TRAIN FOR SUCCESS INC.
CARING FOR THE ELDERLY 4Hr
FOR EXAMINING COMMITTEE MEMBERS

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PURPOSE

The purpose of this course is to educate and reinforce the knowledge of the healthcare professionals/ Examining Committee members who are working with the elderly and assisting with decisions, which will impact their lives. This course reviews the physiological changes that occur with the aging process, factors to take into consideration when caring for the elderly, how aging affects the pulmonary system; lungs, nervous system, the Senses, bones, muscles, joints, reproductive system, immune and other systems and how to treat or manage the complications that may be encountered. The course also review the types of Activities of daily living (ADLs), types of health care and community settings that are available to meet the needs of the elderly and resources that are available within the community to assist with the needs of the elderly.

Objectives/ Goals:

After successful completion of this course the participants will be able to:

1. Describe the physiological changes that occurs with the aging process
2. Discuss factors to take into consideration when caring for the elderly
3. Discuss aging changes in the cells, tissues and organs
4. Describe how aging affects the pulmonary system; lungs, nervous system, the Senses, bones, muscles, joints, immune system and how to treat or manage the various complications that can arise.
5. Discuss the various types of assistance of daily living activities (ADLs)
6. Describe at least 4 types of health care and community settings that are available to meet the needs of the elderly.
7. Discuss various resources that are available within the community to assist with the needs of the elderly.

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INTRODUCTION

Gerontology is defined as the study of the social, cognitive, psychological and biological aspects of aging.

CHARACTERISTICS OF THE ELDERLY

Aging is not a disease; but a NORMAL progressive process. As the individuals get older they may experience multiple physiological changes, chronic illnesses, as well as memory problems, other limitations and often requires some assistance with different aspect of care, activities of daily living (ADLs), medication management, nutritional intake and other issues that can affect safety. Working with the elderly individual requires much caring, patience, knowledge and training.

Providing assistance with activities of daily living

Providing assistance with activities of daily living involves providing assistance with task such as:

- Ambulation
- Bathing
- Dressing
- Eating
- Personal hygiene
- Toileting Transfers
- Assistance with self-administered medication

According to the Agency for Health Care administration, assistance with activities of daily living (ADL) means the certified nursing assistant or a home health aide provides to the patient individual assistance with activities of daily living, which includes:

- Ambulation. Providing physical support to enable the patient to move about within or outside of the patient's place of residence. Physical support includes holding the patient's hand, elbow, under the arm, or holding on to a support belt worn by the patient to assist in providing stability or direction while the patient ambulates.

- Bathing. Helping the patient in and out of the bathtub or shower being available

while the patient is bathing. Can also include washing and drying the patient.

- Dressing. Helping patients, who require assistance in dressing themselves, put on and remove clothing.

- Eating. Helping with feeding patients who require assistance in feeding themselves.

- Personal hygiene. Helping the patient with shaving. Assisting with oral, hair, skin and nail care.

- Toileting. Reminding the patient about using the toilet, assisting him to the bathroom, helping to undress, positioning on the commode, and helping with related personal hygiene, including assistance with changing of an adult brief. Also includes assisting with positioning the patient on the bedpan, and helping with related personal hygiene.

- Providing assistance with physical transfer. Providing verbal and physical cueing, physical assistance, or both while the patient moves from one position to another, between the following: a bed, chair, wheelchair, commode, bathtub or shower, or a standing position. Transfer can also include use of a mechanical lift.

- Providing assistance with self-administered medication, as defined in subsection 59A-8.0095(5), F.A.C.

Various settings for different levels of care

There are several types of care ranging from skilled nursing care to senior living. They vary depending on the level of assistance that is required by the patient /resident.

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Various settings include:

- Senior Communities
- Continuing Care
- Assisted Living
- Board and Care/ group home
- Skilled Nursing facility

Senior Communities

- Senior housing is designed for the elderly who are high functioning, which refers to those who do not require assistance with ADLs.

- Senior communities are often neighborhoods that are limited to elderly of a certain age group.

- They are developed for active seniors and they often provide a variety of social clubs for example arts and crafts, bingo, golf, cards and other social activities.

Some senior communities also offer additional levels of care; many are not equipped for the elderly individuals who require assistance with ADLs. At times the individual may require some assistance through home health care for a short period of time.

Continuing Care

- Continuing care communities are sometimes called progressive care facilities.
- They frequently offer a broad range of options; from independent living to special care.
- The residents are often admitted when they live independently but as their need changes or increases, they are guaranteed vacancies in another level of care.

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Assisted Living

- Assisted living offers the elderly a place to live outside of their home, where they can receive basic assistance in housekeeping, 24-7 monitoring, meal preparation, assistance with shower, dressing, toileting, medication reminders or assistance, eating, transportation, activities and socialization.

- Some individuals may have their own apartment; others will consent to sharing a room with someone.

- There will be access to common areas such as an activity/ recreational room, TV room, library, and communal sitting areas. May also provide a common dining area where everyone will gather for all meals if they desire.

- Assisted living facilities are designed for individuals who require assistance with complex ADLs on a daily basis. More complex ADLs include shopping, money management, cooking and other activities.

Board and Care/ group home

- Board and care / group home setting is similar to assisted living in terms of care

- This is often a single family dwelling which has been converted into a residence for elderly and/ or disabled residents.

- The monthly rent commonly includes room, meals, laundry services, 24 hour staffing and some transportation.

- Basic medical care can be attend to, however residents who have more serious medical conditions will be expected to move into a more appropriate facility to meet their needs.

Skilled Nursing facility (SNF)

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- Skilled nursing facility (SNF) is a level of care that is licensed to administer medical treatment with nurses Licensed Practical Nurses (LPN), Registered Nurses (RN) and Certified Nurses Assistants (CNA).

- Skilled nursing facility (SNF) offers extensive nursing services for the residents. Admission must be initiated by the individuals' physician, who recommends that the patient needs either rehabilitation care or a special care facility.

- Rehabilitation care programs are located in hospitals or long term care, skilled nursing facilities/ nursing homes.

- Rehabilitation care programs provide intensive medical care for patients who are expected to regain functional capacity and return home in a short time.

Special care facility

- There are different types of special care facilities: some are involved with special medical issues and others manage behavioral problems that may arise from dementia/ Alzheimer's.

The patients are often admitted to a skilled nursing facility to address an acute condition for example rehabilitating a fractured hip, or for treating an infection with intravenous (IV) antibiotics.

Many skilled nursing facilities have a portion of their residents who are long- term care patients. These are patients who require the treatment capabilities of a Skilled Nursing facility (SNF), but their status /condition requires that level of care permanently.

Long-term care includes nursing supervision and is focused on maintenance as opposed to curative care. The condition is not expected to improve, the nursing activities are focused on keeping the individual healthy, safe and function at the most optimal level within that person limits.

PHYSIOLOGICAL CHANGES THAT OCCURS WITH THE AGING PROCESS

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AGING CHANGES IN THE BODY AND THEIR AFFECTS ON THE LUNGS

Changes to the bones and muscles of the chest and spine:

- Bones become thinner and change shape. This can change the shape of the ribcage. As a result, the ribcage cannot expand and contract as well during breathing.
- The diaphragm, the muscle that supports breathing becomes weakened. This weakness may prevent the individual from breathing enough air in or out.

These changes in the bones and muscles;

- May lead to lower the oxygen level in the body.

- Also, less carbon dioxide may be removed from the body. As a result symptoms such as tiredness and shortness of breath can occur.

Changes to lung tissue:

- Muscles and other tissues that are near the airways may lose their ability to keep the airways completely open. This causes the airways to close easily.
- Aging also causes the air sacs to lose their shape and become baggy.

These changes in lung tissue can allow air to get trapped in the lungs.

Too little oxygen may enter the blood vessels and less carbon dioxide may be removed. This makes it hard to breathe.

Changes to the nervous system:

- The brain; the part of the brain that controls breathing may lose some of the function. When this occurs, the lungs are not able to get adequate oxygen. Not enough carbon dioxide may leave the lungs. Breathing may become more difficult.
- Nerves in the airways that trigger coughing become less sensitive. Large amounts of particles like smoke or germs may collect in the lungs and may be hard to cough up.

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Changes to the immune system:

- The immune system can get weaker. This means the body is less able to fight lung infections and other diseases.
- The lungs are also less capable of recovering after exposure to smoke or other harmful particles.

COMMON PROBLEMS

As a result of these changes, older individuals are at increased risk for:

- Lung infections; for example pneumonia and bronchitis
- Shortness of breath
- Decreased oxygen level
- Abnormal breathing patterns, resulting in problems such as sleep apnea (episodes of stopped breathing during sleep)

PREVENTION

To decrease the effects of aging on the lungs:

- Do not smoke. Smoking harms the lungs and speeds up lung aging.
- Do physical activity / exercise to improve lung function.
- Get up and move. Lying in bed or sitting for long periods allows mucus to collect in the lungs. This puts the individual at risk of lung infections. This is especially true right after surgery or when the individual becomes ill.

OTHER CHANGES RELATED TO AGING

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As people grow older, other changes will include:

- Changes in the cells, organs and tissues
- Changes in the bones, joints and muscles
- Changes in the heart and the blood vessels

Aging changes in cells, organs and tissues

All vital organs begin to lose some function as the individual age during adulthood. Aging changes occur in all of the body's:

- Cells,
- tissues, and
- organs

and these changes will affect the functioning of all body systems.

Living tissue is made up of cells. There are several different types of cells, but all have the same basic structure. Tissues are layers of similar cells that perform a specific function. The different kinds of tissues group together and form the organs.

There are four basic types of tissue:

Connective tissue

Connective tissue supports other tissues and binds them together. This includes:

- Bone,
- Blood, and
- lymph tissues and
- Other tissues that give support and structure to the skin and internal organs.

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Epithelial tissue

Epithelial tissue is a sheet of cells that lines the body cavity or covers a body surface. There are two forms of epithelial tissue that occur in the human body;

Covering and lining epithelium;

- Forms the outer layer of the skin;
- lines open cavities of the digestive and respiratory systems;
- covers the walls of organs of the closed ventral body cavity.

Glandular epithelium (surrounds glands within the body).

Epithelial tissue provides a covering for the deeper body layers.
The skin and the linings of the passages inside the body, such as the gastrointestinal system, are made of epithelial tissue.

Muscle tissue:

The 3 types of muscle tissue are cardiac, smooth, and skeletal.

Cardiac muscle

Cardiac muscle cells are located in the walls of the heart, appear striated, and are involuntary control. Cardiac muscle makes up most of the heart wall.

Smooth muscle

Smooth muscle fibers are located in walls of hollow visceral organs, except the heart, appear spindle-shaped, and are also under involuntary control.

Smooth muscles (also called involuntary muscle), such as the muscles contained in the stomach and other internal organs

Skeletal muscle

Skeletal muscle fibers occur in muscles which are attached to the skeleton. They are striated in appearance and are under voluntary control.

Nerve tissue

Nerve tissue is made up of nerve cells (neurons) and is used to carry messages to and from different parts of the body. The brain, spinal cord, and the peripheral nerves are made of nerve tissue.

AGING CHANGES

- Cells are basic building blocks of the tissues.
- The cells experience some changes with the aging process.
- Cells often become larger and are less able to divide and to multiply. Also there is an increase in pigments and/ or fatty substances inside the cell (lipids).
- Many cells lose the ability to function, or they begin to function in an abnormal manner.
- As aging continues, waste products build up in tissue. A fatty brown pigment collects in many tissues, as well as other fatty substances.
- Connective tissue changes and often become stiffer. Therefore the airways, organs, and the blood vessels become more rigid.
- Cell membranes also undergo changes, and many tissues have difficulty getting oxygen, nutrients, and removing waste and carbon dioxide.
- Atrophy develops and many tissues lose their mass.
- Some tissues become nodular (lumpy) and/ or more rigid.

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Due to the changes in the cell and the tissue the organs also experience changes with the aging process.

The aging organs begin to gradually lose their function. Most individuals do not notice this loss right away.

The changes may appear slowly and over a long period. When the organs start to work harder than usual, it may not be capable of increasing their function. Therefore the individual may experience

Sudden heart failure or other problems can develop when the body is worked harder than usual.

Things that can place an extra stressor /workload on the body include:

- Sickness
- Lack of sleep
- Significant life changes
- Medications
- Sudden increase in physical demands on the body, for example changes in activity

Loss of reserve also makes it harder to restore equilibrium/ balance in the body. Medications are removed from the body at a slower rate. Lower doses of medications are often needed, and side effects become a very significant concern.

THE AGING THEORY

The researchers, gerontologists and other scientists and other persons are still not sure how and why people change as they get older. There is no single process that can explain all the changes that occurs with the aging process.
Aging is a very complex process that varies as it affects different individuals in different ways.

Many gerontologists feel that aging is due to the interaction of several lifelong influences. These influences may include:

- Heredity, diet, environment, exercise, culture, past illnesses life style and many other factors.

Each individual age at a unique rate. Some systems begin aging as early as age of 30. Other aging processes are not manifested until much later in life.

Although some changes always occur with aging, they often occur at different rates and to different extents. There is no sure way to predict exactly how an individual will age.

TERMS TO DESCRIBE SOME TYPES OF CELL CHANGES EXPERIENCE WITH AGING

Atrophy:

- Atrophy refers to body tissue or an organ wasting away, such as occur in disuse atrophy which occurs from a lack of physical activity. In some individuals, muscle atrophy is caused by not using their muscles enough.

- With atrophy the cells begin to shrink. If enough cells decrease in size, the entire organ will waste away /atrophy. This is often a normal aging change and can occur in any tissue.

- Atrophy is most common in the skeletal muscle, the brain, heart and the sex organs for example the breasts.

The cause of atrophy is not known, but may include:

- Reduced use,

- Decreased workload,

- Reduced blood supply to cells

- Reduced nutrition to the cells

- Reduced stimulation by nerves.

Hypertrophy

- With hypertrophy the cells, tissue/ organs enlarge. For example Left ventricular hypertrophy can occur when some factor makes the heart work harder than normal to pump blood throughout the body; such as hypertension which is the most common cause of left ventricular hypertrophy.

Hyperplasia

- With Hyperplasia the number of cells increases. There is increased rate of the cell division.

- Hyperplasia often occurs to compensate for a loss of cells.

It allows some organs and tissues to regenerate, including the:

- skin,
- Liver,
- lining of the intestines,
- bone marrow.

Tissues that have limited ability to regenerate include:

- Bone,
- cartilage,
- smooth muscle for example the muscles around the intestines.

The tissues that rarely or never regenerate include the:

- Nerves,
- skeletal muscle,
- heart muscle, and
- the lens of the eye.

When injured, these tissues are usually replaced with scar tissue.

Dysplasia

- Dysplasia refers to the changes in the shape, size or organization of mature cells becomes abnormal (also referred to as atypical hyperplasia).

- Dysplasia is common in the cells of the cervix and within the lining of the respiratory system/ tract.

Neoplasia

- Neoplasia refers to the formation of tumors, which may be cancerous/ malignant or noncancerous/benign.

- Neoplastic cells reproduce rapidly. They may have unusual shapes and also have abnormal function.

As mentioned before, as the individuals grow older, there will be various changes throughout the body, including changes in:

- Hormone production
- Immunity
- The skin
- Sleep pattern
- Bones, muscles, joints
- The breasts
- The face
- The female reproductive system
- The heart and blood vessels
- The kidneys
- The lungs
- The male reproductive system
- The nervous system

Aging changes in the bones, muscles and joints

- Changes in the bones, muscles and joints lead to changes in posture and gait / pattern of walking which is very common with aging.

- The skeleton functions to provide support and structure to the body.

- The joints are the areas where the bones come together, this allows the skeleton to be flexible and allow movement.

- In the joint, bones do not contact each other directly; however, they are protected or cushioned by cartilage within the joint, synovial membranes that are around the joint, and fluid.

- Muscles provide the strength to move the body. The brain coordinates the activities is affected by changes in the muscles and joints.

- Changes in the joints, muscles, and bones affect posture and ambulation, and lead to weakness and much slower movement; therefore the older individuals often ambulates at a slower pace.

AGING CHANGES

- Individuals lose bone mass or density as they age, especially women after menopause. The bones lose calcium and other minerals.
- The spine is made up of bones called vertebrae. Between each bone is a gel-like cushion. The middle of the body / trunk becomes shorter as the disks gradually becomes thinner and gradually lose fluid.

- The vertebrae also lose some of the mineral content, making each bone thinner. Therefore the spinal column becomes curved and compressed.

- Bone spurs caused by aging and overall use of the spine may also form on the vertebrae.

- The arch of the foot become less pronounced, this contributes to a slight loss of height.

- The bones are more brittle because of mineral loss, and are more susceptible to fractures.

- Joint stiffness is a frequent complaint of the elderly person and as the joints become stiffer they also become less flexible.

- Fluid within the joints may also decrease, therefore the cartilage experience some friction, as they rub together causing them to wear away.

- Sometime the elderly person may experience some calcification as minerals deposit in and around some of their joints for example in the shoulder.

- There might be degenerative changes in the hip and knee joints as they begin to lose the cartilage.

- The joints in the fingers can also lose cartilage.

- Lean body mass also decreases. This decrease is partly contributed by atrophy or loss of muscle tissue.

- Lipofuscin (age related pigment) and fats are deposited in muscle tissue.

- The muscle fibers also shrink. This lost muscle tissue may be replaced with a tough fibrous tissue.

- This is most noticeable in the hands, which may look bony and thin.

- The muscles become less toned and the ability to contract is reduced because of changes in the muscle tissue and the normal aging changes within the nervous system.

EFFECT OF THE CHANGES

- The bones become more brittle and may break more easily.
- Overall height decreases as the trunk and spine shorten.
- Breakdown of the joints may lead to pain, inflammation/ swelling, stiffness, and deformity.
- These changes may present as minor stiffness to severe arthritis.
- The posture may become more bent over.
- The knees and hips may change and become more flexed.
- Movement slows and may become limited. Ambulation /gait or the walking pattern becomes slower and shorter.
- Ambulation /gait may become unsteady.

Great changes are seen in strength and endurance. As the individual ages they tend to get tired much more easily and have less energy. Loss of muscle mass causes a reduction in strength.

COMMON PROBLEMS THAT DEVELOPS

Osteoporosis

The bones are in a constant state of renewal; the new bone is made and old bone is broken down. When an individual is young, the body makes new bone faster than it breaks down old bone and the bone mass increases, however as people age, the bone mass is lost faster than it is made.

Osteoporosis is a common problem, especially for older women. The bones break more easily. Compression fractures of the vertebrae can cause pain and decrease mobility.

Muscle weakness

Muscle weakness contributes to weakness, fatigue and reduced activity tolerance. Joint problems ranging from mild stiffness to debilitating osteoarthritis are common.

High risk of falls / injuries

As the individual ages and these changes occur, the elderly person is at risk of injury because:

- Gait changes, pain, instability, unsteady gait, and loss of balance can lead to falls.

Involuntary movements

Involuntary movements, muscle tremors, fine movements (fasciculations) are more common in the elderly persons.

Contractures

Contractures develop when the normal elastic tissues are replaced by non-stretchy fiber like tissue. This tissue makes very difficult to stretch the area and thus prevent normal movement.

Elderly as well as individuals who are unable to move or they do not stretch their muscles with Range of motion (ROM) activities or other exercises, may develop muscle contractures.

PREVENTION

Exercise/ Activities

- Exercise is one of the best ways to prevent or slow problems with the joints, muscles, and bones.

- Participation in moderate exercise / physical activities can help to maintain balance, strength and flexibility. Exercise also helps the bones stay strong.

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Well-balanced diet

As the individual ages, it is very significant to eat a well-balanced diet with calcium. The women need to ensure that they get enough calcium and vitamin D as they get older.

women who are postmenopausal and men over age 65 often take 1,200 mg of calcium and 400 to 800 international units (IU) of vitamin D per day (follow the physician's order).

Aging changes in the heart and blood vessels

AGING CHANGES

The Heart

The natural pacemaker system;

- The heart has a natural pacemaker system, the sinoatrial (SA) node, which functions to controls the heartbeat.
- As the individual ages, some of the pathways of this system may develop fat deposits and fibrous tissues.
- The natural pacemaker; the sinoatrial (SA) node, loses some of the cells. These changes may result in a slightly slower heart rate.

Increase in the size of the heart

An increase in the size of the heart is often observed in the left ventricle. The heart wall thickens and the heart may fill more slowly.

Arrhythmias

- Abnormal rhythms or arrhythmias for example, atrial fibrillation, are more common in the older individuals. This is sometimes caused by heart disease.

- Normal changes in the heart include deposits of the lipofuscin (aging pigment) . The heart muscle cells degenerate.

- The valves inside the heart, that control the direction of the blood flow, may thicken and become stiff.

- A heart murmur that is caused by valve stiffness is common in the elderly.

Blood vessels

- Receptors that are called baroreceptors monitor the blood pressure and make changes to help maintain the blood pressure when an individual changes position or is performing other activities.

The baroreceptors often become less sensitive as the individual ages.

Older individuals often experience orthostatic hypotension; this is a condition in which the blood pressure decreases when the person moves from lying position to standing or from a sitting position to standing. This causes the individual to experience some dizziness because less blood flow is going to the brain.

Sometimes the aorta (main artery from the heart) becomes stiffer, thicker, and not as flexible and may cause the blood pressure to be higher and makes the heart work much harder, which can lead to hypertrophy (thickening) of the heart muscle.

Other arteries also become thicker and stiffer.

Blood

- The blood changes slightly as the individual gets older.

- Normal aging process results in a reduction in total body water. With less fluid within the bloodstream, the blood volume is decreased.

- The rate in which the red blood cells are made or produced in response to an illness or stress is reduced. This results in a slower response to blood loss and anemia.

- Most of the white blood cells stay at the same levels, however some white blood cells important to immunity such as neutrophils, decrease in their number and the ability to fight off bacteria. Therefore the elderly person experiences a reduction in the ability to resist infection.

EFFECT OF CHANGES

The heart continues to pump enough blood to supply all the parts of the body. However, the older heart may not be able to pump blood as effectively when it works harder.

Some of the things that will make the heart work a little harder are:

- Various types of medications
- Emotional / physical stress
- Physical exertion
- Illness
- Infections
- Injuries

SOME COMMON PROBLEMS

- Angina (chest pain caused by temporarily reduced blood flow to heart muscle),
- shortness of breath with exertion,

- heart attack may result from coronary artery disease.
- Abnormal heart rhythms (arrhythmias) of various types can occur.

- Anemia may occur, possibly related to malnutrition, blood loss from the gastrointestinal (GI) tract, chronic infections, or as a complication from other diseases or medications.

- Arteriosclerosis (hardening of the arteries), very common in the elderly individuals.

- Fatty plaque deposits, within the blood vessels cause them to narrow and partially or totally block the blood vessels.

- Congestive heart failure is also very common in the elderly.

- Hypertension (High blood pressure) and orthostatic hypotension are more common in older individuals.

- Heart valve diseases are fairly common. Aortic stenosis (narrowing of the aortic valve) most common valve disease in the older individuals.

- Transient ischemic attacks (TIA) or strokes may occur if the blood flow to the brain become disrupted.

Some other complications with the heart and blood vessels may include:

- Blood clots
- Varicose veins
- Deep vein thrombosis
- Thrombophlebitis
- Peripheral vascular disease (causing intermittent pain in the legs when walking-claudication)
- Aneurysms

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Aneurysms are abnormal widening of a part of an artery due to some weakness within the wall of the artery (blood vessel). An aneurysm may develop in one of the major arteries from the heart or in the brain. If an aneurysm bursts it may cause bleeding and death.

PREVENTION

Help the circulatory system, the heart and the blood vessels.

Heart disease risk factors that each individual have some control over include:

- Obesity,
- High blood pressure,
- Cholesterol levels,
- Diabetes and
- Smoking.

Eating a heart healthy diet which has reduced amounts of saturated fat and cholesterol, and controlling the weight is an excellent way to help the circulatory system.
As for individuals with various health conditions such as diabetes, hypertension, high cholesterol, following the health care provider's recommendations for taking care of these conditions will help. For individuals who smoke- stop smoking is highly recommended.

Participate in more exercise

Exercise has several benefits.

- Exercise may help prevent obesity
- Exercise helps individuals with diabetes control their blood sugar.
- Exercise may help maintain your abilities as much as possible
- Exercise helps to reduce stress.
- Individuals who exercise usually have less body fat
- Individuals who exercise also tend to have less problems with blood pressure and less heart disease.

Follow up with regular check-ups for the heart

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Aging changes in hormone production

The endocrine system is made up of tissues and organs that produce hormones.

- As the individuals get older, changes naturally occur in the way that the body systems are controlled.

- Some target tissues may become less sensitive to the controlling hormone. The amount of hormones produced may also change.

- Blood levels of some hormones increase, some decrease, and some are unchanged. Hormones are also metabolized (broken down) more slowly.

- Some of the organs that produce hormones are also controlled by other hormones. Aging also affects this process.

- An endocrine tissue may produce less hormone than it did at a younger age, or it may continue to produce the same amount but at a slower rate.

AGING CHANGES

The hypothalamus is located in the brain and produces hormones that control the other structures within the endocrine system. The amount of the regulating hormones tent to remain about the same, but the response by the endocrine organs may change as the individual gets older.

The pituitary gland which is also located in the brain, reaches maximum size in middle age and then gradually gets smaller as we age.

It has two parts:

The posterior section stores hormones produced in the hypothalamus.

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The anterior section produces hormones that affect:

- Growth, the thyroid gland (TSH), adrenal cortex, ovaries, testes, and breasts.

- The thyroid gland produces hormones that help to control our metabolism.

- As the individual gets older, the thyroid gland may become nodular. Over time the metabolism slows down.

- In some individuals, the thyroid hormone levels may rise, which may lead to an increased risk of death due to cardiovascular disease.

- The parathyroid glands are four tiny glands located around the thyroid.

- Parathyroid hormone affects the calcium and phosphate levels, which then has an effect on bone strength.

- The parathyroid hormone levels rise as the individual gets older, which may contribute to osteoporosis.

- The pancreas- Insulin is produced by the pancreas. It helps to get glucose from the blood into the cells, where it will be used for energy.

- The average fasting blood glucose level rises 6 to 14 milligrams/deciliter (mg/dL) every 10 years after the individual reaches the age 50 as the cells become less sensitive to the effects of insulin.

- The adrenal glands (located just above the kidneys). The adrenal cortex layer produces the hormones aldosterone, cortisol, and dehydroepiandrosterone (DHEA).

- Aldosterone regulates the fluid and electrolyte balance. Aldosterone release decreases with age. This reduction may contribute to a decrease in the blood pressure with sudden position changes (orthostatic hypotension) causing light-headedness etc.

- Cortisol (stress response) hormone affects the breakdown of glucose, fat, protein and has anti-allergy and anti-inflammatory effects. Cortisol release also decreases with aging, but the blood level of this hormone remains relatively the same.

- Dehydroepiandrosterone; the body uses DHEA to make androgens and estrogens, the male and female sex hormones.

- Dehydroepiandrosterone levels also declines with age. The effects of this drop on the body are not clear. Some researchers have wondered if DHEA could work as an anti-aging treatment. For more information see the University of Maryland https://umm.edu/health/medical/altmed/supplement/dehydroepiandrosterone

- The ovaries and testes functions to produce the reproductive cells (ova and sperm). They also produce the sex hormones that control secondary sex characteristics, for example the breasts and facial hair.

- As the individual gets older, men sometimes have lower levels of testosterone. Older women also display lower levels of estradiol and other estrogen hormones after they reach menopause.

EFFECT OF CHANGES

In general, some hormones stay the same, some decrease, and some increase with age. Hormones that usually show a reduction include:

- Aldosterone
- Calcitonin
- Growth hormone
- Renin

In women,

- Estrogen and prolactin levels often shows significant reduction.

Hormones that usually remain the same or only show a slight decrease include:

- Cortisol
- Epinephrine
- Insulin
- Thyroid hormones T3 and T4
- Testosterone levels often decrease gradually as men get older.

Hormones that may increase include:

- Follicle-stimulating hormone (FSH)
- Luteinizing hormone (LH)
- Norepinephrine
- Parathyroid hormone

Aging changes in immunity

The immune system helps protect the body from harmful or foreign substances such as viruses, bacteria, toxins, and tissues or blood from another individual. The immune system makes cells and antibodies that functions to destroy these foreign/ harmful substances.

Aging Changes and their effects on the Immune system
As the individual grow older, the immune system does not work as effectively as before.

The following immune system changes may occur:

- The immune system becomes slower to respond. Therefore the individual now has increase risk of getting sick. The flu shots and other vaccines may not work as effectively or protect the individual for as long as it is expected.
- An autoimmune disorder may develop (the immune system can mistakenly attack and /or destroy the healthy body tissues).

- The body may heal much slowly because there are less immune cells in the body to bring about healing.

The ability of the immune system, to detect and to correct the cell defects also decreases. This may lead to an increased risk of cancer.

Prevention

To decrease the risks from immune system aging:

- Educate the individual to get the flu and pneumonia vaccines, and any other vaccines that the physician/ healthcare provider has recommended.
- Encourage the individuals to participate in exercise activities. Exercise helps boost the immune system (many gyms now offer the silver sneaker program- covered by some insurance companies).
- Teach the individual to make healthy meal choices. Good nutrition helps to keep the immune system strength.
- Remind the individual to stop smoking (if applicable). Smoking can weaken the immune system.
- Teach the individual to limit the intake of alcohol; need to speak with physician regarding how much alcohol is safe, (also alcohol may have harmful interactions with other medications.
- Review safety measures to prevent accident / incidents, falls and injuries because a weakened immune system can slowdown the healing process.

Aging changes in skin

Skin changes are very visible as the individual ages.
Skin changes are among the most visible signs of aging.

Changes such as:

- wrinkles
- sagging skin
- Whitening of hair or
- graying of hair

Integumentary system

The skin is a protective layer/ barrier between the internal organs and the outside environment.

The skin has layers:

Epidermis: The Epidermis is composed of squamous cells that are less sensitive than underlying structures. The epidermis is the first line of defense against infection.

Dermis: Much thicker than the epidermis. This layer consists of blood vessels, hair follicles, sweat glands, sebaceous glands, collagen fibers, lymphatic vessels and nerves. The dermis reacts quickly to painful stimuli as well as to temperature changes and pressure sensation.

The inner layer under the dermis (the subcutaneous layer) has sweat glands, hair follicles, blood vessels, and also fat.

The skin also:

- Helps control our body temperature
- Assist in maintaining the fluid and electrolyte balance
- Has nerve receptors that allow the individual to feel pain, touch and pressure.
- Is a protective layer/ barrier between the internal organs and the outside environment.

Skin changes may be related to environmental factors, exposure to the sun, genetic factors, nutrition among other factors.

AGING CHANGES

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- As the individual gets older, the outer skin layer (epidermis) becomes thinner, although the number of cell layers remains the same.

- The number of melanocytes (pigment-containing cells), decrease. The other melanocytes that remain, increase in size.

- The aging skin appears pale, thinner and much clearer- translucent.

- On sun exposed areas, large pigmented spots such as liver spots, age spots, liver spots may appear.

- The changes that occurs in the connective tissue, lead to a reduction the skin's elasticity and strength. This is referred to as elastosis. It is more noticeable in sun-exposed areas (solar elastosis).

- Elastosis produces a leathery appearance that is commonly seen in individuals who spend a lot of time in the sun/ outdoors.

- As the individual ages, the blood vessels of the dermis become more fragile.This often contributes to easy bruising/bleeding under the skin which is referred to as senile purpura, cherry angiomas.

- As the individual ages, the sebaceous glands produce less oil. Therefore with less moisture in the skin the elderly person often experience dry itchy skin.

- As mentioned earlier, the subcutaneous fat layer becomes thinner; therefore it has less insulation (fat). This reduces the ability to maintain the body temperature (there is less natural insulation) therefore the individual will experience hypothermia in cold weather and also complain of feeling cold when others around feels fine.

- As the subcutaneous fat layer becomes thinner, it has less insulation (fat) therefore there is also increase risk of skin injury.

- Some medications are absorbed by the subcutaneous (fat) layer. As this layer becomes thinner, this affects the way that the medications work.

- The sweat glands also produce less sweat. Therefore this makes it more difficult to cool the body. This increases the risk for developing heat stroke.

- Other changes that are more common in an older individual are growths such as warts, skin tags, warts keratoses (rough patches).

EFFECT OF THE CHANGES

As the individuals get older, they have an increased risk for skin injury. The skin is much more fragile, thinner and they lose the protective subcutaneous layer.

- The individual may also be less able to sense pressure, touch, vibration, cold and/or heat.

- The blood vessels are fragile therefore they may break easily; hematomas may form after minor injury.

- Friction (pulling or rubbing) on the skin can cause skin impairment or injuries/ skin tears, bruises, purpura.

The elderly individual may also develop pressure ulcers as a result of prolonged "pressure" to a site, which reduces the blood flow to that site and can eventually lead to tissue death.

These ulcers may also be caused by some contributing factors such as; changes in the skin, loss of the subcutaneous (fat) layer, poor nutrition, reduced activity and illness. These pressure ulcers can occur anywhere on the body, especially on bony prominences.

As the individual grows older, the healing process is also much slower. The skin repairs itself more slowly than when the person was younger. Other factors such as blood

vessel changes, Diabetes, lowered immunity, and other illnesses can also affect healing.

Skin disorders although common among the elderly population, can also be caused by many conditions, such as:

- Poor Nutritional intake- resulting in deficiencies
- Diseases for example Diabetes, Liver and heart disease
- Stress
- Blood vessel diseases, for example arteriosclerosis Obesity
- Reactions to some medications

Some other causes of skin changes may also include:

- Allergies to plants and other substances
- Exposures to household and /or industrial chemicals
- Indoor heating
- Climate

The exposure to sunlight can cause:

Pigment changes for example liver spots

Loss of the elasticity of the skin

Increased thickness of the skin

Noncancerous growths of the skin

Sun exposure has also been linked to skin cancers, including:

- Basal cell cancer,
- squamous cell carcinoma
- melanoma.

PREVENTION

Encourage good nutrition intake. Sometimes nutritional deficiencies cause skin changes such as rashes, and other skin lesions.

Teach the importance of adequate hydration / fluid intake as dehydration often increases the risk of skin injury.

Educate the patient to prevent sunburn, utilize a good quality sunscreen whenever they go outdoors and to wear a hat and protective clothing as needed.

Keep skin moist with lotions and other moisturizers.

Teach the patient to avoid soaps that have excess perfume.

Aging changes in sleep

AGING CHANGES

As the individual gets older, there are changes seen in sleep patterns.

Some older persons have a harder time falling asleep.

They awaken more often during the night and earlier in the morning.

As the individuals get older they may spend more total time in bed.

Older individuals wake up more often because they spend less time in deep sleep.

There are other factors that also affects sleep such as:

- Pain /discomfort from chronic illnesses
- Nocturia – frequently waking up during the night to urinate
- Anxiety
- Depression
- Stress or worried about something etc

EFFECT OF THESE CHANGES

Sleeping difficulty, chronic insomnia, sleep deprivation can lead to :

Fatigue, chronic insomnia is a major cause of auto accidents

Sleep problems are also a common symptom of depression.

Sleep deprivation can eventually cause confusion and other mental changes but the individual can reduce symptoms when they get enough sleep.

COMMON PROBLEMS

Insomnia is a very common sleep problem in the elderly population. Other sleep disorders that may also occur includes:

- restless legs syndrome,
- narcolepsy (a chronic brain disorder which involves poor control of sleep-wake cycles)
- hypersomnia (recurrent episodes of excessive daytime sleepiness or prolonged nighttime sleep)
  can also occur.

- Sleep apnea (breathing stops for a period during sleep) can cause severe problems and sleep is frequently interrupted.

PREVENTION

Sleep medications

The elderly individuals respond differently to medications than when they were younger. Sleep medications do have side effects and falls risk is also a concern for the elderly patients. Teach patients to take only as recommended by physician or healthcare provider. Some medications can build up in the body. The older individual can develop toxic effects,

Some measures to take to help go to sleep:

For at least 3 or 4 hours before bedtime, people should avoid stimulants for example, caffeine products such as:

- coffee,
- Tea,
- Cola drinks
- Chocolate.

Eating a light bedtime snack can be helpful; sometimes causes people to become sleepy.

Some individuals report that warm milk increases sleepiness it contains a natural, sedative-like amino acid).

Teach patients to avoid tobacco products before bedtime.

Remind individual to avoid too much stimulation before bedtime. Stimulation such as such as; violent shows on the television, loud music and/ or games.

Teach patients relaxation techniques that they can utilize at bedtime.

Remind the individuals to avoid taking naps during the day.

Encourage the patient to try to go to bed the same time every night and wake up at the same time every morning.

Encourage the individual to do some moderate exercise in the afternoon.

Check current medications; some medications may affect sleep.

Aging changes in the breast

As the female gets older, the breasts lose:

- Tissue
- fat
- Mammary glands.

Some of these changes are due to the decrease in the levels /production of estrogen that takes place at menopause.

As estrogen levels decrease, the gland tissue shrinks, making the breasts less full and smaller. The connective tissue which supports the breasts starts to lose its elasticity and the breasts starts to sag.

The breast nipples also change. The areola (area surrounding the nipple) becomes smaller. Around the time of menopause, lumps within the breasts are common (often noncancerous cysts).

Teach the women about the benefits as well as the limitations of breast self-exams. Breast self-exams do not always detect breast cancer in the early stage.

Remind the individuals to discuss mammograms with their physician/ healthcare provider.

Aging changes in the face

The face typically changes with age. As the individuals loose muscle tone and the skin becomes thinner the skin gives the face a drooping appearance. Also due to the increase dryness of the skin and the subcutaneous (fat) layer is reduced, the face no longer has the plump or smooth surface. Wrinkles are seen as the individual ages. The dark spots on the face increase as well. The appearance of the neck also reveals changes with age as the skin appears loose.

The mouth

The shape of the mouth changes as the gum recedes due to missing teeth and changes the appearance of the mouth and lips. The jaw also looses bone mass.

The ears

Men sometimes develop long, course hair in their ears. Ear wax becomes much drier, there are less wax glands in the ears and less oil is produced. The hardened ear wax may block the ear canal and affect the ability to hear; many elderly individuals experience decreased hearing caused by various factors.

The eyes

Eyelashes and /or eyebrows may change to gray. Eyelids may droop as the muscle that supports the upper eyelids becomes weaker.

Aging changes in the female reproductive system

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Changes in the hormone levels bring about changes in the female reproductive system. Menopause - as the female ages older menopause occurs (menstrual periods stop permanently). The period of time before menopause is called perimenopause. (It may begin several years before the last menstrual period).

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Signs of perimenopause include:

As the individual ages, changes occur in the menstrual period; sometimes the individual experiences occasional missed periods. At times the period may be longer and other times it may be shorter. Changes also occur in the amount of the menstrual flow. Eventually the periods become much less frequent, until they eventually stop.

AGING CHANGES AND THEIR EFFECTS

- Many women experience menopause around the age of 50, although it can occur before that age as well as after. When menopause occurs the ovaries stop producing the hormones estrogen and progesterone. The ovaries also stop releasing eggs therefore the individual cannot become pregnant.

- As hormone levels decreases, the older women have increase risk of vaginal yeast infections. The walls of the vagina become dryer, thinner, and less elastic. Sometimes sexual activities become painful.

- The older women experiences symptoms of menopause such as hot flashes, headaches, trouble sleeping and moodiness.

- Decrease in the breast tissue as mentioned before.

- Decreased libido /lower sex drive and sexual response.

- The pubic muscles loose tone and some older women experience prolapse, (falling out of position) of the uterus or bladder.

- Increased risk of osteoporosis / bone loss.

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MANAGING THE CHANGES

Hormone therapy

Hormone therapy with progesterone or estrogen may help menopause symptoms for example; hot flashes and vaginal dryness, however there are also risks with hormone therapy.

- Educate the older person regarding how to manage problems for example, painful sexual intercourse by using a lubricant during sexual activities. There are some vaginal moisturizers that are available without a prescription.

Aging changes in the kidneys and bladder

The kidneys have multiple functions including:

- Filtering the blood and help to remove waste and excess fluid from the body.
- The kidneys also assist in controlling the body's chemical balance.

The urinary system includes:

- The kidneys, ureters, bladder, and the urethra.

Aging Changes and Their Effects on the Kidneys and Bladder

- As the individuals get older, the kidneys and the bladder change. This can definitely affect their function.
- Muscular changes and changes in the reproductive system also affect bladder control.

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Within a healthy aging individual, kidney function remains normal. However with illness, medications, and other conditions may cause changes in the kidney function.

Changes in the kidneys:

As the individual gets older the amount of kidney tissue also decreases. The nephrons, (filtering units in the kidneys) also decreases. The nephrons are responsible for filtering waste material from the blood; therefore you can imagine what will happen when this function is not taking place effectively. The blood vessels that supply the kidneys can become hardened. This will affect the rate at which the kidneys will filter blood (slower rate).

Changes in the bladder:

As the individual gets older, there are changes in the bladder wall. The elastic tissue becomes tough and the bladder becomes less able to stretch.

The bladder is unable to hold as much urine as before.

The bladder muscles become weaker.

The urethra may become blocked. In women, this can be due to prolapsed from weakened muscles that cause the bladder or vagina to fall out of its original position
In men, an enlarged prostate gland may block the urethra.

Common Problems

- Bladder control issues, for example leakage of urine or urinary incontinence (unable to hold the urine), or urinary retention (unable to completely empty the bladder)
- Bladder infections
- other urinary tract infection (UTI)
- Chronic kidney disease

Teach the patients to contact the health care provider or physician if they have any of the following:

Urine that is very dark urine

Fresh blood in the urine

Difficulty with urinating (unable to urinate or hesitant or leakage)

Urinary frequency (more often than usual)

Sudden urge or need to urinate (urinary urgency)

Signs of a urinary tract infection, including

- fever
- chills,
- burning on urination,
- nausea / vomiting,
- low back pain
- extreme fatigue

Aging changes in the male reproductive system

As the male get older some of the changes in the male reproductive system may include changes in:

- Testicular tissue,

- Sperm production, and

- Erectile function.

Most of the time, the changes occur gradually.

Testicular tissue mass, changes and decreases.

The level of testosterone (the male sex hormone), decreases gradually or may stay the same. Some older men may have difficulty getting an erection.

The testes continue to produce sperm however; the rate of sperm cell production slows. The tubes that carry the sperm may become less elastic.

The prostate gland, seminal vesicles and epididymis also experience changes and lose some of their surface cells.

The prostate gland often enlarges with age (some of the prostate tissue is replaced with a scar like tissue). Benign prostatic hypertrophy (BPH) affects about 50% of men.

Benign prostatic hypertrophy (BPH) may cause problems slowing urination and slowing ejaculation.

EFFECT OF CHANGES

Some men may experience a lower sex drive. Decreased testosterone levels may cause sexual responses to become slower. It may also be the result of social or psychological changes illness, chronic conditions, and /or medications.

SOME COMMON PROBLEMS

Erectile Dysfunction (ED)

- Erectile dysfunction (ED) is sometimes a concern for older men. Erectile dysfunction (ED) is often the result of a medical problem, rather than aging. Some medications, such as medications for hypertension and other conditions, may prevent a man from getting an erection. Other conditions such as diabetes can also cause erectile dysfunction (ED).

- If the bladder is not fully drained of urine, this could cause urine to back up into the ureters and even up to the kidneys (vesicoureteral reflux). This is a serious condition which requires treatment. If it is not treated, it can lead to kidney failure.

- Prostatitis (prostate gland infections or inflammation) may also occur.

- The older male may also develop prostate cancer.

Aging changes in the nervous system

The brain and nervous system control the body's:

- Movements
- Memory
- thoughts
- Senses
- They also help control the organs such as the bowels and heart.

AGING CHANGES AND THEIR EFFECTS ON THE NERVOUS SYSTEM

As the individuals get older, the brain and the nervous system experience natural changes. The brain and the spinal cord atrophies, lose nerve cells. The nerve cells may start to pass messages much more slowly than earlier age.

As nerve cells break down, waste products can collect within the brain tissue. This can cause abnormal changes in the brain; plaques and tangles may form. Lipofuscin (fatty brown pigment) can also build up in nerve tissue.

When the changes and breakdown occur in the nerves these changes can affect the senses.

The individual may lose or have reduced or lost reflexes and/ or sensation. This will leads to problems with movement and affects safety of the individual.

As the individual ages, slowing of the thought process and memory may also occur.

Some individual have multiple changes in the brain tissues and nerves while others only experience a few changes.

NERVOUS SYSTEM PROBLEMS IN OLDER INDIVIDUALS

Severe memory loss and dementia are not normal part of the aging process, but may be caused by brain diseases for example, Alzheimer disease, (associated with plaques/ tangles forms in the brain).

Delirium (sudden severe confusion) leads to changes in behavior and thinking. Delirium is most often caused by physical illness or mental illness.

Delirium is usually temporary and reversible; often lasts about 1 week but may take several weeks for the mental function to return to normal.

It is sometimes due to illness that is not related to the brain, for example; an infection can cause the older person to become extremely confused. Some medications may also cause this.

Other causes of delirium may include:

- Surgery
- Alcohol or drug withdrawal
- Electrolyte disturbances
- Poisons
- Infections such as pneumonia or urinary tract infections.

Behavior problems and thinking can also be caused by diabetes that is poorly controlled. Increasing and decreasing levels of blood glucose can interfere with thought process.

Changes in thinking, behavior and /or memory are important if it is different from the usual or normal pattern and also vital if it affects the patient's lifestyle.

PREVENTION

Physical exercise and mental activities can help the brain stay sharp. Mental exercises include activities such as:

- Physical exercise (promotes blood flow to the brain).
- Reading
- Socialization (becoming involved in conversation)
- Doing some crossword puzzles

Aging changes in the senses

As the individual ages, there are changes in the way the senses deliver information. Senses include;

- Hearing,
- Vision,
- Taste,
- Smell,

- Touch

The senses may become less sharp, making it more difficult for the individual to notice details.

Sensory changes may affect the person's lifestyle. They may have problems;

- Communicating,
- Enjoying activities,
- Staying involved with other people.

As the individuals get older, all of the senses can be affected. Sensory changes may lead to isolation.

When hearing and vision are affected, devices such as glasses and hearing aids, or lifestyle changes may improve the individuals' ability to hear and see.

HEARING

The ears functions include;

- Hearing and
- Maintaining balance.

Hearing occurs when the sound vibrations cross the eardrum to the inner ear. The vibrations are then changed into nerve signals within the inner ear and are then carried to the brain by the auditory nerve.

Balance is controlled in the inner ear.

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As the individual gets older, the structures within the ear begin to change and functions decline. Sometime the ability to hear sounds decreases. The older persons may also have problems maintaining balance as they stand, sit and walk.

Age-related hearing loss is called presbycusis. The individual may also have difficulty telling the difference between certain sounds, may have difficulty hearing a conversation when there is background noise.

Approximately one in three people in the United States between the ages of 65 and 74 has hearing loss, and nearly half of those older than 75 have difficulty hearing.

Having trouble hearing can make it difficult to:

- Understand and follow instructions,
- Respond to warnings,
- Hear phones, doorbells, smoke alarms
- Enjoy talking with friends and family (leading to feelings of isolation).

Hearing aids may help to manage hearing loss.

Abnormal ear noise or ringing in the ear (tinnitus) is another common problem in older population. Causes of tinnitus may include wax buildup over time, changes in the eardrum or medications that damage structures inside the ear.

Impacted ear wax, is a very common problem in the older population, which also cause trouble hearing. The health care provider can assist and remove impacted ear wax.

VISION

As the individual grows older, vision is often affected. The eye structures change with aging.

The cornea becomes less sensitive, so you might not notice eye injuries. By the time the individual becomes 60, the pupils may decrease to about one third of the size they were when the individual was younger.

The pupils may react more slowly in response to darkness or bright light.

The lens may become less flexible, yellow and slightly cloudy. The fat pads that support the eyes decrease and the eyes sink into their sockets. The eye muscles become less capable of fully rotating the eye.

As the individual grows older, visual acuity (the sharpness of vision) gradually declines. Presbyopia (the most common problem experience) is difficulty focusing the eyes on close up objects. Device that can help to correct presbyopia includes:

- Reading glasses,
- Bifocal glasses,
- Contact lenses.

Glare may become intolerable; affecting the ability to see. The older person may even have trouble adapting to darkness and/ or bright light.

Reduced peripheral vision is also common in older individuals.

As the individual gets older, the vitreous humor (a clear, jelly-like substance that fills the middle of the eye) starts to shrink. This may create some tiny floaters (particles) in the field of vision.

The older individual often experience dry eyes. If this condition is not treated, the cornea may become inflamed, infected and/ or scarring can develop. However, dry eyes can be relieved by using eye drops or artificial tears.

SMELL AND TASTE

Some loss of smell and taste is natural with aging.

Many factors can also contribute to the loss of taste and smell such as:

- Nasal problems (nasal polyps)
- Sinus problems (sinusitis)
- Allergies
- Head injury
- facial injury
- Some medications, such as angiotensin-converting enzyme (ACE) inhibitors and beta blockers
- Smoking
- Dental problems

Loss of smell and taste can lead to decreased appetite that result in poor nutrition. Loss of smell and taste also might tempt the individual to use excessive salt or sugar on their meals to enhance the taste, which could be a problem if the individual has hypertension as well as other cardiovascular conditions and diabetes. At time the individual needs to switch to a different medication, if the medication is affecting their ability to smell and taste; other times the individual may simply need to try different spices or change the way that the meal is prepared.

TOUCH, VIBRATION, AND PAIN

The sense of touch

Touch makes the individuals aware of:

- Pressure
- Pain,
- Temperature,
- Vibration,

- Body position.

Within the body, the skin, tendons, muscles, joints, organs have nerve endings that are able to detect sensations.

As the individual ages, sensations may be changed or reduced. The changes may occur due to various factors such as of reduced flow of blood to the nerve endings or to the brain or spinal cord.

The spinal cord function to transmit nerve signals and the brain interprets the signals. When the individual experiences health problems they can lead to sensation changes. For example problems in the brain or brain surgery can result in changes in sensation. Also nerve damage from injury or nerve damage from chronic diseases for example diabetes can result in changes in sensation.

Symptoms of changed sensation will vary depending on the cause. When there is decreased temperature sensitivity, the individual may have difficulty differentiating between cold or cool and warm or hot.

This will cause much safety concerns because the individual is at increase risk of injury for example from frostbite, if exposure to hypothermia or may experience burns from exposure to extreme heat. As well as many other conditions.

Scenario: An older individual with diabetic neuropathy had some difficulty removing his shoes, when his wife assisted; there was a nail in the shoe. He reported that he had no pain or discomfort; was not aware that he had stepped on a nail.

There are also reported cases of older individuals with diabetic neuropathy who had ants covering the entire lower extremity and was not aware. Ants bite marks were obvious later as pimples appear at sites.

As the individuals experience decrease ability to detect touch, vibration, and pressure there is increase risk of injuries, for example; pressure ulcers or other injuries.

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After age 50, some individuals have reduced sensitivity to pain. Therefore when an injury occurs the individual may not know how severe the injury is because the pain may not be severe.

Teach the older persons measures that they can take to help stay safe such as:

- Monitor the thermometer to decide what appropriate attire to wear to avoid feeling chilly or overheated.
- To avoid burns, lower the water heater temperature to no higher than 120°F (49°C).
- Inspect the skin, especially the feet, for injuries.
- Follow up for treatment of an injury; may be very serious even if not experiencing pain.

Aging changes in vital signs

Vital signs include (TPR BP):

- body temperature,
- heart rate (pulse),
- breathing rate,
- Blood pressure.

As the individual gets older, the vital signs may change. Some health problems may cause changes in one or more vital signs.

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BODY TEMPERATURE

Normal body temperature does not change much with aging.
But as the individuals get older, it becomes much harder for the body to control its temperature.

A decrease in the amount of body fat below the skin (subcutaneous) makes it harder to stay warm. The individual may need to dress in layers of clothing to feel warm.

As mentioned earlier aging decreases the ability to sweat. The individuals may have problems telling when they are becoming overheated. This may lead to heat stroke.

The older person may also be at risk for dangerous drops in body temperature.

ALERT!!

Fever

Fever is an important sign of illness or infection in older individuals. Teach patient to see the physician/ health care provider if they experience fever that is not explained by a known cause or illness.

Some older individuals may not be able to produce a higher temperature when they have an infection; therefore, it is important to assess the other vital signs, as well as any signs and symptoms of infection.

HEART RATE AND BREATHING RATE

As the individuals get older the pulse rate may be about the same as before. But with exercise, it may take longer for the pulse to increase and longer for it to slow down after the exercise. The highest heart rate with exercise may also be lower than it was at a younger age.

Breathing rate usually does not change with age. But lung function decreases slightly. Healthy older individuals can usually breathe without effort.

BLOOD PRESSURE

Older individuals often experience orthostatic hypotension; this is a condition in which the blood pressure decreases when the person moves from lying position to standing or from a sitting position to standing. This causes the individual to experience some dizziness because less blood flow is going to the brain.

The risk of having hypertension also increases as the individuals get older. Other heart-related problems that are common in older adults include:

Very slow or fast pulse
Problems with heart rhythm for example atrial fibrillation (a-fib)

EFFECTS OF MEDICATIONS ON VITAL SIGNS

Some medications that are used to treat health problems in older individuals can affect the vital signs. Such as; digitalis used for heart failure and blood pressure medications for example beta blockers may cause the pulse to slow.

Diuretic (water pill) can cause a reduction in blood pressure (hypotension), especially when the individuals change body positions too quickly.

PROBLEMS WITH MEMORY, THINKING AND BEHAVIOR

Alzheimer's

Alzheimer's is defined as a type of dementia that causes the individual to experience problems with memory, thinking and behavior. The symptoms usually develop slowly and they become worse over time. The symptom become so severe that they interfere with the individual‘s daily tasks.

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Alzheimer's is not a normal part of aging**,** although the greatest known risk factor is increasing age, and the majority of individuals with Alzheimer's are 65 and older. But Alzheimer's disease is not just a disease of old age. According to the Alzheimer's association, up to 5 percent of people with the disease have early onset Alzheimer's which is also known as younger-onset, which often appears when the individual is in their 40s or 50s.

Alzheimer's disease is the most common form of dementia**,** which is a general term for memory loss and other intellectual abilities serious enough to cause an interference with daily life. Alzheimer's disease accounts for 60 to 80 percent of dementia cases.

Alzheimer's is **not** the only cause of memory loss.

Many individuals have problems with memory; this does not mean that they have Alzheimer's disease. There are many different causes of memory loss. If you or your love ones are experiencing symptoms of dementia consult with the physician to find out the cause.

Dementia help and support are available

If someone has been diagnosed with dementia, the Alzheimer's Association is one of the most trusted resources for information, education, referral and support.
Call the 24/7 Helpline: 800.272.3900

Visit the online Alzheimer's and Dementia Caregiver Center or locate a support group in your community and you can also visit the Alzheimer's Association virtual library at http://www.alz.org/library/index.asp

Some care giving tips which will assist the caregiver include:

- Instruct caregiver to learn about the disease. Read literature /books, consult with the healthcare professional and attend workshops. May also subscribe to AFA's free caregiver magazine, AFA Care Quarterly.
- Learn how to avoid caregiver burnout by making time for themselves and join caregiver support groups.
- Discuss the situation with family and friends. Support systems are very important
- Pursue interests beyond the care giving role, such as hobbies, exercise, and journaling.

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- Do cognitive stimulation activities with him /her. For example, memory games, listening to music and word puzzles.
- Employ positive thinking. Focus on the individual's remaining strengths and enjoy the relationship while they still can.
- Smile and show kindness, humor and creativity are very important aspects of care giving. Hugs, Smiles, hand massage and other gentle physical contact will help their loved one feel connected and loved.
- Take care of the financial, legal and long-term care planning issues. Try to involve the individual in decision-making, if he /she is still able of providing input, and include his/ her wishes related to any future care and / or end-of-life issues.
- Learn care giving techniques. The main areas include safety concerns, communication skills, managing behavioral changes /challenges and assisting with activities of daily living.
- Understanding the experience, be kind and patient with their loved one.
- Maintain their own mental and physical health. Get involved in activities to reduce stress such as: Exercise, respite and hobbies.
- Ensure communication with the physicians. Become involved in the individual’s medical care. Ask any questions they have regarding the progression of the disease, talk about the concerns and discuss available treatment options.

Reach out for care. Call the Alzheimer's Foundation of America at 866.232.8484, for information, counseling, and referrals to local resources nationwide.

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For More Information

To learn more about support groups, services, research centers, research studies, and publications about Alzheimer's disease, contact the following resources:

Alzheimer's Disease Education and Referral (ADEAR) Center
P.O. Box 8250
Silver Spring, MD 20907-8250
1-800-438-4380 (toll-free)
www.nia.nih.gov/Alzheimers

The National Institute on Aging's ADEAR Center offers information and publications for professionals, families, and caregivers on diagnosis, treatment, patient care, caregiver needs, long-term care, education and training, and research related to Alzheimer's disease. The staff answers telephone, email, and written requests and make referrals to local and national resources. The ADEAR website provides free, online publications in English and Spanish; email alert and online *Connections* newsletter subscriptions; an Alzheimer's disease clinical trials database; the Alzheimer's Disease Library database; and more.

Alzheimer's Association
225 N. Michigan Avenue, Floor 17
Chicago, IL 60601-7633
1-800-272-3900 (toll-free)
1-866-403-3073 (TDD/toll-free)
www.alz.org

Alzheimer's Foundation of America
322 Eighth Avenue, 7th Floor
New York, NY 10001
1-866-AFA-8484 (1-866-232-8484; toll-free)
www.alzfdn.org

Eldercare Locator
1-800-677-1116 (toll-free)
www.eldercare.gov

Family Caregiver Alliance
180 Montgomery Street, Suite 1100
San Francisco, CA 94104
1-800-445-8106 (toll-free)
www.caregiver.org

NIHSeniorHealth
www.nihseniorhealth.gov/alzheimersdisease/toc.html

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THIS SECTION IS PREPARED FOR CNA / HHA – Assistance with self administration of medications

Assistance with self-administration of medication

Drug/ Medication, a pharmaceutical drug, also referred to as medicine or medication, can be defined as any chemical substance intended for use in the medical diagnosis, cure, treatment, or prevention of disease.

Various States allow individuals, who do not have a license, such as the Certified Nursing Assistants (CNA) and Home Health Aide (HHA) to assist and help individuals with their medications.

Assisting is not giving or administering the medication; the individual is simply assisting/ helping the patient /client /resident take their medications. The patient has to be competent meaning that the he /she is cognizant regarding when a medication is required and understands the purpose for taking the medication. Be aware of what your state requires and allows you to do.

Assistance with self-administration of medication includes:

- Taking the medication from where it is stored and bringing it to the patient. Make sure the medication container has the label that can be read; if unable to read, you cannot assist with the medication and you must notify your supervisor,
- While you are in the presence of the patient, read the label and make sure that the information is accurate for example, the right patient and other vital information we will discuss later in this course. Open the container for the patient, remove the prescribed amount of medication from the container, and then close the container,
- Place the oral dose that is prescribed, in the patient's hand or in another container and help the patient by lifting the container to his or her mouth,
- Application of topical medications,
- Returning the medication container to proper storage and
- Keeping a record of when a patient receives assistance with self-administration.

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See the Florida Statues below (follow your state guidelines):

Legal Standards

The Florida State Statute (Chapter 465.003) states that "administration means the obtaining and giving of a single dose of medicinal drugs by a legally authorized person to a patient for her or his consumption." (Florida State Statute, 2014)

Florida State Statute (Chapter 400.488) lists what assisting with the self-administration of medicines is and the laws about it when the person is cared for in their own home.

400.488 Assistance with self-administration of medication.—

(1) For purposes of this section, the term:

(a) “Informed consent” means advising the patient, or the patient’s surrogate, guardian, or attorney in fact, that the patient may be receiving assistance with self-administration of medication from an unlicensed person.

(b) “Unlicensed person” means an individual not currently licensed to practice nursing or medicine who is employed by or under contract to a home health agency and who has received training with respect to assisting with the self-administration of medication as provided by agency rule.

(2) Patients who are capable of self-administering their own medications without assistance shall be encouraged and allowed to do so. However, an unlicensed person may, consistent with a dispensed prescription’s label or the package directions of an over-the-counter medication, assist a patient whose condition is medically stable with the self-administration of routine, regularly scheduled medications that are intended to be self-administered. Assistance with self-medication by an unlicensed person may occur only upon a documented request by, and the written informed consent of, a patient or the patient’s surrogate, guardian, or attorney in fact. For purposes of this section, self-administered medications include both legend and over-the-counter oral

dosage forms, topical dosage forms, and topical ophthalmic, otic, and nasal dosage forms, including solutions, suspensions, sprays, and inhalers.

(3) Assistance with self-administration of medication includes:

(a) Taking the medication, in its previously dispensed, properly labeled container, from where it is stored and bringing it to the patient.

(b) In the presence of the patient, reading the label, opening the container, removing a prescribed amount of medication from the container, and closing the container.

(c) Placing an oral dosage in the patient's hand or placing the dosage in another container and helping the patient by lifting the container to his or her mouth.

(d) Applying topical medications.

(e) Returning the medication container to proper storage.

(f) Keeping a record of when a patient receives assistance with self-administration under this section.

(4) Assistance with self-administration **does not** include:

(a) Mixing, compounding, converting, or calculating medication doses, except for measuring a prescribed amount of liquid medication or breaking a scored tablet or crushing a tablet as prescribed.

(b) The preparation of syringes for injection or the administration of medications by any injectable route.

(c) Administration of medications through intermittent positive pressure breathing machines or a nebulizer.

(d) Administration of medications by way of a tube inserted in a cavity of the body.

(e) Administration of parenteral preparations.

(f) Irrigations or debriding agents used in the treatment of a skin condition.

(g) Rectal, urethral, or vaginal preparations.

(h) Medications ordered by the physician or health care professional with prescriptive authority to be given “as needed,” unless the order is written with specific parameters that preclude independent judgment on the part of the unlicensed person, and at the request of a competent patient.

(i) Medications for which the time of administration, the amount, the strength of dosage, the method of administration, or the reason for administration requires judgment or discretion on the part of the unlicensed person.

(5) Assistance with the self-administration of medication by an unlicensed person as described in this section does not constitute administration as defined in s. 465.003.

(6) The agency may by rule establish procedures and interpret terms as necessary to administer this section.

Florida State Statute (Chapter 400.4256) lists what assisting with the self-administration of medications is and the laws about it when the person is cared for in an assisted living home*:*

NURSING HOMES AND RELATED HEALTH CARE FACILITIES

400.4256 Assistance with self-administration of medication.--

(1) For the purposes of this section, the term:

(a) "Informed consent" means advising the resident, or the resident's surrogate, guardian, or attorney in fact, that an assisted living facility is not required to have a licensed nurse on staff, that the resident may be receiving assistance with self-administration of medication from an unlicensed person, and that such assistance, if provided by an unlicensed person, will or will not be overseen by a licensed nurse.

(b) "Unlicensed person" means an individual not currently licensed to practice nursing or medicine who is employed by or under contract to an assisted living facility and who has received training with respect to assisting with the self-administration of medication in an assisted living facility as provided under

s. 400.452 prior to providing such assistance as described in this section.

(2) Residents who are capable of self-administering their own medications without assistance shall be encouraged and allowed to do so. However, an unlicensed person may, consistent with a dispensed prescription's label or the package directions of an over-the-counter medication, assist a resident whose condition is medically stable with the self-administration of routine, regularly scheduled medications that are intended to be self-administered. Assistance with self-medication by an unlicensed person may occur only upon a documented request by, and the written informed consent of, a resident or the resident's surrogate, guardian, or attorney in fact. For the purposes of this section, self-administered medications include both legend and over-the-counter oral dosage forms, topical dosage forms and topical ophthalmic, otic, and nasal dosage forms including solutions, suspensions, sprays, and inhalers.

(3) Assistance with self-administration of medication includes:

(a) Taking the medication, in its previously dispensed, properly labeled container, from where it is stored, and bringing it to the resident.

(b) In the presence of the resident, reading the label, opening the container, removing a prescribed amount of medication from the container, and closing the container.

(c) Placing an oral dosage in the resident's hand or placing the dosage in another container and helping the resident by lifting the container to his or her mouth.

(d) Applying topical medications.

(e) Returning the medication container to proper storage.

(f) Keeping a record of when a resident receives assistance with self-administration under this section.

(4) Assistance with self-administration **does not** include:

(a) Mixing, compounding, converting, or calculating medication doses, except for measuring a prescribed amount of liquid medication or breaking a scored tablet or crushing a tablet as prescribed.

(b) The preparation of syringes for injection or the administration of medications by any injectable route.

(c) Administration of medications through intermittent positive pressure breathing machines or a nebulizer.

(d) Administration of medications by way of a tube inserted in a cavity of the body.

(e) Administration of parenteral preparations.

(f) Irrigations or debriding agents used in the treatment of a skin condition.

(g) Rectal, urethral, or vaginal preparations.

(h) Medications ordered by the physician or health care professional with prescriptive authority to be given "as needed," unless the order is written with specific parameters that preclude independent judgment on the part of the unlicensed person, and at the request of a competent resident.

(i) Medications for which the time of administration, the amount, the strength of dosage, the method of administration, or the reason for administration requires judgment or discretion on the part of the unlicensed person.

(5) Assistance with the self-administration of medication by an unlicensed person as described in this section shall not be considered administration as defined in s. 465.003.

Assistance with self-administration of medication includes:

(a) Take the medication from where it is stored and bring it to the patient. Make sure the medication container has the label that you can read.

(b) In the presence of the patient, reading the label, opening the container, removing a prescribed amount of medication from the container, and closing the container.

(c) Placing an oral dosage in the patient's hand or placing the dosage in another container and helping the patient by lifting the container to his or her mouth.

(d) Applying topical medications.

(e) Returning the medication container to proper storage.

(f) Keeping a record of when a patient receives assistance with self-administration.

Assistance with self-administration does not include:

(a) Mixing, compounding, converting, or calculating medication doses, **except for** measuring a prescribed amount of liquid medication or breaking a scored tablet or crushing a tablet as prescribed.
(b) The preparation of syringes for injection or the administration of medications by any injectable route.
(c) administration of medications through intermittent positive pressure breathing machines or a nebulizer.
(d) administration of medications by way of a tube inserted in a cavity of the body.
(e) administration of parenteral preparations.
(f) Irrigations or debriding agents used in the treatment of a skin condition.
(g) Rectal, urethral, or vaginal preparations.
(h) Medications ordered by the physician or health care professional with prescriptive authority to be given "as needed," **unless the order is written with specific parameters** that preclude independent judgment on the part of the unlicensed person, and at the request of a competent patient.
(i) Medications for which the time of administration, the amount, the strength of dosage, the method of administration, or the reason for administration requires judgment or discretion on the part of the unlicensed person. Assistance with the self-administration of medication by an unlicensed person as described in this section does not constitute administration as defined in s. 465.003.The agency may by rule establish procedures and interpret terms as necessary to administer this section.

In the state of Florida unlicensed personnel **CANNOT** assist with:

- Injections/ shots
- Vaginal routes
- Rectal routes,
- Urethral routes or
- Nebulizers or Intermittent positive pressure breathing therapy (IPPB)**.**

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Check with your state; find out what you are allowed to do and stay within those guidelines / regulations.

INDICATIONS FOR USE

An indication is a valid reason to use a certain medication, test, procedure, or surgery. The opposite of an indication is a contraindication; a reason to withhold a certain medication or medical treatment etc. due to the harm that it would cause the patient. All medications have an indication for use. Most of the indications for use are related to the desired actions of the medication. If you do not know the indication for use of a medication that your patient is taking, use a reference such as a drug guide or ask your supervisor or a Pharmacist. Some medications are not allowed to be used or they are contraindicated for some patients. Therefore, the medication should not be given to the patient. Other medications may only be used with some patients when they are used with extreme caution and with frequent monitoring.

A very common contraindication is an allergy or sensitivity to the medicines. Always check the patient's medical record for allergies and ask the patient before you assist. Sometimes you will observe NKA on the patient's medical record /chart; this indicates that the patient has no known allergies. Sometimes you may observe NKDA- this means no known drug allergies.

ALLERGY

Allergy involves hypersensitivity or an exaggerated response of the immune system, often to common substances such as medication, pollen or foods. A rash or a life threatening reaction such as Anaphylaxis can occur if the patient takes a medication that he/ she is allergic to.

Some types of Allergies are:

- Food allergies e.g. peanuts, peanut butter, shellfish
- Drug allergies
- Latex allergies e.g. latex gloves
- Seasonal allergies
- Animal allergy

Some signs of Allergic reactions include:

- Itching , Hives
- Redness of the skin

- Dyspnea, Shortness of Breath (SOB)
- Problems with breathing
- Throat swelling
- Loss of consciousness
- Irregular heart beat /rhythm
  Decrease in the blood pressure (BP)
  Abdominal discomfort / cramps
- Nausea and / or vomiting
- Death

Anaphylaxis

Anaphylaxis is a severe, whole-body *allergic reaction* to a chemical or substance that has become an allergen. An allergen is a substance that can cause an allergic reaction. Some drugs such as, Penicillin, aspirin, x-ray dye, morphine and others may cause an anaphylactic-like reaction when the patient is first exposed to them. Anaphylaxis is an emergency situation that requires medical attention immediately. Call 911 immediately.

Symptoms will develop very quickly, often within seconds or minutes. They may include:

- Difficulty breathing
- Facial swelling
- Redness of the skin
- Itchy /hives
- Light headed / dizziness
- Loss of consciousness
- Swelling of the face and eyes
- Chest tightness/ discomfort
- Palpitations
- High pitched abnormal breathing sounds
- Wheezing
- Coughing
- Speech becomes slurred
- Difficulty swallowing
- Swelling of the tongue
- Restlessness / anxiety
- Diarrhea
- Abdominal pain
- Nausea or vomiting
- Death

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Medication interactions

Some medications may interact with other medications, various herbs, foods, supplements and drink for example; alcohol. Medication interactions can cause the medication that the patient is taking, to be less effective, or cause unexpected side effects, or cause an increase action of a particular medication. Some drugs interaction can be very harmful to the patient. Always read the medication label for every prescription and nonprescription medications.

Take the time to learn about the medication interactions. You will reduce the risk of potentially harmful medication interactions and / or side effects.

Medication interactions fall into three categories:

Drug to drug interactions

Drug to drug interaction occur whenever two or more medications react with each other. This drug-drug interaction may cause the patient to experience an undesired side effect / reaction, for example, patient who takes a blood thinner e.g. Coumadin and then takes aspirin for a headache will increase the risk of bleeding.

Drug to food/beverage interactions

Drug to food / beverage interactions result from medications reacting with the food or drink. For example, having alcohol with some medications may cause the patient to feel sleepy or slow his/ her reaction.

Drug to condition interactions

Drug to condition interactions may occur when the patient has an existing medical condition / disease that makes some medications potentially harmful. For example, patients with high blood pressure may experience an undesired reaction if he/she takes a cough or decongestant medication.

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Fig.1. Tablets and containers

ADVERSE REACTIONS / SIDE EFFECTS

Side effects

A side effect is also known as an adverse effect, adverse event, or undesirable secondary effect when a medication or treatment goes beyond the desired effect and causes or leads to a problem (an undesirable secondary effect). Some side effects are not life threatening but others can be life threatening.

Side effects vary for each patient, and depend on different factors such as;

- the patient's general health,
- age,
- the stage of their disease,
- weight and
- Gender.

Adverse drug reactions

Adverse drug reactions are serious and they can also lead to death. Some medications also have toxic effects. Learn about the possible adverse drug reactions, side effects and the toxic effects of all the medications that your patient is taking so that you can report them.

DOSAGES/ DOSES

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All medications have prescribed amount or dosage ranges for the adults and for children. Older patients are at greater risk for adverse drug events because of the metabolic changes and decreased medication clearance that is associated with the aging process. Some adult dosages may be lowered for the older patient because they are more susceptible to adverse medication reactions, side effects, over dose and even toxicity. Adolescents can take the adult dosages. Children are given medications with a dose that is based on their body weight.

Toxicity

Toxicity is the degree to which a substance “a toxin” can cause harm to humans or animals. Acute toxicity involves the harmful effects in an individual or organism through short-term exposure. Subchronic toxicity is the ability of a toxic substance to cause effects for more than one year but less than the lifetime of the exposed organism. Chronic toxicity is the ability of a mixture of substances or a substance to cause harmful effects over an extended time period, usually upon continuous or repeated exposure, that can sometimes last for the entire lifetime of the exposed organism/ individual.

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Medication Routes and Forms

Route of medication administration refers to the path by which the medication is taken into the body. Medications are made in various forms and for administration by different routes. Some routes may be unsafe or ineffective. This can be due to the patient's health conditions, such as unable to swallow, dehydration or other factors. Some medications can be administered by more than one route, for example Tylenol is available in tablet form, suppository and also in liquid etc. The tablet may be taken by mouth in tablet or liquid form; however, a child might not be able to take the tablet and able to take the liquid and/ or a suppository may need to be given by a nurse per rectum if the patient is unable to take the medication by mouth. The medication order has to state the form and the route that the physician wants the patient to take.

Route of administration will vary depending on:

- The property of the medication,
- Its action of the medication,
- The desired effect,
- The patient's physical wellbeing,
- The patient's mental status,
- The patient's age.

Routes of medication administration include:

• oral route (by mouth)
• sublingual route (under tongue)
• buccal route (inside the cheek)
• otic (ear)
• ophthalmic (eye)
• topical (applied on the skin)
• nasal route (nose)
• vaginal route (vagina)
• rectal (by rectum)
• inhalation (by inhaling)
• nasogastric tube (tube in the nose to the stomach)
. gastrostomy tube (tube in the stomach)
• intramuscular (into the muscle)
• subcutaneous (under skin)
• intradermal (in the skin)
• intravenous (into the vein via an I.V)
• transdermal (through the skin e.g. a patch on the skin)

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Forms of medications
Medications are made in various forms meaning that they are available in more than one form. Therefore a tablet cannot be given if the order says liquid.

Different forms of medications include:
• capsule (regular and sustained release)
• tablet
• suppositories (rectal and vaginal)
• elixir
• syrup
• cream
• oral suspension
• tincture
• paste
• ointment
• drop (ears and eye)
• Intravenous /IV solutions and suspension
• metered dose inhaler

Fig. 2 Oral suspensions, Tablets, drops and ointment

Some Route and Form considerations

When a patient is very ill or has a problem such as difficulty with swallowing, the following things can be done:

- Crush the pill and put it into applesauce or open the capsule and put it into applesauce. Some medications **cannot be crushed**. Some of these medications include time release capsules, sublingual medications, some coated tablets and other medications that may upset the stomach. We will discuss later in this course. Check with the Pharmacist or your supervisor to find out if a medication can be crushed or what that medicine can be mixed with.
- Use the liquid form of the medication. Using a liquid form can also help patients who have trouble swallowing or using the tablets and/or the capsules. At other times the nurse may have to administer the medicine by I.V.

MEDICATION DELIVERY CONSIDERATIONS

Age is one factor that you must consider when giving medications;

- For an infant you may use a dropper, syringe or nipple for liquid oral medication.
- For the toddler you may use a cup or spoon for oral liquid medication.
- For the preschool and School Age children, they may be able to take tablets and capsules.
- For adolescents, they are allowed to take adult dosages, forms and routes of Medications.

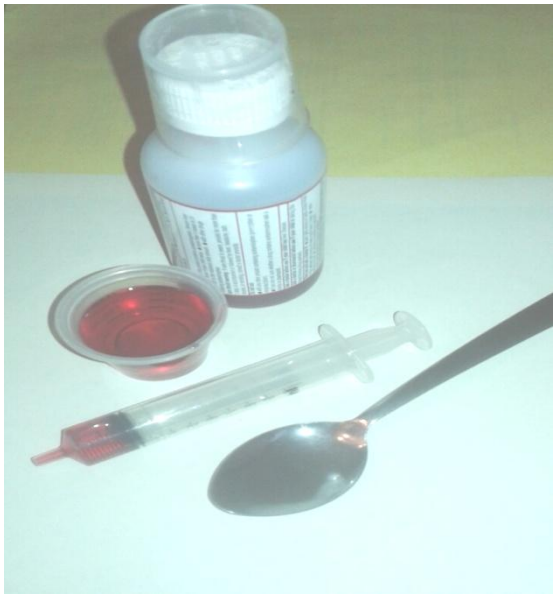

Fig. 3 Liquid Medicine: syringe, spoon

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The Written Physician Order
A prescription (Rx) is the written order to the pharmacist listing the name and quantities of drugs or ingredients to be mixed and/or dispensed to a specific patient or resident including the directions for use. A Physician/ Doctor or another qualified individual, such as a nurse practitioner (ARNP), must write a complete Order. The order has to be legible/ clear – able to read and complete for the medication before it can be administered or taken.

A complete order must have the:

- The Name of the patient
- The name of the medication,
- Strength/ Dose of the medication,
- The form of the medication,
- Quantity of drug,
- The route of administration,
- time the medication should be given
- or frequency that the medication should be taken,
- The date and time of the order
- signature of the MD or nurse practitioner who order the medication

For example:

Date ordered	PHYSICIAN'S ORDER
04/21/2015	Patient: Felicia Br **Amoxicillin** *500mg* **TAB # 21** Take **one** Tablet by **mouth *three times daily*** *with food*
	Signature of Physician: *Dr. Michel Conry* *Date: 04/21/2015* Time: *10am*

There are various formats of Physician's order but they all have to include the factors that are listed above to ensure that the order is complete.

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Medication / Prescription LABEL:

CAUTION!**!!!** Nurses, CNAs, and unlicensed staff cannot change a prescription label.

Medication labels need to have:

(1) The patient's name,
(2) The name and form of the medication,
(3) Strength / Dosage and route of the medication,
(4) Quantity of drug
(5) Time / frequency the medication should be taken
(6) Any directions for use or special precautions
(7) Prescription date and number of refills
(8) Prescriber's / physician's name
(9) Pharmacy name, address, and phone number
(10) Prescription (Rx) number for pharmacy filing
(11) Expiration date/discard date/do not use by date

For example:

Pharmacy ALX
123 LANE
MB, Florida 33123 (863) 000-0000
Rx 7107465 *fill date orgRx 04/21/2015*
Patient: Felicia Br 4/21/2015
Take one Tablet by mouth three times daily *with food*
Amoxicillin 500mg TAB
Dr. Michel Conry
QTY 21
Discard after 04/20/2016
No refills- Dr. must Authorize

Some labels will also include the patient's address.

Examples of AUXILIARY Labels/ instructions:
Take With Food,
Shake Well Before Using
May Cause Drowsiness

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Take With Plenty of Water
Do Not Drink Alcohol
Take Before or After Meals

Food and Drug Administration (FDA) announced new prescription drug labeling requirements that will clarify how medications might affect women who are pregnant or breastfeeding and men and women of reproductive potential. The final **"Pregnancy and Lactation Labeling Rule**" removes the previously used pregnancy letter categories – A, B, C, D, and X – and places information into three main categories:

- **Pregnancy:** Labor and delivery guidelines now fall under this category, which also now includes information for pregnancy exposure registries. Such registries track data on the effects of certain approved medications on pregnant and breastfeeding women.
- **Lactation:** Previously labeled "Nursing Mothers," this category provides information such as how much drug is secreted through breast milk and the potential effects on a breastfed infant.
- **Females and Males of Reproductive Potential:** This is a new category that includes information on how a certain medication might affect pregnancy testing, contraception, and infertility.

The new labeling changes go into effect on June 30, 2015. Over-the-counter medication labels will not be affected. The new rules are available for viewing online through the *Federal Register.*

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Fig. 4.Liquid, Pill organizer, tablet, ointment

Infection Control

Infection control refers to guidelines / regulations that are designed for educating, reporting, monitoring, managing and isolating healthcare related and/or community acquired infections. Therefore, infection control measures are important to control, eliminate or minimize employee exposure to bloodborne pathogens and communicable diseases.

Infection control standards and policies published by Occupational Safety and Health Administration (OSHA), the Centers for Disease Control and Prevention (CDC) the Association for Professionals in Infection Control and Epidemiology (APIC) and National Institute of Occupational Safety and Health (NIOSH) have made recommendations. These guidelines are designed to reduce the transmission of bloodborne and other pathogens and apply to every patient regardless of their diagnosis.

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Universal Precautions

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infection for HIV, HBV and other blood-borne pathogens.

The hands are one of the most common transmitters of pathogens from one person or item to either yourself or another person. According to the Centers for Disease control and Prevention (CDC), appropriate hand washing results in a reduction of both nosocomial (hospital-acquired) and community infections. Guidelines from National and International infection control and prevention organizations have acknowledges that *hand washing is the single most important procedure for preventing infections*.

HAND WASHING

Review the common aseptic practices that should be followed in all settings to prevent the spread of infections. The following applies to patients as well as individuals assisting with medications:

- Wash hands BEFORE and AFTER providing any type of care,
- Always wash your hands after using the bathroom; after urination, bowel movements, and changing of sanitary products,
- Wash hands when there is contact with body fluid and /or substance (for example; blood, saliva, urine, vomit, feces, respiratory secretions, wound drainage, and any other body fluid or drainage).
- Wash hands after covering the mouth and / or nose when coughing or sneezing.
- Wash hands before preparing food
- Wash hands before eating food.

The components of good hand washing include:

Using adequate amount of soap
Rubbing the hands together to create some friction and
Rinsing under running water

The mechanical action of washing and drying removes most of the transient bacteria that is present. Washing hands thoroughly between patient contacts and after contact with body fluids, blood, excretion, secretion, articles or equipment contaminated by them is an important component of infection control and isolation precautions.

Some institutions recommend use adequate soap, make a lather and continue rubbing for ***15-20 seconds***. To wash for the correct time, sing -Happy Birthday to You- two times. If soap and water are not available, you can use an alcohol based hand rub to clean your hands. These foam gels significantly reduce the number of germs on the skin and are fast acting. Follow your institutions' policy and procedure.

Fig. 4 Pill bottles, organizer, blister pack, medicine cup

When assisting with self- administration of medication, the patient must be able to take his/ her own medication; you are simply assisting. Assisting involves:

1. Reminding the patient to take the medication
2. You may prepare items such as: water, juice, cup, or spoon needed to assist the patient in the self administration of medicine.
3. Open and close the medication container
   You may tear open the foil of prepackaged medications
4. Observe the client/patient self-administering the medication
5. Assist the client/patient in the self-administration process. Examples of such assistance include the steadying of the arm, hand or other parts of the client/patient body so as to allow the self-administration of medication
6. If the client/patient removes too much medication you may assist the client/patient by placing unused doses of solid medication back into the medication container
7. Reorder prescriptions from the pharmacy Any time family/client/patient leaves out medication for the client/patient (e.g.. pills in a dish), the patient/client must self-administer the medication

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REPORT any difficulty that the patient may have such as; removing medications from the bottle, understanding the medications, confusion, not taking the medication or complaints of side effects etc.

Fig. 5 liquid medicines

When assisting with the medications:

Always do the - Triple check

Triple check :

1. The medication label with the medication record,
2. Check the medication record, then the medication label,
3. then the medication record before providing the medication to the patient

And FOLLOW the **Rights of medication administration !!!!**

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Rights of medication administration
When assisting a person with their medications, you must make sure that you are following the **Rights of medication administration**. Medication safety is the responsibility of everyone who handles medications. The original five rights of medication administration (Right patient, medication, dosage, time, and route) have increased to the nine rights of medication administration within the ALF, adding the right documentation, right to refuse, right reason, and right response which we will review in this course study. Other resources have also added the Right drug preparation, Right assessment and the Right approach. Follow your facility's policy and procedures.

According to the Elder affairs 2012, medication errors alone, occurring either in or out of the hospital, are estimated to account for 7,000 deaths annually. Adverse drug events cause more than 770,000 injuries and deaths each year and cost up to $5.6 million per hospital.

1. The Right Patient

ALWAYS check to make sure that you have the Right patient.
Two patients may have the same name, and the same birthday
Patients may be moved to a different room
Patients may switch beds within the same room

Identification Procedure

ALWAYS verify the name of the patient by getting:
Two verbal identifiers: *Ask the patient to state their full name*,
and their *Date of Birth (DOB).*
Check the ID bracelet very carefully
Check the identity of the patient before you help him/her with their medication.
It is mandatory for you to use *at least two (2)* identifiers- Use 2 methods to identify the patient. If you assist the wrong patient this may cause a fatal error.
You ***cannot*** use a bed or room number as identifiers. A patient may accidentally enter a room and even go to bed in the wrong room.

Some identifiers include the patient's:

- First, middle and last name,
- DOB – Date of Birth (month, day and year),
- Photograph,
- a medical record number/ code number given to that patient
- social security number.

Do NOT help with any medication if you cannot identify the patient. Tell your supervisor. It is an error when a patient takes another patient's medication. All medication errors have to be reported.

2. The Right Medication

The medication may belong to someone else in the household,
so ALWAYS verify the medication label.
Do NOT use any medication that has a label that you cannot read.
Do NOT use any medication unless it has a complete label.
Read and check the label against the medication record at least three times and tell the person the name of the medicine before you help them.
If the person says they do not take this medicine, STOP. Do not help. Report this to your supervisor. It is an error if a patient takes the wrong medication. This must be reported.

3. The Right Dosage

The patient needs to take the right dosage that is ordered by the Physician or the Health care Practitioner, to achieve the desired effect of the medication. Taking too much of the medication can lead to an overdose. Take steps to reduce overdose errors. Follow the systems in place – for triple checking dosages. Make sure the medication is recorded, so that a second dose is not accidentally given. Giving a half of the ordered dose of medication is also not the correct dosage. Not giving the right amount of the drug is also a medication error and has to be reported.

4. The Right Time

Timing is also very important when assisting with self-administration of medication. Some medications need to reach a consistent level in the bloodstream to work effectively. This means that the medications need to be taken at the right times to keep that level of medication in the system. Usually, the liver or kidneys will remove the medication from the blood and high levels of the medication can build up in the system which can lead to toxicity if that dose is taken too soon. Also, if the patient miss a dose or wait too long between the doses, there might not be enough of the medication in the body to work effectively.

The standard acceptable time is within one hour before or after the scheduled administration time or it is considered a medication error.

5. The Right Route

Check the medication label to find out the right route. If the medication label states by mouth and the medication is placed in the ear. It is an error and must also be reported.

6. The Right Documentation

The right documentation involves properly recording /documenting each dose offered on the patient's record. Document only *AFTER* you have assisted with the ordered medication. Never document that you assist with a medication before you have actually helped the patient. You may be called to another task and another individual takes over; your documentation ahead of the task will stop that other CNA/HHA from assisting, because the documentation reflects that the patient has already received the medication when he/she did not. Document the time, route, and any other specific information, including refusal of medication. If the patient does not want to take the medication, notify the supervisor. Patient has a right to refuse; the supervisor will make sure that follow up is done with the patient and the physician as needed.

7. Right to REFUSE

By Florida's law, a resident/patient has the right to refuse a medication. A patient should not be forced to take a medication. Also, you cannot hide the medication in the patient's food and / or drink.

8. Right Reason

Confirm the rationale for the ordered medication. Is the patient taking the Tylenol for the headache or for fever? If you are not sure of the reason for a medication, ALWAYS ask. Ask the doctor, pharmacist or the nurse. Knowing the reason for the medication will help you to check the patient for the desired effect.

9. Right Response

Assisting with self administration of medication is not just helping the patient to take the medication; It also involves observation of what happens afterward. Professionals are trained to know how medications move through the body, what the effect of the medication is, and what adverse effects may occur. Adverse effects may include allergic

reactions to the drug, overdose of the drug, and drug interactions between multiple drugs.

Make sure that the medication had the desired effect. If a Tylenol was taken for a headache, check the patient and find out if the headache was relieved. If the headache was not resolved the Physician / health care practitioner needs to be notified. Document the patient's report and your observation and that the supervisor / physician was notified.

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MEDICATION ERRORS

A medication error is any preventable event that can cause or lead to inappropriate medication use or harm to the patient while the medication is in the control of the health care professional, pharmacist, patient, or consumer. Errors in prescribing, dispensing and administering medications can lead to serious injuries. Other causes of medication errors include; poor communication between health care providers, between providers and patients, prescribing errors; product labeling, packaging, dispensing, distribution, education, monitoring, medical abbreviations, sound alike medication names, Illegible prescriptions or confusing directions.

Most medication errors can be prevented. Patient needs to be educated regarding their medications and take responsibility for monitoring the effectiveness and side effects. Always ask questions or share concerns with the physician or pharmacist and other health care workers. Also the health care worker should take steps to prevent medication errors.

DO NO HARM!!!!

HOW TO PREVENT MEDICATION ERRORS

Always TRIPLE Check Medications- the three checks.
The DOs and DON'Ts can help you make sure that your patient's medication works safely to improve their well being and overall health.

Medication DOs...

1. DO assist resident in taking each medication exactly as it has been prescribed.
2. DO make sure that all your patients'/residents' physicians and Health Care Practitioners know about all your patients'/ residents' medications.
3. DO let your patients' physicians know about any other over-the-counter medications, supplements, vitamins and herbs they are taking.
4. DO try to use the same pharmacy to fill all your patients' prescriptions, so that the pharmacist can help you keep track of everything the patients are taking.
5. DO keep medications out of the reach of children.
6. DO use the triple check system when checking medications.
7. DO read the medication labels, follow the instructions.
8. DO make sure all medication orders are written and signed.
9. DO make sure all medication orders are on the right patient/ resident chart.
10. DO identify the patient/ resident every time you assist with the medications.

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Medication DON'Ts...

1. DO Not change your patients' medication dose or schedule without talking with their physician or health care provider.
2. DO Not share or use any medications prescribed for any other patient or person.
3. DO Not break or crush pills unless the patient's physician instructs you to do so.
4. DO Not use medications that are expired.
5. DO Not use abbreviations.
6. DO Not assist with any medications already poured by someone else. You cannot be sure what it is.
7. DO Not touch the medications with your hand.
8. DO Not hide the medications in food. Medications cannot be "hidden" in foods or drinks. A resident may knowingly take a medication with food if it is easier.
9. DO Not use contaminated medications or medications dropped on the floor.

Unlicensed personnel are forbidden from using the *pill organizers*. Assistance with self-administration does not include pill organizers. Only a family member or friend may assist patients/ residents with pill organizers, except for pharmacists, physicians, and nurses (ARNP, RN, LPN) licensed under 464.003,FS.

The Complete medication records must include:

- The patient's name (First, middle and last name)
- Room number and bed number if applicable,
- The age/ date of birth (DOB),
- The name of the MD/ Physician,
- All Allergies (food or medications etc),
- medication(s) ordered,
- the dose of the medications,
- the route,
- the form,
- the date and the time that the order was written,
- date and time that the medications are to be taken,
- the start and end date of the order and
- the signatures and initials of all who assist with the medication.

Some of the legal rules for record keeping are:

- Writing has to be legible –clear for others to read and understand
- Use dark ink pen on the patient's medical records

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- Whenever you make an error, use your pen and cross it off with **one thin line**.
  Write error, sign your name and date the cross off. Do not try to cover up the mistake with marker or scribble. Do not rewrite over the error; just one straight line through the error. White out cannot be used when you make a mistake.

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Some self-administration procedures:
As you assist, observe the patient for the correct self-administration procedure. Below are some routes that you can assist with, in the State of Florida.

Topical (Skin Surface) medications are available in creams, lotions, ointments, patches, and sprays.

Topical medications are applied to the skin and absorbed by the skin.
Do NOT use Topical medications on skin that is not intact unless the medicine is being used to treat the broken skin. The procedure for using this route is:

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm/ verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Open the container or tube
- Place the top upside down to keep it clean
- Both the CNA/ HHA and the patient need to put on glove to protect the skin- the medication will have an effect on your skin as well as the patient.
- You may put the medicine on a tongue depressor. Use a cotton tip applicator or sterile gauze for the face. Apply the topical medicine in long strokes, if hair growth is present, apply the medicine in the direction of hair growth.
- Always follow your institution policy and procedures.
- Do not cover with a bandage unless directed by the physician.

Fig. 6 Topical ointment

Fig.7 Topical creams & ointments

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Transdermal

These medications are also applied to the skin and are absorbed by the skin.

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Both the CNA / HHA and the patient need to put on gloves
- If patient has an old patch, remove it
- Wash the new site with soap and water
- Locate a site that has no hair growth (e.g. upper arm, chest)
- Alternate the application sites to avoid skin irritation. Notify the health care provider of irritation
- Dry the new site
- Put the dose on the patch or strip. Do not let it touch your skin.
- With the medicine down against the skin, tell the patient to move the patch /strip gently over about 2-3 inch area to spread the medicine out but do not rub.
- Cover it with a plastic wrap or special dressing; tape it in place so that it will stay on skin without falling off.
- Write on the patch/dressing; the time, date, and your initials
- Always follow your institution policy and procedures.

Transdermal – Some are already made with the medication

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Both the CNA / HHA and the patient need to put on gloves
- Open the package and remove the patch
- Date, time and initial the patch
- Remove the backing from the patch
- Apply the patch to a dry, hairless site on the body, follow package instructions
- Check for and remove the old patch
- Alternate the application sites to avoid skin irritation. Notify the physician of irritation
- Dispose of the supplies and wash hands immediately to avoid absorbing the medication yourself.

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Remember as you assist the patient you will often have to :

- Remind the patient to take the medication
- You may prepare items such as: water, juice, cup, or spoon needed to assist the patient in the self administration of medicine.
- Open and close the medication container
  You may tear open the foil of prepackaged medications
- Observe the client/patient self-administering the medication
- Assist the client/patient in the self-administration process. Examples of such assistance include the steadying of the arm, hand or other parts of the patients' body to allow the self-administration of medication
- If the client/patient removes too much medication you may assist the client/patient by placing unused doses of solid medication back into the medication container.

ORAL

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Give the patient the medicine
- Remain with the patient until he/she swallows the medication.
- Follow your institution policy and procedures.

Buccal and Sublingual

Buccal medication is placed inside of the cheek.
Sublingual medication is placed under the tongue.

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Give the patient the medication
- Tell the patient to put the medication inside the cheek for the buccal medicine or under the tongue (sublingual)
- Remind the patient to leave the medication in place until it dissolves.

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Some medications should not be crushed or chewed

Some medications should not be crushed or chewed for several reasons. If a patient's condition or status does not allow for the oral solid dosage forms such as capsules, tablets, etc., check with the physician to see if it is acceptable to crush the medication. If crushing or chewing is not allowed, consult with the pharmacist or physician to prescribe the medication in a liquid or another suitable form.

Buccal tablets and sublingual tablets

Buccal tablets (cheeks) and sublingual tablets (under the tongue) are designed to dissolve in the oral fluids of the mouth for a more rapid and complete absorption than in the stomach or Gastrointestinal tract.

Enteric Coated tablets

Enteric Coated tablets are designed to pass through the stomach and then dissolve in the gastrointestinal (GI) tract to prevent the destruction of the medications by the acid in the stomach, to prevent the medication from irritating the lining of the stomach, and / or to achieve a prolonged effect/action from the drug.

Sustained or Time Release Capsules

Sustained or Time Release Capsules are designed to release medication over a sustained period or a prolonged time, usually 8-24 hours. The pellets or beads that are in the capsule are designed to dissolve at different rates to reduce stomach irritation or to prolong the action of the medication. It is acceptable to open the capsules and administer the contents in food but do not crush or chew the beads or pellets. Check with the Physician or a pharmacist if you are not sure, before you assist with the medication.

Sustained or Time Release Tablets

Sustained or Time Release Tablets are designed to release the medication over a sustained period or a prolonged period, usually 8-24 hours. The tablets are designed to dissolve at different rates to either reduce stomach irritation or prolong the action of the drug. Some specific time release tablets include formulations with a slow release core, mixed release granules, and multilayer tablets. Do not crush or chew these medications. Check the physician or pharmacist before assisting with these medications.

<u>Ophthalmic (Eye)</u>

- Always identify the patient (Right Patient), gather supplies, wash hands

- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Both the CNA / HHA and the patient need to put on gloves.
- Assist the patient to a sitting position or into a supine position.
- Tell the patient to tilt the head back
- Tell the patient to look up and away
- Have the patient steady his / her hand against the forehead with the eye dropper in the other hand
- Pull down the lower eye lid
- Put the ordered number of drops into the space under the lower eye lid
- If it is an eye ointment, pull down the lower lid
- Tell the patient to squeeze the tube, place the medicine on the inside of the lower eye lid, (from the inside near the nose to the outer part of the inside of the lid). Do not touch the eye with the tip of the tube. Ask the patient to close the eye.
- Clean off the excess with a tissue

Whenever the patient has two or more eye medications to be administered, the medications should be scheduled / administered at least 5-10 minutes apart.
The patient's vision may be blurry after the application. Instruct / teach the patient to remain seated until his/ her vision clears up.

Otic (Ear)

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Make sure the ear drops is warm/ body temperature
- Instruct the patient to lie on the side
- Make sure that the ear that requires the medicine is upward
- Pull the ear lobe up and back to straighten the ear canal
- While you continue to hold the ear, tell the patient to put the drops against the side of the inner ear
- Continue to hold the ear lobe in place until you do not see any more medicine in the ear
- Tell the patient to keep the head to the side for at least 10 minutes

Fig.8 Ear drop and irrigation bulb

Nasal Preparations (Nose / Nostril) Nasal Drops and Nasal Sprays

Nasal Drops

- Always identify the patient (Right Patient), gather supplies, wash hands (supplies e.g. Nose drop medication with label, gloves, cotton balls or tissues)
- If the nasal medication requires refrigeration, store in refrigerator and monitor temperature with a daily log
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Identify the nostril (left, right or both) to receive the medication
- If nose drops are suspension, then you need to shake well
- Assist the patient to a comfortable position and turn the head so that the affected nose is facing up
- If bottle serves as the dropper, remove the cap and place it upright on a barrier or on a clean, dry surface
- If nose drops, instill the prescribed number of drops into nostril or both nostrils. Do not let tip of the dropper touch the nose or any other surface. Recap the container.

If Nasal Spray:

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Prime the nasal inhaler device by holding the bottle upright and away from face while spraying into air
- Have the patient sit up if possible. Instruct to hold head upright, slightly forward
- Identify the nostril (left, right or both) to receive the medication

- Gently press side of nostril that is not receiving drug using finger of other hand
- Keep bottle upright and insert spray tip into nostril (no more than 1/4 inch). Point the tip to the back outer side of nose. Ask the patient to breathe out through the mouth
- Instill prescribed number of sprays into one or both nostrils as prescribed. Have patient press spray tip firmly and quickly and breathe in through nose and out mouth.
- Clean spray tip and device according to manufacturer's guidelines or institution policy and recap container.
- Instruct patient to remain in same position for about five minutes with affected nostril upwards. Wipe off any excess drainage with clean tissue and gently place a cotton ball in the external nostril to prevent leakage.
- Instruct patient to avoid blowing nose for at least 15 minutes.
- If another dose of the same or different nasal medication is required in the same nostril, wait the amount of time recommended by the manufacturer (see package insert) or as prescribed. Repeat dose in either nostril as prescribed
- Replace medication into labeled box/bag and return medication to proper storage area.

Inhalation Medications

Metered-dose inhalers and Turbo inhalers:

Metered-dose inhalers

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Shake the Metered-dose inhaler bottle and remove the cap
- Instruct the patient to breathe out
- Instruct the patient to keep the chin up
- Instruct the patient to place his/her lips around the mouthpiece and
- start to breathe in slowly, press down on the canister one time
- Keep breathing in slowly to completely fill your lungs
- Have the patient hold his/her breath for 10 seconds and then slowly breathe out Count to 10 slowly will assist patient. (holding breath allows the medicine to reach the airways of the lungs)
- Repeat puffs for amount of times ordered by physician. Wait about 1 minute in between puffs.
- Instruct the patient to rinse his/her mouth with water and spit it out
- Replace the cap on the Metered-dose inhaler when finished.

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Turbo inhalers

- Always identify the patient (Right Patient), gather supplies, wash hands
- Confirm / verify that it is the right medication and it is not expired
- Read the medication label to the patient and confirm understanding
- Slide the sleeve away from mouthpiece
- To unscrew, turn the mouthpiece counter-clockwise
- Place the medication into the stem of the mouthpiece
- Rescrew the inhaler
- Slide the sleeve all the way down to make a hole into the capsule
- Instruct the patient to tilt the head back
- Instruct patient to blow out all the air in the lungs and then breathe in deeply and hold it for 10 seconds while the mouthpiece is in their mouth
- Repeat until all of the medication has been used
- When medicine is finished instruct the patient to rinse the mouth.

NOTE:

Rinsing the mouth and gargle with water helps remove any medication left in the mouth and throat. It also reduces the urge to cough. Rinsing and gargling may also help prevent a mouth infection.

Rinse the mouthpiece with warm water. Dry the turbo-inhaler completely before putting it away.

After you have assisted the patient:

- Remove and dispose of gloves, discard any barriers used
- Wash hands thoroughly
- Monitor for side effects or adverse effects
- Return the medications to the proper storage area
- Record that assistance was provided on the patients' record
- Always document the administration of a PRN -as needed medication and the patients' response.

ABBREVIATIONS

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Abbreviation means a shortened form of a word or phrase. Abbreviations can lead to some serious or life threatening errors, therefore there are guidelines in place. The Joint Commission has set guidelines and rules; all healthcare settings has to standardize abbreviations, acronyms and symbols that they are using. They are also required to adhere to a Do Not Use list.

Some abbreviations and their meanings are listed below.

ABBREVIATION and MEANING

a.c. =Before meals
ACL =Anterior cruciate ligament
ad lib= Freely
a/g ratio = Albumin to globulin ratio
AKA = Above the knee amputation
a.m. =Morning
ASA =Aspirin
b.i.d =Twice a day
BM =Bowel movement
BMP= Basic metabolic panel
BP =Blood pressure
BS =Blood sugar
Ĉ= with
CC= cubic centimeters
Cap =Capsule
C&S = Culture and sensitivity
CVA =Cerebrovascular accident
D.C. =Discontinue
Disp= dispense
DNR =Do not resuscitate
DVT= Deep venous thrombosis
ec = enteric coated
elix = elixir
ETOH =Alcohol
Ext =Extract
fl or fld =Fluid
g. or Gm. or g =Gram
Gr =Grain
gtt. =Drop
h. or hr. =Hour
H&H: = Hemoglobin and Hematocrit
H&P = History and physical examination
hs = At hour of sleep, bedtime

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HTN= hypertension /high blood pressure
IM = Intramuscular
I.V. = Intravenous
L = liter
MAR = medication administration record
MEq =Milliequivalent
Min =Minute
Mg =Milligram
ML =Milliliters
NPO =Nothing by mouth
N/V = Nausea or vomiting
NTG =Nitroglycerin
O&P = Ova and parasites
O2 = oxygen
O.D.= Right eye
O.S.= Left eye
O.U.= Both eyes
Oz = ounce
ORIF = Open reduction and internal fixation
P= Pulse
p.c. =After meals
PERRLA = Pupils equal, round, and reactive to light and accommodation
p.m. =Evening
p.o. =By mouth
Post = after
prn =as needed
Pre = before
prn= as needed
q am= every morning
qh= every hour
q2h= every 2 hours
q3h=every 3 hours
q4h= every 4 hours
qid = four times daily
qhs=every night or at bedtime
qpm= each evening
R= respirations
R/O = Rule out
RLQ = Right lower quadrant
RUQ = Right upper quadrant
Š= without
SL = sublingual
SOB =Shortness of breath

Sol =Solution
ss. =One half
Stat =Immediately
SQ = Subcutaneous
Supp= suppository
susp. =Suspension
Syr. =Syrup
T= temperature
tab. =Tablet
Tbsp =Tablespoonful
Tsp = teaspoon
Tid =Three times a day
Tinc =Tincture
TPR= temperature /pulse /respirations
Top =Topically
tsp. =Teaspoon
UA or **u/a**= urinalysis
ung. =Ointment
VS = vital signs
Wt= weight

The Do Not Use List includes some of the following:

Do Not Use **u**, or **for unit**. Mistaken some times for zero. You must write "unit"
Do Not use iu for international unit. Mistaken for IV. Write "international unit"
Do Not Use Q.D., QD, q.d., qd (Daily). Mistaken for each other. Write "Daily".
Do Not Use Q.O.D. QOD, q.o.d., qod (every other day). Write "every other day"
See the complete Do Not Use List (The Joint Commission http://www.jointcommission.org/assets/1/18/Do_Not_Use_List.pdf**)**

MEDICATION CLASSIFICATIONS

A medication can have several names. There is usually a generic name for a medication and one or more brand names. Generic names for medications are chosen by a variety of official bodies. Drug manufacturers choose the brand names of their products. There can be many brands of a particular medication. The brand names are usually easier to pronounce and easier to remember. For example the generic name: Acetaminophen is often called Tylenol (brand name).

Medication classes

A medication/ drug also belong to one or more medication/ drug classes. A drug class is a group of drugs that have something in common. They are similar in some way, but

they are not identical. Medications can also be classified or grouped according to their function or the system that they treat.

Drugs can be in a class with other drugs because: the drugs are related by their **chemical structure / makeup**.

For example*:* Aspirin is a salicylate. Its full chemical name is acetylsalicylic acid or ASA.

Aspirin can prevent the formation of blood clots by stopping molecules in the blood called platelets from clumping or aggregating. So it belongs to a drug class called anti-platelets or platelet aggregation inhibitors.

Function:

Aspirin is used to reduce fever. Drugs that treat fever are called anti-pyretic drugs.

narcotic analgesics reduce pain

System that they treat such as;

Cardiac medications – refers to the heart
Respiratory / Pulmonary medications - refers to the Lungs etc.

Proper Storage of Medications

There are specific directions for stating the appropriate temperature at which medications shall be stored. Research has shown that the storage at a higher or a lower temperature have produced undesirable results. The Pharmacopeia;
a book containing an official list of medicinal drugs together with articles on their preparation, formulas, dosage, use etc. may be accessed at United States Pharmacopeia (USP) / www.usp.org/.

The United States Pharmacopeia and The National Formulary (USP–NF) is a book of public pharmacopeial standards. It contains standards for (chemical and biological drug substances, dosage forms, and compounded preparations), medical devices, and dietary supplements.

Storage definitions, as defined in the General Notices section of the USP-NF, for recommended conditions commonly specified on product labels as follows:

Freezer: The temperature is maintained thermostatically between -20 C and -10 C (-4 F and 14 F).
Cold: Any temperature not exceeding 8 C (46 F).

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A refrigerator is a cold place in which the temperature is maintained thermostatically between 2 C and 8 C (36- 46 F).
Cool: Any temperature between 8 C and 15 C (46-59 F). A substance that requires cool storage, alternatively may be stored in a refrigerator, unless otherwise specified by the individual USP monograph.
Room Temperature: The temperature prevailing in a working area.
Controlled Room Temperature: A temperature maintained thermostatically that encompasses the usual and customary working environment of 20 C to 25 C (68-77 F) that allows for brief deviations between 15 C and 30 C (59-86 F) that are experienced in pharmacies, hospitals, and warehouses.
Warm: Any temperature between 30 C and 40 C (86-104 F).
Excessive Heat: Any temperature above 40 C (104 F).

Protection from Freezing: freezing may cause a substance to lose its potency or strength, or alters its characteristics. The container label must have appropriate instructions to protect the substance from freezing.

Safe Medication Storage

Keep all medications out of reach of children. Keep medications out of the reach of anyone who might abuse/ misuse them. Be careful if medication looks like water or drink. Make sure that medications that need to be in the refrigeration are not stored in an area where they will freeze.
Make sure the medications are kept separate from food items. A good idea is to place them in a container that separates them. Always Store the medication in its original container. Do not mix different medications together in one container. This will make it difficult to identify during an emergency

Store all medicines in one designated location together. The location should be a dry and cool place. Properly dispose of any medication that has expired or that the physician has discontinued.

Proper Disposal of Medications
Federal Guidelines

Discontinued or Unused portions of medications must be disposed of properly to avoid harm. Never flush prescription medications down the sink / drain, or the toilet unless the label or instructions tells you to. The U.S. Food and Drug Administration (FDA) website is an excellent recourse for information regarding proper disposal of medications.

FDA and the White House Office of National Drug Control Policy developed Federal guidelines that are summarized below:

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- Follow any specific disposal instructions on the prescription drug labeling or patient information that accompanies the medicine. Do not flush medicines down the sink or toilet unless this information specifically instructs you to do so.
- Take advantage of community drug take-back programs that allow the public to bring unused drugs to a central location for proper disposal. Call your city or county government's household trash and recycling service (see blue pages in phone book) to see if a take-back program is available in your community. The U.S. Drug Enforcement Administration, working with state and local law enforcement agencies, periodically sponsors National Prescription Drug Take Back Days.
- If no disposal instructions are given on the prescription drug labeling and no take-back program is available in your area, throw the drugs in the household trash following these steps.

  1. Remove them from their original containers and mix them with an undesirable substance, such as used coffee grounds or kitty litter (this makes the drug less appealing to children and pets, and unrecognizable to people who may intentionally go through the trash seeking drugs).

  2. Place the mixture in a sealable bag, empty can, or other container to prevent the drug from leaking or breaking out of a garbage bag.

Over 600,000 pounds of unneeded, unwanted, or expired prescription medications were properly disposed of during the final Drug Enforcement Administration (DEA) National Prescription Drug Take-Back Day, held September 27, 2014.

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