Hypertension 2007’ - Update on How to Choose and Prescribe the Best Medications for our Patients

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Content:
1. Introduction
2. A quick glance on new guidelines - updated 2007'
3. Patient education - our key to success
4. So many drugs - so many choices
5. One step further - treat the patient as a whole, don’t forget the other risk factors
6. Conclusion - our key to success is... ...

Military action is important to the nation - it is the ground of death and life, the path of survival and destruction, so it is imperative to examine it.

~ The Art of War, Sun Tzu, 544-496BC

1. Introduction

Hypertension is one of the most important causes of stroke, coronary artery disease, peripheral artery disease, renal failure and congestive heart failure. In Hong Kong, based on the data collected in the year 1997, the prevalence is a bit less than 10% of the population. There was no large scale epidemiology data available in the past 10 years. With reference to the ~ 10% increase of US prevalence and the data of the other countries, my current Hong Kong prevalence estimation is ~ 25 - 30%. The prevalence in other countries is in Figure 2.

According to the National Health and Nutrition Examination Survey (NHANES), in US, the year 1999-2000, for 100 hypertensive citizens, only 70 of them were aware that they had hypertension, only 59 of them received medical treatment and only 34 of them with their blood pressure controlled (<140/90mmHg).

So, in Hong Kong, for family doctors, the need for hypertension management is strong and the un-tapped market is huge.

In this article, we will have a quick glance on the recent updated international guidelines, a practical, straightforward and updated discussion on how to choose and prescribe anti-hypertensive medications. We will focus on the marvellous newly available anti-hypertensive medications. Once again, I hope that this article will be useful for their daily clinical practice to all my dearest colleagues.

For more detailed discussion on the historical development of hypertension concept and management, the development, rational and practical aspect of the guidelines, and the importance of systolic hypertension and life-style management, please kindly read my previous article "Hypertension- A guide to clinical practice, HKMA, CME Bulletin, Jan 2004 on http://www.hkma.org

~ The Art of War, Sun Tzu, 544-496BC
2. A quick glance on hot new guidelines - updated 2007

All four important guidelines were recently revised because of the numerous mega clinical trials in the recent 5 years:

- World Health Organization - International Society of Hypertension - WHO-ISH 2003 (Figure 3 & 4)
- European Society Of Cardiology - European Society of Hypertension - ESC-ESH 2003 (Figure 5 & 6)
- Joint National Committee (United States) - JNC VII 2003 (Figure 7 & 8)
- National Institute for Health and Clinical Excellence - Royal Hypertensive Society (United Kingdom) - NICE 2006 (Figure 9)

![Figure 3](image3)

**Definition and classification of hypertension: WHO/ISH 1999/2003**

Hypertension is defined as blood pressure >140/90 mmHg

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Normal</td>
<td>&lt;150</td>
<td>&lt;95</td>
</tr>
<tr>
<td>High-normal</td>
<td>150-159</td>
<td>85-89</td>
</tr>
<tr>
<td>Grade 1 hypertension (mild)</td>
<td>160-179</td>
<td>or 90-99</td>
</tr>
<tr>
<td>Stage 1 borderline</td>
<td>180</td>
<td>or 100-109</td>
</tr>
<tr>
<td>Grade 2 hypertension (severe)</td>
<td>190</td>
<td>or 110</td>
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<td>Stage 2 hypertension</td>
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<td>Isolated systolic</td>
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<tr>
<td>hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 3 borderline</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 4](image4)

**Goals of treatment: WHO/ISH 2003**

- In hypertensive patients at low to medium risk*, the SBP goal is <140 mmHg.
- In hypertensive patients at high risk*, a target of <130/80 mmHg is appropriate.

![Figure 5](image5)

**Definition and classification of hypertension: ESH/ESC 2003**

Hypertension is defined as blood pressure >140/90 mmHg

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![Figure 6](image6)

**Goals of treatment: ESH/ESC 2003**

- Achieve maximum reduction in total cardiovascular risk
- Treat all reversible risk factors and associated clinical conditions in addition to treating raised blood pressure
- Target blood pressure <140/90 mmHg and to lower values, if tolerated
- For diabetics, target blood pressure is <130/80 mmHg

![Figure 7](image7)

**Goals of treatment: JNC VII**

Hypertension is defined as blood pressure >140/90 mmHg

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<tr>
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<tr>
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<td>120-139</td>
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<td>160</td>
<td>or 100</td>
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</tbody>
</table>

![Figure 8](image8)

**The BHS recommendations for combining blood pressure-lowering drugs**

- Younger (eg <55 years) and non-black
- Older (eg >55 years) or black

**Step 1**
- A

**Step 2**
- A or C or D

**Step 3**
- A or C

**Step 4**
- Add further diuretics, alpha-blockers or beta-blockers

![Figure 9](image9)

**Definition and classification of hypertension: JNC VII**

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*When a patient's systolic and diastolic blood pressures fall into different categories, the higher category should apply.*
We can all easily see that the following issue was unified throughout the whole world:
- Hypertension is Systolic BP ≥ 140mmHg and / or Diastolic BP ≥ 90mmHg (true for adult, all ages and both sexes)
- Optimal BP is Systolic BP < 140mmHg and Diastolic BP < 80mmHg
- Medication can start whenever your patient has Systolic BP ≥ 140mmHg and / or Diastolic BP ≥ 90mmHg
- The treatment target BP is Systolic BP < 140mmHg and Diastolic BP < 90mmHg.
- For high risk patients (diabetes and/or renal disease), the treatment target is further lowered to Systolic BP < 130 and Diastolic BP < 80mmHg.

In my opinion, within the 4 international guidelines, the most recently updated treatment guideline of NICE 2006 is the easiest one to understand and use. (Figure 9)

In figure 9, there are four classes of medications:

A. ARB or ACEI
B. Beta-blockers
C. Calcium channel blockers
D. Diuretics

For patients younger than 55, because of their stronger Renin- Angiotensin System (RAS), we can start with A (ARB or ACEI), C (calcium channel blockers) or D (diuretics) and will have a better result for patients older than 55 years old. A + C or D is the second step for patients with BP not reaching the target. The third step is A + C + D. For resistant hypertension, with the present of A + C + D, beta-blocker and alpha-blocker can then be added in the fourth step.

Because of the recent trials, there is a very recent change in the global practice and the NICE guideline: Beta-blocker is not a first line drug anymore. Beta-blocker is only indicated for patients with hypertension plus:
- ischaemic heart disease and /or
- congestive heart failure
- young patients with ACEI/ARB intolerance

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(Figure 10 & 11)
The newest class of medications. The prototype, Cozaar (Losartan) was marketed around 10 years ago.

**Good Points:**
- Effective medication for patients < 55 years old
- Extremely low in side effect rates
- Apart from hypertension, ARB is also effective in the morbidity and/or mortality reduction for patients with:
  - Congestive heart failure (CHARM)\(^1\)\(^2\)
  - Ischaemic Heart Disease (VALIANT)\(^1\)\(^3\)
  - Stroke (LIFE)\(^1\)\(^4\)
  - DM Nephropathy (Type II) (RENAAL)\(^1\)\(^5\)

**Bad Points:**
- A bit more expensive (again, no free lunch)
- As a class, not very potent in BP lowering
- 3% of patients will have dizziness

ARB is my favourite medication. It is effective in patients with simple or complicated hypertension\(^2\), \(^3\), \(^4\), \(^5\) and is virtually free from major and minor side effects. Most of my patients think that ARB is a very money valued medications for their long term combat with hypertension.

Now, let us go through the major medications one by one...

### 1. Angiotensin Receptor Blockers

#### A - ARB

<table>
<thead>
<tr>
<th>ARB</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aprovel</td>
<td>75-300mg</td>
</tr>
<tr>
<td>Blopress</td>
<td>4-16mg</td>
</tr>
<tr>
<td>Cozaar</td>
<td>25-100mg</td>
</tr>
<tr>
<td>Diovan</td>
<td>40-160mg</td>
</tr>
<tr>
<td>Olmesartan</td>
<td>20-40mg</td>
</tr>
<tr>
<td>Telmisartan</td>
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</tbody>
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### 2. Angiotensin Converting Enzyme Inhibitor (ACEI)

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<tr>
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<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acertil</td>
<td>2-8mg</td>
</tr>
<tr>
<td>Tritace</td>
<td>2.5-10mg</td>
</tr>
<tr>
<td>Zestril</td>
<td>5-20mg</td>
</tr>
</tbody>
</table>

In this chapter, I will try to share with you a prescription habit based on a hybrid between:
- most updated guidelines,
- most recently available trial results and
- my personal local experiences.

My personal local experiences may be different from yours. Cost is also a genuine consideration on prescription. New and better drugs are in no exception, a bit more expensive. Based on the evidence based data and your own personal experiences, you can easily develop a prescription pattern that can serve you the best.

The most important points affecting the choice of medications are illustrated on Figure 12.

**Efficacy**
- how fast and how low the blood pressure can be achieved

**Adverse Effects**
- for ultra long term medical therapy, as hypertension, the side effects must be as minimal as possible to enhance the compliance
ACEI is one of the most important milestones in the medical history. It is the predecessor of ARB. It opened a whole new world to the treatment of ischemic heart disease and congestive heart failure 25 years ago.

Good points:
- Cheap (hot market competition from generic companies)
- Effective for patients < 55 years old
- Apart from hypertension, ACEI is also effective in the morbidity and/or mortality reduction for patients with:
  - Congestive heart failure (SOLVD\textsuperscript{16}, CONSENSUS\textsuperscript{17})
  - Ischaemic Heart Disease (SAVE\textsuperscript{18}, HOPE\textsuperscript{19}, EUROPA\textsuperscript{20})
  - Stroke (HOPE\textsuperscript{19})
  - DM Nephropathy (Type I)\textsuperscript{21, 22}

Bad points:
- Dry Cough
  - Very common in Asian populations (~ 15-50%)
  - Nocturnal and even daytime
  - Can be very bad, distressing and affecting the productivity and life-style of our patients
  - Can lower the rate of drug compliance for patients with cough
  - Higher optimal dose can not be achieved in many patients

ARBs with no side effect of cough. ARB has nearly all the capacity of ACEI. That is why ARB is gradually replacing ACEI, especially in the private sector. Nowadays, I seldom use ACEI in my clinic.

3. Beta-blockers

Among diuretics, Beta-blockers are one of the giants in the old days.

Good Points:
- Cheap (again, hot competition from generic companies)
- Effective in morbidity and mortality reduction for ischaemic heart disease\textsuperscript{23} and congestive heart disease patients\textsuperscript{24}
- Long history of usage with a lot of trials supports their efficacy in BP lowering (SHEP)\textsuperscript{25}

Bad Points:
- Lethargy
- Reduce exercise tolerance (defeat our aim to get the patient on regular exercise)
- Cold hands and feet
- Erectile impotence (a real nightmare for male patients from 16-100 years old!)
- Poor sleep and bad dreams (Atenolol cross the Blood Brain Barrier)
- Compared with CCB and ARB/ACEI, less favourable in stroke reduction and diabetes prevention.
- Adverse effect on the glucose and lipid profile, especially when using with diuretics\textsuperscript{7}
- Adherence rates at 1 year are highest if individuals start therapy with ARBs, ACEIs and Calcium Channel Blockers.\textsuperscript{27}

From the above points and the recent NICE guideline, I can't see a simple, single reason to use beta-blockers in simple hypertension apart from a cheaper price. For more than 3 years, I never use beta-blockers for simple hypertension. But they are actually invaluable good friends of mine for treating patients with ischaemic heart disease and congestive heart failure.

4. Calcium Channel Blockers

Among the new drugs, CCB is one of the best choices. (Note: The word “Best” in this context is relative.)

**Figure 15**

**B - Beta-blockers**

- Betaloc: Zok (Metoprolol) 25-200mg QD
- Concor: (Bisoprolol) 1.25-10mg QD
- Dilatarend: (Carvediol) 3.125-25mg BD

**Figure 16**

**C - Calcium Channel Blockers**

- Norvasc (Amlodipine) 2.5-10mg QD
- Plendil (Felodipine) 2.5-10mg QD

This is again, one of my favourite choices.

Good points:
- Very powerful in patients ≥ 55 years old
- Very powerful in Systolic BP reduction (as you can see in figure 1 and my article, Hypertension- A guide to clinical practice, HKMA, CME Bulletin, Jan 2004 on http://www.hkma.org, SBP is a more important killer than DBP)
- Plendil (felodipine) and Norvasc (Amlodipine) are safe for Congestive Heart Disease patients
- Apart from hypertension, Norvasc (Amlodipine) is also effective in ischaemic heart disease patients (CAMELOT)\textsuperscript{26}
- ↓30% cardiovascular death, nonfatal MI, resuscitated cardiac arrest, need for revascularisation, hospitalisation for angina and congestive heart failure, fatal and nonfatal stroke, transient ischaemic attack (TIA) and peripheral vascular disease (PVD)\textsuperscript{27}
- Very low in side-effect rates and well tolerated

Bad points:
- A bit more expensive (again, No Free Lunch!)
- Mild flushing, palpitation, lower limb oedema (can be avoided by low salt diet)

A point to note:
I only mentioned the dihydropyridine Calcium Channel Blockers (CCB). Please kindly avoid the using of non-dihydropyridine CCBs. This sub-group of CCB included Herbesser (Diltiazem) and Isoptin (Verapamil). They are negative inotropic and chronotropic in nature. That means they slow down the pulse and decrease the pumping power of the heart. Serious side effects like bradycardia, heart block and heart failure can be the result. Again, I can not find a reason to use them in simple hypertension apart from money reasons. Actually they are the good friends for cardiologist in the treatment of tachyarrhythmias such as Supra-Ventricular Tachycardia (SVT)

5. Diuretics

**Figure 16**

**D - Diuretics**

- Natrilix SR (Indapamide) 1.5mg QD
This is the oldest type of anti-hypertensive agent in common use. I only use Natrilix SR (Indapamide). In my experience, Lasix (Frusemide) and Moduretic (amiloride / hydrochlorothiazide) have a higher chance of getting electrolyte imbalance, fluctuation of blood pressure and gouty arthritis.

Good points:
- Cheap
- Effective in patients ≥55 years old
- Useful in hypertensive patients with lower limb edema and congestive heart failure

Bad points:
- Lethargy
- Reduce exercise tolerance (again, defeat our aim to get the patient on regular exercise)
- Hypokalaemia (can cause lethargy, leg cramps and arrhythmia)
- Polyuria (causing embarrassment, affects the life-style and leads to poor sleep)
- Precipitating Gouty Arthritis
- Adverse effect on the glucose and lipid profile, especially when used with beta-blockers
- Poorer compliance and higher drop out rates.28

When used in combination (With CCB, ARB/ACEI) diuretics can be very useful in treating patients with hypertension and water retention.

6. Alpha Blockers

In elderly patients, Alpha-blockers can cause serious postural hypotension, dizziness and falls. This is one of the common cause of osteoporotic fractures. Fractures in elderly can have very gloomy outcomes. (up to 50% mortality in 1 year) In ALLHAT27 trial, compared with the other group of medications, alpha blockers are also comparatively not as good in cardiovascular disease prevention. In my personal experience, as an alpha-blocker, Cardura XL (Doxazosin- slow release) has a more acceptable lower rate of postural hypotension attacks. I only use alpha-blockers in male hypertensive patients with true prostatism.

5. Combination Pills

Recent guidelines and my experience suggest that combination treatment can have lower side effect rates with a much higher BP lowering potency. Except the patients with very mild hypertension, I used to initiate the treatment with once daily, low dose combination pills for maximising the potency, minimising the side effects and achieving good compliance.

1. ARB + D

Combination Pills
A + D →
ARB + Diuretics (hydrochlorothiazide)
- Co-Approval 150 /300 + 12.5
- Blopress Plus 8 + 12.5
- Co-Diovan 80/160 + 12.5
- Hyzaar 50/100,
- Hyzaar Forte 12.5/25
- Micardis Plus 40 + 12.5

This is a very effective drug combination. Side effect rate is very low. Good for newly diagnosed patients. Because of the potassium conserving effect of ARB, very few patient need extra potassium supplement. They are my favourite combination pills

2. ACEI + D

Combination Pills
A + D → ACEI + Diuretics
- Predonium
  - Accertil (Perindopril) 2mg + Natrilix (Indapamide) 0.625mg

Same as ARB + D, this is a very effective pill. Unfortunately, dry cough is again not an uncommon problem.

3. B + D

Combination Pills
B + D →
Beta-Blocker + Diuretics (hydrochlorothiazide)
- Lodoz (Bisoprolol)2.5mg/6.25mg
- Betaloc Comp (Metoprolol) 100mg/12.5mg

This is not a good choice for simple hypertensives. Lethargy, cold hands, erectile impotence, hypokalaemia, poorer lipid profile and even diabetes can be the results. But B + D is actually a very good combination for patients with hypertension and ischaemic heart failure.
This is also not a perfect choice for simple hypertension. B + C combination is very useful for patients with hypertension and ischaemic heart disease.

The rule of military operations is not to count on opponents not coming, but to rely on having ways of dealing with them; not to count on opponents not attacking, but to rely on having what cannot be attacked

~ The Art of War, Sun Tzu, 544-496BC

5. One step further - treat the patient as a whole, don’t forget the other risk factors

Nowadays, metabolic syndrome (Central obesity, hyperlipidaemia, hyperuricaemia, hypertension, impaired insulin sensitivity) is a very common problem in adults. Patients with multiple risk factors have a higher cardiovascular risk. We should treat all the risk factors as a whole to save their lives and their family. (Figure 23, 24 & 25)

Some good news, there is a new combination drug Caduet (Lipitor + Norvasc). Caduet will be on the market in 2007. This is truly a great move. The combination can further lower our patients’ cardiovascular risks with a better compliance and a lower cost. I am looking forward that we are going to have more and more combination pills of this kind in the market.

In 2007, there is also another coming new drug with multiple effects, Acomplia (rimonabant). Coming from a new class, Acomplia regulates the over-activity of the central and peripheral endocannabinoid system. By selectively blocking CB1 receptor in central and peripheral tissues, rimonabant regulates energy balance, reduces abdominal obesity and improves glucose and lipid metabolism, thus resulting in the improvement of multiple cardiometabolic risk factors including blood pressure, lipid and glucose profile.

6. Conclusion

- Intimate trust between Doctors and Patients + Patient education = Successful Hypertension Control

Hypertension is a very common and under-diagnosed disease in Hong Kong. It is the most important cause of disastrous diseases such as stroke, ischaemic heart disease, renal and heart failure. Hypertension can be easily controlled to the international target (<140/90mmHg) by life-style modification and medications. New medications such as calcium channel blockers and angiotensin receptor blockers are potent, user/Doctor - friendly, nearly side-effect free and money valued. Beta-blocker is no-longer a first line medication in our most up-dated guideline. The most important key for success is patient education delivered within an intimate trust between patients and doctors.
References
6. NCP VII. JAMA 2003;289:2560-2572
8. P. Sever et al, for the ASCOT investigators. Lancet, September 10, 2005
20. EUPean Trial on reduction of cardiac events with Perindopril in stable coronary Artery disease Investigators, Efficacy of perindopril in reduction of cardiovascular events among patients with stable coronary artery disease: randomised, double-blind, placebo-controlled, multicentre trial (the EUROPA study), Lancet 2003;362:792-8
27. ALLHAT Officers and Coordinators, Antihypertensive and Lipid -Lowering treatment to prevent Heart Attack Trial (ALLHAT), JAMA 2002; 288: 2881-3007
29. Eli V. Gelfand, Christopher P. Cannon, Rimonabant: A Cannabinoid Receptor Type 1 Blocker for the management of multiple cardiometabolic risk factors. JACC Med 2001:345:861-869

MCHK CME Programme Self-assessment Questions

Please read the article entitled “Hypertension 2007” - Update on How to Choose and Prescribe the Best Medications for our Patients by Dr. Bernard BL. Wong, and complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded 1 CME credit under the Programme for returning completed answer sheets via fax (2865 0345) or by mail to the Federation Secretariat on or before 28 February 2007. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary.

Questions 1-10: Please answer T (true) or F (false)

1. Hypertension is one of the most important causes of stroke, coronary artery disease, renal failure and congestive heart failure.

2. Hypertension is Systolic BP > 140mmHg and / or Diastolic BP ≥ 90mmHg (true for adult, all ages and both sexes)

3. Optimal BP is Systolic BP < 120mmHg and Diastolic BP < 80mmHg

4. For high risk patients (diabetes and/or renal disease), the treatment target is Systolic BP < 130 and Diastolic BP < 80mmHg

5. In NICE guideline June 2006, beta-blockers are not a first line drug anymore.

6. ARBs have dry cough as a common side effect

7. Beta-blockers would not cause lethargy and erectile impotence.

8. Diuretics would not cause polypuria

9. Alpha-Blockers have a superior stroke and ischaemic heart disease prevention power over the other types of anti-hypertensives

10. Patient education and intimate trust between doctors and patients is totally irrelevant for the long term success in hypertension control.