Demographics of HT in HK
The Rule of Halves

27% of the population had high blood pressure in the Population Health Survey in 2003-2004\(^1\)

– Among them, 56% were unaware by patients
– For those known HT, 73% had taken anti-HT prescribed by doctors while 16% reported to have taken over-the-counter medications.

In 2 other surveys in 2008 and 2009, the prevalence of Hypertension in HK was **10.0%** and **10.3%** respectively.\(^2,3\)

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1. Population Health Survey 2003-2004. Collaborative project of DH and the Department of Community Medicine of HKU
Management of hypertension by private doctors in Hong Kong

Hong Kong Med J 2006;12:115-8

• Only 24% of the private doctors measured blood pressure in all new patients aged above 18 years.
• 30% of the hypertensive patients were diagnosed by opportunistic BP screening.
• The choice of anti-HT drugs based mainly on drug efficacy.
  – Drug efficacy 56.9%
  – Habit 22.9%
  – Simple regimen 19.7%
  – Drug safety 19.1%
  – Clinical guidelines 18.4%

Service Gaps

1. A significant proportion of HT patients were undiagnosed.
2. A significant proportion of HT patients were not properly educated.
3. A significant proportion of HT patients were not adequately treated.
Aims of the reference framework

1. Promote health, prevent disease and tackle major health risks in the population
2. Recommend interventions which are evidence-based and appropriate to primary care settings
3. Use as common reference for co-ordinating different healthcare disciplines across Hong Kong
4. Empower patients and their carers
Recommendations from Reference Framework

Prevention and early identification of HT

Opportunistic blood pressure measurement in all adults from 18 years of age at least every 2 years

Advise individuals at increased risk of developing HT to:
- maintain optimal body weight,
- restrict dietary salt intake,
- abstain from smoking and
- practise healthy lifestyles
### Recommendations from Reference Framework

<table>
<thead>
<tr>
<th>BP classification</th>
<th>Initial BP (mmHg)</th>
<th>Recommended Minimum Review Period</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-hypertension</td>
<td>SBP 120-139, DBP 80-89</td>
<td>Recheck &lt;1 year</td>
<td>Lifestyle advice</td>
</tr>
<tr>
<td>Stage I HT</td>
<td>SBP 140-159, DBP 90-99</td>
<td>Confirm &lt; 2 months</td>
<td>Lifestyle modification</td>
</tr>
<tr>
<td>Stage II HT</td>
<td>SBP 160-179, DBP 100-109</td>
<td>Evaluate &lt; 1 month</td>
<td>Treat &lt; 1 month</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lifestyle modifications</td>
</tr>
<tr>
<td></td>
<td>SBP &gt;180, DBP &gt;110</td>
<td>Evaluate &lt; 1 week</td>
<td>Drug treatment once</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>confirmed. Refer if</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>malignant HT</td>
</tr>
</tbody>
</table>

### Relationship between Blood Pressure and Cardiovascular Risk

1. The association between BP and CVD risk is continuous at all levels, starting as low as **115/70 mmHg**, without a threshold.

2. The higher the BP, the greater is the chance of stroke, IHD, heart failure and other vascular causes

3. For individuals 40–70 years of age, each increment of **20 mmHg** in SBP or **10 mmHg** in DBP **doubles** the risk of CVD across the entire BP range from 115/75 to 185/115 mmHg
CVD Mortality Risk Doubles with Each 20/10 mm Hg BP Increment*

*Individuals aged 40-69 years, starting at BP 115/75 mm Hg.
CV, cardiovascular; SBP, systolic blood pressure; DBP, diastolic blood pressure
JNC VII. JAMA. 2003.

Measure BP Properly (Module 2)

Electronic devices that record the pressure in the fingers or the wrist should be avoided.

<table>
<thead>
<tr>
<th>Blood pressure recording techniques</th>
<th>Δ Blood pressure (mm Hg) if not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest ≥ 5min before BP recording</td>
<td>↑ BP</td>
</tr>
<tr>
<td>Seated and with arm supported, in a relax manner</td>
<td>↑ BP</td>
</tr>
<tr>
<td>The antecubital fossa at heart level</td>
<td>↑ BP if below heart level</td>
</tr>
<tr>
<td>Correct cuff size</td>
<td>↑ BP if cuff size too small</td>
</tr>
<tr>
<td>Deflate 2 mm Hg/ sec</td>
<td>↓ BP if deflate too fast</td>
</tr>
</tbody>
</table>
Evaluation for Newly Diagnosed Hypertensive Patients (Module 4)

1. To identify cardiovascular risk factors that may affect prognosis and guide treatment,
2. To reveal identifiable causes of high blood pressure, and
3. To assess the presence or absence of target organ damage and CVS disease.
   (FBS, RFT, Lipid profile, ECG, urine analysis)

Recommendations from Reference Framework

<table>
<thead>
<tr>
<th>Treatment of HT – Lifestyle modifications (Module 5, 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Encourage overweight and obese patients to <strong>lose weigh</strong></td>
</tr>
<tr>
<td>2. Increase level of physical activity and take regular exercise</td>
</tr>
<tr>
<td>3. Increase fruits &amp; vegetables to <strong>5 portions/day</strong> and reduce total fat &amp; saturated fat consumption</td>
</tr>
<tr>
<td>4. Reduce salt intake to <strong>less than 5 grams/day</strong> (~a teaspoon) and not to use added salt</td>
</tr>
<tr>
<td>5. Reduce alcohol intake to no more than <strong>2</strong> standard drinks/day for men and <strong>1</strong> standard drink/day for women</td>
</tr>
<tr>
<td>6. Encourage all hypertensive patients to stop smoking</td>
</tr>
</tbody>
</table>
### Lifestyle Modifications

<table>
<thead>
<tr>
<th>Modification</th>
<th>Recommendation</th>
<th>Approximate SBP Reduction (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight reduction$^1$,$^2$</td>
<td>Maintain normal body weight</td>
<td>5-20 mmHg/10 kg weight reduction</td>
</tr>
<tr>
<td>Adopt DASH eating plan</td>
<td>Diet rich in fruits, vegetables, high K and low fat dairy products with a reduced content of saturated and total fat.</td>
<td>8-14 mmHg</td>
</tr>
<tr>
<td>Dietary sodium reduction$^3$,$^4$,$^5$</td>
<td>Reduce dietary sodium intake to no more than 6g per day</td>
<td>2-8 mmHg</td>
</tr>
<tr>
<td>Physical activity$^6$,$^7$</td>
<td>Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).</td>
<td>4-9 mmHg</td>
</tr>
<tr>
<td>Moderation of alcohol consumption</td>
<td>Limit consumption to no more than 2 drinks per day in most men and to no more than 1 drink per day in women and lighter weight persons.</td>
<td>2-4 mmHg</td>
</tr>
</tbody>
</table>

What are the benefits of BP control in reducing complications?

- Meta-analysis of 61 prospective, observational studies which involve 1 million adults
- Blood Pressure reduction of **2 mmHg** decreases the risk of cardiovascular events by **7–10%**

First line anti-HT recommended by evidence based guidelines

1. European Society of HT guidelines 2003
   - any drug (beta-blocker, ARBs, ACE inhibitors, CCBs, diuretics) at the discretion of individual doctor

2. WHO International Society of HT guideline 2003
   - thiazide-type diuretics

3. US JNC VII in 2003
   - thiazide-type diuretics

4. UK NICE in 2006
   - calcium-channel blockers or thiazide-type diuretics for most patients
   - ACEI/ ARB for the younger HT (Grade C recommendation)

Recommendations from Reference Framework
Choice of anti-hypertensive drugs (Module 7)

1. The main benefits of antihypertensive therapy in CVS outcomes are due to lowering of blood pressure per se, rather than choice of drug class, except patients with compelling indications.

2. ACEI, calcium channel blockers and thiazide-type diuretics are largely equivalent in efficacy and safety.

3. It is noted that beta-blockers were less effective than the comparator drug at reducing major CVS events, in particular stroke. An additional concern is the increased risk of developing diabetes, particular with the combination of thiazide-type diuretic.
Referral to specialist

- Suspected secondary hypertension
- Patients aged 30 or below
- Patients with progressive complications e.g. target organ damage
- Pregnancy

Immediate referral to hospital setting

- Malignant hypertension
  - DBP > 130mmHg; Heavy proteinuria; Papilloedema; Encephalopathy
- Accelerated hypertension: DBP > 130mmHg and retinal hemorrhage
- Persistent BP > 220/120mmHg despite rest or drug treatment
- Pregnancy:
  - BP 140/90mmHg and > 20 weeks gestation
  - Signs and symptoms of pre-eclampsia (headache, proteinuria, oedema)
Class of Drug | Compelling Indications | Compelling Contraindications
--- | --- | ---
ACE Inhibitors (ACEI) | Heart failure, Left ventricular dysfunction, Post myocardial infarction, Diabetic nephropathy | Pregnancy, Bilateral renal artery stenosis, Hyperkalaemia
Angiotensin II Receptor Blockers (ARB) | ACE inhibitor intolerance | Pregnancy, Bilateral renal artery stenosis, Hyperkalaemia
Alpha-Blockers | Benign prostatic hypertrophy |
Beta-Blockers | Angina, Post myocardial infarction Tachyarrhythmias | Asthma, chronic obstructive pulmonary disease, Heart block
Calcium Channel Blockers (dihydropyridine) | Elderly patients, Isolated systolic hypertension |
Calcium Channel Blockers (rate limiting, e.g. verapamil, diltiazem) | Angina | Heart block
Thiazide/thiazide-like Diuretics | Heart failure, Elderly patients, Isolated systolic hypertension | Gout

### Recommendations from Reference Framework

**Goals of treatment (Module 7)**

The goal of therapy for simple hypertensive patients is blood pressure below **140/90 mm Hg**
Target blood pressure for patients with diabetes and chronic kidney diseases is below **130/80 mmHg**

**Control of all cardiovascular risk factors**
Multiple Antihypertensive Agents Are Often Needed to Achieve Target BP

<table>
<thead>
<tr>
<th>Trial</th>
<th>Target BP (mm Hg)</th>
<th>No. of Antihypertensive Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>UKPDS¹</td>
<td>DBP &lt;85</td>
<td></td>
</tr>
<tr>
<td>ABCD²</td>
<td>DBP &lt;75</td>
<td></td>
</tr>
<tr>
<td>MDRD³</td>
<td>MAP ≤92</td>
<td></td>
</tr>
<tr>
<td>HOT⁴</td>
<td>DBP ≤80</td>
<td></td>
</tr>
<tr>
<td>AASK⁵</td>
<td>MAP ≤92</td>
<td></td>
</tr>
<tr>
<td>IDNT⁶</td>
<td>SBP ≤135/DBP ≤85</td>
<td></td>
</tr>
<tr>
<td>ALLHAT⁷</td>
<td>SBP ≤140/DBP ≤90</td>
<td></td>
</tr>
</tbody>
</table>

DBP - diastolic blood pressure; MAP - mean arterial pressure; SBP - systolic blood pressure

The Care Model

Community
- Resources and Policies
- Self-Management Support
- Patient-Centered

Health Systems
- Organization of Health Care
- Delivery System Design
- Decision Support
- Clinical Information Systems
- Coordinated

Services
- Timely and Efficient
- Evidence-Based & Safe
- Informed, Empowered Patient and Family
- Productive Interactions
- Prepared, Proactive Practice Team

Improved Outcomes
Initiatives

1. Health promotional activities for patients will be organized to enhance patient education and empowerment.
2. To review and update the Reference Framework regularly based on latest medical development and research.
3. CME programmes for doctors will be organised with professional organisations.
4. Engage community partners in implementation of the recommended strategies.
YOUR SUPPORT WILL BE CRUCIAL IN THE PROMOTION OF REFERENCE FRAMEWORKS!

THANK YOU!