

## **A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO NEW HORIZONS IN HYPERTENSION**

**some available as free full-text and some requiring payment**

**Selection of readings made by A/Prof Goh Lee Gan**

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### **READING 1 – Non-pharmacological aspects of blood pressure management**

**Hedayati SS, Elsayed EF, Reilly RF. Non-pharmacological aspects of blood pressure management: what are the data? *Kidney Int.* 2011 May;79(10):1061-70. Epub 2011 Mar 9. Review. PubMed PMID: 21389976.**

URL: <http://dx.doi.org/10.1038/ki.2011.46> (payment required)

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#### ABSTRACT

Hypertension affects 29% of US adults and is a significant risk factor for cardiovascular morbidity and mortality. Epidemiological data support contribution of several dietary and other lifestyle-related factors to the development of high blood pressure (BP). Several clinical trials investigated the efficacy of non-pharmacological interventions and lifestyle modifications to reduce BP. Best evidence from randomized controlled trials supports BP-lowering effects of weight loss, the Dietary Approaches to Stop Hypertension (DASH) diet, and dietary sodium (Na(+)) reduction in those with prehypertension, with more pronounced effects in those with hypertension. In hypertensive participants, the effects on BP of DASH combined with low Na(+) alone or with the addition of weight loss were greater than or equal to those of single-drug therapy. Trials where food was provided to participants were more successful in showing a BP-lowering effect. However, clinical studies with long-term follow-up revealed that lifestyle modifications were difficult to maintain. Findings from controlled trials of increased potassium, calcium, or magnesium intake, or reduction in alcohol intake revealed modest BP-lowering effects and are less conclusive. The reported effects of exercise independent of weight loss on BP are inconsistent. PMID: 21389976 [PubMed - indexed for MEDLINE]

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### **READING 2 – The effect of nutrition on blood pressure**

**Savica V, Bellinghieri G, Kopple JD. The effect of nutrition on blood pressure. *Annu Rev Nutr.* 2010 Aug 21;30:365-401. Review. PubMed PMID: 20645853.**

URL: <http://www.annualreviews.org/doi/pdf/10.1146/annurev-nutr-010510-103954> (payment required)

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#### ABSTRACT

The incidence and severity of hypertension are affected by nutritional status and intake of many nutrients. Excessive energy intake and obesity are major causes of hypertension. Obesity is associated with increased activity of the renin-angiotensin-aldosterone and sympathetic nervous systems, possibly other mineralocorticoid activity, insulin resistance,

salt-sensitive hypertension and excess salt intake, and reduced kidney function. High sodium chloride intake strongly predisposes to hypertension. Increased alcohol consumption may acutely elevate blood pressure. High intakes of potassium, polyunsaturated fatty acids, and protein, along with exercise and possibly vitamin D, may reduce blood pressure. Less-conclusive studies suggest that amino acids, tea, green coffee bean extract, dark chocolate, and foods high in nitrates may reduce blood pressure. Short-term studies indicate that specialized diets may prevent or ameliorate mild hypertension; most notable are the Dietary Approaches to Stop Hypertension (DASH) diet, which is high in fruits, vegetables, and low-fat dairy products, and the DASH low-sodium diet. Long-term compliance to these diets remains a major concern. PMID: 20645853 [PubMed - indexed for MEDLINE]

### READING 3 – Ambulatory blood pressure monitoring

**7: Kanbay M, Turkmen K, Ecdar T, Covic A. Ambulatory blood pressure monitoring: from old concepts to novel insights. *Int Urol Nephrol*. 2011 Jul 6. [Epub ahead of print] PubMed PMID: 21732053.**

URL: <http://www.springerlink.com/content/4m6252043xr63t51/> (payment required)

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#### ABSTRACT

Ambulatory blood pressure monitoring (ABPM) is an out-of-office technique for the assessment of 24-h blood pressure measurements. ABPM is indicated to diagnose many conditions, including white-coat hypertension, resistant hypertension, episodic hypertension, nocturnal hypertension, autonomic dysfunction, hypotension secondary to excessive usage of antihypertensive medication, and masked hypertension. ABPM gives a better prediction of clinical outcomes in patients with hypertension and cardiovascular diseases when compared to office blood pressure measurements. Recently, several new indices have been introduced with the aim of predicting various clinical end-points in several patient populations. In this review, we aimed to determine the clinical utility of 24-h ABPM and its potential implications for the management of hypertension in patients with a high risk of cardiovascular mortality and morbidity, as well as various novel indices that can predict clinical end-points in different patient populations. PMID: 21732053 [PubMed - as supplied by publisher]

### READING 4 – Coping style and lifestyle factors and hypertension

**Ariff F, Suthahar A, Ramli M. Coping styles and lifestyle factors among hypertensive and non-hypertensive subjects. *Singapore Med J*. 2011 Jan;52(1):29-34. PubMed PMID: 21298238.**

URL: <http://smj.sma.org.sg/5201/5201a5.pdf> (free full text)

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#### ABSTRACT

**INTRODUCTION:** The objective of this study was to investigate the relationship between hypertensive patients and their coping style and associated lifestyle factors.

**METHODS:** A total of 502 participants attending nine outpatient clinics completed the validated Bahasa Malaysia version of the Coping Inventory for Stressful Situations and sociodemographic questionnaires. The height, weight, pulse rate and blood pressure of all the participants were measured using standardized methods.

**RESULTS:** A total of 264 (52.6 percent) participants were hypertensive, while 238 (47.4 percent) were not. Participants with

a high task-oriented core showed a significantly lower risk of hypertension compared to those with a low score (odds ratio [OR] 0.546; 95 percent confidence interval [CI] 0.371-0.804). Those with a high emotion-oriented coping score were associated with an increased risk of hypertension (OR 1.691; 95 percent CI 1.107-2.582). Hypertension was also significantly associated with a higher mean body mass index, positive family history of hypertension, history of diabetes mellitus and hypercholesterolaemia. In multiple logistic regression analysis with hypertension status as the dependent variable, a high emotion-oriented coping score, a low task-oriented coping score, age, body mass index, positive family history of hypertension and history of diabetes mellitus remain significant factors in the final model.

**CONCLUSION:** These results indicated a significant relationship between hypertension and coping styles and lifestyle factors. They underscored the importance of further study as well as the development and implementation of intervention measures to improve coping skills among hypertensive patients, which may be incorporated into the management of hypertension. PMID: 21298238 [PubMed - indexed for MEDLINE]

## READING 5 – Individualized guidelines in blood pressure management

**Eddy DM, Adler J, Patterson B, Lucas D, Smith KA, Morris M. Individualized guidelines: the potential for increasing quality and reducing costs. Ann Intern Med. 2011 May 3;154(9):627-34. PubMed PMID: 21536939.**

URL: <http://www.annals.org/content/154/9/627.long> (free full text)

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### ABSTRACT

**BACKGROUND:** Current guidelines focus on a particular risk factor and specify criteria for categorizing persons into a small number of treatment groups. **OBJECTIVE:** To compare current guidelines with individualized guidelines (that use readily available characteristics from each person to calculate the risk reduction expected from treatment and to identify persons for treatment in ranked order of decreasing expected benefit), in the context of blood pressure management. **DESIGN:** Analysis of person-specific, longitudinal data. **SETTING:** The ARIC (Atherosclerosis Risk in Communities) Study. **PARTICIPANTS:** Persons aged 45 to 64 years without preexisting cardiovascular disease who currently do not receive antihypertensive treatment. **INTERVENTION:** Treatment according to the criteria of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7 guidelines); individualized guidelines, or treatment in decreasing order of expected benefit; and random care, or treatment of persons selected at random. **MEASUREMENTS:** Number of myocardial infarctions (MIs) and strokes and medical costs. **RESULTS:** Compared with treating people according to random care, individualized guidelines could prevent the same number of MIs and strokes as JNC 7 guidelines at savings that are 67% greater than using JNC 7 guidelines, or it could prevent 43% more MIs and strokes for the same cost as treatment according to JNC 7 guidelines. The superiority of individualized guidelines was not sensitive to a wide range of assumptions about costs, treatment effectiveness, level of risk for cardiovascular disease in the population, or effects on workflow. The degree of superiority was sensitive to the accuracy of the method used to rank patients and to its span (the proportion of the population for whom all of the outcomes of interest can be calculated). **LIMITATIONS:** Specific results apply to the effects of blood pressure management on MI and stroke in the ARIC Study population. The methods for calculating individual benefits require quantitative evidence about the relationships among risk factors, long-term outcomes, and treatment effects. **CONCLUSION:** Use of individualized guidelines can help to increase the quality and reduce the cost of care. PMID: 21536939 [PubMed - indexed for MEDLINE]

## READING 6 – Role of vasodilating beta-blockers in controlling hypertension

**Basile JN. One size does not fit all: the role of vasodilating beta-blockers in controlling hypertension as a means of reducing cardiovascular and stroke risk. Am J Med. 2010 Jul;123(7 Suppl 1):S9-15. Review. PubMed PMID: 20609697**

URL: <http://www.sciencedirect.com/science/article/pii/S0002934310003396> (payment required)

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### ABSTRACT

Beta-blockers have played a key role in the management of hypertension-related cardiovascular disease for decades, and continue to be recommended as a mainstay of therapy in national guidelines statements. Recent data have shown less optimal reductions in total mortality, CVD mortality, and CVD events with beta-blockers compared with renin-angiotensin system-blocking agents or calcium channel blockers. The beta-blocker class, however, spans a wide range of agents, and the growing concern about the risk-benefit profile of beta-blockers should not be generalized to later-generation vasodilating beta-blockers such as carvedilol and nebivolol. A growing database from hypertension studies confirms the clinical efficacy and safety of vasodilating beta-blockers, and outcome studies indicate that these agents can play an important role in global CVD reduction in patients with hypertensive or ischemic heart failure. PMID: 20609697 [PubMed - indexed for MEDLINE]

## READING 7 – Management of hypertension in older persons

**Aronow WS. Office management of hypertension in older persons. Am J Med. 2011 Jun;124(6):498-500. PubMed PMID: 21605724.**

URL:

<http://www.sciencedirect.com.libproxy1.nus.edu.sg/science/article/pii/S0002934311001859> (payment required)

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### ABSTRACT

Antihypertensive drug therapy reduces cardiovascular events in older persons. In the Hypertension in the Very Elderly Trial, at 1.8-year follow-up, patients aged 80 years and older treated with antihypertensive drug therapy had a 30% reduction in fatal or nonfatal stroke ( $P=.06$ ), a 39% reduction in fatal stroke ( $P=.05$ ), a 21% reduction in all-cause mortality ( $P=.02$ ), a 23% reduction in death from cardiovascular causes ( $P=.06$ ), and a 64% reduction in heart failure ( $P<.001$ ). The goal of treatment of hypertension is to lower the blood pressure to less than 140/90 mm Hg in older persons and to less than 130/80 mm Hg in older persons with diabetes or chronic kidney disease if tolerated. The selection of antihypertensive drug therapy in persons with associated medical conditions depends on their medical conditions. Large meta-analyses of published trials show that thiazide diuretics, angiotensin-converting enzyme inhibitors, calcium channel blockers, angiotensin receptor antagonists, and beta-blockers do not significantly differ in their ability to lower blood pressure and to exert cardiovascular protection in older and younger persons. If the blood pressure is more than 20/10 mm Hg above the goal blood pressure, drug therapy should be initiated with 2 antihypertensive drugs. Other coronary risk factors must be treated. PMID: 21605724 [PubMed - indexed for MEDLINE]

**READING 8 – Approach to patient with drug-resistant hypertension**

**Townsend RR. Attending rounds: a patient with drug-resistant hypertension. Clin J Am Soc Nephrol. 2011 Sep;6(9):2301-6. Epub 2011 Aug 18. PubMed PMID: 21852665.**

URL: <http://cjasn.asnjournals.org/content/6/9/2301.full.pdf+html> (payment required)

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**ABSTRACT**

Drug-resistant hypertension is present in about one in eight patients with high BP. It can be a frustrating and expensive condition to pursue from an office-based perspective. In this review, utilizing the American Heart Association scientific statement on drug-resistant hypertension as a guide, a case of drug-resistant hypertension is presented and walked through exactly as encountered by the author. Woven into the discussion is a combination of insights from the literature on this topic, blended with the experience of the author. This is not intended as an exhaustive review of each step in the evaluation and management process but, rather, as an overview incorporating a few carefully chosen references and, hopefully, a logical and useful approach to a common clinical challenge. PMID: 21852665 [PubMed - in process]

**READING 9 – Diagnosis of secondary hypertension**

**Viera AJ, Neutze DM. Diagnosis of secondary hypertension: an age-based approach. Am Fam Physician. 2010 Dec 15;82(12):1471-8. Review. PubMed PMID:21166367.**

URL: <http://www.aafp.org/afp/2010/1215/p1471.html> (payment required)

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**ABSTRACT**

Secondary hypertension is a type of hypertension with an underlying, potentially correctable cause. A secondary etiology may be suggested by symptoms (e.g. flushing and sweating suggestive of pheochromocytoma), examination findings (e.g., a renal bruit suggestive of renal artery stenosis), or laboratory abnormalities (e.g., hypokalemia suggestive of aldosteronism). Secondary hypertension also should be considered in patients with resistant hypertension, and early or late onset of hypertension. The prevalence of secondary hypertension and the most common etiologies vary by age group. Approximately 5 to 10 percent of adults with hypertension have a secondary cause. In young adults, particularly women, renal artery stenosis caused by fibromuscular dysplasia is one of the most common secondary etiologies. Fibromuscular dysplasia can be detected by abdominal magnetic resonance imaging or computed tomography. These same imaging modalities can be used to detect atherosclerotic renal artery stenosis, a major cause of secondary hypertension in older adults. In middle-aged adults, aldosteronism is the most common secondary cause of hypertension, and the recommended initial diagnostic test is an aldosterone/renin ratio. Up to 85 percent of children with hypertension have an identifiable cause, most often renal parenchymal disease. Therefore, all children with confirmed hypertension should have an evaluation for an underlying etiology that includes renal ultrasonography. PMID: 21166367 [PubMed - indexed for MEDLINE]

## READING 10 - Malignant middle cerebral artery (MCA) infarction

**Treadwell SD, Thanvi B. Malignant middle cerebral artery (MCA) infarction: pathophysiology, diagnosis and management. Postgrad Med J. 2010 Apr;86(1014):235-42. Review. PubMed PMID: 20354047.**

URL: <http://pmj.bmj.com./content/86/1014/235.full.pdf> (payment required)

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### ABSTRACT

'Malignant MCA infarction' is the term used to describe rapid neurological deterioration due to the effects of space occupying cerebral oedema following middle cerebral artery (MCA) territory stroke. Early neurological decline and symptoms such as headache and vomiting should alert the clinician to this syndrome, supported by radiological evidence of cerebral oedema and mass effect in the context of large hemispheric infarction. The prognosis is generally poor, and death usually occurs as a result of transtentorial herniation and brainstem compression. Treatment options include general measures and pharmacological agents to limit the extent of oedema, and surgical decompression to relieve the pressure effects. Until recently there has been little evidence to guide appropriate treatment, though in the last few years randomised data have been published addressing the role of surgical decompression. A pooled analysis of three European randomised controlled trials suggests that hemicraniectomy performed within 48 h significantly reduces mortality, and improves functional outcome in selected patients, and this has been reflected in recent national guidelines. PMID: 20354047 [PubMed - indexed for MEDLINE]