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Circulation and Content

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The aim of the journal is to promote the development of quality family medicine/general practice in Hong Kong and the region, by publishing editorials, original articles, update reviews, letters to the editor, and self-assessment materials.

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Standard of care: how can we safeguard it?

Colman SC Fung 馮兆璋, William CW Wong 黃志威

With the Government's healthcare reform consultation document, "Your Health, Your Life"¹ and the recent campaign promoting Family Medicine and Primary Care as the first point of contact and for continuity of care, it is likely that the demand of primary healthcare service will increase; therefore there is a continuous pressure for an effective and efficient way to deliver high quality care within the limited resources. In this issue of *The Hong Kong Practitioner*, a pilot study on clinical risks/outcomes of a "Repeat Prescription" programme tries to answer the question of whether repeat prescribing could potentially be beneficial and feasible in our public primary care setting.

Worldwide, there is no single best method of delivering repeat prescriptions. In some countries, such programmes are led by nurse practitioners; others, are led by pharmacists or dispensers. For example, in the United Kingdom, patients under the National Health Service can get a repeat prescription online and choose where they want to collect the medicine and from which selected pharmacy or have the medicine delivered.² Questions such as: "Who would be in a position to review the patients if it is not the doctors" or "When should the patients be reviewed" and issues such as refill adherence,³ need to be addressed.

The first assumption for such arrangement is that only stable patients can receive repeat prescriptions. But then what is the universal definition of being "stable"? Can "stable" conditions be readily assessed by the available health parameters and not changed with time?

Another question is what advantages and limitations are associated with the additional service of repeat prescriptions provided by other healthcare professionals such as pharmacists or nurse practitioners versus follow-ups with family doctors at longer intervals and having longer drug duration. Subsequent questions are how long before a doctor should review a patient

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with chronic disease even if the condition is stable, and what needs to be done at each follow-up consultation. Clinical judgment and share of responsibility as to which patients can receive repeat prescribing without seeing the doctors needs to be clearly spelt out.

One potential drawback is that while repeat prescriptions may help solve the problem of long waiting time to see a doctor, the doctor-patient relationship can be affected. Apart from ensuring that the patient's condition is clinically stable and achieving health parameters targets, what else can or should be done at a doctor's consultation? During the sharing session in a recent teaching of a Master course at the University of Hong Kong, a patient with diabetes mellitus for more than 10 years and was known to be under "stable" condition was asked if she would prefer to see a doctor or a nurse for follow-ups for her diabetes mellitus. She chose to see a doctor, as it would give her a sense of reassurance. It is well known in the literature that the presence of a doctor could act as a medicine,⁴ and the effectiveness of such an event is based on the well-established doctor-patient relationship. On the other hand, some patients may value more the holistic and comprehensive care provided by the primary care team instead of just care provided by one single doctor. Thus, research studies taking into account patients' perspectives are required in the local setting in order to help pave way for the most appropriate primary care delivery model.

Another argument is that if "repeat prescription" can save some time for the doctor, the doctor can spend more time with patients on some other tasks such as on lifestyle assessment or smoking cessation, which is the focus of another article in this issue. While the detrimental health effects of smoking have been proven beyond doubts, it was found that the recording of smoking status and details about smoking cessation and counselling advice were poor, that these are not even coded in the Clinical Management System. In this article, it also shows that a simple audit exercise not only can identify weaknesses in our routine care but can also potentially bring improvements in our standard of care. This audit is one example of translating theory (e.g. the 5A's framework in smoking cessation) into practice. Although the number of smokers who quit smoking was not the main target in this audit exercise, it is encouraging to see that there were four who managed to quit smoking in the second audit cycle compared to none in the first cycle.

The third article also looked at how theoretical evidence could be translated into clinical practice. The paper discussed how the family doctors can translate the Reference Framework⁵ recommendations on hypertension care into daily clinical practice. The reference framework is a consensus document endorsed by various stakeholders, including academic and professional bodies, as the most appropriate and feasible application of available evidence in primary healthcare in Hong Kong. The Reference Framework aims at providing a common reference to guide and coordinate healthcare for patients, from all healthcare professionals across different sectors for the provision of continuous, comprehensive and evidence-based care for hypertension in the community. As the reference framework is now accepted by all healthcare professionals, multifacet strategies to actively engage primary healthcare professionals to adopt the recommendations within the framework are the key for successful implementation⁶ and worth further exploration. Following the recommendations within the framework helps to safeguard our standard of care while the individual needs and circumstances of each patient must be taken into account by the treating doctor.

While family doctors are trying their best to improve the objective health outcome indicators such as blood pressure and body mass index, flexibility in clinical practice must be allowed because each patient is an individual and the management plan cannot be simply taken out of one same mould. As a family doctor, who understands patients' individual circumstances and needs, helping the patients to identify barriers and negotiate achievable targets are essential steps in successfully managing their chronic diseases.

While family doctors are working hard to raise the standards of care, they should also enable and equip their patients so that patients can take up more responsibility and take good care of themselves. Self-care and patient enablement are other areas that family doctors can focus on and help their patients manage their chronic diseases, especially if some workload of the doctors such as writing repeat prescriptions can be shared out by other health professionals like nurses or pharmacists who are actually within the same primary care team. ■

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A pilot study on clinical outcomes of a 'repeat prescription' programme

Tammy KW Tam 譚嘉渭, KH Kwok 郭冠雄, Luke CY Tsang 曾昭義

Summary

Objective: To study changes in clinical parameters and pattern of health seeking behavior of patients after joining the 'repeat prescription' programme. To report on rate of adverse events and patient's level of satisfaction.

Design: Retrospective cohort.

Subjects: Patients who joined the repeat prescription programme in a primary care clinic from May 2004 to February 2008.

Main outcome measures: Mean blood pressure and lipid level, number of diagnostic codes per consultation, number of breakthrough consultations. Rate of adverse events. Level of satisfaction.

Results: By the end of the study period, 210 subjects who have been in the programme for ≥ 1 year were included for outcome analysis. Significant reductions in mean systolic blood pressure of 2.2 mmHg ($p=0.01$) and diastolic blood pressure of 2.2 mmHg ($p=0.0003$) were observed; there were no significant changes in lipid levels ($p=0.30$). Significantly more diagnostic codes were entered per consultation ($p=0.0003$). No adverse event was reported. 99% of patients were satisfied or highly satisfied with the programme.

Conclusion: This pilot study shows that a repeat prescription arrangement is worthy of development in the context of primary care. Further studies in larger scale, longer duration, more clinical conditions, involving cost effectiveness considerations might be beneficial for the increasingly overloaded public primary health care sector.

Keywords: Repeat prescription, chronic illness, clinical outcome

摘要

目的: 研究參加重複處方項目的患者臨床指標及求醫行為模式的變化, 並報告其不良事件率和患者滿意度。

設計: 回顧性隊列研究。

對象: 2004年5月至2008年2月間, 某基層醫療診所參加重複處方項目的患者。

主要測量內容: 血壓和血脂平均值、每次就診的診斷編碼數量、未預約就診的次數、不良事件率和滿意度。

結果: 截至研究結束, 共有210位加入時間已達到或超過1年, 被吸納做臨床結果分析。血壓下降有顯著意義, 收縮壓平均值下降2.2 mmHg ($p=0.01$), 舒張壓下降2.2 mmHg ($p=0.0003$); 血脂水平無顯著變化 ($p=0.30$); 每次就診的診斷編碼數量有所增加 ($p=0.0003$)。無不良事件報告; 99%的患者對此項目感到滿意或十分滿意。

結論: 臨床效果預備研究顯示, 重複處方項目在基層醫學領域有發展價值, 進行更大規模、更長時間、包含更多臨床疾病和成本效益的綜合研究, 可能對於日漸超負荷運作的公共醫療服務有所幫助。

主要詞彙: 重複處方, 慢性疾病, 臨床結果

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Introduction

For most patients with stable chronic medical conditions, their ritualistic return to medical consultations involves mainly confirmation of their stable clinical status and re-stocking of necessary medications. This ebb and flow of patients utilizes a significant amount of healthcare resources. 'Repeat prescription' refers to the issuing of a subsequent prescription within a given period, whether it is accompanied by a doctor's consultation or not.¹

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This practice has been widespread in health care for some time. In Western countries, the proportions of repeat prescription range from 29% to 75% of all items prescribed,²⁻³ a substantial part of which involves medications that are potentially toxic such as psychotropics, cardiac drugs and anti-epileptic drugs, and are issued without direct doctor-patient contact.⁴⁻⁵ There is also a wide variation in reviewing policies between practices; a clinical review published by De Smet & Dautzenberg in 2004 demonstrated that 66% of repeat prescriptions were not periodically reviewed in the previous 2 years.¹

The potential benefits of repeat prescription without a doctor's consultation are reduced costs for the service provider, expanded servicing capacity of the healthcare system and increased convenience for the patient.¹ On the other hand, traditional models of repeat prescription have been criticized on its compromised quality on patient care and failure to monitor the effectiveness and safety of the prescribed medication regime.¹ No doubt, repeat prescribing in the absence of patient contact should never be undertaken as a light matter.

To address the drawbacks of repeat prescription, studies have been conducted, targeting at developing interventions to improve the quality and process of repeat prescriptions.⁶⁻⁹ Nonetheless, published studies have yet to evaluate repeat prescription objectively in terms of its humanistic, economic or clinical outcomes to guide future approach in its utilization.

A controlled programme of repeat prescription was piloted in a primary care clinic in May 2004, with an aim to improve the organization and monitoring of the process of repeat prescription, and hoping to achieve an optimal balance between increasing the clinic's servicing capacity and yet upholding drug safety and good standard of patient care. The pilot stage of this programme recruited only patients with stable chronic diseases. At the end of 2008, the clinic had around 44,000 patients in its registry. For the clinic, all medical appointments were normally made by telephone booking up to 1 week in advance of the requested day of appointment. For patients with chronic illnesses/conditions like hypertension, diabetes mellitus, etc., at each attendance, they would be given a follow-up appointment to enable continued care and monitoring by the attending physician. Usually, the follow-up interval would be 12 weeks and at most 16

weeks, which is also the maximum duration of drug dispensed.

We hope that the results generated from the pilot repeat prescription programme would provide more insight to development of future repeat prescription model in primary care setting, and help to improve safety of patients on repeat prescription.

Method

Our study was conducted in a public funded primary care clinic in Hong Kong.

After identifying appropriate patients, clinical parameters of patients before and after utilizing the repeat prescription system were compared, and evaluated to check if the process of repeat prescription would affect disease control adversely or modify the patient's health seeking behavior. Adverse events were carefully monitored. Patients' satisfaction to the change was also collected.

The Repeat Prescription (RP) Programme

From May 2004 through February 2008, patients with stable chronic condition were invited to join the RP programme. Under usual care, a patient would be arranged to see the physician every 12 weeks for follow-up. Under the RP programme patients would be followed up at a longer interval - 24 weekly instead of 12 weekly. If conditions allowed, they would be stocked with 12 weeks medications after each consultation, and between the two consultations, a specially trained and experienced nursing colleague will be responsible to check their condition, check their level of satisfaction and arrange re-stocking of the medications for another 12 weeks.

The chronic conditions included in the RP programme were hypertension, diabetes mellitus, hyperlipidaemia, gout, asthma, allergic rhinitis, benign prostatic hyperplasia, dry eyes and onychomycosis. The inclusion criteria were a number of clinical assessments that indicated that the chronic condition was stable. (**Appendix I**) The criteria were decided by the Clinical Practice Improvement Team of our unit after several team meetings with physicians, nursing colleagues, dispensing colleagues, and clerical colleagues.

During the study period, chronic patients attending follow-up consultation were screened by their case physician for eligibility for inclusion into the RP programme. Patients attending with any of the listed conditions and had fulfilled the specified inclusion criteria would be personally invited to participate in the RP programme on a voluntary basis. Should any problem related to their illnesses arise in the RP period, for example deteriorated disease control, unscheduled consultations would be made for them to see their case physician as soon as possible; who would then determine whether or not these patients would continue to be included in the RP programme.

After starting the RP programme each subject would be given an identification number for quick retrieval of details including name, Hong Kong identity number, type of clinical conditions and name and duration of medications to be re-stocked. Individual chart review was performed to obtain clinical data.

To evaluate the clinical outcomes of subjects before and after starting the RP programme, those who had been on the programme for one year or more were included for data analysis, and specific clinical parameters were used for comparison. For instance, for hypertension, the mean recorded clinic blood pressure over the past year, before the change and then over the ensuing year before the last day of consultation were compared. Similarly, for diabetes mellitus, asthma, gout, and hyperlipidaemia, the mean values of glycated haemoglobin, peak flow rate, number of gouty attacks, and the ratio of total cholesterol (TC) to high density level cholesterol (HDL) respectively were compared. To evaluate whether the health seeking behavior of subjects had been modified after joining the programme, the frequency of subject attending the clinic was also monitored i.e. more unscheduled consultations, either for concerns about the identified conditions or other acute problems; and whether subjects would present with more complaints during subsequent follow-up consultations, reflected in increased diagnostic codes per consultation.

The level of satisfaction with the RP programme and the rate of adverse events were also recorded.

Statistical analysis

The results were expressed as proportions, means, and standard errors where appropriate. Student *t* test

was performed to compare continuous variables and Pearson chi-square test to compare categorical variables. A two-sided *p* value of < 0.05 was used to indicate statistical significance. All statistical analyses were performed with the use of SAS software, version 9.1.

Results

During the study period, 304 patients were recruited to the RP programme. **Table 1** showed the characteristics of subjects. Over eighty percent of subjects (255) had one chronic illness, the commonest condition being hypertension (**Table 2**); 90% (276) required less than three types of medications for drug restock.

Of the 304 subjects, 210 had been in the programme for one year or more. Analysis of specific clinical parameters showed that the mean blood pressure of the RP group was 127.5/77.4 mmHg; there was a small but statistically significant reduction of 2 mmHg in mean systolic ($p=0.01$) and diastolic blood pressure ($p=0.0003$) after joining the programme; and there was an insignificant increase in the ratio of total cholesterol over high density level cholesterol (TC/HDL). For other types of chronic illnesses, the number of subjects was not adequate for a valid comparison. There was no significant difference in the number of unscheduled consultations, either for identified RP condition or non RP condition, but the number of diagnostic codes per consultation increased after entering the programme ($p=0.0003$). (**Table 3**)

Table 1: Subject characteristics (N=304)

Gender	
Male	161 (53.0%)
Female	143 (47.0%)
Mean age (years)	58.4 ± 8.3
Mean body mass index kg/m²	24.3 ± 3.6
Mean duration of illness (years)	9.0 ± 5.0 (1.7 – 33.0)
Mean duration of repeat prescription (years)	1.7 ± 1.0 (1.2 – 52.8 months)
Number of drug items for repeat prescription	
1	197 (64.8%)
2	79 (26.0%)
3	22 (7.2%)
4	5 (1.6%)
5	1 (0.3%)

Table 2: Number of patients for different types of diseases

Types of chronic conditions	Number of patients
Hypertension	198
Diabetes mellitus	4
Asthma	2
Hyperlipidaemia	58
Benign prostatic hyperplasia	12
Gout	10
Hypothyroidism on thyroxine replacement	40
Allergic rhinitis	12
Eczema	10
Chronic urticaria	2
Onychomycosis	1
Dry eyes	7
Others	8

N.B. some patients have more than one chronic condition

During the study period, monitoring of subject's level of satisfaction was conducted by nursing colleagues during the interim patient review. This showed that 99% of subjects were satisfied or highly satisfied with the programme. No adverse events were reported.

The drop-out rate from the programme was 6.1%. The reasons for dropping out included patient's preference, unsatisfactory disease control, non-compliance with medications, side effects of drugs, and ineligibility for joining the RP programme.

Discussion

Results of our study revealed that after entering the programme, blood pressure levels significantly

decreased by around 2mmHg. Although this may not be clinically significant, more importantly, by the end of the study period of almost 4 years, these clinical parameters had remained rather optimal with mean SBP measured 120-130 mmHg, mean DBP measured 70-80 mmHg. These initial results were encouraging. The selection criteria established by our team played a crucial role in maintaining a good standard of care for selected patients on RP. The selection criteria enabled case physicians to detect any disease progression early enough and to act promptly, by diverting patients back to the usual care schedule, and had their condition optimized before re-entering the RP programme again.

We also found that RP under the current programme had not changed patient's health seeking behavior to a great degree. Although there was a small but statistically significant increase in the number of minor physical complaints in subsequent consultations (↑0.18 diagnostic code/consultation), this small numerical difference may not be clinically meaningful. And it was a relief to observe that, there was no increase in total number of unscheduled consultations. Participants seemed not to have become excessively worried about their health status or other health problems after joining the RP programme. In fact, most subjects showed high satisfaction to the RP programme and only very few dropped out (6.1%) during the study period. As the most common condition for drug refill was hypertension, and most subjects in this study had home BP machine for self-monitoring, the home readings might have also helped to assure the participants that their condition was stable. Most importantly, the nurses who were available to assess them in the interim period probably provided much needed support that had helped

Table 3. Comparison of clinical variables before and after joining repeat prescription programme

Clinical variable	Before joining RP program	After joining RP program	Magnitude of difference (after-before)	p value
No. of unscheduled consultation (RP conditions)	0.07	0.04	-0.03	0.4
No. of unscheduled consultation (non RP conditions)	0.5	0.62	0.12	0.17
No. of diagnostic codes/ consultation	1.77	1.95	0.18	0.0003*
Mean systolic blood pressure (mmHg)	129.7	127.5	-2.2	0.01*
Mean diastolic blood pressure (mmHg)	79.6	77.4	-2.2	0.0003*
Mean ratio of total cholesterol/high density level cholesterol	4.3	5.4	1.1	0.3

* statistically significant

to alleviate any anxiety. This idea was very similar to nurse-led clinics which has become increasingly popular in the recent decade. A randomized controlled trial involving dermatology practice has showed that nurses, by providing effective patient education and support, can help to free up physician's time, allowing physicians to see more patients.¹⁰ Potentially, the RP programme may lead to improved cost effectiveness of the healthcare system by enhancing the role of nurses in patient management.

Furthermore, during the study period, we observed low rate of patient non-compliance to medications (1.2%) and no adverse event arose that was related to the RP programme. All subjects in the RP programme were given a hotline telephone number through which they could talk with the nurses directly during office hours whenever they encountered problems with the use of medications. The high rate of compliance was in contrast with other studies, which reported that 12.4% of patients had compliance problems, side-effects, adverse drug reactions, or drug interactions.¹¹

Limitations

However, at this point, the available evidence is not sufficiently strong for us to conclude that RP under the monitored programme would have no adverse effect on the long term clinical outcomes such as disease complications and mortality as compared with usual care. Obviously, more clinical data are needed and further controlled trials with parallel comparison of the control (usual care system) and intervention (RP system) groups are required to provide a stronger conclusion for this question.

Compared with the traditional system of repeat prescription, where a wide variety of medications including antibiotics, psychotropics, anti-epileptics and cardiovascular drugs would be refilled without consultation and for even longer periods, the scale of repeats in our programme was much smaller. One might challenge that the impact of our repeat system on the overall healthcare capacity would be small. However, this was only the pilot stage of our programme. In the era of an aging population, and substantial rise in the prevalence of chronic illnesses, the scale of the RP programme would also expand accordingly. We might also consider extending the period of repeat, and

simplifying and streamlining the repeat procedure to promote a higher rate of participation of both doctors and patients. Most importantly, the clinical outcomes of patients should be reviewed regularly. By following the stringent selection criteria, our programme will help to maintain a standard quality of drug use and patient care, which will in turn contribute to a good standard of chronic care modeling.

To the best of our knowledge, this study is the first of its kind to objectively evaluate clinical outcomes after repeat prescription. At this pilot stage, the sample size was relatively small compared with the whole clinic population. Time constraint in a busy clinic setting and the extra work involved had been the major barriers for doctors to do the invitations to include patients to the RP programme. With the present sample size, we were only able to assess the blood pressure and serum lipid levels, while comparative analysis for other diseases was not performed. But with the encouraging results obtained in this first phase of programme, we believe that comprehensive evaluation of the whole spectrum of chronic diseases would be possible with further recruitment of patients in the near future.

This is a retrospective study to review clinical outcomes of RP patients by the fourth year of the programme. Duration of chronic illness may also affect disease progression, and may become confounders to our results. Standardization of patient's duration of illness, or conducting clinical trials to compare outcomes between RP group and usual care group would help to reduce the biases involved.

As repeat prescription used in long-term pharmacotherapy is often associated with patient non-adherence,¹² under our current system, we were only able to monitor drug compliance for patients who turned up for follow-up, and not for those who defaulted in the interim period. The overall rate of drug non-adherence and its ultimate effect on disease outcomes might be under-estimated. Establishment of a call-back system might be considered to help identify defaulters in the interim period and arrange them for further follow-up.

Conclusions

After implementation of the RP programme, control of hypertension and hyperlipidaemia remained

Key messages

1. For carefully selected patients, after inclusion into the 'Repeat Prescription Programme' for 4 years, there was no deterioration in control of hypertension and hyperlipidaemia; patients also showed high level of satisfaction to the procedure.
2. Essential elements for success of the pilot programme included careful selection of patients against a specified set of selection criteria and having a team of dedicated nurses to provide needed support for patients in the interim period.
3. Larger scale controlled trials are warranted for proper evaluation of the impact of repeat prescription on long-term clinical outcomes of patients and health care cost.

stable. No adverse events were reported and patients' satisfaction levels were high in this cohort. The essential elements of success for this pilot programme included careful selection of patients against the specified list of inclusion criteria and having a team of dedicated nurses to provide the needed support in patient review and use of medications. Hopefully, our study has painted a primitive framework for future development of the repeat prescription arrangement, to maximize patient coverage while balancing the quality of patient care and medication safety.

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Appendix I

Inclusion criteria for “Repeat Prescription Programme”

Clinical condition	Inclusion criteria
Hypertension	<ul style="list-style-type: none"> – Uncomplicated hypertension without target organ involvement – Consecutive clinic BP <140/90 for 2 times or more – Repeat drug(s) for 12 weeks – Review 24/52
Diabetes mellitus	<ul style="list-style-type: none"> – Uncomplicated DM – Optimal glycaemic control with HbA1c \leq 7.0% – Repeat drug(s) for 12 weeks – Review 24/52 <p>For those patients who have both DM and HT, they are also eligible provided that both selection criteria were satisfied</p>
Asthma	<ul style="list-style-type: none"> – Free of asthmatic attacks for at least 6 months – Repeat drug(s) for 12 weeks – Review 24/52
Gout	<ul style="list-style-type: none"> – Free of gouty attacks for at least 6 months – Repeat drug(s) for 12 weeks – Review 24/52
Hyperlipidaemia	<ul style="list-style-type: none"> – Optimal lipid profile – Repeat drug(s) for 12 weeks – Review 24/52
Hypothyroidism on T4 replacement	<ul style="list-style-type: none"> – Normal thyroid function test for 2 or more consecutive years – Repeat drug(s) for 16 weeks – Review 32/52
Allergic rhinitis	<ul style="list-style-type: none"> – No previous complications e.g. sinusitis, middle ear effusion – Stable symptom control – Repeat drug(s) (can include nasal steroid) for 12 weeks each time – Review yearly
Eczema	<ul style="list-style-type: none"> – Stable symptom control, mild to moderate eczema – Do not repeat very potent topical steroid (Dermovate) – Repeat other drug(s) for 12 weeks – Review 24/52
Chronic urticaria	<ul style="list-style-type: none"> – Stable symptom control – Repeat drug(s) for 12 weeks each time – Review yearly
Benign prostatic hyperplasia	<ul style="list-style-type: none"> – Stable symptom control for at least 6 months – Normal renal function and PSA – Repeat drug(s) for 12 weeks – Review 24/52
Onychomycosis on systemic anti-fungal agents	<ul style="list-style-type: none"> – Satisfactory treatment progress – Normal liver function – Repeat drug(s) for 12 weeks – Review 24/52
Dry eyes	<ul style="list-style-type: none"> – Clinical diagnosis documented by ophthalmologists or doctors in families clinics – Absence of coexisting eye disorders – Repeat eye drops for 12 weeks (maximum 3 bottles) – Review 1 year



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# An evidence-based clinical audit on smoking cessation management for patients with chronic diseases in a Hong Kong general outpatient clinic

L Lo 盧令, David VK Chao 周偉強

## Summary

**Objective:** To evaluate smoking cessation management for patients with chronic diseases in a Hong Kong public primary care clinic by conducting a clinical audit, with an aim to induce change and improvement in service provision.

**Design:** The first phase of the audit (7/2007 to 6/2008) was a retrospective medical record review that identified potential areas for enhancements in smoking cessation service. The second phase (7/2008 to 6/2009) was a prospective audit period implementing the improvement changes. Results from the two phases were compared.

**Subjects:** All patients attending the Day, Evening, Sunday and Public Holiday clinics with one or more of the following six most common chronic diseases namely, hypertension (HT), diabetes mellitus (DM), asthma, chronic obstructive pulmonary disease (COPD), ischaemic heart disease (IHD), or cerebral vascular accident (CVA).

**Main outcome measures:** The data from the 2 audit phases were measured against 5 audit criteria (Ask, Advice, Assess, Assist, Arrange) to look for improvement across the 2 phases and whether the final results were able to meet pre-set standards.

**Results:** Statistically significant improvements were observed in criteria 1 to 3. Only criterion 5 could achieve the pre-set standard of 100%.

**Conclusion:** A clinical audit with a targeted team approach to implement changes was capable of achieving significant improvements in the process of care for smoking cessation. However, systems limitations and human factors did exist preventing clinical performance to achieve pre-set standards.

**Keywords:** Smoking, smoking cessation, clinical audit, chronic disease, evidence-based health care

## 摘要

目的：在本港一所公立基層醫療診所進行臨床審計，評估對慢性病患者所提供戒煙服務的質素，以進行改善措施。

設計：臨床審計分兩段為期一年的時間進行。第一階段（7/2007至6/2008）是將醫療記錄作回顧性分析，以確定在戒煙服務上的潛在改善空間。第二階段（7/2008至6/2009）是進行改善措施並作前瞻性審計。最後，分析及比較兩個階段中的服務質素，以研究作進一步改善。

對象：在日診、夜診、星期日及公眾假期診所求診的六種常見慢性病患者，包括所有高血壓、糖尿病、哮喘、慢性阻塞性肺病、缺血性心臟病及中風的病人。

主要測量內容：衡量在兩個階段數據中的五項審計準則：詢問、建議、評估、協助、安排，以便確定質素是否得到改善，並評估最終成果能否達到預定標準。

結果：戒煙服務中的前三項審計準則有顯著改善，而第四及第五項審計準則因牽涉人數較少，其改善程度未能確定。於五項審計準則中，只有第五項能夠達到預定的100%標準。在是次為期一年的臨床審計，4位病人能夠成功戒煙，41位病人獲轉介至戒煙中心跟進。

結論：在指定團隊以臨床審計方法推行改善措施，能顯著改善戒煙服務質素。然而，制度上的限制及人為因素的存在，都阻礙了達至臨床上的預期標準。

**主要詞彙：**吸煙、戒煙、臨床審計、慢性疾病、實證醫學醫療。

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## Background

Smoking is arguably the most preventable cause of deaths in Hong Kong (HK) and in many other countries. Indeed, tobacco use is a risk factor for 6 of the 8 leading causes of deaths globally.<sup>1</sup> The World Health Organization estimates that smoking kills nearly 6 million people a year, and approximately 1 person dies every 6 seconds due to tobacco accounting for 1 in 10 adult deaths. Up to half of all current users will eventually die of a tobacco-related disease.

As at 2010-2011, the prevalence of smoking in HK is approximately 12.0 - 13.6%. Smokers consume an average of 13.4 cigarettes per day. Of the smokers, 68.8% are aware of local smoking cessation services but only 2.5% have tried them before.<sup>2-3</sup>

A local study<sup>4</sup> in 2006 estimated that among those, in 1998 who were aged >35 years, 5,596 and 1,324 deaths were attributed to active and passive smoking respectively. In 2000, almost 34,500 people were hospitalized from smoking related illnesses. For adults, the attributable cost of public hospital use was \$230 million a year, representing 7% of the Hospital Authority's total expenditure on public hospitals in 1998. The cost of visits to public primary care outpatient clinics was estimated at \$21 million, representing 12% of the total cost for such clinics in 1998.

Smoking poses a significant risk on health, regardless of age and sex. However patients with chronic diseases are especially at risk. The General Outpatient Clinics (GOPCs) of HK look after a large number of patients with chronic diseases, and are also the point of entry for many other walk-in patients. GOPCs are therefore at a pivotal position to intervene and to offer help to smokers.

The principal investigator conducted a clinical audit on smoking cessation because the standard of care in his clinic had room for improvement: the lack of standardized guidance for clinicians on smoking cessation practice, the relative lack of nursing and clerical support, and an apparent low intervention (e.g. referral / anti-smoking prescription) rate observed. This situation is similar to the published data from another local primary care clinic.<sup>5</sup>

## Objective

The objective of the audit is to evaluate the process of care for smoking cessation intervention in the principal investigator's clinic, with an aim to induce change and improvement in service provision:

- Improving identification and documentation of smokers in consultation
- Enhancing assessment of smokers' intention to quit and the identification of motivated quitters
- Providing consolidated assistance to motivated smokers by pharmacological treatments, referral and follow-up reviews
- Arousing the awareness of all fellow colleagues in the same department on the importance of smoking cessation

## Method

### Study design

This clinical audit consists of 2 phases, with comparable setup and collection of statistical data. The first phase (1/7/2007 to 30/6/2008) is a retrospective review of records, followed by the identification of areas for enhancements. The second phase (1/7/2008 to 30/6/2009) is a prospective audit period implementing the improvement measures. After the second phase, a final analysis is performed to compare the performance in the 2 phases and to further investigate areas for future improvement.

Medical records were reviewed to assess whether details relating to the 5 audit criteria were included in the records during the previous 12 months.

- |            |                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------|
| 1. ASK     | For all patients, has the smoking status been documented in notes?                                                             |
| 2. ADVISE  | For smokers, have they been advised to quit OR advised about the hazards of smoking?                                           |
| 3. ASSESS  | For smokers, has their willingness to quit been assessed?                                                                      |
| 4. ASSIST  | For motivated smokers, have they been offered pharmacological treatment OR referred to a specialized smoking cessation centre? |
| 5. ARRANGE | For motivated smokers, were follow-up appointments arranged?                                                                   |

### *The evidence-based audit criteria*

A literature search in Pubmed, corresponding government authorities, academic colleges, and local institutions involved in smoking cessation services was undertaken to retrieve relevant clinical resources including previous audit reports, established clinical guidelines, and known standards of care. A number of clinical guidelines on smoking cessation have been released by various health authorities and professional organizations (**Table 1**).<sup>6-13</sup> However, there was a paucity of *local* guidelines.

The 5 criteria used in this audit are based on the 5A's framework put forward by the US guideline.<sup>9</sup> The guideline was selected because it provides the *most* comprehensive information on the evidences underpinning its recommendations. The 5 criteria are also well supported by the latest Cochrane reviews.<sup>14-18</sup>

Criterion 1 (ASK). This originates from the 2000 US Public Health Service clinical practice guideline: treating tobacco use and dependence.<sup>19</sup> The evidence supporting this stems back from the meta-analysis in the 1996 US Guideline,<sup>20</sup> where identifying smokers increases rates of clinician intervention. Although asking *alone* does not improve abstinence rate significantly, it forms the first step in providing *any* intervention to potential patients.

Criterion 2 (ADVISE). The US Guideline recommends that all physicians should strongly advise every smoker to quit because evidence shows that physician advice to quit smoking increases abstinence rates. The evidence originates from a meta-analysis of 7 studies in the 1996 US Guideline.<sup>20</sup> The benefit of physicians' advice is also supported by the latest Cochrane review in 2008,<sup>14</sup> showing that simple advice has a *small effect* on cessation rate. Assuming an unassisted quit rate of 2 to 3%, a brief advice-intervention can increase quitting by a further 1 to 3%. It is also interesting to note that advice delivered by other health care providers also result in an increased quit rates.<sup>21</sup> These support the team approach in intervening patients who smoke.

Criterion 3 (ASSESS). The US guideline recommends that once a tobacco user is identified and advised to quit, the clinician should assess the

patient's willingness to quit. One systematic review shows that assessing the smokers' motivation enables a stage-based smoking intervention, which is effective in changing smoking behaviour.<sup>22</sup>

For the principal investigator's clinic, the availability of specialized smoking cessation service is limited. Assessing the willingness to quit enables the clinician to stratify the more eager patients who would benefit most.

Criterion 4 (ASSIST). Assisting encompasses a range of cognitive and behavioural strategies offered by the clinician. Only prescriptions and referrals are audited in this exercise.

The efficacy of the 3 first-line medications for smoking cessation (nicotine replacement therapy or NRT, Bupropion, and Varenicline) is well evidenced by the Cochrane reviews,<sup>15-17</sup> the NICE review<sup>23</sup> and the 2008 US Guideline.

The US guideline shows that combining medication and counseling is better than medication alone or counseling alone. Currently, combining NRT prescription and smoking counseling are not a routine in GOPCs, but is part of the services provided in the specialized Smoking Counseling and Cessation Centres (SCCCs).

Criterion 5 (ARRANGE). The US guideline recommends that all smokers should be assessed with respect to their smoking status during follow-up clinical contacts of all patients. In particular, assessments within the first week after quitting should be encouraged. This recommendation is based on 2 studies.<sup>24-25</sup> However, the existing evidence does not show that these steps will prevent relapse, but continued involvement on the part of the clinician may increase the likelihood that the patient will consult the clinician in later quit attempts should they be needed.

### *Setting of standards*

The setting of standard for each criterion has taken into consideration known standards published by a local audit<sup>5</sup> in 2005, and an audit protocol by the National Institute for Health and Clinical Excellence (NICE) of the United Kingdom in 2006<sup>26</sup> (**Table 2**).

**Table 1: Comparison of guidelines on smoking cessation**

|                                                             | WHO <sup>6</sup> | UK-NICE <sup>7-8</sup> | US <sup>9</sup>   | Australia-AFP <sup>10-12</sup> | New Zealand <sup>13</sup> |
|-------------------------------------------------------------|------------------|------------------------|-------------------|--------------------------------|---------------------------|
| • Documentation of smoking status                           | √                | √                      | √<br>(evidence A) | √<br>(strength A)              | √<br>(grade A)            |
| • Advice to quit OR on smoking hazards                      | √                | √                      | √<br>(evidence A) | √<br>(strength A)              | √<br>(grade A)            |
| • Assessment of willingness to quit                         | √                | √                      | √<br>(evidence C) | √<br>(strength B)              | X                         |
| • Assessment of nicotine dependence                         | X                | (√)                    | X                 | √                              | √                         |
| • Prescription of NRT, Bupropion, or Varenicline            | √                | √                      | √<br>(evidence A) | √<br>(strength A)              | √<br>(grade A)            |
| • Referral to smoking cessation centre OR telephone hotline | X                | √                      | √<br>(evidence A) | √<br>(strength A)              | √<br>(grade A)            |
| • Assistance on cognitive OR behavioural strategies         | √                | X                      | √                 | √                              | √                         |
| • Arranging follow-up for review                            | √                | √                      | √<br>(evidence A) | √<br>(strength A)              | √<br>(grade A)            |

√ Recommended in guideline (√) – Mentioned in guideline X – Not mentioned in guideline

Levels of evidence in guidelines

#### US Guidelines – Strength of Evidence

- Multiple well-designed randomized clinical trials, directly relevant to the recommendation, yielded a consistent pattern of findings.
- Some evidence from randomized clinical trials supported the recommendation, but the scientific support was not optimal. For instance, few randomized trials existed, the trials that did exist were somewhat inconsistent, or the trials were not directly relevant to the recommendation.
- Reserved for important clinical situations in which the Panel achieved consensus on the recommendation in the absence of relevant randomized controlled trials.

#### Australian Guidelines - Strength of Recommendation

- There is good evidence to support the recommendation
- There is fair evidence to support the recommendation
- There is poor evidence regarding the inclusion or exclusion of the recommendation but recommendations may be made on other grounds.

#### New Zealand Guideline - Grade of Recommendation

- The recommendation is supported by GOOD (strong) evidence.
- The recommendation is supported by FAIR (reasonable) evidence, but there may be minimal inconsistency or uncertainty.
- The recommendation is supported by EXPERT opinion (published) only.
- There is INSUFFICIENT evidence to make a recommendation.
- GOOD PRACTICE POINT (in the opinion of the guideline development group).

**Table 2: Audit criteria and standards**

|                                                                                                                                                                     | Standard |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Criteria 1<br>In the past 12 months, has the smoking status of all patients been asked and documented in the case notes?                                            | 100%     |
| Criteria 2<br>In the past 12 months, have smokers been advised to quit smoking OR the hazards of smoking?                                                           | 100%     |
| Criteria 3<br>In the past 12 months, have smokers been assessed their willingness to quit?                                                                          | 100%     |
| Criteria 4<br>In the past 12 months, have eager smokers been assisted by offering pharmacological treatment OR referral to a specialized smoking cessation service? | 100%     |
| Criteria 5<br>In the past 12 months, have eager smokers been arranged a follow-up appointment for review?                                                           | 100%     |

(Definition: Smokers means daily smokers; Ex-smokers means having quit for > 4 months.)

## Subjects

The target population (grand audit population) in this audit is all patients attending the author's clinic with any of the 6 commonest chronic diseases, namely hypertension (HT), diabetes mellitus (DM), asthma, chronic obstructive pulmonary disease (COPD), ischaemic heart disease (IHD), and cerebral vascular accident (CVA), and who are at least seen once by one of the regular resident doctors in the clinic. Patients with the specified diagnoses who had only been seen by locum / relieving doctors were excluded because of the potentially wide variation in practice among this group of doctors.

## Sample size calculations

The grand target population has been defined above. However, the "sub-population", and therefore the sample size required, for each of the 5 criteria is different:

For criterion 1 (ASK), the population is the total number of eligible chronic patients. It is approximately 18,000 in each phase. From previous local audit data<sup>5</sup> and clinical experience, the percentage of smoking status documentation is roughly 90%. Therefore, assuming that 90% of the patients would meet the criterion, the sample size required at 95% confidence level with 95% confidence interval (85-95%) is estimated to be 138.

For criteria 2 (ADVISE) and 3 (ASSESS), the population is the *total number of smokers*. In the

retrospective first phase, this number was unknown as there was not a complete list of smokers. One solution was to retrieve and audit those patients coded<sup>27</sup> with Tobacco Abuse in the clinic computer system. However, there were only 348 such coded records. This low coding rate meant that the coded list of smokers was not representative of the total number of smokers. Many smokers were simply un-coded.

In the second phase, the total number of smokers was again unknown. So, in order to find the total number of smokers, the principal investigator underwent a pilot audit.

*The Pilot and Main Audits.* From the review of the initial sample of 138 (above), it was found that there were 16 smokers, 120 non-smokers, and 2 patients with unknown documentation status in the first phase. The rough percentage of smokers in the clinic was ~12% (= 16/136). Therefore with the known grand population of 18,352 in the first phase, the total number of smokers was roughly 2,159 (= 18,352 x 12%) (**Table 3**).

In criteria 2 and 3, the expected percentage of patients intervened (Advised or Assessed) is uncertain. It is prudent to assume a 50% chance to arrive at the largest possible sample size. With a target population of ~2159, assuming that 50% of the patients would meet the criterion, the sample size required at 95% confidence level with 95% confidence interval (45-55%) is estimated to be 327.

As there was not a complete list of all smokers, those 327 smokers were extracted from the grand

population. Here 2,780 (= 327 / ~12%) random patients from the grand population were required. Allowing a 10% safety margin, 3,058 (2,780 x 110% = 3,058) records were ultimately reviewed to recruit the 327 smokers. A similar pilot audit was also performed for the second phase to find the total number of smokers.

For criteria 4 and 5, the population is theoretically the total number of smokers who are eager to quit. This figure is expected to be small. And even smaller is the actual number of patients who have been intervened. Statistical comparison of the 2 phases is less meaningful, and therefore the actual number of patients intervened is presented instead.

### **Data extraction and collection**

The grand populations of eligible chronic patients are retrieved from the clinic computer system. The lists of samples of patients for review are randomly generated by a custom-made randomization Macro in Microsoft EXCEL. They are then reviewed by the principal investigator against the 5 audit criteria. Computerized records are the standard operational notes used in the clinic, and so they were the main documentation reviewed. In case of uncertainty, the paper records were also reviewed.

### **Interventions**

#### *Identification of deficiencies and implementation of changes*

After the completion of the first phase, a systematic review was undertaken by the principal investigator to identify the deficiencies in the process of care. The principal investigator also sought advice from his senior colleagues and the clinic doctor-in-charge. The

identified areas for enhancements and improvement changes are summarized in **Table 4**.

After identifying the areas for enhancement, the principal investigator discussed with his clinic supervisor on the proposed improvement measures. A clinic meeting involving the principal investigator, the clinic supervisor, the nursing officer, a nurse representative, a dispenser, and a member of the clerical staff was held to introduce the importance of smoking cessation activities. The initial findings of the first phase, the setup of the audit, and the proposed improvement changes were discussed. The consensus of the meeting was then relayed to all nursing, supporting and clerical team members.

A formal invitation letter detailing the audit design was sent to all other medical staff of the same department to seek their assistance on the project. A second reminder was also delivered to each Evening, Sunday, and Public Holiday clinic relieving doctor when he / she first came back to the clinic for relieving duties.

Furthermore, during the review of the first phase data, it was noted that there had been a wide range of clinical performance on smoking cessation intervention within the medical team. The principal investigator then approached his colleagues individually to relay the importance of anti-smoking activities, to discuss any barrier to practice, and to seek their active participation in the second phase.

### **Outcome measures**

The outcome measures in this audit refer to improvement achieved across the 2 phases, and whether the final results met pre-set standards.

**Table 3: Frequencies of patients derived from the pilot audits in each phase**

|                                       | First phase                | Second phase               |
|---------------------------------------|----------------------------|----------------------------|
| <b>Pilot study</b>                    |                            |                            |
| <b>Smoker</b>                         | 16/138                     | 14/138                     |
| <b>Non-smoker</b>                     | 120/138                    | 119/138                    |
| <b>Unknown smoking status</b>         | 2/138                      | 5/138                      |
| <b>Total patient</b>                  | 18352                      | 19421                      |
| <b>Total smoker estimated</b>         | 18352 x 16/136 = 2159      | 19421 x 14/133 = 2044      |
| <b>Sample size for criteria 2, 3</b>  | 327                        | 324                        |
| <b>Patient records to be reviewed</b> | 327 x 136/16 x 110% = 3058 | 324 x 133/14 x 110% = 3386 |



**Table 4: Areas for enhancement in the first phase and improvement measures**

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| <b>Deficiencies identified</b>                                                                                                                                                                                                                                   | <b>Improvement measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>System:</b>                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Lack of a formal integrated clinic protocol for anti-smoking activities.</li><li>• Lack of on-site smoking cessation clinic.</li><li>• Lack of an updated list of referral destinations by doctors and nurses.</li></ul> | <ul style="list-style-type: none"><li>• Currently, there is no established unified guideline on anti-smoking activities in the author's clinic. Therefore, a series of tailor-made anti-smoking initiatives were adopted locally for implementation in the clinic.</li><li>• Liaison with a local community organization has been made to introduce an alternative referral centre.</li><li>• Updated information on smoking cessation centres has been dispatched and communicated with all clinicians and nursing staff.</li></ul>                                                                                                                                                                                                                                                                                                                             |
| <b>Practice:</b>                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Lack of a central documentation of referrals to Smoking Counseling and Cessation Centres.</li><li>• Lack of updated resources on smoking cessation.</li><li>• Lack of educational information.</li></ul>                 | <ul style="list-style-type: none"><li>• Establishment of a formal logbook to collect data on referrals.</li><li>• Procurement of updated pamphlets for distribution in the waiting area and nursing station.</li><li>• Procurement of updated posters.</li><li>• Monthly afternoon talk on smoking cessation conducted by nursing colleagues.</li><li>• Showing of anti-smoking videos in the waiting area.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Staff:</b>                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Lack of integral team involvement to promote smoking cessation.</li><li>• Lack of involvement from, and communication channel for relieving / locum doctors.</li></ul>                                                   | <ul style="list-style-type: none"><li>• Summon of a clinic meeting to relay the anti-smoking message to all nursing, supporting, clerical, and dispensary staff.</li><li>• Encouragement was given to all nursing staff, supporting staff and clerical staff to offer brief anti-smoking advice to patients.</li><li>• Emphasis has been placed on building a team approach to intervene smoking patients, and to create an anti-smoking atmosphere within the clinic.</li><li>• A letter detailing the aim, setup and implementation of the audit was sent to all doctors in the same department before commencement of the audit.</li><li>• A dedicated newsletter with detailed information on various local (both public and community) smoking cessation centres was sent to all doctors in the same department during the implementation period.</li></ul> |
| <b>Dispensary:</b>                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Lack of access to medications, e.g. NRTs, Bupropion, or Varenicline.</li></ul>                                                                                                                                           | <ul style="list-style-type: none"><li>• A Quick Reference Card with practical examples on the prescription of various pharmacological agents was placed in every consultation room to facilitate prescription as self-financed items.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Reminder system:</b>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Lack of tools to facilitate the incorporation of anti-smoking activities into clinical practice.</li><li>• Lack of reminder to clinicians on anti-smoking activities.</li></ul>                                          | <ul style="list-style-type: none"><li>• A stack of specially designed Treatment Sheet has been placed in each room to facilitate clinicians to direct eager smokers to nursing station for further actions.</li><li>• A concise Consultation Notes Template in the computer system has been set up to ease documentation.</li><li>• A clipboard carrying the Quick Reference Card and the Treatment Sheet was placed on each consultation table as a reminder.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                         |

### Statistical methods

Chi-square (without Yate's correction as the sample sizes are large) is employed to evaluate statistical significance. Two-tailed *p* values are used to demonstrate statistical significance. For criteria 4 and 5, the actual numbers of subjects are small. Therefore, the actual frequencies are presented.

### Results

The results of the 2 audit phases are summarized in **Table 5**.

In both phases, criteria 1 to 3 did not meet pre-set standards, although there were statistically significant improvements. Criterion 4 shows an apparent drop in the performance, but that could be attributed to the very small number of subjects.

Across the 2 phases, there is a large increase in the number of eager smokers identified (from 1 to 12). It is due to an enhanced assessment of the willingness to quit. For the actual number of patients quitted smoking during the audit period, there is none in the first phase while there are 4 in the second phase. For the total number of smokers referred to a smoking cessation centre, there is no data available in the first phase, while there are 41 in the second phase as demonstrated in a prospective logbook.

### Discussion

#### *Why were some pre-set standards not met?*

The principal investigator's clinic is a large regional GOPC with evening, sunday and public holiday clinics. Many patients who have defaulted appointment in their original district clinics come to have follow up in this clinic as the final resort. Many of them are seen only once or infrequently over a one-year period, and that leaves little opportunity for preventive activities.

Furthermore, patients with stable chronic illnesses are increasingly given longer follow-up appointments. Longer follow-up intervals result in fewer encounters for opportunistic preventive interventions.

A final reason for the inability to meet standards could be linked to human factors. During the data collection of the first phase, it had been noticed that there was a wide range of performance among different clinicians. This large deviation was again observed when the principal investigator reviewed the second phase records. An impression was that several clinicians were not performing according to expectation in the process of care. This impression of the principal investigator, however, cannot be quantified because patients are frequently seen by more than one clinician over the one-year period.

**Table 5: Results of the 2 audit phases**

|                                      | First phase          | Second phase         | Standard | p-value |
|--------------------------------------|----------------------|----------------------|----------|---------|
| <b>Criterion 1 (ASK)</b>             | 87.6%<br>(2680/3058) | 96.1%<br>(3254/3386) | 100%     | 0.0001  |
| <b>Criterion 2 (ADVICE)</b>          | 33.3%<br>(108/324)   | 58.0%<br>(181/312)   | 100%     | 0.0001  |
| <b>Criterion 3 (ASSESS)</b>          | 4.6%<br>(15/324)     | 43.6%<br>(136/312)   | 100%     | 0.0001  |
| <b>Criterion 4 (ASSIST)</b>          | 100%<br>(1/1)        | 66.7%<br>(8/12)      | 100%     | /       |
| <b>Criterion 5 (ARRANGE)</b>         | 100%<br>(1/1)        | 100%<br>(12/12)      | 100%     | /       |
| <b>No. of quitters</b>               | 0                    | 4                    | /        | /       |
| <b>No. of patients referred SCCC</b> | N/A                  | 41                   | /        | /       |

(No. of quitters = number of smokers whose smoking status changed from Smoker to Ex-smoker during the one-year second phase.)  
(SCCC = Smoking Counseling and Cessation Centre.)

## Key messages

1. Smoking cessation in patients with chronic diseases is a commendable clinical audit topic.
2. A targeted team approach can achieve significant improvements.
3. High degree of relieving staff is an important systemic setback.
4. A well-designed audit setup including a pilot study can truthfully reflect the process improvement.

## Impact on patient care

The benefits brought about by the implementation were not limited to service improvement, but also a change in attitude of all clinic staff. Many dedicated colleagues continued to keep updating patients' smoking status, assessing patient's willingness to quit or even referring patients to SCCC after the formal audit period has ended. This is indeed an atmosphere and motivation brought about by the audit, continuing the *audit spiral*.<sup>28</sup>

## Limitations

One limitation of this audit is that it is not easy to motivate locum doctors to adhere well to the audit protocol. The resident doctors of the principal investigator's clinic are on average more motivated because there are more regular liaisons during the audit period.

Another weakness of the audit is that the record reviewing process demands a high professional time input. Although the computer system is able to capture the smoking status of patients, it is not possible to draw such data by the frontline clinician without the help of the central information technology (IT) team. Currently, the reviewing process is mainly manually performed. Enhancement in computer system and close liaison with the IT team in planning would probably facilitate future audits.

## Future directions

Further audits should be considered to assess smoking cessation management among patients without chronic illness, and also to review the management provided by nurses.

## Conclusions

By completing a clinical audit cycle and combining a targeted team approach to implement changes, it is possible to bring about significant improvements in the process of care of smoking cessation intervention. However, systems limitations and human factors prevent clinical performance to approach pre-set standards. Further changes in care delivery are expected to result in further improvement. Further audits encompassing patients without chronic illnesses, or including nursing interventions, should be considered.

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# The Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings – translating evidence into practice

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## Summary

*Hypertension is the most common chronic disease among people aged 15 years or above in Hong Kong. It is the second commonest reason for consultation in primary care. The Reference Framework for Hypertension Care for Adults in Primary Care Settings was published by the Task Force on Conceptual Model and Preventive Protocols of the Working Group on Primary Care in 2010 in order to translate medical research evidence into health benefit of our population. It is a consensus document endorsed by various stakeholders including patient groups and primary care doctors and considered to be the most appropriate and feasible application of evidence to Hong Kong's primary care. This article discusses how the family doctor can translate the Framework recommendations on hypertension management into daily practice. It is believed that adoption of the reference framework can lead to more effective management of this common chronic condition in primary care settings.*

## 摘要

高血壓是15歲或以上香港人最常見的慢性疾病，也是基層醫療中的第二種最常見診症原因。為將醫學研究結

果轉化成病人的健康效益，基層醫療概念模式和預防工作常規專責小組在2010年出版了治理成年人高血壓的參考概覽。這份文獻的制訂得到各方面人士的共識，其中包括病人團體和基層醫療醫生的利益相關者。它被認為是在香港基層醫療最合適和可行的做法。本文論述家庭醫生可以如何將參考概覽中的建議應用在日常高血壓的預防及治療上。我們認為參考概覽的採用能在基層醫療更有效地處理這常見的慢性病。

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## Introduction

Hypertension is the commonest chronic disease in Hong Kong with a prevalence of 27% among people aged 15 years or above.<sup>1</sup> It is the second commonest reason for consultation in primary care.<sup>2</sup> The evidence on the association between high blood pressure and premature death and stroke has been known since the publication of the Society of Actuaries study on body build and blood pressure in 1959.<sup>3</sup> Tens of thousands of research studies confirmed the harm of hypertension and the benefit of treatment to lower blood pressure. The Prospective Study Collaboration (PSC) meta-analysis of over a million subjects from 61 studies concluded that at all blood pressure levels down to 115/75 mmHg, a 10mmHg systolic blood pressure (SBP) or a 5mmHg diastolic blood pressure (DBP) reduction is associated with a 40% and 30% relative risk reduction (RRR) in stroke and other vascular mortalities respectively.<sup>4</sup> Other studies have shown that a reduction of as little as 2 mmHg in DBP could reduce cardiovascular complications significantly.<sup>5</sup> Many drugs have been shown to be effective in lowering blood pressure and reduction of cardiovascular complications.<sup>6,7</sup>

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Translation of medical research evidence into health benefit of the population is always a challenge. Wilber and Barrow described the “rule of halves” in the rates of detection, treatment and control of hypertension were all around 50% among the relevant populations in the U.S. in 1972,<sup>8</sup> which was later also observed in many other populations.<sup>9,10</sup> The Hong Kong Population Health Survey 2003-2004 found that only 44.5% of those with high blood pressure were diagnosed.<sup>1</sup> A survey on the management of hypertension among local primary care doctors found that only 30% would start treatment for patients with blood pressure >140/90 and the control targets of SBP <140 and DBP <90 were adopted by only 26% and 47% of the surveyed doctors respectively.<sup>11</sup>

To promote best practice, the World Health Organisation (WHO)<sup>12</sup> and many overseas national professional bodies have developed guidelines on the treatment of hypertension.<sup>7, 13, 14</sup> Similar initiative was also called for to assure the quality of care of hypertension for our population in Hong Kong.<sup>11</sup>

### The Hong Kong Reference Framework

The Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings, which is available online ([www.fhb.gov.hk](http://www.fhb.gov.hk) and [www.pco.gov.hk](http://www.pco.gov.hk)),<sup>15</sup> was first published in 2010 to address the needs of our local practice, and is being updated regularly. It is a consensus document endorsed by various stakeholders including patient groups and primary care doctors and is considered to be the most appropriate and feasible application of evidence to Hong Kong’s primary care. The framework consists of a core document and eight modules. Summary of the hypertension reference framework is shown in **Figure 1**.

The core document describes the principles of the management of hypertension from primary prevention to patient empowerment for self-management, and makes evidence-based recommendations for practice as summarized in **Table 1**.

### Translating research evidence into daily practice

The commitment of both public and private primary care doctors, to the prevention, detection and management of adults with hypertension is of primary

importance. We need to assure the public that primary care doctors have the needed competence and support services to manage hypertension to a high standard.

### Prevention & Screening of Hypertension

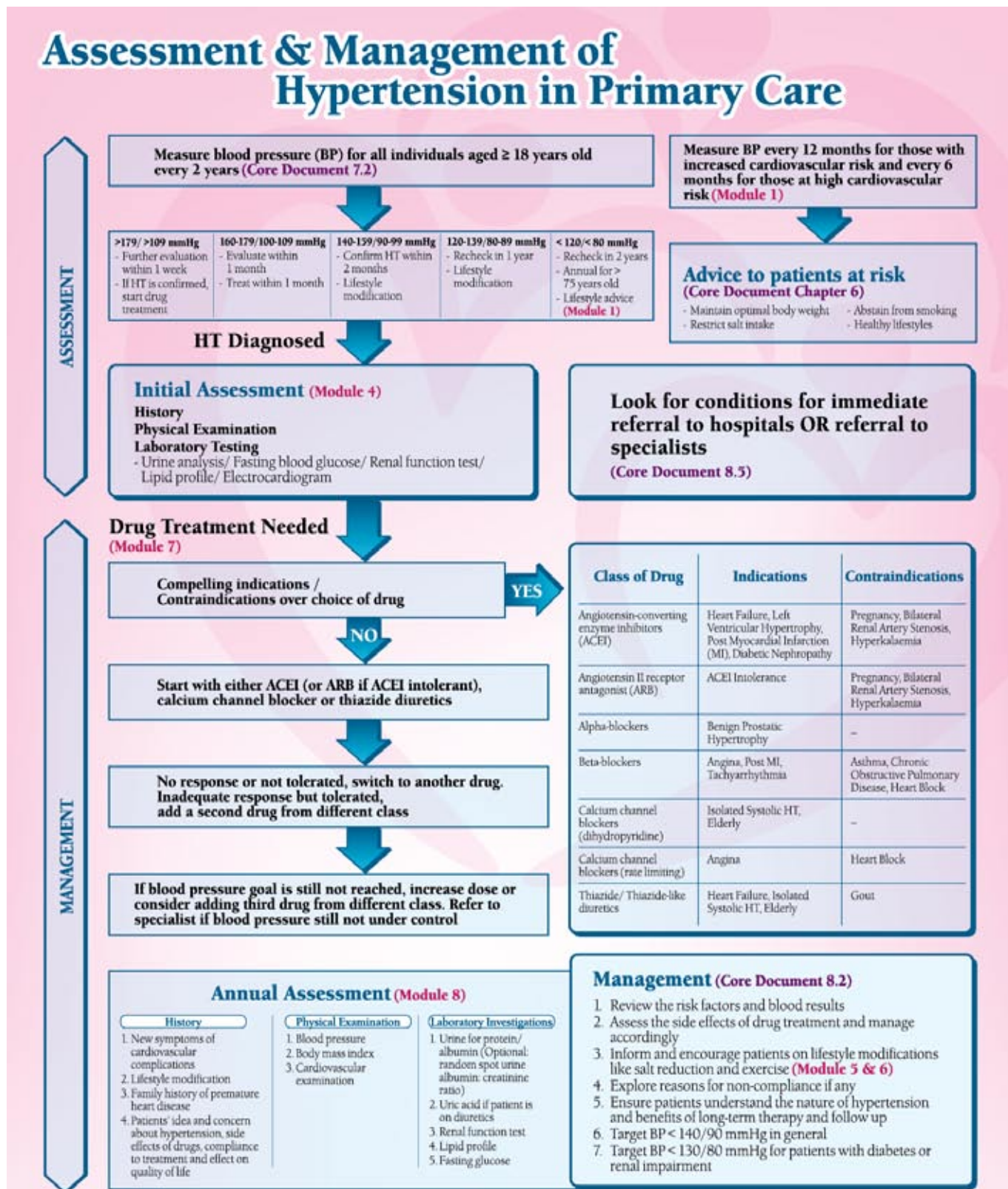
Every primary care consultation is an opportunity for preventing and screening hypertension. People in Hong Kong consult primary care an average of 8 times a year and 80% of the population would have consulted primary care at least once within a year<sup>16,17</sup> which provides plenty of opportunities for doctors “to advise individuals at increased risk of developing hypertension and patients with hypertension to maintain optimal body weight, restrict dietary salt, abstain from smoking, and practise healthy lifestyles”, and to carry out opportunistic blood pressure measurement for all adults aged 18 or above.<sup>15</sup> Classification of blood pressure and recommendations for frequency of blood pressure screening is summarized in **Table 2**.<sup>13</sup>

To ensure efficient service delivery to all eligible patients, a system for identifying eligible patients, accurate blood pressure measurement (Module 2 of Reference Framework), counseling on lifestyle modifications, recalling high-risk patients, and proper record keeping must be incorporated into routine practice. There should be an agreed protocol among primary care team members on who, when, what and how various tasks are to be carried out. The medical record must provide continuous recording and promote easy retrieval of blood pressure measurements as well as data on lifestyle, health advice, cardiovascular risk factors and other relevant parameters. An illustration of a supplementary record sheet or module for hypertension care is shown below (**Figure 2**).

To serve the purpose, dietary and physical exercise advice needs to be very specific (Modules 5 and 6 of the Reference Framework).<sup>15</sup> Repeated counseling and coordinated input from different health professionals including dietitians, physiotherapists (for exercise counseling), nurses from smoking cessation counseling clinic, are needed to enhance the effectiveness of various preventive advice.<sup>16, 18</sup> It cannot be over-emphasized that screening of hypertension is worthwhile only if patients with suboptimal BP are adequately reviewed in order to establish the diagnosis and to provide appropriate treatment. Hypertension should confirm if blood pressure is persistently high in at least



Figure 1: One-page summary of the Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings



Extracted from the Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings which is available at [www.fhb.gov.hk](http://www.fhb.gov.hk) and [www.pco.gov.hk](http://www.pco.gov.hk) Developed by the Task Force on Conceptual Model and Preventive Protocols of the Working Group on Primary Care October 2011

**Table 1: Recommendations of the Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings<sup>15</sup>****Prevention of Hypertension – Adoption of a Healthy Life Style**

- 1 Advise individuals at risk of developing hypertension and patients with hypertension to maintain optimal body weight, restrict dietary salt, abstain from smoking, and practise healthy lifestyles.

**Early Identification of People with Hypertension**

- 2 Opportunistic blood pressure measurement in all adults from 18 years of age at least every 2 years, with appropriate follow up actions according to blood pressure results
  - BP120-139/80-89 mmHg: re-check 1 year + lifestyle
  - BP140-159/90-99 mmHg: confirm within 2 months + lifestyle
  - BP160-179/100-109 mmHg: evaluate within 1 month + lifestyle, and drug treatment if high blood pressure is confirmed.
  - BP>180/110 mmHg: further evaluation within 1 week+ lifestyle, and drug treatment if high blood pressure is confirmed.

**Management of Adults with Hypertension**

- 3 Initial comprehensive assessment for co-existing cardiovascular risk factors or other problems that may affect prognosis and treatment
  - Cigarette smoking
  - Obesity
  - Physical inactivity
  - Dyslipidaemia
  - Diabetes mellitus
  - Microalbuminuria or estimated GFR < 60 ml/min
  - Age (older than 55 for men, 65 for women)
  - Family history of essential hypertension and premature cardiovascular disease (men under 55 or women under 65)
- 4 Adoption of a healthy lifestyle with the following modifications
  - Encourage overweight (BMI  $\geq$  23) and obese (BMI  $\geq$  27.5) hypertensive patients to lose weight
  - Increase consumption of fruits and vegetables to 5 portions per day, and reduce total and saturated fat consumption
  - Reduce salt intake to less than 5 g (around 1 teaspoon of table salt) per day and not to use added salt.
  - Increase level of physical activity and take regular exercises ( aerobic exercise >30 min per day and resistance exercise 8-10 sets at 8-12 repetitions per set 2-3 times per week).
  - Reduce alcohol intake to no more than two drinks per day for men and 1 drink per day for women
  - Encourage to stop smoking and refer to smoking cessation services if needed.
- 5 Start drug treatment in patients with sustained BP  $\geq$  140/90 mmHg despite lifestyle modification or if target organ damage is present. Start with angiotensin converting enzyme inhibitor (ACEI) / Calcium Channel Blocker (CCB) / thiazide diuretic, switch if there is side effect, add if inadequate BP control.
- 6 Goal of therapy for simple hypertensive patients is <140/90 mmHg, and <130/80 mmHg for patients with hypertension and diabetes or chronic kidney diseases respectively.
- 7 Regular follow up after initiating antihypertensive drug treatment
  - Every 2 weeks until blood pressure goal is achieved. More frequent visits may be indicated for patients with BP 160/100 mmHg, or with complications.
  - Every 6-12 weeks after blood pressure goal is achieved
  - Annual assessment of lifestyle, drug adherence and side effects, family history of premature coronary heart diseases, BMI, urine protein, renal function, lipid profile, and fasting blood sugar
- 8 Referrals to hospital or specialists are indicated for the following patients
 

Immediate referral to hospital

  - Malignant hypertension
  - Accelerated hypertension DBP >130mmHg and retinal haemorrhage
  - Persistent BP >220/120 mmHg despite rest or drug treatment
  - Pregnancy and BP 140/90 mmHg and >20 weeks gestation, or signs and symptoms of pre-eclampsia

Referral to specialists

  - Suspected secondary hypertension
  - Patients aged 30 or below
  - Hypertension in pregnancy < 20 weeks gestation without signs or symptoms of pre-eclampsia.
  - Patients with progressive complications
  - Medication problems such as severe drug reaction, treatment resistance, multiple drug intolerance, or multiple drug contraindications

*Adapted from the Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings<sup>15</sup>*

3 properly measured seated blood pressure readings, each at least 1 week apart during office visits. People with BP >180/110 mmHg should be further evaluated within 1 week; those with levels of 160-179/100-109 mmHg should be evaluated again within 1 month; while those with levels of 140-159/90-99 mmHg should be re-checked within 2 months to confirm the diagnosis, in addition to providing lifestyle advice (**Table 1**).<sup>15</sup> Medical records of patients with raised blood pressure should be flagged for repeat blood pressure measurements. Furthermore the practice should set up a recall system to remind patients due for follow up. 24-hour ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) for seven consecutive days are suitable alternatives for confirming the diagnosis of hypertension.<sup>7</sup> A modeling study in

the United Kingdom suggested that 24-hour ambulatory blood pressure may be the most cost-effective method for diagnosing hypertension<sup>19</sup> but it needs to be confirmed by empirical clinical studies before it can be recommended as a routine practice.

### Management of Adults Hypertension

Patients confirmed to have hypertension should be evaluated for possible secondary hypertension, co-existing cardiovascular risk factors, or target organ damage (**Table 1**). The details for evaluation on possible secondary hypertension and target organ damage assessment have been described in Module 3 and Module 4 of the Reference Framework respectively.<sup>15</sup> To achieve this, direct access to reliable and affordable investigation services is essential.

**Table 2: Classification of blood pressure and recommendations for frequency of blood pressure screening (Adapt from the seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure)<sup>13</sup>**

| Blood pressure classification <sup>Note 1</sup> | Initial Blood Pressure (mmHg) <sup>Note 2</sup> |           | Recommended minimum review period <sup>Note 3</sup>        | Action                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|-------------------------------------------------|-----------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | Systolic                                        | Diastolic |                                                            |                                                                                                                                                                                                                                                                                   |
| Normal                                          | <120                                            | <80       | Recheck in 2 years (annual check for adult aged >75 years) | Encourage to adopt healthy lifestyle                                                                                                                                                                                                                                              |
| Pre- hypertension                               | 120-139                                         | 80-89     | Recheck in 1 year                                          | Lifestyle modification                                                                                                                                                                                                                                                            |
| Stage I hypertension                            | 140-159                                         | 90-99     | Confirm within 2 months <sup>Note 4</sup>                  | Lifestyle modification                                                                                                                                                                                                                                                            |
| Stage II hypertension                           | 160-179                                         | 100-109   | Evaluate within one month                                  | <ul style="list-style-type: none"> <li>Treat within one month</li> <li>Lifestyle modification</li> </ul>                                                                                                                                                                          |
|                                                 | >180                                            | >110      | Further evaluation within one week                         | <ul style="list-style-type: none"> <li>If high blood pressure is confirmed, drug treatment should be commenced</li> <li>May warrant urgent referral if patient presents features suggestive of malignant hypertension (Refer to Box 2)</li> <li>Lifestyle modification</li> </ul> |

Note 1. The classification is based on the average of 3 or more properly measured seated blood pressure readings, at least 1 week apart on office visits.<sup>21</sup>

Note 2. If systolic and diastolic categories are different, follow recommendations for shorter review period.

Note 3. Modify review period according to reliable information about past blood pressure measurements, other cardiovascular risk factors, or target organ diseases.

Note 4. Updated NICE guideline in August 2011.<sup>7</sup> If the clinic blood pressure is 140/90 mmHg or higher, offer ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of hypertension. If a person is unable to tolerate ABPM, home blood pressure monitoring (HBPM) is a suitable alternative to confirm the diagnosis of hypertension. When using ABPM to confirm a diagnosis of hypertension, ensure that at least two measurements per hour are taken during people's usual waking hours (for example, between 08:00 and 22:00). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension. When using HBPM to confirm a diagnosis of hypertension, ensure that: for each blood pressure recording, two consecutive measurements are taken, at least 1 minute apart and with the person seated and blood pressure is recorded twice daily, ideally in the morning and evening and blood pressure recording continues for at least 4 days, ideally for 7 days. Discard the measurement taken on the first day and use the average value of all the remaining measurements to confirm a diagnosis of hypertension.

Figure 2: Example of Medical Record Template for Continuing Health Assessment and Hypertensive Care

| Health Assessment Chart -All Adults |  |  |  |  |  |  |  |  |  |  |
|-------------------------------------|--|--|--|--|--|--|--|--|--|--|
| Date                                |  |  |  |  |  |  |  |  |  |  |
| Family History                      |  |  |  |  |  |  |  |  |  |  |
| Weight                              |  |  |  |  |  |  |  |  |  |  |
| Height                              |  |  |  |  |  |  |  |  |  |  |
| BMI                                 |  |  |  |  |  |  |  |  |  |  |
| B.P.                                |  |  |  |  |  |  |  |  |  |  |
| Drinking                            |  |  |  |  |  |  |  |  |  |  |
| Smoking                             |  |  |  |  |  |  |  |  |  |  |
| Exercise                            |  |  |  |  |  |  |  |  |  |  |
| Diet                                |  |  |  |  |  |  |  |  |  |  |
| Others                              |  |  |  |  |  |  |  |  |  |  |

|                             | HT Initial Assessment | HT Follow up Assessment |  |  |  |  |
|-----------------------------|-----------------------|-------------------------|--|--|--|--|
| Lens & Fundi                |                       |                         |  |  |  |  |
| Peripheral Pulse            |                       |                         |  |  |  |  |
| Cardiovascular Examination  |                       |                         |  |  |  |  |
| Fasting Blood Sugar         |                       |                         |  |  |  |  |
| Renal Function Test         |                       |                         |  |  |  |  |
| Urine for protein / albumin |                       |                         |  |  |  |  |
| Lipids                      |                       |                         |  |  |  |  |
| ECG                         |                       |                         |  |  |  |  |
| Drugs Regimen               |                       |                         |  |  |  |  |
| Others                      |                       |                         |  |  |  |  |

The treatment of hypertension starts with lifestyle modifications similar to those recommended for prevention, therefore support from relevant multi-disciplinary services is necessary. Patients with malignant hypertension (DBP > 130 and heavy proteinuria, papilloedema or encephalopathy) or accelerated hypertension (DBP > 130mmHg and retinal hemorrhage) should be referred to the hospital immediately. Drug treatment should be started, if hypertension is confirmed, within one week for patients with blood pressure >180/110 mmHg, within one month for patients with blood pressure of 160-179/100-109 mmHg, and for those with sustained blood pressure of 140-159/90-99 mmHg despite lifestyle modifications for 6 months. Angiotensin converting enzyme inhibitors (ACEI), calcium channel blockers (CCB), and thiazide diuretics are recommended as first-line drugs for hypertension. Beta blockers are no longer recommended as first line drugs for uncomplicated hypertension. The choice of drug needs to be individualized according to

other patient characteristics, e.g. diuretics should be avoided in patients with co-existing gout. A detailed description of the different anti-hypertensive drugs is described in Module 7 of the reference framework.<sup>15</sup> Since some patients may be reluctant to commit to life-long anti-hypertensive drug treatment, continuing follow up and motivational counseling by the family doctor would be helpful. A treatment algorithm is illustrated in **Figure 3**.

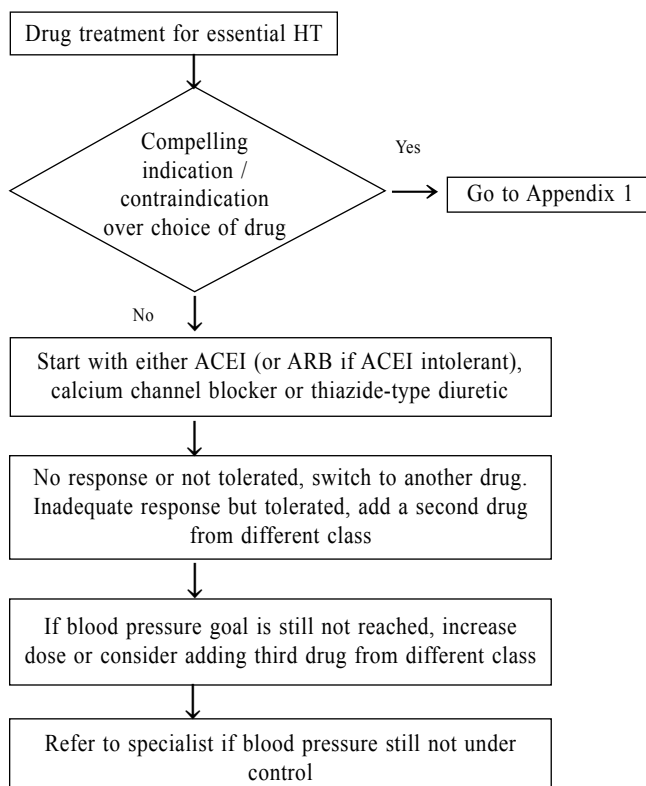
Patients should be followed up two weekly after initiation of drug treatment until the target blood pressure is attained, after which the follow-up intervals can be increased to 8-12 weeks.

Over 90% of the adult patients with hypertension can be managed exclusively in primary care but referral to specialists for further management is recommended for patients with high risk of complications or features suggestive of secondary hypertension (**Table 1**).

**Key messages**

1. Hypertension is the commonest chronic disease among people aged 15 years or above in Hong Kong.
2. Hypertension is the second commonest reason for consultation in primary care.
3. The Reference Framework for Hypertension Care for Adults in Primary Care Settings was published by the Task Force on Conceptual Model and Preventive Protocols of the Working Group on Primary Care in 2010 in order to translate medical research evidence into health benefit of our population.
4. It is believed that adoption of the reference framework can lead to more effective management of hypertension in primary care settings.
5. Implementation of the recommendations requires appropriate organization of the work flow and medical records, and adequate support from laboratory and other health professionals.

**Figure 3: Treatment algorithm for people with Hypertension**



**The family doctor**

Local research has shown that having a regular family doctor is associated with a higher likelihood of blood pressure screening and healthy lifestyle.<sup>20</sup> The family doctor’s emphasis on a continuing trusting doctor-patient relationship and person-centred care is the key to the appropriate translation of recommendations into individualized management. However, family doctors are only part of the larger health care delivery system, the proper function of which requires the co-ordinated input from different partners including patients, the government, specialists, academia, other health professionals, laboratories, community services. The public and medical profession need to make a joint effort to prevent, detect and manage hypertension better in Hong Kong to break the “rule of halves”.<sup>8</sup> ■

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### Appendix 1: Compelling and Possible Indications and Contraindications for the Major Classes of Antihypertensive Drugs

| Class of Drug                                                       | Compelling Indications                                                                                 | Possible Indications                                                                                                     | Compelling Contraindications                                  | Possible Contraindications                                                      |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------|
| ACE Inhibitors (ACEI)                                               | Heart failure,<br>Left ventricular dysfunction,<br>Post myocardial infarction,<br>Diabetic nephropathy | Proteinuria renal disease                                                                                                | Pregnancy, Bilateral renal artery stenosis,<br>Hyperkalaemia  | Renal impairment<br>Close monitoring of electrolyte and creatinine level needed |
| Angiotensin II Receptor Blockers (ARB)                              | ACE inhibitor intolerance                                                                              |                                                                                                                          | Pregnancy, Bilateral renal artery stenosis, Hyperkalaemia     | Renal impairment<br>Close monitoring of electrolyte and creatinine level needed |
| Alpha-Blockers                                                      | Benign prostatic hypertrophy                                                                           |                                                                                                                          |                                                               | Orthostatic hypotension                                                         |
| Beta-Blockers                                                       | Angina, Post myocardial infarction<br>Tachyarrhythmias                                                 | Heart failure (Metoprolol succinate sustained releasing, Bisoprolol, and Carvedilol at medium to high dose) <sup>a</sup> | Asthma, chronic obstructive pulmonary disease,<br>Heart block | Peripheral vascular disease                                                     |
| Calcium Channel Blockers (dihydropyridine)                          | Elderly patients,<br>Isolated systolic hypertension                                                    | Peripheral vascular disease                                                                                              |                                                               | Congestive heart failure                                                        |
| Calcium Channel Blockers (rate limiting, e.g. verapamil, diltiazem) | Angina                                                                                                 |                                                                                                                          | Heart block                                                   | Congestive heart failure, combination with beta-blockers                        |
| Thiazide / thiazide-like Diuretics                                  | Heart failure,<br>Elderly patients,<br>Isolated systolic hypertension                                  |                                                                                                                          | Gout                                                          | Dyslipidaemia, Pregnancy,<br>Sexually active males                              |

a. Metoprolol succinate slow release, bisoprolol and carvedilol were shown by RCT to be beneficial in patients with heart failure.

# An incidental finding in a man with psoriasis

King-man Ho

Readers are invited to participate in the Clinical Quiz. A prize draw, sponsored by Pfizer Corporation Hong Kong Limited, will be undertaken among the successful entries. For entry into the draw, simply answer the question, fill in the reply slip and return it to the College by 18 August 2012. Each reader is allowed to submit one entry only. The name of the winner and the answer will be published in the September 2012 issue.

## Clinical history:

This gentleman known to have psoriasis was found incidentally to have skin changes as shown.



## What is the most likely diagnosis?

- A. Erythrodermic psoriasis
- B. Mycosis fungoides
- C. Tinea incognito
- D. Ichthyosis

### *The Hong Kong Practitioner* Clinical Quiz – June / 2012

Answer :

Name : \_\_\_\_\_

Tel. No. : \_\_\_\_\_

Address : \_\_\_\_\_

Date : \_\_\_\_\_

Please send your answer to :- **HKCFP**  
Room 802, 8/F., Duke of Windsor Social Service Building, 15 Hennessy Road, Hong Kong.

The slide and the question were prepared by:  
**Dr King-man Ho**, FRCP (Glasg, Edin), MRCP (UK), FHKCP, FHKAM (Medicine)  
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**Answer to last month's Clinical Quiz****Question:**

An 11-year old girl with complex genetic disease presented with poor bone mineralization (see figure). She is on liquid formula via G-tube. She was never on total parenteral nutrition. Her only medication includes valproic acid, which she has been on since the age of 2 for her seizure activities. Laboratory investigations were significant for: normal renal functions, low bicarbonate at 16 mmol/L (16 mEq/dL),

The winner of the March 2012 Clinical Quiz is **Dr Ho Tai Wai, David**

low phosphate level at 0.57 mmol/L (1.8 mg/dL), normal ionized calcium and elevated alkaline phosphatase. Urine was positive for glucose and protein. Further testings confirmed that she has high renal loss of sodium, potassium, bicarbonate, amino acids, calcium and phosphorus.

**Answer:**

C. Prolong use of valproic acid

The patient presented with osteopenia and bone demineralization. The laboratory investigations showed that she had renal Fanconi syndrome with generalized proximal tubulopathy. While prolonged non-ambulation and poor diet may lead to rickets, they did not explain the urine findings. Genetic conditions such as Lowe's syndrome may present with Fanconi, but it is usually associated with renal dysfunction. Hence, the most likely cause of her Fanconi syndrome was secondary to the rare but well documented side effect of the valproic acid. Valproic acid was discontinued and the patient was supplemented with vitamin D, phosphorus and citrate. Her renal Fanconi resolved after 12 months and she is currently not requiring any more supplementation.



# What's in the web for family physicians – multimedia musculo-skeletal resources

Alfred KY Tang 鄧權恩, Wilbert WB Wong 王維斌

## A Practical Guide to Clinical Medicine: Musculo-Skeletal Examination

<http://meded.ucsd.edu/clinicalmed/joints.htm>

This is a website dedicated to physical examination skills of the musculoskeletal system. Clinical examination of all important joints of the body are covered at the website, and teaching materials are all in multimedia format, well illustrated by photos and videos. More detailed descriptions of the shoulder, knee and low back examinations are included as these are the more commonly affected joints. Review of relevant anatomy, function and common disorders are also described for most of the major joints.

## Clinical assessment of the musculoskeletal system

<http://www.arthritisresearchuk.org/~media/Files/Education/Student%20handbook%2011-1.ashx>

This online handbook (2011 Edition), published by Arthritis UK, provides revision materials on regional examination of the musculoskeletal system, as well as screening and diagnosis of common musculoskeletal problems. It outlines the simple screening method, **GALS**, by which observing the **gait, arms, legs and spine** of a patient can give valuable clues to identification of potential neuromuscular disorders. Demonstrations of clinical examination techniques of spine, upper and lower limbs are also available in the handbook.

## Procedural Skills Resources : Musculoskeletal

<http://guides.lib.uiowa.edu/content.php?pid=5859&sid=36912>

This website is maintained by the University of Iowa Libraries. The webpage on Procedural Skill Resources

has a collection of videos and weblinks which cover many common medical procedures. The section of musculoskeletal medicine has hyperlinks on clinical skills involved in the physical examination of different joints of the body, and there are tutorials and videos on arthrocentesis of the knee joint and well as intra-articular injections of the knee and shoulder joints. It is a useful site for family physicians looking for videos on physical examination skills as revision and also keeping themselves updated on medical procedures of musculoskeletal system.

## Guidelines for pain relief

[http://www.nhmrc.gov.au/\\_files\\_nhmrc/publications/attachments/cp104\\_3.pdf](http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cp104_3.pdf)

This is a comprehensive guideline for acute pain management developed by Australian and New Zealand College of Anaesthetist, and the Faculty of Pain Medicine (3<sup>rd</sup> edition, 2010). The guideline includes the basic patho-physiology of acute pain, different types of pharmacological and non-pharmacological interventions for acute pain and various methods to deal with acute pain in different clinical situations. The document consists of 490 pages of evidence based materials. The section on *Summary of Key Messages* allow users to revisit the main points covered in the Guideline at a glimpse.

## Muscle Energy Techniques (MET)

[http://www.mc.uky.edu/Athletic\\_training/docs/ModalityProject\\_MuscleEnergy\\_Spring2010.pdf](http://www.mc.uky.edu/Athletic_training/docs/ModalityProject_MuscleEnergy_Spring2010.pdf)

Muscle Energy Technique (MET) is a kind of manipulative treatment that a family physician can easily practice in his own clinic. It is a stretching technique which facilitates relaxation of tight muscles, leading to rapid and effective reduction of pain. The article, with the help of video clips, provides a good introduction and working knowledge on MET, allowing beginners to get acquainted with the skillset very readily.

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**Taping Techniques.com**

*<http://www.tapingtechniques.com/>*

Acute finger sprains, knee pain, foot and ankle sprain injuries are common conditions in general practice. Taping can be an easy yet effective way in dealing with these sports injuries. This website has a collection of videos showing different taping methods for ankle, foot, shoulder and back. There are also clinical photos which allow learners to pick up the technique more easily.

**Ankle Taping and Bracing**

*<http://emedicine.medscape.com/article/86495-overview#a15>*

Ankle injuries in sports are very commonly seen in our everyday practice. For patients prone to develop ankle injury, taping and bracing before sports engagement can be very useful. In this article, taping and bracing techniques of the ankle joint are introduced and outlined. The content is very useful to family physicians interested in sports medicine, especially when they are treating their patients or giving counselling to athletes. ■

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## Publication Committee : Problem-based Approach to Family Medicine

The Committee is pleased to announce the publication of the first academic book from the College – Problem-based Approach to Family Medicine. This comprehensive 500-paged book, full of coloured illustrations and photos, was written by a group of experienced family physicians using a scenario-based approach that simulates the work of a family physician. It contains 24 different clinical scenarios commonly encountered in family practice to illustrate the content and principles of Family Medicine. It is an excellent reference book in Family Medicine for undergraduates, practising family physicians and doctors of other specialties locally and world-wide. For non-members, the price of the book is \$300 and college members are entitled to a 30% discount\*\*\* (postage fee excluded). For those who are interested, please fill in the order form below. We know that you will find this book a valuable tool to further your learning as well as a way to appreciate the fine art of Family Medicine.

\*\*\* \$210 & \$300 is for self-collection at Wan Chai or Wong Chuk Hang office. Amount of postage fee depends on the no. of books ordered. For details, please contact Carmen Cheng at 2528 6618.



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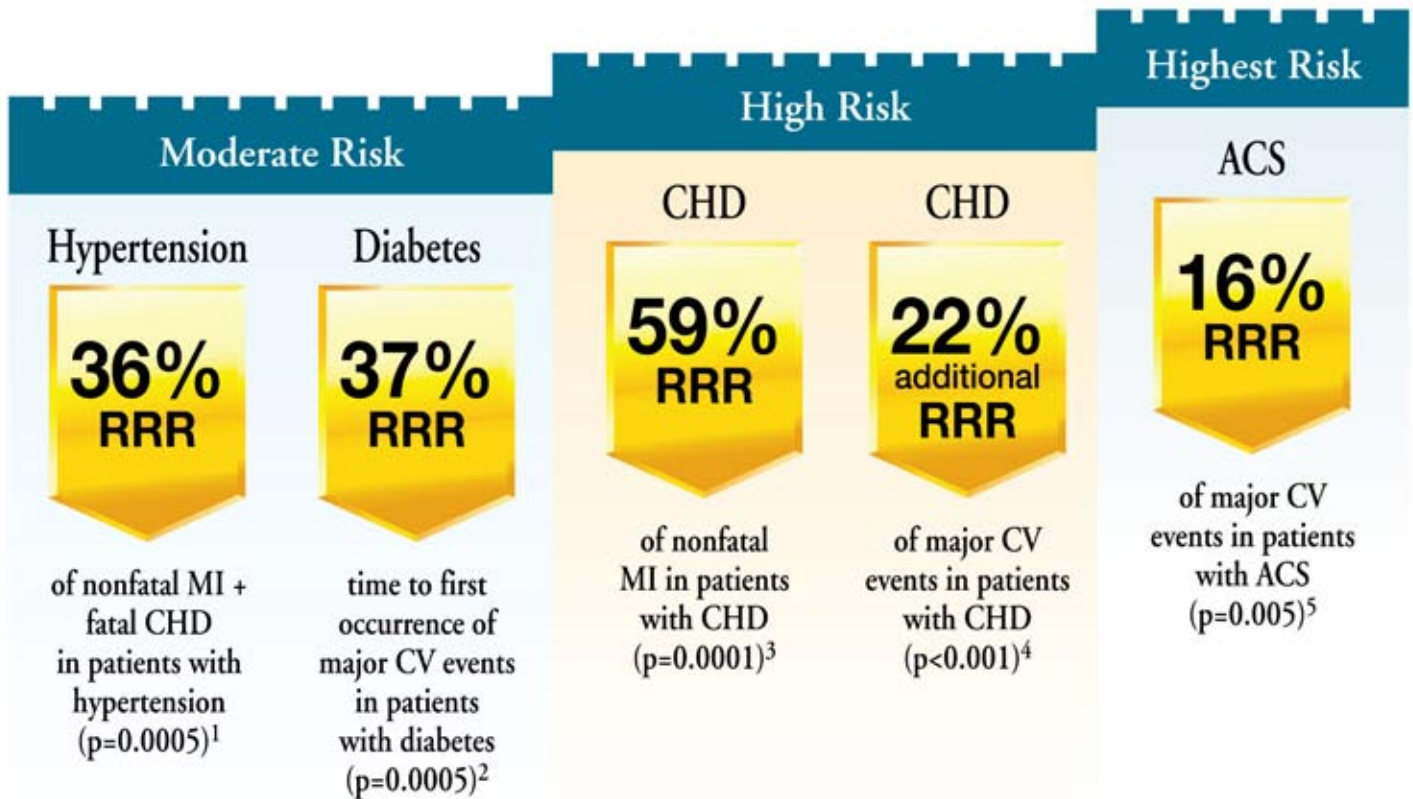




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**References:** 1. Sever PS, Dahlöf B, Poulter NR, et al; for the ASCOT investigators. Prevention of coronary and stroke events with atorvastatin in hypertensive patients who have average or lower-than-average cholesterol concentrations, in the Anglo-Scandinavian Cardiac Outcomes Trial-lipid lowering Arm (ASCOT-LLA): a multicentre randomised controlled trial. *Lancet*. 2003;361(9364):1149-1158. 2. Colhoun HM, Betteridge DJ, Durrington PN, et al, on behalf of the CARDS investigators. Primary prevention of cardiovascular disease with atorvastatin in type 2 diabetes in the Collaborative Atorvastatin Diabetes Study (CARDS): multicentre randomised placebo-controlled trial. *Lancet*. 2004;364(9435):685-696. 3. Athyros VG, Papageorgiou AA, Mavroukis BR, et al. Treatment with atorvastatin to the national cholesterol education program goal versus 'usual' care in secondary coronary heart disease prevention: the GREEK Atorvastatin and Coronary-heart-disease evaluation (GReACE) study. *Curr Med Res Opin*. 2002;18(4):220-228. 4. laRosa JC, Grundy SM, Waters DD, et al; for the Treating to New Targets (TNT) investigators. Intensive lipid lowering with atorvastatin in patients with stable coronary disease. *N Engl J Med*. 2005;352(14):1425-1435. 5. Cannon CP, Braunwald E, McCabe CH, et al; for the Pravastatin or Atorvastatin Evaluation and Infection Therapy-Thrombolysis in Myocardial Infarction 22 investigators. Intensive versus moderate lipid lowering with statins after acute coronary syndromes. *N Engl J Med*. 2004;350(15):1495-1504. **Detailed information is available upon request.**



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