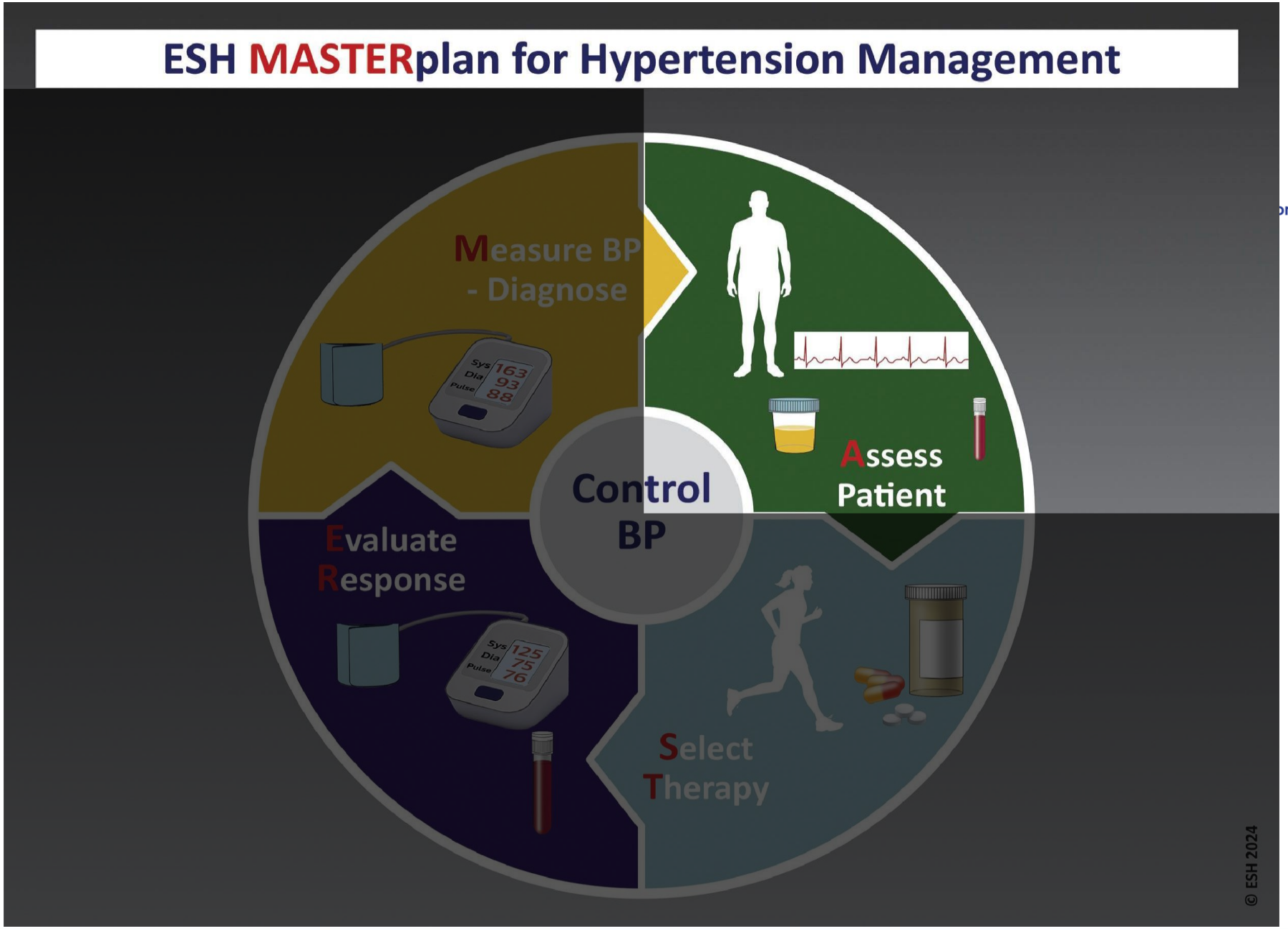


European Society of Hypertension

- Emphasis on “accurate” BP measurement.
- Validated electronic upper arm-cuff BP monitors.
- Measurement protocols.

Office BP	→	Basis for HTN evaluation.
Home BP	→	For most treated individuals.
24h ABP	→	Unique diagnostic method.

ESH MASTERplan for Hypertension Management



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Assess patient

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Assessment of patients should be adapted according to the severity of hypertension and clinical circumstances.

Assess patient

Basic evaluation: Medical history

- **Personal Hypertension related aspects, Family history; Risk factors and Comorbidities**

Personal history

- Time of the first diagnosis of hypertension, including records of any previous medical screening, hospitalization
- Stable or rapidly increasing BP
- Recordings of current and past BP values by self BP measurements
- Current/past antihypertensive medications including their effectiveness and intolerance
- Adherence to therapy
- Previous hypertension in pregnancy/preeclampsia

Assess patient

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Basic evaluation: Medical history

- Cardiovascular risk factors
- Symptoms of HMOD, CVD, stroke or CKD
- Other drug treatments or use including over the counter (OTC)

Drug treatments or use (other than antihypertensive drugs)

- Recreational drug/substance abuse, concurrent therapies including nonprescription drugs, e.g. glucocorticoids, NSAIDs/COX-2 inhibitors, paracetamol (acetaminophen), immunosuppressive drugs, anticancer drugs, nasal vasoconstrictors

Assess patient

Basic evaluation: Medical history

- **Possible secondary hypertension**

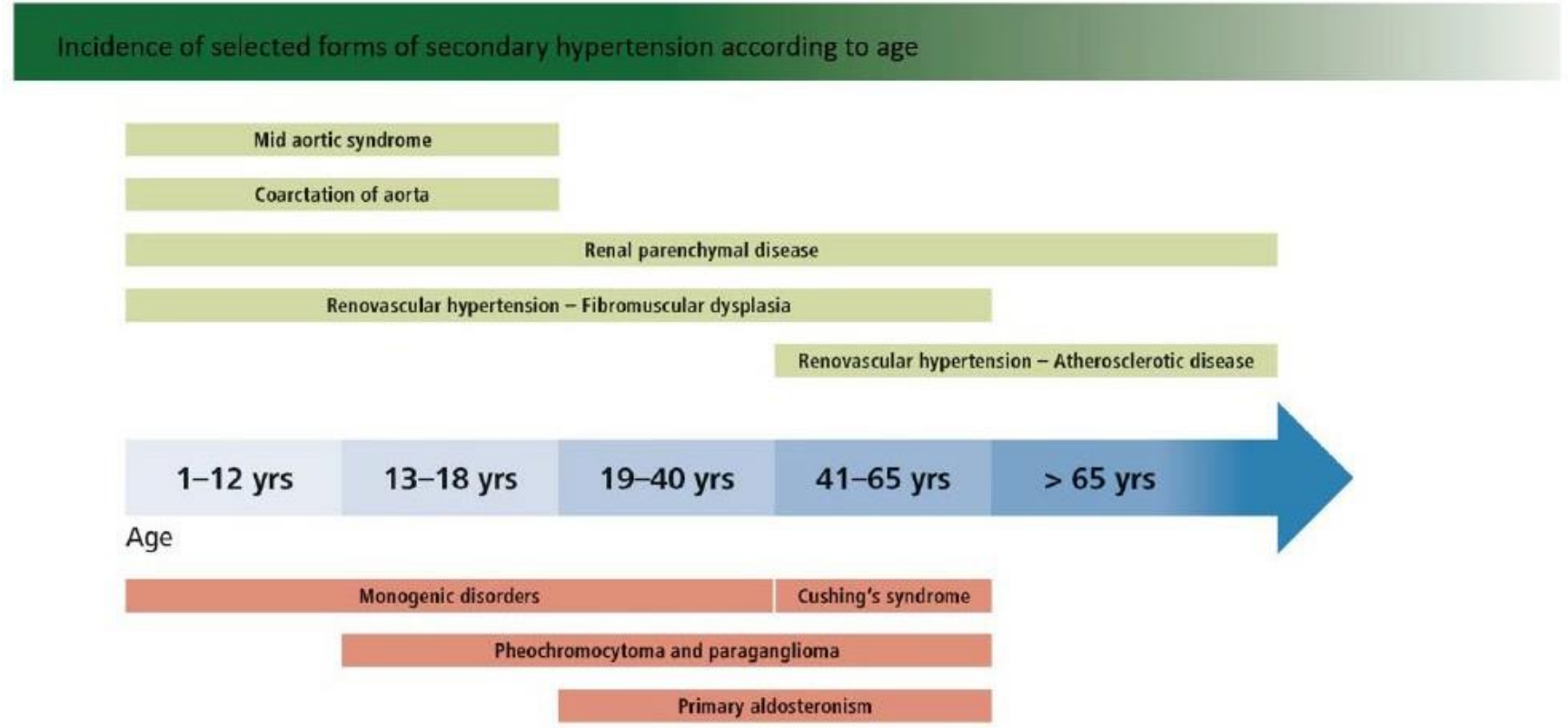
History of possible secondary hypertension

- Young onset of grade 2 or 3 hypertension (<40 years), or sudden development of hypertension or rapidly worsening BP in older patients
- History of repetitive renal/urinary tract disease
- Repetitive episodes of sweating, headache, anxiety or palpitations, suggestive of pheochromocytoma
- History of spontaneous or diuretic-provoked hypokalemia, episodes of muscle weakness and tetany (hyperaldosteronism)
- Symptoms suggestive of thyroid disease or hyperparathyroidism
- History of or current pregnancy, postmenopausal status and oral contraceptive use or hormonal substitution

Assess patient

Basic evaluation: Medical history

- Possible secondary Hypertension depending on age of onset



Assess patient

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Basic evaluation: Physical Examination

- ✓ Weight and height with calculation of BMI
- ✓ Body build and posture
- ✓ Waist circunference

- ✓ Skin inspection
- ✓ Aus cultation of heart and carotid arteries
- ✓ Neurologica l examination and cognitive status
- ✓ Resting pulse rate
- ✓ Signs of HMOD
- ✓ Signs of secondary hypertension

Assess patient

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Basic evaluation: Physical Examination Older Patient

- Level of frailty/functionality in older persons > 80 years

Assess patient

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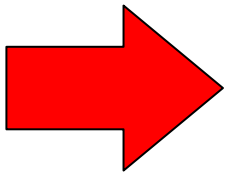
Basic evaluation: Physical Examination Older Patient

- Level of frailty/functionality in older persons > 80 years

➢ Assess functional status as a measurement to perform activities of daily living independently. The Index ranks adequacy of performance in the six functions:

- ✓ bathing,
- ✓ dres sing,
- ✓ toileting,
- ✓ transferring,
- ✓ continence,
- ✓ feeding.



5, 6 full function= Group 1

3, 4 moderate= Group 2

1,2 impa irment = Group 3

Assess patient

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Basic evaluation : Investigation with lab test and other

Lab test: blood serum / plasma

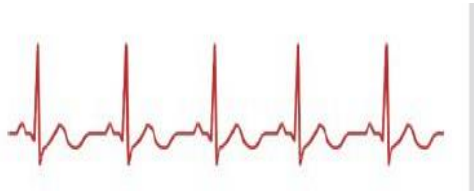
- Hemoglobin and/or hematocrit
- Fasting blood glucose and HbA1c
- Blood lipids: Total COL, LDL, HDL, triglycerides
- Blood potassium and sodium
- Uric acid
- Serum creatinine with calculation of eGFR
- Blood calcium

Urine:

- Urina ry albumin/creatinine ratio
- Urine analys is (multicomponent dips tick test; first voided urine in the morning)

Other investigation:

- ECG



Assess patient

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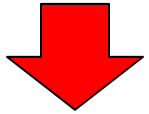
Basic evaluation: Investigation with lab test and other

What if I need to assess more information?



Extended Assessment

Assess patient

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HMOD: Select if deemed necessary and available

History and symptoms of HMOD, CVD, stroke and kidney disease

- Brain and eyes: headache, vertigo, syncope, impaired vision, TIA, sensory or motor deficit, stroke, carotid revascularization, cognitive impairment, memory loss, dementia (in older people)
- Heart: chest pain, shortness of breath, edema, myocardial infarction, coronary revascularization, syncope, history of palpitations, arrhythmias (especially AF), heart failure
- Kidney: thirst, polyuria, nocturia, hematuria, urinary tract infections
- Peripheral arteries: cold extremities, intermittent claudication, pain-free walking distance, pain at rest, ulcer or necrosis, peripheral revascularization
- Patient or family history of CKD (e.g. polycystic kidney disease)

Assess patient → Extended Assessment

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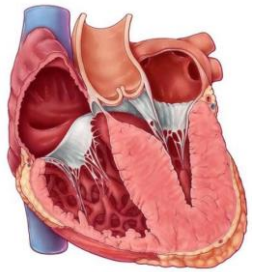
HMOD: Select if deemed necessary and available



Echocardiography

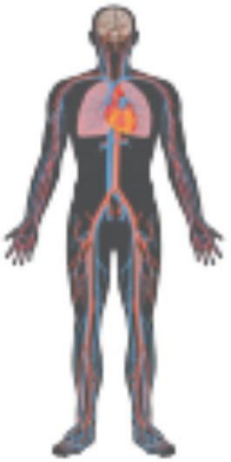
MRI

Coronary Calcium score

Convent. US

Doppler US

Carotid ultrasound

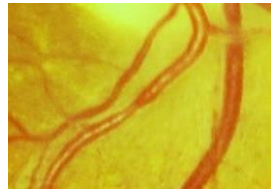


Pulse wave velocity

Ankle-brachial index

Cognitive funtion tests

Brain imaging



Fundoscopy

Retinal micro- vasculature

Assess patient

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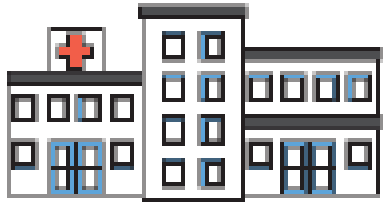
Basic and extended evaluation

What if I need to assess more information, investigation or other care

Refer to a specialist or to the hospital



Assess patient

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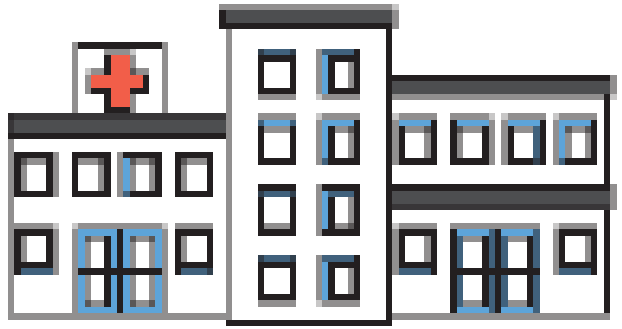
When to refer a patient: To a hospital

- Hypertensive emergencies, i.e. in severe hypertension (grade 3) associated with acute symptomatic HMOD
- Severe hypertension with conditions that need intensified BP management:
  - Acute stroke
  - Complicated aortic aneurysm
  - Acute heart failure
  - Acute coronary syndrome
  - Acute kidney failure
- Hypertension caused by phaeochromocytoma or exogenous sympathomimetic substances (e.g. substance abuse)
- Severe forms of Hypertension during Pregnancy including preeclampsia/eclampsia



Assess patient

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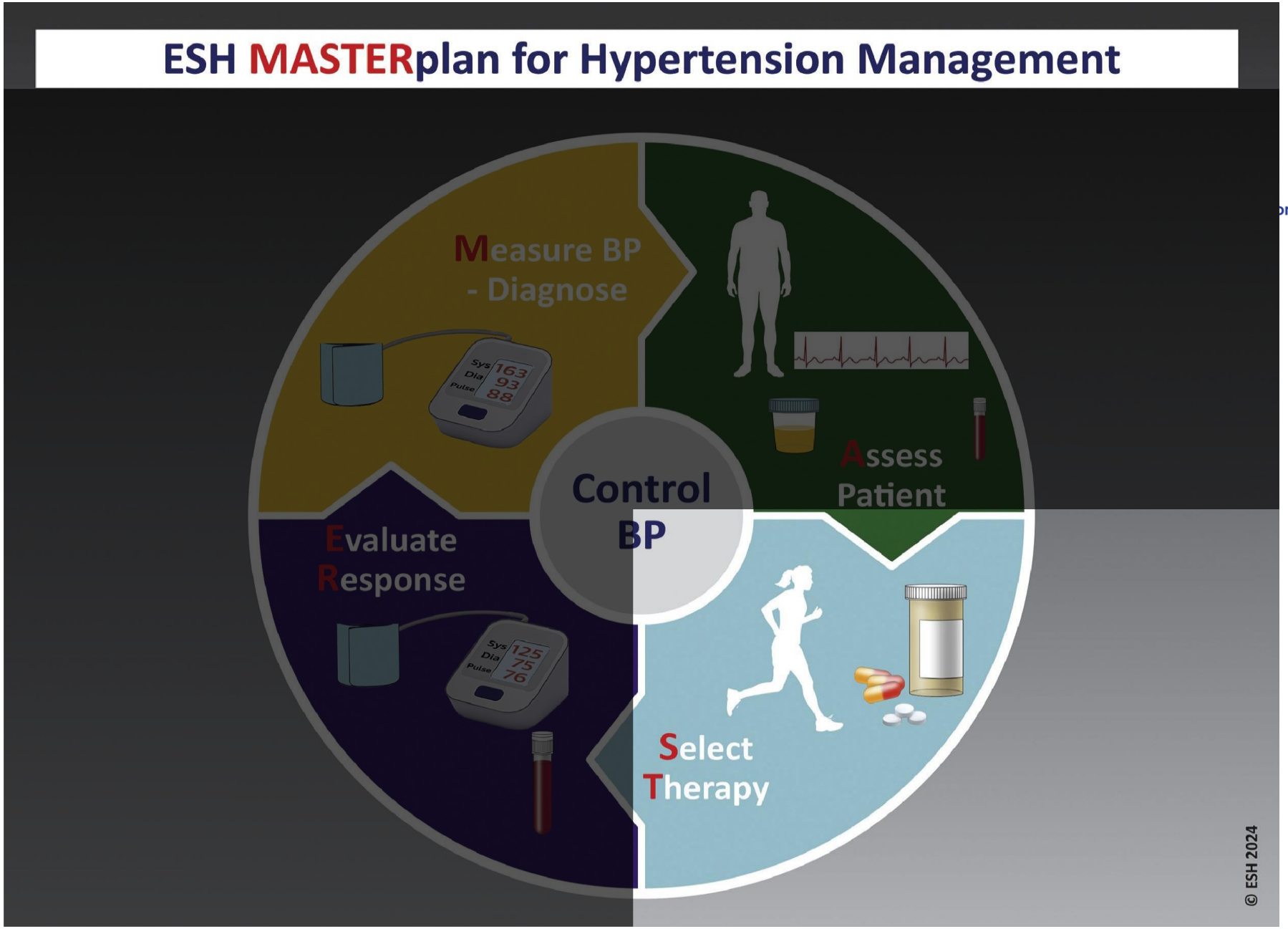
Patient's personal and medical history, other relevant factors and co-morbidities that may impact their blood pressure, CV risk and management.

Physical examination,

basic lab tests and 12 leads ECG



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The selection of the best individual therapy is based on the level of Cardiovascular risk

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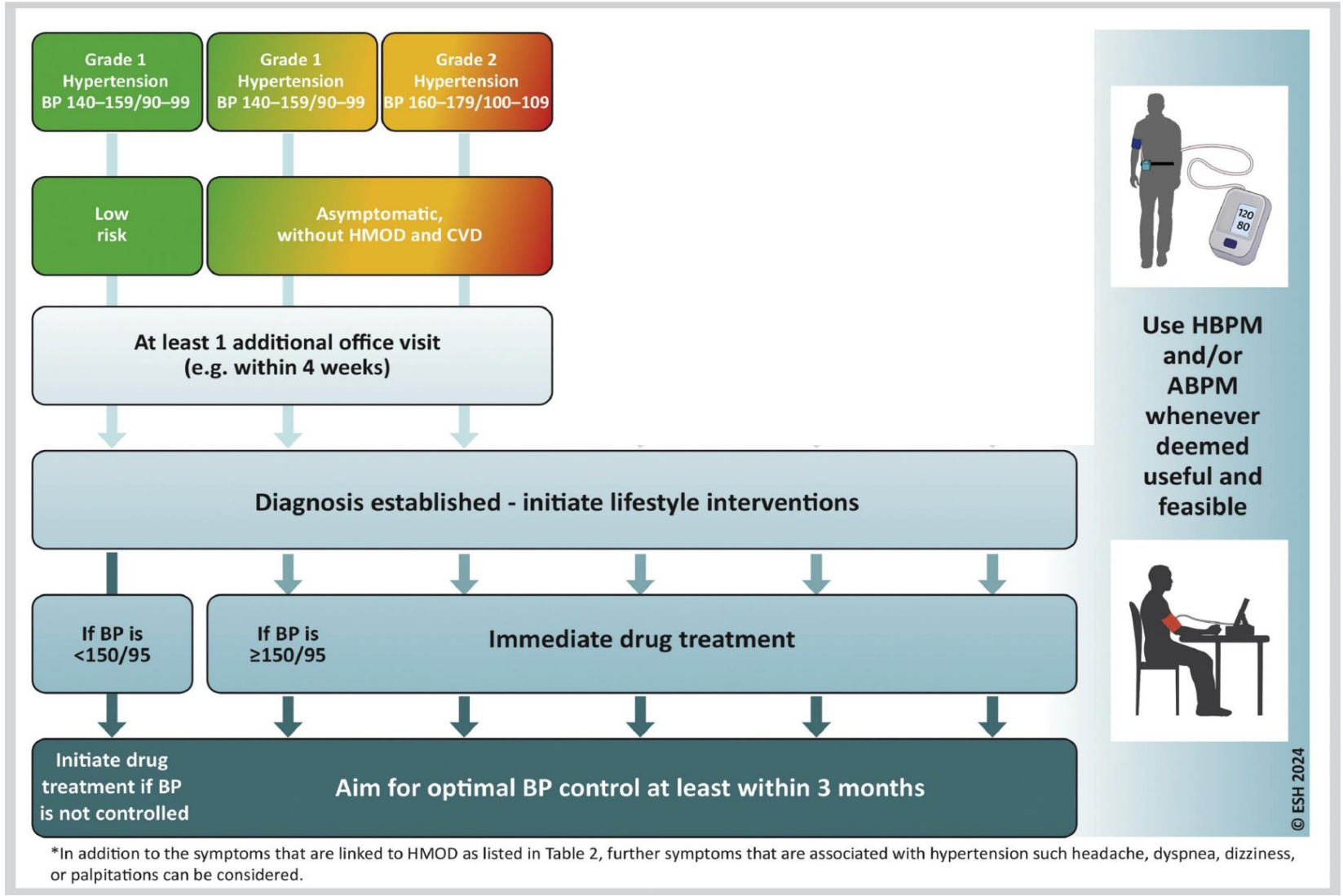
Hypertension disease staging	Other risk factors, HMOD, CVD or CKD	BP (mmHg) grading			
		High-normal SBP 130–139 DBP 85–89	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP 160–179 DBP 100–109	Grade 3 SBP ≥ 180 DBP ≥ 110
Stage 1	No other risk factors	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate risk	Moderate to high risk	High risk
	≥3 risk factors	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2	HMOD, CKD grade 3, or diabetes mellitus	Moderate to high risk	High risk	High risk	Very high risk
Stage 3	Established CVD or CKD grade ≥4	Very high risk	Very high risk	Very high risk	Very high risk

	<50 years	50–69 years	≥70 years
	<2.5%	<5%	<7.5%
	2.5 to <7.5%	5 to <10%	7.5 to <15%
	≥7.5%	≥10%	≥15%

Complementary risk estimation in Stage 1 with SCORE2/SCORE2-OP

Select Therapy: Initial management according to the level of risk



*In addition to the symptoms that are linked to HMOD as listed in Table 2, further symptoms that are associated with hypertension such headache, dyspnea, dizziness, or palpitations can be considered.

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Select Therapy: Initial management according to the level of risk

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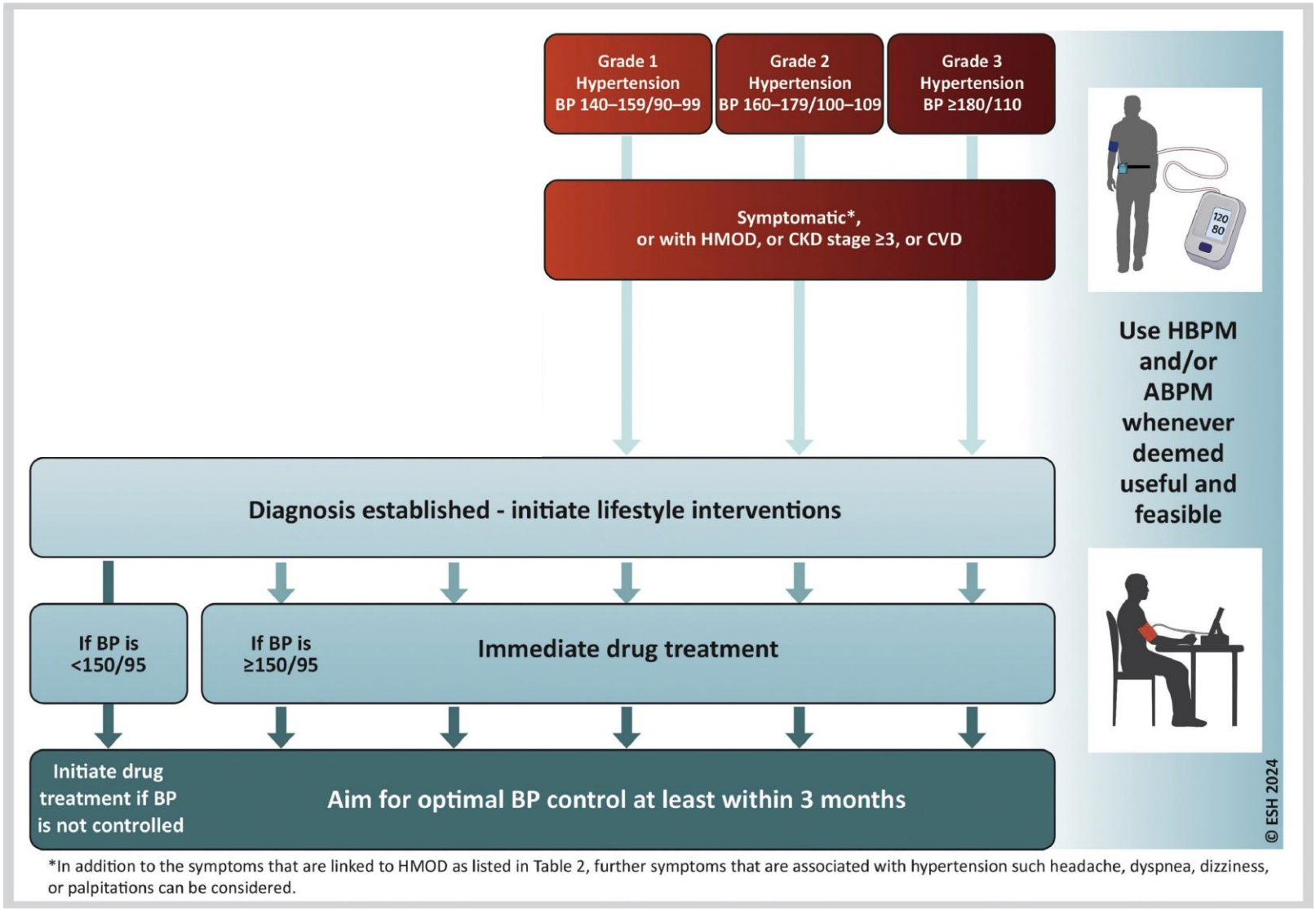

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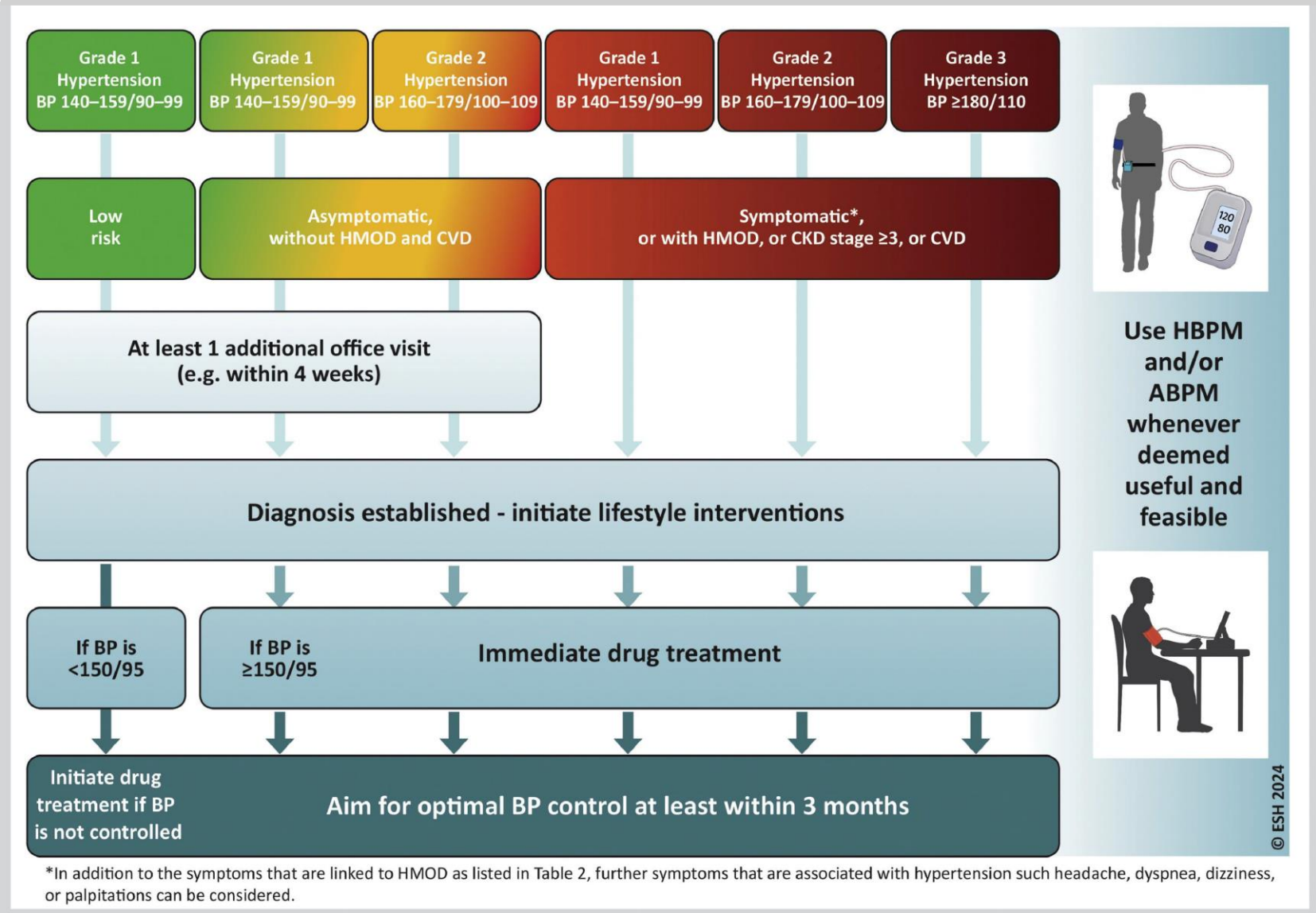
Select Therapy: Initial management according to the level of risk



*In addition to the symptoms that are linked to HMOD as listed in Table 2, further symptoms that are associated with hypertension such headache, dyspnea, dizziness, or palpitations can be considered.

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Select Therapy: Lifestyle interventions

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Relevance	Prescribing	Supportive additional interventions
• Prevent or delay onset of hypertension • Improve overall/CV health and well-being • Reduce BP • Booster BP lowering effects of medications • Reduce the number/dose of drugs needed for BP control	• To all patients with diagnosed hypertension • To patients with white-coat or masked hypertension • To patients with high-normal BP • Individual patient counseling and support • Prescribe with specific instructions, e.g. intensity and type of exercise • Assess, adapt, and reinforce during follow-up	**Smoking cessation** • Smoking cessation, supportive care and referral to smoking cessation programs are recommended for all smokers

Key interventions to reduce BP

Healthy diet

Prefer:

- DASH or Mediterranean type diets
- A healthy dietary pattern including more plant-based and less animal-based food
- Vegetables , fruits, beans, nuts, seeds, and vegetable oils
- Lean protein (e.g. fish, poultry)

Limit:

- Fatty meats, full-fat dairy
- Sugar, sweets and sweetened beverages

Daily physical activity and regular exercise

- Incorporate physical activity (e.g. walking, cycling) into everyday life and reduce sedentary behavior (e.g. sit less)
- Aim for:
  -150-300 min of aerobic exercise per week performed at a moderate intensity or
  -75-150 min of aerobic exercise per week performed at a vigorous intensity or
  -an equivalent combination of moderate and vigorous physical activities
- Add dynamic resistance (muscle strengthening) exercise 2-3 times per week
- Start slow and gradually to build up the amount/ intensity of activity

Weight reduction

- Combine a low-caloric diet with daily physical activity in patients with overweight or obesity
- Monitor waist circumference and weight

Restriction of sodium intake

- Sodium is mainly consumed as salt, which comes from processed foods or is added to the food during cooking or at the table
- Salt (NaCl) restriction to < 5 g (~2g sodium) or 1 teaspoon per day is recommended

Augmentation of potassium intake

- Increase potassium consumption, preferably via dietary modification, except for hypertensive patients with advanced CKD
- Foods high in potassium are for example white cannellini beans (1200 mg/cup), unsalted boiled spinach (840 mg/cup), avocado (708 mg/cup) and bananas (450 mg per medium fruit)
- Use salt substitutes replacing NaCl with KCl in patients consuming a high sodium diet

Limit alcohol intake

- Limit alcohol intake close to abstinence, particularly if intake is ≥3 drinks/day[a]
- Avoid excessive (binge) drinking

Improve stress management

- Reduce stress by use of
  -Regular physicial activity
  -Mindfulness-based exercise
  -Relaxation techniques, e.g. deep breathing, meditation, yoga or Tai Chi
- Get enough sleep (7-9 hours)
- Find individual ways to cope with stress, e.g. practicing mindfulness, engaging in hobbies or talking to a therapist
- Moderate alcohol and caffeine intake, avoid drugs

Minimize exposure to noise and air pollution

- Reduce indoor exposure to noise and air pollution.
- Consider to reduce exposure to air pollution by modifying the location, timing and type of outdoor activities

[a]About 350 ml of regular beer containing 5% alcohol by volume or 150 ml of wine containing 12% alcohol by volume per drink.

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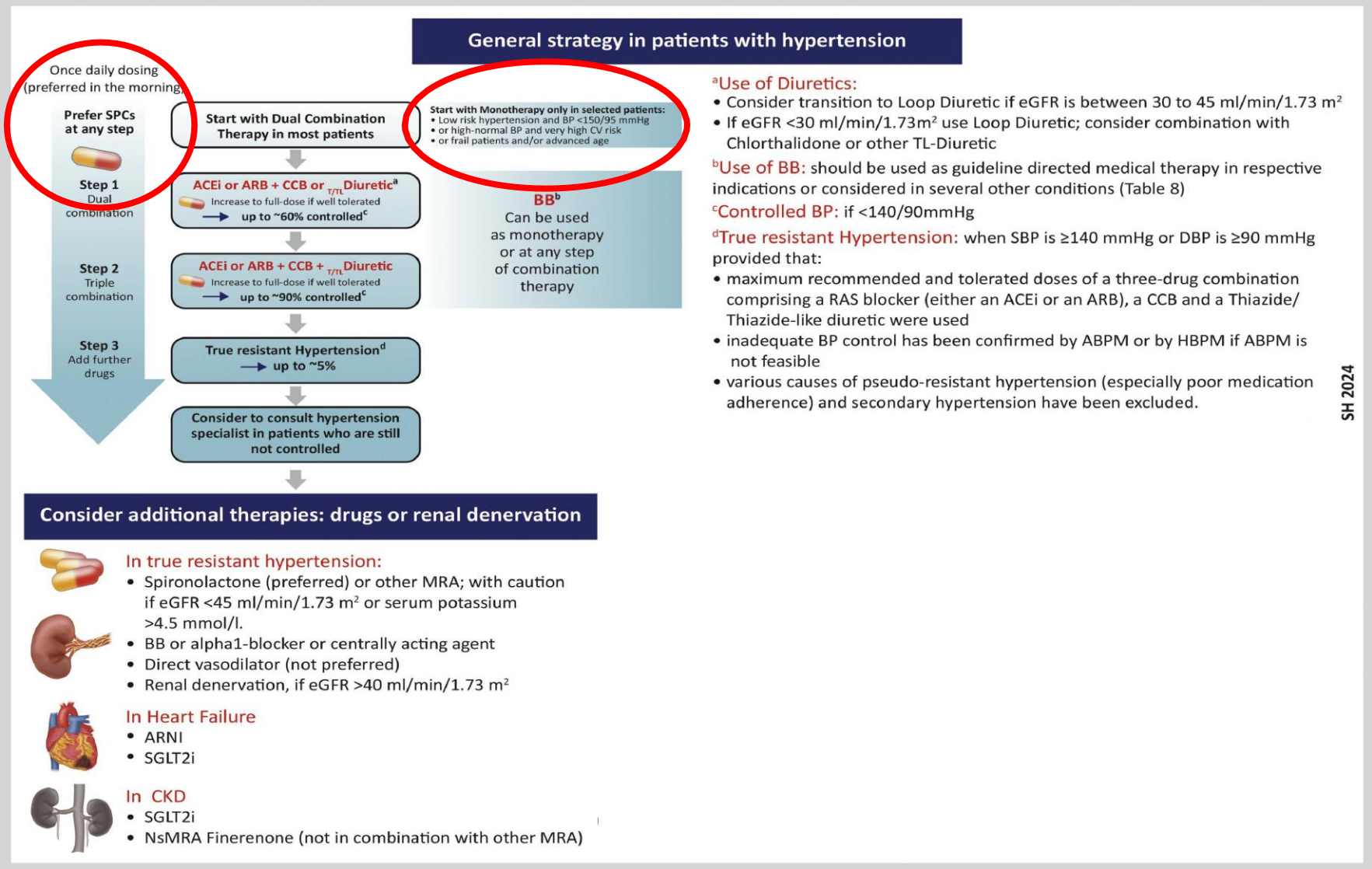
Select Therapy: Drug Therapy and Target BP



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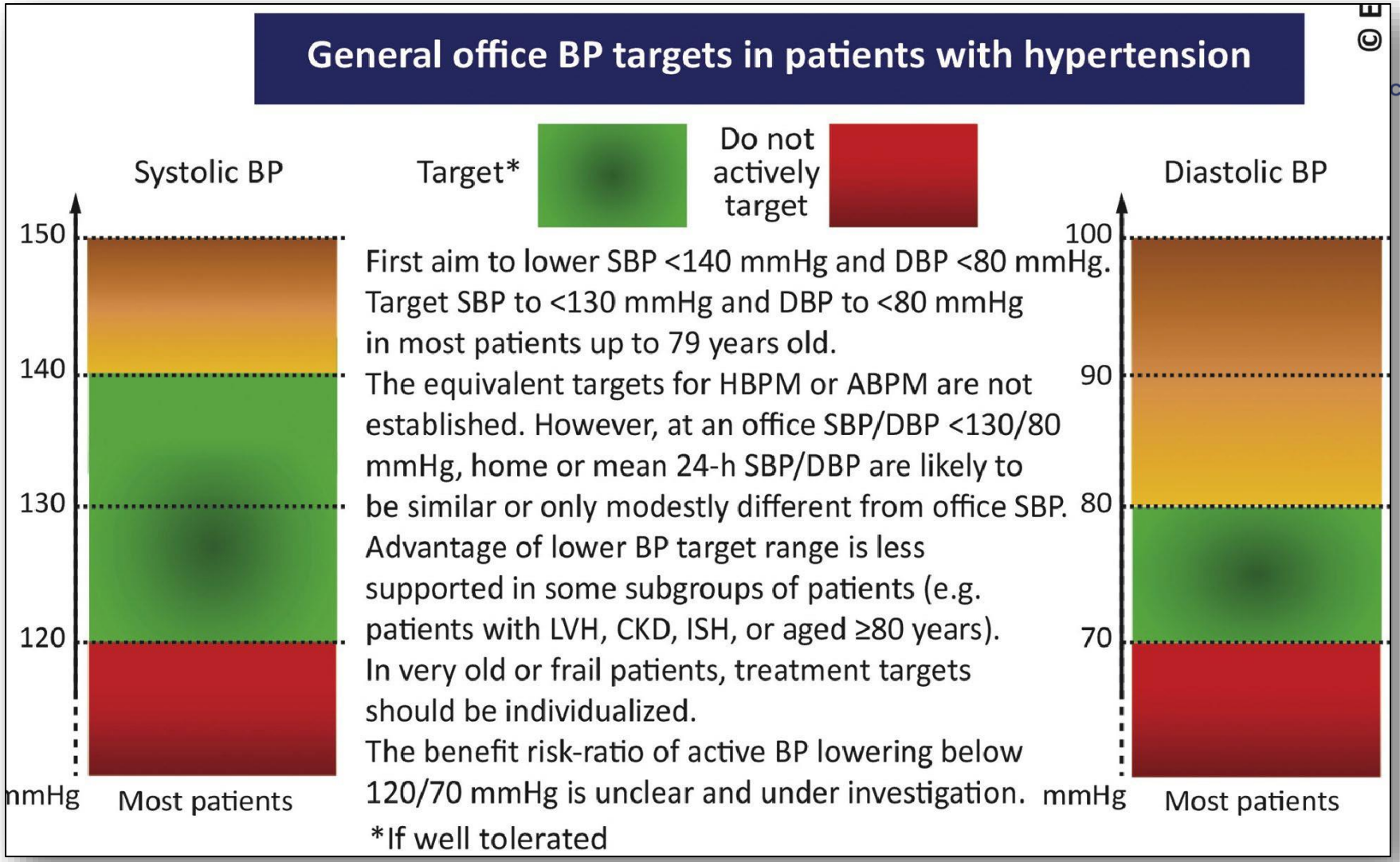
Select Therapy: Drug Therapy and Target BP



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Select Therapy: Drug Therapy and Target BP in Older Patients

	Fit*	Slowed but autonomous for most activities*	Severely Dependent
Treatment initiation	1. If office SBP ≥160 mmHg. 2. Consider also in most cases if office SBP is between 140 and 159 mmHg.	1. If office SBP ≥160 mmHg. 2. Consider ialso in most cases if office SBP is between 140 and 159 mmHg.	1. According to comorbidities and polypharmacy. 2. Consider treatment if office SBP ≥160 mmHg.
Target BP	3. Office SBP in the range of 140 to 150 mmHg. 4. A range of 130-139 mmHg may be considered if well tolerated 5. Be cautious if DBP is already below 70 mmHg.	3-5 from Fit apply also.	3. Office SBP in the range of 140 to 150 mmHg.
Strategy	6. Consider starting with monotherapy. [a]See Table 5: How to Assess	6. Consider starting with monotherapy. 7. Uptitrate cautiously. 8. Reduce treatment if SBP is very low (<120 mmHg) or in patients with orthostatic hypotension. 9. Consider a detailed assessment of functional status with the tools below or equivalent:: • Mobility (Short Physical Performance Battery) • Muscular force (Handgrip) • Depression (Mini Geriatric Depression Scale) • Nutrition (Mini Nutritional Assessment Short Form)	4. Start treatment cautiously. 5. Reduce treatment if SBP is very low (<120 mmHg) or in patients with orthostatic hypotension. 6. Correct other factors and medications lowering BP.

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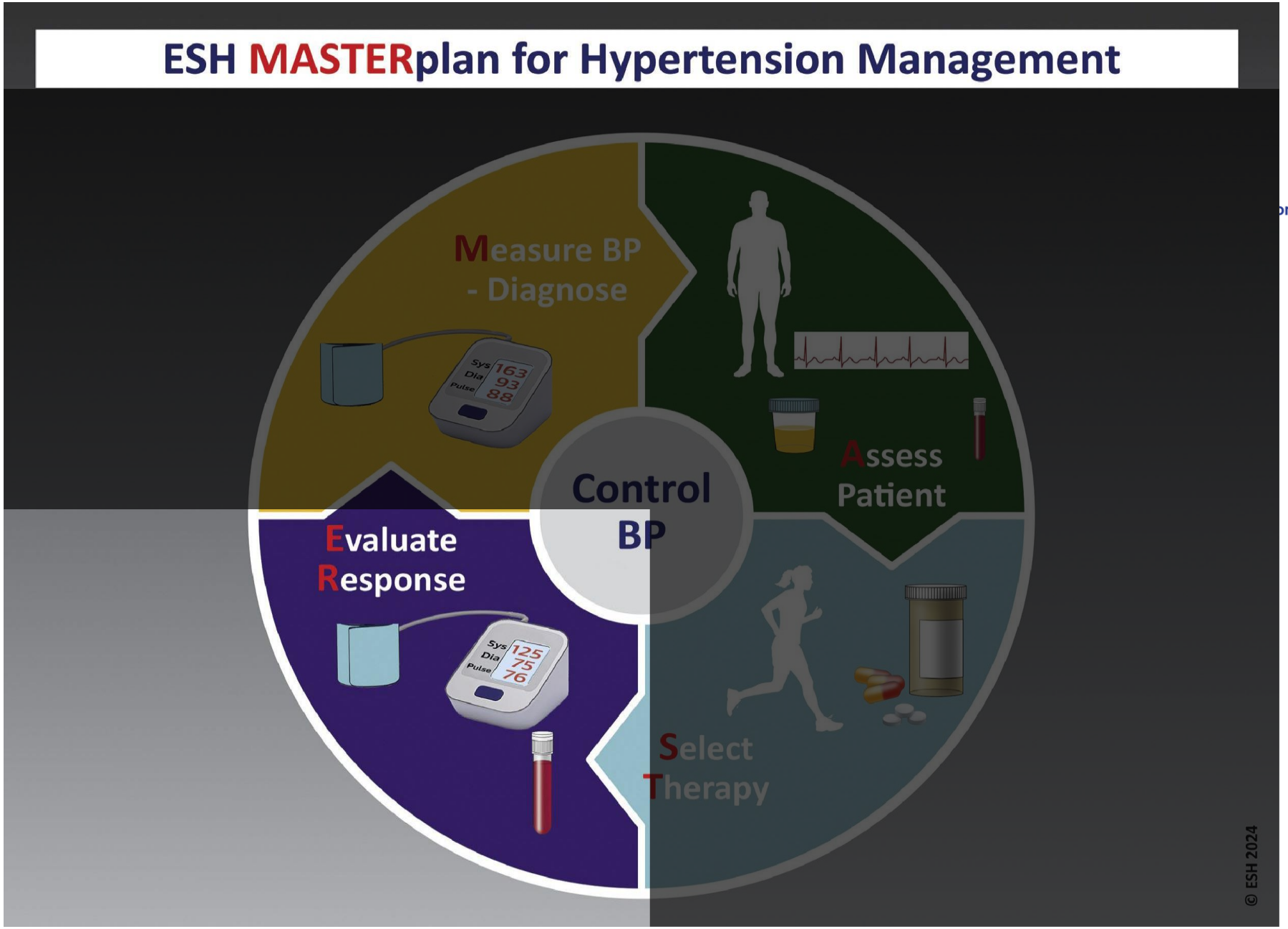

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Evaluate Response

Below 140/80 mm ASAP and more

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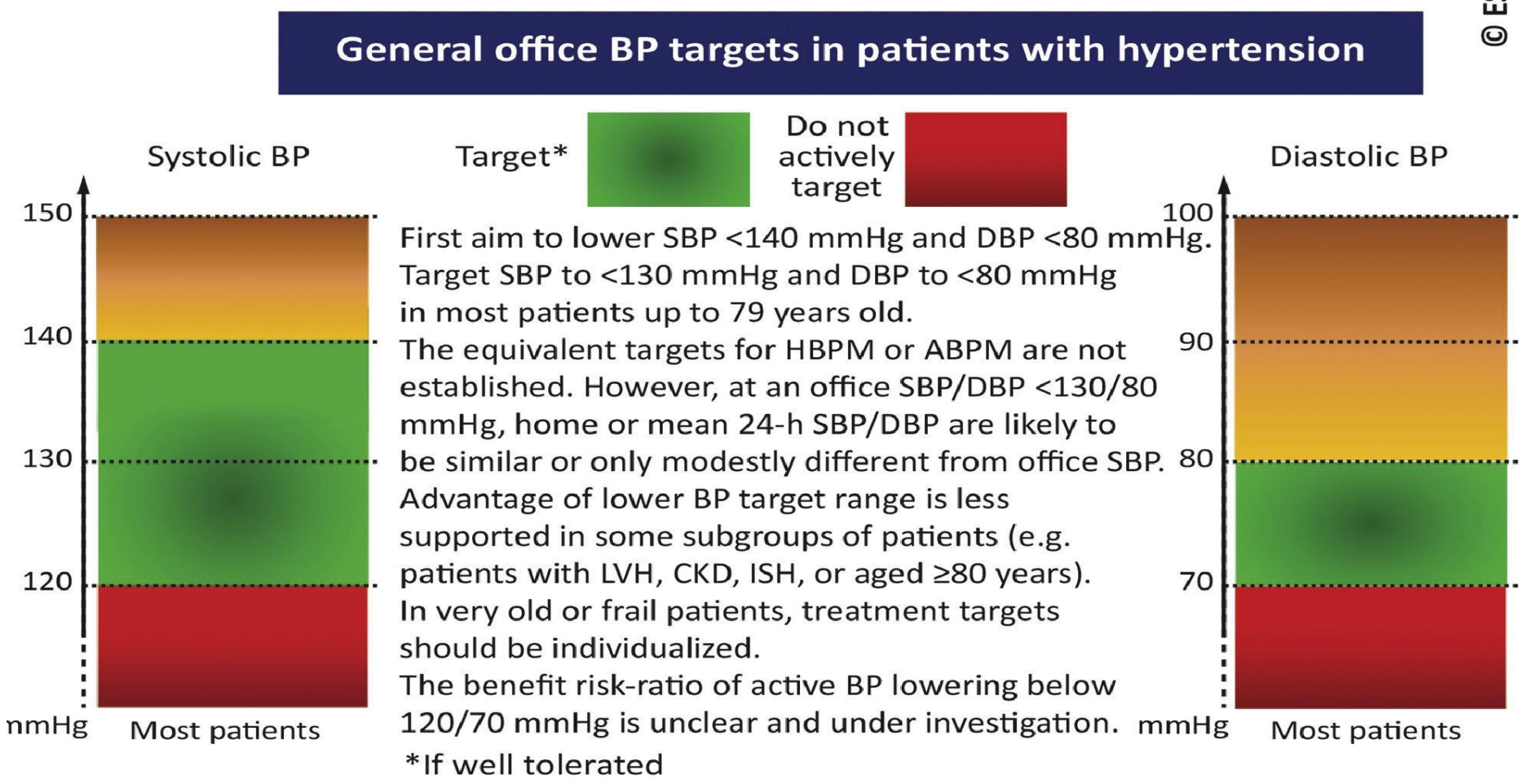

Evaluate Response

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Initiation 0- 3 months

Aim for BP control ASAP.

- 1-2 visits (4-6 weeks)
- Office BP and Home BP
- Support individual (shared decision making); Verify initiation and discuss adherence. Verify and adapt lifestyle interventions and recommend drug therapy prescribing patterns
- Selected lab tests to address safety of drug therapy / risk factors
- Re-Assess modifiable risk factors and HMOD

Evaluate Response

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Short term Follow Up 3-12 months

Optimise BP control ASAP.

- 1-2 visits depending on CV risk and difficulty to control BP (4-6 weeks)
- Office BP and Home BP (before visits)
- ABPM in apparent treatment resistance hypertension(refer to a specialist)
- Periodic re-assessment of parameters with impact on drug safety and selection, e.g. eGFR, potassium ,risk factors, e.g. glucose, HbAlc, LDL- cholesterol
- Verify BP- induced changes on HMOD (eGFR, albuminuria, PWV or LVH)

Evaluate Response

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Short term Follow Up 3-12 months

Build an effective ecosystem

- Support implementation of lifestyle interventions. Consider adjustment of medications depending on BP control, tolerability and change in co- morbidities, avoid inertia. Consider deprescribing in symptomatic very old and frail patients with low BP.
- Monitor adherence/persistence to drug therapy: assess barriers, e.g. changes in co-morbidities, side-effects, polypharmacy including OTC use
- Organize and implement patient support: consider use of team-based care, telehealth, virtual visits, self-monitoring and patient empowerment

Evaluate Response

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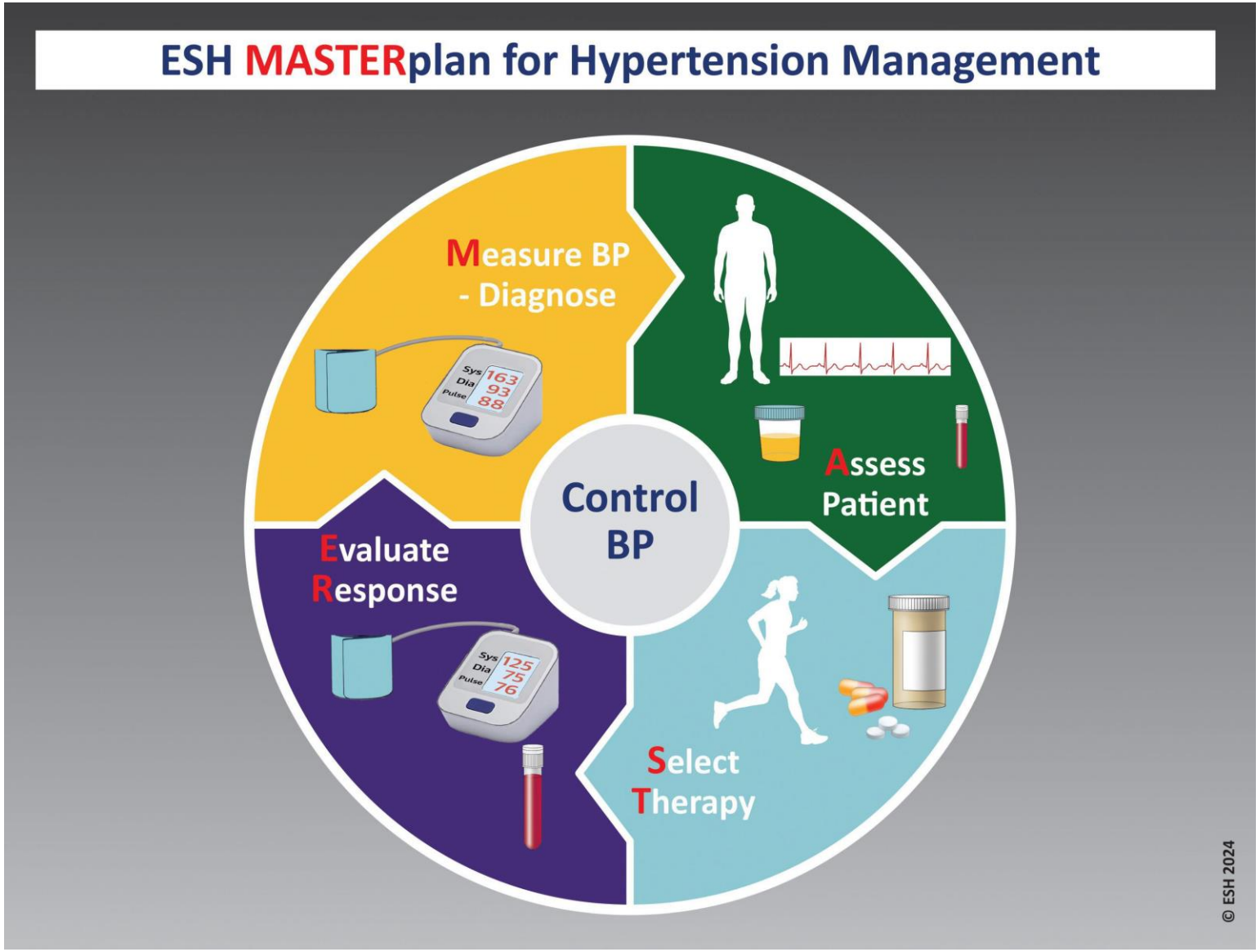
Long term Follow Up > 12 months

Maintain optimal BP control

- Low-risk : 1 visit per year
- High risk and difficult to control BP: more frequent visits (2-3/year)
- In patients without pre-existing HMOD re-assess in longer intervals, e.g. every 3 years
- In patients with pre-existing HMOD more frequent re-assessments of BP- induced changes
- Maintain patient support



Towards Holistic & Comprehensive Cardiac Care

Kreutz R et al. Eur J Intern Med. doi: 10.1016/j.ejim.2024.05.033


thank you

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Comprehensive Cardiac Care

References

- 1. Bjertness MB, Htet AS, Meyer HE, Htike MMT, Zaw KK, Oo WM, et al. Prevalence and determinants of hypertension in Myanmar - a nationwide cross-sectional study. BMC Public Health. 2016 Dec;16(1):590.
- 2. Noncommunicable and Health Promotion Unit The WHO. Indicator Metadata Registry Details [Internet]. [cited 2023 May 10]. Available from: https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3155
- 3. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020 Jun;75(6):1334–57.
- 4. Than Lwin Tun, Kyaw Kan Kaung, Nan Nai Nai Shein. Community health clinics combat hypertension, diabetes in rural areas once a week across the nation [Internet]. MDN - Myanmar DigitalNews. [cited 2023 May 11]. Available from: https://www.mdn.gov.mm/en/community-health-clinics-combat-hypertension-diabetes-rural-areas-once-week-across-nation

WORLD HYPERTENSION DAY May 17th 2023
Measure Your Blood Pressure Accurately
Control It, Live Longer.