2020 ISH Global Hypertension Practice Guidelines

6th May 2020
Introduction

Alta Schutte
Introduction

2018 ESC/ESH Guidelines for the management of arterial hypertension

Hypertension in adults: diagnosis and management

NICE guideline
Published: 28 August 2019

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA
Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

International Society of Hypertension

www.ish-world.com
Introduction

- 1.39 billion estimated with hypertension in 2010
- 349 million from HIC
- 1.04 billion from LMIC
Introduction

• To align with the mission of the ISH: to reduce the global burden of raised BP – we developed the *ISH 2020 Global Hypertension Practice Guidelines* for adults.

• We extracted evidence-based content from recently published guidelines and tailored standards of care; and standards of care
The **ISH 2020 Global Hypertension Practice Guidelines** were thus developed based on evidence criteria,

a) to be used globally

b) to be fit for application in low-resource and high-resource settings by advising on **ESSENTIAL** and **OPTIMAL** standards of care; and

c) to be concise, simplified and easy to use by clinicians, nurses and community health workers, as appropriate.
Process of Writing

Thomas Unger
Process of Writing

Scepticism

● Is it necessary at all?
● Is this a hypersimplistic view?
● Is it strictly evidence-based?
● Is it helpful for low-income settings?
Process of Writing

1st Meeting of ISH Hypertension Guidelines Committee
Feb. 3, 2019 London, UK


COMMITTEE:
13 ISH Scientific Council members

Thomas Unger *(Chair)* The Netherlands
Claudio Borghi Italy
Fadi Charchar Australia
Nadia Khan Canada
Neil Poulter United Kingdom
Dorairaj Prabhakaran India
Agustin Ramirez Argentina
Markus Schlaich Australia
George Stergiou Greece
Maciej Tomaszewski United Kingdom
Richard Wainford USA
Bryan Williams United Kingdom
Alta Schutte S Africa/Australia
Define our goal (1):

- Not to review the current evidence again - done by ACC/AHA-, ESC/ESH- and other colleagues.

- Develop a balanced practical, realistic, feasible hands-on proposal for global use in line with the ISH mission.
Define our Goal (2):

- Stick to recent guidelines (ESC/ESH, ACC/AHA, NICE) as background.

- Define **ESSENTIAL** vs **OPTIMAL** criteria of diagnosis and treatment according to resources availability in LMI vs HI settings.
Process of Writing

Practical questions to be addressed:

- Definition of office hypertension
- Diagnosis of hypertension (office and out-of-office)
- Investigation (essential vs optimal tests)
- Non-pharmacological measures
- Treatment initiation (duration of observation, BP level, high-risk groups)
- Stepwise drug choices – Combination therapies
- Goal of treatment
- When to refer to hypertension specialist
- Long-term follow-up plan (how often do you see Dr.)
Process of Writing

Review Process

- **Internal Review**: Each section reviewed by another member of the Guidelines committee

- **External Review**: Two rounds with 24 Experts around the world with special consideration of colleagues from LMICs
<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hind Beheiry</td>
<td>Sudan</td>
</tr>
<tr>
<td>Irina Chazova</td>
<td>Russia</td>
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<tr>
<td>Albertino Damasceno</td>
<td>Mozambique</td>
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<tr>
<td>Anna Dominiczak</td>
<td>UK</td>
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<tr>
<td>Anastase Dzudie</td>
<td>Cameroon</td>
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<td>Stephen Harrap</td>
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<td>Tazeen Jafar</td>
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<td>Marc Jaffe</td>
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<td>Patricio Jaramillo-Lopez</td>
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<td>Kazuomi Kario</td>
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<td>Giuseppe Mancia</td>
<td>Italy</td>
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<td>Sanjeevi N. Narasingan</td>
<td>India</td>
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<tr>
<td>Elijah Ogola</td>
<td>Kenya</td>
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<td>Srinath Reddy</td>
<td>India</td>
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<tr>
<td>Ernesto Schiffrin</td>
<td>Canada</td>
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<td>Ann Soenarta</td>
<td>Indonesia</td>
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<td>Rhian Touyz</td>
<td>UK</td>
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<td>Yudah Turana</td>
<td>Indonesia</td>
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<tr>
<td>Michael Weber</td>
<td>USA</td>
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<tr>
<td>Paul Whelton</td>
<td>USA</td>
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<tr>
<td>Xin Hua Zhang</td>
<td>Australia</td>
</tr>
<tr>
<td>Yuqing Zhang</td>
<td>China</td>
</tr>
</tbody>
</table>

www.ish-world.com
May 6: Online in Journal of Hypertension, Hypertension

May 6: First Webinar: Global and Chinese

May 20: Second Webinar with Q & A.

Internet, Social Media:

Homepage ISH:

Translations:
Definition of Hypertension

George Stergiou
## Definition of Hypertension

### Classification of hypertension based on Office blood pressure (BP) measurement

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal BP</td>
<td>&lt;130</td>
<td>&lt;85</td>
</tr>
<tr>
<td>High-normal BP</td>
<td>130–139</td>
<td>85–89</td>
</tr>
<tr>
<td>Grade 1 Hypertension</td>
<td>140–159</td>
<td>90–99</td>
</tr>
<tr>
<td>Grade 2 Hypertension</td>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>
# Definition of Hypertension

Hypertension based on Office-, Ambulatory (ABPM)- and Home Blood Pressure (HBPM) measurement

<table>
<thead>
<tr>
<th></th>
<th>SBP / DBP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Office BP</strong></td>
<td>≥ 140 and/or ≥ 90</td>
</tr>
<tr>
<td><strong>ABPM</strong></td>
<td></td>
</tr>
<tr>
<td>24h average</td>
<td>≥ 130 and/or ≥ 80</td>
</tr>
<tr>
<td>Day Time (or awake)</td>
<td>≥ 135 and/or ≥ 85</td>
</tr>
<tr>
<td>Night Time (or asleep)</td>
<td>≥ 120 and/or ≥ 70</td>
</tr>
<tr>
<td><strong>HBPM</strong></td>
<td>≥ 135 and/or ≥ 85</td>
</tr>
</tbody>
</table>
Blood Pressure Measurement and Diagnosis of Hypertension

George Stergiou
Blood Pressure Measurement and Diagnosis of Hypertension

Office Blood Pressure Measurement

- 2-3 office visits at 1-4-week intervals.
- Whenever possible, the diagnosis should not be made on a single visit (unless BP ≥180/110 mmHg and CVD).
- If possible and available the diagnosis of hypertension should be confirmed by out-of-office measurement.

www.ish-world.com
# Blood Pressure Measurement and Diagnosis of Hypertension

## Office BP Measurement

### Conditions
- **Position**
  - Setting
  - Body position
  - Talking

### Device
- **Cuff**
  - Validated electronic upper-arm cuff ([www.stridebp.org](http://www.stridebp.org))
  - Alternatively manual auscultatory device
  - Cuff size

### Protocol
- **Interpretation**
  - Average 2\textsuperscript{nd}-3\textsuperscript{rd} measurement
  - 2-3 office visits required

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*International Society of Hypertension*

[www.ish-world.com](http://www.ish-world.com)
### Blood Pressure Measurement Plan according to Office Blood Pressure Levels

<table>
<thead>
<tr>
<th>Office blood pressure levels (mmHg)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;130/85</td>
<td>• Remeasure within 3 years (1 year if other risk factors).</td>
</tr>
<tr>
<td>130-159/85-99</td>
<td>• If possible confirm with out-of-office measurement.</td>
</tr>
<tr>
<td>160/100</td>
<td>• Confirm within a few days/weeks.</td>
</tr>
<tr>
<td></td>
<td>• Alternatively confirm with repeated office visits.</td>
</tr>
</tbody>
</table>

*ESSENTIAL*

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**Blood Pressure Measurement and Diagnosis of Hypertension**

- **International Society of Hypertension**

[www.ish-world.com](http://www.ish-world.com)
# Blood Pressure Measurement and Diagnosis of Hypertension

## Office Blood Pressure

### Initial evaluation
- Measure BP in both arms. Difference >10 mmHg: use arm with higher BP; >20 mmHg: consider further investigation.

### Standing BP
- In treated patients when symptoms of postural hypotension.
- At first visit in elderly and diabetics.

### Unattended BP
- More standardized. Lower BP levels with uncertain threshold.
- Out-of-office BP again needed in most cases.
Blood Pressure Measurement and Diagnosis of Hypertension

Clinical Use of Home and Ambulatory BP Monitoring

- Conditions
- Device
- Protocol
- Position
- Cuff
- Interpretation

International Society of Hypertension

www.ish-world.com
# Blood Pressure Measurement and Diagnosis of Hypertension

## Home BP Monitoring vs. Ambulatory BP Monitoring

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As for office blood pressure (see above).</td>
<td>Routine working day.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As for office BP (see above).</td>
<td>Avoid strenuous activity. Arm still and relaxed during each measurement.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Validated electronic (oscillometric) upper-arm cuff device (<a href="http://www.stridebp.org">www.stridebp.org</a>, and Section 11: Resources)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cuff</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size according to the individual’s arm circumference</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement Protocol</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before each visit to the health professional:</td>
<td>• 3–7-day monitoring in the morning (before drug intake if treated) and the evening.</td>
<td>• 24-hour monitoring at 15 – 30 min intervals during daytime and nighttime.</td>
</tr>
<tr>
<td></td>
<td>• Two measurements on each occasion after 5 min sitting rest and 1 min between measurements.</td>
<td>• At least 20 valid daytime and 7 nighttime BP readings are required. If less, the test should be repeated.</td>
</tr>
</tbody>
</table>

**Long-term follow-up of treated hypertension:**
• 1–2 measurements per week or month.

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Home BP Monitoring</th>
<th>Ambulatory BP Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average home blood pressure after excluding readings of the first day ≥ 135 or 85mmHg indicates hypertension.</td>
<td>• 24-hour ambulatory blood pressure ≥ 130/80mmHg indicates hypertension (primary criterion).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Daytime (awake) ambulatory blood pressure ≥ 135/85mmHg and nighttime (asleep) ≥ 120/70mmHg indicates hypertension</td>
</tr>
</tbody>
</table>
# Blood Pressure Measurement and Diagnosis of Hypertension

## White-coat Hypertension
- Intermediate CV risk.
- If low total CV risk and no organ damage, drug treatment may not be prescribed.
- Follow with lifestyle changes.

## Masked Hypertension
- Similar CV risk as sustained hypertensives.
- Drug treatment may be required aiming to normalise out-of-office BP.
Diagnostic and Clinical Tests

**ESSENTIAL**

- **Medical History** (BP, risk factors, co-morbidities, signs/symptoms of secondary hypertension…)
- **Physical Examination** (circulation, heart, other systems)
- **Lab Investigations** (Na⁺, K⁺, creatinine, eGFR, dipstick lipids, Fasting Glucose where available)
- **12 lead ECG** (AF, LV hypertrophy, IHD…)

**OPTIMAL**

- **Additional tests to consider** (extended biochemistry, cardiac/kidney/brain/vascular imaging, fundoscopy…)

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Cardiovascular Risk Factors

Markus Schlaich
Cardiovascular Risk Factors

- More than 50% of hypertensive patients have additional CV risk factors.
- **Most commonly:** Met Syn, T2DM, lipid disorders, ↑ uric acid.
- CV risk assessment is important and should be assessed in all hypertensive patients.
- **Consider increased risk with:** chronic inflammatory disease, COPD, psychiatric disorders, psycho-social stressors.
# Cardiovascular Risk Factors

| Other risk factors, HMOD, or disease | High-normal  
| SBP 130 – 139  
| DBP 85 – 89 | Grade 1  
| SBP 140 – 159  
| DBP 90 – 99 | Grade 2  
| SBP ≥ 160  
| DBP ≥ 100 |
|---|---|---|
| No other risk factors | Low | Low | Moderate -- High |
| 1 or 2 risk factors | Low | Moderate | High |
| ≥ 3 risk factors | Low -- | Moderate High |
| HMOD, CKD grade 3, diabetes mellitus, CVD | High | High | High |

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[www.ish-world.com](http://www.ish-world.com)
Hypertension-mediated Organ Damage

Markus Schlaich
Hypertension-mediated Organ Damage

- Hypertension-mediated organ damage (HMOD) defined as structural or functional alterations of arterial vasculature and/or organs it supplies caused by elevated BP.

- HMOD assessment can provide important therapeutic guidance on:
  1. management for hypertensive patients with low or moderate overall risk through re-classification due to presence of HMOD.
  2. preferential selection of drug treatment based on the specific impact on HMOD.
Hypertension-mediated Organ Damage

HMOD Assessment

**ESSENTIAL**
- Serum creatinine
- eGFR
- Dipstick urine test
- 12-lead ECG

**OPTIMAL**
- Brain
- Eyes
- Heart
- Kidneys
- Arteries

Serial assessment of HMOD may help to determine efficacy of treatment
# Exacerbators & Inducers of Hypertension

<table>
<thead>
<tr>
<th>Category</th>
<th>Effect and Details</th>
</tr>
</thead>
</table>
| Non Steroidal Anti-Inflammatory Drugs (NSAIDs) | - No difference or an increase of up to 3/1 mmHg with celecoxib  
- 3/1 mmHg increase with non-selective NSAIDs  
- No increase in Blood Pressure with aspirin  
- NSAIDs can antagonize the effects of RAAS inhibitors and beta blockers |
| Combined Oral Contraceptive Pill | - 6/3 mmHg increase with high doses of estrogen (>50 mcg of estrogen and 1-4 mcg progestin)                                                      |
| Antidepressants                  | - 2/1 mmHg increase with SNRI (Selective Norepinephrine and Serotonin Reuptake Inhibitors)  
- Increased Odds Ratio of 3.19 of hypertension with Tricyclic antidepressant use  
- No increases in blood pressure with SSRI (Selective Serotonin Reuptake Inhibitors) |
| Acetaminophen                    | Increased relative risk of 1.34 of hypertension with almost daily acetaminophen use                                                                 |
| Other Medications                | - Steroids  
- Anti retroviral therapy: inconsistent study findings for increased blood pressure  
- Sympathomimetics: pseudoephedrine, cocaine, amphetamines  
- Anti-migraine serotonergics  
- Recombinant human erythropoietin  
- Calcineurin inhibitors  
- Anti-angiogenesis and kinase inhibitors  
- 11 β-hydroxysteroid dehydrogenase type 2 inhibitors |
| Herbal and Other Substances     | Alcohol, Ma-huang, Ginseng at high doses, Liquorice, St. John’s Wort, Yohimbine                                                                  |
Exacerbators & Inducers of Hypertension

● Specific medications and substances may increase BP or antagonize antihypertensive therapy.

● The effect on BP can vary widely between individuals.

● All patients with or at risk for hypertension be screened for such medications and substances.

● Where appropriate, consider reducing or eliminating these substances or medications.
Exacerbators & Inducers of Hypertension

Most common medications that can increase BP

- Non-selective or traditional NSAIDs
- Combined oral contraceptive pill
- Select anti depressant medications including tricyclic antidepressants and SNRIs
- Acetaminophen when used almost daily and for prolonged periods
Exacerbators & Inducers of Hypertension

- The effect of Anti-retroviral therapy is unclear as studies demonstrate either no effect on BP or some increase.
- Alcohol raises BP regardless of the type of alcoholic drink.
- Limited evidence on herbal and other substances.
- Ma Huang, Ginseng at high doses and St. John’s Wort reported to increased BP.
Non-Pharmacological Treatment of Hypertension

Fadi Charchar
Healthy lifestyle choices can prevent or delay the onset of high BP and can reduce CV risk.

Lifestyle modification is often the first line of antihypertensive treatment.

Modifications in lifestyle can also enhance the effects of antihypertensive treatment.
Non-pharmacological Treatment - Diet

- Reducing salt added when preparing foods and at the table. Avoid or limit consumption of high salt foods.
- Eating a diet rich in whole grains, fruits, vegetables, polyunsaturated fats and dairy products, such as DASH diet.
- Reducing food high in sugar, saturated fat and trans fats.
- Increasing intake of vegetables high in nitrates (leafy vegetables and beetroot). Other beneficial foods and nutrients include those high in magnesium, calcium and potassium (avocados, nuts, seeds, legumes and tofu).
Non-pharmacological Treatment - Diet

- Moderate consumption of healthy drinks (coffee, green and black tea, Karkadé (Hibiscus) tea, pomegranate juice, beetroot juice and cocoa.
- Moderation of alcohol consumption and avoidance of binge drinking.
- Reduce weight and avoid obesity.
- Be careful with complementary, alternative or traditional medicines – little/no evidence.
Non-pharmacological Treatment - Lifestyle

- Smoking cessation.
- Engage in regular moderate intensity aerobic and resistance exercise, 30 minutes on 5 – 7 days per week or HIIT (High Intensity Interval Training).
- Reduce stress and introduce mindfulness.
- Reduce exposure to air pollution and cold temperature.
Drug Treatment of Hypertension

Neil Poulter
Drug Treatment of Hypertension: Thresholds and Targets

Established Diagnosis of Hypertension

- Lifestyle advice

Grade 1
BP 140–159 / 90–99 mmHg

Immediate drug treatment in high-risk patients or those with CVD, CKD, DM or HMOD

Grade 2
BP ≥160 / 100 mmHg

Immediate drug treatment in all patients

ESSENTIAL

Limited drug Availability?

Yes

NO

Drug treatment in low to moderate risk patients without CVD, CKD, DM or HMOD after 3–6 months of lifestyle intervention, if BP still not controlled

In those at lower risk, supply lifestyle intervention for 3–6 months. If BP still not controlled and where possible start drug treatment in those aged 50–80 years

ESSENTIAL

Target BP reduction by at least 20/10 mmHg, ideally to <140/90 mmHg

OPTIMAL

<65 years: BP target <130 / 80 mmHg if tolerated (but >120 / 70 mmHg).
≥65 years: BP target <140 / 90 mmHg if tolerated but consider an individualised BP target in the context of frailty, independence and likely tolerability of treatment.

Aim for BP control within 3 months
Drug choice & Sequencing

**ESSENTIAL**

- Use whatever drugs are available with as many of the ideal characteristics (see *Table 9*) as possible.
- Use free combinations if SPCs are not available or unaffordable.
- Use thiazide diuretics if thiazide-like diuretics are not available.
- Use alternative to DHP-CCBs if these are not available or not tolerated (i.e. Non-DHP-CCBs: diltiazem or verapamil).

**OPTIMAL**

<table>
<thead>
<tr>
<th>Step</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Dual low-dose# combination</td>
</tr>
<tr>
<td>Step 2</td>
<td>Dual full-dose combination</td>
</tr>
<tr>
<td>Step 3</td>
<td>Triple combination</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Resistant Hypertension) Triple Combination + Spironolactone or other drug*</td>
</tr>
<tr>
<td></td>
<td>A + C a, b, c</td>
</tr>
<tr>
<td></td>
<td>A + C a, b</td>
</tr>
<tr>
<td></td>
<td>A + C + D</td>
</tr>
<tr>
<td></td>
<td>A + C + D Add Spironolactone (12.5 – 50 mg o.d.)d</td>
</tr>
</tbody>
</table>

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**ESSENTIAL** and **OPTIMAL**

Consider beta-blockers at any treatment step when there is a specific indication for their use, e.g. heart failure, angina, post-MI, atrial fibrillation, or younger women with, or planning pregnancy.

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**International Society of Hypertension**

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**a)** Consider monotherapy in low risk grade 1 hypertension or in very old (≥80 yrs) or frailer patients.

**b)** Consider A + D in post-stroke, very elderly, incipient heart failure or CCB intolerance.

**c)** Consider A + C or C + D in black patients.

**d)** Caution with spironolactone or other potassium sparing diuretics when estimated GFR <45 ml/min/1.73m² or K⁺ >4.5 mmol/L.

**A** = ACE-Inhibitor or ARB (Angiotensin Receptor Blocker)

**C** = DHP-CCB (Dihydropyridine -Calcium Channel Blocker)

**D** = Thiazide-like diuretic
## Drug Treatment of Hypertension

### Ideal Drug Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Treatments should be evidence-based in relation to morbidity/mortality prevention.</td>
</tr>
<tr>
<td>2.</td>
<td>Use a once-daily regimen which provides 24-hour blood pressure control.</td>
</tr>
<tr>
<td>3.</td>
<td>Treatment should be affordable and/or cost-effective relative to other agents.</td>
</tr>
<tr>
<td>4.</td>
<td>Treatments should be well-tolerated.</td>
</tr>
<tr>
<td>5.</td>
<td>Evidence of benefits of use of the medication in populations to which it is to be applied.</td>
</tr>
</tbody>
</table>
Drug Treatment of Hypertension

Summary 1

In established hypertension, uncontrolled by lifestyle measures:

**Drug Treatment Threshold**
≥140/90 mmHg (raising to ≥160/100 mmHg for those at lowest risk)

**Drug Treatment Target**
- **Optimal**
  - <65 years: <130/80 mmHg
  - ≥65 years: <140/90 mmHg
- **Essential**
  - reduce BP by ≥20/10 mmHg
Summary 2

(i) Uptitration to target, of the following:
Low dose A+C → Full dose A+C → A+C+D
→ A+C+D + spironolactone
(ii) Consider other initial combinations for specific patient subgroups
(iii) Use SPC’s where possible
(iv) Use thiazide-like diuretics preferentially

• Where less ideal agents are available, focus on effective BP lowering (≥20/10 mmHg)
Common and Other Comorbidities of Hypertension

Claudio Borghi
Comorbidities of Hypertension

- Most Hypertensive patients have several comorbidities affecting CV risk profile and treatment strategies.
- The number of comorbidities increases with age, duration of hypertension and emerging clinical complexity.
- The management of comorbidities is insufficient.
- Common and uncommon comorbidities should be identified and managed according to the best available evidence.
Comorbidities of Hypertension

- Well established **common comorbidities** include CAD, stroke, CKD, Heart failure, COPD and HIV/AIDS.

- Emerging **uncommon comorbidities** include rheumatic/inflammatory diseases and psychiatric diseases.

- Uncommon comorbidities are largely underestimated by guidelines and often treated with self-prescribed drugs frequently interfering with BP control.
Comorbidities of Hypertension

In patients with common comorbidities the therapeutic strategy depends on CV risk profile and includes:

- Lifestyle changes (diet, exercise, body weight, smoking).
- BP control to target.
- Antiplatelet therapy in patients with CVD.
# Comorbidities of Hypertension

## TABLE 10. Outline of evidence-based management of other comorbidities and hypertension

### Additional co-morbidity

<table>
<thead>
<tr>
<th>Additional co-morbidity</th>
<th>Recommended Drugs</th>
<th>Warning</th>
</tr>
</thead>
</table>
| **Rheumatic disorders** | • RAS-inhibitors and CCBs ± Diuretics  
• Biologic drugs not affecting blood pressure should be preferred  
(where available) | High doses of NSAID’s |
| **Psychiatric disorders** | • RAS-inhibitors and diuretics  
• Beta-blockers (not metoprolol) if drug-induced tachycardia (antidepressant, antipsychotic drugs).  
• Lipid-lowering drugs/Antidiabetic drugs according to risk profile | Avoid CCBs if orthostatic hypotension (SRI’s) |
Specific Circumstances: Resistant Hypertension

Maciej Tomaszewski
Resistant Hypertension

- Suspect resistant hypertension if office BP >140/90 mmHg on treatment with at least 3 antihypertensives (in maximal or maximally tolerated doses) including a diuretic.

- Exclude pseudo-resistant hypertension (white-coat effect, non-adherence to treatment, incorrect BP measurements, errors in antihypertensive therapy) and substance-induced hypertension as contributors.

- Optimise health behaviours and lifestyle.
Resistant Hypertension

- Consider changes in the diuretic-based treatment prior to adding the fourth antihypertensive medication.

- Add a low dose of spironolactone (if serum potassium is <4.5 mmol/L and eGFR is >45 ml/min/1.73 m²).

- Consider amiloride, doxazosin, eplerenone, clonidine and beta-blockers as alternatives to spironolactone. If unavailable, consider any antihypertensive class not already in use.

- Optimally, consider referring to a specialist centre with sufficient expertise/resources.
Specific Circumstances: Secondary Hypertension

Maciej Tomaszewski
• **Consider screening for secondary hypertension in:**
  early onset hypertension, resistant hypertension, sudden BP control deterioration, hypertensive urgencies and emergencies, high clinical probability of secondary hypertension.

• **Exclude:**
  pseudo-resistant hypertension and drug/substance-induced hypertension prior to investigations for secondary hypertension.
Basic screening for secondary hypertension

- thorough history + physical examination (clinical clues) +
- basic blood biochemistry (including serum sodium, potassium, eGFR, TSH) + dipstick urine analysis.

Arrange other investigations for secondary hypertension (additional biochemistry/imaging/others) based on information from history, physical examination and basic clinical investigations and/or if feasible refer to a specialist centre.
Hypertension in Pregnancy

- Pre-existing hypertension
- Gestational hypertension
- Pre-eclampsia
- Eclampsia
- HELLP syndrome
Hypertension in Pregnancy

- Affects 5-10% of pregnancies worldwide.
- Maternal risks include placental abruption, stroke and long term risk of cardiovascular disease.
- Fetal and newborn risks include fetal growth restriction, pre-term delivery, increased fetal and neonatal morbidity and mortality.
Hypertension in Pregnancy

BP Measurement in Pregnancy

**ESSENTIAL**
- Use either: office manual auscultation or an office automated upper arm BP device validated specifically in pregnancy ([www.stridebp.com](http://www.stridebp.com)).

**OPTIMAL**
- Use either 24hr ABPM or home BP monitoring validated in pregnancy to evaluate white coat hypertension.
Investigation of Hypertension in Pregnancy

**ESSENTIAL**

- Urinalysis, complete blood count, liver enzymes, serum uric acid and serum creatinine.
- Test for proteinuria in early and the second half of pregnancy. A positive urine dipstick should be followed with a spot UACR.

**OPTIMAL**

- Ultrasound of kidneys, doppler ultrasound of uterine arteries
Prevention of Pre-eclampsia

In women at increased risk of pre-eclampsia:

- **Aspirin** (75-162 mg/day) and
- **Oral calcium** (1.5-2 g/day if low dietary intake)

- **Increased Risk:** 1st pregnancy >40 y age, pregnancy interval >10 y, BMI >35 kg/m², multiple pregnancy, chronic hypertension, diabetes, CKD, autoimmune disease, hypertension in previous pregnancy or family history of pre-eclampsia
Management (1)

Initiate Drug treatment if BP persistently:
• >150/95 mmHg in all women
• >140/90 mmHg if gestational hypertension or subclinical HMOD

First Line Drug Therapy Options
Methyldopa, beta-blockers (labetalol), and Dihydropyridine-Calcium Channel Blockers (DHP-CCBs)
Management (2)

If SBP $\geq 170\text{mmHg}$ or DBP $\geq 110\text{mmHg}$ (Emergency):

- Immediately hospitalize
- Initiate IV *labetalol* (alternative i.v. nicardipine, esmolol, hydralazine, urapidil), or oral methyldopa or DHP-CCBs)
- Magnesium
- If pulmonary edema, IV nitroglycerin
Hypertension in Pregnancy

Delivery in Gestational Hypertension or Pre-Eclampsia

• At 37 weeks if asymptomatic
• Expedite delivery in women with pre-eclampsia with visual disturbances or haemostatic disorders or HELLP syndrome.

Post Partum

• ESSENTIAL: Lifestyle adjustment
• OPTIMAL: Lifestyle adjustment with annual BP checks
Specific Circumstances: Hypertensive Emergencies

Nadia Khan
Hypertensive Emergencies

Emergency:
• Severely elevated BP associated with acute hypertension mediated organ damage (HMOD).
• Requires immediate BP lowering, usually with IV therapy.

Urgency:
• Severely elevated BP without acute HMOD.
• Can be managed with oral antihypertensive agents.
Hypertensive Emergencies

Assessment

**ESSENTIAL**

- Clinical exam: Evaluate for HMOD including fundoscopy
- Investigations: Hemoglobin, platelets, creatinine, sodium, potassium, lactate dehydrogenase, haptoglobin, urinalysis for protein, urine sediment, ECG.
Optimal:
In addition, context specific testing:

- Troponins (chest pain or anginal equivalent)
- Chest x-ray (congestion/fluid overload)
- Transthoracic echocardiogram (cardiac structure and function)
- CT/MRI brain (cerebral hemorrhage/stroke)
- CT-angiography thorax/abdomen (acute aortic disease)
Hypertensive Emergencies

Management

- Requires immediate BP lowering to prevent or limit further HMOD
- Sparse evidence to guiding management – recommendations largely consensus based.
- Time to lower BP and magnitude of BP reduction depends on clinical context.
- IV Labetalol and nicardipine generally safe to use in all hypertensive emergencies
<table>
<thead>
<tr>
<th>Clinical presentation</th>
<th>Timeline and target BP</th>
<th>1st line treatment</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant hypertension with or without TMA or acute renal failure</td>
<td>Several hours, MAP – 20% to – 25%</td>
<td>Labetalol</td>
<td>Nitroprusside</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nicardipine</td>
<td>Urapidil</td>
</tr>
<tr>
<td>Hypertensive encephalopathy</td>
<td>Immediate, MAP – 20% to – 25%</td>
<td>Labetalol</td>
<td>Nitroprusside</td>
</tr>
<tr>
<td>Acute ischemic stroke and BP &gt; 220 mmHg systolic or &gt; 120 mmHg diastolic</td>
<td>1 h, MAP – 15%</td>
<td>Labetalol</td>
<td>Nitroprusside</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nicardipine</td>
<td></td>
</tr>
<tr>
<td>Acute ischemic stroke with indication for thrombolytic therapy and BP &gt; 185 mmHg systolic or &gt; 110 mmHg diastolic</td>
<td>1 h, MAP – 15%</td>
<td>Labetalol</td>
<td>Nitroprusside</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nicardipine</td>
<td></td>
</tr>
<tr>
<td>Acute hemorrhagic stroke and systolic BP &gt; 180 mmHg</td>
<td>Immediate, systolic 130 &lt; BP &lt; 180 mmHg</td>
<td>Labetalol</td>
<td>Urapidil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nicardipine</td>
<td></td>
</tr>
<tr>
<td>Acute coronary event</td>
<td>Immediate, systolic BP &lt; 140 mmHg</td>
<td>Nitroglycerine</td>
<td>Urapidil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Labetalol</td>
<td></td>
</tr>
<tr>
<td>Acute cardiogenic pulmonary edema</td>
<td>Immediate, systolic BP &lt; 140 mmHg</td>
<td>Nitroprusside or Nitroglycerine</td>
<td>Urapidil (with loop diuretic)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(with loop diuretic)</td>
<td></td>
</tr>
<tr>
<td>Acute aortic disease</td>
<td>Immediate, systolic BP &lt; 120 mmHg and heart rate &lt; 60 b.p.m.</td>
<td>Esmolol and Nitroprusside or Nitroglycerine or Nicardipine</td>
<td>Labetalol or Metoprolol</td>
</tr>
<tr>
<td>Eclampsia and severe pre-eclampsia/HELLP</td>
<td>Immediate, systolic BP &lt; 160 mmHg and diastolic BP &lt; 105 mmHg</td>
<td>Labetalol or Nicardipine and Magnesium sulphate</td>
<td></td>
</tr>
</tbody>
</table>
Ethnicity, Race and Hypertension

Doraidaj Prabhakaran
Prevalence, treatment and control rates vary significantly according to ethnicity.

Mainly attributed to:

- Genetic differences
- Contextual and cultural practices
  - *Lifestyle and socio-economic status differences*
  - *Health behaviors such as diet, alcohol and PA*
- Access to health system
- Availability and Distribution of essential drugs
Populations from African descent

- Hypertension & associated organ damage at younger ages.
- Resistant & nighttime hypertension.
- Risk of kidney disease, stroke, HF & mortality.

- Physiological differences (↓ RAAS, altered renal sodium handling, ↑ CV reactivity & early vascular aging).
Population from AFRICAN descent

Management of hypertension:
- Annual screening (for adults \( \geq 18 \) years)
- Lifestyle modification
- First line pharmacological therapy – single pill combination (thiazide-like diuretic + CCB or CCB + ARB)

ARBs preferred over ACEIs among black patients
(3x chances of angioedema with ACEIs)
Ethnicity, Race and Hypertension

Populations from ASIA

- 🔺 Morning & nighttime hypertension vs Europeans

EAST ASIAN populations

- 🔺 Likelihood of salt-sensitivity + mild obesity in hypertensive patients
- 🔺 Stroke prevalence (esp. hemorrhagic) & non-ischemic HF vs Western populations

SOUTH ASIAN populations (Indian subcontinent)

- 🔺 Risk for CV & metabolic diseases (CAD & T2DM)

Management of hypertension

SOUTH EAST ASIA: Standard treatment until more evidence becomes available

International Society of Hypertension

www.ish-world.com
Hypertension Management at a Glance

Thomas Unger
Hypertension Management at a Glance

**Diagnosis**

- **Normal BP level** (<130/85 mmHg)
  - Remeasure after 3 years (1 year in those with other risk factors)

- **High-normal BP level** (130–139/85–89 mmHg)
  - Take 2 more readings — use the average of 2nd–3rd
  - Remeasure in 2–3 office visits.
  - If possible confirm with home or ambulatory BP monitoring

- **Hypertension BP level** (≥140/90 mmHg)
  - Repeated office BP ≥140/90 mmHg indicates hypertension, particularly if home BP ≥135/85 mmHg or 24h ambulatory BP ≥130/80 mmHg
  - *Use a validated upper arm-cuff device with appropriate cuff size for the individual patient.*

**Evaluation**

- **History & Physical Exam**
  - Exclude drug-induced hypertension
  - Evaluate for organ damage
  - Assess total cardiovascular risk
  - Search for symptoms/signs of secondary hypertension

- **Lab Tests**
  - Serum sodium, potassium & creatinine
  - Lipid profile & glucose
  - Urine dipstick
  - 12 lead ECG

- **Additional Tests**
  - If necessary for suspected organ damage or secondary hypertension

**Treatment**

- **Grade 1 Hypertension:** 140–159/90–99 mmHg
  - 1. Start lifestyle interventions
  - 2. Start drug treatment in:
    - High-risk patients (CVK, CKD, diabetes, organ damage, or aged 50–60 years)
    - All others with persistent BP elevation after 3–6 months of lifestyle intervention

- **Grade 2 Hypertension:** ≥160/100 mmHg
  - 1. Start drug treatment immediately
  - 2. Start lifestyle intervention

**Lifestyle Interventions**

- Stop smoking
- Regular exercise
- Lose weight
- Salt reduction
- Healthy diet and drinks
- Lower alcohol intake

**Drug Therapy Steps**

- Use any drugs available and include as many of those below as possible.
- Consider monotherapy in low-risk grade 1 hypertension and in patients aged >80 years or frail. Simplify regimen with once daily dosing and single pill combinations.

**Non-Black Patients**

1. Low dose ACEI/ARB* + dCCB
2. Increase to full dose
3. Add thiazide/thiazide-like diuretic
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

**Black Patients**

1. Low dose ARB* + dCCB or dCCB + thiazide/thiazide-like diuretic
2. Increase to full dose
3. Add diuretic or ARB /ACEI
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

* No ACEI/ARB in women with or planning pregnancy

**Monitoring**

- **Target**
  - Reduce BP by at least 20/10 mmHg, ideally to < 140/90 mmHg
  - Individualize for elderly based on frailty

- **Monitor**
  - BP control (achieve target within 3 months)
  - Adverse effects
  - Long-term adherence

- **Referral**
  - If BP still uncontrolled, or other issue, refer to care provider with hypertension expertise

---

**International Society of Hypertension**
Hypertension Management at a Glance

**Diagnosis**
- **Office BP measurement** (3 readings – use the average of 2nd–3rd)
  - <130/85 mmHg: Remeasure after 3 years (1 year in those with other risk factors)
  - ≥130/85 mmHg: Confirm with home or ambulatory BP monitoring

**Evaluation**
- **History & Physical Exam**
  - Exclude drug-induced hypertension
  - Evaluate for organ damage
  - Consider additional CV risk factors
  - Assess total cardiovascular risk
  - Search for symptoms/signs of secondary hypertension
  - Check adherence
- **Lab Tests**
  - Serum sodium, potassium & creatinine, uric acid
  - Lipid profile & glucose
  - Urine dipstick
  - 12 lead ECG
- **Additional Tests**
  - If necessary for suspected organ damage or secondary hypertension

**Treatment**
- **Grade 1 Hypertension**: 140–159/90–99 mmHg
  - 1. Start lifestyle interventions
  - 2. Start drug treatment:
    - Immediately: In high-risk patients (CVD, CKD, diabetes or organ damage)
    - After 3–6 months of lifestyle intervention: In low-moderate risk patients with persistent BP elevation
- **Grade 2 Hypertension**: ≥160/100 mmHg
  - 1. Start drug treatment immediately
  - 2. Start lifestyle intervention

**Lifestyle Interventions**
- Stop smoking
- Regular exercise
- Lose weight
- Salt reduction
- Healthy diet and drinks
- Lower alcohol intake
- Lower stress
- Reduce exposure to air pollution

**Drug Therapy Steps**
- Simplify regimen with once daily dosing and single pill combinations.
- Consider monotherapy in low-risk grade 1 hypertension and in patients aged >80 years or frail

**Non-Black Patients**
1. Low dose ACEI/ARB* + dCCB
2. Increase to full dose
3. Add thiazide-like diuretic
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

**Black Patients**
1. Low dose ARB* + dCCB or dCCB + thiazide-like diuretic
2. Increase to full dose
3. Add diuretic or ACE/ARB
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

* No ACEI/ARB in women with or planning pregnancy

**Monitoring**
- **Target**
  - BP <130/80 mmHg
  - Individualised for elderly based on frailty
- **Monitor**
  - BP control (achieve target within 3 months)
  - Adverse effects
  - Long-term adherence
- **Referral**
  - If BP still uncontrolled, or other issue, refer to care provider with hypertension expertise
ISH- vs European Guidelines

Bryan Williams
## ISH vs European Guidelines

<table>
<thead>
<tr>
<th>Target Population</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on Optimal Care</td>
<td>Optimal Care when possible</td>
<td>Essential Care as a minimum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BP Classification and Definition of Hypertension</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on office BP Hypertension ≥140/90mmHg</td>
<td>Based on Office BP Hypertension ≥140/90mmHg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis of Hypertension</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening:</strong> Office BP</td>
<td><strong>Optimal:</strong> Same as ESC-ESH Essential: Office BP, confirm with ABPM or Home BP if possible</td>
<td></td>
</tr>
<tr>
<td><strong>Confirmation:</strong> ABPM, Home, or repeated office BP</td>
<td><strong>Essential:</strong> Focus on Grade 2 and high-risk Grade 1 if resources limited</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiovascular Risk Assessment</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk:</strong> CV disease, CKD3, Diabetes, HMOD</td>
<td><strong>Same as ESC-ESH</strong> CV risk assessment tool not specified</td>
<td></td>
</tr>
<tr>
<td><strong>CV risk assessment</strong> in all others</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug Treatment BP Threshold</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Treatment &amp; Lifestyle for: Grade 2 hypertension Grade 1 &amp; High risk Grade 1 &amp; low risk after 3-6 months lifestyle intervention</td>
<td>Same as ESC-ESH Essential: Focus on Grade 2 and high-risk Grade 1 if resources limited</td>
<td></td>
</tr>
</tbody>
</table>
# ISH vs European Guidelines

<table>
<thead>
<tr>
<th>Lifestyle Interventions</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cessation, healthy diet/drinks, reduce salt, alcohol moderation, weight control and regular exercise</td>
<td>Same as ESC-ESH</td>
<td>Optimal: In addition, stress reduction and avoid air pollution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial Drug Treatment</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual therapy single pill combination</strong> (SPC) for most patients - Usually A+C or A+D</td>
<td>Optimal: Ideally A+C SPC for most, or C+D in Black patients. Other drugs same as ESC-ESH Essential: As above if possible, or any available drugs proven to lower BP</td>
<td></td>
</tr>
<tr>
<td>Beta-blockers when indicated Other Drugs for Specific indications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Further Drug Treatment</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Triple therapy:</strong> A+C+D, ideally as SPC Four drugs (Resistant Hypertension) e.g. spironolactone, or other drugs if needed</td>
<td>Optimal: Same as ESC-ESH Essential: As above if possible, or any available drugs proven to lower BP</td>
<td></td>
</tr>
</tbody>
</table>
# ISH vs European Guidelines

<table>
<thead>
<tr>
<th>Treatment Targets</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Ranges</strong></td>
<td><strong>18-65yrs</strong></td>
<td>&lt;140/90mmHg down to 130/80mmHg or lower if tolerated</td>
</tr>
<tr>
<td><strong>65+yrs</strong></td>
<td>&lt;140/90mmHg down to 130/80mmHg, if possible and if tolerated</td>
<td></td>
</tr>
<tr>
<td><strong>Optimal:</strong></td>
<td>&lt;130/80 but individualize in the elderly based on frailty</td>
<td></td>
</tr>
<tr>
<td><strong>Essential:</strong></td>
<td>Reduce BP by at 20/10mmHg and ideally to &lt;140/90 and individualize in the elderly based on frailty</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring Treatment</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim for BP control within 3 months</strong></td>
<td></td>
<td><strong>Optimal</strong> and <strong>Essential:</strong></td>
</tr>
<tr>
<td><strong>Monitor for side effects</strong></td>
<td></td>
<td>Aim for BP control within 3 months</td>
</tr>
<tr>
<td><strong>Check adherence if BP not controlled</strong></td>
<td></td>
<td>Monitor for side effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor adherence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiovascular Risk Management</th>
<th>ESC-ESH 2018</th>
<th>ISH 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statins for all high-risk patients</strong></td>
<td></td>
<td><strong>No specific recommendation</strong></td>
</tr>
<tr>
<td><strong>Consider statins for moderate/low risk patients</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antiplatelets for secondary prev.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ISH- vs ACC/AHA Guidelines

Richard Wainford
Blood pressure definitions of normal blood pressure stages of hypertension are different.

Inclusion of high-normal blood pressure category.

Blood pressure value thresholds for treatment are therefore different (i.e., treatment initiated at lower blood pressure in ACC/AHA guidelines).

Adoption of **ESSENTIAL** vs. **OPTIMAL** throughout ISH guidelines.
### ISH vs ACC/AHA Guidelines

<table>
<thead>
<tr>
<th>ISH Classifications</th>
<th>SBP (mm Hg)</th>
<th>DBP (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal BP</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Elevated</td>
<td>120-129</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>130-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Stage 2</td>
<td>≥140</td>
<td>≥90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACC/AHA Classifications</th>
<th>SBP (mm Hg)</th>
<th>DBP (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal BP</td>
<td>&lt;130</td>
<td>&lt;85</td>
</tr>
<tr>
<td>High-normal BP</td>
<td>130-139</td>
<td>85-89</td>
</tr>
<tr>
<td>Grade 1 Hypertension</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Grade 2 Hypertension</td>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>

*ISL (International Society of Hypertension) vs ACC/AHA (American College of Cardiology/American Heart Association) Guidelines

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal BP</strong></td>
<td>&lt;130</td>
<td>&lt;85</td>
</tr>
<tr>
<td><strong>High-normal BP</strong></td>
<td>130-139</td>
<td>85-89</td>
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<td><strong>Grade 1 Hypertension</strong></td>
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<td>90-99</td>
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<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
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*Isolated Systolic Hypertension (ISH) vs ACC/AHA Guidelines

**ISH**

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<thead>
<tr>
<th><strong>SBP (mm Hg)</strong></th>
<th><strong>DBP (mm Hg)</strong></th>
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<tbody>
<tr>
<td>&lt;120</td>
<td>&lt;80</td>
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**ACC/AHA**

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<th><strong>DBP (mm Hg)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;130</td>
<td>&lt;85</td>
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<tr>
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<tr>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>
ISH- vs Latin American Guidelines

Agustin Ramirez
LA and Challenges Referring Arterial Hypertension

- Among the challenges common to all parts of the world, in LA there are *growing global burden of morbidity and premature mortality associated with NCDs* and the *financial constraints and inefficiencies* that traditional healthcare models have for coping with chronic diseases.

- Specific challenges result from the fact that LA is one of the world regions with the *greatest disparities in socio-economic conditions and availability of healthcare.*
In general, more congruence than discrepancy between the new ISH 2020 Guidelines and the last Latin America Guidelines of 2017.

Diagnosis and use of Office and Out of Office blood pressure measurements, Ambulatory or Home Blood Pressure Monitoring are points of agreement.
### ISH vs Latin American Guidelines

<table>
<thead>
<tr>
<th>Categories</th>
<th>ISH SBP/DBP (mmHg)</th>
<th>LASH SBP/DBP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Considered</td>
<td></td>
<td>Optimal &lt;120/&lt;80</td>
</tr>
<tr>
<td>Normal</td>
<td>&lt;130/&lt;85</td>
<td>Normal 120-129/80-84</td>
</tr>
<tr>
<td>High Normal</td>
<td>130-139/85-89</td>
<td>High Normal 130-139/85-89</td>
</tr>
<tr>
<td><strong>Arterial Hypertension</strong></td>
<td></td>
<td>Arterial Hypertension</td>
</tr>
<tr>
<td>Grade 1</td>
<td>140-159/90-99</td>
<td>Grade 1 140-159/90-99</td>
</tr>
<tr>
<td>Grade 2</td>
<td>≥160/≥100</td>
<td>Grade 2 160-179/100-109</td>
</tr>
<tr>
<td><strong>Isolated Systolic</strong></td>
<td>Included in Text</td>
<td>Grade 3 &gt;180/&gt;110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isolated Systolic ≥140/&lt;90</td>
</tr>
</tbody>
</table>
Non-Pharmacological Treatment

- Despite the differences in the usual daily diet in LA, there is agreement on the benefit of lifestyle changes to the general population.

Common and Other Comorbidities

- Due to the prevalence of specific pathologies, the LA Guidelines emphasize the accuracy in diagnosis and treatment of malnutrition, especially in children and adolescents.

Relating to Ethnic Populations

- In addition to Afro-descendants, the LA Guidelines give directives for people living on high altitude in the Andes Mountain Range (Andinean populations).
ISH- vs Japanese Guidelines

Hiroshi Itoh
- Office BP $\geq 140/90$ mmHg is the criterion of hypertension in JSH 2019, which the same in ISH 2020.
- Normal BP $<120/80$ mmHg, in contrast to ISH 2020 $<130/85$ mmHg.
- JSH 2019 has a category of “Elevated BP,” which implies a disease-state required for intervention.
- JSH 2019 shows the criteria of both office and home BP with equal values for BP classification.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Office blood pressure (mmHg)</th>
<th>Home blood pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SBP</td>
<td>DBP</td>
</tr>
<tr>
<td>Normal blood pressure</td>
<td>$&lt;120$</td>
<td>and</td>
</tr>
<tr>
<td>High normal blood pressure</td>
<td>$120-129$</td>
<td>and</td>
</tr>
<tr>
<td>Elevated blood pressure</td>
<td>$130-139$</td>
<td>and/or</td>
</tr>
<tr>
<td>Grade I hypertension</td>
<td>$140-159$</td>
<td>and/or</td>
</tr>
<tr>
<td>Grade II hypertension</td>
<td>$160-179$</td>
<td>and/or</td>
</tr>
<tr>
<td>Grade III hypertension</td>
<td>$\geq 180$</td>
<td>and/or</td>
</tr>
<tr>
<td>(Isolated) systolic hypertension</td>
<td>$\geq 140$</td>
<td>and</td>
</tr>
<tr>
<td></td>
<td>$\geq 160$</td>
<td>and/or</td>
</tr>
<tr>
<td></td>
<td>$\geq 135$</td>
<td>and</td>
</tr>
</tbody>
</table>
“Elevated BP” in JSH 2019 is regarded as having high risk when it is complicated with CVD, diabetes, CKD with proteinuria, nonvalvular atrial fibrillation, or >3 risk factors. That is the case with “high-normal BP” in ISH 2020. It can be high risk if it is complicated with hypertension-mediated organ damage, CKD grade 3, diabetes mellitus, or CVD.
Blood Pressure Measurement Plan According to Office Blood Pressure levels

- In patients with “elevated BP”, pharmacological therapy can be initiated when CV risk is high and BP control is insufficient with non-pharmacological therapy.
- That is the case with “high-normal BP” in ISH 2020 and 2018 ESC/ESH guidelines, which indicate that drug treatment should be considered if CV risk is very high.
In ISH 2020, the diagnosis of hypertension is made by repeated office BP but not home BP.

In JSH 2019, the diagnosis of hypertension is made by office BP and home BP.

When an office BP-based diagnosis differs from a home BP-based diagnosis, the latter is prioritized.
In ISH 2020 the BP target differs at age 65 years, but in JSH 2019 at 75 years.

In JSH 2019, BP of patients with CVD, CAD, diabetes, CKD with proteinuria or on antithrombotic drugs should be lowered to <130/80, even if in age ≥75 years.

In ISH 2020, the lower limit (120/70) is shown.

JSH 2019 calls attention against excessive BP lowering.

### Target of Blood Pressure Control

<table>
<thead>
<tr>
<th>Adults younger than 75*1</th>
<th>Office blood pressure (mmHg)</th>
<th>Home blood pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with cerebrovascular disease (without bilateral carotid artery stenosis and cerebral main artery occlusion)</td>
<td>&lt;130/80</td>
<td>&lt;125/75</td>
</tr>
<tr>
<td>Patients with coronary artery disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients with CKD (proteinuria positive)*2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients using antithrombotic drugs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Older patients aged 75 and over*3</th>
<th>Office blood pressure (mmHg)</th>
<th>Home blood pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with cerebrovascular disease (bilateral carotid artery stenosis or cerebral main artery occlusion present or unevaluated)</td>
<td>&lt;140/90</td>
<td>&lt;135/85</td>
</tr>
<tr>
<td>Patients with CKD (proteinuria positive)*2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lifestyle Modifications

**JSH 2019**
- **Salt** reduction <6 g/day
- **Diet**: Increase vegetables/fruit intake; reduce saturated fatty acids and cholesterol; increase polyunsaturated fatty acids and low fat dairy products
- **Weight**: Maintain BMI <25 kg/m²
- **Exercise**: Mild aerobic (dynamic/static muscle load) ≥30’/day or 180’/week
- **Alcohol**: Reduce intake; ethanol ≤20-30 mL/day in men; ≤10-20 in women
- **Smoking cessation**

**ISH 2020**
- **Salt** reduction
- **Healthy diet**
- **Healthy drinks**
- **Moderate alcohol** consumption
- **Weight** reduction
- **Smoking cessation**
- **Regular physical activity**
- **Reduce stress** – Mindfulness
- **Complementary, alternative or traditional medicines**
- **Reduce exposure to indoor cold**
- **Temperature - Air pollution**

- JSH 2019 gives concrete values to the goals.
- ISH 2020 gives additional goals.
As 1\textsuperscript{st} line, JSH recommends monotherapy, whereas ISH 2020 recommends combination therapy using combination tablet.

In JSH 2019, thiazide diuretics are included in 1\textsuperscript{st} line drugs.

JSH 2019 does not mention triple combination using single pill.

In JSH 2019, β- and α-blockers are equally recommended as MR antagonist at step 4.