Learning Objective: Recite general precautions and contraindications for patients who wish to work in the water.

There are as many different lists of precautions and contraindications as there are therapy pools. The important point to remember is this: labeling a condition a "precaution" allows the therapist the discretion to treat or not treat the patient. Labeling a condition a "contraindication", on the other hand, takes the discretion out of the aquatic therapy provider’s hands. If a facility chooses to label something a contraindication, they must make sure never to allow a person with that condition into their pool. A contraindication means “no exceptions”.

If your patient presents with any of the following conditions, disorders or infections, you need to make a calculated decision about the relative potential for harm — to the patient and to others — with aquatic therapy.

Possible Precautions or Contraindications: If your patient has

- A documented or anecdotal risk of aspiration; orders reading “Thickened Liquids only” or “Nothing by Mouth”; an absent cough reflex
- An open access port to lungs (open stoma; on ventilator)
- A nasogastric (NG) or gastrostomy (G-) tube or a PEG
- A colostomy, urostomy, or ileostomy bag
- An area of open, macerated or non-intact skin, especially non or poorly healing wounds
- A rash or skin condition (contact dermatitis, eczema, psoriasis); a chlorine or other halogen sensitivity
- Environmentally communicable condition (head lice; athlete’s foot)
- Incontinence of bladder or bowel, especially diarrhea
- An infectious respiratory disease (cold, flu, tuberculosis)
- An infection of the skin or nares especially an antibiotic-resistant infection (MRSA, VRSA)
- A stool-borne infection (Hepatitis A; E-Coli)
- Significant cardiovascular disease or respiratory compromise (low vital capacity; low ejection fraction)
- A low T-cell count (or other sign of immunocompromise)
- Instability of ligament or capsule (ACL tear; history of shoulder dislocation)
- Poor thermoregulation skills (multiple sclerosis; children; pregnant women)
- Ventilation tubes for ears; prone to ear infections
- A seizure disorder
- Diabetes, especially insulin dependent DM
- Exercise induced chest pain (angina)
- Autonomic dysreflexia
- Orthostatic hypotension
- Active joint inflammation (rheumatoid arthritis, hemophilia)

Or if your patient is:

- Significantly dehydrated
- Feverous, especially >101
- Taking a diuretic
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- On dialysis
- On chemotherapy
- On post-surgical restrictions to motion (e.g. no twisting of spine, no crossing legs over midline, no abduction of shoulder)
- Pregnant
- Very young (< 1 year old)
- Fearful of water (hydrophobia)
- Combative or difficult to control
- Sensitive to chlorine or other pool chemicals
- Mentally impaired to the point of the inability to be safe in water
- Culturally unable to be seen in immodest dress or to share pool facilities with the opposite sex.

Then you will need to be aware of any potential risks with immersion and exercise in water. Only you and your facility infection control and other management can decide which should become precautions and which should be absolute contraindications to aquatic therapy.

Let’s examine the reasons behind these potential barriers to aquatic participations one at a time.

A documented or anecdotal risk of aspiration; orders reading “Thickened Liquids only” or “Nothing by Mouth”; an absent cough reflex

Patients who are on aspiration precautions, especially those with an absent cough reflex, are unable to keep liquid from entering their trachea — or unable to expel liquid effectively before it enters the lungs. Certainly, patients with these restrictions should be limited from underwater activities. However, surface swimming and exercise may also present a high risk for both accidental and purposeful splashing and immersion. This risk is higher with children and individuals without the mental capacity to understand the risks involved in aspiration.

An open access port to lungs (open stoma; on ventilator)

Individuals with tracheotomy stomas are at special risk during immersion in water. Because these patients do not have an anatomical barrier (closed mouth, closed glottis) preventing water from entering the trachea, there is a direct and open port to the respiratory tract. The risk of aspiration pneumonia becomes even greater in pools with poor water quality or inadequate disinfection. There are several commercially available products for individuals with trachs such as trach caps and even trach snorkels (for underwater swimming), but this remains one of the often cited contraindications to aquatic therapy at many facilities.

A nasogastric (NG-) or gastrostomy (G-) tube

Nasogastric tubes (feeding tubes which travel through the nose to the stomach) are more an inconvenience than a true precaution for aquatic activities. Prior to water sessions, most facilities separate the tubing from the feeding bag, “cap” the tub and tape the distal end on the face or neck of the patient. Because the tubing leads into the stomach and not the lungs, there is little risk involved even if the cap becomes loosened or separated. And NG tubes are relatively easy to reposition in the unlikely event that the tubing is pulled during aquatic sessions.

G-tubes or gastrotomy tubes are commonly seen in children with feeding disorders. These “buttons” serve as a direct port for feeding into the stomach. Many physicians permit their patients with G-tubes to be immersed in clean water (private bathtubs, swimming pools, therapy pools) without special preparations. Other physicians ask patients with G-tubes to prepare for immersion by placing a water-impermeable dressing, such as Opsite or Tegaderm over the G-tube. Typically all patients with G-tubes are told to avoid more suspect bodies of wa-
ter; those with greater risk for contact with contaminants: ponds, lakes, and public hot-tubs.

**A colostomy, urostomy, or ileostomy bag**

Patients with any -ostomy bag (bags which collect waste from the intestinal tract) present a special risk with immersion, especially if their bags do not seal properly or the skin around the bag is macerated. Because these bags collect waste, a punctured or leaky bag can result in fecal matter being deposited into the pool. Equally troubling perhaps, is the potential for additional contaminants from poorly disinfected pool water from entering the system of a patient who is already at high risk due to the underlying medical condition which required the bag.

Patients with long-standing and well-managed –ostomies are not typically barred from swimming or therapy pools. One method of preparation for aquatic activities is for the patient to empty his collection bag, place a clean gauze dressing over the bag, place a bio-occlusive dressing (such as Tegaderm) over the entire bag, and then place a pair of compression or “bikers” shorts over the site. Some patients will take the additional step of wrapping a compression bandage like an Ace wrap around their abdomen prior to pulling on the shorts.

**An area of open, macerated or non-intact skin, especially non- or poorly healing wounds**

Open wounds and macerated, unhealthy skin present a risk during immersion — both to the public and to the patient. Any significant area of non-intact skin presents an open port for infection in poorly disinfected water. And immersion in water can further degrade the integrity of macerated, unhealthy skin, especially that present around wound beds or open – stomies. Even immersion in properly disinfected water can cause additional skin irritation in patients with chlorine or other halogen sensitivities. And while clean surgical wounds (such as those present after a knee surgery) present little risk to the public, persistent open sores or wounds can be colonized with infections such as MRSA which theoretically can be spread to others.

**A rash or skin condition (contact dermatitis, eczema, psoriasis); a chlorine or other halogen sensitivity**

Patients with skin conditions such as eczema or psoriasis may experience an exacerbation of their condition after immersion in pool water. Long bouts of immersion, especially immersion in halogen-treated water, can remove moisture and break down protective mechanisms of the top layer of skin.

Patients with sensitivities to chemicals such as chlorine may experience a contact dermatitis with exposure to pool water. Approximately 5% of the population is “allergic” to chlorine while approximately 17% is “allergic” to bromine. Even individuals without these halogen sensitivities may develop rashes from excessive immersion or poor water quality. Contact dermatitis has been deemed an occupational hazard for aquatic therapists.

**Environmentally communicable conditions (head lice; athlete’s foot)**

Patients with head lice may present a health hazard by attending therapy sessions. According to the CDC, lice do not “swim” and are not transmitted from host to host in water. However, they are easily transmitted on items found in most locker-rooms such as towels, combs and other shared items.

Fungal infections such as athlete’s foot are rarely — if ever — transmitted in pool water. However, they are easily shared in the moist, rarely cleaned environ-
ment of locker-room and pool deck.

Incontinence of bladder or bowel, especially diarrhea

Incontinence is often cited as one of the leading precautions for aquatic therapy. However, urine incontinence, while unpleasant to think of, should not limit patients from participation. Urine is sterile and unable, under normal conditions, to transmit pathogens. However, urine incontinence does place a strain on a pool’s chemical balances as urine is bound by free chlorine during the disinfection process. Individuals with urine incontinence should be instructed to void immediately prior to entering the pool and at regular intervals for sessions exceeding 30 minutes. Plastic pants or swim diapers do not "retain" urine and are not an effective barrier between patient and pool water.

Patients with condom catheters should be instructed to void, remove the condom catheter and proceed normally with aquatic activities. Individuals with indwelling catheters can participate in aquatics by: emptying their leg bag of urine, positioning the bag so that there is some slack in the tubing, wrapping an Ace wrap around the leg bag to hold it in position and then pulling on a pair of compression or “biker’s” shorts to hold the whole thing in place and prevent an accidental tug on the tubing.

Patients with suprapubic catheters should not participate in aquatic activities without clearance from their treating physician. Many physicians discourage their patients with suprapubic catheters from using public pools.

In contrast to urinary incontinence, fecal incontinence should raise more of a red flag, especially loose stools or diarrhea. The CDC has now instructed facilities to discourage individuals with diarrhea from entering the pool for 2 weeks after the last bout of loose stools. This may be an abundance of caution, but is a response to the alarming rise in water-borne illnesses which have occurred, especially those caused by highly difficult-to-kill pathogens such as cryptosporidium.

Firm stool fecal incontinence is less likely to transmit pathogens than diarrhea because of the surface area of fecal matter which touches water. Firm stools present a smaller surface area than do loosely disseminated stools. However, any kind of fecal matter presents the risk of infection.

To lessen the probability of fecal contamination, ask patients to use the toilet, to wash their hands, and to take a cleansing shower prior to entering the water. Do not permit diaper changing at poolside. Request that patrons not use the pool if they are suffering from an illness that causes diarrhea or have had diarrhea in the past two weeks. Require the wearing of "swimsuit diapers" or tight fitting rubber/plastic pants by children who are not yet toilet trained or individuals who do not have bowel control. Request that patrons remove their street shoes when walking on the pool deck.

A stool-borne infection (Hepatitis A; E-Coli; cryptosporidium)

Patients with a known active infection which can be transmitted through stool such as Hepatitis A, E-Coli or cryptosporidium may place the public at risk of infection, if they choose to enter a public pool, especially during bouts of diarrhea or fecal incontinence. See above for details.

An infection of the skin or nares especially an antibiotic-resistant infection (MRSA, VRSA)

Patients with a known active infection of the skin or nares which is resistant to antibiotics (such as MRSA or VRSA) have a special responsibility for not transmitting these pathogens to others. The CDC recommends that patients with open wounds colonized with a resistant organism should not participate in
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aquatic activities. Recent research seems to indicate that it is highly improbable that MRSA can be transmitted in properly disinfected water. However, there have been multiple incidences of cross-infection occurring among athletes sharing whirlpool water or comingling towels or razors.

An infectious respiratory disease (cold, flu, tuberculosis)
Communicable respiratory diseases such as colds, flu and TB may be transmitted in any area of close contact. However, poorly ventilated, moist environments such as some pool natatoriums may present an especially high risk for transmission. Common sense precautions should prevent individuals with colds and influenza from attending aquatic sessions while ill. Patients with active TB infections should be under a physician’s care and should not be released to participate in aquatic therapy until cleared by a physician.

Significant cardiovascular disease or respiratory compromise (low vital capacity; low ejection fraction)
Patients with compromised cardiovascular or respiratory systems may not tolerate immersion. However, an arbitrary cut-off for participation (e.g. ejection fraction<25% or vital capacity<1.5L) does not take into account individual differences. The risks involved during vertical exercise in water has recently been distinguished from the risk involved in horizontal exercise (swimming). Swimming is a highly complex task, often requiring VO2s and heart rates of 90% or more, especially in the poorly efficient swimmer. These conditions can create cardiac complications in compromised patients, such as those recovering from a myocardial infarction or those with congestive heart failure. However, vertical exercise in water has been shown to be as safe or safer than its land-based counterparts under many conditions.

A low T-cell count (or other sign of immuno-compromise)
Patients suffering an autoimmune disorder such as AIDS may present with a low T-cell count at certain times during their illness. The CDC cautions individuals with such significantly impaired immune systems from using public pools as the risk of infection, albeit quite low, can result in catastrophic consequences.

Instability of ligament or capsule (ACL tear; history of shoulder dislocation)
Patients with ligamentous or capsular instability are often treated with aquatic exercise as a gentle, early intervention. However, the freedom of movement which comes with buoyancy, coupled with turbulence and unpredictable movement of water, may result in the exacerbation of an instability. Furthermore, patients often do not experience the same pain signals in water as present on land. This may encourage the patient to perform unsafe or excessively stressful movements.

Poor thermoregulation skills (multiple sclerosis; small children; pregnant women)
Patients with poor thermoregulation skills (such as small children, pregnant women and those diagnosed with multiple sclerosis) may overheat during aquatic exercise. Although the temperature of therapy pools rarely exceeds the temperature of the human skin (approx 93-94 degrees), this thermoneutrality only holds when the patient is not exercising. Once the body generates heat, it becomes necessary to dissipate the heat through evaporation, radiation, convection or conduction. Warm pool water (and warm room air) will slow this dissipation and may result in an intolerable build-up of core temperature.

Ventilation tubes for ears; prone to ear infections
Patients who are prone to ear infections, especially those with ventilation
tubes, have been told to avoid water activities. Some recent research seems to indicate that surface swimming (and certainly surface exercise) does not increase the risk of ear infections. However, many physicians still restrict access to immersion for these patients.

**A seizure disorder**
Patients with seizures can often participate in aquatic activities safely under close supervision. However, the patient with uncontrolled seizures or the patient for whom the pool environment triggers a seizure onset may be an inappropriate candidate for pool therapy. Often times, the seizure itself is not the limiting factor; it is often the aftermath of the seizure. Under close supervision and assistance, the pool can be a safe place to have a seizure. However, patients who experience seizures often experience profound fatigue and disorientation afterwards, neither of which is conducive to safety in water. These patients need to be attended to and may require several hours to return to “normal” function.

**Diabetes, especially insulin dependent variety**
Patients with diabetes often find the pool an excellent place to exercise. However, aquatic exercise (like any exercise) can produce an almost immediate drop in blood glucose which may result in a hypoglycemic state. Consistent participation in aquatic exercise over the long term may result in patients needing a downward adjustment of medication dosages from their physicians.

**Exercise-induced chest pain (angina)**
Patients with exercise-induced angina are typically instructed to avoid the level of exertion which brings on angina, whether on land or in water.

**Autonomic dysreflexia**
Patients with autonomic dysreflexia often have in-dwelling catheters which can be prone to tugging or other trauma during aquatic sessions. Such circumstances must be avoided to prevent the cascade of medical consequences of autonomic dysreflexia.

**Orthostatic hypotension**
Patients with orthostatic hypotension have difficulty regulating blood flow from the feet back to the core during a change in position (typically from supine to sit or from sit to stand). These patients do not experience this phenomenon while immersed in water. The hydrostatic pressure experienced during vertical immersion actually “fixes” the problem by promoting extra blood flow from the legs to the core. The caution of orthostatic hypotension comes during the aftermath of therapy. When a patient exits the pool, the pressure support received during immersion vanishes immediately, potentially resulting in an exaggerated return to a hypotensive state.

**Active joint inflammation (rheumatoid arthritis, hemophilia)**
Patients with an active, excessive joint inflammation flare-up are typically instructed to avoid active exercise, whether on land or in water.

**Dehydration**
Patients who are already dehydrated will exacerbate this condition by exercising in water unless they drink fluids to replace their volume.

**Feverous, especially >101**
Patients experiencing fever are typically ill and should not be exposing the public if infectious. Additionally, a high body temperature, coupled with the near-skin temperature water of most therapy pools, will result in an inability of the body to dissipate heat at a rapid enough rate during exercise. This may result in an in-
crease in body temperature, exacerbating the fever.

**Taking a diuretic**
Patients taking a diuretic to control water weight may be at risk for excessive diuresis if participating in regular aquatic immersion. Because immersion signals the body’s volume receptors to activate the kidneys, it has a diuretic effect. Patients will void more urine after immersion and — if coupled with a “normal” dosage of diuretic — may result in a too large drop in volume. This may then result in a dangerous drop in blood pressure.

**On dialysis**
Patients who are actively participating in dialysis receive regular sessions intended to “clean” their blood and regulate their fluid volume. Participation in regular water immersion may alter volume levels (through an increase in urination) and may confuse the picture for dialysis if the appropriate medical personnel are not made aware.

**On chemotherapy**
Patients who are actively participating in a bout of chemotherapy are receiving doses of “medicine” which are intentionally designed to harm some human tissues. Although this has not been examined scientifically, it is possible that these medications may be excreted through sweat into pool water during exercise, thus theoretically exposing others.

**On post-surgical restrictions to motion (e.g. no twisting of spine, no crossing legs over midline, no abduction of shoulder)**
Post-surgical patients often make excellent candidates for aquatic therapy because of pain, limited mobility, lower extremity edema and other factors. However, those on post-operative restrictions (such as no twisting, no lifting, no crossing legs, no abduction or external rotation of the shoulder) may find too much freedom of movement in water. Often, in the pool, pain signals can be reduced or absent; thus patients may overdo exercise or move into contraindicated positions without knowledge or concern.

**Pregnant**
While aquatic exercise is considered especially helpful during pregnancy, immersion in poorly ventilated or overheated pools can be a concern for pregnant women. Because the byproducts of disinfection are heavier than air, they hover immediately above the surface of the pool. This “air space” is where aquatic participants breathe and — if air flow does not carry off these byproducts effectively — may create a harmful scenario for mother and fetus. Additionally, although hot tub immersion during the first trimester may present risk of neural tube defect in the fetus, therapy pools do not typically exceed 93-94 degrees, a temperature range considered thermoneutral. However, pregnant women are notoriously poor thermoregulators and high intensity exercise in warm water should be avoided.

**Very young (< 1 year old)**
Emerging research is showing that repeated exposure of very young children (“water babies”) to poorly ventilated or poorly disinfected pools is correlated with an increased incidence of diarrhea, ear infections and asthma onset later in life.

**Fearful of water (hydrophobia)**
Frank fear of water immersion is probably one of the few actual contraindications to aquatic therapy. Such a phobia is very difficult to overcome and is certainly not within the scope of therapeutic interventions. How-
ever, most people are not truly phobic about immersion; they are just uncomfort-
able around water.

**Combative or difficult to control**
Patients with combative tendencies are often a challenge to work with in a meaningful, therapeutic way. Add immersion in water to the mix and the combi-
nation can become dangerous to both patient and provider. Of special concern is the patient who refuses to get out of the water at the end of treatment. At-
tempting to remove a belligerent and uncooperative individual from a body of water is a risky proposition, one therapists should avoid whenever possible.

**Mentally impaired to the point of the inability to be safe in water**
Patients with impaired reasoning skills may perform unpredictable and risky behaviors such as swallowing water, diving into shallow water or harmful horse-
play. Additionally, patients with impaired mental capacities may experience diffi-
culty with transitions (in or out of the pool) which may make aquatic sessions unfeasible.

**Culturally unable to be seen in immodest dress or to share pool facilities with the opposite sex**
Patients with cultural restrictions of modesty may be barred from participating in aquatic therapy sessions for many reasons. Some religions prohibit women from allowing men to see their body in any state of immodest dress. Pools which cannot guarantee that men will not be permitted into the pool may find it impossible to provide services under such circumstance. A recent development in the Mus-
lim world is the Burkini, a modest bathing costume modeled after the Burka. This permits the user to participate in water activities without being exposed.