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NEWSLETTER
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Editors Note

Its April already, whew! How quickly the time has flown by. It tends to do so when you have plans and changes that need implementing and when you are chasing deadlines. Anyways, to the business at hand. In this issue there are a few things I'd like to highlight.

Firstly I was touched by a story that I read in the Sunday Times about a young woman and her experiences with HIV and how it changed her life and so I thought to share this story with you. Also included are the benefits of folic acid in early second trimester pregnancy and the scourge of human papilloma virus (HPV) from our resident Pathologist Dr Ritalin.

We have also included in our issue a new segment meant mainly for the avid health readers and patients called "Ask the Prof". This is a section where our resident fundi Prof Bhagat will be answering some common niggling questions that we normally have to do with our health.

Now that I have highlighted some of what is present in this issue, I want to tell you of the plans for the future. We are hoping to have the newsletter divided into areas for different interest groups. The aim being for everyone in the health sector to be able to get something out of our publication. Be it being able to use it as a reminder or refresher or as an update to the latest happenings in the medical world.

In short, be a reference point. I take this opportunity to plead to you to kindly send us your articles and let us bring them to the world for you. And to the patients, if you have any accounts you want to relate to us, please feel free to send your correspondence. It could be an account of your battle with an illness or experiences with anything medical, they are much appreciated.

With that, I say, have a pleasant winter. And try keep warm and away from the flu. And if you do get the flu, get a few hints that we've sprinkled around in our newsletter and notice the difference.

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Dr. Ritalin and Jabulani working on the new Histology/Cytology machinery

DIAGNOFIRM MEDICAL LABORATORIES

Recent And Upcoming Events @ Diagnofirm

Welcome to our quarterly update of events taking place at Diagnofirm.

Diagnofirm was earlier on this quarter involved together with some other health providers in the parliamentary health awareness week. This was a drive by parliament to make sure its staff knew they are healthy and those who were not were empowered by knowing they are not. It is very heart-warming to see health awareness being taken to the nation's highest decision making institution and to see MPs and general staff actively participate in such an event.

Also, recently, Diagnofirm bolstered its Histology/Cytology department by purchasing state of the art machinery. This will see a very quick turnaround time in results such as PAP smears. This we hope will encourage more women to screen for cervical cancer which is public health in our country.

Again Diagnofirm was invited to participate in a Health Fair held on the 18th April at the Main Mall with a theme to encourage people to stop smoking. It was organized by the Department of Environmental Health in the Faculty of Health Science at the University of Botswana. It was a very successful fair that included exhibitions from many other health and health-related practitioners in Botswana. We only hope people will heed the call and stop smoking.

Please send any questions or suggestions for topics to be covered to
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Inside this Issue

Tiger Design and Graphics

ProBNP Test

What is the proBNP test?

This test measures the concentration of brain natriuretic peptide (BNP), a hormone that is produced mainly by the heart's left ventricle. It is released by the heart in response to heart failure, hypotension, angina, heart attack or left ventricular hypertrophy. BNP dilates blood vessels and promotes sodium and water loss, reducing fluid load on the heart and improving cardiac performance.

The proBNP assay is indicated in the diagnosis of individuals suspected of having congestive heart failure (CHF) and the detection of mild form of cardiac dysfunction. The test also aids in the assessment of heart failure severity in patients with CHF.

It is further indicated for risk stratification of patients with acute coronary syndrome and CHF and can also be used for monitoring the treatment of patients with left ventricular dysfunction.

Heart Failure

Heart failure (HF) is caused by any structural or functional cardiac disorder that impairs the ability of the heart to fill with or pump a sufficient amount of blood through the body. This failure is in other words caused by any condition that reduces the efficacy of the myocardium (heart muscle) through damage or overloading.

HF is difficult to diagnose because symptoms are non-specific, and typical physical signs are present in less than half of all patients with HF. Studies have shown that the diagnosis of HF is poor with less than 50% of patients being correctly identified during the initial consultation.

Misdiagnosis of congestive heart failure (CHF) causes morbidity and increases time to discharge and treatment cost. Moreover, five years after the diagnosis of HF, 50% of HF patients will have died from the disease. HF is associated with high rates of hospitalisation in patients more than 65 years of age, and these hospitalisations contribute significantly to the enormous cost of the disease.

An example of the worth of a proBNP test in an emergency is illustrated in this situation:

"It's a family gathering and you have just finished dinner when your uncle begins to show disturbing signs of discomfort. As the minutes pass, he experiences an increasing shortness of breath, which worsens as he begins to panic. Recognizing the potential seriousness of the situation, you guide him to the car and rush to the nearest emergency room (ER). There, the ER team speculates if he is suffering from heart failure, the flu, asthma or too much turkey the symptoms are similar. The physician in charge orders the proBNP test, a blood test that quickly determines that he is indeed experiencing heart failure and needs to be hospitalized. Later that day, the same test on another patient rules out heart failure, confirming the physician's suspicions of seasonal flu. The patient is given intravenous fluids and medication and sent home to recover. In both cases, the hospital provided a fast, accurate diagnosis without the use of more expensive tests, such as the echocardiogram, which is a widely used diagnostic test in which ultrasound is used to examine the heart."

Physiology and Clinical Significance

Brain (or B-type) natriuretic peptide is a 32 amino acid polypeptide produced by the heart in response to pressure overload or excessive stretching of the myocytes in the ventricles. It is produced as a pro-hormone pro-BNP which is subsequently cleaved into (1) BNP, the physiologically active C-terminal amino acid molecule and (2) NT-proBNP, the inactive N-terminal amino acid fragment.

Both BNP and NT-proBNP as indicated in studies have been shown to have diagnostic and prognostic applications. NT-proBNP is however more commonly used in diagnosis as it has a longer half-life. They have been shown to aid in the diagnosis of heart failure. In patients presenting with acute myocardial infarction, the levels of BNP and pro-BNP correlate with left ventricular dilation, vascular remodeling and dysfunction as well as with the risk for development of CHF or death.

Bay and colleagues published one of the first large studies revealing the utility of NT-proBNP in predicting Left Ventricular (LV) dysfunction. From 3,236 hospitalized patients with symptomatic and asymptomatic CHF, NT-proBNP had a sensitivity of 73%, specificity of 82%, and, most impressively, a negative predictive value of 98% (meaning, the proportion of patients with negative test results who are correctly diagnosed was 98 out of every 100).

Following such large-scale studies demonstrating the feasibility of detection of LV abnormalities, the use of NT-proBNP for the acute evaluation of dyspnoeic patients with possible CHF was then explored in three recent studies. In the first such study, Lainchbury and colleagues demonstrated NT-proBNP to be of value in the evaluation of patients with dyspnoea and suspected acute CHF in the emergency department (ED). Subsequently, Bayes-Genis and colleagues found that NT-proBNP levels were significantly higher in patients with decompensated CHF, and also demonstrated the value of the marker for identifying those patients with 'masked' heart failure, defined as those patients with LV dysfunction and concomitant pulmonary disease. Furthermore, Bayes-Genis and others demonstrated as the heart failure was treated, NT-proBNP levels fell in tandem. This illustrated that, when levels are within the normal range, the patient's symptoms are probably not due to heart failure and conversely, when levels are elevated, there is increased probability of heart failure and further assessment would be warranted.

Most recently, more definitive data supporting the use of NT-proBNP in the emergency department were reported. In a blinded prospective analysis of 600 patients presenting with acute dyspnoea, the ProBNP Investigation of Dyspnea in

Factoid

Fever raised body temperature often caused by the immune system fighting infection. It's a symptom of many acute illnesses, one of the most common being influenza. Any temperature higher than 37°C is classified as fever. High fevers may be accompanied by delirium (or confusion) and sometimes, especially in children, by convulsions

Laryngitis strained or inflammed vocal chords which give the sufferer a hoarse whispery voice. The condition is caused by overuse or infection.

the Emergency Department (PRIDE) Study investigators demonstrated NT-proBNP levels to be markedly elevated among patients with decompensated CHF. NT-proBNP was highly sensitive and specific for the diagnosis of acute CHF, and correlated with the severity of CHF symptoms. Among all the factors evaluated, an elevated NT-proBNP proved to be the single strongest independent predictor for the final diagnosis of acute CHF. Lastly, in the PRIDE Study, NT-proBNP was superior to clinical assessment for the identification of acute CHF. However, the combination of NT-proBNP testing plus clinical assessment was the most superior tool for patient evaluation.

The slide below also helps illustrate this point of the importance of proBNP in the emergency set-up. It shows the different predictors of CHF and shows which of these best correctly leads to diagnosis of CHF.

The benefits of BNP and NT-proBNP testing are thus:

- Strong negative predictive value for ruling out CHF depending on age and gender.
- Help triage possible CHF patients by determining whether symptoms such as dyspnoea (difficulty breathing or painful breathing), oedema and fatigue are due to heart or lung disease.
- Can detect asymptomatic left ventricular dysfunction in post myocardial infarct patients
- Help optimize treatment in individuals with HF changes in NT-proBNP levels can be used to evaluate the success of treatment in patients with left ventricular dysfunction. In addition, NT-proBNP is suitable for use in assessing vascular remodeling, and therefore contributes in the establishment of individualized rehabilitation procedures.
- Aid in the prognosis of existing CHF patients- these marker levels increase proportionally with severity of disease. Baseline levels also correlate with risk of death, CHF and MI.
- Track the course of CHF levels correlate with the New York heart Association classification of CHF.

The test has a large analytical range spanning from about 5 35000pg/mL.

Commonly doctors and patients from Diagnofirm Laboratory will see their lab report with the following data:

NYHA Class	All	II	III	IV
Mean	644	371	647	3387
Median	286	238	355	1729
5th percentile	34	20	39	81
95th percentile	2151	1007	2153	17732
Minimum	<5	8	<5	81
Maximum	17732	2959	9760	17732
N	410	193	198	19

This is the table showing NT-proBNP values described for patients with restricted left ventricular ejection fraction, according to the classifications of the New York Heart Association (NYHA).

So, in conclusion, interpretively what can be said about proBNP is that: higher than normal results suggest that a person is in heart failure and the level of proBNP is related to the severity of the heart failure. Higher levels are also associated with a worse outlook for the patient.

Also, whilst proBNP when elevated most likely point to heart failure, correction ought to be made for age, sex and weight. And also, proBNP levels are increased in persons with kidney disease, since the BNP is excreted renally.

As a final point, although this test may seem to be the 'be all and end all' of heart failure but as a cautionary statement: it still needs to interpreted together with the clinical data for maximum results as shown by the results of the PRIDE study.

References Available On Request

Results: Predictors of CHF

Testing performed in 599 dyspneic patients in the Emergency Department setting. Independent predictors of a diagnosis of CHF included:

Predictor	Odds Ratio	95% Confidence Intervals	P value
Elevated NT-proBNP	44	21.0-91.0	<1.0001
Interstitial edema on chest X-ray	11	4.5-26.0	<0.0001
Orthopnea	9.6	4.0-23.0	<0.0001
Loop diurectic use at presentation	3.4	1.8-6.4	0.01
Rales on pulmonary examination	2.4	1.2-5.2	0.05
Age (per year)	1.03	1.01-1.05	0.01
Cough	0.43	0.23-0.83	0.05
Fever	0.17	0.05-0.50	0.03

Januzzi et al, 2005

Image from American College of Cardiology Foundation

Here are some tips for "natural" flu and cold remedies that may relieve your symptoms.

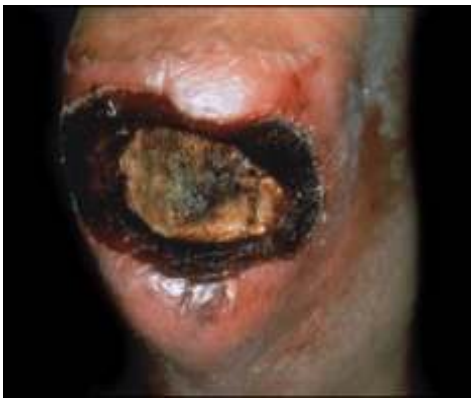
- **Treat That Stuffy Nose With Warm Salt Water**
  Salt-water rinsing helps break nasal congestion, while also removing virus particles and bacteria from your nose.

- **Stay Warm and Rested**
  When you get a cold, you often feel down and droopy, infections sap your energy.
  Staying warm and resting when you first come down with a cold or the flu helps your body direct its energy toward the immune battle. This battle taxes the body. So give it a little help by getting as much rest as possible.

- **Use a Balm Under Your Nose**
  A small dab of mentholated balm under your nose can open breathing passages and help restore the irritated skin at the base of the nose. Menthol, eucalyptus and camphor all have mild numbing ingredients that may help relieve the pain of a nose rubbed raw by too much blowing.

- **Gargle**
  Gargling can moisten a sore throat and bring temporary relief. Try a teaspoon of salt dissolved in warm water, two times daily. Once before going to sleep and once after waking up.

How Should I Manage A Diabetic Foot Ulcer?



The primary goal in the treatment of diabetic foot ulcers is to heal the ulcer as quickly as possible, so reducing the possibility of infection and the likelihood of recurrence.

Treatment of the ulcerated foot should be prompt and appropriate to prevent avoidable amputation in people with diabetes.

Key points in the management of diabetic foot ulcers are:

- Mechanical control (relief of pressure)
- Wound control (debridement and dressings)
- Vascular control (interventions to improve the vascular supply to the foot)
- Microbiological control (treatment of infection)

It is important to decide at an early stage whether the problem is neuropathic, ischaemic, or critically ischaemic (needing very urgent attention).Any foot-care emergency (new ulceration, swelling, cellulitis, discoloration) should be referred to a multidisciplinary foot-care team within 24 hours.

Ongoing care of a person with an ulcerated foot should be undertaken by a multidisciplinary foot-care team, including trained specialist podiatrists and orthotists, nurses with training in dressing diabetic foot wounds, and specialist physicians with experience in lower-limb complications.

As a minimum:
Investigate for neurological and vascular insufficiency and to refer on as appropriate

- Initiate and supervise wound management, including:
- Appropriate dressings and debridement as indicated
- Systemic antibiotics for cellulitis or bone infection as indicated
- Ensure an effective means of distributing foot pressures, including specialist footwear, orthotics, and casts/offloading devices
- Try to achieve optimal glucose levels and control of risk factors for cardiovascular disease
- Liaise with practice nursing colleagues for regular wound inspection and care

Advise the person to seek help from a foot-care team if:

- The ulcer increases in size or changes colour (i.e. redness of skin around ulcer, bluish marks, blackening of the skin, or change in colour of the ulcer)
- The ulcer discharges (i.e. blood, pus) or the ulcer becomes more moist
- New ulcers develop
- The ulcer or foot become painful or swollen
- The ulcer develops a smell
- They feel systemically unwell (e.g. fever, flu-like symptoms, or poorly controlled diabetes)

Available evidence does not support treating clinically uninfected ulcers with antibiotics, but antibiotic therapy is indicated for almost all infected wounds in conjunction with good wound care.

It is noteworthy that clinical signs of infection may be masked in a person with diabetes and it important to have a low threshold for considering antibiotic use, especially in someone with a neuro-ischaemic ulcer.

Pressure reduction ('offloading') is the main approach to ulcer management. This can be achieved in a variety of ways, including 'total contact casting' (the use of a plaster cast to redistribute weight over the foot).

Wound management

Wound healing and neutrophil function is impaired by hyperglycaemia, so tight control of blood sugar is vital.

Debridement may be necessary to remove callus or devitalized tissue, including bone.

Debridement will be required regularly and should only be performed by those adequately trained and competent to do so. The aim of this is to:

- Reduce the bacterial load of the ulcer
- Restore chronic wounds to acute wounds
- Release growth factors to aid the healing process
- Enable a deep swab to be taken for culture
- Allow accurate visualization of the wound extent
- Establish drainage
- Remove dead and unhealthy tissue

Dressings should be sterile and non-adherent, have good exudate control, be strong enough to withstand walking, and should allow frequent inspection of the wound. They are used to:

- Protect the wound from trauma
- Absorb exudate
- Reduce infection
- Promote healing

Other interventions which have been developed include growth factors, larvae, vacuum-assisted closure, hyperbaric oxygen, and skin grafting, but these are beyond the scope of primary care.

Vascular management

Revascularization may be necessary in people with significant lower-extremity ischaemia.

Angioplasty or arterial bypass can improve arterial flow in the presence of ischaemic ulcers.

Interlude

A famous champion is in bed with flu. A doctor visits him:
"You've got a high fever, my friend," says the doctor.
"How high?" asks the champion.
"39.5°C," the doctor nods.
"Yeah? And what is the world record?"

"If a doctor treats your cold, it will go away in fourteen days. If you leave it alone, it will go away in two weeks". Gloria Silverstein

Can I Drink Alcohol If I'm Taking Antidepressants?

If possible, it is best to avoid alcohol completely if you are feeling depressed, as alcohol has a depressant effect on your brain and nervous system and could make you feel worse.

The main groups of antidepressants are:

Tricyclic antidepressants (TCAs) - e.g. amitriptyline.

- Monoamine-oxidase inhibitors (MAOIs) - e.g. phenelzine.
- Selective serotonin re-uptake inhibitors (SSRIs) - e.g .paroxetine.

There are also some newer antidepressants, which do not fit into the above groups; they include venlafaxine, mirtazapine, and reboxetine.

Tricyclic antidepressants (TCAs)

If you drink alcohol and take TCAs, it may lead to increased drowsiness and lack of co-ordination particularly with amitriptyline. This effect may be worse in the first few weeks after you start to take TCAs. Increased drowsiness is also possible with related antidepressants: mianserin, maprotiline and trazodone. It is probably sensible not to drink alcohol for at least the first few weeks when you start taking TCAs, to assess your reaction to the potential side effects.

Monoamine-oxidase inhibitors (MAOIs)

MAOIs produce serious side effects if you take them with tyramine. Some alcoholic drinks contain tyramine e.g. red and white wine, and beer. If you are taking MAOIs you must avoid drinks containing tyramine, as they can cause your blood pressure to raise suddenly, which may be harmful. However, no serious reaction is likely between alcohol and moclobemide, a Reversible Inhibitor of Monoamine Oxidase (R.I.M.A.)

Selective serotonin re-uptake inhibitors (SSRIs)

Some evidence shows that fluoxetine does not produce side effects (interact) with alcohol. Similarly, sertraline, paroxetine or citalopram seem unlikely to significantly increase any side effect associated with drinking alcohol. However, there may be a slight increase in the effects of alcohol if you are taking fluvoxamine. Manufacturers of these medicines still advise that alcohol should be avoided whilst taking these medicines because all antidepressants can potentially impair the performance of skilled tasks e.g. driving, operating machinery.

Newer antidepressants

Venlafaxine does not significantly increase the co-ordination problems associated with drinking alcohol and neither does

reboxetine. However, the manufacturers of venlafaxine still advise you to avoid drinking alcohol, when taking venlafaxine. Mirtazapine has been shown to increase co-ordination problems related to drinking alcohol, and you should not operate machinery or drive motor vehicles whilst taking the combination. The manufacturer advises you to avoid drinking alcohol, while taking mirtazapine.

Summary

Alcohol should be used with caution when you are taking any antidepressant because of the risk of increasing the side effects of these medicines: particularly drowsiness and reduced co-ordination. All antidepressants can potentially impair the performance of skilled tasks, including driving. Since alcohol can make this worse, you should not drink any alcohol if you intend to drive or operate machinery.

If alcohol is consumed at all, it should be in moderation (i.e. within the recommended amounts of less than 14 units per week for females and less than 21 units per week for males. One unit of alcohol is equal to half a pint of beer, a glass of wine or a single spirit).Wines and beer should be avoided completely if you are taking MAOIs because of the risk of a sudden increase in blood pressure. Individual responses to alcohol may vary. Special care should also be taken if other medicines are being taken at the same time.

Can I Take Cough And Cold Remedies While I'm Breastfeeding?

This information only applies to full term, healthy babies. Further advice should be sought if your breastfed baby is premature, low birth weight or has an underlying medical condition.

The majority of coughs and colds will get better on their own, and medicines may not help. Symptoms can often be relieved with simple measures such as rest, plenty of fluids, paracetamol and inhaling steam. These measures should be the preferred choices if you are breastfeeding.

Products sold for the treatment of coughs and colds usually contain several ingredients, each intended to ease a different symptom. It is recommended that individual drugs are used for specific symptoms; some people however like to take 'all in one' preparations.

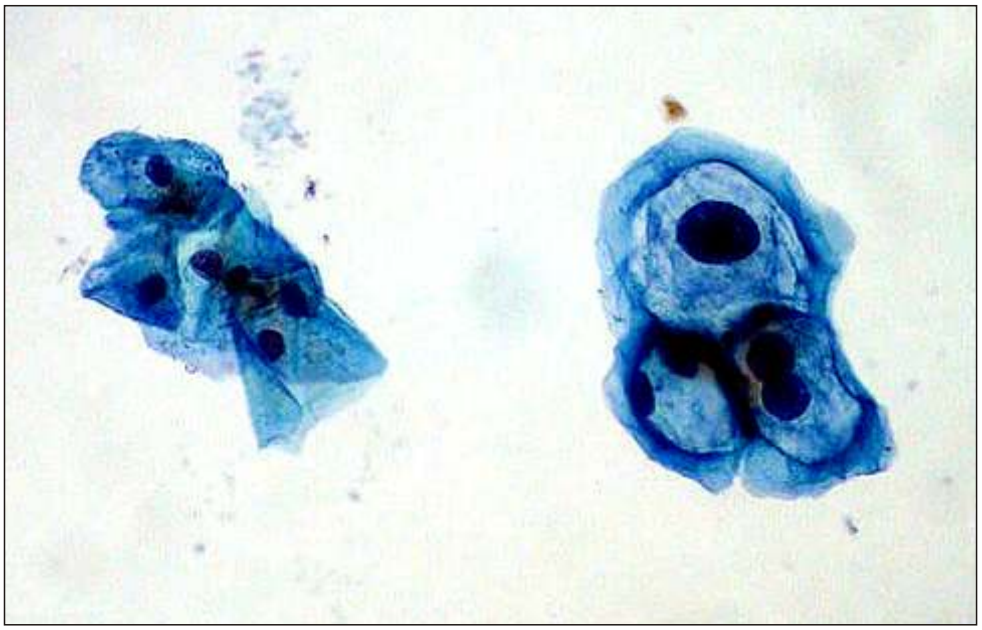
Most combined medicines for coughs and colds contain two or more of the following:

- antihistamines (to dry up a runny nose and also cause drowsiness),
- decongestant (to relieve stuffiness),
- cough suppressant (to relieve a dry, tickly cough),
- cough expectorant (to aid a productive, 'chesty' cough),
- analgesics (painkillers),
- antipyretics (to reduce fever) and vitamin C.
- Antihistamines

Continued on page 10

By Dr. Ritalin (Pathologist - Diagnofirm)

Genital Human Papilloma(HPV) Virus Infection



Normal squamous cells on left; HPV-infected cells with mild dysplasia on right.

What is genital HPV infection?

Genital human papilloma virus (HPV) infection is one of the most common sexually transmitted infections (STI). The virus infects the skin and mucous membranes of the lower genital tract. HPV has been linked to many types of cervical diseases ranging from the innocuous condyloma acuminatum (viral papilloma or wart) to the fatally invasive squamous cell carcinoma of cervix.

HPV are a family of DNA viruses of which more than 60 types have been identified. Most are harmless but about 30 genotypes put you at a higher risk for cervical cancer. It can infect genital areas of men and women, including the skin of the penis, vulva (area outside the vagina), anus, the lining of the vagina, cervix and rectum.

What are the symptoms and potential health hazards of HPV infection?

Most people infected with HPV are not aware of their infection and may be asymptomatic. It may remain dormant for a long time. However, certain types of HPV can cause genital warts in men and women. These are known as the *Low Risk Types* (wart causing).

Other types can cause cervical cancer and other less common cancers e.g. vulva, vagina, anus, and penis. These are known as the High Risk Types (cancer causing). In 90% of cases, the body's immune system is able to clear the infection naturally within one to two years.

Genital Warts

Are small bumps, or group of bumps in the genital area. They may be raised, flat, single or multiple, small or large, and cauliflower shaped. If they are not treated they may spontaneously resolve, remain unchanged, or increase in size or number. They do not turn malignant.

Cervical Cancer

May not have symptoms until advanced. Hence it is very important for women to get screened regularly by Pap smears. If the High Risk type HPV infection is not cleared by the immune system it can linger for many years and turn the abnormal cells into cancerous cells over time. Approximately 10% of women with High Risk HPV will develop longer lasting infection putting them at risk for cervical cancer.

Mode of Transmission

- Through genital contact during vaginal or anal intercourse.
- Rarely a pregnant woman with genital HPV can pass HPV to the baby during vaginal delivery.

How common are HPV infections?

It has been estimated that more than 50% of sexually active men and women acquire genital HPV infection at some point in their lives!

The Importance of Regular Pap Smears

Routine Pap smears are an important screening tool for cancer of the cervix as there is no precise way to determine in which patients HPV infections will persist and lead to cancer. In females, the cervix is a common site for HPV infection, which can be an active or inactive infection.

With an inactive infection, cells appear normal under a microscope and the patients may never know that they have been infected. However, with an active infection, changes can be detected in the cervical cells under a microscope during a Pap test, allowing them to be treated and followed up.

If changes are not detected early it may progress to cancer. It can follow two courses:-

1. Abnormal cells become normal again and the infection is cleared from body by a healthy immune system (approx 1 to 2 years).
2. Abnormal cells slowly progress to cancerous cells (approx 5 to 10 years) .

HPV testing, where recommended and available, is used along with Pap smears to decide if a woman is at risk of developing precancerous or cancerous changes in the cervix.

Minimizing Your Risk for Genital HPV Infection and Cancer Cervix

Anyone with sexual exposure is at risk for HPV infection. Since, not all infections have symptoms or noticeable symptoms, you often cannot tell if you are infected. The following are the 'dos' to reduce risk:-

1. See your doctor regularly for Pap test and/ or HPV DNA test where recommended and available. HPV

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By Xavier Mugari (Chemistry Department)

Prostate Cancer

Prostate cancer is cancer of the small walnut-shaped gland in men that produces seminal fluid, the fluid that nourishes and transports sperms.

For many men a diagnosis of prostate cancer can be frightening, not only because of the threat to their lives, but because of the threat to their sexuality. In fact, the possible consequences of treatment for prostate cancer- which includes bladder control problems and erectile dysfunction(ED) or impotence- can be of great concern to men.

Signs and symptoms

Prostate cancer often doesn't produce any symptoms in its early stages. That is why many cases are not detected until it has spread beyond the prostate.

When signs and symptoms to occur, they include the following:

- Having difficulty starting your urine stream-hesitancy
- Having a weaker than normal urine stream
- Pain or a burning feeling during urination-dysuria
- Dull pain in lower pelvic area
- Frequent urination at night-nocturia
- Having blood in urine-haematuria
- Having blood in semen-hematospermia
- Painful ejaculation

Symptoms that may indicate the cancer has spread, or metastasized, to other parts of the body include:

- Weight loss
- Bone pain, especially in the lower abdomen, hip, pelvis, or lower back
- Swelling in the legs

Risk factors

Age- As you get old, your risk of prostate cancer increases

Family history

Diet- A high fat diet and obesity may increase your risk

Vasectomy- surgery to become infertile

High levels of testosterone.Because testosterone naturally stimutales the growth of the prostate gland, men who have high levels, such as those with hypoganadism are more likely to develop prostate cancer than are men who have lower levels of testosterone.

Diagnosis

Prostate-Specific Antigen (PSA) Test

PSA is a glycoprotein produced by the cells of the prostate gland. The PSA test measures the level of the PSA in blood. Because PSA is produced by the body and can be used to detect disease it is called a biological marker or tumor marker. As PSA is also present in para-urethral and anal glands, as well as in breast tissue or with breast cancer, low levels of PSA can also be detected in women.

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 and prostate cancer become more frequent. The most common benign prostate conditions are prostatitis(inflammmation of the prostate) and benign prostatic hyperplasia (BPH) which is enlargement of the prostate. An inflammation or trauma of the prostate (e.g. in cases of urinary retention or following rectal examination, cystoscopy, coloscopy, transurethral biopsy or laser treatment) can lead to PSA elevations of varying duration and magnitude.

The US Food and Drug Administration (FDA) has approved the PSA test along with digital rectal exam(DRE) to help detect prostate cancer. During a DRE a finger is inserted into the rectum and feels the prostate gland through the rectal wall to check for bumps or abnormal areas. These two tests can help in the detection of prostate cancer in men who have no symptoms of the disease. The FDA has also approved the PSA test to monitor patients with a history of prostate cancer to see if the cancer has recurred(come back).If the PSA starts to rise, it may be the the first sign of recurrence. A single elevated PSA level in a patient with a history of cancer does not always mean the cancer has come back. It is recommended to check for a trend of rising PSAs over time rather than a single elevated PSA. The steepness of the rate of fall on PSA down to no-longer detectable levels following radiotherapy, hormonal therapy or radical surgical removal of the prostate provides information on the success of therapy.

PSA test results report the level of PSA in the blood. The tests results are reported in nanograms of PSA per milliliter(ng/ml) of blood. In the past levels below 4.0ng/ml were considered normal, however recent research found prostate cancer in PSA levels below 4.0ng/ml.

PSA circulates in the blood in two forms:free or attached to a protein molecule. The free PSA is more often used for men who have higher PSA level. Free PSA may help tell what kind of prostate problem a man has. With benign prostate conditions such as BPH there is more free PSA, while cancer produces more of the attached form. If the attached PSA is high but free PSA is not , the presence of cancer is more likely. In this case more testing, such as prostate biopsy, may be done.

Reference ranges for Total PSA

-0 to 4.0ng/ml is normal

-4.1 to 10.0ng/ml is slightly elevated. Free PSA test should be done to distinguish between cancer and BPH.

-11.0ng/ml or more is significantly elevated

More flu and cold tips

- **Drink Hot Liquids**
  Hot liquids relieve nasal congestion, prevent dehydration, and soothe the uncomfortably inflamed membranes that line your nose and throat. If you're so congested you can't sleep at night, try a hot toddy, an age-old remedy. Make a cup of hot herbal tea. Add one teaspoon of honey and 1 small shot of whiskey or bourbon. Limit yourself to one. Too much alcohol inflames those membranes and is counterproductive.

- **Don't Fly Unless Necessary**
  There's no point adding stress to your already stressed-out upper respiratory system, and that's what the change in air pressure will do. Flying with cold or flu congestion can temporarily damage your eardrums as a result of pressure changes during takeoff and landing. If you must fly, use a decongestant and carry a nasal spray with you to use just before takeoff and landing. Chewing gum and swallowing frequently can also help relieve pressure.

*Remember, serious conditions can masquerade as the common cold such as: sinus infections, bronchitis, meningitis, strep throat, and asthma. If you have severe symptoms, or feel sicker with each passing day, call your doctor.

From left: Lance Brogden (Air Bots); Professor Bhagat, Dr. Caroline Akim (WHO);Lindsey Jones at launch of Botswana Heart Foundation

Speaker of Parliament Hon. Patrick Balopi listening attentively

Former Minister of Health Sheila Tlou, was one of the people who attended the lectures on Parliament Wellness week

Boerhinger Ingelheim was also present ta Parliament Wellness week to perform blood pressure measurements and dispense advice

Ms Mbongwe Explains the hazard of the public who took part in the Anti-Smoking Campaign Fair

Dr. P. Mazonde and some Parliament Members at Parliament Wellness Week official opening

Lesego from Cardiac Clinic performing a blood glucose on Hon. MP Dumelang Saleshando

Silas performing a blood glucose on a parliamentary staff member

ds of smoking to some members
e Department of Health Sciences

A traditional dance group entertains people at the Department of Health Sciences Anti-Smoking Campaign Fair

Summarised by Dr Paluku Mulyangote

Folic Acid in Early Second Trimester may Reduce Risk of Preeclampsia

Most statistics and publications around the world list the hypertensive diseases as among the three major causes of maternal mortality, along with haemorrhage and infection. Preeclampsia toxaemia (PET) also termed Pregnancy Induced Hypertension (PIH) is one of the hypertensive diseases in pregnancy.

Using multivitamin supplements containing folic acid early in the second trimester of pregnancy is associated with a reduced risk of preeclampsia, results of a study in Canada suggest.

According to the researchers, led by Dr. Shi Wu Wen at the University of Ottawa, "an adequate cellular folate supply may play an important role in the implantation and development of the placenta. Folate may also reduce the risk of developing preeclampsia by improving endothelial function at both placental and systemic levels."

The current paradigm of the pathophysiology of preeclampsia is that it's a two-stage disorder:

- Stage 1: (Most likely at late first trimester or early second trimester of pregnancy) there is a decrease in placental perfusion, which is secondary to abnormal migration of trophoblasts into maternal spiral arteries.
- Stage II (most likely at early third trimester), the maternal syndrome of preeclampsia develops, which is secondary to systemic endothelial dysfunction.
- Impaired angiogenesis, inflammation, and autonomic activation may all contribute to endothelial dysfunction, the researcher explained.

Current guidelines for folic acid supplementation recommend 4mg or 5mg for women with high risk of pregnancy for foetal neural tube defects.

Supplementation of large doses of folic acid in early gestation may work at both stages of preeclampsia development.

Dr. Wen and colleagues prospectively followed nearly 3,000 pregnant women who presented for prenatal care between 12 and 20 weeks' gestation. They report their findings in the January issue of the American Journal of Obstetrics and Gynecology.

A total of 2713 (92%) women were taking folic acid alone or multivitamins containing folic acid, usually at doses of 1.0 mg or higher.

As theorized, folic acid supplementation was associated with a lower rate of preeclampsia. Preeclampsia developed in 2.17% of patients taking folic acid and in 5.04% of those not taking supplements.

After the researchers analysed the results of folic acid supplement on high risk patients for preeclampsia (maternal age, ethnicity, education, parity, BMI, income, smoking, diabetes, multiple gestation, chronic hypertension and history of previous preeclampsia), folate supplementation reduced the risk of preeclampsia by about two thirds.

Thus, they wrote and concluded:

"For preeclampsia prevention, folic acid supplementation in the late first trimester or early second trimester - the most critical time window for preeclampsia development - may be the most important. There is a dose-response relationship, with further reduction of the risk of preeclampsia with higher doses of folic acid"

Clinical Note

Preeclampsia is hypertension and proteinuria that develops during pregnancy. Affecting approximately 5% of pregnancies worldwide, it is a leading cause of maternal and neonatal morbidity and mortality and is also associated with an increased risk for later cardiovascular disease in both mother and infant. Recent studies have found a protective effect of folic acid against preeclampsia possibly by improving placental and systemic endothelial functions by directly or indirectly lowering homocysteine levels.

Adapted from Am J Obstet Gynecol. 2008; 198:45.e1-45.e7.

Continued from page 5

Cold Remedies While Breastfeeding?

Diphenhydramine, triprolidine and promethazine are the antihistamines most commonly found in cough and cold remedies. All three drugs cause drowsiness, and are generally not recommended if you are breastfeeding as they may cause effects such as irritability, drowsiness or stop babies sleeping properly.

Decongestants

Pseudoephedrine, phenylephrine and phenylpropanolamine are the decongestants most commonly found in cough and cold remedies. If you are breastfeeding the use of phenylephrine and phenylpropanolamine is not recommended. However, limited information indicates that the amount of pseudoephedrine passing into breast milk is small and breastfeeding after occasional doses is considered safe.

Cough Suppressants

Dextromethorphan is a cough suppressant commonly found in cough and cold remedies. It may be considered for occasional use if you have an unproductive and severe cough. However drinking plenty of fluids and inhalation treatment are considered treatments of choice.

Pholcodine linctus is another cough suppressant. There is no research on the effects of pholcodine on breast fed babies so is not recommended in breastfeeding mothers. Again, plenty of fluids and inhalation treatment are the best treatments of choice.

Cough Expectorants

It is recommended that you should avoid guaifenesin if you are breast feeding.

Simple linctus contains citric acid, which is also widely found in foods and beverages as flavouring. It is is considered safe to be taken by breastfeeding mothers. Glycerin and honey linctus is considered safe to be taken by breastfeeding mothers.

Vitamin C (ascorbic acid) is included in a number of combination cough and cold remedies. The inclusion of vitamin C in cough and cold remedies is considered safe to be taken by breastfeeding mothers.

by Kgomotso P. Vasco (Dietitian RD) - Abundant Life Dietetics Services (PTY) Ltd

Essentials of Dietary Fibre

The market is currently over flooded with refined food products. This is mainly targeted at improving palatability and possibly improving product shelf life. Refined foods have little or no fiber in them. Do we really need fiber in our diet and what is fiber anyway? Dietary fiber is a part of food that can not be broken down by digestive enzymes in the stomach and the small intestine. These include cellulose, hemicellulose, pectin, gum, and mucilage, lignin, cutin and tannin. However, these fibers can be broken down by the healthy micro flora in the large intestine. Fiber is rich in vegetables, fruits, cereals and legumes (beans, lentils, nuts, peas). The American Dietetics Association recommends that adults should have 20-35g of fiber per day. Children aged 2-20 years require a total of age plus 5g fiber per day. Unfortunately many people do not meet their daily recommended fiber needs.

A diet deficit of fiber can lead to obesity, colon cancer, dyslipaedimia (elevated fat in the blood), constipation, heart disease, diverticulosis, haemorrhoids, and uncontrolled blood sugars.

Fiber is rich in vitamins and minerals. Refined foods lack these nutrients and frequent intake of such can lead to micronutrient deficiencies. Some refined products will have these micronutrients artificially added to them. This information can be seen on the food labels on food packages. Unfortunately some of our locally produced refined products such as mealie meal, sorghum and others do not have minerals and vitamins added back in them.

A diet normal in fiber generally promotes a healthy body weight because it is low in energy. Fiber also delays digestion. A refined meal will be quickly digested but a diet with fiber is usually slowly digested. Fiber therefore allows food to stay longer in the stomach and prevent premature and frequent hunger and snacking. This automatically helps prevent obesity. Sugar from a high fiber diet will also be slowly released into the blood stream and this helps control blood sugar levels. This is particularly beneficial for diabetics.

Constipation is mainly caused by a low fiber diet. A chronic incidence of constipation can lead to complications such as haemorrhoids and diverticulosis. However, a diet high in fiber is bulky and promotes movement of the gastrointestinal (GI) contents and reduces the transit time. Fiber has the ability to absorb water and make the faecal matter moist for easy defacation. A short transit time also helps prevent colon cancer because the cancer causing agents in the faecal matter will have less chance to act on the intestinal walls.

High cholesterol levels have been associated with heart disease and diabetes. But did you know that a diet high in fiber can reduce blood cholesterol levels especially the low density lipoprotein (LDL). Fibers which are mainly active in reducing cholesterol are viscous soluble fibers seen in oats, fruits, vegetables, beans, lentils and other legumes. The viscous fiber works by interfering with the bile acid absorption from the ileum and this reduces the recycling efficiency of bile.

Inappropriate intake of any food item can give a negative effect, so is fiber. Too much fiber in the diet can result in reduced absorption of some vitamins and minerals into the body. A diet high in fiber that exceeds the daily requirement is generally much lower in energy and will results in energy malnutrition. This is especially evident in children and will lead to poor growth.

Fiber should be introduced slowly in the diet. The GI needs time to adapt. As the micro flora break down the fiber in the large intestine, several gases are released and these can cause abdominal distension and discomfort. Too much fiber can also cause diarrhea. Constipation can also result if fiber is increased in the diet, with less fluid intake. Ensure that you have two liters or more of water per day.

In conclusion, fiber is vital in our diet and will benefit us better if we follow the recommended daily amounts for adults and children. This can be achieved if we have unrefined cereals, legumes, and have the recommended 4-5 fruit and vegetable portion per day. Do not forget to drink adequate amounts of water. For individual guidance, contact your nearest Dietitian.

Interlude

"My dear doctor, I'm surprised to hear you say that I am coughing very badly, because I have been practicing all night." John Philpot Curran

Continued from page6

Genital Human Papilloma (HPV) Virus

genotyping can identify the High Risk type HPV infection and help the doctor to decide if more tests are required, further relevant treatment and follow up.

2. Learn about sexually transmitted infections (STI), their signs and symptoms, consequences, and methods of transmission. Learn about safer sex methods and use them consistently.
3. Use of condoms may reduce your risk for getting HPV as well as preventing other STIs if used all the time and in the right manner. However, HPV can infect areas of the skin not protected by the condom. **Hence, condoms are not fully protective!**
4. HPV vaccine has been developed against four types of HPV causing cancer and genital warts. It has been recommended for girls aged 11-12 years and also in the age group of 13-26 years who have not been vaccinated earlier.
5. Make informed decisions about your sexual health. Talk to your partner(s) about their STI status and use of protection. Remember that the previous sexual behavior of your partner is also a risk factor.

HPV SYMPTOMS - YOU SHOULD GO TO A DOCTOR OR CLINIC IF:

- You notice any unusual growths, bumps or skin changes on or near your penis, vagina, vulva, or anus
- You notice any unusual itching, pain or bleeding
- Your sex partner(s) tells you that he or she has genital HPV or genital warts.

Remember- education, health awareness, informed sexual behaviour and regular investigations in the form of Pap Smears are the key issues in mitigating this avoidable but potentially fatal infliction!

Auditing a QMS

Executive Summary

Context

The paper seeks to outline a general baseline Laboratory Quality Management System (LQMS) audit focusing on the presence and absence of documents and records including completeness, adequacy and accuracy .This paper also seeks to introduce and recommend techniques and instruments that can be adopted for the implementation and monitoring (project cycle-process model) of LQMS.Total Laboratory Automation and interpretation of laboratory reports will be reviewed considering the automation drive in the laboratory ,the changing roles of the medical laboratory and laboratory personnel, increasing acknowledgement and orientation towards quality management systems certification and or accreditation as tools for success and the need to exceed the customer's perception of service quality.

Setting

Background

Most errors occurring in the work of a laboratory have been reported to arise from divided responsibilities, clerical, technical or organisational, lack of free knowledge, inadequate skill and problems in attitude. This results in poor quality service delivery, low productivity of staff, under utilization of institutions and resource misadministration

In quality managed laboratory systems the aim of the laboratory is to continuously identify and prevent possible sources of error that influence the outcome of the process. To achieve this status or operate a QMS therefore in summary allows essential attributes to positively impact on quality and management minimizing or eliminating sources of errors that occur in the work of a laboratory.

'Quantity is what you can count. Quality is what you can count on'

Introduction

Quality having been defined as the totality of features and characteristics of a service that bear on its ability to satisfy a given need the implementation and monitoring of quality therefore should be integrated or more aptly put combined /circled through organised participation in process improvement.[1]

Quality has also been broadly defined more than conventional standardization of activities as involving the increasing use of QMS, QC & QA, evolutional approaches, improvement in cost and quality, expansion of quality education, special training in quality control methods, quality tools and statistical methodology, development of organizational quality policies, objectives, planning and reporting, need for quality conferences and seminars, quality control societies, publications.

Subject

Quality management system elements (QSE)[1]

Quality management system elements including Quality Documents and Records, Quality Control, Quality Assurance, Quality Assessment and Quality Monitoring are essential aspects of laboratory medicine and contribute to among other things cost effective laboratory management and eliminate preventable inaccuracy and unnecessary delays in service delivery.

The Quality Manual or Handbook and Standard Operating Procedures are Documents used to instruct the staff broadly on how the quality system policies and objectives are to be addressed and achieved and answers client requirements meeting and or exceeding their expectations. Documents also include organisational structure and reporting formats, job descriptions, duties and responsibilities for performance management review and management.

Work instructions (forms) and records will describe how each specific activity is to be undertaken and defines the standards of acceptability of service. Thus demonstrating that the service provided has been developed and produced in accordance with specific requirements (efficiency of a quality system for clients and staff).In structuring a quality system you "Document what you are doing and do it as it is documented". An effective documentation system will bridge forms and records and procedures operating manuals (manuals/sop).

Quality Control has been reported as the best known component of quality management systems and focuses on procedures for returning to the sources of data to verify them and to prevent recurrence of errors. [1] O M Westgard describes the purpose of a statistical quality control procedure as to monitor the analytical quality of the measurements during stable operation, detect changes from the stable operation, and eliminate reporting of results with medically important errors. [2]

The use of simple statistical concepts like the Mean, Proportion, Confidence Intervals, Standard Deviation,QC charts, and Westgard "rules" and techniques like Flow Charting, Deming cycle (and its variants),Ishikawa diagram, Pareto Analysis, Quality Costing, Quality Function Deployment, Failure Mode Critical Effects Analysis (FMCEA), Indicators, Design of experiments, Employee and Customer Surveys by laboratory personnel develops a better understanding of clinical quality control and improve the quality of results reported.

Quality Assurance for its implemen-tation and monitoring requires organisational commitment to excellence from the highest levels of organisational policy making and must be harmoniously integrated by top management into the entire organisation. [3] Quality Assurance is both internal and external and its successes have been attributed to QA scheme migration to maintain the semblance of acceptable performance and operational classification to identify system failures in addition to technical aspects of pre/post analytical works and failures to the following: manufacturer quality cycle for reagents and EQA materials, method related with regard to reagent manufacturing defects, matrix related due to steric hindrance differences between QA material and human samples and matrix related due to interaction between QA samples and its container (O ring sealing the top of the container)[4]

Assuring quality can be prospective or retrospective, periodic ,internal or and will involve the following attributes: review of job descriptions and contracts, IQC & EQA, health & safety, facilities, staff, training programmes, equipment and instrumentation, reagents, consumables and reference materials, methods data

capture and reporting. This process introduces the Quality Assessment concept which basically deals with evaluating the presence and adequacy of documents and data complementing in forming the structure of a quality system [5] the objectives and tools of assessing quality will be detailed later.

Quality Monitoring unlike assessment will be a dual activity (both real time and non real time) in which performance is examined for trends and systematic deficiencies. Monitoring can be done concurrently or continuously, in house and through supervision.

SWOT

The **strengths** of the QMS elements introduced above have not been fully utilised routinely in medical laboratory work due to the inherent **weaknesses** of lack of quality costing, poor operational performance of most measurements, poor data usage and management, inadequate and inappropriate equipment maintenance and calibrations respectively, challenges in data collection (,request from, worksheet design ,QC charts), internal quality controls and calibrations, quality control materials and outsourcing.

Today, the majority of the world's population is suffering from poverty and is denied adequate, safe and reliable access to the solutions that health technologies can offer. In many low income countries, private providers have long been a significant source of healthcare and while concerns remain about quality, effectiveness and cost, there is also interest in their untapped potential to help meet public health goals. [6] The WHO Commission on Macroeconomics and Health has documented how heavy investment in building basic health systems in developing countries will result in huge returns. [7]

Opportunities then arise for the medical laboratories given the above scenario. These include increasing workloads, continuous reduction in health care costs resulting in easy accessibility of laboratory services at reduced costs, improvement of turn around times and provision of interpretative reports in real time. The threats outlined in the background section of this paper can be contained and eliminated.

Design

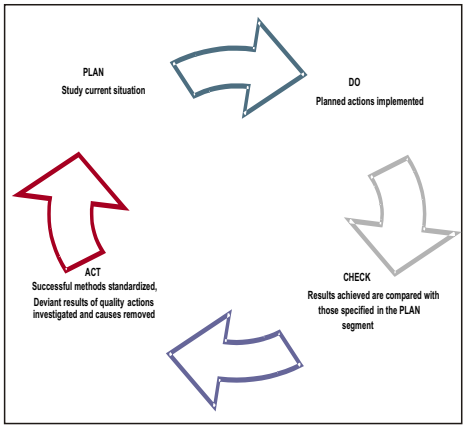
"Without data you're just another opinion" Bill Gaw

OBJECTIVES

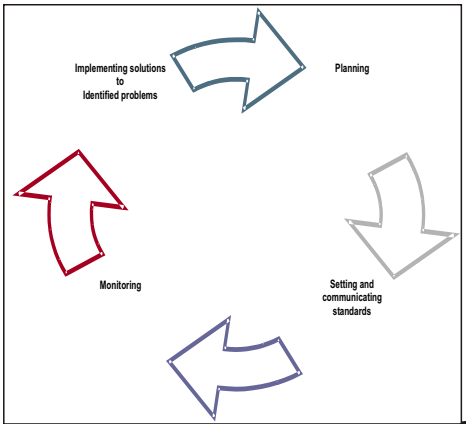
- To translate statements about expected quality into measurable outcomes
- To propose and recommend requirements for auditing a LQMS
- To assess the professionalism, accountability, and ethics through scrutiny of private laboratory performance (good and poor)
- To initiate debate and discussion on Total Laboratory Automation and the "controversial" interpretation of laboratory reports

Deming one of the gurus in the Quality field has been credited for popularizing the concept of quality in Japan developed his Deming's 14 points for quality improvement. [8] To make the improvements permanent Deming modelled a cycle of improvement loosely referred to as the Deming cycle or technically as the Plan Do Check Act cycle ,this cycle can be adopted and adapted for the planning, implementation, assessment, control and monitoring in short auditing a quality program.

Deming Cycle



QC/QA Cycle



Outcome measures

A Quality audit (defined as the examination of the work of an organization through independent and objective inspections)should be both objective and quantitative for purposes of comparison and assessing progress and should have a joint point of reference (specific standards and checklists)

The audit will capture the control process attributes of inputs leading to outputs after review, verification and validation, exposing the insufficiency of the traditional subdivision of laboratory practice into its service elements of preanlayltical, analytical and post analytical in the description of Good Laboratory Practice. The audit cycle of quality improvement will include direct laboratory contact in areas of material receipt and the report after data processing.

HOW TO IMPLEMENT A QUALITY CONTROL PROGRAM

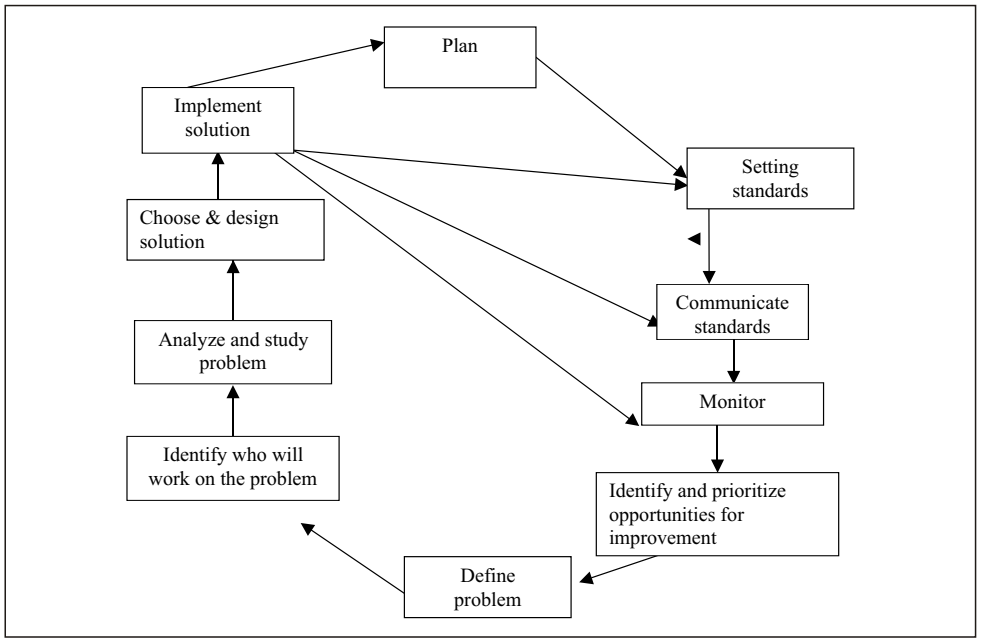
- Establish written policies and procedures
- Assign responsibility for monitoring and reviewing
- Train staff
- Obtain control materials
- Collect data
- Set target values of the mean and standard deviations
- Establish Levey Jennings charts
- Routinely plot data
- Establish trouble shooting and corrective action protocols
- Establish and maintain system for documentation

To control process improvement all activities concerned with the attainment of quality assurance and control there is need for total quality control defined by Ishikawa as "a system for integrating quality technologies into various functional departments to achieve client satisfaction" Ishikawa developed the fishbone diagram an instrument which can be utilised in root cause analysis. The diagram can be modified to suit requirements as shown below.

FISHBONE ANALYSIS (5 M + E DIAGRAM) OF IDENTIFIED PROBLEM

1. Machine
2. Material
3. Measurements

Quality Assurance Cycle



4. Method
5. Manpower
6. Environment

To assess the permanence of process improvement quality assessment becomes the according to Donabedian the "managed process whereby the comparison of care (laboratory test results) against predetermined standards is guaranteed to lead to action in change implementation and production of desired improvement" [9]

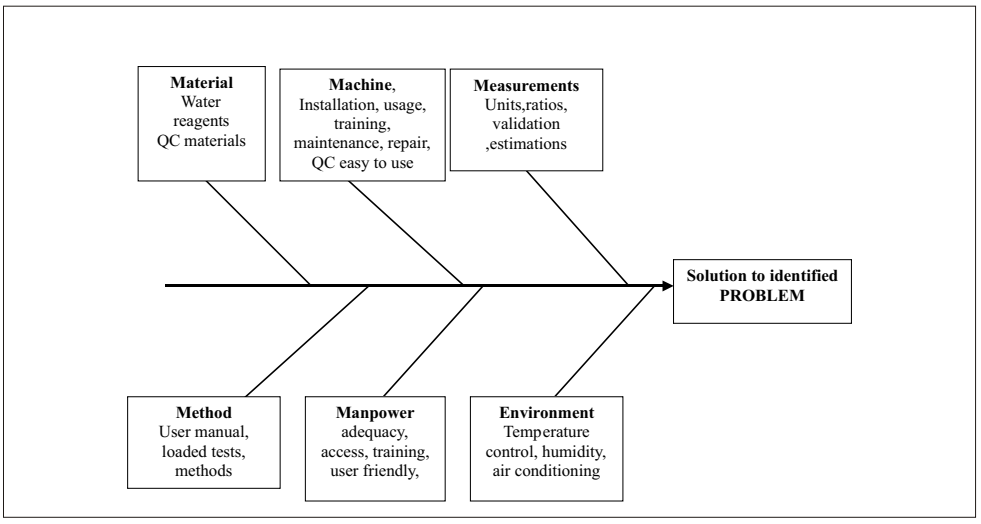
Quality assessments in management can be either man or material driven with the former being one of the following forms: audit, onsite inspection or observation, internal and external and the latter due to inconsistent IQC results within the laboratory (reagents, controls, equipment and proficiency testing) or incomparable EQA results reflecting overall standard of performance and performance relative to techniques. Following is an outline of how Quality Assessments can be formulated, implemented and monitored. [10, 11]

Tools in Quality Assessment Management

Main findings

Objectives

- Monitor laboratory performance and evaluate QC measures
- Establish interlaboratory comparability
- Influence reliability of future testing



- Ensure credibility of laboratory
- Stimulate performance improvement and promote high standards of practice
- Encourage use of standard reagents/methodology and trained personnel
- Identify common errors
- Provide mechanisms to remedy deficiencies revealed
- Facilitate information exchange
- Support accreditation
- Education through exercises, reports and meetings

Implementation Guidelines

- General aspects of QA
- Quality manual
- Safety manual
- Guidelines for staff
- Description of measurement procedures
- Instruments and measurement system

Monitoring and Self Assessment Checklists

- Review job descriptions and contracts
- General LQMS checklist
- IQC and EQA
- Health and Safety
- Facilities
- Human Resources
- Training programmes
- Equipment and instrumentation
- Reagents, consumables and reference materials
- Methods data capture and reporting

Conclusion

Opportunities for Quality Managed Laboratory Systems

- Be capable of identifying needs
- Capable of analyzing those needs
- Deal efficiently with competence related needs
- Deliver the right service at the right time and in the right manner
- Be able to make follow ups on the performance on the product

Quality Professional

- Observant strategist
- Fearless analyst
- Diligent value creator
- Pro-active team builder
- Destroyer of communication

barriers within organizations
- Management system rejuvenator

Value Based Management Principles include:

- TQM
- Supply Chain Management
- Customer Focus
- Activity Based Costing (ABC)

"Coming together is a beginning, keeping together is progress, and working together is success"

Total Laboratory Automation

Clients' expectation of the delivery of the highest quality healthcare mirror the quality essentials and productivity targets in the wake of increasing workloads and pressure for continuous reduction in the healthcare costs.Despite inhibitive costs (outright purchase or rentals) of equipment automation has become an integral part of modern day laboratory medicine.

With ever increasing improvements in diagnostic technology departments can be merged and operated within the same laboratory using single or interconnected technologies. Unions and traditionalists are concerned with 'machines taking away people's jobs' but the opportunities brought by total laboratory automation far outweigh the odds as expressed below. [12]

Advantages

- Repeat and reflex testing
- Auto verification
- Good communication systems
- Fewer biological hazards
- Reduced turn around times (TATs)
- Improved analytical performance
- Financial saving

Disadvantages

- Lack of standardisation (sample containers,carriers,caps,barcodes0
- Single vendor problems

Interpretation of clinical laboratory reports

"Information shared is information used"

A lot of laboratory tests are available for clinicians which when correctly used can contribute immensely in the diagnosis, treatment and management of a lot our health priorities. When wrongly used there are useless, misleading and fatally dangerous. Communication with the laboratory therefore is required when requesting and interpreting laboratory reports and information. Technical authorization through technical control procedures to ensure optimum analytical quality of reported results must be implemented and monitored by the clinical laboratory.

Interpretation of clinical laboratory information/data defines the role of the clinical laboratory given the workload increases due to clinical, laboratory and scientific factors. [4, 12]

Clinical

- Increase in scientific training of students
- Increase in reliance on test results
- Increase in investigations based on adherence protocols
- Unnecessary repetition of tests
- Laboratory data overload
- Misunderstanding of test results

Laboratory & Scientific

- Advent of multiple test analyzers
- Introduction of new tests
- Failure to eliminate unnecessary tests
- Delays in reporting test results
- New diagnostic and management strategies

Recommendations

An implemented LQMS therefore becomes the nth degree ('Ad infinitum') of service delivery, quality of service, service management and the following service attributes:

- Professionalism
- Teamwork
- Integrity
- Respect
- Trust

Attitude has become the most important and most difficult of all essential qualities which include:

- Morale, confidence and sense of professional pride
- Consciousness of the importance of the work to be done and the seriousness of errors
- Intellectual honesty
- Understanding of each person's precise roles
- Good communication throughout staff
- A spirit of TEAMWORKI
- Together Everyone Achieves More

Changing provider attitudes is important since once those attitudes change so too will clients' attitude

Characteristics of a team

- Presence of a unifying task
- Interdependence among the members in accomplishing the task

Teamwork builds a network system where thinking and action is less hierarchical and more flexible .Innovation and creative input will come from all corners in the network with each service level determining its own priorities with the ultimate goal of enhancing networking and collaboration. Staffs has to be encouraged to lose their stronger allegiances to vertical divisions and their individual targets and focus on integrated service delivery to a given population.

Supplementary innovative approaches for optimalisation of service delivery or solving identified problems include:

- Creation of specialties and sub specialties
- Control on issue of certain products/services
- Consultations initiated by unusual requests received
- Guidelines for use (of service)
- Audit procedures evaluated retrospectively
- Analysis pf product use by department and individual
- Reporting system for aberrant results

An Account from Nokhwezi of Her Experience with HIV

More than just my life was saved

As an HIV-positive woman, I was so afraid of losing my child to AIDS.

In 1998 I became pregnant with my first child. I was only 18 and had just started dating and had had sex for the first time. During my pregnancy my doctor asked to take some blood for testing.

When the result came back, the doctor told me I had tested positive for a rare illness but he would have to book me into a hospital and give me some pills that would make my baby fine. I did not ask him what the illness was. I went to hospital for two weeks and was given some tablets. One of the night duty nurses asked me if I knew what those pills were and I told her that I didn't know but my doctor had told me they would help me have a healthy baby.

On January 22 1999 I had a baby boy. I breast-fed him. He became sick when he was 2 months old and was admitted to hospital for gastroenteritis. From then onwards he was in and out of hospital. He lost much weight and developed pneumonia when he was 4 months old. This was so hard on me because I was young and had just been diagnosed with tuberculosis (TB). He died on June 19 1999. I became depressed but never received any counseling. I just moved on with my life as if nothing happened.

On June 14 2002 I gave birth to a beautiful baby girl. I had a caesarian-section delivery due to labour possibly due to depression. I remember during one of my antenatal visits, my gynaecologist advised me to do an HIV test and I refused. I was scared of getting tested and knowing my status as I had heard many people say that if you are tested HIV-positive you would die within a few months.

My baby girl started coughing when she was two months old and was diagnosed with pneumonia. She had to be hospitalized and that meant travelling to the hospital everyday again. The thought of testing for HIV never crossed my mind because I believed if you breast-fed your baby, she would be protected from infections. The baby became ill at three months. She did not respond to antibiotics and my doctor asked me if he could test her for HIV and I agreed. She tested positive. She developed pneumonia and had to be transferred to ICU. Her health declined steadily. I asked if there was treatment for her AIDS and, for the first time, I found out about anti-retrovirals.

Unfortunately she was on an oscillator at this stage and too sick to start treatment. One of the doctors called me aside and told me that my daughter was in so much pain and that I had to make a choice whether to keep her on the oscillator, sedated until she was about three or four years old by which time she would be brain damaged, or to switch off the machines and let her die peacefully without any more pain. This was very hard but I had to decide. I asked the doctors to let me hold her in my arms when they switched off the machines. After her funeral, I tested HIV-positive. I was put on antiretroviral treatment. My doctor told me to take my medication twice a day but he didn't explain about adherence so when I felt better in 2003, I stopped taking the medication. If our clinics had pamphlets about HIV/AIDS or the nurses educated pregnant women about HIV/AIDS then I would have had a chance to save my kids by making sure that both them and I received ARV medication.

When I did a CD4 count in 2004, it had dropped to three. I had TB for the second time and oral thrush. I did not know where to go for treatment since the remedy I was taking (called Amazing Grace) was not effective. I finally realized that I had AIDS and I was admitted to a hospice. This is where I received more information about HIV/AIDS and its treatment. I then had to restart my ARV treatment. I experienced some side effects but I received treatment for them. I was discharged from the hospice after two months. I was taking my treatment at the right times and my mother was my treatment supporter. I regained my strength and picked up some body weight.

Now I knew how manage my HIV and my family was very supportive. I never thought I would conceive again because I was afraid of losing another child. In August 2004 I joined the Treatment Action Campaign and I met more people who were living with HIV. This gave me hope as I could see that there were people living ordinary lives although they were infected with HIV. I attended treatment literacy training where I learnt more about the science of HIV and its treatment and about opportunistic infections.

In 2007 I met my current partner, who knew about my status, and we started dating. We used protection during sexual intercourse. One day the condom broke during intercourse and I did not bother going to buy the morning-after-pill because I didn't think I could conceive after being so ill.

In March I found out I was pregnant. I was so excited because now I knew with good HIV management and treatment I could have an HIV negative child. My partner was also excited about having a baby. I received so much support from my family, friends and colleagues. My doctor and I discussed ways of delivery, I decided on having a Caesarian-section, and we set the date for November 12 2007. I made sure that I took my medication on time because I did not want to pass on HIV to my son.

My son was born prematurely on the morning of October 9 2007 weighing only 1.6kg. He was immediately sent to neonatal ICU because he had breathing problems. He was put on a ventilator to assist him with breathing and he was given nevirapine syrup twice a day. His breathing improved on the second day and he had nasal cannula for oxygen supply. He was feeding well with a nasal tube but the doctor started him on bottle feeding on the third day because he was showing signs of being able to suck a bottle. His health improved and the necessary tests were done on him an all back negative.

He was discharged on October 28 2007. I was so happy to take him home, and the nurses reminded me not to forget to give him his nevirapine syrup. When I got home, everyone was happy to have an additional member of the family. Giving him the syrup was easy because I gave it to him at the same time when I was taking my antiretroviral treatment. The paediatrician told me to bring my son back when he was six weeks old for him to get tested for HIV.

The six weeks seemed like a long time but eventually on November 20, I took him to the paediatrician for testing and to the clinic for immunization. I was told to come back November 23 for the results. I will never forget that day, when my son had tested HIV negative. I cried tears of joy, I was so happy that finally I was getting a chance of raising an HIV-negative child.

I wish that all young women would get all the necessary information about HIV in pregnancy in order to prevent the transmission of HIV from mother to child.