

Introduction

Management of hypertension should be comprehensive and not directed only at blood pressure. It should also address its risk factors and causes, its complications and the other components of the metabolic syndrome, as well as their inter-related causes and risk factors. These conditions and factors form an interactive complex which must be addressed as a whole. The initial personal preventive and therapeutic approach is non-pharmaceutical. It should start when a diagnosis of hypertension or an associated condition is made or suspected.

RISK FACTORS FOR PRIMARY HYPERTENSION

age and gender
family history of the metabolic syndrome
metabolic syndrome
overweight and non-central obesity
high sodium intake
low potassium and magnesium intake
high sodium/potassium intake ratio
physical inactivity
intra-uterine under-nutrition
low birth weight
starvation during puberty
alcohol abuse and tobacco use
some medicines and herbal remedies
psycho-social stress

CAUSES OF SECONDARY HYPERTENSION

renal and adrenal disease
sleep apnoea
coarctation of the aorta
thyroid and parathyroid disease
some medicines and herbal preparations
eclampsia and pre-eclampsia predispose

* Extract from *Guidelines for the management of hypertension in primary care in South Africa*.
E Schultz. August 2004.

MEDICINES AND HERBAL PREPARATIONS ASSOCIATED WITH BLOOD PRESSURE ELEVATION

oral contraceptives, ACTH and cortico-steroids, cyclosporine
 sympatheticomimetics such as appetite suppressors,
 respiratory decongestants and amphetamines
 sodium-containing preparations such as urinary and gastric alkalisers
 anti-inflammatory agents - NSAIDs and COXIBs
 monoamine oxidase [MAO] inhibitors, tri-cyclic anti-depressants
 licorice, alcohol, tobacco, and cocaine
 herbal preparations like St John's wort, ephedra and bitter orange

COMPLICATIONS OF HYPERTENSION

COMPLICATIONS OF HYPERTENSION	
pressure-related disease:	
brain	arterial thrombosis or embolism
heart	left ventricular hypertrophy
	left ventricular failure, pulmonary oedema
vessels	aortic aneurysm
micro-vascular disease:	
brain	encephalopathy
retina	hypertensive retinopathy
kidney	renal impairment
macro-vascular disease:	
brain	arterial thrombosis or embolism
retina	atherosclerotic retinopathy
heart	coronary artery disease
kidney	renal impairment
vessels	dissecting aortic aneurysm
	carotid artery disease
	intermittent claudication

RISK FACTORS FOR THE COMPLICATIONS OF HYPERTENSION

the height of blood pressure elevation
 risk factors for hypertension
 other components of the metabolic syndrome
 damaged target organs = other complications
 increased platelet aggregation
 elevated renin, homocysteine and fibrinogen
 elevated c-reactive protein levels
 polycythaemia and anaemia
 NSAIDs and COXIBs
 exposure to second-hand tobacco smoke
 use of cocaine and metamphetamines
 moderate and high fructose intake
 high saturated fat intake
 trans-fatty acid intake
 low intake of indigestible food residue [roughage]

COMPONENTS OF THE METABOLIC SYNDROME

hypertension
abdominal, central or visceral obesity
insulin resistance
impaired glucose tolerance and type 2 diabetes
dyslipidaemia
atherosclerosis
hypercoagulability and endothelial abnormalities
pro-inflammatory state
non-alcoholic fatty liver disease

FORMAL DIAGNOSTIC CRITERIA FOR THE METABOLIC SYNDROME

central obesity [waist circumference]

males ≥ 82 cm, females ≥ 72 cm [Asians]

males ≥ 94 cm, females ≥ 80 cm [others]

together with two of the following:

triglycerides ≥ 1.7 mmol/l

HDL-cholesterol males < 1.04 mmol/l, females < 1.29 mmol/l

blood pressure $\geq 130/85$ mm Hg

fasting blood glucose ≥ 5.6 mmol/l, diabetes or impaired glucose tolerance

RISK FACTORS FOR THE METABOLIC SYNDROME

risk factors for hypertension and its complications
with special emphasis on:

- moderate and high fructose intake
- eating food containing artificial trans fatty acids
- low intake of anti-oxidants found in vegetables
- tobacco use
- physical inactivity

The risk factors for hypertension and its associated conditions have become inherent in the way of life of industrial societies and are steadily infiltrating all other social groups and replacing healthy habits. Personal preventive measures should therefore be recommended at all encounters between medical service providers and patients regardless of whether any of the conditions are suspected or present.

What is to be done?

1 remove or reduce risk factors

The modifiable risk factors for primary essential hypertension and for the causes of secondary hypertension must be, if not removed, at least reduced. The same applies to the risk factors for conditions associated with hypertension. The reversion to the status quo ante or an approximate disease-free normality depends on the age of the subject, the stage of the disease and the timing and extent of the interventions.

It is necessary to look at the whole inter-related chain of causality of hypertension and the associated conditions, and not to be limited by a restrictive methodology subsumed in the doctrine of a specific aetiology, such as, for example, omega-3 fatty acids, olive oil, even fruit and vegetables, and a pedantic subservience to double-blind random controlled trials. People eat food, not individual nutrients.

People live in evolving historical, social, economic, political and geographic contexts which influence their habits, and the way they live, their so-called “lifestyle”. Increasingly diet, tobacco use, alcohol abuse and physical inactivity reflect social and market pressures.^{1, 2} Most risk factors for hypertension and its associated conditions are inherent in the consumerist society, where people eat commercially-prepared and industry-produced high fat, sugar-sweetened, salt-saturated food, smoke, sniff and chew tobacco and abuse alcohol, cocaine and other recreational drugs, where people are dependent on motor vehicles, escalators and “lifts” for commuting and click a computer mouse or a remote control for exercise. This is the “life-style” which hypertensives are urged to “modify”. It is the environment that should be modified as noted in the WHO-FAO report on chronic diseases:

“For interventions to have a lasting effect on the risk factor prevalence and health of societies, it is ... essential to change or modify the environment in which these diseases develop.”³

The message to individuals should be realistic and positive – try to adopt healthy, life-sustaining practices. In the current macro and micro environment it is however not easy - perhaps not even possible. It is therefore incumbent on medical service providers to be knowledgeable, understanding, supportive and constructive. Blaming patients for non-compliance is unproductive. It can be construed as victim-bashing and, if aggressively pursued, even as harassment.

Many communities in industrialising countries are not yet fully ensnared in this unhealthy way of living and do not rely on medicines to manage every discomfort and ailment. Many, however, have limited access to appropriate medical care and some are, in addition, also devastated by poverty, war and social disruption. Hopefully they may not need medical care for hypertension and its associated diseases but the trend seems to be in the other direction, presaging another epidemiological disaster.

2 implement personal general or non-drug measures

General non-pharmaceutical or non-drug measures are essential management tools for all stages in the life and care of a hypertensive. They play a much more important role than do drugs. Their effects are synergistic, incremental and cumulative.

Non-drug measures not only lower blood pressure but also enhance anti-hypertensive drug efficacy and help prevent and manage associated conditions. They also prevent and manage other diseases linked to the metabolic syndrome and to gluteal-femoral obesity, prevent several cancers, modulate the response to immune-sensitive conditions, promote general health and improve the quality of life. There are no negative side-effects.

CONDITIONS LINKED TO THE METABOLIC SYNDROME

sleep apnoea
gastro-oesophageal reflux disorder
Alzheimer's disease
adult macular degeneration
ovarian polycystic disease

CONDITIONS LINKED TO GLUTEAL- FEMORAL OBESITY [BMI ≥ 25]

osteo-arthritis and
other musculo-skeletal disorders
varicose veins and piles
hiatus hernia
reduced respiratory capacity
erectile dysfunction
reproductive disorders
cholelithiasis
poor surgery risk
psycho-social stress and depression

CANCERS ASSOCIATED WITH A WRONG DIET, TOBACCO USE AND ALCOHOL ABUSE

lip, tongue, mouth and throat
lung and larynx
oesophagus, stomach and colon
liver and pancreas
breast and uterus
kidney, bladder and prostate

**OTHER CONDITIONS ASSOCIATED
WITH TOBACCO USE, ALCOHOL ABUSE,
PHYSICAL INACTIVITY AND A WRONG DIET**

dental caries and dyspepsia
liver dysfunction and disease
acute and chronic pancreatitis
obstructive lung disease
frequent respiratory tract infections
polycythaemia
osteoporosis and fractures
sexual and reproductive disorders
foetal alcohol syndrome
mental disease and peripheral neuritis
social and psychological dysfunction
immune system dysfunction
premature aging and impaired cognition

The components of a non-drug programme

A a healthy diet

Eating a diet high in vegetables, fruit and low-fat dairy products and low in fats - the DASH diet [Dietary Approaches to Stop Hypertension] diet⁴ - lowers blood pressure by 8 -14 mm Hg. Dietary sodium restriction is associated with a 2 - 8 mm Hg blood pressure reduction and a 10 kg weight loss with a 5 - 10 mm Hg blood pressure reduction.³ A desk-top calculation of the effect of six dietary items with demonstrated efficacy [wine, fish, dark chocolate, walnuts, fruit, vegetables and garlic] estimated that the strategy could reduce cardiovascular disease by more than 75%.⁵ Calorie restriction to below daily requirements but with an adequate intake of essential nutrients delays biological aging, reduces weight, blood pressure, triglycerides, total and LDL cholesterol, C-reactive protein, and the risk of stroke, ischaemic heart disease and diabetes.⁶ Diastolic function is improved⁷ and HDL is elevated.

The following recommendations are based on nutritional, clinical, epidemiological,⁸ anthropological and historical evidence. They also draw on material prepared for governments⁹ and the WHO¹⁰ and promoted by scientific groups and societies.¹¹

1. food groups

Four macro-nutrient food groups are identified, according to their dominant macro-nutrient content.

The word "carbohydrate" is deliberately not used as it includes sugars, also called simple carbohydrates - to be avoided, edible starches, also called complex carbohydrates, - a dietary staple in all communities and in all times, and highly recommended, and non-digestible poly-saccharides, preferably called roughage and not fibre because many items in this group are not fibrous. Roughage is the major

component of indigestible food residue, an adequate intake of which is recommended. High starch vegetables and legumes are counted as sources of starch and not as vegetables as in the USA dietary guidelines.⁹

MACRO-NUTRIENT FOOD GROUPS WITH EXAMPLES	
group	examples
starch-rich foods	grains, high starch vegetables, legumes
oils and fats	dairy fat, vegetable and fish oils, margarine
vegetables and fruit	all except high starch vegetables
protein-rich foods	meat, fish, dairy products, eggs, legumes

INDIGESTIBLE FOOD RESIDUE *	
plant cell wall material:	cellulose, β -glucans, hemi-cellulose, pectin, lignin, waxes, cutins, indigestible cell wall proteins,
intracellular plant material:	gums, mucilages, resistant starch
animal derived material:	amino-polysaccharides
non-absorbed sugar alcohol fractions	
and can be soluble or insoluble, resistant or non-resistant	
soluble:	guar and other gums, pectins, psyllium, and resistant starch as in oats, barley, wheat, legumes, potatoes
insoluble:	cellulose, lignin as in whole seeds, bran, peels
resistant:	when raw or cooled after cooking
non-resistant:	when cooked, warm and mixed with water

Vegetables and fruit are rich in sugars, anti-oxidants, vitamins, minerals and roughage [abbreviated to VMR foods]. The contribution to the sugar and calorie load of this group - especially of fruit - should not be ignored. They have been allocated to a separate group. Dried legumes are also included in the protein-rich group.

2. daily calorie requirement

The daily calorie requirement depends on body build and level of activity.

DAILY CALORIE REQUIREMENTS					
BODY BUILD	LEVEL OF ACTIVITY				
	4	3	2	1	0
obese	30	25	20	17.5	15
overweight	35	30	25	20	17.5
normal	40	35	30	25	20
thin	45	40	35	30	25
calories/kg IBM/day					

* see http://www.effieschultz.com/files/pdf/2011_dietary_fibre.pdf and http://www.effieschultz.com/files/pdf/2011_fibre_slides.pdf for an update on indigestible food residue

Body build is defined by the BMI [body mass index] which is calculated as weight [kg] divided by height [m²] or by the degree of deviation from a weight associated with relative longevity, called the ideal body mass [IBM]. It can be read off life insurance tables – see appendix. The IBM can also be roughly estimated in kg by using the formula: height [cms] – 105.

DEFINITIONS OF BODY BUILD				
	THIN	NORMAL	OVERWEIGHT	OBESE
% deviation from IBM	<10	-10 - 9.9	10 - 19.9	≥ 20
BMI [Asians]	<16.5	16.5 - 22.9	23 - 27.9	≥ 28
BMI [others]	<18.5	18.5 - 24.9	25 - 29.9	≥ 30

Level of activity depends on the type and frequency of activity and can be usefully graded from the data below.

PHYSICAL ACTIVITY GRADES		
GRADE	TYPE OF ACTIVITY *	FREQUENCY/WEEK
4	sub-maximal	5 - 6
3	sub-maximal	3 - 4
3	taxing	5 - 6
2	sub-maximal	1 - 2
2	taxing	3 - 4
2	moderate	5 - 6
1	taxing	1 - 2
1	moderate	3 - 4
1	minimal	7
0	moderate	1 - 2
0	minimal	< 7

DESCRIPTION OF TYPE OF ACTIVITY *	
sub-minimal activity	sedentary life, no domestic work
minimal activity or light exercise	walking less than 1 block per day, domestic work
moderate activity or exercise	brisk walking, gardening, sports like golf and active bowls, social tennis, gentle aerobic exercises
taxing activity or intense exercise	as sub-maximal, but less strenuous like swimming, sawing wood
sub-maximal activity or very intense exercise	dynamic exercises, strenuous sports, running, jogging, physically demanding work such as loading and carting

3. macro-nutrient balance

Meals and snacks should be balanced so that the different macro-nutrient food groups provide calories in approximately the following proportions:

starch-rich foods	≥ 60%	fats and oils	≤15%
protein-rich foods	5%	VMR foods	20%

BALANCING FOOD GROUP AND CALORIE REQUIREMENT				
food group	starch-rich foods	fats & oils	vegetables & fruit	protein-rich foods
1000 – 1499	5	5	5	3
1500 – 1999	8	8	8	3
2000 – 2499	11	11	11	3
2500 – 2999	13	13	13	3
calories/day	average number of portions/day			

The calorie ranges in the table are large. The number of portions the recommended maximum. Portion sizes should therefore be adjusted down.

4. meal frequency:

At least 5, preferably more, evenly-spaced, small meals or snacks should be eaten each day, and not 3 or fewer large meals.

SUGGESTIONS FOR TIMING OF ≥ 5 MEALS OR SNACKS PER DAY	
morning:	on rising, breakfast, mid-morning “tea”
afternoon:	lunch, afternoon “tea”
evening:	early evening snack, supper, bed-time snack

5. calorie and macro-nutrient distribution over 24 hours

The calorie content of meals and snacks should be apportioned to provide more energy when physically active and less when sleeping while maintaining as far as possible the recommended macro-nutrient balance at each meal and snack or at least during the morning, afternoon and evening.

6. portions

Portions or helpings should be small and served in small plates and bowls. They need not be emptied. It is better to stop eating when almost full. Left-overs can be eaten at another occasion.

CALORIES PER PORTION - BY MACRO-NUTRIENT GROUP

Examples of portions of starch-rich foods [providing about 100 calories]

bread	1 slice - 1.5 cm	potato	1 medium boiled
legumes - dry	1/3 - 1/2 cup cooked	oats porridge	2/3 cup cooked
maize porridge	1 cup soft	pasta	1/2 cup cooked
mealie - on the cob	1 medium	rice - white	1/2 cup cooked

Examples of food portions containing oils and fats [providing about 45 calories]

avocado pear	2 teaspoons	full-cream milk	1/4 cup
butter	1 teaspoon	vegetable oil	1 teaspoon

Examples of portions of protein-rich foods [providing about 70 calories]

chicken [raw]	5 x 4 x 2 cms	legumes - dry	1/4 cup cooked
cheese - gouda	3 x 3 x 2 cms	hake [raw]	5 x 5 x 3 cms
egg [whole]	1 small	fat-free milk	1 cup

7. fruit and vegetables

Vegetables are preferable to fruit because of the high sugar content of fruit. No more than 1 portion of one variety of fruit should be eaten daily. Fruit juices do not qualify as portions and their intake should be avoided or very low. Vegetable juices should also not be counted as portions.

EXAMPLES OF PORTIONS OF VEGETABLES AND FRUIT [± 50 CALORIES]

carrots	1 cup cooked	vegetable salad *	2 cups raw
cauliflower	1 mug cooked	apple	1 small
green beans	1 mug cooked	grapes	20 large
spinach	1 mug cooked	orange	1 medium
tomato	2 medium raw	raisins	15 small

* lettuce, cucumber, tomato, onion – without oil or sugar in dressing

8. sugar - sugars

Food containing “free” sugars should be avoided. Sugars are considered to be “free” unless as in whole fruit and vegetables. Sugars in fruit juices are therefore “free”. The presence of healthy nutrients in fruit compensate for the deleterious effects of the sugars. Nevertheless the intake of fruit should be limited - to not more than one item of one kind per one day.

Several different types of sugars are found in food and each type may have several names. Sugars are handled differently in the body. Fructose is directly linked to the development of the metabolic syndrome while the other mono-saccharides merely contribute empty calories. Because fructose is sweeter and cheaper than sucrose [half glucose and half fructose], it has replaced sucrose in most industrially prepared drinks, sweets, and baked goods. It is found abundantly in fruit. Sugar alcohols, not regarded as sugar in food labels in the USA, are broken down to yield fructose and should therefore also be avoided.

NAMES FOR SUGARS

white sugar, brown sugar, raw sugar, table sugar
sucrose, glucose, lactose, maltose, dextrose
anhydrous dextrose, crystal dextrose, dextrin
malt syrup, maple syrup, pancake syrup
corn syrup, corn-syrup solids, corn sweetener
high-fructose corn syrup, honey, molasses, syrup
fructose sweetener, liquid fructose, fructose
sorbitol, xylitol, mannitol, starch hydrolysates
invert sugar, and fruit-juice concentrate

FOOD HIGH IN FREE SUGARS

jam, syrup, honey, and alcohol.
cold-drinks, colas, lemonades, fruit juices
chocolates, sweets, custard, jelly, puddings, ice-cream, sorbet
stewed and glazed fruit
cakes, biscuits, buns, crackers, cookies, muffins, pastries
instant mixed coffee, shop magewu, tonic and chocolate drinks
sweetened yoghurt and other sweetened milk products
ready-cooked breakfast cereals, commercial muesli

9. At least 3 glasses of fluid - free of all sugars - should be taken daily
10. unsaturated fatty acids

The intake of food containing unsaturated fatty acids should be adequate. Mono-unsaturated fatty acids such as oleic acid present in high concentration in olive oil and erucic acid as in mustard and rape seed oils are associated with an elevated HDL cholesterol. These oils were commonly used in societies with a relatively low prevalence of the metabolic syndrome. The use of erucic acid was, however, banned for spurious reasons in the 1980s. Canola, an artificial low erucic acid rape seed oil with a transgenic high concentration of oleic acid, is now

promoted in their stead. Herring which contains a lot of erucic acid is nevertheless still highly recommended. The re-introduction in Poland during the 1990s of rape seed oil - and to a lesser extent soya oil - instead of trans and saturated fat was associated with a remarkable reduction in coronary heart disease.¹²

Short-chain poly-unsaturated fatty acids such as linoleic acid which is present in high concentration in natural non-transgenic sunflower, soya, maize, peanut and other vegetable oils are considered essential and also lower LDL cholesterol, while the long-chain poly-unsaturated omega 3 fatty acids found in oily fishes reduce platelet aggregation and improve endothelial function.

11. saturated fatty acids

The intake of food with a high saturated fatty acid and/or cholesterol content should be low – associated with LDL cholesterol elevation.

FOOD WITH A HIGH SATURATED FATTY ACID AND/OR CHOLESTEROL CONTENT

egg yolk
full-cream dairy products – milk, butter, cheese, yoghurt, ...
meat – especially organ meats which are high in cholesterol
sausages, polony, salami and other fatty processed meats
food made with palm, coconut and palm kernel oil

12. trans-fatty acids [trans-fats]

Food containing trans-fatty acids should be avoided. They lower HDL cholesterol, increase LDL cholesterol and the risk of atherosclerosis. Two to five % of the total fatty acid content in the milk and body fat of ruminants [cows, sheep, goats] are in the trans form. Artificial trans-fats formed by partially hydrogenating vegetable oil have displaced natural solid fats and liquid oils in the restaurant, fast food, snack food, fried food, baked good industries and in shortening used for deep frying.

In countries where their use is not yet banned trans-fatty acids constitute 30-45% of the fatty acid content in commercial and industrial food products. Margarines may contain up to 15% trans fatty acids by weight.¹³

FOOD CONTAINING TRANS FATTY ACIDS

hard and soft margarines, vegetable oil blends
non-dairy creamers and milk blends
tinned meat and fish dishes, commercial bottled sauces
snacks and crackers, candies/sweets, ice-cream
industrial confectionaries sold in packets and cartons
shop bread and cake
commercial doughnuts, muffins, pies, cookies, scones, ...
French fries, most/all other take-aways and fast-foods
restaurant food – usually prepared with fat high in trans fatty acids
full-cream dairy products, beef and mutton

13. meat

The intake of meat, particularly from ruminants, should be limited. It should be used as a flavour, not as the main item of a meal. The fat content of meat is affected by the method of preparation – especially high if fried or roasted, lower if grilled.

14. dairy products

Dairy products are a good source of protein, calories, vitamins and minerals. An adequate intake is advised. Fat-free products are preferred.

15. salt - sodium

Food containing added sodium [as in table salt] should be avoided, or if not possible, at least strictly limited. People must select, prepare and eat food with little salt and stop eating commercially processed food with a lot of added sodium [or until the amount of added salt in them is reduced. The daily sodium intake should not exceed 1,500 mg [2/3 teaspoon table salt].

FOOD HIGH IN ADDED SODIUM

salty snacks, crisps, pickles
buns, pastries, cakes, shop bread
commercially blended spices
spreads, sauces, chutneys, atchas
mayonnaise and most cheeses
bacon, sausages, polony, meat pies
smoked and pickled meat and fish
most tinned foods, dehydrated soups
most breakfast cereals

16. dietary supplements and fad diets

Dietary supplements such as potassium and magnesium salts may be used and wheat and oat bran can be added to food. Vitamin, mineral, omega-3 fatty acid, phytosterol and other dietary supplements are best avoided.

Fad diets, including the so-called low-carb diets, should not be followed.

17. Patients suffering from renal impairment should:

- restrict protein intake
- not use potassium and magnesium supplements

18. labels

Read the labels of commercially prepared food for data on ingredients. The following cut-off values are advised.

CUT-OFF VALUES	
FOOD ITEM	DAILY INTAKE
fat - total calories	± 15%
unsaturated fatty acids	≥10%
saturated fatty acids	< 5%
trans fatty acids	0%
cholesterol	< 300 mg
free sugars	0%
indigestible food residue	> 14 g
sodium	< 1.5 gm
sodium chloride - table salt	< 3 gm
potassium	± 3 gm
magnesium	± 350 mg
sodium/potassium ratio	< 0.75

Summary of recommendations on diet

Small, raw [where appropriate] and slow-cooked meals made from fresh, natural, locally grown and tended produce, eaten slowly and enjoyed in friendly company and pleasant surroundings are best! For detail see box.

SUMMARY OF DIETARY RECOMMENDATIONS
<p style="text-align: center;">meals should be</p> <p>varied within food groups balanced between food groups balanced within each meal or snack adequate to meet needs [age, habitus, activity] eaten slowly with each mouthful savoured enjoyed in a relaxed and convivial atmosphere</p> <p style="text-align: center;">food should be</p> <p>enough – a bit less [80% full] and not too much served in small portions eaten 5 or more times per day culturally acceptable and feasible in season, available, accessible and affordable correctly prepared, tasty, fresh, clean and edible minimally salted, sweetened or refined suitable for the whole family and all disease states</p>

2 tobacco

Smoking cessation has a dramatic short-term and a large long-term effect on cardiovascular mortality in smokers as well as in non-smokers exposed to second-hand smoke.¹⁴ Among smokers the risk of sudden death and acute myocardial infarction declines within days or months after cessation. Male British doctors observed over 50 years had a 25% excess mortality from ischaemic heart disease due to smoking. In those who stopped smoking at age 50 the excess mortality rate was halved. Those who stopped smoking at age 30 years avoided almost all risk of excess mortality.¹⁵ The protective effect of quitting after myocardial infarction is more than that from standard drug treatments.¹⁶ Reducing tobacco use, as opposed to stopping, does however not lower the risk of dying from cardiovascular disease, ischaemic heart disease, smoking-related cancers, nor from all causes.¹⁷

DISEASES LINKED TO TOBACCO

several cancers
arterial and arteriolar disease:
 coronary heart disease
 cerebro-vascular disease
 renal and visual impairment
 peripheral arterial disease
reduced resistance to infection
respiratory disease and disability
disorders of nutrition and digestion
female and male reproductive disease
premature senility

“One of the most simple and cost effective of all medical interventions is for doctors to tell every smoker they encounter in their work that giving up the habit is one of the most important things they can do for their health.”¹⁸

Advice on how to stop smoking and how to avoid second-hand smoke should be given to patients verbally and in writing [see appendix for a hand-out]. Compliance should be monitored and reinforced at every encounter. The use of telephonic reinforcement has been shown to improve the rate of quitting. Text messaging could have similar effects.

C alcohol

The socially complex association of alcohol consumption with eating undermines attempts at interpreting the apparently contradictory data of the role of alcohol in cardiovascular disease.

There is evidence that moderate alcohol consumption promotes cardiovascular health, especially if taken with meals. In a cohort of 8867 professional men who ate a healthy diet, were physically active, did not smoke and whose BMI was <25,

moderate alcohol consumption [defined as 15 – 30g per day] further reduced the risk for myocardial infarction over 16-years¹⁹. In a larger unselected cohort in the same study 11,711 hypertensive subjects who drank 1 to 2 drinks per day had a lower rate of myocardial infarction than abstainers. The rate of stroke and cardiovascular and all-cause mortality was the same for both groups.²⁰ The cardio-protective properties of alcohol, however, may be outweighed by its detrimental effects on cardiovascular and general health, especially if intake is high or binge drinking is the preferred drinking mode. The evidence that any direct harmful cardiovascular effect would be reduced as intake decreases is not strong.

The 2003 USA hypertension guidelines²² and the 2005 USDA dietary guidelines⁹ recommend limiting alcohol intake to 1 USA drink per day for women and light-weight men and 2 USA drinks for men of average size.¹⁸ One USA drink contains a bit more alcohol than 1 unit of alcohol which is equivalent to about 10g of alcohol. This level of alcohol consumption could be regarded as safe and moderate for cardiovascular and general health.

SIZE AND CALORIE CONTENT OF DRINKS AND UNITS OF ALCOHOL			
1 unit of alcohol = about 10g alcohol =			
mkomboti	scale	500 ml	
beer	mug or can	340 ml	
wine	wine glass	120 ml	
port and sherry	sherry glass	60 ml	
spirits	metric tot	25 ml	
dry martini	glass	4 units	
1 USA drink of alcohol =			
beer - regular	12 oz	360 ml	150 cal
wine - 12% alcohol	5 oz	150 ml	100 cal
spirits - 80% proof	1.5 oz	45 ml	100 cal

Because alcoholic drinks provide calories, a reduction of intake might be expected to result in weight loss and its attendant benefits. Alcohol, including red wine and beer, elevates blood pressure but reducing alcohol intake to moderate levels in heavy drinkers may reduce blood pressure by 2 - 4 mm Hg.³ Red wines and spirits are associated with elevated HDL cholesterol levels and possibly a reduced coronary heart disease risk but only people over the age of fifty tend to benefit.²³

Alcohol use is a risk factor for other components of the metabolic syndrome. Unsafe, heavy and binge drinking [alcohol abuse] is increasing in all age groups, countries and communities with disastrous consequences. Recommendations on safe moderate drinking must always be accompanied by strong warnings against alcohol abuse. Because alcohol-foetal syndrome is associated with alcohol use in pregnancy, alcohol should not be used at all by pregnant women or by women contemplating pregnancy. Children and adolescents should also not use alcohol.

DISEASES LINKED TO ALCOHOL ABUSE

anxiety and depression, psycho-social dysfunction
psychological and physical dependency
dyspepsia and gastritis
acute and chronic alcoholic liver disease
acute and chronic pancreatitis
insulin dependent and brittle diabetes
hypertension, dyslipidaemia
heart failure, gout, obesity
psychosis, epilepsy, peripheral neuritis
sexual impotence, gynaecomastia, shrunken testes
foetal alcohol syndrome and other reproductive disorders
parotitis and skin lesions
anaemia and other haematological disorders
cancer of the tongue, mouth, throat, gullet and liver, etc
reduced resistance to infections
skin disorders
increased surgical and accident risk

Patients should be helped not to use tobacco or to abuse alcohol. Those who are already doing so, should be helped to stop.

HOW TO PREVENT PATIENTS FROM STARTING TO USE TOBACCO AND ABUSE ALCOHOL

be a good role model
encourage role models, teachers, parents and significant others to set a good example
build self-confidence to resist peer pressure
encourage recreational and cultural pursuits
remove adverts from waiting areas
display supportive material and posters

HOW TO HELP PATIENTS STOP USING TOBACCO OR ABUSING ALCOHOL

take a detailed tobacco and alcohol history
inform patients why they personally should stop
discuss with them how to stop
supply them with written material if wanted*
monitor change and reinforce messages
provide support to reduce [before and after] stress
enlist the help of family, friends and colleagues
refer for professional assistance when necessary
prescribe anti-craving medication when necessary

* see appendix for hand-outs

USEFUL SELF-HELP MATERIAL ACCESSIBLE TO PATIENTS IN WAITING AREAS AND FOR TAKING AWAY

testimonials of successful quitting
effects of tobacco use and alcohol abuse
methods, guidelines and tips on how to stop*
clear details on where to find help
contract forms

* see appendix for hand-outs

D adequate physical activity

In addition to improving cardio-pulmonary function, exercise also lowers blood pressure, helps to achieve and maintain weight loss, positively impacts on lipid and glucose metabolism, lowers C-reactive protein, promotes musculo-skeletal and psychological well-being and reduces cardiovascular and all cause morbidity and mortality. The intensity and duration of exercise are independently associated with cardiovascular and general health benefits and a sense of well-being. Leisurely strolling is better than aggressive striding in promoting cardiovascular health and walking on cobble-stones has been shown to reduce blood pressure.²⁴ The effects may be dose-dependent.

EFFECTS OF PHYSICAL ACTIVITY

improves cardio-pulmonary function
lowers blood pressure
helps to achieve and maintain weight loss
positively impacts on lipid and glucose metabolism
lowers C-reactive protein
reduces cardio-vascular morbidity and mortality.
promotes musculo-skeletal health
promotes psychological well-being
reduces all cause morbidity and mortality.

Thirty minutes of moderately strenuous aerobic exercise at least 4 times per week is recommended. This is just not a realistic prescription for the majority of healthy people never mind for those suffering from - and on medication for - hypertension and/or one or more diseases associated with hypertension.

Everybody should be advised to be as physically active as their personal circumstances allow and to use every possible opportunity for walking.

EVERYBODY CAN BE PHYSICALLY ACTIVE

no need to attend a gym, to jog or lift weights
no need to "work up sweat" - also not sustainable
low levels of regular routine activity are beneficial
cleaning the house, gardening, mowing the lawn
walking up and down stairs and to and from bus stops
playing ball, walking and cycling with the family
dancing and racquet sports
in-door, regular callisthenics and physical jerks
encourage work-related physical activity
limit time children spend with TVs and computers

E psycho-social stress management

Some patients could benefit from directed counselling and assistance but all will respond to a sympathetic hearing. Health educator/advisor members of a chronic disease care team could help to address this need.

F reduced or no dependence on medicines

Societies are becoming medicalised - a pill for every ill. Medicines and herbal remedies that elevate blood pressure should be avoided.

DRUGS AND HERBAL PREPARATIONS ASSOCIATED WITH BLOOD PRESSURE ELEVATION

oral contraceptives, ACTH and cortico-steroids, cyclosporine
sympathomimetics such as appetite suppressors
respiratory decongestants, amphetamines
sodium-containing preparations like urinary and gastric alkalisers
anti-inflammatory agents - NSAIDs and COXIBs
monoamine oxidase [MAO] inhibitors, tri-cyclic anti-depressants
licorice, alcohol, tobacco, cocaine
herbal preparations like St John's wort, ephedra, bitter orange

Drugs used to treat hypertension and its associated diseases may also paradoxically elevate the blood pressure and precipitate or aggravate glucose intolerance and dyslipidaemia – components of the metabolic syndrome.

HYPOTENSIVE AGENTS THAT MAY CAUSE BLOOD PRESSURE ELEVATION AND/OR PRECIPITATE THE METABOLIC SYNDROME

diuretics - activate renin, elevate LDL cholesterol, impair glucose tolerance
b blockers - elevate LDL cholesterol, impair glucose tolerance
anti-adrenergic agents and vasodilators - sodium and water retention

Patients should be advised to use alternative appropriate and safe medicines.

APPROPRIATE ALTERNATIVES	
MEDICINES TO BE REPLACED	ALTERNATIVE STRATEGY
appetite suppressors	a healthy diet
respiratory decongestants	steam inhalation
sodium containing urinary alkalisers	fluids, perineal hygiene, antibiotics x prn
sodium containing gastric alkalisers	small frequent bland well-chewed meals
NSAIDs and COXIBs	exercise, liniments, paracetamol x prn
MAO inhibitors and tri-cyclics	psycho-social counselling

all together

There is evidence¹⁸ of a reduction of between 21 and 55 mm Hg in systolic blood pressure from weight reduction, the DASH diet⁴, regular strenuous physical activity, and salt and alcohol restriction. Blood pressure levels of <120/80 mm Hg were achieved in 35% of subjects after 6 months of intensive counselling to be physically active and to eat a diet high in fruit, vegetables and low-fat dairy products, and low in salt, fats, red meats, sweets, and beverages containing sugars.²⁵ At a hypertension clinic run by the author 46% of patients with mild and moderate hypertension achieved fair blood pressure control [\leq 140/90 mm Hg] without the use of hypotensive agents on a non-drug programme, incorporating all the above.²⁶

Summary of non-drug general measures

- healthy dietary practices
- no tobacco use and as little as possible exposure to second-hand smoke
- low to moderate alcohol intake; no binge drinking
- physical activity - as much as possible
- stress management
- avoidance of drugs which elevate blood pressure and precipitate or aggravate associated diseases and their risk factors

SUMMARY OF PERSONAL GENERAL MEASURES AND THEIR EFFECTS													
PERSONAL GENERAL MEASURES	SITE OF ACTION												
	risks		metabolic syndrome					complications of hypertension					
	PIA	ICF	HT	IGT	BMI	DLP	EUA	CHD	CVA	PVD	IRF	MHT	CCF
EATING A HEALTHY DIET													
appropriate calorie intake	X		X	X	X			X	X				X
complex carbohydrates ≥ 60% calories		X	X	X	X	X							
legumes ≥ 3 portions per week		X	X	X		X					X	X	
vegetables ≥ 5 portions per day		X	X	X	X	X		X					
fruit [not fruit juice] 1 – 2 per day		X	X			X		X					
dairy products - fat-free			X			X		X					
fish 1-2 per week		X	X			X					X		
sodium [table salt] little or nothing			X										X
sugars [all kinds] little or nothing			X	X	X	X							
beef or mutton - little or nothing			X		X	X	X				X		
vegetable oil as food dressing		X	X			X		X		X	X	X	
water ≥ 3 glasses per day		X					X				X		
≥ 5 small meals or snacks per day	X		X	X	X	X		X					
CULTIVATING HEALTHY HABITS													
no exposure to tobacco smoke	X	X	X			X		X	X	X	X	X	
limited alcohol use			X	X	X	X	X						
regular physical exercise		X	X	X	X	X		X	X				
≥ 8 hours sleep per night or 24 hours	X			X									
stress management	X		X	X	X			X					
AVOIDING CERTAIN DRUGS													
oral contraceptives		X	X	X	X	X			X	X		X	
cortico-steroids		X	X	X	X	X			X				X
sympatheticomimetics			X			X			X	X			
NSAIDs and COXIBs		X	X								X	X	
diuretics in high doses			X	X		X	X						
β-blockers in high doses or all	X			X		X							

Summary of general measures that could lower blood pressure, improve total risk profile and prevent and manage conditions associated with hypertension

Key to abbreviations:

PIA physical inactivity, ICF = increased clotting factors, HT = hypertension, IGT = impaired glucose tolerance, BMI = visceral obesity, DLP = dyslipoproteinaemia, EUA = elevated uric acid, CHD = coronary artery disease, CVA = cerebro-vascular disease, PVD = peripheral vascular disease, IRF = impaired renal function, MHT = malignant hypertension, CCF = cardiac failure/increased Na and water retention.

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