

Healthy Chemistry For Optimal Health

Learn About Chemicals That Will Harm Or Aid You

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Chemicals and Optimal Health

Foreword

Maintaining good health is not as difficult as you think. The body, as you probably know from your school days, has built-in mechanisms for taking care of itself. The problem is that people sometimes forget that for these built-in mechanisms to work, they are to maintain a certain diet as each and every one of the nutrients they get from foods they eat contributes to the maintenance of a body chemistry that allows the body to function smoothly. Get all the info you need here.



Healthy Chemistry for Optimal Health

Learn About Chemicals That Will Harm or Aid You

Chapter 1:

Introduction

Synopsis

This course on healthy body chemistry helps you understand what balanced body chemistry is and what it does for optimum body performance and sustaining good health. Here, you will learn about the chemicals the body produces and the impacts of these chemicals in your body. With this knowledge, you will have a good idea which types of foods to include in your diet and those you better avoid.



What Balanced Body Chemistry Means

The term body chemistry applies to all processes that occur inside the body from heartbeats to production of cells. All these processes are made possible by the chemicals that the body produces. From this definition of body chemistry, we can define balanced body chemistry as having the right amounts of chemicals that support the proper functioning of the body.

The health of a person is said to be good when his body chemistry is well balanced. To attain and maintain this balance, your body continually needs the nutrients provided by the food that you eat. You get proteins (amino acids), vitamin, minerals and fats which are used for maintaining and sustaining the operations of the body. Too much or too little of these nutrients could lead to health problems.

How does body chemistry affects your body? Every day, your biochemistry constantly changes. It changes when you eat, study, work, exercise, and sleep. When you eat, the sugar in your blood increases; after jogging your heart rate goes faster, or your blood pressure rises after arguing with somebody.

Whatever you do that leads to changes creates either a balance or imbalance in your body chemistry which means that these changes can be damaging or beneficial.

When your weight is just about right, meaning you are neither fat nor thin, your blood pressure is normal and you do not suffer from any

kind of health problems; then, you have balanced body chemistry. Conversely, when you weigh more or less than you should, you are likely to have abnormal blood pressure and suffer from various health problems; then, you have imbalanced body chemistry.

What is a balanced pH and why is it important to balance body chemistry?

One of the most important aspects that contribute to body chemistry balance or imbalance is the amount of acid/alkaline in your body. PH is the unit of measuring the acid or alkaline content in your body. A pH level lower than 7 means your body contains more acid while more than seven means your body contains more alkaline. The neutral pH level is 7.

It has been proven medically that when your urine and saliva is a bit over 7 PH level, your body works the best, although your blood PH is slightly alkaline. It is in this pH level that the body is equipped to fend off fatigue and illnesses. Your metabolism works well and you are able to keep your suitable weight.

A body suffering from over-acidity could face dangerous health problems over a long term because your body, to counter the acidity, is forced to get nutrients from your vital organs, weakening your body until it's no longer able to perform its tasks.

Now that you already know the importance of balanced body chemistry, you will find the next chapters even more helpful.

Chapter 2:

The Chemistry of the Blood

Synopsis

Blood tests are mandatory especially when your doctor needs to find out any possible sickness. It is a part of diagnostic procedures where all members of the healthcare team will be able to check the actual condition of your body to confirm their findings from physical assessment. Often, these blood tests are your worst enemy as they inflict pain although they are actually important. To better be aware of the importance of these tests, start by knowing the chemistry of the blood.



What is Blood Chemistry?

Our body is composed of millions of chemicals working together to provide function for all organs. They are usually contained in the blood and flowing all around our body to be distributed into cells of your body organs. With that, blood chemistry is defined as the actual composition of the chemicals that is present in our blood. Whenever we are sick, or we have ingested something harmful, our blood chemistry automatically changes. First, because it needs to fight the harmful substances (or microorganisms) off and second, these harmful substances also have their own blood chemistry that mixes with yours.

This is also the reason why your blood tests differ from one health problem to another. Too much sugar changes your blood glucose; a kidney problem may disrupt your blood flow because of too much salt or your liver may give off yellowish color when damaged. These are just few of the chemical changes in the blood whenever our body is harmed.

What are the Blood Chemistry Tests?

There are so many kinds of blood tests that are performed, depending on the symptoms your body is manifesting. Your doctor may order one kind of blood test, or in combination of many. This is because our organs work together in such a way that when one is damaged, the

other may be affected too. So, here are the common blood tests that your doctor may request.

1. **Glucose** – this is by far the most common blood test since the emerging obesity and sedentary lifestyle causes people to have blood sugar problems. With this, your doctor can see how your body uses glucose and diagnose if you have diabetes or any metabolic problems.
2. **SGOT and SGPT** – for liver function, these two blood tests are necessary to check the condition of your liver. These two are enzymes that work with the liver and so when the said organ is damaged, both of them will be dispersed into the blood that causes them to rise. Elevated levels of SGPT and SGOT indicate liver problems.
3. **Blood Urea Nitrogen** – the condition of your kidneys are measured by a blood test called blood urea nitrogen or BUN. Your kidney works 24/7 filtering waste from the blood and one of which is nitrogen. When kidney is damaged, nitrogen becomes unfiltered and thus, goes into the blood stream. So, an increase in BUN indicates kidney problems.

Other tests include T2 and T3 for thyroid function, Creatinine test for kidney function or sodium and electrolytes to check dehydration. These are the common blood tests that your doctor can request so your illness can be diagnosed, or check if your organs are still working properly.

Chapter 3:

The Relationship between the Biology and the Chemistry of the Blood

Synopsis

The relationship of biology and blood chemistry in your life can be seen everywhere. If you may observe, chemicals are all around us and they all contribute to many uses. Our body also is composed of different chemicals that are necessary for proper function. This includes sustaining life, which biology is all about. Find out the relationship between biology and chemistry of the blood, and how it can nourish and sustain your life.

Even these letters are made up of series of chemicals to make it readable. The computer you are using is made up of chemicals from the monitor to the internal hardware. In fact, all the things you see are chemically structured to give a specific function. Actually, you can think about all the things in the world and all of them definitely have a unique chemical composition. However, the most important thing to understand is its relationship to your blood chemistry, which defines how your body exactly performs.

The Relationship Defined

The relationship of biology to the chemistry of our blood involves three areas of science: genetics, biochemistry and molecular biology. These are interrelated to keep each body system functioning efficiently. Here are their definition and works:

1. **Genetics** – the study of genes is one of the biological studies which aim to trace roots by means of DNA (deoxyribonucleic acid), where chemicals intertwine to create a unique structure for each individual.
2. **Biochemistry** – is defined as the study of a living organism's body processes. Biochemistry is important in the field of biology as it focus on the specific function of molecules in the body. These include organ functions, cellular structure and blood's chemical components.
3. **Molecular biology** – derived from the word molecule, molecular biology focuses on the cell's structure and function. It involves studying how a specific cell reacts to given conditions, how it replicates and makes use of the substances ingested in the body.

These three sciences are all related to the biological functions of our body and its relationship to your blood chemistry. When a certain chemical enters your body, it automatically reacts and alters the normal composition of the blood. This may be harmful or medicinal,

depending on the type of chemical. This is the reason why your body reacts to some chemicals differently.

Significance of Relationship

The relationship of biology and blood chemistry to the body is considered to be a whole new approach. With that, the application of it for therapeutic and healing purposes is called molecular medicine. Molecular medicine involves many biological processes that include physical and chemical techniques to identify a specific health problem or provide ways of prevention. Sometimes, it also looks into a patient's gene expression to determine cause of current medical condition.

The relationship of biology and blood chemistry is not just important to sustain daily life, but to give progress to the surroundings as well. We all are interconnected with all these chemicals, either for the betterment of life or otherwise.

Chapter 4:

Dangerous Chemicals to the Body

Synopsis

Every day, you are prone to chemicals and pollutions that may affect your health. In fact, you may be unaware of the chemicals that invade your body. So whether you are in a hospital, laboratory or even in the comfort of your own room, there are hazardous chemicals that may linger around you.

Although they are everywhere, you also need to know that these chemicals can only do harm when they are absorbed in the body. So before jumping to any conclusions, it is important for you to know the terms related to chemicals; whether they may be toxic or hazardous. Do you know the difference?

Hazardous – this is the term used when certain substances accumulate in a concentration that can possibly harm to body.

Toxic – this is the term used when a certain substance has produced a harmful effect to the body especially when it reaches a certain amount.

The Passages Explained

So when you say that a certain chemical is toxic, it simply states that a chemical can cause negative effects at a concentration given. Usually, scientist and other professionals would define toxicity by percentage and measure them according to the amount that can cause fatality.

Usually, rats are the ones tested. These rats do a heroic act in defining toxicity since when a certain chemical caused 50% of death, then it is considered toxic. On the other hand, hazardous chemicals may or may not be toxic and as such, it should be handled carefully so as not to impose dangers.

Now that you have known the difference between toxic and hazardous chemicals, the next thing you need to know is their usual route in the body. These harmful chemicals may enter our body without knowing it. Sometimes, we inhale them; we ingest them and even our skin absorbs them. They invade in such a way that they do everything to penetrate our system.

When we ingest: It is only by the route of your mouth that you can actually let these chemicals invade your system. Eating in a contaminated area, drinking dirty water or food is a potential harm.

When we inhale: People who are working in a hazardous environment are more susceptible to invasion of chemicals. These chemicals invade

by getting into your lungs first then contacting the blood vessels in the body. Via these vessels, they begin to enter the system.

When we absorb: Your skin, even your eyes, is made up of series of cells that can absorb substances. The chemicals in your lotions and topical medications are absorbed this way. So, when a harmful chemical drops into your skin, it will then have a passageway through your skin.

These are the things you need to know about the pollutions and chemicals that may invade your system. The harmfulness of a material can still be described depending on their health cause. Irritants causes aggravation to our body tissues, narcotics are depressants, mutagen alters DNA of cells and cause cancer. Furthermore, poisons causes internal damages, teratogens affect the fetus of pregnant women and sensitizers cause allergies. For more information, visit your doctor today.



Chapter 5:

Good Chemicals to the Body

Synopsis

In order for a person to get fit and healthy, he or she should engage in exercise. It would have physical benefits to your body and physiological advantages as well.

While exercising, the body produces good chemicals to the body. For instance, running is a form of exercise that generates chain reaction to your body that activates chemicals called neurotransmitters in a cycle on brain.

Neurotransmitters can give out sensations or feeling of happiness and excitement while running or a feeling of exhaustion after exercising.

What's Good

Endorphins

Endorphins target the body's limbic and prefrontal area of a person's brain. These parts of the brain are responsible for emotion and feelings of a person. Endorphins that are released are related to the runner's high activity they mostly experience. This chemical can boost the mood of the runner and can minimize the feeling of pain.

According to a study conducted by a Germany researcher, people who run every day have higher tolerance than people who don't. This chemical is also associated with addiction. Drug users are believed to release endorphins, which make them addicted to drug intake. Same with runners, they would say that running is "addictive".

Serotonin

Serotonin is a chemical that is responsible with a person's mood, appetite, the cycle of sleep and libido. Aside from exercising, it is also released when you eat turkey and carbohydrates. In some cases of depression, artificial serotonin is given as medication to reduce the symptoms of depression and to boost your moods. The effect of serotonin stays longer in your body even after exercising, therefore increasing and improving overall feelings.

Brain-derived Neurotrophic Factor

Neurotrophic is a neurotransmitter that helps the brain, targeting the hippocampus. This chemical is responsible for a person's memory

improvement and the overall fitness of the brain. According to experts, people suffering from depression are low on this neurotransmitter.

By exercising, it can build up the mind's alertness and the feeling of happiness after working out. However, the body only releases a certain amount of this neurotransmitter during an exercise session. Even if you exercise longer, it would not increase the neurotransmitter that will be released.

A person exercising regularly will be more likely to have a feeling of happiness and good appetite. The reason behind this would be the 'feel-good' neurotransmitters that are released by the body, which will help a person stay fit and healthy not only physically, but also mentally. Having these good chemicals released, a person will be eliminating the risk of having symptoms of depression and would maintain the happiness that they are feeling.

These neurotransmitters will also maintain the balance of producing a feeling to a person. Thus, if you want to stay healthy and happy, both physically and mentally, you should engage yourself on an exercise regularly. These chemicals won't be released on your body, not until you do a body work out regularly. Make sure that exercise is part of your schedule every week so that it would also have positive outcome when you go to work, as it also eliminates stress.

Chapter 6:

The Impact of the Chemistry of the Chemicals

Synopsis

It is not difficult to relate health with chemicals. You have probably have heard of the term organic chemicals or organic compounds that is defined generally as substances composed of molecules that contain carbon-based atoms. And you know what? These compounds occur in all living things and in fact are the source of all natural or biological processes.



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Why the fear of chemicals?

It's obvious that chemicals have a lot to do with why we can do the things we do as living beings. Lately, however, the mere mention of the word chemical evokes negative feelings among people. We hear of chemical warfare and we see people staggering around gasping for breath. The health conscious when he or she hears of vegetables produced through the application of chemical-based or synthetic fertilizers shudders at the thought of eating such foods.

Scientists can do a lot with chemicals. They can combine different chemicals to come up with fearful weapons like the chemical weapons that we often hear about, and they can combine different chemicals to come up with health or life giving solutions.

Benefits to Health Industry

The health industry will not be what it is today if it does not know how chemicals work in the body. They would not know how to make use of the PH measurement that determines the acidity or the alkalinity of the body and they wouldn't know how to come up with programs that would address health problems. Worse, they wouldn't know what solutions to recommend for preventing problems.

Chemistry of Chemicals

A chemical has impact on another chemical. The impact or reaction falls within the realms of chemistry and this knowledge is very

important to the health industry. How should acidity that causes a lot of health problems for people be countered? Well, a health expert will declare caffeine, aerated drinks, spicy chutneys, pickles and vinegar off-limits and will recommend tea, milk, banana, cucumber and melon. He couldn't have known what to avoid and or recommend what the sufferer should take if he did know his chemicals and chemistry.

The key, then, to maintaining good health and coming up with cures is knowledge on what chemicals do for and to the body and what will happen if two chemicals of different properties are combined.

The field of chemistry has made great advances over the years and the health industry is one of the main beneficiaries of these advances. This is the reason why the industry has stayed stagnant and every so often, we see different health schemes and products based on new knowledge hitting the market. The best products that have come out from the industry, however, are those that are based on simply balancing the amounts of chemicals in the body so that the natural and proper biological processes are promoted and preserved.

Does this mean that all health products out there are effective? Well, people are given choices. One has to look at specifications – nutrition fact for health products or chemical content for non-food solutions. The choice should also consider the condition of the body as the chemicals absorb through the products can result to negative body reactions.

Chapter 7:

10 Reasons Why You Should Avoid the Bad Chemicals

Synopsis

Chemicals, especially the ones that you use to clean your place, are potentially hazardous if not handled with precaution. The marketing strategies of some industrial cleaners have succeeded to give the public enough awareness of the importance of cleanliness. On the other hand, they also did not put much effort to give certain precautions of the potential harm these chemicals can do to your health. Well, to give you safer ideas, here are the reasons why you should avoid bad chemicals.



Why

1. The Polycyclic Aromatic Hydrocarbons Scare

These are sealants that are made of potent chemicals that may cause cancer. In fact, they can be mixed up with your drinking water and impose much danger. In case you still insist to use these chemicals to seal your driveway, see to it that it is far enough not to reach your water supply.

2. The Triclosan Effect

This chemical is used commonly in soaps that are made to be anti-bacterial. These harsh chemicals may eliminate bacteria in your body but they also impose dangers. They have an effect on your metabolism as it reacts with your thyroid glands. This can also cause danger to aquatic animals especially when it reacts with contaminated water. Do not overuse this product. It can be harmful and will make your body more resistant to other antimicrobial medications.

3. The Ammonia Warning

Ammonia can be inhaled when used in household cleaners. In fact, children may inhale this chemical and cause health problems. For alternative, why not try baking soda to clean your tiles or your sink. They are natural and safe to use.

4. The Dangers of Pesticides

You are pretty sure that pesticides are poison even if marketing campaigns launch them as ‘natural.’ In fact, these chemicals actually kill the soil and so the plant cannot get any nutrition.

5. Problems About Synthetic Fragrance

Whether it may be lotion, soap and perfumes, they still are made synthetically and far from being natural. They cause skin irritants and other problems. As much as possible, opt for unscented ones as they are safer.

6. The Scented Candle Warning

Scented candles are sure way to give your home a good vibe but they impose danger when taken excessively. Be sure to only use them when necessary.

7. The Problems with Grilling

Grilling causes your food to char a bit and this produces a substance called heterocyclic amines. This substance is found to be carcinogenic so it is good to scrape them out of your plate.

8. Sunless Tanning Precaution

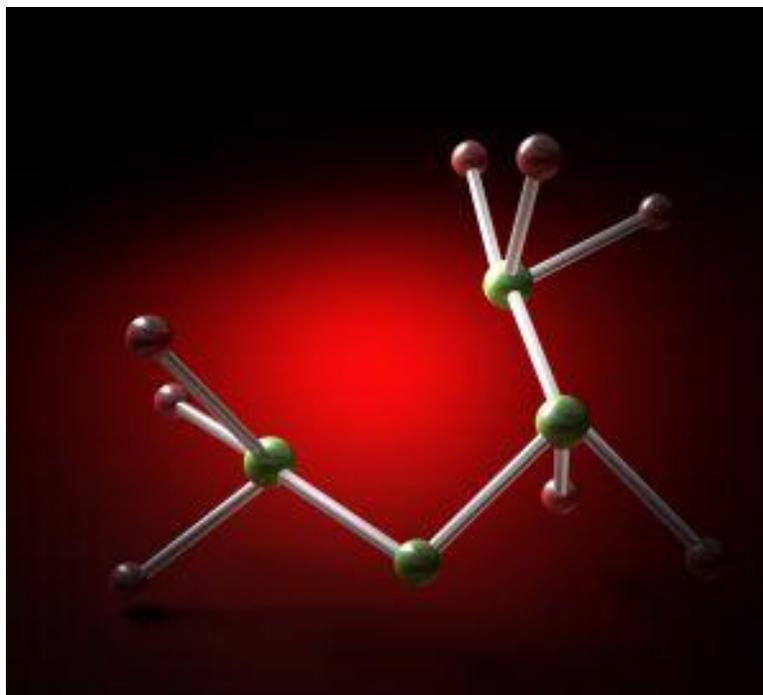
Even if you are to avoid the ultraviolet rays, these sunless tanning still contains strong chemicals that may cause skin irritants and other skin problems.

9. Smoke Belching Dangers

You are aware of how smoke damages your lungs due to carbon monoxide. Well, you can start cleaning your car and give your surrounding a much cleaner environment.

10. Nail Polish Alert

Nail Polish has an active ingredient called butyl acetate and may be harmful when inhaled, especially when children are around you. Be sure to apply it at an open space or away from children.



Chapter 8:

Reasons on Why You Should Only Have the Good Chemicals

Synopsis

From the previous chapter, you are given facts about the dangers of chemicals to your body. Actually, not all of them are bad. There are chemicals that are actually safe and tagged as good chemicals. These are the reasons why you should opt for good chemicals and the things to do in case you cannot avoid them.



The Process of Substitution or Elimination

The most common idea to lessen the risk of using harmful chemicals is either substitute them for another safer choice, or completely eliminate them from being used. Here are good ways to substitute bad chemicals:

- The use of paints can be substituted to those that are water-based.
- Substituting trichloroethylene with trichloromethane as a way to eliminate grease

You can also eliminate the products completely out of your surroundings. For example, do not use antibacterial soaps anymore or completely avoid the use of hair sprays. The thing to remember here is to reduce the use of bad chemicals either by choosing to buy less-harmful ones or completely eradicating the use of such chemicals.

Shielding Yourself Away from Dangers

We are prone to dangers most of our lives. Even from our daily work, we still get into contact with these chemicals. With that, you need to shield yourself away from dangers by doing something to strengthen your immune system. Our body is able to defend itself from invasion but with weak defense system, we are at risk to develop infections.

If you take a poor diet, make sure to take vitamin supplements as they are needed to give you stronger immune system. If you are constantly exposed to chemicals, it is better to use mask and laboratory gowns to keep you away from potential dangers. Sometimes, equipment should be isolated to a place where there is minimal exposure to the public as it can provide contaminants when touched or inhaled.

The Importance of Proper Ventilation

Having an environment where there is air circulation is very important to protect yourself from bad chemicals. There are unseen airborne chemicals that may enter a room and invade the whole space especially when there is a limited way out. So by proper ventilation, these bad chemicals will not linger around for some time and thus, fresh oxygen will continue to fill-in the space. This will give the chemicals less chance to cause dangers.

The Benefits of Good Hygiene

Above all, before you start cleaning your surrounding and making sure that we are using safer chemicals, it is good to start with yourself first. Practice a good hygiene by making sure that your body is clean before going to work or going to bed. This is especially important if you are working in an environment where you are constantly exposed to chemicals. These bad chemicals can stick to your skin and clothing, risking your health and the people around you.

These are the reasons why you need to opt for good chemicals and some safety precautions if you must really use a certain chemical. As mentioned earlier, chemicals are around you, so proper precaution and protection should be carried out at all times.



Chapter 9:

Factors to Take Into Consideration in Selecting the Kinds of Chemicals to Incorporate Into the Body

Synopsis

The usual route of the body when it enters the system is through the lining of your cells, either via your lungs, skin or mouth. Then it goes into the fluids in your body wherein there are two types: the interstitial and the intracellular.

Your body is made up of fluids and it fills up almost 60% of your body weight. These harmful chemicals may go into your body fluids and invade one part of your organ or multiple ones.

With that, you need to be more careful in choosing the right product to avoid bad chemicals harming your body. Here are the factors to be considered when selecting the chemicals we incorporate to the body.

Learn How Chemicals Can Circulates Into Body

These were briefly explained in the previous chapter so we are now going into details. A chemical can go to your interstitial fluid, the fluid that surrounds your cells. These fluids are not like your blood where it constantly flows in and around your heart to keep it clean. Instead, it remains in one location where water and nutrients move in and out of it. So when a bad chemical is in your interstitial fluid, it will not be carried away by your blood and thus, remain in one part of the body causing infections.

The chemical, before it completely invades a cell, will have to penetrate first in the cell's membrane. It needs to go into the blood vessels then eventually into the organ it wants to invade. This ability of the chemicals may vary according to their molecular structure, solubility, polarity and other factors. This also explains why a certain chemical causes different health problems as compared with others.

Know the Route of Exposure

This actually defines whether a certain chemical has a certainty to be eliminated. There are some that goes into the blood stream and are further eliminated. For example, a specific chemical focuses on invading your liver before any other organ. As we all know, the liver is one major filtering system that can destroy harmful chemicals.

With that, a certain chemical will be in the process of 'downstreaming' in which it will be dramatically eliminated or destroyed. This also explains why certain medications are administered differently in accordance to their function. Some should not pass the liver to provide medications to organs while some have to pass through to target the organ itself.

The Body Stores Them

Often times, the chemicals may enter the body and are trapped within the plasma proteins. Plasma proteins are storage cells and can put the chemical in dormant condition. This is because the plasma's proteins block its toxins so it will not cause harm. With that, a certain chemical is bound to protein at a short time.

These are the things you need to consider in selecting the kinds of chemicals in your body. There are some that invades while some are destroyed. In order for you to know all about it, check your product with your local stores.

Wrapping Up

Chemicals and Optimal Health

In our environment, many different materials we use can be hazardous to our health. These chemicals affect our health via direct body contact, ingestion or internal absorption. In order to understand the importance of chemicals to optimal health, and to assess the possible health effects of particular chemicals, we have to know the difference between ‘hazardous’ chemicals and ‘toxic’ chemicals.

Toxicity

Toxicity is defined as the degree to which a substance or chemical can damage any organism after it has made contact with a particular body part. If it results to unwanted effects, then the material is toxic. Here’s how it works: the more toxic a material is, the less amount of it is needed to be ingested, absorbed or become in contact to cause any harmful effects. If the substance is less toxic, a greater amount is needed in order to cause more harm to the body. These chemicals are tested on animals, oftentimes rats, to measure the level of toxicity.

Hazard

Hazard refers to the possible danger or risk a concentration may cause to the body. Toxicity is a property that is inherent to the material, whereas hazard is the degree of probability a material or substance presents. The way to understand this better is to consider

that even if a material is very toxic, it can be non-hazard if handled properly. On the other hand, another substance may be less toxic, but highly hazardous due to its prevalence and packaging, such as acid in an open container.

Possible Entry Routes

There are three possible entry routes for toxic materials into one's body. These are:

- Via oral ingestion, which pertains to swallowing of the toxic substance by the mouth
- Via skin or eye absorption that pertains to direct contact of the material or substance with the skin, which is then absorbed through the pores of the eyes or skin
- Nasal or oral inhalation which is when a chemical substance is inhaled through the nose or mouth via the air in the environment.

Classification of Chemical Substances

There are a lot of chemicals that can harm one's body. It is very important to know the types of substance that can be dangerous and how it will affect the body. The following are the classification of these harmful substances and some good examples:

- Irritants that can cause aggravation of the tissues when in contact such as ammonia and nitrogen dioxide
- Narcotics or anaesthetics that can damage the central nervous system such as chloroform and xylene
- System poisons that can damage internal organs such as carbon tetrachloride and halogenated hydrocarbons
- Carcinogens refers to substances that can cause cancer such as arsenic, benzene, inorganic chromium salts, beryllium and nickel
- Mutagens that can induce cancer as well such as radiation and variety of chemical agents that alter the genetic components
- Teratogens that are harmful to pregnant women for it could generate defects on foetus such as thalidomide and possibly steroids
- Sensitizer agents that can cause allergic reaction such as cutting oils, isocyanates in polyurethane foam operations, paint spraying operation and some laboratory solvents.

There are a lot of chemical substances present in our environment that can be hazardous to our health. We just need to be aware of its effects and proper usage to avoid dangerous and fatal effects to our body. Awareness of chemicals and optimal health are very essential.

As there are many toxic and hazardous chemicals all around us, there are also good chemicals that we need in order to survive and thrive. For optimal health, we need to use moderate amounts of these

chemicals. It is highly recommended that before we let any chemicals touch our body, we know more about them and what they can do for us. The world in itself is a huge ball of chemicals and substances, and so are our human bodies. Understanding how we interact with each other will help us achieve optimal lives.

