WISDOM OF THE AGEDS:

ANALOGIES FOR SIMPLER PATIENT EDUCATION

RICK RICER, M.D.

FOREWORD

This book is the second e-book in a series entitled "Wisdom of the Ageds". This book is a compilation of explanations that Family Physicians use to help their patients understand the processes occurring in their bodies. Family Physicians seem to be able to explain processes to their patients, in the patients' own language, using everyday occurrences as analogies (or metaphors) so that patients can understand what is happening to them. With experience and feedback, these explanations become part of the physician's routine daily practice, altered only as is individually necessary for specific patients and situations. Patients seem to understand these explanations well even if they aren't totally physiologically correct.

Early in a physician's career, patient education explanations tend to be scientifically correct, but difficult for the patient to understand since most patients do not have a scientific background or an understanding of scientific language. Through years of experience, physicians learn to couch their explanations in common language and common experiences. Patients tend to understand these explanations better. Some physicians become masters of using common analogies whereas others struggle to connect with their patients. Hopefully, this book will help physicians who struggle with these analogies to better communicate with their patients.

Over 100 board certified Family Physicians from almost every section of the United States were interviewed by the author. The physicians were chosen using a targeted convenience sampling technique and were asked to list three of their favorite patient explanations or analogies that their patients seemed to understand well. The majority of the physicians interviewed had been in medicine for over 15 years and some as long as 55 years. This project was part of a sabbatical experience entitled, "Wisdom of the Ageds" (experienced Family Physicians). Hopefully, the reader can benefit from the wisdom of these experienced doctors.

ABOUT THE AUTHOR

Rick E. Ricer, M.D. is a board certified Family Physician who has been in medicine for 28 years. He currently is a tenured professor in the Department of Family Medicine at the University of Cincinnati. He attended medical school at The Ohio State University and completed a Family Practice residency in the military at Fort Belvoir, Virginia. After an honorable discharge from the US Army, he practiced rural medicine in West Virginia and was on faculty at Marshall University. He then joined the faculty in the Department of Family Medicine at The Ohio State University and later transferred to the University of Cincinnati. He has been residency faculty, Predoctoral Director, Vice-Chair, researcher, author, and mentor. He has continued to actively practice the art of Family Medicine throughout his career in rural or inner city practices.

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FOREWORD 2
ABOUT THE AUTHOR 3
CONTRIBUTING FAMILY PHYSICIANS 4
ENDOCRINE 8
    HYPOTHYROIDISM 8
    DIABETES MELLITUS 8
HEART AND BLOOD VESSELS 12
    HIGH BLOOD PRESSURE 12
    CHOLESTEROL 13
    DETERMINING SATURATION OF DIETARY OILS 13
    PERIPHERAL VASCULAR DISEASE 14
    AORTIC STENOSIS 15
    ANEURYSM 15
    BLOOD VESSELS 15
    SED RATE 15
    MURMUR 15
    STROKE 15
    EDEMA 16
    LYMPHATIC SYSTEM 16
    ATRIAL FIBRILLATION 16
    THALLIUM STRESS TEST 16
    BLOOD THINNERS 16
    LEFT VENTRICULAR HYPERTROPHY 17
MUSCULOSKELETAL 18
    FIBROMYALGIA 18
    BACK MICE 19
    ARTHRITIS 19
    TENDONITIS 20
    IMPINGEMENT OF THE SHOULDER 20
    BACK PAIN 20
    PATELLAR SYNDROME 21
WOMEN 22
    POLYCYSTIC OVARIAN SYNDROME (PCOS) 22
    DYSFUNCTIONAL UTERINE BLEEDING/ANOVULATORY CYCLES 22
    OSTEOPOROSIS 23
    EPISIOTOMY 23
    ABNORMAL PAP SMEARS 24
    BIRTH CONTROL 24
    URGE INCONTINENCE 24
    PREGNANCY 24
MEN 25
    PROSTATE 25
    SCREENING TESTS 25

ERECTILE DYSFUNCTION 25
BEHAVIORAL 26
DEPRESSION 26
ANXIETY 29
STRESS 29
ADOLESCENT BEHAVIOR 30
ATTENTION DEFICIT HYPERACTIVITY DISORDER 30
CHILDREN FIGHTING 30
STOPPING SMOKING 30
SMOKER'S COUGH 31
TEMPER TANTRUMS 31
AUTISM 31
DOWN SYNDROME 31
ENCOPRESIS 31
HIGH RISK BEHAVIORS 32
GETTING A BABY TO SLEEP 32
GASTROINTESTINAL 33
IRRITABLE BOWEL SYNDROME 33
HEMORRHOIDS 34
HEARTBURN 34
GASTRITIS/ULCER 35
FOOD INTAKE 35
CONSTIPATION 36
GALL STONES 36
DIARRHEA 36
DIVERTICULI 36
HEAD TO CHEST 37
SINUSITIS 37
LABYRINTHITIS 37
SEROUS OTITIS/OTITIS MEDIA WITH EFFUSION 38
BRONCHITIS 38
ANTIBIOTICS IN VIRAL INFECTIONS 38
ASTHMA 39
SLEEP APNEA 39
ASPIRATION 39
COPD 39
SUBCONJUNCTIVAL HEMORRHAGE 40
ACUTE OTITIS MEDIA 40
NEURO 41
MIGRAINES 41
LUMBAR DISK DISEASE 41
BRAIN INJURY 41
ALZHEIMER'S AND DEMENTIA 42
MUSCLE TENSION 42
CLUSTER HEADACHE 42
PARKINSONS 43

SKIN 44
SEBORRHEA 44
SEBORRHEIC KERATOSES 44
POISON IVY 44
KIDNEYS 45
RENAL INSUFFICIENCY 45
PHILOSOPHY FOR OFFICE EDUCATION 46
ACKNOWLEDGEMENTS 49
FURTHER READING 50

ENDOCRINE

HYPOTHYROIDISM

- In hypothyroidism, the thyroid is being lazy, so its supervisor, the pituitary, is working too hard. Taking synthetic thyroid hormone allows the pituitary to rest.

- Draw the feedback loop from the pituitary to the thyroid to the body and back to the pituitary. The pituitary is like the thermostat and the thyroid is like the furnace.

- When we tell our children to do something, many times they will ignore us. We have a tendency to raise our voice until they move. Soon, we find ourselves screaming. This is similar to the pituitary (parent) and the thyroid (child). The pituitary is screaming at the thyroid, "more thyroid hormone".

- Thyroid Stimulating Hormone is the governor on the motor of the body.

DIABETES MELLITUS

Diabetes Mellitus is a disorder of insulin and blood sugar maintenance. There are many types of diabetes and this can be very confusing to patients and to physicians. The two main types of diabetes are Diabetes Mellitus type 1 and Diabetes Mellitus type 2. Ninety to ninety five percent of diabetes in the United States is type 2. Only a small percentage (5-10%) of patients have true type 1. There is a huge distinction between type 1 and type 2. They are two completely different diseases with totally different mechanisms. Many people confuse the two.

Type 1 diabetes is probably the easiest to understand. This type was called "juvenile onset diabetes" in the past but is not anymore because you don't have to be young or "juvenile" to get this type of diabetes. Plus, with obesity becoming an epidemic problem in the U.S., overweight young people can get type 2. Therefore, the name was a misnomer and confusing. Another name for type 1 used to be "insulin dependent diabetes". While this does describe this type of diabetes, type 2 diabetics can also be on insulin. This led to much confusion.

The simplest way to understand Type 1 Diabetes Mellitus is to realize that the pancreas in these patients does not produce insulin. It is theorized that the patient gets a viral infection and the antibody the body produces against that virus mistakes the insulin producing cells of the pancreas for the virus and destroys the insulin producing cells instead. Patients may be genetically prone to this "mistaken identity" by the antibodies. The end result is that the patient cannot produce insulin and will die if insulin is not given through some mechanism (usually an injection). This is the type of diabetes that can result in what is known as "ketoacidosis". These patients must receive insulin throughout the rest of their lives. Usually, younger persons develop this type of diabetes. However, if anyone of any age is involved in a trauma, like an automobile accident, which destroys the pancreas or has their pancreas destroyed by alcohol or other toxins,

they develop Type 1 Diabetes Mellitus immediately. Patients with Type 1 Diabetes are usually thin.

One of the problems with treating Type 1 is that the amount of insulin given daily can be regulated, but the amount of exercise (decreases the need for insulin) and the amount and type of calories ingested (increases the need for insulin) must also be regulated in order to equalize the amount of insulin given. For example, imagine someone is taking 25 units of insulin each day, which, for them, perfectly covers 2000 calories when they are only mildly active throughout the day. If that same person only takes in 1000 calories one day, they have too much insulin and may have a low blood sugar episode. If that same person takes in 3000 calories one day, they don't have enough insulin to cover that many calories. To make matters more complicated, exercise affects insulin need. If the patient above, taking 25 units each day, is used to only mild walking each day and one day plays sports or other vigorous activity all day, then they will have too much insulin that day for only 2000 calories. It is very difficult to balance the calories, insulin needed, and exercise EVERY day, especially in adolescents.

Type 2 diabetes is much more complicated. Type 2 is part of a syndrome, which also includes high blood pressure, changes in the lipids of the body (most notably low HDL cholesterol and mildly elevated triglycerides), and other changes that lead to accelerated hardening of the arteries. These patients are almost always overweight.

Type 2 patients genetically have problems with insulin RECEPTORS at the cellular level of the muscles, nerves, and other cells. This is called insulin resistance. Their pancreas produces plenty of insulin, but the body is resistant to the insulin produced. If a patient with these genes stays at ideal body weight all their life, they probably will never become diabetic. However, as they get more obese, the problem accelerates. Obesity worsens insulin resistance. The pancreas tries to compensate for this resistance by producing more insulin than would normally be necessary. Therefore, this patient produces too much insulin in order to keep the blood sugar (or glucose) in the normal range. For many years, this person's blood sugar will show up as "normal" when they have a blood sugar checked. However, this extra insulin in the bloodstream theoretically leads to higher blood pressure, changes in the lipids and the other components of what is called Syndrome X or the Insulin Resistance Syndrome or the Metabolic Syndrome. These are all names of the same process and insulin resistance (type 2 diabetes) is the cornerstone of this syndrome. The more obese one gets, the worse the syndrome becomes.

The diagnosis of diabetes may be the last diagnosis to "show up" since the body can keep the blood sugar in the "normal" range until years or decades later. On the other hand, diabetes may be the first diagnosis made with the blood pressure and lipid problems "showing up" later. Usually, however, diabetes is the last diagnosis to be made. Unfortunately, atherosclerosis (hardening of the arteries) has been going on for years before the diagnosis of diabetes type 2 is finally made. Only when the body can no longer compensate for the insulin resistance by overproducing insulin will the blood sugar be "abnormal" on laboratory analysis.

If a person does not have the genes for this problem, they can become very obese and never develop diabetes type 2. On the other hand, if they do have these genes, at a certain weight or obesity, they will begin to show the major diseases of the Insulin Resistance Syndrome. A small percentage of people do not have to be very obese to show this syndrome.

The treatment of this entire syndrome is diet and exercise. If the patient can achieve ideal body weight, many times the diabetes, the high blood pressure, and the lipid changes disappear without any medications. When a patient is unwilling or unable to lose weight, a medication is usually prescribed. The most appropriate medications are the ones that reduce insulin resistance.

These medications do not increase the amount of insulin from the pancreas but help the insulin present in the bloodstream work more efficiently. Some medication increase the amount of insulin released from the pancreas. Giving insulin by injection or other means increases the amount of insulin in the patient. If the patient is already producing too much insulin, adding even more insulin does not treat the basic problem of insulin RESISTANCE.

To complicate matters further, if a patient has this syndrome for many years, their pancreas may "burn out" and not be able to produce enough insulin. At this point, the patient becomes a type 1 diabetic or a mixture of type 1 and 2. Occasionally a patient is found who has Insulin Resistance Syndrome (type 2 diabetes) and is NOT overweight. This patient may have a combination of type 1 and type 2 diabetes. In the future, this may be designated as type 3 diabetes, but currently is still considered type 2. These patients have great difficulty controlling their blood sugars and tend to have complications much sooner than the obese type 2 diabetics.

Two other types of diabetes are worth mentioning, but are probably type 2 diabetes as well. One is called MODY or maturity onset diabetes of the young. This is probably type 2 diabetes in a child or young adolescent, who is obese. With obesity becoming more of a problem in this country, this is being seen more and more. Gestational diabetes is diabetes than develops during pregnancy. This is probably a type 2 diabetes, with the hormones of pregnancy leading to insulin resistance. Certainly these patients are at much higher risk for developing true type 2 diabetes in the future. Because there is such a short time frame during pregnancy before the baby is affected and because many of the oral medications to treat diabetes can't be used during pregnancy, if diet and exercise doesn't control this problem, insulin is used for tight control of blood sugar throughout the pregnancy.

Diet and exercise are very important for both type 1 and type 2 diabetes but for different reasons. In type 1, it is important to balance the diet and exercise with the amount of insulin given. In type 2 diabetes, diet and exercise is the major treatment and may even "cure" the patient of their diabetes. Insulin is mandatory in type 1 but is usually a treatment of last resort in type 2. In fact, patients with type 2 tend to gain even more weight when treated with insulin. This worsens the syndrome causing the patient to need even more insulin for treatment. This develops into a vicious cycle of increasing obesity and increasing need for more insulin.

One of the best ways to try to understand Diabetes Mellitus and the interaction of blood sugar and the cells is to visualize a long hallway with multiple rooms along the hallway. Each room is a muscle cell or a nerve cell or a brain cell. The energy they need to utilize to function is sugar (glucose). However, the sugar is in the hallway (the blood stream) and cannot get into the rooms (cells) until the door is unlocked. Insulin acts like a key to unlock the doors. In type 1 diabetes, there is no insulin, so the doors cannot be unlocked. In type 2 diabetes, the door itself is blocking the key from entering the keyhole. Either way, the cell (room) is starving because there is no sugar entering the room. There is a lot of sugar in the hallway, but none in the rooms. The body tries to correct this as a carpenter would, by building more hallways. This is called neovascularization or new growth of blood vessels. The problem is that these new blood vessels take up space. If that space is taken up on the retina, the person has less retinal surface with which to see. If that space is taken up on a nerve, the nerve loses function and the patient cannot feel things as well. In order to get the sugar from the hallway into the room, the door must be opened. In type 1, that means giving insulin. In type 2, that means decreasing the resistance at the door usually by decreasing the obesity or giving medications that reduce resistance. The door can be visualized as being covered with Velcro®. The insulin key also has Velcro® on it and the key gets "stuck" on the door without getting to the keyhole. As the patient gets more

obese, the door gets much bigger with more Velcro® to catch the key and keep it from the keyhole (more resistance).

- Basically, high blood sugar levels are poisonous to all parts of the body.
- Normal blood sugar can be remembered by remembering normal blood pressure: 80-120.
- People usually pay little attention to their feet, but it is mandatory that diabetics pay special attention to their feet.
- When the blood sugar is out of control, the arteries are "boiling". Long term, diabetes isn't a sugar problem, but is an artery problem.
- The process that affects arteries when the blood sugar is too high is the same process that causes browning of turkey skin in the oven. When the blood sugar is too high, the arteries are cooking. When the blood sugar is normal, it's like taking the turkey out of the oven. It doesn't reverse the damage done, but stops further damage from occurring.
- The bloodstream is like an interstate highway. No work is being done on the highway, only in the communities off the off-ramps. The fuel (blood sugar) must get off the highway and into the communities (cells). Even if the highway is busy, the communities are starving if there is no off-ramp.
- Diabetes affects every blood vessel in the body. That's why the doctor checks blood pressure, cholesterol, eyes, urine, legs, and feet.
- Diabetes is a disorder of metabolism. It affects the way the car runs.
- When there is insulin resistance, the body calls for more troops (insulin) to knock the doors down.
- A hemoglobin A1C is like the batting average of the blood sugars for the past three months.
- Having too much blood sugar is like flooding a carburetor. The energy is floating around in there but the mixture is too rich.

HEART AND BLOOD VESSELS

HIGH BLOOD PRESSURE

- There are over a dozen mechanisms the body uses to raise or lower blood pressure. A problem with any of these systems could raise blood pressure. The definition of hypertension is high blood pressure over a long period of time. The best way to think of this is to imagine that person's thermostat is set too high. Medications can help lower the thermostat but only while the person is taking the medication. Once that person stops taking the medication, the thermostat goes back up to its set point. Unfortunately, we cannot reset the thermostat. Any medication that affects any of these dozen or so mechanisms of blood pressure control will lower blood pressure. That is why so many different medications can be used to lower blood pressure.

- Normal blood pressure and normal blood sugar are the same numbers: 80-120.

- High blood pressure sneaks up on you, as you get older, like weight gain does. You gain about a pound a year and don't really notice it until much later.

- Blood pressure is like the air in a car's tires. When the blood pressure is too high, it's like over-inflating the tires. You can drive for a time like this, but it wears out the tires quicker and you could have a blow out.

- Blood pressure is simply fluid mechanics, pump versus pipes. The systolic reading is the pressure head from the pump (heart), the diastolic reading is the resistance in the pipes (arteries).

- The biggest risk factor for high blood pressure or diabetes is Dunlop disease. That's where your belly done lopped over your belt.

- We treat hypertension to decrease the pressure in the pipes. The pipes go into the brain and kidney, so decreasing the pressure in the pipes helps these organs. It also helps the heart not work so hard.

- Hypertension is a misnomer. It is not from stress or tension. A better name is high blood pressure.

- Hypertension is not a problem in the short run. People with it feel fine. The problems occur years down the road. That's why it's called the "silent killer". It's more of a risk factor for hardening of the arteries than it is a disease in and of itself.

CHOLESTEROL

- Blood is mostly water. Lipids (fats) are mostly oil and do not mix well with blood since oil and water do not mix. The lipids of the body are triglyceride or cholesterol. Therefore, cholesterol does not freely float around in the blood stream. Cholesterol has to be "coated" or put inside special spheres or boats, which can be transported in the bloodstream and moved to where the body needs it. We can actually measure and name these carriers. They are called lipoproteins and each carrier has a very specific function. The lipoprotein that carries absorbed triglycerides and cholesterol from our food and takes them to the liver is called chylomicrons. This is their only function. Very low density lipoproteins (VLDL) are the vessels that carry mostly triglycerides around the body. Cholesterol is transported by two very specialized capsules. Low density lipoproteins (LDL) carry cholesterol from the liver out into the blood stream where it can be embedded into the wall of blood vessels. These are the "bad guys" or "bad cholesterol". Cholesterol transport in the body, like everything else, is a balanced mechanism. High density lipoproteins (HDL) are the capsules that carry cholesterol from the wall of the blood vessel back to the liver for breakdown. They are like the garbage men of the cholesterol system or the "good cholesterol". Therefore, if you have a lot of LDLs and not very many HDLs, then you have your cholesterol going in the wrong direction and it will build up in the arteries. If, however, you have a lot of HDLs and not very many LDLs, then you have your cholesterol going in the right direction and won't develop hardening of the arteries.

- HDL is like Draino® for the artery. It cleans it out.

- In the bodies of young men killed in Vietnam, there was evidence of "hardening of the arteries" already starting. This needs to be treated in young people, since it could be too late by the time they reach their 50s and 60s.

- Good cholesterol is like Pac-Man, bad cholesterol is like hair that clogs the drain and gums up pipes.

- Lousy cholesterol cakes the pots and pans. Healthy cholesterol acts like Teflon® or Liquid Plumr®.

- The covering that carries cholesterol around in the blood stream is like a Tootsie-Pop® with cholesterol being the candy center.

- The lipoproteins (HDL and LDL) act like taxis to move cholesterol around in the bloodstream.

- All of the "risk factors" for heart attack are weak predictors, but cholesterol is the weakest predictor.

DETERMINING SATURATION OF DIETARY OILS

The oil in a plant acts very much like the blood in our bodies and has to be able to "flow" in all environmental conditions for the plant to survive. Saturated fats remain congealed or solid at higher temperatures than unsaturated fats. This is why butter can be solid at room temperature whereas butter substitutes that are polyunsaturated fats will melt into liquid at room temperature. Given that the oil is the "lifeblood" of the plant and saturated fats become solid more easily in colder weather than unsaturated, plants that have saturated fats as their major oil cannot survive in a temperate climate. When the weather got cold, a saturated fat oil would solidify and the plant would die. By evolution, plants with saturated fat oil never survived in colder climates and are only found growing in very warm environments. Therefore, plants that grow in environments that are warm all year round (palm oil, coconut oil) have saturated fats. Plants that grow in temperate climates where the weather gets cold can only survive with polyunsaturated oils (corn, safflower, canola). Plants with monounsaturated fats will be found growing in the intermediate regions where it is warm most of the time but can get cold weather (peanut, olive). If you can remember where the plant grows, you can make a good guess as to whether its oil is saturated, monounsaturated, or polyunsaturated.

Saturation simply refers to the bonding of the carbon atoms in the substance. If all the bonds of the carbon atoms are singularly joined to other carbons or hydrogen, this is a saturated fat. There is no place for the body to break the bonds. If there is "double" bond between carbons, the body can break down the molecule at that double bond and change it. If there is one double bond in a fat, it is called a mono (one) unsaturated fat. If there is more than one double bond, it is called a poly (many) unsaturated fat.

A polyunsaturated fat can be changed to a saturated fat by injecting hydrogen ions into the substance and breaking the double bonds. This is called hydrogenation. If only some of the double bonds are broken but not all, it is called partially hydrogenised. This can make the food product more solid at room temperature, but usually makes it a less healthy alternative. Since an animal's body can break down unsaturated fats and store them as saturated fats like human bodies do, animal fat is saturated fat. All meat has saturated fats, some animals simply have more than others. Too much "white" meat equals "red" meat.

PERIPHERAL VASCULAR DISEASE

- The blood vessels in this process are like hoses left out in the sun for a long period of time. They become stiff and brittle.

- The arteries are like pipes. If you cut into a pipe that has been in place for years, you will see build up inside the pipe. The arteries are the same way. Hypertension creates too much pressure inside the pipe tearing the inside lining. The body clots this off, but the pipe now is much narrower. Diabetes chemically tears the inside lining. Smoking is poison to the inside lining. This tearing and clotting off happens over and over until there is no flow through the pipe. This process is happening to all the arteries throughout the entire body.

- High blood pressure stretches the tubes (the arteries of the body) and creates cracks in the tubes. At the same time, "impurities of the water" like calcium and cholesterol find their way into the cracks.

AORTIC STENOSIS

Aortic stenosis is like a partially blocked sink. There is build up behind the blockage and only a part of the backup can get through at a time.

ANEURYSM

An aneurysm is like a garden hose that has a defect from being run over by a car. The defect is a weak area and the pressure inside the hose makes it "balloon" out.

BLOOD VESSELS

- The blood vessels of the body are like the plumbing in a house.
- The blood vessels in hypertension are like garden hoses. When they are new, they handle the pressure well, but later they become stiff and spring leaks.

SED RATE

The sedimentation rate and blood tests like it are similar to a fish net. The net catches all species in the area (inflammation) instead of a lure that catches a specific fish (disease). If you cast a fish net into a lake, it will catch fish (if there are any) but you can't tell what kind of fish you'll get. If you don't catch anything, there probably aren't any fish around. If you do catch some fish in the net, then you can use a specific lure to catch the specific fish present.

MURMUR

- Hearing an innocent heart murmur is like hearing water running through a hose. There's nothing wrong with the water or the hose.
- A murmur or bruit sounds like a kinked garden hose. The same amount of water and pressure is trying to get through a smaller area.

STROKE

- A stroke is like a heart attack that occurs in the brain. It's caused by the blockage of blood flow through an artery and the cells that are fed by that artery dies of starvation.

- Blockage of an artery by a clot or platelets is like a rock in a stream slowly gathering moss. The moss grows out into the stream and eventually, the force of the stream breaks off pieces of the moss and that moss gets stuck further downstream and blocks water from entering a small side stream.

EDEMA

Edema is too much water in the wrong places. We can help move the water from the legs to the kidneys by elevating the legs or using compression stockings.

LYMPHATIC SYSTEM

The lymphatic system is the drainage ditch or garbage collectors of the body to remove the infectious or waste products.

ATRIAL FIBRILLATION

The upper chambers of the heart are receptacles to collect the blood from the body. The lower chambers of the heart let the blood out into the body. The upper chamber is the foreman and starts the contraction of the heart. In atrial fibrillation, the upper chamber is not contracting, but quivering like a bowl of gelatin.

THALLIUM STRESS TEST

This test looks at how fast the arteries feed the muscles in the different areas of the heart and how fast that blood drains from that area of the heart. It is similar to the faucet filling up a bathtub. It can fill fast or slow depending on the size of the pipe leading to the faucet. If the pipe is clogged, the tub fills slowly or not at all. If the drain is clogged, the tub drains slowly or not at all. This test is not diagnostic but gives evidence that there is a problem inside the artery. An angiogram may be needed to show the anatomy inside the arteries.

BLOOD THINNERS

Taking “blood thinners” is like greasing up the red blood cells and platelets so they slide off each other instead of sticking to each other. The platelets float in the bloodstream like snowflakes.

LEFT VENTRICULAR HYPERTROPHY

When the heart is constantly pumping against high pressure, it is like trying to lift more and more weight. The muscles will get bigger. If the heart muscle gets too big, it can't pump all the blood out of the lower chamber because the extra big muscle get in the way. The muscle becomes like an old piece of rubber, no longer soft and pliable, but stiff and tough to bend. It becomes like a leather bag or a deflated balloon.

MUSCULOSKELETAL

FIBROMYALGIA

Fibromyalgia means painful areas of muscles from fibrous tissue. This is a common, but extremely frustrating problem because it cannot be proven that this actually exists. Some physicians will refuse to make this diagnosis on the grounds that it does not exist, whereas patients with chronic pain from fibromyalgia are very convinced that it does exist. The best way to think of fibromyalgia is a tear in one of the muscles and the tear heals by scar tissue or fibrous tissue. Therefore, that area of the muscle cannot contract as well as the surrounding areas of the muscle. This scar tissue can make lumps or cause local contraction of the muscle around the scar tissue, which feel like lumps. If the scar tissue happens to be across a nerve or the contraction includes a nerve, there will be chronic pain from that nerve.

Many people complain of fibromyalgia pain after accidents where there has been some tearing of the muscles. However, in the majority of people, the muscle tear heals with normal tissue and there is no chronic pain and there is no fibromyalgia. Only a small subset of people will develop the symptoms of fibromyalgia. We do not know why this is. It seems to occur more commonly in people who are not satisfied with their lives, do not like their jobs, do not want to return to work, or suffer with depression. There probably is a chemical reason that these people do not form the normal muscle tissue where other people do. This could be why fibromyalgia occurs after some muscle tears in a person but not at other times in their lives in the same person.

Unfortunately, the scar tissue cannot be removed surgically since this creates more scar tissue. Also, the scar tissue or abnormal healing has not been found when these areas have been biopsied and examined under the microscope. This is why some physicians believe this condition does not exist. Exercise, proper nutrition, a positive outlook on life, and keeping these muscle active will help with this chronic problem. Nothing gets rid of the fibromyalgia. The patient is the most important part of the treatment. If the patient will not exercise and remain active, the problem will worsen. The muscles around the scar tissue must remain active, loose, and strong so that more tearing or spasms will not occur. Stretching this scarred area gently may increase the elasticity and allow the whole muscle to function more correctly. Antidepressant medications may help change the chemical balance necessary for normal muscle growth and healing although they may not be able to overcome the body's own ability to change these chemicals through lack of motivation, lack of exercise, lack of proper sleep, a poor diet, and a negative attitude.

- Fibromyalgia seems to have many subsets. It presents differently in different people and may need different treatments. The pain seems to stay past the time of normal healing. There is a strong mind-body connection. The chemicals in and around the muscles are probably changed and exercise and medications may help to change it back toward normal.

- The pain from fibromyalgia can come from multiple sources – chronic tension in the muscles, poor posture, holding emotional tension, or poor conditioning of the muscles from lack of use or exercise. The treatment is largely up to the patient. Relaxation, stretching, brisk walking, exercising, a positive attitude, and more confidence result in stronger and less stiff muscles.

- After the patient and physician have diligently looked for the cause of pain in fibromyalgia, both have to acknowledge the work expended looking for a cause, but then shift the focus from "fixing" this to living with it. The goal becomes helping the patient to live their life better.

- The pain fibers to the brain work very well in acute pain, but become inaccurate in chronic pain. Quit searching for the specific cause of the pain and help the patient live with the current condition.

- Fibromyalgia affects the whole person, spiritually, physically, socially, and psychologically. All of these must be addressed.

BACK MICE

Some people normally have little nodules of fibrous tissue beneath the skin of the lower back. These nodules or lumps are called "back mice". These small lumps are fairly common and most people who have them never notice them. However, if a person with back mice develops low back pain, they will notice the back mice when they feel around the area that hurts. The back mice usually have nothing to do with the back pain. If they are part of the cause of the low back pain, the patient will have worse pain when these back mice are pressed. If there is no increase in pain when pressure is applied to the back mice, then they are probably not the cause of the pain and do not necessarily need to be removed.

ARTHRITIS

- People can have a "touch" of arthritis. In fact, the majority of us will get this as we get older. This doesn't mean that it will go anywhere else or get a lot worse.

- Morning stiffness is inflammation "setting up" overnight, like lake ice forming on a still winter night.

- Osteoarthritis or degenerative joint disease is simply wear and tear on the joints over years. A cycle develops. There is pain in the joint, so you try not to move the joint. Without movement,

the muscles that move the joint weaken. With weakened muscles, there is more stress on the joint. With more stress on the joint, there is more pain. Keep moving and exercising.

- Osteoarthritis is helped as much by exercise and weight loss as by any medication.

- Next time you're eating chicken, look at the bones of the drumstick and wings. There is gristle between the bones. In arthritis, there is a lot less gristle between the bones at the joint from the pounding the joints have taken over years. The bones can actually touch without gristle in between. To help symptoms, try to strengthen the muscles that control the joint and do full range of motion exercises of that joint without doing any further pounding.

- The body's joints are like a tractor in a field. If it is used everyday, it works fine. If it just sits in the field, it will rust up.

- The cartilage in a joint is like a shock absorber. When the cartilage is thin and worn out, the bones have to absorb the shock. Over years, repetitive shock wears on the joints. Even a minor incident can be the "straw that broke the camel's back" and pain can begin.

TENDONITIS

- The inflammation of tendonitis is similar to scratching your skin. The skin gets red and irritated. This is what is happening to the muscles and tendons.

- Tendons slide through a sheath like an arm slides through a sleeve. This back and forth movement can cause friction and if irritated, can cause pain. Inflammation is like sand along the sleeve, which causes more irritation.

- There must be a specific amount of inflammation before pain will begin. The anti-inflammatory medications knock the inflammation down, but don't get rid of it completely. When a person stops taking the medication, the inflammation rises back up to the pain level again. One needs about three weeks of medication to get rid of all the inflammation.

IMPINGEMENT OF THE SHOULDER

- This can be demonstrated well using a fist as the humeral head. The fist is then placed into the opposite palm (shoulder socket). The knuckles represent the pinching tuberosities.

- Weak muscles suck the bone into the joint and make the problem worse. Strong muscles push the bone out of the joint. Exercise the muscles and make them strong.

BACK PAIN

- Get down on the floor and demonstrate the exercises you want the patient to perform. They can see the stretch and the proper form. This also stresses how important the exercises are.

- Draw two blocks. When the blocks are on top of each other, everything is OK. When a block is off to the side, the pad in between is squeezed and problems occur. Show the abdominal muscles as the muscles that keep the blocks where they're supposed to be.

- Most back pain is muscular in origin. The muscles become flabby and deteriorate if you just lie in bed.

PATELLAR SYNDROME

The action and anatomy of the kneecap on the femur can be simulated using the knuckle of the right forefinger as the patella and the knuckles of the left fist between the forefinger and the middle finger as the ends of the femur. Place the knuckle of the right forefinger between the knuckles of the left forefinger and middle fingers to show the movement and position of the patella.

WOMEN

POLYCYSTIC OVARIAN SYNDROME (PCOS)

Polycystic Ovarian Syndrome (many cysts on the ovaries) or Stein-Leventhal Syndrome was originally described in very overweight, hirsute (hairy all over), and infertile (unable to conceive) women. We now know that there are much milder forms of this process. Classically, the lining that covers the ovaries was very thick and the eggs could not escape from the ovaries but instead were trapped by the thick coating and became little cysts in the tough outer layer. Over time, many cysts formed on both ovaries. Of course, these women could not conceive and had very irregular menstrual periods if they had any at all. At one time, surgeons would make a wedge shaped resection of the tough lining, which allowed eggs to escape so these women could conceive and have regular menstrual periods. Unfortunately, this area could scar back down and the problem would recur. Later, surgeons used a laser to punch multiple holes in the tough lining allowing eggs to escape. Again, scarring could overcome this procedure over time. We now know that there is more than this one classic presentation of this process. There are multiple variations and very mild versions can occur in patients. Patients don't have to be obese or hairy or infertile. PCOS commonly occurs with or precludes Syndrome X (Insulin Resistance Syndrome, Metabolic Syndrome), which culminates in Diabetes Mellitus type 2, high blood pressure, high triglycerides, low HDL cholesterol and accelerated atherosclerosis. As patients become obese or more obese, the problem worsens.

DYSFUNCTIONAL UTERINE BLEEDING/ANOVULATORY CYCLES

- The simplest way to view anovulatory cycles is to try to understand the function of the hormones, which regulate the female cycle. Estrogen is produced in the first part of the cycle, which causes the lining of the uterus to grow. Then progesterone is produced in the second part of the cycle, which causes the uterine lining to soften and get ready for a fertilized egg to implant. Once the progesterone stops being produced, the uterus sheds its lining and a menstrual flow begins. It is best to think of the egg leaving the ovary as the event that causes the estrogen to decrease and the progesterone to increase. If the egg cannot escape from the ovary (an egg is not produced or an egg gets trapped by the lining of the ovary and produces an ovarian cyst), then an anovulatory cycle results, meaning that no egg was released. The estrogen is not shut down and the progesterone does not increase. Therefore the inside lining of the uterus continues to grow from the continued stimulus of estrogen. The lining grows until the blood supply can no longer keep up with the new growth and part of the lining sloughs off. This usually takes about 6

weeks. So, a menstrual period is missed and spotting occurs about two weeks after the missed menstrual period. Then the lining continues to grow and the same event happens again about two weeks later. Once an egg is produced, the entire cycle reverts back to normal. Many times physicians give their patients progesterone for 10 days to try to convert the body back into its normal cycle and to get the uterus to shed its entire lining.

- Estrogen is like fertilizer on a lawn to help it grow and flourish. Progesterone is like a lawn mower to cut the grass back to its original size. If no progesterone is part of the cycle, the grass continues to grow.

- The lining of the uterus is like a brick wall with estrogen being the bricks and progesterone being the mortar. If there is not enough mortar, the wall falls down.

- The effect of hormones on the uterus is similar to the effect of fertilizer when growing tomatoes. The fertilizer used early has nitrogen to help the plant grow (estrogen). The fertilizer used later contains phosphorus, which helps the plant to flower and bear fruit (progesterone).

OSTEOPOROSIS

- Check pictures of aunts and grandmothers looking for dowager humps to help determine who needs extra prevention.

- The bones are like brick walls. The body has bricklayers and brick removers constantly working. After menopause, there are more brick removers than bricklayers and there are fewer bricks (calcium). Eventually, there are breaks in the wall that can't be repaired so the wall has to be lowered. Some of the medications act as stronger mortar so the remaining bricks stick together better.

- Medications like Fosimax® are the mason, calcium is the bricks, and vitamin D is the mortar. You need all three to build a wall.

- Normal bone looks like American cheese whereas osteoporosis bone looks like Swiss cheese. It doesn't bounce as well and it breaks easily.

- Women are living longer these days, so osteoporosis has a longer time to take effect. Prevention is key.

EPISIOTOMY

To demonstrate that an episiotomy is usually not necessary, draw a star on a paper towel to represent the perineum. Stretch the towel and show that it doesn't tear. Then make a small cut at the top of the towel and stretch the towel again. This shows that the same force easily tears the towel starting at the small cut (episiotomy).

ABNORMAL PAP SMEARS

- "Bad" human papilloma virus (HPV) types tend to invade deeply into the cervix, which gives a report on the PAP smear of high-grade dysplasia. This needs to be cut out deeply. Not so bad HPV types don't go very deep and can be removed by superficial freezing.

- An abnormal PAP does not mean cancer. The degree of abnormality is like a gas gauge with normal on one end and cancer at the other. Another way to look at this is a scale of 1-5 with 5 being cancer and 1 being normal. The current report lies in between.

- The cervix is like a doughnut. The virus is like icing on that doughnut. Over time, the icing soaks into the doughnut. The virus makes the cells go crazy and multiply faster.

BIRTH CONTROL

- The pills and the long acting shot work by taking over your cycle and not allowing an egg to get loose.

- Depo thins out the lining of the uterus, making it fragile and giving unpredictable spotting.

URGE INCONTINENCE

In urge incontinence, the brain no longer fully controls the bladder and people have "accidents". The signals from the bladder to the brain function better than the signals back down from the brain to stop urination. Frequent, scheduled urination helps "train" the bladder so you don't get caught off guard.

PREGNANCY

- Pregnancy is an act of faith. No one can guarantee a good outcome just like no one can guarantee that when the child becomes 14, they won't grab the car keys and run away. Nothing in a child's life and development can be guaranteed.

- After the child is born, it is sometimes necessary to assign dating to mom and dad. They have a tendency to forget each other's needs as they focus on the child.

MEN

PROSTATE

- The prostate gland is like an apple. You can't tell what's inside until you cut it open. You can feel the outside, but you can't feel the inside.

- Draw a 10 by 10 grid using little men and show how many men fit into each category.

- Describe two types of people and find out which is most like the patient. One person feels good and is not certain that more good can be done than bad. That person wants to be left alone. The other person is afraid of cancer and wants something done if there's any possibility that it might help. Screen that person.

SCREENING TESTS

- When a patient is reluctant to have screening tests done, explain the analogy of oil changes. If the car is running well with no known problems, does that mean you never have to check the oil to see if its low, or change the oil periodically? If the oil runs dry, the first symptom could be destruction of the engine.

- If you had a car under warranty, you wouldn't be hesitant to do preventive maintenance. Preventive screening is like keeping the body under warranty.

ERECTILE DYSFUNCTION

When a man is keeping score like sex is a competition, he puts pressure to perform on himself. This by itself can lead to erectile dysfunction or make it much worse.

BEHAVIORAL

DEPRESSION

There are multiple theories as to why depression occurs, why it runs in certain families, why it is recurrent, and what are the best treatments. The reason this is so poorly understood is probably because there are multiple reasons for depression including genetics, environment, stress, and biochemistry.

Every area of the brain uses electronic impulses to perform its functions. These electrical impulses are derived from chemical reactions. Each area of the brain uses a different chemical in order to create these electronic impulses. If not for different chemicals in different areas, the impulses would be confused and the brain would not function correctly. For example, if you want to move your left little finger, there is an area in the right side of the brain which creates a chemical reaction which creates an electronic impulse which crosses over and travels down the spinal cord out the arm to the muscles of the finger and causes the finger to move. If this chemical were not different from the other areas of the brain, the body would simply quiver instead of a specific area moving. We have determined what area of the brain controls emotions and the area for depression. This is called the limbic system. It can actually be dissected out of the brain, a true, finite entity. The chemical used in the limbic system is serotonin or norepinephrine. In some cases, both.

The body can only manufacture a certain amount of this chemical on a daily basis. When a person is under stress, that person is using up a lot of this chemical. If that person is under enough stress for a long enough period of time, they lose more than the body is able to replace and become depressed. The best way to picture this is to imagine a sink or reservoir that has a faucet coming into it and a drain coming out of it. If there is no open drain, the faucet can fill up the sink. The body's production of serotonin or norepinephrine is the faucet. Stress opens the drain.

When the body uses up its reserves or reservoir, there is a drought situation and the patient displays certain symptoms. Physicians can see those symptoms and can make the diagnosis. The limbic system controls appetite (depressed people either eat too much or don't eat much at all), sleep patterns (depressed people tend to sleep a lot or can't sleep much at all – a classic symptom is waking up early in the morning and being unable to get back to sleep), feelings of self worth (depressed people feel that they are worthless and feel guilty), motivation (depressed people lack motivation to do anything and feel tired all the time), mood (depressed people cry easily, feel sad, and react blandly to almost everything), and sex drive (depressed people have little sex drive). These symptoms are not unique to depression and physicians need to determine if other problems are causing these symptoms.

The reason that people from some families seem to go into depression easily can be argued. It certainly could be genetic since the genes would determine the size of the reservoir or sink. Persons with a small sink would quickly go into a depression whereas persons with a very

large reservoir would need more stress over more time to show a depression. The environment in which we are raised also helps to determine how fast the drain of the reservoir works. We are positively or negatively reinforced to behave in certain ways as children and we learn to use certain defense mechanisms over other defense mechanisms. For example, laughter may be a good defense mechanism whereas crying in some families is frowned upon and not allowed. Therefore, whenever a child cries, they are negatively reinforced for this behavior and may never learn to appropriately cry. If their defense mechanism is laughter and they are placed in a situation where laughter is inappropriate (eg: death of a loved one), their defense mechanism may be overwhelmed. This would open the drain. Therefore, there is a combination of genetics and environment in this condition, both mediated through chemicals.

Patients may be prescribed antidepressant medications. These usually affect the breakdown of serotonin or norepinephrine (or both) and allow more of the chemical to remain in the limbic system. This is like adding another faucet or opening the faucet further. Unfortunately, if the drain is more than the combination of the body's ability to make new chemicals and the ability of the medication to add additional chemicals or stop the breakdown of the chemicals already there, the depression will continue or even worsen.

If nothing is done about the drain, depression will recur once the medication is stopped. Counseling is sometimes indicated. Counseling is not "magic". A simple way to view counseling is to see the counselor as someone who can help the patient learn and use other defense mechanisms. Their own defense mechanisms are being overwhelmed, so the patient needs permission or training to use other defense mechanisms. This helps close the drain. If the drain is slowed at the same time a second faucet is added, the patient comes out of the depression quicker and stays out of it longer.

- Depression is a function of serotonin in the brain. This is a naturally occurring chemical. The body sometimes needs help to supplement the functioning of this natural chemical. The medications help to utilize the naturally occurring chemical already in the brain. This is very similar to supplementing a low functioning thyroid with thyroid hormone.

- Depression can be viewed as an imbalance of chemicals in the brain. The medications simply help to balance these chemicals.

- Depression is a chemical illness similar to diabetes. A person can't "will it away" just like they couldn't "will away" diabetes. Patients with diabetes may need insulin and patients with depression may need medications. Medications can help, but just like diabetes, the person has to change their behaviors to completely control it.

- Taking medications for depression will not change your situation. Everything is still tough. You will still have the same problems and troubles to deal with. However, it could be like the difference between a rainy, cold, lousy day and a beautiful, sunny day. You feel like you can handle everything better and things don't weigh as heavily on you.

- The messages in the brain are passed along from nerve to nerve, but depend on the right balance of chemicals in the spaces between the nerves for the message to be sent correctly. This is like a small engine needing the right mixture of gasoline and oil to function properly. It is similar to a

party game, where people in a circle whisper a message to the next person. By the time the message gets all the way back to the original person, the message has been changed a lot. The messages related to sleep, appetite, enjoyment, and concentration get changed from the "real" message to a "depressed" message by the chemical imbalance between the nerves. Medication helps to restore this chemical balance. They help the patient return to who they are, not someone else.

- Antidepressant medications are like using a crutch with a sprained ankle or knee. They won't cure you, but will help until the healing process completes. Some people don't mind using a crutch, but they do mind taking antidepressant medications. They work the same way.

- Counseling is many times needed for depression. It's like being stuck in the mud, lost in the woods, in a fog. Medications can work like sand under the tires, but you're still lost in the fog.

- Depression is like a valley. Medications are like a bridge across the valley, but we don't know how wide the valley is. If one stops taking the medication too soon, they will fall off the bridge back down into the valley.

- Antidepressants are like hormone supplements. Counseling is simply having someone to talk to.

- Giving antidepressants to someone with depression is like giving iron to someone with anemia. It has to build up over time and only a certain amount can be absorbed everyday.

- If we could scan brains, depression would look distinctly different from normal.

- Depression is like a very cold room. Medications can act like a sweater, but sooner or later you have to close the window (counseling).

- A therapist is like a coach. They don't play the game, they give observations and suggestions.

- Depression is a chemical imbalance like diabetes is a chemical imbalance. Unfortunately, we can't measure the chemicals like we can blood sugar, so we monitor symptoms instead of blood.

- Although the patient doesn't feel very deserving, they deserve to get better. They deserve help and treatment.

- In depression, the different chemicals seem to affect different symptoms. The chemicals overlap in this condition. Dopamine seems to affect pleasure, serotonin affects anxiety, and norepinephrine affects energy. This may explain why some patients don't respond to certain medications. Pick the medications to deal with the worst symptoms.

- Depression is like the garbage disposal or the washing machine being stuck from being off balance. Medications hit the reset button.

- Unlike an electric cord, brain cells don't connect. There is a gap between cells and the gap is filled with chemicals. The chemicals breech the gap so the current can go from one cell to the

next. Depression lessens these chemicals or results from a lessening in these chemicals. Medications increase the chemicals.

ANXIETY

- The best way to think of anxiety attacks and anxiety symptoms is to visualize the "fight or flight response" that is innate in the human body. When the body considers itself under attack, it releases hormones and enzymes such as epinephrine and the body gets ready to run or fight. In anxiety disorders, the person really can't identify the stimulus that is "attacking" them and this "fight or flight" response is turned on constantly. This is very confusing to the body and many symptoms develop. If one thinks of the human body along evolutionary lines, the responses make perfect sense. During "fight or flight", the heart rate increases delivering more blood to the vital organs such as the heart, brain, and kidneys. Respiration increases delivering more oxygen to the blood. Blood is shunted away from the extremities and gut toward the vital organs. If one receives a wound to the extremities, this decreased blood flow decreases the chances of dying from this type of wound. Acid is increased in the stomach to kill bacteria in the gut and the gut tries to evacuate any stool and bacteria currently in the system. If one receives a wound to the gut, there is less chance of dying from that wound. When this response system is never turned off, the body gets confused. There is an increased acid production leading to heartburn or ulcers. The body is trying to get rid of stool so the patient gets diarrhea, then later alternating bouts of diarrhea with constipation. Breathing is faster so the patient feels lightheaded, tingling around the mouth, dry mouth, and tingling of the fingers and toes. The heart rate increase gives them symptoms of "skipped beats" and "racing heart". The blood shunted away from the extremities makes the hands and feet feel cold. All of these symptoms make sense when one understands what the body does during this "fight or flight" response, which is never turned off. If the person can determine and deal with that which is making them worried or alarmed, the symptoms can be resolved. If the person can never determine the cause of their chronic concern, then the problem simply continues.

- Panic attacks are like "false alarms", repeatedly.

STRESS

- Stress is the difference between how life is and the way you want it to be. This difference leads to symptoms. Use the things you can control to change life to being closer to the way you want it to be.

- Stress is like a pressure cooker. If everything is kept bottled up, eventually there will be an explosion or a crack in the system.

- When trying to sleep at night, "download" your problems to a disk and pick them up in the morning or put them on your hard drive and out of RAM by writing them down and making plans for them for the next day. Then go back to bed.

- We all have different buckets. The size may change at different times in our lives. Stress fills the bucket until it overflows. Love, exercise, and sleep are all spigots that help keep the bucket from overflowing.

ADOLESCENT BEHAVIOR

- There is no reason to feel guilty about telling your children to stop behaviors that you wouldn't tolerate from friends or strangers in public places.

- Sooner or later, in an adolescent's life, the parent will feel like they just want to kill the kid – don't.

ATTENTION DEFICIT HYPERACTIVITY DISORDER

- Show the parent a card with a big C on it. Explain that in a crowded restaurant, people can rotate the C to let in conversations they want through the open end and block out conversations they don't want. The ADHD child has no C and all things going on compete for their attention.

- Medications like Ritalin® are like eyeglasses. If you aren't wearing your glasses, you can't focus. Medication is like glasses for people with ADHD, and helps them focus.

- The hunter/farmer analogy – in evolution, ADHD would be beneficial since the hunter would be versatile, always on the move, and aware of all the sounds of the woods. Then the farmers took over and wrote the social rules, which left the ADHD person out of favor.

CHILDREN FIGHTING

If children are fighting in your presence, give them a distasteful chore to do each time it happens. They will learn to quit fighting (at least in your presence).

STOPPING SMOKING

- Trying to stop smoking is like warming up for an Olympic race. You stretch. You get in and out of the starting blocks. Sometimes, even when you are ready, there is a false start.

- Quitting is not the hard part, not lighting up is.

- Medications will not make you quit. You have to really want to quit. Smoking is a three-pronged addiction – physical (nicotine addiction), psychological (stress reliever, calming), and sociological (need is strong when doing specific actions like being at a bar or after the evening meal). Medication can help with the physical, but behaviors have to be changed.

SMOKER'S COUGH

Smoking paralyzes the muco-ciliary elevator that moves mucous up and out of the lungs. That is why smokers have a productive cough in the morning (system is trying to function normally) but the productive cough stops after that first cigarette (system paralyzed again). This is also why many smokers develop a productive cough after they quit smoking (the system is trying to clear itself out).

TEMPER TANTRUMS

Temper tantrums are learned behaviors. They are no fun without an audience. When a child throws a temper tantrum, get up and leave the room. The child will probably follow you and pick up where they left off. Leave again. The behavior will not continue if you aren't there to observe it.

AUTISM

Autism is a sensory intake problem. Having autism is like riding on a twisty, fast roller coaster blindfolded while people are screaming at the top of their voices – everyday.

DOWN SYNDROME

Patients with Down syndrome usually have imaginary friends. They are similar to young children. When they are disciplined, many times they will line up their dolls and discipline them too. They are not always on the same cognitive and intellectual level at the same time. They rarely need psychotropic medications.

ENCOPRESIS

Children are retaining stool and not into the routine of defecation. The rectum is stretched, the sphincter is weakened, and there is decreased sensation to tell the child the stool is there. First, get rid of the stool that's there. Don't blame the child or the parent. Use enemas to get rid of the plug at the bottom, then stimulate the bowel while a re-learning process takes place. Grease the skids to prevent more build up. Lastly, practice regularity.

HIGH RISK BEHAVIORS

It is sometimes better to have the patient come to their own realization of the consequences of their high-risk sexual behaviors. Ask yes or no questions. "Do you want to get HIV infection?" "Do you want to become pregnant?" "Do you want to get a sexually transmitted disease?" Follow up with an observation. "What you are currently doing is how people get these problems. Since you continue to do this and you don't take precautions, it appears that you want the results."

GETTING A BABY TO SLEEP

There is a process called "Ferberizing" that can help a 6 month to one year old baby learn to go to sleep without crying or without a parent in the room with them. Put the baby in bed while they are still awake and leave the room. If the baby screams, wait 5 minutes then go back in the room to touch and soothe the baby. Then leave the room again. Stretch the waiting times to seven minutes, then nine minutes, then eleven minutes. After 2 or 3 nights of this, the baby will learn to go to sleep on their own. They are learning independence and the parent is giving them a true gift of being somewhat on their own.

GASTROINTESTINAL

IRRITABLE BOWEL SYNDROME

- This is another chronic problem for which no one has determined the true cause. Irritable bowel syndrome is not a true disease but is a variation of normal responses. No one knows why certain people are more sensitive to distention or contractions of the gut. Patients with irritable bowel will have spasms and bloating sensations, alternating diarrhea with constipation, extra mucous on the stool, and symptoms of an "overactive" gut. Studies, however, have shown that these patients' intestines hold the some amount of air or gas as normal people (those without symptoms) but "feel" any distention of the intestine much sooner. Anything that causes distention or spasms will cause symptoms in these affected people. Stress causes symptoms. Certain foods that create gas in the intestines will cause symptoms to worsen. Each person reacts differently to different foods so this varies among individuals. Studies have shown that the time from eating food to discarding the remnants of that food are the same in person with irritable bowel as persons without it. Therefore, there is no specific lesion or test to help a physician diagnose this problem. It is usually a "diagnosis of exclusion" after making sure the patient doesn't have any other problem that can give these same symptoms. Medications that can help raise pain threshold (the point at which the brain acknowledges pain) is useful. This is one way the antidepressants are thought to work.

- The diarrhea and constipation of IBS seems reversed to most people. It is easier to understand if one realizes that the bowel moves food along regularly. If the bowel isn't contracting, the food slides through and actually gives diarrhea. If the bowel is "twitchy", the food can't get through and constipation results.

- IBS is like blowing up a long thin balloon. If you squeeze in one area, it will puff out elsewhere.

- Irritable Bowel Syndrome is a great example of the body-mind connection. It is the way some minds express their reaction to stress. The gut is where stress seems to "settle".

- There is no known cause for irritable bowel syndrome, but patients can take control of their fate instead of being victims of it.

HEMORRHOIDS

Hemorrhoids are really varicose veins of the butt. There is a series of veins that are positioned around and inside the anus. When these veins become enlarged and engorged, a person can have symptoms of itching or pain. If they pass a hard stool or large stool, the top of one of these veins can be torn leading to bright red blood on the stool, on the toilet paper, and in the toilet bowl. Most women who have had children have hemorrhoids or the remnants of hemorrhoids because they had a large mass above the anus that acted like a tourniquet and pushed the blood flow to the lower part of the body. Then, during delivery, they pushed very hard and prolonged which also acted like a tourniquet, which distended these veins. An extremely common cause of hemorrhoids is the great American diet. This diet is lacking in fiber because our grains have been milled which takes out most of the fiber. We have a tendency not to eat as many fruits, vegetables, and whole grains as we should and only have about 1/3 of the fiber we should have in our diet. In cultures and countries with very high fiber diets, hemorrhoids are rare as is appendicitis, gall bladder disease, colon cancer, diverticulitis, and constipation. The constant straining to produce bowel movements acts like a tourniquet and, over time, dilates those veins. The long-term treatment of hemorrhoids is dietary change. Fiber must be increased. Fresh fruits and vegetables, salads, whole wheat breads and pastas, bran cereals, and other high fiber foods are needed daily. If this does not give enough fiber, people may use oat bran sprinkles, wheat bran sprinkles, or medications that add fiber. The goal is a soft stool and no straining.

HEARTBURN

- The esophagus is simply a muscular tube that transfers food from the mouth to the stomach. There are no digestive enzymes secreted by the esophagus. The stomach produces acid, but it is designed to withstand this acid. The esophagus is not designed to withstand acid and isn't supposed to be exposed to stomach acid. The "valve" between the esophagus and the stomach is really just a pressure differential, which can fail. Many times pregnant women have symptoms of acid reflux because there is a growing mass pressing on the stomach increasing the pressure on the stomach and overcoming the pressure differential into the esophagus. The same thing happens in obese individuals. Alcohol, caffeine, and tobacco all reduce the pressure at the junction of the stomach and esophagus allowing for more reflux. Once the acid splashes back up into the esophagus (reflux), it burns. The acid can actually splash all the way back up into the mouth or be breathed in toward the lungs. This can cause a sour taste in the mouth, hoarseness, or a chronic cough. Over time the acid can cause ulcers in the esophagus, a narrowing or scarring of the esophagus, and even cancer of the esophagus. The esophagus only has one defense mechanism, to squeeze the acid back down into the stomach. If different areas of the esophagus squeeze at the same time, there is a "bubble" that forms between the two contracted areas. Persons can experience this as a squeezing mid-chest pain that is similar to the pain of a heart attack. Many people are admitted to the hospital with this type of pain to make sure they didn't have a heart attack. Nitroglycerine relaxes the smooth muscles of arteries, allowing for more blood flow and decreasing the pain of angina. Since the esophagus is smooth muscle, it also relaxes and the pain can go away. This can really confuse the issue of heart pain versus esophagus pain. The treatment of reflux is to neutralize the stomach acid so that the solution splashing up into the esophagus is more like water. Antacids can help neutralize acid already

formed and other medications can reduce the amount of acid being produced. Surgery can rebuild the valve between the esophagus and the stomach. Symptoms are usually worse at night. Gravity helps keep the acid in the stomach when one is standing. When the person lies down, there is a straight shot up the esophagus. Elevating the head of the bed can bring gravity back into helping, but bending at the waist increases pressure on the stomach, which increases reflux. Therefore, the head of the bed can't be raised if it causes bending at the waist.

- There are positive aspects of stomach acid. It helps sterilize food and absorb nutrients. If not absolutely necessary, don't take medications that shut down this acid production.

- The irritation of the esophagus is like the irritation you can see when you fall down and scrape your skin. The trick is to decrease or neutralize the acid and let the body heal itself.

- The sphincter between the stomach and the esophagus is like your fist. If you cough into your fist and keep the fist tightly clenched, no air gets through to the other side. If you relax your fist and cough into it, you can feel some air getting through. If the air were acid, you can see where it would go.

GASTRITIS/ULCER

The difference between gastritis and an ulcer can be demonstrated using the skin as a proxy. If the surface of the skin is scratched or scraped, that is like gastritis. If there is a deeper hole in the skin, that is like an ulcer. Imagine dropping acid on the skin. At first, the skin would turn red and angry looking. If the acid continues, sooner or later it will eat a hole in the skin.

FOOD INTAKE

- The digestive track is the longest organ of the body and stokes the body's engine. Inadequate or improper fuel makes the engine function poorly. This is of paramount importance in the elderly.

- Breakfast keeps the fire in the furnace stoked.

- Don't believe in diets. Diets connote something that ends. Weight loss must be a life style change for the rest of your life. Otherwise, the weight will come right back when you finally stop the "diet" and you will experience a yo-yo effect of weight loss and regain.

- You can sit down at the table and eat more in five minutes than you can work off in a day. Add multiple five-minute feedings each day and weight gain is inevitable.

- Drinking fruit juice or soft drinks at a rate of five glasses per day adds 1000 calories per day. Drink water instead.

- To lose one pound in a week, your body has to use up 500 more calories than it takes it, every day. One pound = 3500 calories. Mild to moderate exercise is at least 30 minutes each day. This can be broken up into smaller time increments.

- As we get older, our bodies become wiser with experience and use food more efficiently. We have to eat less than when we were younger or we will gain weight.

- Each person's body in weight loss is like a thermostat with different set points. Sometimes people have difficulty losing more weight after getting to a stable weight. Their "thermostat" is stuck and needs a kick to get it started again. They may need to eat very few calories for a few days (500-800 calories/day) and then start eating sensibly (1200-1500 calories/day) again until the next "set point". They may have to repeat this process periodically.

CONSTIPATION

For eons, we were hunter/gatherers. We walked a ton, drank only water, and meat was tricky. We ate a diversity of fruits, nuts, grains, and roots. Constipation is related to our lack of water, high fat diet, lots of meats, and lack of exercise.

GALL STONES

The biliary system is like a system of plumbing. A stone anywhere in the system backs up the entire system. This is why the liver and the pancreas can be affected when there is a gall stone in the biliary duct system.

DIARRHEA

One of the treatments of diarrhea is to add bulk. The gut needs to slow down so water can be absorbed and not just passed on through. The gut needs something to grab onto so it can slow down. This is similar to threading elastic through the waistband of a garment. It is difficult to thread when there is nothing to grab onto. If you place a safety pin on the elastic first, it is much easier to thread.

DIVERTICULI

A diverticulum in the colon looks like the "out-pouching" on a tire, viewed from the inside. It can also be likened to a snake that has just eaten a mouse and you can see the "puffing" out of the snake's body by the swallowed mouse.

HEAD TO CHEST

SINUSITIS

- Many people have airborne allergies. If they have symptoms all year long, this is called perennial allergies. If they have symptoms only when certain things are in the air, this is called seasonal allergies. When the symptoms of allergies flare, many people think they have developed a sinus infection or sinusitis. Sinusitis is simply inflammation of the lining of the air sacs (sinuses) in the head. This does not mean infection. The sinuses are lined with mucous producing membranes and the mucous drains into the nose. When the nose is "stuffed up", the drainage ports of the sinuses (about the size of the lead of a mechanical pencil) close off. The sinuses continue to produce mucous but it can't drain into the nose. This produces congestion and pressure in the sinuses that can be felt in the cheeks, the nose, between the eyes, or above the eyes. This still does not mean infection. The most common cause of this sinus congestion is allergies followed by the common cold. Rarely do the sinuses truly become infected with bacteria. If there is no relief of this congestion, bacteria can grow in the mucous of the sinuses and then cause an infection. This usually takes 7-10 days. The best treatment is to "drain" the sinuses by decreasing the congestion of the nose and allowing normal sinus drainage. This does not mean antibiotics. Clues to when antibiotics might be necessary include one sided cheek pain that radiates down into the tooth, a process that has been going on longer than 10 days, or a "cold" that was getting better then suddenly worsened. Even if antibiotics are used, drainage is still necessary. The most commonly used medication to help the sinuses drain is an oral decongestant. The only one on the market currently is pseudoephedrine. Most of the over the counter and trade name medications for colds are an antihistamine plus pseudoephedrine. The antihistamine is usually not necessary unless one is trying to prevent the symptoms of airborne allergies. Nasal decongestants don't work as well since they do not get high enough up the nose to open all the sinus drainage ports. People can get "hooked" on nasal decongestants if used for more than 4 days. Just because a medication is available without a prescription does not mean that it is perfectly safe. Another means of decongesting the nose is flushing with saltwater solutions.

- Mucous production is how the sinuses and lungs keep themselves clean. Therefore, good hydration is important when there is a problem with either.

LABYRINTHITIS

There are two major balance mechanisms in the body - the cerebellum, which sits in the back part of the brain, and the inner ear. The inner ear functions using 3 semicircular canals, which

contain fluid that flows against hair follicles. This tells the brain where the head is positioned in space. These canals work similarly to a carpenter's level. When the head is tipped in a certain direction, gravity pulls the fluid down and the brain recognizes how the head is tipped. By having three canals, all in different planes of orientation, a specific canal comes into control depending upon the position of the head. These canals are also called the labyrinth of the ear. With labyrinthitis, a viral infection has caused the fluid in one or more of these canals to become thickened and more gel-like. When the head is tilted to bring that canal into function, the fluid does not flow like it should, but instead "clunks" all at once. This sends multiple discharges to the brain and the patient gets the feeling of dizziness. It is similar to when, as a child, you would spin around in circles very quickly and then stop. The fluid inside the canals would "slosh" back and forth sending multiple impulses to the brain and you would feel very dizzy. Unfortunately, there is little that can be done about the viral infection. It usually runs its course and goes away on its own. The dizziness can last much longer than the viral infection. Other problems can affect the inner ear and give a similar type of dizziness.

SEROUS OTITIS/OTITIS MEDIA WITH EFFUSION

- Serous otitis (effusion) can be viewed like a dam in a river. The eardrum acts as the dam and fluid builds up behind this wall so that a "lake" forms in the middle ear.

- Bacteria can breed in middle ear fluid like a stagnant pond.

- The middle ear is like a box and we can only see into it through a window on one side of the box. On the other side of the box is the drainage tube (Eustachian tube). If this tube is blocked, there is no way to change the pressure inside the box when the outside pressure changes.

BRONCHITIS

The bronchial tubes are like an upside down tree. In bronchitis, the infection is in the trunk, not out in the leaves. With pneumonia, the infection is out in the leaves.

ANTIBIOTICS IN VIRAL INFECTIONS

Antibiotics kill susceptible bacteria, but do nothing to viruses. In fact, when antibiotics are given to someone with a viral illness, only bad things can happen. The antibiotics will kill the usual bacteria that are in our bodies and the only bacteria that can survive and grow are the ones that are resistant to the antibiotic. Then, if that same antibiotic is used again, it won't have any effect on the resistant bacteria. If enough people in an area are using that antibiotic, then the resistant bacteria will become the dominant form of bacteria in that region. This can cause a huge problem in a community or even a country. Also, people can have bad reactions to antibiotics. Don't take antibiotics for viral illnesses.

ASTHMA

- Imagine muscle cramps all along the breathing tubes. This squeezes the breathing tubes down and makes it harder to get air in or out.
- Viral infections many times trigger an asthma attack. It is like a domino effect where one tips over the other.
- In an acute asthma attack, the airways become smaller pipes, but they're the only things you can breathe through. You can simulate this by breathing through your almost closed fist.
- There are two types of medications for treating asthma, controllers and relievers. Controllers are taken everyday whether there is a problem or not and relievers are only taken when there is a problem. It is like the lungs could be on fire. The controllers are the smoke alarms on duty all the time. The relievers are like calling the fire department.
- When a chronic inhaler is needed, write on the prescription "two puffs twice a day whether you need it or not".
- Asthma is like a campfire with both glowing coal (inflammation) and flames (wheezing). The "rescue" medication is like using a squirt bottle on the campfire. It will put out the flames, but not the glowing coals, which will inevitably burst back into flames at some point. The steroid inhaler or long-term medication is more like a bucket of water that douses the glowing coals.

SLEEP APNEA

The obstruction of sleep apnea is like blowing up a balloon. It is hard to get the balloon started, but then gets easier. It stays easy unless you let the balloon deflate all the way, then it's difficult again. CPAP doesn't let the tissues of the nose and throat deflate all the way.

ASPIRATION

Aspiration pneumonitis is similar to acid spilled onto the back of your hand. This would cause a lot of irritation, fluid, and swelling. This is what's happening in the lungs. If this then gets infected, it becomes aspiration pneumonia.

COPD

Chronic Obstructive Pulmonary Disease (COPD), when severe, is like breathing through a straw. Give the patient a straw and have them breathe through it while in the office.

This is what it will be like in the future. They can remember this every time they drink through a straw.

SUBCONJUNCTIVAL HEMORRHAGE

The layers of the white part of the eye are like layers of an onion. Blood gets between these layers and smears out.

ACUTE OTITIS MEDIA

- Most of the cases of otitis media are caused by viruses and don't need antibiotics. If the body hasn't taken care of the problem itself by 2 or 3 days, then antibiotics may be necessary.

- Children get otitis media more often than adults because of the anatomy and direction of their ear tubes. The Eustachian tube is a straight shot in kids, then becomes slanted and curved as the face grows.

NEURO

MIGRAINES

- The best way to try to understand classic migraine headaches is to visualize spasm of an artery and then release of the spasm giving dilatation. This is similar to when one falls asleep on their arm. What has happened is blockage of the artery (spasm) that feeds that arm. This decreases blood flow, which causes a "tingling" sensation (the arm is "asleep"). When the pressure on the arm is release, the artery maximally dilates to allow as much blood flow as possible. Severe pain in that area of blood flow occurs especially with any movement of that arm. Classic migraines are similar to this. When an artery to the head goes into spasm, people will have what is called an "aura". Since different nerves do different things, the "tingling" of that nerve can be very different. If the artery involved feeds the eye, the "tingling" will be visual. Flashing lights, jagged vision, or halo vision are common. If other arteries of the head are being affected, nausea, tingling on one side of the face or head, or other symptoms occur. Once the artery dilates, then there is severe pain in the area fed by that artery. Since only one artery goes into spasm, the symptoms are usually only on one side. Medications that help to put the artery back toward spasm and out of dilatation have been shown to relieve the acute symptoms. If the dilatation of the artery can be prevented, the headache can be aborted.

- The word migraine comes from hemicrania or half of the head. If we could look inside the head during a headache, it would look different, all red, hot, and swollen. The problem is inherited but can miss generations. It's really not a "disease" and it can't be cut out or "cured". It is mostly a dysfunction or varied functioning, but it can interfere with your life. The patient is the number one doctor and the doctor is only a coach. It is almost all the patient's efforts that help control this problem.

LUMBAR DISK DISEASE

The disk between the bones of the vertebra is like a jelly doughnut. It is hard on the outside, but is filled with soft, squishy material. When the disk ruptures, the jelly squirts out and the bones get closer together.

BRAIN INJURY

The brain is like gelatin and it sloshes around inside the skull. An injury to the brain can occur on the opposite side of the head from where the blunt injury happened.

ALZHEIMER'S AND DEMENTIA

- Alzheimer's is a memory problem that also affects personality and other facets of a person's mind. Dementia is a much broader term for any memory problem. Alzheimer's is just one specific cause of dementia.

- Dementia is damage to the brain affecting short-term memory.

- Delerium is confusion and it usually transient. It is a sudden variation from the usual disease process and it probably not caused by the disease but by all the other things happening to the patient recently.

- Alzheimer's is a problem with memory as the patient gets older, but it doesn't interfere with other functions until much later. The patient can look physically normal and can appear able to take care of themselves. The changes in the brain then lead to behavioral changes.

- In family who live to ripe old ages, Alzheimer's risk seems to be increased. That's because all the other families died off before they could show their Alzheimer's.

- If you have a relative with Alzheimer's, your risk for developing it doubles from one in twenty people to two in twenty people. It is important to note that eighteen out of twenty people won't develop it.

MUSCLE TENSION

- A headache can be caused by tightened neck muscles. This can be simulated by making a fist. The fist is the head and the wrist is the neck. If you relax the muscles, the hand droops forward. If the muscles are tightened, the wrist and hand tense up. If this stays this way for a prolonged time, the muscles begin to ache. Many times these types of headaches are at the back of the head, the front of the head, in a "band" distribution around the head, behind the eyes, or any combination of these areas.

- Using the same fist analogy, squeeze the fist. All the blood is squeezed out and lactic acid builds up.

CLUSTER HEADACHE

This is a rare type of headache, but very severe. There seems to be as much eye pain as headache. It is usually one sided. If you look in a mirror while having this type of headache, the eye will be red and tearing. It feels like an ice pick is going into the head

or eye. It can wake the patient up at night. The headaches tend to be multiple attacks in "clusters", especially in the spring and fall.

PARKINSONS

The problem with Parkinsons is not the tremor but the slow movements and problems getting started. Imitate the gait for the patient and family to show why it is easy to fall.

SKIN

SEBORRHEA

Seborrhea is really just very bad dandruff. The natural oils that are secreted by the oil glands on the head mix with the dying skin that is flaking off, creating dandruff. In people with seborrhea, the glands are producing a different type of oil, which is more irritating. The dandruff falls down upon the prominent areas of the head and neck – top of the ears, nose, cheeks, chin, above the eyebrows, the front of the chest, and the top of the shoulders. The skin reacts to the dandruff and classic seborrhea develops. There is no true "cure" for this problem but it can be controlled using strong dandruff shampoos. The reaction of the skin on the face and neck can be treated with steroid creams until the dandruff is controlled. Seborrhea can occur from the eyebrows, beard, or mustache. Many times an anti-fungal shampoo is used to control P. ovale, which likes to grow in this changed sebaceous environment.

SEBORRHEIC KERATOSES

These skin lesions on older persons are like barnacles on a ship.

POISON IVY

The course of poison ivy is like a hill, three days up and seven days down.

KIDNEYS

RENAL INSUFFICIENCY

In renal insufficiency the kidneys are able to run at full speed. They should be going 100 mph but are only running at 50 mph. They'll get there, it will just take a lot longer.

PHILOSOPHY FOR OFFICE EDUCATION

- For the doctor-patient relationship to function properly, both have to cooperate. The doctor is like a plug, the patient like a wall socket, they have to work together for the light to come on.
- Draw pictures for the patients as you try to educate them. A picture is worth a thousand lectures.
- Educate children by story telling.
- Give patients permission to make choices.
- Talk to preadolescents about sex, drugs, and rock-and-roll. Explain normal functioning and change to them. Especially, discuss prevention.
- The age of a person is not a good indicator of their state of health. Like a car, if preventive maintenance is done properly, it will last longer.
- It's okay to share your faith with patients, but not to push it on them.
- Less is more. When someone is trying to lose weight, they try to lose too much, too fast, and get frustrated. Giving them reasonable goals helps them succeed and stay positive.
- Work with interpreters to develop patient education, metaphors, and analogies that are effective, culturally sensitive, and inoffensive.
- Use diagrams when discussing feedback loops.
- Breastfeeding is simple supply and demand, the more suckling, the more milk produced.
- Stretch your arms out wide to simulate the broad range of possibilities.
- Try to make changes in behaviors in small steps. Try to improve the health status in some way at each visit.
- You may convince people to adopt a healthier life style or use vitamins by telling them that this "boosts" the immune system.
- Use anatomical charts to help patients visualize their problems.

- When the problem is viral and antibiotics are not necessary, let the patient know that you know what the problem is and it's significant. They have a really "bad" virus giving them uncomfortable symptoms and here's what we can do to treat the symptoms.

- When you refer a patient to a consultant, you are lending your doctor-patient relationship to the consultant. This must be used wisely or you will lose the patient.

- Draw on the table's paper, use flipcharts, hand patients hard copy printouts – give them something.

- Find the patient's belief system and work with it.

- Use plain words like snot and pee.

- There are truths in this world. We all die and gravity wins.

- Exercise – some is better than none, more is better than some. When you break a sweat, that's when it's a good level for aerobic.

- Idiopathic means we're idiots and don't know what causes it.

- If you can't explain something using words with two syllables or less, you don't understand it yourself.

- Consider having a chalk board or flip chart in the room for drawing patient explanations.

- Write out instructions (like a prescription).

- Remind the patient that you can't foresee the future and that you can't always predict problems or failures.

- Numbing medicine is like soap in your eyes, it stings for a little while.

- The doctor is usually just a cheerleader, the patient has to take the responsibility for their own health.

- Good health is a treasure.

- It is the patient's body and therefore their decision. With difficult decisions, give both the good and bad sides of all options and multiple ways to handle the problem.

- Change your style of communication to allow the patient to "feel at home".

- Ask the patient what they think causes their disease and what it may lead to. Dispel the myths.

- Give a specific exercise prescription - the type of exercise, the amount of time to do it, and the number of times per week.

- Acute problems are self-limited, like strep throat. Chronic problems last years and recur. You can't just take something and make it go away.

- When rehydrating, you have to put in as much as comes out plus make up for what was already lost.

- Chronic illnesses, unfortunately, involve the same adjustments day in and day out, everyday for years.

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