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BLOOD CANCERS

► Types and Treatment Options

INSIDE A MEDICAL LAB

► – It's More than
Test Tubes and Beakers

● **THE BURDEN OF
FUNGAL DISEASE
AND UNMET
MEDICAL NEEDS**

**VACCINATION:
IMPORTANCE
OF TIMING**

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Dear Reader

One of the great aspects of this job is having the opportunity to talk with and listen to the many different manufacturers, distributors, and of course the huge network of dealers that is the backbone of our industry.

Years ago I never would have ever imagined I would be in this position, and it is amazing. To say I really enjoy this job is an understatement.

What makes Diagnostics Update.com so unique is their informative and educative ways to the nation.

The staff and management is always looking for ways to inform their readers on how to tackle different medical issues. Basically, you want more people to enjoy reading more and more.

That said, there is still the need to get more readers to embrace healthy routines within and outside the homestead.

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BLOOD CANCERS

Types and Treatment Options

Blood cancer happens when something goes wrong with the development of your blood cells. This stops them working properly and they may grow out of control.

This can stop your blood doing the things it normally does to keep you healthy, like fighting off infections or helping repair your body.

Types of blood cancers

- **Leukemia:** Cancer that originates in blood-forming tissue.
- **Non-Hodgkin lymphoma:** Cancer that develops in the lymphatic system from cells called lymphocytes, a type of white blood cell that helps the body fight infections.

- **Hodgkin lymphoma:** Cancer that develops in **the** lymphatic system from cells called lymphocytes. Hodgkin lymphoma is marked by the presence of an abnormal lymphocyte called the Reed-Sternberg cell (or B lymphocyte).

- **Multiple myeloma:** Cancer that begins in the blood's plasma cells, a type of white blood cell that is made in the bone marrow.

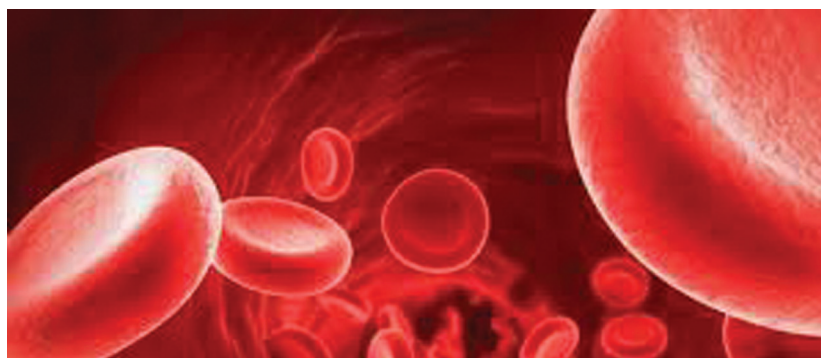
There are also other blood cancers and related conditions that don't fit within these groups such as myelodysplastic syndromes and myeloproliferative neoplasms.

Within these broad groups are many different blood cancers. Each specific type

affects a particular type of blood cell and will have different symptoms, treatments and outlook (prognosis).

Blood cancer symptoms

- **Fever, chills**
- **Persistent fatigue, weakness**
- **Loss of appetite, nausea**
- **Unexplained weight loss**
- **Night sweats**
- **Bone/joint pain**
- **Abdominal discomfort**
- **Headaches**
- **Shortness of breath**
- **Frequent infections**
- **Itchy skin or skin rash**
- **Swollen lymph nodes in the neck, underarms, groin**



Blood cancers, or hematologic cancers, affect the production and function of blood cells. Most of these cancers start in the bone marrow where blood is produced.

Acute and chronic blood cancers

You might see blood cancers described as either:

- **acute:** this means an aggressive or fast-growing cancer that spreads quickly, or
- **chronic:** this means a slower-growing or 'indolent' (lazy) cancer that takes longer to spread.

Childhood cancers

Some types of blood cancer affect both adults and children. The symptoms and treatments can be different between age groups, so you might see these described as a childhood or adult cancer.

How does blood cancer start?

Cells are the tiny building blocks that our bodies are made of. Every second of every day your body is refreshing your cells by making new ones and destroying old ones.

DNA is a substance within your cells. It's a kind of code that controls how cells develop, behave, and die. DNA is made up of small sections known as genes and packed into



chromosomes in your cells.

If the DNA changes (mutates) in the stem

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cells that make your blood cells in your bone marrow, your blood cells might start to develop wrongly (abnormally), or fail to die when they should. These are the 'cancerous' or cancer cells.

The type of blood cancer you have generally depends on the type of blood cell that's affected.

Leukaemia happens when your leukocytes (white blood cells) become cancerous. Lymphoma happens when your

lymphocytes (a certain type of white blood cell) become cancerous.

Myeloma happens when your plasma cells (a type of B lymphocyte) become cancerous.

What causes blood cancer?

All blood cancers are caused by faults in our DNA (mutations). In practically all cases these changes to our DNA happen for reasons we can't explain and are linked to things we can't control.

While in most cases we don't know exactly what causes the changes to DNA that can lead to blood cancer, research has shown that there are a number of things that can affect how likely you are to develop certain types of blood cancer.

These 'risk factors' include:

- age,
- sex,
- ethnicity,
- family history,
- radiation or chemical exposure, and
- some health conditions and treatments.

The risk factors vary between the different types of blood cancer.

How does age affect my risk?

Generally as we age we're more likely to pick up mutations / faults that can lead to blood cancer, meaning many blood cancers are more common in older people.

How does family history affect my risk?

While blood cancers are caused by problems in our DNA, in most cases this doesn't mean blood cancer happens because the genes get passed down from parents to children (hereditary).

Although there's some evidence for some blood cancers that having a family member with blood cancer slightly increases your risk, it's not clear if this is because of a genetic (gene) fault passed down by parents, or for some other reason.

Does radiation cause blood cancer?

There's some evidence that environmental factors such as radiation or chemical exposure may be linked to some types of blood cancer, but these would need to be at a much higher level than you'd experience in everyday life.

Is there anything I can do to prevent or lower my risk of blood cancer?

Unlike some other cancers, lifestyle factors such as your diet or levels of exercise have little effect on your risk of developing blood cancer. Nevertheless, we encourage people to lead a healthy lifestyle, including eating a balanced diet and being physically active regularly, this can help reduce the risk of developing a range of diseases.

How does blood cancer affect my immune and lymphatic systems?

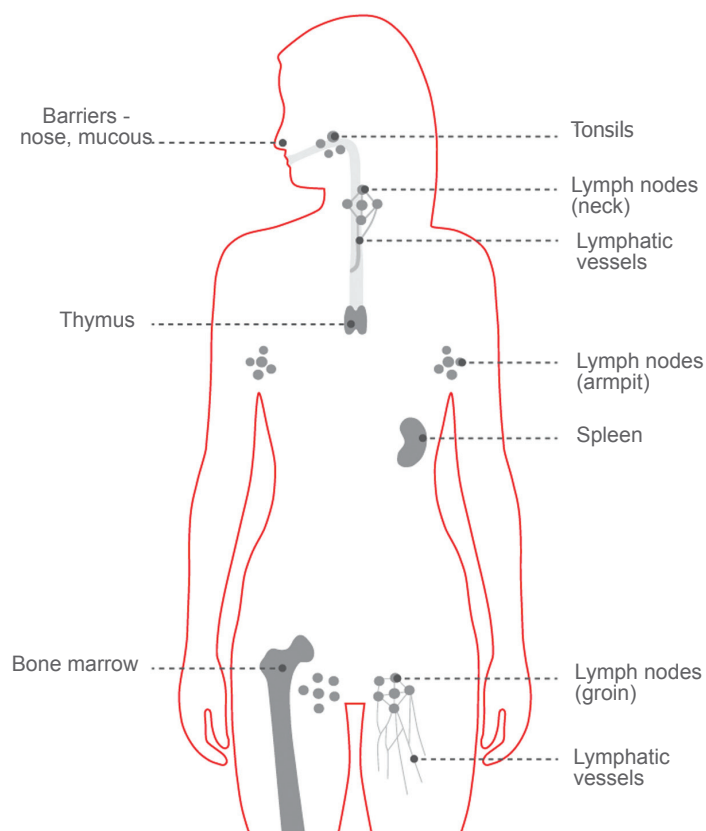
If the blood cells that fight infection become cancerous, they don't do their job properly and your body finds it much harder to fight infections.

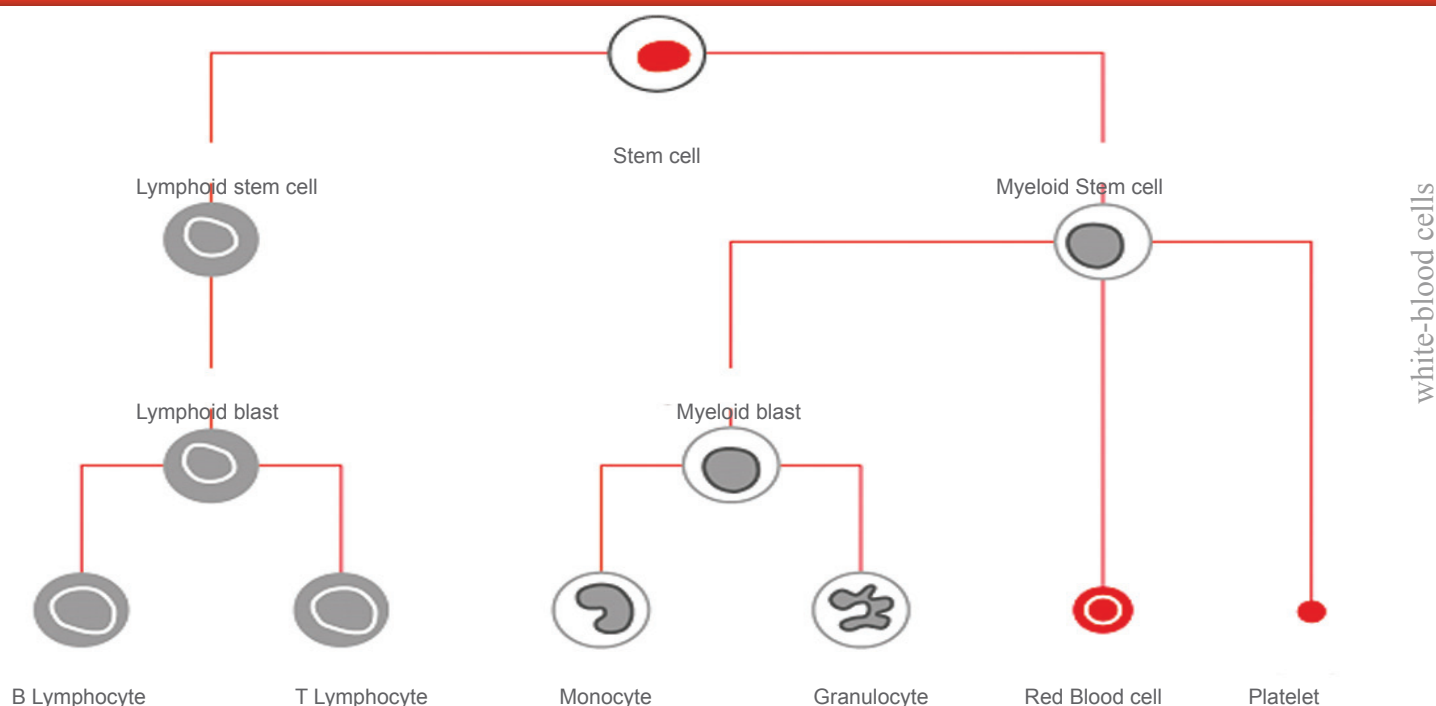
Certain types of treatment such as chemotherapy can also put you at risk of infection because they kill off healthy blood cells that usually help to fight infections.

This means some people with blood cancer get more infections

and they may be more serious. If this affects you, your healthcare team can let you know about the ways to reduce your risk.

Some types of blood cancer can cause problems with your lymphatic system – for example if you have lymphoma, abnormal lymphocytes may clump in your lymph nodes, causing noticeable swelling in your groin, armpit or neck. It may also cause your spleen to swell.





BONE MARROW

and how blood cells are made

Bone marrow is a spongy material found in the centre of some of your bones, such as the back of your hips. It's made up of blood vessels, fat, and tissue that makes blood cells (haemopoietic tissue).

How are blood cells made?

Blood cells start off in your bone marrow as a type of cell called a stem cell.

The stem cells then split (divide) to create either lymphoid stem cells or myeloid stem cells.

Lymphoid stem cells develop to form lymphocytes (white blood cells that help fight infections)

Myeloid stem cells go on to form red blood cells, platelets and other types of white blood cells.

They then move from your bone marrow into your blood and other parts of your body where they develop into fully grown (mature) blood cells.

Your body needs to keep constantly producing blood cells. It's when something

goes wrong with the development of your blood cells in your bone marrow that you may develop blood cancer.

If everything's working normally, your body makes the right number of each type of cell to keep you healthy. If there are too many or too few of any type of blood cell, this can make you unwell.

<https://bloodwise.org.uk/info-support/blood-cancer/what>

BLOOD COUNTS

Everyone has slightly different numbers of each type of blood cell. If you're healthy, the amount you have normally stays in the same range.

A 'blood count' is the term used to describe how many blood cells are in a sample of your blood.

What's a normal blood count?

What's considered a 'normal'

blood range (blood count) can vary depending on age, sex and population demographics, but as a general rule a healthy

person is expected to have blood counts in the following ranges:

Type of blood cells	Normal range for women	Normal range for men
Red blood cells	3.8 to 4.8 x 10 ³ /uL	4.5 to 5.5 x 10 ⁶ /uL
Haemoglobin	12.0 to 15.0 g/dL	13.0 to 17.0 g/dL
White blood cells	4.0 to 10.0 /uL	4.0 to 10.0 /uL
Neutrophils	2.0 to 7.0 x 10 ³ /uL	2.0 to 7.0 x 10 ³ /uL
Lymphocytes	1.0 to 3.0 x 10 ³ /uL	1.0 to 3.0 x 10 ³ /uL
Platelets	1.0 to 3.0 x 10 ³ /uL	150 to 410 /uL

ALL YOU NEED TO KNOW ABOUT TUBERCULOSIS

What is tuberculosis?

Tuberculosis is an infectious disease that usually affects the lungs.

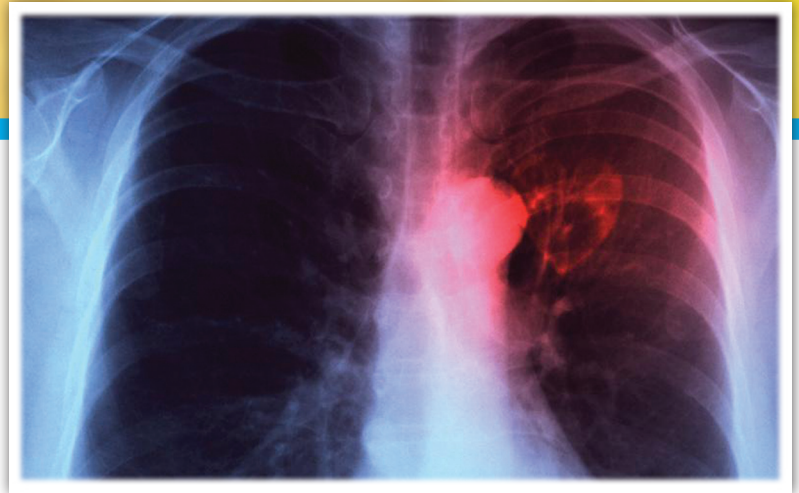
Doctors make a distinction between two kinds of tuberculosis infection: latent and active.

Latent TB - the bacteria remain in the body in an inactive state. They cause no symptoms and are not contagious, but they can

become active.

Active TB - the bacteria do cause symptoms and can be transmitted to others.

There is a slight chance of latent TB becoming active, but this risk is much higher in people who have



compromised immune systems, i.e., people

living with HIV or malnutrition, or people who smoke.

TB affects all age groups and all parts of the world.

Diagnosis of tuberculosis

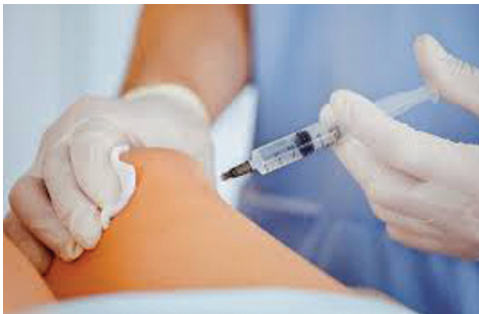
To check for TB, a doctor

will use a stethoscope to listen to the lungs and check for swelling in the lymph nodes.

They will also ask about symptoms and medical history as well as assessing the individual's risk of exposure to TB.

The most common diagnostic test for TB is a skin test where a small injection of PPD tuberculin, an extract of the TB bacterium, is made just below the inside forearm.

The injection site should be checked after 2-3 days, and, if a hard, red bump has swollen up to a specific size, then it is likely that TB is present.



Unfortunately, the skin test is not 100 percent accurate and has been known to give incorrect positive and negative readings.

However, there are other tests that are available to diagnose TB. Blood tests, chest X-rays, and sputum tests can all be used to test for the presence of TB bacteria and may be used alongside a skin test.

Muti-Drug resistance TB (MDR-TB) is more difficult to diagnose than regular TB. It is also difficult to diagnose regular TB in children.

Treatments for tuberculosis

The majority of TB cases can be cured when the right medication is available and administered correctly. The precise type and length of antibiotic treatment depend on a person's age, overall health, potential resistance to drugs, whether the TB is latent or active, and the location of infection (i.e., the lungs, brain, kidneys).

People with latent TB may need just one kind of TB antibiotics, whereas people with active TB (particularly MDR-TB) will often require a prescription of multiple drugs.

Antibiotics are usually required to be taken for a relatively long time. The standard length of time for a course of TB antibiotics is about 6 months.

TB medication can be toxic to the liver, and although side effects are uncommon, when they do occur, they can be quite serious. Potential side effects



should be reported to a doctor and include:

Dark urine
Fever
Jaundice
Loss of appetite
Nausea and vomiting

It is important for any course of treatment to be completed fully, even if the TB symptoms have gone away. Any bacteria that

have survived the treatment could become resistant to the medication that has been prescribed and could lead to developing MDR-TB in the future.

Directly observed therapy (DOT) may be recommended. This involves a healthcare worker administering the TB medication to ensure that the course of treatment is completed.

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WHAT IS KIDNEY DISEASE?

Kidney disease can affect your body's ability to clean your blood, filter extra water out of your blood, and help control your blood pressure.

You're born with two kidneys. They're on either side of your spine, just above your waist.

When your kidneys are damaged, waste products and fluid can build up in your body. That can cause swelling in your ankles, vomiting, weakness, poor sleep, and shortness of breath. Without treatment, the damage can get worse, and your kidneys may eventually stop working. That's serious, and it can be life threatening.

What Your Kidneys Do

Healthy kidneys:

- Keep a balance of water and minerals (such as sodium, potassium, and phosphorus) in your blood
 - Remove waste from your blood after digestion, muscle activity, and exposure to chemicals or medications
 - Make renin, which your body uses to help manage your blood pressure
 - Make a chemical called erythropoietin, which prompts your body to make red blood cells
 - Make an active form of vitamin D, needed for bone health and other things
- Not enough blood flow to the kidneys
 - Direct damage to the kidneys themselves
 - Urine backed up in the kidneys
 - Those things can happen when you:
 - Have a traumatic injury with blood loss, such as in a car wreck
 - Are dehydrated and your muscle tissue breaks down, sending too much protein into your bloodstream
 - Go into shock because you have a severe infection called sepsis
 - Have an enlarged prostate that blocks your urine flow
 - Take certain drugs or are around certain toxins

Acute Kidney Problems

If your kidneys suddenly stop working, doctors call it acute kidney injury or acute renal failure. The main causes are:

- Not enough blood flow to the kidneys
- Direct damage to the kidneys themselves

- Urine backed up in the kidneys
- Those things can happen when you:
 - Have a traumatic injury with blood loss, such as in a car wreck
 - Are dehydrated and your muscle tissue breaks down, sending too much protein into your bloodstream
 - Go into shock because you have a severe infection called sepsis
 - Have an enlarged prostate that blocks your urine flow
 - Take certain drugs or are around certain toxins
- Have complications



during a pregnancy, such as eclampsia and pre-eclampsia

- Autoimmune diseases, when your immune system attacks your body, can also cause an acute kidney injury.

Chronic Kidney Disease

When your kidneys don't work well for longer than 3 months, doctors call it chronic kidney disease. You may not have any symptoms in the early stages, but that's when it's simpler to treat.

Diabetes (types 1 and 2) and high blood pressure are the most common culprits. High blood sugar levels over time can harm your kidneys. And high blood pressure creates wear and tear on your blood vessels, including those that go to your kidneys.

Other conditions include:

- Immune system diseases (If you have kidney disease due to lupus, your doctor will call it lupus nephritis.)
- Long-lasting viral illnesses, such as HIV/AIDS, hepatitis B, and hepatitis C
- Pyelonephritis, a urinary tract infections within the kidneys, which can result in scarring as the infection heals. It can lead to kidney damage if it happens several times.
- Inflammation in the tiny filters (glomeruli) within your kidneys. This can happen after a strep infection.
- Polycystic kidney disease, a genetic condition where fluid-filled sacs form in your kidneys.

Defects present at birth can block the urinary tract or affect the kidneys. One of the most common ones involves a kind of valve between the bladder and urethra. A urologist can often do surgery to repair these problems, which may be found while the baby is still in the womb.

Drugs and toxins, such as lead poisoning, long-term use of some medications including NSAIDs (nonsteroidal anti-inflammatory drugs) like ibuprofen and naproxen, and IV street drugs can permanently damage your kidneys. So can being around some types of chemicals over time.

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VACCINATION: IMPORTANCE OF TIMING

According to the Recommended Immunization Schedule for Persons 0 — 6 years of age, children may receive up to 24 vaccinations to protect them from up to 14 diseases by the time they're 2 years of age. It may seem like a lot of vaccines for your child, but some parents are unnecessarily concerned..

Vaccines are recommended for very young children because their immune systems are not yet fully mature and also because their stomachs produce less acid, making it easier for ingested bacteria and viruses to multiply. These factors leave them the most vulnerable to the devastating effects of these serious diseases.

When a baby is developing in the mother's womb it is in a sterile environment. The baby's immune system goes into action at birth, as the child confronts bacteria outside of the womb. But our bodies are an amazing creation with an immune system that is ready to go to work from the moment that we are born. Infants begin to immediately develop an active immune response to these bacteria -- an immune response that prevents these bacteria from entering the bloodstream and causing harm.

Within the first two years of life a child is exposed to 11 or 12 vaccines, some of which are given over time in multiple doses. The degree to which these vaccines challenge a child's immune system is just a drop in the ocean when compared to the tens of thousands of environmental challenges that babies successfully manage every single day.

Things you should discuss with your child's health care provider when scheduling vaccinations:

- If your child has had an



allergic reaction to a previous vaccination or a vaccine ingredient, such as eggs or gelatin.

- If your child has a high fever, or a history of fever after receiving a vaccination.

Doctors and other public health experts have worked hard to come up with the optimal vaccination schedule, affording the most complete and safest protection possible. It is not advisable to skip or delay vaccines, as this will leave the child vulnerable to disease for a longer period of time. Parents should discuss any concerns with their child's pediatrician.

Types of Vaccines

There are several types of vaccines, each well-suited to prevent different diseases. When administered, vaccines trigger your body's defenses which create antibodies to fight the bacteria or virus.

The small amount of virus or bacteria that vaccines contain is much weaker than what your child may encounter naturally, and are designed to prepare the immune system to defend against the disease.

The scientific community chooses what type of vaccine to develop based upon the characteristics of the infecting agent (bacteria, virus or toxin), and then works to make the safest vaccine possible.

Over time, the type of vaccine may change for a given disease. For example, protection from polio infection was once achieved by getting the oral polio vaccine which is a live attenuated vaccine (see below). The drawback to that vaccine was that some people could get polio from the vaccine. But once polio was declared eradicated, we switched to the Inactivated Polio Vaccine which cannot cause the recipient of the vaccine to get polio.

Here are the main types of vaccines:

Live Attenuated Vaccines: These vaccines are made up of living virus or bacteria that have been weakened (attenuated) by scientists. These vaccines are very effective, but in rare cases (such as in people with compromised immune systems), can cause infection.

Inactivated Vaccines:

More stable than live vaccines, these vaccines contain disease microbes that have been killed with chemicals. Inactivated vaccines tend to stimulate a weaker immune response than live vaccines, and may require booster shots to maintain immunity.

Toxoid vaccines:

When the cause of illness is a toxin that the virus or bacteria emits, scientists may be able to formulate a vaccine from just the deactivated toxin, rather than the whole bacteria. When the vaccine is administered, the immune system learns to fight off the toxin.

Conjugate Vaccines:

Some bacteria have special coatings that hide them from the immune

system. Conjugate vaccines link these coatings to an organism that an immature immune system can recognize, so it can respond and produce immunity.

Subunit Vaccines:

These vaccines are made with only the parts of the microbe that stimulate the immune system. Subunit vaccines can be made by taking apart the actual microbe, or they can be made in the laboratory using genetic engineering techniques. Since these vaccines contain only parts of the microbe rather than the whole microbe, the chance of temporary reactions is even lower than with other kinds of vaccines.

Vaccine Production

Vaccine scientists work under the premise that it is always better to prevent a disease than to treat it. As a result, research is constantly being conducted to identify microorganisms, viruses or toxins that merit preventative action, and to develop corresponding vaccines.

Candidate vaccines are developed and rigorously tested throughout various stages of their development starting with laboratory tests which are followed by a three-stage clinical trial program. The Food and Drug Administration (FDA) ultimately evaluates vaccines and determines their date of release for medical use based on three main variables:

- Safety
- Effectiveness
- Stability during shelf life

The Journey of Your Child's Vaccine

Before a new vaccine is ever given to people, extensive lab testing is done that can take several years. Once testing in people begins, it can take several more years before clinical studies are complete and the vaccine is licensed.

INSIDE A MEDICAL LAB

- IT'S MORE THAN TEST TUBES AND BEAKERS

25-hydroxy vitamin D test

In our bid to offer you the Complete Diagnostic Solution for your pathology, we, as Diagnofirm Medical Laboratories, are happy to announce that 25-Hydroxy Vitamin D Test is now being performed locally and not being referred out of the country as was the previous practice. The test is performed by highly qualified, trained and competent personnel using adequately maintained, state of the art laboratory equipment, following standard procedures to ensure the quality and reliability of your laboratory results.

The main Advantages include:

- quicker access to test results for the clinician, leading to more treatment options for the patient;
- greater efficiency of the clinical workflow

What is the 25-hydroxy vitamin D test?

Vitamin D helps your body absorb calcium and maintain strong bones throughout your entire life. Your body produces vitamin D when the sun's UV rays contact your skin. Other good sources of the vitamin include fish, eggs, and fortified dairy products. It's also available as a dietary supplement.

Vitamin D must go through several processes in your body before your body can use it. The first transformation occurs in the liver. Here, your body converts vitamin D to a chemical known as 25-hydroxyvitamin D, also called

calcidiol.

The 25-hydroxy vitamin D test is the best way to monitor vitamin D levels. The amount of 25-hydroxyvitamin D in your blood is a good indication of how much vitamin D your body has. The test can determine if your vitamin D levels are too high or too low.

The test is also known as the 25-OH vitamin D test and the calcidiol 25-hydroxycholecalciferol test. It can be an important indicator of osteoporosis (bone weakness) and rickets (bone malformation).

Why is a 25-hydroxy vitamin D test done?

Your doctor may request a 25-hydroxy vitamin D test for several different reasons. It can help them figure out whether too much or too little vitamin D is causing bone weakness or other abnormalities. It can also monitor people who are at risk for having a vitamin D deficiency.

Those who are at high risk of having low levels of vitamin D include:

- people who don't get much exposure to the sun
- older adults
- people with obesity
- babies who are breastfed only (formula is usually fortified with vitamin D)
- people who have had gastric bypass surgery
- people who have a disease that affects the intestines and makes

it difficult for the body to absorb nutrients, such as Crohn's disease.

Your doctor may also want you to do a 25-hydroxy vitamin D test if they've already diagnosed you with a vitamin deficiency and want to see if treatment is working.

Evaluating the results of a 25-hydroxy vitamin D test

Results will depend on your age, sex, and the testing methods used. Results can also slightly vary from lab to lab.

Levels of vitamin D are measured by the 25-hydroxy level in nanomoles/liter (nmol/L) or nanograms/milliliter (ng/mL).

The results can indicate the following:

- deficiency: less than 30 nmol/L (12 ng/mL)
- potential deficiency: between 30 nmol/L (12 ng/mL) and 50 nmol/L (20 ng/mL)
- normal levels: between 50 nmol/L (20 ng/mL) and 125 nmol/L (50 ng/mL)
- high levels: higher than 125 nmol/L (50 ng/mL)

If your vitamin D levels are low and you're having symptoms of bone pain, a doctor may recommend a special scan to check bone density. Doctors use this painless scan to evaluate a person's bone health.

Low blood levels of 25-hydroxy vitamin D usually mean one (or more) of the following:

- you aren't eating a balanced, complete diet

• your intestines aren't absorbing the vitamin properly

• you're not spending enough time outside to absorb adequate vitamin D levels through sun exposure

Some evidence links vitamin D deficiency to a higher risk of certain cancers, immune diseases, and cardiovascular disease.

High vitamin D blood levels generally result from taking too many vitamin pills and other nutritional supplements. High doses of vitamin D can result in a condition called hypervitaminosis D. Hypervitaminosis is a rare but serious condition that could put you at risk for liver or kidney problems.

High levels are rarely due to consuming too much of the vitamin through foods or sun exposure.

Your doctor will help explain the results of your test and determine if you have a vitamin D deficiency.

Outlook

Vitamin D is vital to the body. Deficiencies at any age can cause problems. Your doctor may recommend supplements or other treatment options if you're very deficient. Eating foods that contain vitamin D in addition to adding supplements to your regimen can help keep your vitamin D levels stable.

Reference: South African Clinical guideline for the diagnosis and management of Osteoporosis, 2017.

The Affinity solution for Chemotherapy



Another great development is in the oncology department and its use of technology to create more meaningful and efficient patient visits for testing and cancer treatment. In cancer patients, the effects of chemotherapy often reduces blood cell counts. This means that patients are more prone to

get infections, anemia and other problems. Research shows that low blood counts are one of the main causes of delayed treatment or reduced treatment dosage. In 20% of the cases, the patient is sent home before they undergo treatment because onsite blood tests showed that their blood counts were too low.

A hand-held blood testing device is helping to change this. This kit can be used by the chemotherapy patient at home and can minimize cancellations for chemotherapy appointments. It also means that hospital visits just for blood count checks are also reduced. The upshot of this is increased slots for people awaiting urgent treatment. This new piece of hand-held technology is called Affinity, created by a team of scientists from Marsden Hospital. This facility is renowned for cancer research, treatment, and education. This device is able to give patients an accurate indication before leaving home that they are ready for chemotherapy treatment. The patients' visits are now more meaningful and productive, and less unproductive visits mean less healthcare expense.

Part of this device, called the Aptus, monitors both hemoglobin and hematocrit. It identifies under-filled cuvettes and eliminates air bubbles. This gives prompt results at the point of care and allows immediate decisions on patient treatment to be made. This device works with venous, capillary or arterial whole blood samples. Aptus is user friendly, only

takes minimum maintenance, and comes with a rechargeable battery. It is also fully portable meaning it can be used comfortably everywhere. As blood counts are not only used for cancer care, this device can be used both in hospitals and general practices. The possibilities and applications for medical labs and their patients are endless.

The Medical Laboratory-not just about beakers and test tubes, but a whole lot more

So, as one can see, life for managers and teams in the laboratory is a challenging one. It demands efficiency, skill and a reliability that hospitals depend on. The Medical Center, by improving access for patients and providers, has improved patient satisfaction. They also

have shown that with each team member's involvement in decision making, they can improve team cohesion and employee engagement. New practices and new technology will continue to not only improve efficiency but make a greater impact on patients' lives.

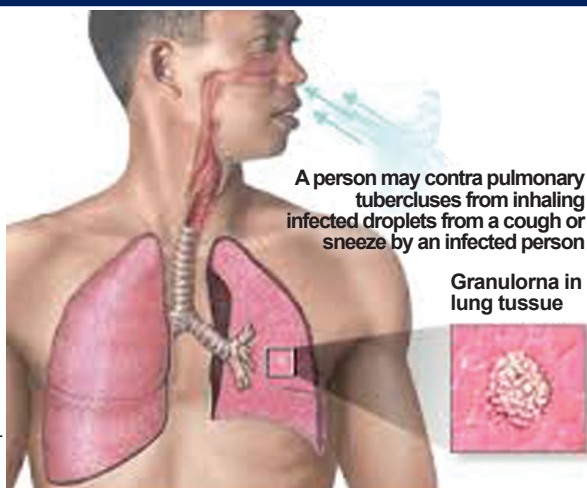
Source: <http://www.merraine.com>

WHAT CAUSES TUBERCULOSIS?

FROM PAGE 06

The *Mycobacterium tuberculosis* bacterium causes TB. It is spread through the air when a person with TB (whose lungs are affected) coughs, sneezes, spits, laughs, or talks.

TB is contagious, but it is not easy to catch. The chances of catching TB from someone you live or work with are much higher than from a stranger. Most people with active TB who have received appropriate treatment for at least 2 weeks are no longer contagious.



Since antibiotics began to be used to fight TB, some strains have become resistant to drugs. Multidrug-resistant TB (MDR-TB) arises when an antibiotic fails to kill all of the bacteria, with the surviving bacteria developing resistance to that antibiotic and often others at the same time.

MDR-TB is treatable and curable only with the use of very specific anti-TB drugs, which are often limited or not readily available.

Prevention of tuberculosis

A few general measures can be taken to prevent the spread of active TB.

Avoiding other people by not going to school or work, or sleeping in the same room as someone, will help to minimize the risk of germs from reaching anyone else.

Wearing a mask, covering the mouth, and ventilating rooms can also limit the spread of

bacteria.

TB vaccination

In some countries, BCG injections are given to children to vaccinate them against tuberculosis. It is not recommended for general use in the U.S. because it is not effective in adults, and it can adversely influence the results of skin testing diagnoses.

The most important thing to

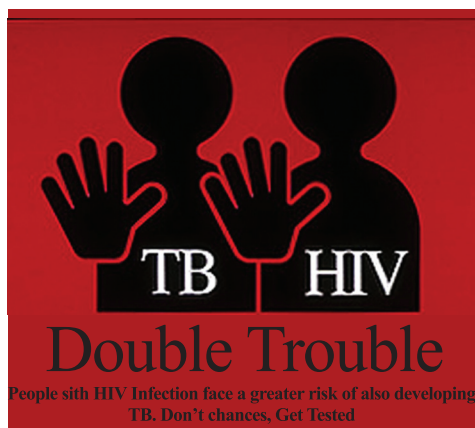
do is to finish entire courses of medication when they are prescribed. MDR-TB bacteria are far deadlier than regular TB bacteria. Some cases of MDR-TB require extensive courses of chemotherapy, which can be expensive and cause severe adverse drug reactions in patients.

If you have active TB, a face mask can help lower the risk of the disease spreading to other people.



Risk factors

People with compromised immune systems are most at risk of developing active tuberculosis. For instance, HIV suppresses the immune system, making it harder for the body to control TB bacteria. People who are infected with both HIV and TB are around 20-30 percent more likely to develop active TB than those who do not have HIV.



Tobacco use has also been found to increase the risk of developing active TB. Over 20 percent of TB cases worldwide

are related to smoking. People with the following conditions have an increased risk:

- diabetes
- certain cancers
- malnutrition
- kidney disease

Also, people who are undergoing cancer therapy, anyone who is very young or old, and people who abuse drugs are more at risk.

Complications

If left untreated, TB can be fatal. Although it mostly affects the lungs, it can also spread through the blood, causing complications, such as:

Meningitis: swelling of the membranes that cover the brain.

- Spinal pain.
- Joint damage.
- Damage to the liver or kidneys.

Heart disorders: this is more rare.

SYMPTOMS OF KIDNEY DISEASE?

FROM PAGE 07

You might not notice any problems if you have chronic kidney disease that's in the early stages. Most people don't have symptoms at that point. That's dangerous, because the damage can happen without you realizing it.

If your chronic kidney disease is already more advanced, you may:

- Be vomiting or often feel like you're going to
- Pee more often than normal, or less often
- See "foam" in your pee
- Have swelling, particularly of the ankles, and puffiness around the eyes
- Feel tired or short of breath all the time
- Not feel like eating
- Not be able to taste much
- Have muscle cramps, especially in your legs
- Have very dry, itchy skin
- Sleep poorly
- Lose weight for no obvious reason

A child with chronic kidney disease may also feel worn out and sleepier than usual, have less appetite than normal, and not be growing as expected.

When to See Your Doctor

Make an appointment if you notice any of the symptoms listed above. There could be other possible causes, but you'll need to see your

doctor to find out what the problem is and what treatment you need.

If you're at risk -- you have high blood pressure or diabetes, or if kidney disease runs in your family, for instance -- ask your doctor how often you'll need to get tested. It's very important to do this so your kidneys can work as well as possible.

TREATMENTS FOR KIDNEY DISEASE?

If a condition is "chronic," that means it's a long-term condition. If you have chronic kidney disease, you and your doctor will manage it together. The goal is to slow it down so that your kidneys can still do their job, which is to filter waste and extra water out of your blood so that you can get rid of them when you pee.

First, your doctor will work to find out what caused the kidney disease. For instance, it can happen if you have diabetes or high blood pressure. You may work with a nephrologist, a doctor who specializes in kidney disease.

You'll take medicines and may need to change your diet. If you have diabetes, it needs to be managed. If your kidneys don't work anymore, you might need dialysis (in which a machine filters your blood) and you could talk with your doctor about whether a kidney transplant would help.

Medications

High blood pressure makes chronic kidney disease more likely. And kidney disease can affect your blood pressure. So your doctor may prescribe one of these types of blood-pressure medicines:

"ACE" inhibitors, such as ...
Captopril (Capoten)
Enalapril (Vasotec)
Fosinopril (Monopril)

Lisinopril (Prinivil, Zestril)
Ramipril (Altace)

"ARBs," such as ...
Azilsartan (Edarbi)
Eprosartan (Teveten)
Irbesartan (Avapro)
Losartan (Cozaar)
Olmesartan (Benicar)
Valsartan (Diovan)

Along with controlling blood pressure, these medicines may lower the amount of protein in your urine. That could help your kidneys over time.

You might also need to take medication which is a chemical that prompts your body to make red blood cells. So you might get a prescription for darbepoetin alfa (Aranesp) or erythropoietin (Procrit, Epogen) to curb anemia.

Medicines to Avoid

If your kidneys don't work well, check with your doctor before you take any medications, including over-the-counter drugs (medicines you can get without a prescription.)

Your doctor may tell you to avoid certain pain relievers such as aspirin, ibuprofen, naproxen (Aleve) and celecoxib (Celebrex). These drugs, which doctors call "NSAIDs" (nonsteroidal anti-inflammatory drugs), could play a role in kidney disease. If you take a type of heartburn drug called a "proton pump inhibitor (PPI)," you may also want to know that some studies show a link between those medicines and chronic kidney disease. Your doctor may want to check on whether you need these medicines, or if a different dosage or something else might work better for you.

Tell your doctor if you take any herbal products or other supplements. It's best to have that talk before you start to take them.

Source: <https://www.webmd.com/a-to-z-guides/understanding-kidney>

THE BURDEN

Diagnofirm Medical Laboratories in collaboration with Barker Medical and Associates of Cape Cod hosted an evening talk on invasive Fungal infections and how the Fungitell Assay assists with diagnosis and treatment regimes. The talk was attended by several health professionals including Doctors, Nurses and Medical Laboratory Scientists. The Deputy Minister of Health and Wellness, Honourable Phillip Makgelele was the key note speaker. Below is an extract from his speech:



Mr Innocent Mupunga,
Diagnofirm Laboratories
Manager directing proceedings



Dr Malcom Finkelman



Prof Mervyn Mer



Deputy Minister



Innocent Mupunga and William Abram of Diagnofirm with Mr Neil Barker,
Managing Director of Barker Medical

Thank you Master of Ceremonies. My task this evening is an easy one. I am here to give the opening remarks for this remarkable seminar.

I am not the expert in the field of fungal diseases, the experts will give their in depth lectures.

However I am going to give brief background information on this condition.

Fungal disease is widespread but under-diagnosed and under-treated. This is true world-wide but is of special concern in Sub Saharan Africa.

The health toll of fungal disease is hidden due to many factors and some of these include:

- Invasive fungal disease is often a “complication” associated with other significant conditions.
- The major contributing condition is immunosuppression resulting from HIV/AIDS. Mortality rate from fungal diseases is very high, ranging from 30 – 100% depending upon the organism, the affected organs and tissues, and the patient’s clinical status.

Some of the key fungal

“Mortality rate from fungal diseases is very high, ranging from 30 – 100% depending upon the organism, the affected organs and tissues, and the patient’s clinical status”

OF FUNGAL DISEASE AND UNMET MEDICAL NEEDS



Mr Paul Cross - Associates of Cape Cod, International Distribution Manager (red tie), Mr Neil Barker - Barker Medical MD and Mr Iqbal Chand, Diagnofirm CEO

- Reduction in toxic drug exposure
- Reduction in adverse events
- Reduction in selection for resistance

Several initiatives are already underway.

Many organizations, including the World Health Organization, Centers for Disease Control, Leading International Fungal Education (LIFE) and Global.

Action Fund for Fungal Infections (GAFFI), are highlighting the global burden of fungal disease and leading initiatives in prevention, early diagnosis, and effective treatment.

diseases include:

- Cryptococcosis which can be disseminated and also causes meningitis. More than half a million deaths are estimated to occur annually from Cryptococcal disease.

- Sub-Saharan Africa is particularly hard-hit; with about 73% of the global burden of Cryptococcal meningitis.

- Approximately 166,000 deaths were recorded in Sub-Saharan Africa in 2014 alone
- Other fungal diseases include:
 - Candidiasis
 - Pneumocystosis
 - Aspergillosis
 - Histoplasmosis
 - Blastomycosis

A number of key issues predispose Sub-Saharan.

Africa to fungal infections

- Resource-limitations lead to under-investment in diagnosis and therapy
- Factors that lead to immunosuppression for example the HIV burden and malnutrition Sub-Saharan African countries including

Botswana need to formulate health care initiatives to combat the health burden of fungal diseases and these may include:

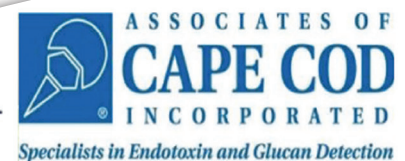
- Identification of the at-risk patient population
- Greater availability of fungal diagnostics
- Greater availability of antifungal drugs
- Avoidance of antifungal drug mis-use through anti-microbial stewardship programs in hospitals and healthcare facilities. Anti-microbial stewardship program benefits include:
 - Reduction in wasted clinical, pharmacy, and nursing resources
 - Reduction in unnecessary anti-fungal drug cost

The fight for a healthy nation is never a sprint, it is always a marathon and requires all of us to run together. The Ministry of health,private healthcare

sector, healthcare products manufacturers and suppliers and the donor community need to work together towards the same goals.

Ladies and gentlemen I declare this educational seminar officially opened.

Thank you



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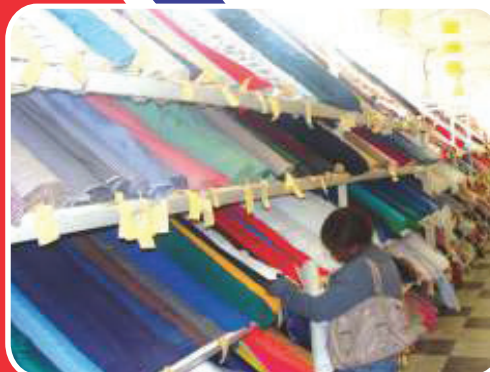
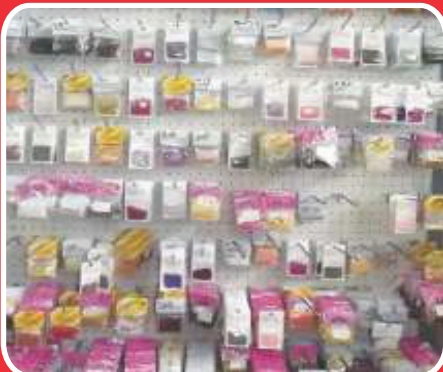
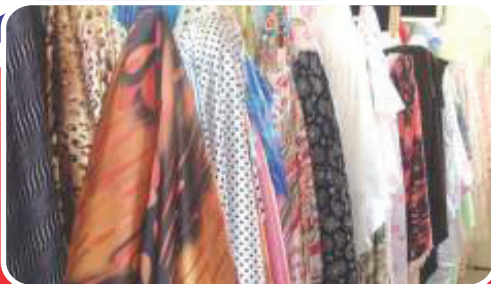
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