

# DIAGNOSTICS

## UPDATE .COM

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### From my Keyboard



Attending this year's World Youth AIDS day and World Hypertension Day got me realizing how most of us take our good health for granted until it is too late to do anything. By the time that we decide to have good sex practices, stop smoking, improve the diet, stop taking alcohol, stop using addictive drugs, lose weight and begin to exercise most of us will have been infected by HIV, suffered a heart attack, developed liver cirrhosis, hypertension, diabetes or cancer. Unfortunately most of these conditions are not reversible and we would have to live with them for the rest of our lives. Quoting Benjamin Franklin, "there are few things which are appreciated more in their absence and less in their presence than health. When we have it, we take it for granted, giving little care to its preservation. When we do not have it, there is precious little we would not do to get it back."

In today's health care provision, there is more focus on managing a diagnosed disease, which is quite stressful and expensive for both the patient and health care providers. There seems to be less concentration on preventive medicine, which is quite unfortunate because preventing diseases and disability, is a better alternative than treating problems when they arise. Hence I am in total agreement with Joseph Knight, MD who believes that laboratory professionals have a significant impact on shifting medicine from disease diagnosis to wellness assessment, thus making health care more efficient and less costly.

All in all there is no way our beautiful country is going to develop if the whole population is in poor health. Therefore the onus is on you as an individual to make sure good health is maintained otherwise what right do you have to be called a citizen if ultimately your purpose is not to improve and maintain the state of your country?

Stay informed!!

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DML Nurse Tyrone Burton with one of the people who came for free Cholesterol testing on World Hypertension Day Commemorations Sponsored by Diagnofirm



## DIAGNOFIRM MEDICAL LABORATORIES

by Silas Nunu

### Recent Events @ Diagnofirm

Winter is upon us and once again we meet to review social events in the last quarter of the year that have appeared on the Diagnofirm calendar and hope they will give you a warm and cuddly feeling as we hope they have brought to their beneficiaries.

We start off in March where Diagnofirm took part in the month of youth commemoration against HIV/AIDS in collaboration with Mabule Village youth. The theme of the event was "Harmonising adolescents' sexual health programmes". The objective of the programme was to encourage people - the youth especially - to test for HIV and hence know their status and also to sensitize the youth of programmes available to inform and educate them about their sex lives and sexuality. Programmes such as: School Health Programme, Safe Motherhood Programme, Family Welfare Education and the Adolescent Reproductive Health Programme.

Participants in the event included DML Director, Mr. Iqbal Chand, Diagnofirm staff members Chishamiso and Munyaradzi; Staff and children from Mariba Junior Secondary and Mabule Primary Schools and members of various Youth programmes. The guest speaker was the musician Bulldog.

In April Diagnofirm further stretched its philanthropic tentacles as far as Selebi Phikwe. Here, the S/Phikwe based

Diagnofirm staff members, Nicholas and Blessing worked tirelessly to organize the distribution of 60 food hampers, some beds and blankets donated by DML. Councillor B. Bagayi welcomed guests to the event and Mr. M. Habangana who is the head of the Orphan Care Committee in S/Phikwe gave the keynote address. He raised issues about the welfare of orphans; whose number he said is constantly rising and he also thanked Diagnofirm for its unbridled generosity. The M.D. Mr. M.I. Chand, Lab Manager D. Mhlabi and staff members Faustina, Boitumelo, Karabo, Blessing, Nicholas and Silas represented Diagnofirm. Also present were Magistrate Mr. V. Segasothy, Dr. and Mrs. Chothia and other S/Phikwe councilors.

On the 20<sup>th</sup> of May the Transport and Telecommunications Branch of the Botswana Police Service held a workshop on voluntary counseling and testing. DML offered its HIV testing facilities to test staff from the BPS and also staff from the Meteorological Services and the Central Transport Organisation. The day was a resounding success as DML lab scientists Desire and Lesley tested 110 people.

To look forward to in our next Edition, DML will be hosting a seminar entitled "CD4 testing: a new alternative in Botswana". Until then, enjoy our publication and we wish you healthy living! ■

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# “Metabolic Syndrome”, myth or fact?

Many of us today take our health for granted, until it's too late. We only stop smoking, begin to exercise, lose weight, improve our diet, stop or decrease our alcohol intake and stop using addictive drugs after we've had a heart attack or stroke, or developed cirrhosis, hypertension, diabetes, or cancer. But these diseases are rarely, if ever reversible and we must live with them for the rest of our lives. Furthermore not only do they decrease our longevity, they also diminish our quality of life.

The current health care system tries to manage an individual's disease after it has been diagnosed, which is stressful to the patient, as well as expensive for both the health care system and the patient. Currently many physicians primarily diagnose and treat diseases with little attention given to preventive medicine. As laboratory professionals, we believe we can have a significant impact on shifting medicine from disease diagnosis to wellness assessment, thereby making health care more efficient and less costly, as well as improving individual's quality of life.

A combination of complications of the latest lifestyles has now been referred to as Metabolic syndrome. Approximately 7 years ago The World Health Organization (WHO) published the first definition and criteria for Metabolic Syndrome (MS). However, before the publication of the World Organization (WHO) report many clinicians had recognized a loose collection of risk factors that dramatically increased the chances of developing potentially life-threatening illnesses. “Syndrome X, Insulin

Resistance Syndrome, Dysmetabolic Syndrome, and multiple metabolic syndrome were all among the labels physicians initially used for factors that promote the development of atherosclerosis and increase the risk of cardiovascular problems.

With increased knowledge, the most widely accepted definition and criteria for Metabolic Syndrome was proposed in 2001 as part of the Third Report of the National Cholesterol Education Program (NCEP). Also known as the Adult treatment panel III (ATPIII), the report put new emphasis on this growing epidemic. The most recent study conducted by the CDC (Center for Disease Control) shows that as many as one in four American adults and 40% of the Adult age 40 or older have metabolic Syndrome. Looking at results from our own Laboratory, Botswana may not be far from those found in the US study. Please note that these observations are from laboratory results only and no study has been done in Botswana so far. Shockingly there is increasing evidence of an increase in prevalence of metabolic syndrome in children and adolescents.

As the ATPIII criteria has several Laboratory tests, clinical laboratories play an important role in helping patients already affected to reverse the trend of metabolic syndrome and hopefully educate those not yet affected. Initial prevention and treatment centers on diet and exercise intervention, but at risk patients should be evaluated and followed by a number of well - established

laboratory tests.

So what do we mean by Metabolic Syndrome? It is a common condition in which we find these risk factors occurring together in a person. (i.e. High Blood pressure, Obesity, diabetes mellitus, abnormal Lipid profile)

Definitions have been developed by NCEP-ATPIII, The WHO for Metabolic syndrome as shown in table 1 and 2.

Even though they do differ slightly, both definitions include many risk factors that predispose an individual to metabolic syndrome. Some of the most important being, genetic predisposition, excess weight, lifestyle, age, and a high carbohydrate diet. Common characteristics of metabolic syndrome include abdominal obesity, atherogenic dyslipidemia (elevated triglycerides; Low Density Lipoproteins (LDL) cholesterol, and low High Density Lipoprotein cholesterol), a high Blood Pressure, elevated glucose, insulin resistance (High HOMA index > 2.1 or by the QUICKI INDEX). To Calculate HOMA INDEX use the formula;

$$\frac{\text{Fasting insulin (uU/ml)} \times \text{Fasting Glucose (mmol/L)}}{22.5}$$

Patients can be identified by first measuring waist circumference. A measurement of >100cm in men and > 87.5 cm in women defines abdominal obesity as per NCEP-ATP III guideline;

The WHO criteria uses elevated body mass index (BMI) and /or waist-to-hip ratio. This provides us with a general index of

**TABLE-1 NCEP- ATPIII**

**Definition of Metabolic Syndrome**

**Diagnosis of Metabolic Syndrome can be made with three or more of the following Risk Determinants or present**

S.No:	Particulars	Range
1	Abdominal obesity -Waist Circumference	> 100 CM in Men & > 87.5 CM in Woman
2	Fasting triglycerides	> 1.7
3	HDL Cholesterol	< 1.0 in Men & < 1.3 in Women
4	Blood Pressure	> 130/85 mm hg
5	Fasting Glucose	> 5.6 mm/l

**TABLE-2**

**World Health Organization Definition of Metabolic Syndrome**

Presence of insulin resistance (type 2 Diabetics Impaired Glucose Tolerance – Homa Index > 2%) plus two of the following;

S.No:	Particulars	Range
1	Anti Hypertension treatment or elevated BP	> 140/90 mm hg
2	Elevated plasma triglycerides HDL Cholesterol	> 1.7 mm/l < 0.9 in Men < 1 in Women
3	Elevate Body Mass Index High waist to hip ration	> 30 Kg/m > 0.90 in men & 0.85 in women
4	Elevated Microalbumin	

During the course of being interviewed by the press, the noted doctor was asked by a reporter: "Doctor, did you ever make a serious mistake?"

"Yes, was the reply, "I once cured a millionaire in three visits!"

**Q.** Who is more satisfied, a man with a million dollars, or a man with six children?

**A.** The man with six children. The man with a million dollars wants more.

Two confirmed bachelors sat talking, their conversation drifted from politics to cooking.

"I got a cookbook once," said one, "but I could never do anything with it."

"Too much fancy work in it, eh?" asked the other.

"You said it. Every one of the recipes began the same way - 'Take a clean dish'".

**Doctor:** I see you're over a month late for your appointment. Don't you know that nervous disorders require prompt and regular attention? What's your excuse?

**Patient:** I was just following your orders, Doc.

**Doctor:** Following my orders? What are you talking about? I gave you no such order.

**Patient:** You told me to avoid people who irritate me.

A man goes to the doctor and tells him that he hasn't been feeling well. The doctor examines him, leaves the room and comes back with three different bottles of pills.

The doctor says, "Take the green pill with a big glass of water when you get up. Take the blue pill with a big glass of water after lunch. Then just before going to bed, take the red pill with another big glass of water."

Startled to be put on so much medicine the man stammers, "My goodness, doc, exactly what's my problem?"

Doctor says, "You're not drinking enough water."

central fat mass. This leads us to a point where one needs to define Obesity. A general consensus is if a person has a weight of 20% above ones ideal weight. From various studies it has been found that obesity promotes insulin resistance, an inability to respond normally to insulin.

Hypertension is another easily detected component of Metabolic Syndrome, which is an independent risk factor for atherosclerosis. Both The WHO and NCEP-ATPIII include elevated blood pressure in their criteria for Metabolic Syndrome. An elevated fasting triglyceride measurement also frequently triggers further evaluation of a patient for Metabolic Syndrome.

Highly sensitive C-reactive Protein (h-CRP) is another analyte receiving a great deal of attention for its role in atherosclerosis. Numerous studies on normal subjects have now found that elevated h-CRP in the absence of obvious inflammation predicts increased risk for Cardio-Vascular Events (CVEs). Studies of patients with Metabolic Syndrome also show elevated h-CRP. (Please note High Sensitive CRP is the test of choice)

Studies have shown that high levels of h-CRP increase the risk of CVEs in both men and women, but elevated h-CRP appears to increase the overall risk of mortality when the patient also has elevated total Cholesterol levels and a high Total Chol/HDL ratio. In a study for insulin resistance and atherosclerosis, h-CRP was positively correlated with BMI, waist circumference, blood pressure, triglycerides, LDL Cholesterol, glucose, and fasting insulin, all of which are characteristics of Metabolic Syndrome.

Each of the components of Metabolic Syndrome independently contributes to

increased cardiovascular risk. Therefore management should firstly include lifestyle changes- normalizing body weight, limit intake of saturated fats and cholesterol, increase physical activity, stop smoking and reducing the intake of alcohol. Furthermore drugs are often required to lower lipids, glucose and control blood pressure.

Laboratory testing plays an important role in evaluating patients for Metabolic Syndrome, as well as monitoring patients on treatment. Regular health checks, it can even be annually can help to detect and even predict the risk for these disorders timeously. With the increasing prevalence of Metabolic Syndrome laboratories should be prepared to offer appropriate testing and ensure appropriate cut off levels. The frequent test requested for evaluating patients risk are tabled in table 3.

In view of the increase risk of Metabolic syndrome, patients should be educated on ways to improve their life style hence reduce the risk of many complication such as Hypertension, Diabetes, Cardio-Vascular, Liver problems and Stroke.

### How does this happen?

Weight loss of up to 10% of you body weight has been found to help your body regain its ability to recognize insulin.

Increase exercise helps increase your HDL cholesterol as well as reduce your LDL Cholesterol and lowers your Blood Pressure. Exercise also helps in the Reversal of insulin resistance thus reducing the risk of type 2 diabetes.

Therefore by keeping fit and eating healthy one has the ability to keep conditions associated with metabolic syndrome at bay. ■

**TABLE – 3**

### Useful Tests For Assessing Metabolic Syndrome

S.No:	Name of the Tests
1	Modified Lipid Profile (Total Cholesterol, HDL, LDL and Triglycerides)
2	Fasting Insulin
3	Homa Index / QUICKI INDEX
4	Fasting Glucose
5	h- CRP
6	HTSH
7	Fibrinogen
8	Uric Acid
9	Electrolytes / Urea
10	Liver Enzymes

# Hypertension



**DML Nurse Tyrone Burton with a patient to be tested for cholesterol levels during the World Hypertension Day Commemorations**

High blood pressure is frequently referred to as the “silent killer”. Although elevated blood pressure causes no symptoms in most people, it directly causes deaths each year from heart attacks, congestive heart failure, and stroke. Two-thirds of the population will experience at least mild high blood pressure before the age of 65. Although the majority has mild hypertension, even this condition requires medical attention. Only 20% of adults have their blood pressure under control. About one-third of patients with high blood pressure are overweight. Anyone who is overweight has a risk for hypertension that is 50% higher than people with normal weight. Proper detection and treatment of high blood pressure can improve quality of health and delay or prevent many premature deaths in people having hypertension.

## What is Blood Pressure?

Blood pressure is produced by the pumping heart. Most people are familiar with two separate numbers used in measuring blood pressure. Medically speaking blood pressure has a systolic (top number) measurement and a diastolic (bottom number) measurement. Systolic pressure is the blood pressure created while the heart is contracting (systole). Diastolic pressure is the blood pressure measured when the heart is not contracting (diastole).

## What Is High Blood Pressure?

Optimal blood pressure is less than 120/80 mm Hg (systolic/diastolic). Normal pressure is below 140/90. A person is considered to have hypertension (high blood pressure) if their blood pressure is above 140/90.

Hypertension is divided into four stages:

**Mild** (greater than 140/90 but less than 160/100);  
**Moderate** (less than 180/110);  
**Severe** (less than 210/120);  
**Very severe** (greater than 210/120).

When the systolic and diastolic numbers are in different categories the measurement in the higher category should be used to determine the severity of hypertension. For example, if systolic pressure is 165 (moderate) and diastolic is 92 (mild), the patient would still be diagnosed with moderate hypertension.

**A child's blood pressure is normally much lower than an adult's. Children are at risk for hypertension if blood pressure is greater than:**

- 116/76 for ages 3-5
- 122/78 for ages 6-9
- 126/82 for ages 10-12
- 136/86 for ages 13-15.

High blood pressure is a very important risk factor for heart disease (coronary artery disease). There are other major risk factors as well including family history, smoking, diabetes, and high cholesterol. The effects of these risk factors are additive. A person with all of these risk factors, including high blood pressure, is more likely to develop heart disease than another person with the same blood pressure but no other risk factors.

Blood pressure varies the same way throughout a given day. It is usually highest at work and then drops a bit at home. Pressure is lowest during sleep but suddenly increases at waking.

## Causes of High Blood Pressure

In over 90% of patients with high blood pressure the physician cannot find a specific cause. This is called **essential, or primary, hypertension**. Several genetic factors regulating important physiologic processes may interact with environmental influences to produce essential high blood pressure.

## Secondary Hypertension

Secondary hypertension (less than 10% of people with high blood pressure) has identifiable causes, which are usually treatable or reversible. Medical conditions and medications may contribute to secondary hypertension. Medical conditions include:

- pregnancy
- liver disease
- kidney disease
- adrenal disorders causing excessive production of certain adrenal hormones
- sleep apnea patients who have disordered breathing while sleeping tend to have higher blood pressure and poorer responses to high blood pressure medication.

Certain prescription and over-the-counter drugs can cause temporary high blood pressure. Medications contributing to secondary hypertension include:

- Some prescription medications include cortisone, prednisone, estrogen, and indomethacin.
- Oral contraceptives may increase the risk for high blood pressure, but the risk is very small (41.5 cases per 10,000 people who take birth control pills) and is highest in women using them for more than 6 years.
- Cold medicines containing pseudoephedrine have also been found to increase blood pressure in hypertensive people, but they seem to do no harm in people who have brought their blood pressure under control.

## Salt

Diets high in salt may speed up hypertension in people as they age. There have been conflicting views in the medical community on how much a high salt diet contributes to hypertension. Between 30 - 50% of people with high blood pressure are salt-sensitive; that is they are particularly vulnerable to the effects of salt on blood pressure. People who are most likely to be very salt-sensitive are overweight, older, and African American. High salt diets in such people can also harm the kidney and brain, even independently of high blood pressure.

## Alcohol

An estimated 10% of hypertension cases are caused by excessive alcoholic intake. An

## Risk Factors that predispose to Hypertension

### Age and Weight

About one-third of patients with high blood pressure are overweight. Anyone who is overweight has a risk for hypertension that is 50% more than people with normal weight. In fact, the increase in blood pressure as one ages may be due primarily to weight gain. Children and adolescents who are obese and babies who are underweight at birth are at greater risk for high blood pressure when they reach adulthood.

### Gender

Women under 60 are 50% to 75% less likely to have hypertension than men of the same age.

### Genetic Factors

Hypertension may be inherited in 30% to 60% of cases, although several genes, not just one, are probably involved. It is difficult to differentiate between genetic and environmental influences, even in studies of identical twins.

### Cholesterol and Stress

About 40% of people with high blood pressure also have high cholesterol levels, although any causal relationship remains unclear. Stress may play a role in this association; in one study people with high cholesterol levels experienced a steep increase in high blood pressure when given a mental stress test; those with normal cholesterol levels had only a modest increase. When the high-risk group lowered their cholesterol intake, their blood pressure dropped to normal levels during stressful situations. This finding should encourage physicians to test for heart disease risks, particularly unhealthy cholesterol levels,

### Emotional Disorders

A number of studies have linked chronic stress, depression, and anxiety with high blood pressure in both men and women. People who are anxious or depressed may have over twice the risk for high blood pressure than those without these problems. It is not clear whether these mood disorders contribute to high blood pressure due to some physiologic effect on blood vessels or if they may lead to behaviors, such as weight gain or alcohol abuse, which are also risk factors for hypertension. Anger does not appear to predict high blood pressure.

### Other Factors

People who experience sleep apnea, a disorder in which breathing halts briefly but repeatedly during sleep, also have a higher incidence for hypertension. Many experts believe that a causal relationship exists between the sleep disorder and high blood pressure. Seasonal changes may influence variations in blood pressure, with hypertension increasing during cold months and declining during the summer. This seasonal effect is particularly high in smokers.

### Damage to Other Organs

Hypertension can cause certain organs to deteriorate over time. People who do not control their blood pressure die earlier than people who control their blood pressure. High blood pressure contributes to 75% of all strokes and heart attacks. Compared with normal individuals, hypertensive people can have as high as ten times the risk of stroke and five times the risk of a heart attack depending on the severity of the hypertension. The risk for developing congestive heart failure is also significantly higher with high blood pressure. People

whose high blood pressure has caused left ventricular hypertrophy (a thickening of the muscles on the left side of the heart causing enlargement) remain at risk for strokes, heart attacks, sudden death, and heart failure even after their blood pressure is under medical control. High blood pressure causes 30% of all cases of kidney failure that require dialysis and transplant operations. This rate is second only to diabetes.

### Mental Deterioration

High blood pressure may accelerate age-related shrinkage of the brain. Chronic high blood pressure is associated with mental deterioration, especially short-term memory and attention. A study has found that middle-age people with high systolic blood pressure are at higher risk for poor mental function in later life; the higher the blood pressure the greater the risk. Increased blood pressure in elderly men is also associated with a higher risk for Alzheimer's and dementia.

### Pregnancy and Preeclampsia

Severe, sudden high blood pressure in pregnant women caused by a condition called preeclampsia can be very serious for both mother and child. It occurs in up to 10% of all pregnancies, usually in the third trimester (last three months) of a first pregnancy, and resolves after delivery. Symptoms and signs of preeclampsia include protein in the urine and swollen ankles. The reduced supply of blood to the placenta can cause low birth weight and eye or brain damage in the fetus. Severe cases of preeclampsia can cause kidney damage, convulsion and coma in the mother and can be lethal to both mother and child.

analysis of a major study found that those who drank more than three alcoholic drinks a day had higher blood pressure than those who didn't, with heavier drinkers having higher pressure. People who were binge-drinkers had higher blood pressure than people who drank regularly. On the other hand, mild to moderate drinking (one to two drinks a day) seems to have certain benefits, including raising HDL cholesterol levels (high levels of HDL cholesterol are considered good, whereas high levels of LDL cholesterol are considered bad) and reduced risk of heart disease.

### Other Causes of Secondary High Blood Pressure

Temporary high blood pressure can result from stress, exercise, and long-term

consumption of large amounts of licorice. Exposure to even low lead levels also appears to cause hypertension in adults.

### What Are the Symptoms of High Blood Pressure?

Hypertension has been called the "silent killer", because it usually produces no symptoms. It is important for anyone with risk factors to have their blood pressure checked regularly and to make appropriate lifestyle changes. Following these recommendations is important for individuals who have overall high-normal blood pressure, mild or above systolic pressure with normal diastolic, family histories of hypertension, are overweight, or are over forty years old.

Untreated hypertension increases slowly

over the years. In rare cases (fewer than one percent of hypertensive patients), the blood pressure rises quickly (with diastolic pressure usually rising to 130 or higher), resulting in malignant or accelerated hypertension. This is a life threatening condition and must be treated immediately.

#### Symptoms may include:

- Drowsiness,
- confusion,
- headache,
- nausea, and
- loss of vision.

Hypertensive individuals should call a physician immediately if these symptoms appear.

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# MYTHS OF HYPERTENSION

The number of patients achieving the target blood pressure of <140/90mmHg recommended by the WHO - ISH (World Health Organization - International Society for Hypertension) guidelines is startlingly low.

In China it is less than 3%, in the UK less than 6% and in the US less than 20%. Statistics for Africa are not available but are likely to be lower than China.. This is especially surprising, as hypertension is one of the most important preventable causes of death. Indeed, numerous clinical trials have demonstrated that lowering BP confers large benefits in terms of reduced morbidity and mortality.

Why then are so many patients failing to reach BP goals? There are many reasons, but it is certainly true that a number of beliefs - the 'myths of hypertension' - which have remained unchallenged over the years play their part.

In this article, I have taken 8 myths and will discuss, examine and dispel them using current clinical evidence.

## MYTH 1: Diastolic blood pressure is the most important predictor of cardiovascular risk.

### FACT: Systolic blood pressure is a better predictor of cardiovascular risk

Although the importance of systolic BP has been known for over 30 years, it has been largely neglected as a cardiovascular risk factor. Both mean systolic and diastolic rise with age. When patients reach their 50s, systolic BP continues to rise becoming the dominant cardiovascular risk factor. In contrast, the association between diastolic BP and cardiovascular risk becomes negative in older patients, as diastolic BP reaches a plateau and then falls. This pronounced rise in systolic compared with a diastolic BP (isolated systolic hypertension) is largely due to decreased elasticity of the large arteries.

Many of the large outcome studies in hypertension have shown treatment benefit in terms of diastolic BP achieved because this has often been the focus of anti-hypertensive treatment. The result has been a steady decline in average diastolic BP over the last decade, with little change in systolic BP. There is clear evidence, however that reducing high systolic BP is effective: a meta-analysis of clinical trials involving over 15,000 older patients with isolated systolic hypertension demonstrated that lowering systolic BP reduced the risk of all-cause mortality, cardiovascular events, and stroke.

Increased pulse pressure (the difference

between peak systolic and diastolic BP) is a significant cardiovascular risk factor. As with systolic BP, the cardiovascular risk associated with pulse pressure increases with age.

Elevated pulse pressure accompanies isolated systolic hypertension, and is a good indicator of increased risk of heart failure and stroke in such patients. In addition, both isolated systolic hypertension and increased pulse pressure are more significantly associated with the development of target organ damage than diastolic BP.

## MYTH 2: All once-daily anti-hypertensive agents control blood pressure for 24 hours

### FACT: Once-daily anti-hypertensive agents vary in their ability to provide 24-hour control

Achieving sufficient reductions in BP will not in itself improve cardiovascular morbidity and mortality in patients with hypertension; smooth and sustained BP control must be achieved throughout the 24-hour dosing interval. True 24-hour BP control both protects against target organ damage and reduces the risk of cardiovascular events during the early morning BP surge; not all 'once-daily' anti-hypertensive agents achieve this goal.

### Why 24-hour control is necessary

Blood pressure is usually highest during the day and falls at night - a phenomenon known as nocturnal dipping. Some people's BP remains high at night or falls only slightly - they are 'non-dippers'. Such people are thought to run a significantly greater risk of developing target organ damage and premature cardiovascular death than dippers. The relationship between 24-hour BP and increased cardiovascular risk means that the ideal anti-hypertensive treatment should lower BP effectively throughout the night as well as during the day.

Clinical guidelines for the management of hypertension recommend the use of long-acting agents (trough: peak ratio > 50%) because they provide 24-hour BP control. With short-acting anti-hypertensive agents (those with low trough: peak ratios), BP control is likely to be lost before the next dose is due. Indeed, as most patients prefer to take their medication in the morning, this loss of control will correspond to the early morning BP surge, during which there is an increased risk of cardiovascular events.

## Consistency is important

Cardiovascular morbidity and mortality in patients with hypertension depend not only on the level of BP, but also on its variability. The development of target organ damage correlates with the degree of short-term variability of BP.

According to clinical guidelines, anti-hypertensive agents should not only reduce BP, but also cardiovascular risk. The way in which BP is reduced, however, influences such risk. A drug that does not control BP smoothly throughout the 24hr dosing interval will produce markedly different BPs at different times, increasing BP variability and hence cardiovascular risk. The ideal anti-hypertensive therapy should induce smooth and sustained BP control over 24hrs.

The smoothness index is a sensitive and reproducible measure of BP variability. An increase in this index means that BP has become less variable, a potentially beneficial effect.

## MYTH 3: Most hypertension patients are well controlled

### FACT: A startling low number of hypertensive patients are well controlled

### A large proportion of hypertensive patients need combination therapy

Generally, anti-hypertensive monotherapy will reduce BP by around 7-12/4-8mmHg in patients with a BP of 160/90mmHg, irrespective of the class of agent used. Furthermore, monotherapy is effective (reduces diastolic BP to <95mmHg after 1 year) in only 40-60% of patients. Thus, a substantial proportion will need more than monotherapy to reduce their BP adequately. Clinical experience shows that this is particularly true in isolated systolic hypertension, a common problem in the elderly.

In the HOT study, almost two thirds of patients required two or more anti-hypertensive agents to achieve their BP targets. Furthermore, in ALLHAT - the largest prospective, randomized trial completed to date examining the control of hypertension 63% of patients who achieved the BP target of < 140/90mmHg required two or more anti-hypertensive agents.

Clearly, the majority of patients who require two or more anti-hypertensive agents to achieve BP control, a view supported by current guidelines.

## Is combination therapy being used adequately?

No. Several reports strongly suggest that a major factor in the inadequate control of BP is failure to increase the dose or number of anti-hypertensive medications when confronted with a patient with uncontrolled hypertension. Indeed, even in the ALLHAT study, anti-hypertensive therapy was not intensified in many patients with controlled diastolic BP, but uncontrolled systolic BP (140-159mmHg).

Despite recommendations that systolic BP should be <140mmHg, the ALLHAT investigators considered systolic BPs in the low 150s to be adequate.

The most recent USA guidelines state that 'Failure to titrate or combine medication, despite knowing a patient is not at goal blood pressure, represents clinical inertia and must be overcome.'

## MYTH 4: It is dangerous to lower blood pressure in the elderly

### FACT: Elderly patients gain more from blood pressure control than younger patients

Hypertension in the elderly undoubtedly demands effective treatment. These patients are at high cardiovascular risk and have the most to gain from effective anti-hypertensive treatment because the absolute benefit they achieve is greater. Therefore, treatment should not be withheld from older patients, and they should be not be treated sub-optimally. This is particularly true in patients with isolated systolic hypertension, which is generally much more difficult to control than diastolic hypertension, but is clearly a significant risk factor in the elderly that demands effective treatment.

The benefits of treating hypertension in the elderly in terms of reducing cardiovascular morbidity and mortality have been well documented in several prospective intervention studies; a pooled analysis of studies involving more than 18,000 patients with systolic and/or diastolic hypertension provided further confirmation. The benefits of treating isolated systolic hypertension in elderly patients were also illustrated in a meta-analysis of more than 15,000 older patients (aged >60 years); treatment significantly reduced the risk of stroke, coronary events, and cardiovascular and all-cause mortality.

As anti-hypertensive treatment is effective in older and younger patients, and older patients have a higher absolute risk of cardiovascular events, the absolute benefit of treatment in older patients is correspondingly greater. So, why do so many older patients have uncontrolled hypertension?

Until recently, treating hypertension in

the elderly was not given much prominence. Fry et al published an article in the Lancet in 1974 called the 'Natural history of hypertension. A case for selective non-treatment', in which he stated that 'Anti-hypertensive agents produce no obvious benefit in patients over 65'. Gaining credibility for the control of hypertension in the elderly has been an uphill struggle ever since. A number of factors contribute to this:

- Underestimating the importance of hypertension
- Setting inappropriate thresholds and target
- The belief that it is not cost-effective

## Underestimating the importance of hypertension

Increasing age is an important cardiovascular risk factor; cardiovascular risk increased to a similar level to that of patients who had ischaemic heart disease, diabetes, renal dysfunction, or who smoked, and to a significantly greater extent than that associated with dyslipidaemia in the Hypertension Optimal Treatment (HOT) study, which evaluated the benefits of intensive BP control in 18,790 patients, including almost 6000 patients aged 65 years or older.

The cardiovascular risk related to hypertension increases with age because the large arteries stiffen over time, commonly resulting in isolated systolic hypertension; for example, older patients had mean systolic BPs 7mmHg higher than younger patients in the HOT study. Indeed, half of the 60-70% of people aged over 60 years estimated to have hypertension have isolated systolic hypertension, which is much more difficult to control than diastolic hypertension. While the absolute risk of hypertension is undoubtedly at its highest in elderly patients, the majority of clinical trials have been conducted in younger patients. So, to a large extent, treatment of elderly patients has been based on experience in younger patients or on a subgroup analysis of trials involving patients of varying ages.

## Inappropriate thresholds and targets

Inappropriate treatment thresholds are often set for elderly patients with hypertension. For example, a survey of more than 300 doctors in the UK set a median threshold for drug treatment of 180/100mmHg for general clinicians, 165/90mmHg for doctors specializing in older age, and 180/100mmHg for family doctors - all higher than 160/90mmHg, the British Hypertension Society threshold at that time (since reduced to 140/85mmHg). As a result, the Health Survey for England in

1966 found that more than half of patients over the age of 65 years had untreated BPs of BPs > 160/95mmHg.

A further example of setting inappropriate thresholds comes from the Evaluation and Interventions for Systolic Blood pressure Elevation-Regional and Global (EISBERG) Project, a survey carried out in seven countries, including France, Italy, Canada and Germany. This survey found that only two out of five patients had a systolic BP at or below the targets recommended in national guidelines (typically < 140/90mmHg), which are commonly less stringent than international guidelines<sup>12</sup> or those from the USA.<sup>19</sup> Moreover, doctors tended to treat older patients (>65 years) later and less aggressively compared with younger patients.

Part of the reason why BP remains uncontrolled in older patients is that doctors commonly use diastolic BP to guide anti-hypertensive treatment so, whilst average diastolic BPs have steadily decreased in the last decade, average systolic BPs have remained the same (see Myth 1: Diastolic blood pressure is the most important predictor of cardiovascular risk). Systolic BP should be an important focus of anti-hypertensive treatment to improve outcome in older patients, as confirmed in the latest European and USA guidelines.

## Lowering BP is not dangerous in elderly patients

Anti-hypertensive medication is often taken for life, but the side-effects of treatment may impair the patient's quality of life. This is believed to be particularly true in elderly patients. Evidence from a substudy of the HOT study, however, showed that well-being of elderly patients improved the lower their achieved BP. Moreover, there was no increased risk when diastolic BP was lowered to 70mmHg in the HOT study, which is lower than current target levels.

Until recently, doctors commonly believed that low BP may be a risk factor for dementia. The contrary is probably true: hypertension is a risk factor for dementia, both vascular and of the Alzheimer type, and for a decline in cognitive function.

## Treating older patients can be cost-effective

Many doctors believe that effective anti-hypertensive treatment is not cost-effective in older patients. They may be concerned about the sheer numbers of elderly hypertensive patients in the community, estimated to be 60-70% of those aged over 60 years, and the cost of giving them anti-hypertensive medication.

The results of a meta-analysis involving

# Diagnofirm in Pictures



Mrs. W. Chand with one of the orphans from S/Pikwe



Some of the Orphans who came to receive the Gifts



Mr. I. Chand chats with Mr. Habangana



Mr. I. Chand and Mrs W. Chand together with Diagnofirm Staff Members pose for Photos with the recipients of gifts







Chishamiso and Munyaradzi in Mabule for the month of youths against HIV/AIDS Commemoration



Students from Mabule Junior Secondary School Commemorating the month of Youth Against HIV/AIDS



Students from Mabule Junior Secondary School Commemorating the month of Youth Against HIV/AIDS



Bulldog with Mabule Village Chief



Guests of Honour at World Hypertension Day Celebrations



Dr. Caroline Akim from WHO giving her Speech on the World Hypertension Day Celebrations



Speaker of the National Assembly Mr. P. Balopi giving the speech on World Hypertension Day Celebrations with Professor Kiran Bhagat looking on



over 15,000 patients aged 60 years or more, however, indicate that treating elderly patients with hypertension is more cost-effective than treating younger hypertensive patients: only 19 hypertensive patients aged over 70 years (n=7773) needed treatment to prevent one major cardiovascular event over a 5-year period, compared with 39 younger patients (n=7920).

### **MYTH 5: Hypertension is less of a problem in women than in men**

#### **FACT: Hypertensive women are at greater risk than hypertensive men**

Hypertension is the leading cause of death in women. Despite the fact that women gain at least benefit from anti-hypertensive treatment as men, being female may adversely influence the management of hypertension. The Hypertension Optimal Treatment (HOT) study showed that women may receive less intensive anti-hypertensive treatment than men.

Women are also less likely than men to undergo major diagnostic procedures for the adequate detection of heart disease or to undergo revascularization when they present with an acute myocardial infarction (MI). Moreover, since women with an acute MI often present without chest pain (considered to be a key symptom), there is an increased risk of delayed or less intensive treatment and in-hospital mortality.

Gender may also indirectly influence the inclusion of women in clinical studies, as many study protocols have an upper age limit as part of their inclusion criteria. As a result, more older women with hypertension will be excluded and trial populations will not fully reflect the hypertensive population.

Women tend to develop hypertension later in life than men as oestrogens in premenopausal women have a cardiovascular protective effect: they induce a down-regulation of AT<sub>1</sub>-receptor, which mediate most of the harmful cardiovascular effects associated with activation of the renin-angiotensin system (RAS). The onset of the menopause is associated with a sharp increase in the risk of developing hypertension and an even greater risk of cardiovascular morbidity and mortality than in men.

#### **Hypertensive women are at greater risk than hypertensive men**

In addition to developing hypertension later in life, women are more likely to progress from hypertension to congestive heart failure and are less likely to survive their first heart attack.

The increased risk of cardiovascular events in older women is associated with

various factors. Women are more prone to develop isolated systolic hypertension, which is associated with greater risk of cardiovascular events. In the HOT study, women presented with systolic BPs 3-5mmHg higher than men. They are commonly non-dippers, i.e. the usual dip in BP at night is blunted or absent, and this is associated with an increased risk of cardiovascular events and premature death. Furthermore, since women tend to live longer than men, they accumulate further cardiovascular risk factors over time. Such risk factors, e.g. diabetes, increase cardiovascular risk to a greater extent in women than in men.

#### **Should women be treated differently?**

Women have been shown to gain at least as much benefit from anti-hypertensive treatment as men.

More women than men achieved diastolic BP targets as low as 80mmHg in the HOT study, despite having higher baseline systolic BPs. There was significantly lower incidence of MI in women than in men as diastolic BP decreased (p=0.034), as well as a trend towards a lower incidence of other cardiovascular events.

Current guidelines do not recommend different treatment according to a gender; therefore, women with hypertension should be treated in a similar manner to men. Women, however, are more sensitive to the side effects of anti-hypertensive agents, highlighting the importance of tolerability as a key issue in the management of hypertension in women.

### **MYTH 6: All anti-hypertensive agents promote compliance**

#### **FACT: Not all anti-hypertensive agents promote compliance**

Poor patient compliance is a well-known therapeutic problem. Anti-hypertensive treatment is often for life, so the initial choice of anti-hypertensive agent is important. Discussing compliance with the patient as well as monitoring it improve BP control significantly (p<0.001), but even under these achieve >90% compliance. The properties of the anti-hypertensive agents itself often influence compliance.

#### **Class of anti-hypertensive agent**

The class of anti-hypertensive agent used can affect patient compliance. More than half of patients switched therapy or stopped taking a new course of ACE inhibitors, calcium channel blockers or beta-blockers within six months of starting it, according to a study involving over 37,000 patients with hypertension. AT<sub>1</sub>-receptor blockers, however, improve persistence with

treatment, aiding compliance. The percentage of new patients continuing AT<sub>1</sub>-receptor blocker therapy one year after initiation was substantially higher than those receiving ACE inhibitors, calcium channel blockers, beta-blockers or diuretics.

#### **Dosing frequency**

Once-daily dosing improves compliance. Compliance increased by 30% when calcium channel blockers were given once daily rather than twice daily in 113 patients with hypertension and/or angina (p<0.001). Overall, 91% of patients receiving once-daily therapy took their medication on at least 80% of study days, compared with 66% receiving a twice-daily regimen.

#### **Tolerability of treatment**

Because hypertension is typically asymptomatic, but requires long-term treatment, the tolerability of the anti-hypertensive agent used has a direct effect on patient compliance. Adverse effects and lowered quality of life are the main reasons for non-compliance with and discontinuation of drug therapy.

#### **Can we compensate for poor compliance?**

Total compliance is the ideal, but is unlikely to happen in real life. Prescribing an anti-hypertensive agent with a long duration of action can go some way towards compensating for poor compliance.

Many people forget to take their medication occasionally. When a dose of anti-hypertensive medication is missed or delayed, there may be a period during which BP control and hence cardiovascular protection is reduced or lost. As most people prefer to take their medication in the morning, this period generally occurs at the most dangerous time – during the early morning BP surge that is accompanied by an increased risk of cardiovascular events. An anti-hypertensive agent that maintains BP control beyond 24hrs would provide better cardiovascular protection. ■

## **Medical Trivia**

**Q. Why is HDL cholesterol considered the "good" cholesterol?**

**A Studies have shown that higher HDL cholesterol is associated with lower risk of heart disease.**

**Did you know: that high blood pressure can damage almost every organ in your body?**

# Men and the Aging Process

## Aging Male Syndrome (AMS)

Aging male syndrome (AMS), is also called male menopause, andropause, viropause, male climacteric, and late onset hypogonadism. Men go through AMS between the ages of 35 and 65 (normally between 40 and 55) when their hormone levels (especially testosterone) go down. Testosterone is a hormone that helps maintain sex drive, sperm production, pubic and body hair, muscle, and bone. Testosterone levels decrease over time. This decline is normal in healthy males as they age. Unlike women who lose their fertility (ability to get pregnant) when they reach menopause, men do not lose their fertility. All men have different experiences—some men's hormone levels go down more than others, and some have more symptoms than other men. A decline in testosterone can affect a man's body. AMS has many signs:

- Feeling fat/weight gain
- Problems sleeping
- Less interest in sex
- Feeling irritable or angry
- Loss of motivation
- Loss of drive at work
- Erection problems
- Nervousness
- Problems with memory and concentration
- Indecisiveness
- Lower self-confidence
- Tiredness
- Muscle loss
- Increased urination
- Depression
- Mood swings
- Loss of energy
- Bone loss and Hair loss

Between the age of 40 and 55 or older, men can experience something very close to female menopause called andropause. Both phenomenon are a natural step in the process of aging. In women, menopause is marked with the cessation of menstruation, but male menopause may be a misnomer as men continue to be fertile beyond andropause. Not all men get such a clear-cut signal even if they experience drop in hormone levels. In men, lower levels of available testosterone are responsible for many symptoms, some more difficult to track and more serious than others. All men will experience a lowering of their testosterone levels starting at age 30, but not all will present symptoms such as changes in mood, fatigue, loss of energy, sex drive and physical agility. Although no one can reverse the course of time or nature, there are still things you can do to help

uncover the silent effects and prevent the development of certain medical conditions. Low levels of testosterone put men at higher risk of getting osteoporosis or cardiovascular disease.

Exercise, eating healthy foods and managing the weight can help minimize the impact of andropause on a man feels about himself and others around him. Hormone replacement therapy for men can help increase available testosterone levels, overcome symptoms and help reduce the risk of developing osteoporosis or cardiovascular disease. Studies have shown that older men with lower levels of testosterone could be at higher risk of developing cognitive/memory diseases such as Alzheimer's disease. Studies have also demonstrated that hypogonadal men (those with low testosterone levels) had an increased incidence of depression. Because it is harder to track, the long-term effects of andropause should not be taken lightly. Although apparent symptoms such as a decline in sexuality and overall energy, changes in mood and depression can really have an impact on the quality of life, the risk of cardiovascular disease and osteoporosis increase in men with andropause and should be closely monitored.

Screening for testosterone deficiency should begin at age 50 or 55 and be repeated every five years or more frequently if symptoms are present. Restoring testosterone has shown to be beneficial to men on many levels. Monitoring the level of testosterone can help prevent osteoporosis. By making a few lifestyle changes, like healthy eating habits, exercising, and better weight management, men can influence the course of things. This can help them feel more energetic, motivated and positive, decrease anger, irritability, sadness and the decline in mood. Hormone replacement therapy helps to overcome symptoms, as it has been associated with very positive responses.

Although some of the symptoms that accompany andropause are obvious, there are more silent, difficult to track effects that need to be identified. In men with andropause, more bone tissue is lost than regenerated because not as much available testosterone can help bone formation. Also, testosterone provides much of the bone protecting estrogen found in a man's body. Low testosterone results in more fragile, weaker bones (osteoporosis) leading to increased

risk of hip fractures, pain, and in many cases loss of independence. About one in eight men over the age of 50 has osteoporosis.

## Impotence

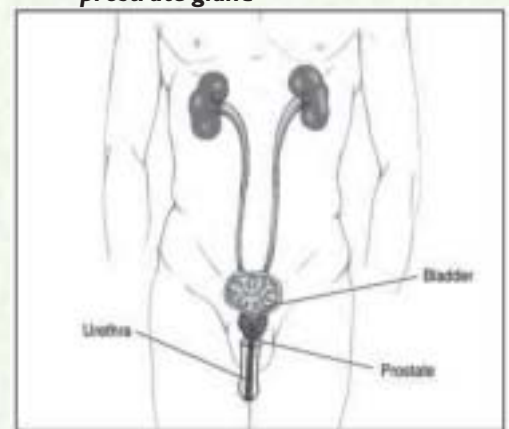
Impotence, also called "erectile dysfunction" is a consistent inability to sustain an erection sufficient for sexual intercourse. Impotence can be a total inability to achieve erection, an inconsistent ability to do so, or a tendency to sustain only brief erections. An erection requires a sequence of events. Impotence can be a result of a disruption in one of the events. The sequence involves nerve impulses in the brain, spinal column, and area of the penis, and response in muscles, fibrous tissues, veins, and arteries in and near the corpora cavernosa. Other cause of impotence are: injury to the penis, prostate surgery, medication, psychological factors, and injury to the bladder. Diseases such as **diabetes, kidney disease, chronic alcoholism, multiple sclerosis, atherosclerosis**, and vascular disease account for a large percentage of cases of impotence. Impotence can be diagnosed by patient history, physical examination, laboratory tests and a psychosocial examination.

Impotence is treatable in all age groups. Some of the most common treatments for impotence are: psychotherapy, drug therapy, vacuum devices, and surgery

## Prostate Health

The prostate is a doughnut-shaped cluster of glands located at the bottom of the bladder about halfway between the rectum and the base of the penis. It encircles the urethra, the tube that carries urine from the bladder out through the penis. The walnut-sized gland produces most of the fluid in semen.

### Diagram Showing position of the prostate gland



The three most common prostate problems are:

- Infection (prostatitis). Some prostate infections come on suddenly and give you symptoms such as:
  - fever and chills
  - pain and burning when urinating and during ejaculation
  - a strong and frequent urge to urinate, but only being able to pass small amounts of urine
  - lower back or abdominal pain
  - blood in the urine
- Prostate enlargement (benign prostatic hypertrophy). In some men, a natural part of aging is having a prostate that gets larger with time. While this is not a disease, as the gland gets bigger, the prostate tends to squeeze the urethra and can cause urinary problems. Some of these problems include:
  - painful urination
  - an urge to urinate a lot
  - a decreased force of the urine stream
  - having an incomplete emptying of the bladder
  - problems getting the urine started and completely stopped If urination becomes difficult for you because of these symptoms.
- Prostate cancer. Prostate cancer is the most common cancer and the second leading cause of cancer deaths in men. Most cases are in men over the age of 65. It sometimes runs in families, and is more common in men who eat a high-fat diet. It is a small and slow-growing cancer, but it can be very serious if it is large, advanced, or appears at a younger age. Because there are no specific symptoms, except in some cases when the symptoms are like those of prostate enlargement, screening tests to find the cancer are important.

Prostate-specific antigen (PSA) is a protein produced by the cells of the prostate gland. The PSA test measures the level of PSA in the blood. The doctor takes a blood sample, and the amount of PSA is measured in a laboratory. Because PSA is produced by the body and can be used to detect disease, it is sometimes called a **biological marker** or **tumor marker**. It is normal for men to have low levels of PSA in their blood; however, prostate cancer or **benign** (not cancerous) conditions can increase PSA levels. As men age, both benign prostate conditions and prostate cancer become more frequent. The most common benign prostate conditions are **prostatitis** (inflammation of the prostate) and **benign prostatic hyperplasia (BPH)** (enlargement of the prostate). There is no evidence that prostatitis or BPH cause cancer, but it is possible for a man to have one or both of

these conditions and to develop prostate cancer as well. PSA levels alone do not give doctors enough information to distinguish between benign prostate conditions and cancer. However, the doctor will take the result of the PSA test into account when deciding whether to check further for signs of prostate cancer. The PSA test along with a digital rectal exam (**DRE**) help detect prostate cancer in men age 50 and older. During a DRE, a doctor inserts a gloved finger into the **rectum** and feels the prostate gland through the rectal wall to check for bumps or **abnormal** areas. Doctors often use the PSA test and DRE as prostate cancer screening tests; together, these tests can help doctors detect prostate cancer in men who have no **symptoms** of the disease. The PSA test is also used to monitor patients with a history of prostate cancer to see if the cancer has come back (recurred). An elevated PSA level in a patient with a history of prostate cancer does not always mean the cancer has come back. A man should discuss an elevated PSA level with his doctor. The doctor may recommend repeating the PSA test or performing other tests to check for evidence of **recurrence**. It is important to note that a man who is receiving **hormone therapy** for prostate cancer may have a low PSA reading during, or immediately after, treatment. The low level may not be a true measure of PSA activity in the man's body. Men receiving **hormone therapy** should talk with their doctor, who may advise them to wait a few months after hormone treatment before having a PSA test. Several **risk factors** increase a man's chances of developing prostate cancer. Age is the most common risk factor, with nearly 70 percent of prostate cancer cases occurring in men age 65 and older (1). Other risk factors for prostate cancer include **family history**, race, and possibly **diet**. Men who have a father or brother with prostate cancer have a greater chance of developing prostate cancer. In addition, there is some evidence that a diet higher in fat, especially animal fat, may increase the risk of prostate cancer. PSA test results report the level of PSA detected in the blood. The test results are usually reported as **nanograms** of PSA per **milliliter** (ng/ml) of blood. Most doctors are now using the following ranges, with some variation:

- 0 to 2.5 ng/ml is low
- 2.6 to 10 ng/ml is slightly to moderately elevated
- 10 to 19.9 ng/ml is moderately elevated
- 20 ng/ml or more is significantly elevated

There is no specific normal or abnormal PSA level. However, the higher a man's PSA level, the more likely it is that cancer is present. But because various factors can cause PSA levels to fluctuate, one abnormal

PSA test does not necessarily indicate a need for other diagnostic tests. When PSA levels continue to rise over time, other tests may be needed. If no other symptoms suggest cancer, it is recommended repeating DRE and PSA tests regularly to watch for any changes. If a man's PSA levels have been increasing or if a suspicious lump is detected during the DRE, the doctor may recommend other tests to determine if there is cancer or another problem in the prostate. A **urine** test may be used to detect a **urinary tract** infection or blood in the urine. The doctor may recommend **imaging** tests, such as **ultrasound** (a test in which high-frequency sound waves are used to obtain images of the **kidneys** and **bladder**), **x-rays**, or **cystoscopy** (a procedure in which a doctor looks into the **urethra** and bladder through a thin, lighted tube). Medicine or surgery may be recommended if the problem is BPH or an infection. If cancer is suspected, a **biopsy** is needed to determine if cancer is present in the prostate. During a biopsy, samples of prostate **tissue** are removed, usually with a needle, and viewed under a microscope. The doctor may use ultrasound to view the prostate during the biopsy, but ultrasound cannot be used alone to tell if cancer is present. Detection does not always mean saving lives: Even though the PSA test can detect small **tumors**, finding a small tumor does not necessarily reduce a man's chance of dying from prostate cancer. PSA testing may identify very slow-growing tumors that are unlikely to threaten a man's life. Also, PSA testing may not help a man with a fast-growing or **aggressive** cancer that has already spread to other parts of his body before being detected. False positive tests: False **positive test results** (also called false positives) occur when the PSA level is elevated but no cancer is actually present. False positives may lead to additional medical procedures that have potential risks and significant financial costs and can create anxiety for the patient and his family. Most men with an elevated PSA test turn out *not* to have cancer; only 25 to 30 percent of men who have a biopsy due to elevated PSA levels actually have prostate cancer. False negative tests: False **negative test results** (also called false negatives) occur when the PSA level is in the normal range even though prostate cancer is actually present. Most prostate cancers are slow-growing and may exist for decades before they are large enough to cause symptoms. Subsequent PSA tests may indicate a problem before the disease progresses significantly. PSA velocity: PSA velocity is based on changes in PSA levels over time. A sharp rise in the PSA level raises the suspicion of cancer. PSA density: PSA density considers the relationship of the PSA level to the size of

the prostate. In other words, an elevated PSA might not arouse suspicion if a man has a very enlarged prostate. Free versus attached PSA: **PSA circulates in the blood in two forms: free or attached to a protein molecule. With benign prostate conditions, there is more free PSA, while cancer produces more of the attached form.**

## GOUT

Gout is one of the most common forms of arthritis (joint inflammation). It appears as an acute attack. Within 12-24 hours of the attack, there is severe pain and swelling in the affected joint. Gout usually affects only one joint at a time - most often the feet and ankles. The joints in the big toe are common sites. The most common symptoms of gout are inflammation, swelling, and tenderness in a joint. The tenderness is often felt in the joint of the first toe.

Gout is caused by an excess of uric acid in the body. The excess can be caused by an increase in production of uric acid in the body and by the inability of the **kidneys** to adequately clear uric acid from the body. Shellfish, certain medications, and an excess of alcoholic beverages may increase uric acid levels and cause gout attacks.

Some of the major complications are:

1. **Tophi.** When high levels of high uric acid has been present for a long time, deposits of uric acid salts may appear around the affected joint and even in tissues elsewhere such as the ears. These nodules are called tophi.
2. **High Blood Pressure.** When **blood pressure** is high and levels of uric acid are high, kidney damage can occur.

Decrease intake of alcohol and rich foods that are primary contributors to excessive uric acid levels. Gout can be treated. If it is not treated, the attack subsides in a week or so. Sometimes months or even years will pass before having another attack.

## Diabetes in Men

Most of the food we eat is turned into glucose (sugar) for our bodies to use for energy. The pancreas makes insulin, which helps sugar get into the cells. When you have diabetes, your body either doesn't make enough insulin or can't use the insulin it does make. This causes sugar to build up in your blood. Over the years, high blood sugar leads to problems like heart disease, **stroke**, blindness, kidney disease, nerve problems, gum infections, and **amputations**.

### Diabetes-Related Problems in Men

Men with diabetes suffer more from some

diabetes-related health problems than women.

- In people who develop diabetes before the age of 30, men develop retinopathy (a vision disorder that can lead to blindness) more quickly than women.
- Having the main symptoms of **peripheral vascular disease** (pain in the thigh, calf, or buttocks during exercise) is linked to a two- to three-fold increased risk of **coronary heart disease**, stroke, or cardiac failure in men with diabetes.
- Amputation rates from diabetes-related problems are 1.4 to 2.7 times higher in men than women with diabetes.

Men with diabetes also face special concerns like impotence (not being able to have or keep an erection). Men with diabetes can help prevent impotence by:

- controlling blood sugar levels
- not worrying (fear of becoming impotent can sometimes be the cause)
- not drinking large amounts of alcohol, which can cause impotence
- not smoking, (smoking causes blood vessels to narrow, which can lead to impotence)

### Signs of Diabetes

- feeling tired
- frequent urination (especially at night)
- being very thirsty
- weight loss
- blurry eyesight
- recurring skin, gum, or bladder infections
- sores that heal slowly
- dry, itchy skin
- loss of feeling or tingling in your feet

## Type 1 and Type 2 Diabetes

There are different kinds of diabetes:

- **Type 1 diabetes.** Type 1 diabetes is usually first diagnosed in children, teenagers, or young adults. In this form of diabetes, the immune system (the body's way to fight infection) attacks the cells that make insulin in the pancreas and destroys them. The pancreas then makes little or no insulin, and cells can't take sugar from your blood. If not diagnosed and treated with insulin, a person can lapse into a life-threatening coma. Someone with type 1 diabetes takes insulin shots or uses an insulin pump. He also needs to make wise food choices, exercise regularly, and control blood sugar, blood pressure, and cholesterol. We don't know yet how to prevent type 1 diabetes, but you can benefit by keeping your blood sugar under control.
- **Type 2 diabetes.** Type 2 diabetes is the most common form of diabetes. People

can develop it at any age-even during childhood. Type 2 diabetes begins when your body can't use insulin right (insulin resistance). There is too much sugar in your blood. At first, the pancreas keeps up with the added demand by making more insulin. In time though, it can't make enough insulin. Treatment for type 2 diabetes includes taking diabetes pills, making wise food choices, exercising regularly, and controlling blood sugar, blood pressure, and cholesterol. The good news is we now know that if you have pre-diabetes, you can reduce your risk of getting type 2 diabetes. If you have diabetes, you can prevent or delay complications.

To help you lose weight, choose low-fat foods and foods high in fiber. Cut down on fat and cholesterol by having low-fat dairy products, lean cuts of meat, fish, poultry, fruits, and vegetables. Also, limit foods high in salt and sugar.

It's important to find out early if you have type 2 diabetes or if you are at risk of developing it. To find out if you're at risk, check off each item that applies to you.

- overweight or obese. (Obesity is measured with a body mass index (BMI), which shows the relationship of weight to height)
- family background .
- blood pressure is 140/90 or higher
- cholesterol is not normal..
- not very active.

Talk to your health care provider about the risks that you checked off. If you are age 45 or older, also talk to your health care provider about getting tested for type 2 diabetes. If your test result is normal, you should then be tested every three years. People younger than age 45 who are overweight or obese and checked off any of the items above should also talk to their health care provider about getting tested for diabetes.

It is important for older men to constantly have a wellness assessment so as to try and avoid most of the conditions encountered in old age before they occur. ■

## Medical Trivia

**Q. How often will the rheumatoid factor (RF) be present in patients with active rheumatoid arthritis?**

**A. RF is present in about 85% of these patients.**

# A PHARMACIST AS A HEALTH PROFESSIONAL

Pharmacists are one of the key health professionals in any healthcare system. They have an important role to play in the provision of healthcare. They are custodians of essential medicines and other medicines. Pharmacists are usually involved in the dispensing, formulation, manufacture, regulation, distribution and therapeutic evaluation of medicines.

Dispensing of medicines can be done in retail pharmacies, which are sometimes referred to as chemists or in a hospital dispensary. It involves issuing of the medicines, ensuring that the correct medicine, strength, dose, dosing interval has been prescribed. As part of the dispensing process pharmacists also check whether the medicine prescribed will affect the effectiveness or safety of the other medicines already prescribed. This is part of therapeutic evaluation. Pharmacists sometimes have to contact the prescribers if necessary to discuss the medicine prescribed in the interest of the patient.

Pharmacists play an important role in improving health outcomes, quality of life, and safety for the patient. This is done by selection of the most cost-effective treatment. Appropriate medicine selection can also provide cost-savings for stakeholders like the government and medical aids. Patients can be protected from drug-related morbidity and mortality by the selection and use of cost-effective medicines.

Therefore pharmacists are in the best position to be cost/disease managers, monitoring drug interactions, checking prescriptions for legal and clinical correctness.

Therapeutic evaluation can be done at the dispensing stage or during rounds taken by pharmacists with other healthcare professionals in hospitals. This means that the pharmacist has to be convinced that medicine prescribed will do what it is intended to do. Therefore, pharmacists need to know about human diseases as well. Pharmacists have a particular responsibility to educate consumers and patients on how best to use medicines including the crucial aspect of adhering to their treatment regime. During a counselling session patients are made aware of the possible side-effects and the benefits of their medicines.

Prior to manufacturing a medicine pharmacists have to do some studies to find out suitable inactive ingredients that need to be added to the active ingredient to ensure it is safe and of good quality. This is called Research and Development studies. Pharmacists are also involved in the manufacturing of medicines at large scale for public consumption. These medicines are then distributed to wholesalers or pharmacies under supervision of pharmacists. During the storage and distribution of medicines pharmacists must ensure that storage conditions stated by the

manufacturers are adhered to in order to prevent degradation of the medicine.

In most countries medicines have to be given a marketing authorisation (registration of medicines) before the public or any health professional can use it. These medicines have to be evaluated for efficacy, quality and safety. If a particular medicine meets the three requirements then it can be authorised (registered). Pharmacists inspect manufacturing firms for compliance with Good Manufacturing Practice Standards. The standards are set out to ensure medicines are manufactured under good quality environment. Wholesalers and pharmacies are also inspected to ensure that they are of good condition to store medicines. This is called regulation of medicines.

Pharmacists' training gives them knowledge and expertise about medicines. Undergraduate pharmacy programmes differ from country to country and in some areas like the European Community the curricula is harmonised. The duration of the programmes ranges from four years to six years.

This is the first of a series of articles, which is aimed at enlightening readers on issues related to pharmacy. The next article will address readers on how best to use the pharmacy. ■

continued from page 5

## Hypertension

### How is High Blood Pressure Diagnosed?

#### Medical History

If hypertension is suspected, the physician should obtain the following information:

1. Family and personal medical history, especially high blood pressure, stroke, heart problems, kidney disease, or diabetes;
2. Risk factors of heart disease and stroke, including tobacco use, salt intake, obesity, physical inactivity, and unhealthy cholesterol levels;
3. Any medications—both prescription and nonprescription—being taken;
4. A review of symptoms that might indicate secondary hypertension, such as headache, heart palpitations, excessive sweating, muscle cramps or weakness, or excessive urination; and

5. Any emotional or environmental factors that could affect blood pressure.

#### Physical Examination

Almost all physical exams include blood pressure measurement. An inflatable cuff is placed around the arm, and the person taking the blood pressure listens with a stethoscope over the artery. If high blood pressure is present or suspected, the physician or health professional should take two or more measurements separated by two minutes with the patient sitting or lying down, as well as one taken after the patient has been standing for two minutes. Patients should not smoke or drink caffeinated beverages within 30 minutes of the measurement.

#### Laboratory Tests

If a physical examination indicates hypertension, additional laboratory tests may determine whether it is secondary hypertension (high blood pressure caused by another disorder) or essential hypertension (no other disorder is present). The physician might also order tests to uncover organ damage due to hypertension. These tests include a complete blood count, urinalysis, and measurements of potassium, blood urea nitrogen, fasting blood glucose, serum cholesterol, and serum uric acid. Marked hypertension can result in increased 24hr urine microalbumin levels. An electrocardiogram (ECG) may also be performed. ■

# Patients Corner

## WHAT IS A TUMOUR

A tumour is any growth of tissue formed by a collection of cells into an abnormal mass. There are two types of tumours:

- 1) Benign (non-cancerous)
- 2) Malignant (cancerous)

Benign tumours do not spread and do not cause disease. Malignant tumours can spread rapidly through the body, invade and destroy normal tissues therefore causing cancer.

## WHAT IS CANCER

Cancer is an abnormal growth of cells. Cancer cells rapidly produce despite restriction of space, nutrients shared by other cells, or signals sent from the body to stop reproduction. Cancer cells are often shaped differently from healthy cells, they do not function properly and they can spread to many areas of the body.

## HOW IS EACH CANCER TYPE NAMED

Cancer is named after the part of the body it originated from e.g. breast cancer. When cancer spreads (metastasis) the name remains the same. If kidney cancer spreads to the lungs, it is still kidney cancer, not lung cancer.

## BLOOD TESTS CAN HELP DETECT CANCER

According to the World Health Organization (WHO) there are more than six million deaths from cancer annually, 10 million new cases are diagnosed worldwide every year. WHO estimates that cancer depends on its sensitivity and specificity. (A test that is 100 % sensitive has no false negatives; it is positive or increased in every person who has that type of cancer. A test that is 100 % specific has no false positives, it is negative or normal in every person who does not have that type of cancer.) Most tumour markers are neither sensitive nor specific enough to screen or diagnose without the support of other clinical findings. Increased levels can be followed up with a tumour biopsy, endoscopic examination, ultrasound, x-rays or surgery.

Tumour markers can be used for four main purposes:

1. Screening high risk population for the possible presence of cancer.
2. Making a diagnosis of cancer or of a specific type of cancer, along with other clinical findings.
3. Determining the prognosis of the patient.
4. Monitoring the course of the disease in the patient either in remission or receiving treatment such as Radiation, Chemotherapy or Surgery. (This is done if the marker was increased before treatment)

Some of the more useful and routinely requested Tumour markers are:

## ALPHA FETOPROTEIN (AFP)

AFP is a protein made by fetal cells. When certain types of cancer cells revert to a fetal form they begin to produce AFP. Increased levels are associated with liver, testicular and ovarian cancer. AFP is mostly used to monitor the extent of liver cancer as 70% of patients with liver cancer have high levels of AFP. Serial measurements can be used to monitor treatment response. Pregnant women and people with non-cancerous liver conditions such as cirrhosis and hepatitis have moderately increased levels.

## BETA SUBUNIT HUMAN CHORIO-NIC GONADOTROPIN (BHCG)

BHCG is a subunit of the hormone HCG that appears normally in pregnancy and is produced by the placenta. Women with Choriocarcinoma (a cancer originating in placenta following pregnancy) or molar pregnancy (a tumour inside the uterus) have increased BHCG levels. 70% of men with testicular cancer also have increased levels. Serial BHCG measurements monitor the progress and treatment of these cancers.

## CARBOHYDRATE ANTIGEN 15-3

CA 15-3 is produced by cells in the breast. Increased levels are associated with breast cancer. It is rarely increased in women with early breast cancer. CA 15-3 is most useful in evaluating the treatment or recurrence of breast cancer, or post mastectomy. Increased levels are also associated with cancers of ovary, lung and prostate, and non-cancerous conditions such as benign breasts or ovarian disease, endometriosis, pelvic inflammatory disease (PID) and hepatitis.

## CARBOHYDRATE ANTIGEN 19-9

CA 19-9 is a monoclonal antigen. It is increased in gastric cancer, colon cancer and at least 70% of pancreatic cancers. Increased levels are also found in non-cancerous conditions such as gallstones, pancreatitis, cirrhosis and cholecystitis.

## CARBOHYDRATE ANTIGEN 125

CA 125 is a glycoprotein made by ovarian cells. 80% of women with ovarian cancer have increased levels. Serial measurements are useful to detect remaining or recurrent cancer post treatment. Women may have increased levels in PID, endometriosis, pancreatitis, liver disease and non-ovarian cancers.

## CARCINOEMBRYONIC ANTIGEN (CEA)

CEA is a protein made by fetal tissues especially liver, intestinal and pancreatic tissues. It is increased in cancers of these three organs and is used in diagnosis. Serial measurements are useful in post surgery of colorectal cancer. Several other cancers may increase CEA levels eg lung, prostate, thyroid and breast. Non-cancerous conditions such as peptic ulcers, cirrhosis and inflammatory

intestinal conditions such as colitis or diverticulitis may have high levels.

## PROSTATE SPECIFIC ANTIGEN (PSA)

PSA is a protein produced by the prostate gland. PSA is prostate specific not cancer specific, although increased levels are associated with prostate cancer. PSA exists either free or bound to another substance. Measurements of total and free PSA can be done to distinguish between prostate cancer and benign prostate hyperplasia (BPH) an enlarged prostate condition common in older men. The percentage of free PSA is greater in BPH rather than prostate cancer. A rapid increase in PSA is more likely due to cancer than BPH. Increased PSA levels may be found in post ejaculation and following prostate manipulation or digital rectal examination.

## PROSTATIC ACID PHOSPHATASE (PAP)

PAP is an enzyme originating in the prostate gland and normally present in small amounts in the blood. In addition to prostate cancer, increased levels are found in testicular cancer, leukemia, Non-Hodgkin's Lymphoma and BPH.

## IMMUNOGLOBULINS

Production of a monoclonal immunoglobulin molecule is a characteristic of Multiple Myeloma. Immunoglobulins are paraproteins that usually complete antibody molecules. They may be found as isolated lambda or kappa light chains or rarely as heavy chains and can be of any immunoglobulin subtype. Immunoglobulins are valuable in the staging and treatment of Myeloma, the amount of paraproteins serves as an index of tumour volume. Response to treatment is indicated by a fall in production whereas a rise points to a relapse.

## OTHER TUMOUR MARKERS

### BREAST CARCINOMA-ASSOCIATED ANTIGEN (CA27.29)

CA 27.29 is a marker for breast cancer. 80% of women with advanced breast cancer have increased levels. Serial measurements monitor treatment and response and help indicate recurrences. CA27.29 is not used to screen for breast cancer because women with small or localized tumours often have normal CA27.29 levels. Cancers of colon, stomach, kidney, lung, liver, ovary, pancreas, uterus and liver may also increase CA27.29 levels, as well as non cancerous conditions such as first trimester pregnancy, benign breast disease, ovarian cysts, kidney and liver diseases.

### NEURON SPECIFIC ENOLASE (NSE)

NSE is an isoenzyme of glycolytic pathway that is found only in brain and neuroendocrine tissue. NSE is mostly used to monitor treatment in neuroblastoma and lung cancer. ■

# EATING DISORDERS

## Anorexia Nervosa

Anorexia Nervosa is a disorder characterized by a distorted body image, an extreme fear of obesity, refusal to maintain a minimal body weight and in women, the absence of menstrual periods. 95% of people with anorexia are women and it starts from adolescence and affects people in the middle and upper socio economic class.

### Causes

The real causes are not known but social factors appear to be important. The desire to be thin prevails and obesity is considered to be unattractive/unhealthy or undesirable. Even before adolescence the child will be aware of these attitudes and two thirds of the adolescent girls diet or take measures to control their weight. However there are some factors that predispose to anorexia nervosa which include

- physical, emotional or sexual trauma
- relationships with peers and family members
- loss and grief
- psychological effects of dieting
- stress and copying styles
- genetic factors and
- a feeling of lack of control of one's life.

### Symptoms

Symptoms mainly associated with anorexia nervosa are

- Not wanting to eat when hungry
- Feeling of being too fat yet in fact one will be slim
- Too much weighing of oneself
- No complains of weight loss and lack

of appetite and refusal of treatment

- Studying of diets and calories with hoarding of food, concealing it and subsequent waste of food.
- Over exercising in an attempt to lose weight
- Women tend to stop menstruating and men tend to lose interest in sex
- Typically have low blood pressure, low heart rate, low body temperature, oedema and excessive soft fine hair all over the body and face.
- Hormonal changes resulting from anorexia nervosa include marked reduced levels of oestrogen and thyroid hormones and increased levels of cortisol.

If a person becomes more and more malnourished every major organ in the body is affected. The blood chemistry becomes affected and may be acidic. The person may become dehydrated and prone to fainting. The heart rates get weaker and less blood is pumped through the body and death can occur.

### Diagnosis

Anorexia nervosa is diagnosed on the basis of severe weight loss and characteristics of psychological symptoms.

### Treatment

Treatment consists of two steps

- Restoring normal body weight
- Psychotherapy often-supplemented with drugs.

Treatment is aimed at establishing a calm, concerned, stable environment while encouraging the consumption of an adequate amount of food.

## Bulimia Nervosa

It is a disease characterized by repeated episodes of binge eating followed by forced vomiting, rigorous dieting or excessive exercising to counteract the effects of bingeing. Mostly done by women who are deeply concerned about body shape and body weight.

### Symptoms

Bingeing (rapidly eating large amounts of food while feeling a loss of control) then followed by forced vomiting and dieting. The amount of food consumed is quite larger than a normal meal. Emotional stress often triggers bingeing, which is usually done in secret. Bulimics express concern about their body weight and tend to be more aware of their behaviour and tend to feel remorseful or guilty about it. They can admit their concerns to a doctor. They are also outgoing and are more prone to impulsive behaviour, drug abuse and depression.

### Diagnosis

The condition is detected through wide fluctuations in weight especially with evidence of excessive use of laxatives. Other clues include swollen salivary glands, scars on the knuckles from using the fingers to induce vomiting, erosion of the tooth enamel from stomach acid and low level of potassium in blood tests.

### Treatment

Treatment is generally drugs and psychotherapy. Psychotherapy is generally best done by a therapist with an experience in eating disorders and may be very effective. Drugs can be used if the bulimia nervosa is due to depression. ■

# CUSTOMER FEEDBACK

from Quality Assurance Department

On receiving the Arch of Europe Quality Award, this is what some of our clients feel:

**Tiyapo Pelaelo-Grand** – feels it gives comfort and confidence when a laboratory recognized for its Quality of work is doing tests.

**Tiro Mokgautsi of Thebephatshwa** – feels it's an excellent achievement for us to have received the award.

**K.B of Maun**- wishes us well in our business and wishes DML was found all over Botswana and not only in Gaborone

**Daniel Obara from premier School of Accounting** – hopes we maintain the standards

and keep on trying to achieve the greater success and avoid failures.

**Mathudi Makgale of Water Utilities Corporation Gaborone** - feels that its always-good when excellent work is being appreciated.

**Peggy Gangaidzo of Gaborone** - is proud to be associated with Diagnofirm Medical Laboratories.

**P.K. Roy** - Gaborone – feels its good to know that an operation in Botswana can achieve a global award.

**Konokono C. Lesetedi** – feels that it's an indicator of valuable quality services provided by Diagnofirm that they received the award

and the achievement is also an achievement for our customers who support us.

**Orial Sejadepeo** - feels that Diagnofirm deserves the award because of the high quality of our work and great professionalism.

For the past six months we have collected information from our customers concerning the service they got at Diagnofirm on their visits. This was a very helpful exercise as it brought to light some issues that we were not aware of. To all those who responded, we thank you and we would like to encourage that on every visit you make please let us know how you were treated. Your information is of great value as it helps us maintain standards and improve in areas we are lagging behind. We can only provide the service you desire if you tell us what you expect from us as the service providers. ■