Common Precautions for Health Care Professionals

**Purpose:** This course is designed to review common types of precautions that health care professionals often utilize when treating a variety of clients. Precautions covered include standard/universal precautions, isolation precautions, sternal precautions, hip precautions, weight bearing precautions, and common precautions when treating a person with deep vein thrombosis or lymphedema. In addition, precautions to remember when treating a client utilizing cold and heat modalities are also reviewed. The course will give the healthcare provider a general understanding of the above precautions while recognizing that it is their professional responsibility to follow individual physician recommendations at all times.

**Objectives:**

1. The student will understand the general use of Standard Precautions
2. The student will understand the general use of Isolation Precautions
3. The student will understand the general use of Sternal Precautions
4. The student will understand the general use of Hip Precautions
5. The student will understand the general use of Weight Bearing Precautions
6. The student will understand the general use of precautions for individuals with Deep Vein Thrombosis
7. The student will understand the general use of precautions when utilizing heat or cold modalities
8. The student will understand the general use of precautions for individuals with lymphedema

**Introduction:**

Healthcare professionals, regardless of setting, are commonly called upon to put into place and/or monitor certain common precautions for their clients. These include very commonly utilized precautions such as Standard and Isolation Precautions, to more diagnosis-specific precautions such as those for clients with a deep vein thrombosis or with lymphedema. For this reason, it is important that healthcare workers are familiar with some general indications for the implementation of precautions as well as have a general knowledge of some of the common precautions utilized. While this course will review those general indications and principles, it is important to note that precautions put into place often vary from physician to physician. The healthcare professional should always clarify with the individual physician what specific precautions are appropriate for individual clients.

**Standard Precautions**

Infectious diseases are caused by a variety of organisms. They may be cause by bacteria, viruses, fungi or parasites. A common way to get an infectious disease is through direct contact. In other words, a person comes into contact with an infected individual and the infectious agent is transmitted. Direct contact can also come from an animal or a disease being passed from a mother to an unborn child. Indirect contact is another way to spread infection. An infectious agent can be found on a doorknob, or a table surface and be passed on to another person who touches that surface. Less common ways to spread infection are through insect bites or food contamination. All of these routes lead to the spread of infection. (Mayo Clinic, 2009) Health care settings are a prime location for the spread of infection. Many healthcare workers are familiar with the term Universal Precautions. These were precautions developed in the 1980’s to protect health care workers from the transmission of infectious agents. Standard precautions were developed in the 1990’s and went beyond universal precautions to protect the patient from the healthcare worker, the healthcare worker from the patient and to protect from patient to patient transmission of infection. Standard Precautions are infection control...
procedures that apply to the handling and care of all patients in a health care setting regardless of whether or not they carry a known infectious agent. Utilizing standard precautions, one assumes that every patient you come in contact with has an infectious potential. The precautions protect against the transfer of infectious agents through blood, body fluids, secretions, non-intact skin and mucus membranes and other sources. Standard precautions utilize some or all of the following protective measures:

- Hand hygiene
- Protective wear/equipment (not always indicated)
- Sharp injury prevention
- Equipment management
- Respiratory Hygiene

**Hand hygiene** involves taking care to minimize touching areas/surfaces that may be contaminated as well as performing regular hand washing. Hand washing should be performed:

- Before touching a patient
- After contact with blood, body fluids, secretions, both intact and non-intact skin, and mucus membranes
- When touching inanimate objects in the area of the patient
- After removing gloves (CDC, Standard Precautions, 2007)

The following is an excerpt from the Guidelines for Hand Hygiene in Healthcare Settings by the Centers for Disease Control and describes the recommended hand washing technique:

“When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Follow the manufacturer’s recommendations regarding the volume of product to use. When washing hands with soap and
water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet. Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis. Liquid, bar, leaflet or powdered forms of plain soap are acceptable when washing hands with a non-antimicrobial soap and water. When bar soap is used, soap racks that facilitate drainage and small bars of soap should be used. Multiple-use cloth towels of the hanging or roll type are not recommended for use in health-care settings.” (CDC, Guidelines for Hand Hygiene in Healthcare Settings, 2002)

*Note – as part of hand hygiene, the wearing of artificial nails is also discouraged in anyone who may have direct contact with a patient.

Utilizing **protective equipment** is another way to deter the spread of infection. Protective equipment helps by forming a non-porous barrier that can interfere with transmission. Examples are:

- Gloves
- Masks
- Gowns
- Goggles or face shields

**Sharp injury prevention** is achieved through the proper use and disposal of needles and lancets. Used sharp instruments are to be handled carefully after use, disposed of in a special container, and the container emptied and discarded in a location designed for this purpose.

**Equipment management** refers to the cleaning and disinfecting of surfaces and objects that regularly come in contact with patients. This may include door knobs, mats, tables, weights, and other items regularly used. These items should be cleaned with a disinfectant solution designed to kill harmful bacteria.

Finally, **respiratory hygiene**, sometimes referred to as cough etiquette, includes covering the mouth and nose area with a tissue when sneezing or coughing or utilizing the crook of the elbow instead of the hand to cover your mouth and
nose. Respiratory hygiene also includes practicing good hand washing techniques, disposing of used tissues, separating yourself more than 3 feet from an individual with a respiratory condition or having the individual with a respiratory infection wear a protective mask. (Wisconsin Department of Health Services, 2008)

**Transmission Based Precautions (Isolation Precautions)**

In addition to the above Standard Precautions, some clients with an identified infectious agent may be placed on additional precautions sometimes referred to as Transmission Based Precautions or Isolation Precautions. These precautions are often put into place for infectious agents such as C. difficile, MRSA, Shingles, Influenza, etc… Isolation precautions are divided into 3 sub-groups identified as:

- Contact Precautions
- Droplet Precautions
- Airborne Precautions

**Contact Precautions (commonly used for C. difficile, MRSA, VRE, VRSA)**

1. Patient placed in room alone or with another infected individual
2. Wearing of gown and glove for all health care personnel who come in contact with individual – Gown should be put on when entering room and taken off when leaving room.
3. Wash hands immediately after removing gown and gloves
4. Use disposable equipment as much as possible or resident dedicated equipment. If you must use equipment that will be re-used with another patient, equipment must be thoroughly cleaned and disinfected.

**Droplet Precautions (commonly used for Influenza, Sepsis, Pneumonia, Whooping Cough)**

1. Includes all precautions listed in Contact Precautions
2. Mask is worn
Airborne Precautions (commonly used for Shingles, SARS)

1. Includes all precautions listed in Contact and Droplet Precautions
2. Mask or Individual Respirator is worn
3. Patient may be in a specially ventilated room. If such a room is not available, door to room is to be kept closed as much as possible. (Guidelines for Isolation Precautions – CDC, 2007)

**Sternal Precautions**

Sternal precautions are commonly recommended following open heart surgery or any surgery in which the sternum has been cut in two pieces and then repaired (wired together) following the surgical procedure. This procedure is known as a sternotomy and the sternum is actually “sawed” through. Although the procedure sounds drastic, the recovery is generally not very painful following the procedure. (Sundt, 2008) The most common type of surgery in which this occurs is a Coronary Artery Bypass Graft surgery commonly referred to by the acronym CABG. The surgery is used to treat coronary artery disease when one or more of the arteries to the heart are blocked or partially blocked. The surgical procedure takes a vein from another area of the body (many times the leg) and grafts it into the heart to “bypass” the blocked artery. (Weinrauch, 2008)

Other surgeries where a sternotomy may be performed are valve replacements and repairs. Following surgeries in which a sternotomy is performed, many doctors will place their patients on what are referred to as sternal precautions. Generally, sternal precautions are to be maintained for 4-8 weeks following surgery as this is generally the length of time it takes for a broken bone to heal. There are a variety of protocols for sternal precautions but in general they are as follows:

- UE exercise should be limited to gentle isometric exercise that is performed below shoulder level and in forward flexion and extension.
• Avoid UE abduction, external rotation and scapular retraction. Also avoid doing unilateral UE exercise.
• Do not lift anything over 10 lbs.
• Avoid excessive twisting and turning of the body
• Do not push or pull anything (for some that includes not using UE to push or pull up in bed – a log-rolling technique is generally taught for moving from supine to sit)
• Avoid driving and heavy housework
• Do not hold your breath during activity
• Brace chest when coughing or sneezing (Sometimes done by holding a pillow close to the chest)
• Limit use of canes and walkers (refrain from putting a lot of pressure into UE when using assistive devices, sometimes handheld assistance for walking is suggested.) (DeTurk, 2004)

*Due to the increased strength of the material that is used to “wire” the sternum together, there are many doctors that do not feel the use of sternal precautions are necessary.

**Hip Precautions**

The hip consists of the head of the femur bone (ball) which fits into the acetabulum (socket) of the pelvic bone. Synovial fluid and ligaments, which are located around the joint, assist with the smooth movement of the joint. When any of these components are damaged by diseases such as Osteoarthritis, Rheumatoid Arthritis or a Traumatic Arthritis (following injury such as a hip fracture), pain and restriction of movement can occur. A partial (hemiarthroplasty) or total hip replacement (arthroplasty) is commonly performed when the hip has been damaged to the extent that there is considerable and consistent hip pain which cannot be remedied in other ways, and considerable difficulty with movements such as walking. Hip replacements are most common in the elderly and in women. Hip replacements are performed by replacing the hip joint with man-made parts of metal, plastic or ceramic material. Sometimes cement is used to help hold the parts in place. Other times,
parts utilized are made from material that allows the bone to grow and connect with the artificial part. These are referred to as "non-cemented" hip replacements and are often used in the younger population. Sometimes a surgeon will use a combination of "cemented" and "non-cemented" parts. (American Academy of Orthopedic Surgeons, 2009) A common problem following surgery is the dislocation of the hip. The ball and socket are smaller when replaced and this leads to the possibility of dislocation. For this reason, surgeons will usually place their patients on hip precautions following a total or partial hip replacement. Hip precautions vary between physicians and care settings but usually last from 6 to 12 weeks. The precautions themselves vary depending on the approach to the surgery (anterior, posterior, or lateral) as well as the type of materials utilized in the surgery. In their simplest form hip precautions are generally listed as 3 basic precautions:

- **Do not rotate the hip (internally or externally)**
  Sample precaution – Do not turn your toes inward
- **Do not cross (adduct) hip beyond midline**
  Sample precaution - Do not cross your legs
- **Do not bend (flex) hip beyond a 90 degree angle.**
  Sample precaution - Do not bend down to reach for something or sit in a low chair (Addy, 2006)

From this list of basic precautions, all other precautions stem. Vanderbuilt University Physical Therapy Department lists the following precautions for total hip replacement patients (Total Hip Precautions).

- “Do not combine two or more of the following movements: bending way over, turning toes inward, twisting body.
- When lying on your back, keep your operative leg positioned so that toes and kneecap point up toward ceiling.
- Do not lie on your operative hip for six weeks following surgery. When lying on your non-operative side, make sure you have a pillow between your knees.
- Do not sit in a low chair or recliner. Sit in firm, high chairs (or place cushions in lower chairs), preferably with armrests. This will make it easier for you to get out of the chair.
- Do not sit in booths or low chairs when dining out.
- Do not sit on a low toilet. Use an elevated toilet seat for the first twelve (12) weeks following surgery.
• No crossing of the legs
• Continue to use your walker or crutches until your surgeon specifies otherwise.
• Stairs: UP: Step up with your non-operative leg first, then raise your operative leg up to the same step. DOWN: Step down with your operative leg first, and then lower your non-operative leg to the same step.” (Vanderbuilt University Medical Center)

**Weight Bearing Precautions**

Weight bearing precautions are often put into place following a variety of lower extremity orthopedic surgeries. Some common surgeries that may require weight bearing precautions include:

- Total and partial hip replacements
- Open reduction and internal fixation fracture repairs
- Knee replacements and some other knee surgeries

Weight bearing precautions are generally defined as follows:
- Non-weight bearing → No weight allowed
- Toe touch weight bearing → Approximately 10% of normal weight
- Partial weight bearing → Less than 50% of normal weight allowed
- Weight bearing as tolerated → As much weight as the patient will allow
- Full weight bearing → 100% weight allowed (Cooper, 2006)

**Deep Vein Thrombosis (DVT) Precautions**

Deep vein thrombosis, or a blood clot, may occur in a variety of areas in the body but most commonly they occur in the lower extremities. A DVT is often caused by surgery and/or immobility. For example, DVT’s are common following hip replacement or knee replacement surgery. Signs and symptoms of a DVT include redness, warmth, edema, increased temperature, and limb tenderness, however, about 50% of individuals show no signs at all. One of the more severe consequences of a deep vein thrombosis is the possibility that the clot may “break off” or become mobile in the body and get lodged and block blood flow to the lungs. This is
referred to as a pulmonary embolism. Possible signs that a pulmonary embolism is present are fever, increased pulse, shortness of breath, and/or a heavy feeling in the chest and or pain with breathing. When a blood clot occurs in one of the deep veins, treatment is aimed at keeping the blood clot from getting bigger, keeping it from “breaking off” and traveling, and preventing further blood clots from forming. Most commonly DVT’s are treated with anticoagulants. Additionally, they may be treated with a filter inserted in the vein and compression stockings. (National Heart Lung and Blood Institute, 2007)

General precautions to be aware of:

Health care professionals must be aware of any individual with a DVT. When a DVT is diagnosed, the individual is often required to limit mobility, including not participating in therapy, until the individual has begun anticoagulant medications, and the medication has been determined to be “working”. When the medications are working, the doctor often gives clearance for increased mobility, including participation in therapy. Other precautions sometimes include refraining from utilization of therapeutic heat as heat causes the veins to dilate and increases the chance of pulmonary embolism. (Note – some physicians actually prescribe heat to dissolve blood clots, however this should only be done with caution and with a physician order). Estim is also contraindicated for DVT as is massage or manual lymph drainage techniques. Massage causes increased flow of the lymphatic system and may also cause the blood clot to dislodge. (Prentice, 2005)

**Lymphedema Precautions**

Lymphedema is a blockage in the lymphatic system that results in swelling, most commonly, to the limbs. There are inherited conditions that cause lymphedema (primary lymphedema), however lymphedema secondary to other conditions are more common. These include lymphedema caused by
surgery, cancer, infection or injury. The symptoms include swelling in a part of or in the entire extremity, tightness and aching in the affected limb, and possible restriction of movement in the extremity. Other than medications, treatment often involves light exercises, compression techniques (bandages, special garments, pneumatic), and manual lymph drainage techniques. (MFMER, 2007)

The following are general precautions and contraindications for lymphedema treatment taken from the standards of care utilized by Brigham and Women’s Hospital rehabilitation department:

“General Contraindications (for Lymphedema)

- No heat in the involved quadrant
- No blood pressure taken in the involved extremity
- No exercise with active infection
- No exercise with excessive pain
- No ultrasound in the involved quadrant for patients with a history of cancer only

General Precautions

- Rapid exacerbation of lymphedema as it may be a sign of a deep vein thrombosis or new malignancy
- New redness in the involved extremity as it may be a sign of infection
- Unmanaged lymphedema

Manual lymph drainage (MLD)

Contraindications:

- Active infection: e.g. cellulitis
- Signs and symptoms include: erythema, warmth, local edema, tenderness to touch, and potentially systemic signs of fever, chills and myalgias
- Impaired arterial perfusion
- Potential or known malignant tumor that has not been treated
- Malignant tumor that is in the early stage of treatment and is in the area to be addressed with MLD. The patient should complete 2-3 cycles
of chemotherapy prior to initiating treatment. See below for precautions in cases of palliative care.

Precautions:

- History of cardiac disease, specifically congestive heart failure (CHF), obtain clearance from cardiologist to begin MLD
- Renal failure
- Current medical treatment for malignant tumor. MLD is considered palliative in this case and the patient, therapist and MD agree that the potential benefits of MLD in providing comfort outweigh the potential risk of spreading the disease.
- History of deep vein thrombosis and current use of anticoagulation medications.
- History of insulin dependent diabetes mellitus (IDDM) or non-insulin dependent diabetes mellitus (NIDDM) as altering fluid balance may alter blood sugar levels

Compression Bandages and Garments

Contraindications:

- Arterial disease and/or ulcers. An arterial Doppler or perfusion test can be used to rule them out.
  a. Signs and symptoms of arterial disease include: diminished pulse compared to opposite extremity; pale, bluish, smooth, shiny and cold or clammy skin; and presence of arterial ulcers. Test for capillary refill in the nail beds.
  b. Signs and symptoms of arterial ulcers: distal 1/3 of lower leg, small, round, shallow, little drainage, pain with elevation.

- Signs of infection or wound (Standards of Care, 2007)

**Precautions for Use of Cryotherapy and Thermotherapy**

(Heat and Cold Modalities)

The use of superficial hot and cold modalities is a common occurrence in many healthcare environments. It is important to realize that these forms of treatment must be used with the proper care. Cryotherapy can be delivered in the form of ice massages, ice packs, and cold baths. Its general use is
usually for one of the following: to relieve pain, reduce swelling and inflammation, and to reduce bleeding. Cold applications are indicated for some common conditions including:

- Acute/subacute inflammation
- Acute or chronic pain
- First degree burns
- Edema
- Muscle spasms and strains
- Bursitis
- Tendonitis
- Arthritis
- Spasticity

Some contraindications for cold applications include:

- Cold hypersensitivity
- Cold intolerance
- Utilizing over a regenerating nerve
- Raynaud’s syndrome
- Impaired circulation/ peripheral arterial disease

Precautions to keep in mind when utilizing a cold modality include:

1. Monitor the individual’s skin throughout application
2. Never place cold pack directly on skin, always wrap in a towel or other protective surface
3. Never leave cold pack on skin for longer than 20 minutes
4. May need to monitor blood pressure while using cold applications
5. Avoid applying directly to wounds that are 2-3 weeks old

Superficial thermotherapy (heat modality) can be delivered in the form of hot packs, heating pads, paraffin baths and whirlpools. Its general use is usually for one of the following: to decrease pain and stiffness, to improve range of motion and joint movement, and to increase relaxation and healing. Heat applications are indicated for common conditions including:
• Contractures
• Arthritis
• Inflammation
• Muscle spasms
• Sympathetic nervous system disorders

Some common contraindications for heat applications include:

• Acute inflammation or hemorrhage
• Impaired sensation
• Impaired cognition
• DVT
• Severe peripheral vascular disease
• Existing fever
• Malignancy/ cancer
• Radiation therapy

Precautions to keep in mind when utilizing a heat modality include:

1. Monitor the individual’s skin throughout the application
2. Watch for increased edema, redness or any blistering
3. Note any changes in individual’s respiration and blood pressure
4. Do not use heat on a new injury that exhibits increasing edema
5. Never place heat source directly on skin but wrap in a towel or other protective surface
6. Do not leave heat source on area for longer than 20 minutes (Bracciano, 2008)

**Conclusion:**

The precautions reviewed in this course are commonly utilized in various health care settings including hospitals, long term care facilities, outpatient clinics and even home care environments. Health care professionals are often given the task of implementing and monitoring these precautions. For this reason, it is important for all health care workers are familiar with the general concepts surrounding precautions that are outlined in this course.
References:


