

Diabetes is a disease that is quickly becoming an epidemic. It is a disorder of the metabolism. There are several types of diabetes:

- Type 1 (used to be called juvenile onset)
- Type 2 (used to be called adult onset)
- gestational
- pre-diabetes

Type 1 diabetes can appear at any age, but most often occurs in children. The pancreas stops making insulin, or does not make enough. Insulin is necessary for life, so people with Type 1 diabetes must take insulin either from injections, or from a pump that they have attached to their bodies.

Type 2 diabetes occurs most often in adults. The pancreas does make insulin but it is not used very well. This could be due to the person being overweight, to being sedentary, to the person's genetic heritage, or to many other causes. A person with Type 2 diabetes might be on either oral or injected medications to control their insulin level.

Gestational diabetes is high glucose that occurs during pregnancy. It often disappears after giving birth, but just as often may appear later in life. Also the child has a good chance of becoming diabetic in his or her life.

Pre-diabetes means that one's blood sugar is above "normal", but not yet at the "diabetic" level. People with pre-diabetes run a great risk for developing Type 2 diabetes and/or heart problems.

Diabetes ranks number one in direct costs; one healthcare dollar out of seven is used for this disease. In the US alone, in 2002, the tab for diabetes-related doctor visits, medications, and hospitalizations was \$92 billion. If lost work productivity and lost work wages are added in, the cost is about \$137.7 billion. This amount is rising drastically as the diabetes epidemic continues to mount.

If we could prevent obesity, Type 2 diabetes could be contained. This can and needs to be done through proper eating habits and exercise. Obesity is caused by the consumption of more calories than are being burned. Increased physical activity would certainly be conducive in the control and prevention of Type 2 diabetes. However, this does not take into account the hereditary genes that can contribute to Type 2 diabetes.

Regular exercise helps maintain overall health. It benefits one's circulatory and cardiovascular systems, and helps control blood sugar as well as fosters a personal feeling of well being and accomplishment. As exercise burns calories and uses energy, a person with Type 2 diabetes should closely monitor their blood sugar before, during, and after exercise to avoid hypoglycemia. Regular exercise, healthy eating habits, and weight

control may reduce or eliminate the need for a person with Type 2 diabetes to take oral medications and/or insulin.

Water exercise is quickly becoming an acknowledged form of exercise that is good for all. The water has many beneficial properties that make it the perfect medium in which to exercise.

One beneficial property of water is buoyancy. In the water, a person who is waist deep has approximately 50% of their body weight supported. In water that is chest high, the percentage grows to approximately 80%. This is wonderful for anyone with any kind of joint or weight problems. It is becoming better recognized that many people with diabetes also have arthritis. One cause of this is that many people with diabetes Type 2 are obese. Buoyancy also can aid in balance.

Another beneficial property of water is hydrostatic pressure, which acts as a continual “massage”. This is very beneficial to those with edema or poor circulation. People with diabetes often have very poor circulation in their extremities.

Resistance is another property that makes exercising in the water beneficial. Because the viscosity of water is greater than air, each movement takes more energy and is more challenging. Also, on land, one has to work each muscle individually. In the water, muscle groups work in pairs as each movement provides resistance to one of the muscles in a group and the returning movement to the other. The more resistance, the more calories are burned, and the more weight is lost.

Water also eliminates the threat of falling and injuring oneself. Nor is there the problem of turning ankles, or blowing out knees or elbows. Also, in the water movements that cannot be done on land can be done. These advantages make movements that are difficult to perform on land easier to perform in the water. It is also possible to do exercises in the water that involve both feet being lifted off the bottom at the same time.

Since one’s weight is only about 20% of actual weight at chest level, that is the ideal depth for exercise because the joints that are being used have the support of the water. Warm water is more conducive to the non-aerobic exerciser. This is because muscles relax better when warm, and because the chill factor goes down, especially when performing static exercises. The Arthritis Foundation recommends that the water temperature for such exercises is no lower than 84 degrees. A more experienced person might be able to exercise more aerobically, and as a result, the water temperature could be cooler as the chill factor would not be present.

Range of motion exercises are great exercises to do as they not only promote range of motion, they promote circulation. Exercises in this

category would include movement in the neck, shoulder, elbows, wrists, hands, hips, knees, ankles and toes. There are many combinations that could be done to avoid joint stress and boredom. Walking in the water is very important for people with diabetes as the lower extremities are often at risk. This allows people to have their feet on the bottom and feel the compression, which is not always possible on land.

There are cautions that must be observed when dealing with people with diabetes and water exercise. One is that they should always wear some type of water shoe. This is necessary to protect their feet, especially on rough flooring and locker rooms or pool decks that could be carrying infections.

Many people with diabetes have neuropathy in their feet so that they do not feel pain when injured, which can result in infection and amputation. Another caution for people with Type 2 diabetes is the risk of hypoglycemia. This can be caused by many things. If a person does not eat before exercising, their blood sugar level could drop to levels too low for safety. Also, since exercise uses calories, if a person with Type 2 diabetes works out harder than the calories (carbs) they have ingested, their sugar could drop. It is for this reason that the person running the class or therapy session should be sure to have blood monitoring meters and juice or a snack of carbs and protein available quickly.

Diabetes is an epidemic that can be stopped, or at least slowed down by exercise and eating properly. Eyesight, kidneys, amputations and heart problems can be stopped if only people learn to control their sugar levels. We can help them by encouraging them to exercise, and water is a much more pleasant medium to exercise in than land.

DIABETES AQUATIC EXERCISE CLASS

Sample 1

Warm up: (10 min)

Breathing – Ai Chi first 5 postures go thru 2X

Walking – forward, backwards, marching, side to side, crossover

Use varied arm exercises while walking ie swinging, breast stroke, front crawl

Class: (25 min)

Walking – heel to toe (forward and back), up on toes,
back on heels, elbow to knee, lunges (if class is ready for them)
Using the aquafit bar, noodle, or wall for balance if needed:
squats, pelvic circles (hula hoop), leg circles (small to big, reverse
big to small), hamstring curl
Arms - arm circles (small to big, reverse big to small), golf swing, baseball
Swing, overhead stretch (climbing a ladder)
Barbells – front to hips (together then one at a time), front to back swing
(together then one at a time), “bicep curls”, “tricep curls”, rotator
cuff in and out, row boat (forward and back), jog and punch (to
front, side, up, down)
Shoulders and hands –open and close hands, play piano, shoulder shrugs,
shoulder circles (forward and back), shoulder pinches
Noodles – bicycle, jumping jack legs, foot inversion-eversion, foot flex and
point, crunches

Cool Down (10 Min)

Shoulder stretch across on each side and tricep stretch on both sides
Leg stretch (hold foot and stretch back NOT out) and balance with ard
forward on each side

On wall:

modified runner stretch on each side

push aways

push ups (if able)

Shoulder shrugs

Look over shoulder left, center, right, center, etc

Big stretch, climbing up ladder

Hugs one each arm on top

The purpose for all of these exercises are:

Warm up to warm muscles and get them going to exercise. The exercises
are great for range of motion, strengthening, and endurance as well as
circulation, proprioception, and balance. Cool down gets the body back to a
more relaxed state.