

AQUATIC THERAPY

PRESENTED BY
MICKEY BARON, PHYSICAL
THERAPIST

- WATER COVERS 72% OF THE EARTH'S SURFACE
- 2/3 OF THE HUMAN BODY IS COMPOSED OF WATER
- IN WATER YOU WORK BOTH HALVES OF EACH MUSCLE
- WATER PROVIDES 12 TIMES MORE RESISTANCE THAN AIR
- HEART RATES ARE 10-15% LOWER IN WATER THAN ON LAND.

- IN CHEST DEEP WATER YOU WEIGH ONLY 35-45% OF YOUR BODY WEIGHT
- IN WATER UP TO YOUR NECK, YOU WEIGH ONLY 10% OF YOUR LAND WEIGHT
- THEREFORE WATER PROVIDES ONLY A FRACTION OF THE IMPACT YOU WOULD HAVE ON LAND

PHYSICAL PROPERTIES OF WATER

- RELATIVE DENSITY: THE DENSITY OF THE BODY IS LESS THAN THE DENSITY OF WATER AND THEREFORE WE FLOAT. IF A PERSON'S RELATIVE DENSITY IS MORE THAN ONE, THEY WILL SINK, BUT THIS CAN BE ADJUSTED WITH EQUIPMENT.

BUOYANCY

- THE UPWARD THRUST IN THE WATER ACTS IN THE OPPOSITE DIRECTION OF THE FORCE OF GRAVITY.
- DECREASED JOINT COMPRESSION
- DECREASED WEIGHT BEARING
- LESS EFFORT
- LESS FEAR OF FALLING
- COUNTERS THE EFFECT OF GRAVITY ON VENOUS POOLING OF DEPENDENT LIMBS
- INCREASED FUNCTIONAL ACTIVITIES

HYDROSTATIC PRESSURE

- PRESSURE EXERTED BY MOLECULES OF A FLUID ON AN IMMERCED BODY
- AIDS IN RESOLUTION OF EDEMA
- HELPS OFFSET TENDENCY OF BLOOD TO POOL IN LOWER EXTREMITIES
- EVENS TACTILE INPUT WITH CONSTANT SENSORY INPUT
- HELPS BUILD UP MUSCLES OF INSPIRATION AND EXPIRATION

VISCOSITY

- THE FRICTION BETWEEN MOLECULES OF A LIQUID CAUSES RESISTANCE TO FLOW.
- PROVIDES RESISTANCE TO MOVEMENT
- RESISTANCE DROPS TO ZERO THE MOMENT THE FORCE/EFFORT STOPS
- ALLOWS INCREASED TIME OF RESPONSE FOR EQUILIBRIUM REACTIONS
- WHEN YOU WALK OUT OF WATER, YOU CARRY UP TO 7 POUNDS OF WATER WITH YOU

TURBULENCE

- IRREGULAR FLOW OF FLUID CAUSES INCREASED IMPEDANCE AND DRAG.
- DRAG FORCES SUCH AS WALKING AGAINST RESISTANCE
- EDDIE DRAG ALONG SIDE OF BODY
- QUICKER MOVEMENT FOR GREATER TURBULANCE
- TURBULENCE CAN INCREASE RESISTANCE, TO IMPROVE TACTILE ISSUES, TO TREAT BALANCE, FOR IMPROVED PROPRIOCEPTIVE FEEDBACK AND DECREASE INVOLUNTARY MOVEMENT.

REFRACTION AND REFLECTION

- DISTORTION OF VISUAL FEEDBACK IN WATER
- REFRACTION CAUSES OBJECTS AND EXTREMITIES TO APPEAR 25% LARGER
- REFLECTION CAUSES OBJECTS AND EXTREMITIES TO APPEAR 25% CLOSER TO SURFACE.
- THIS NEEDS TO BE ACCOMMODATED BY TEACHER OR PARTICIPANT

PHYSIOLOGICAL PROPERTIES OF WATER

- CIRCULATORY:
- GREATER VENOUS PRESSURE TO DECREASE EDEMA
- CARDIAC AND STROKE VOLUME INCREASES
- CARDIAC OUTPUT IS INCREASED
- BLOOD PRESSURE IS DECREASED IN WARM WATER
- WATER DEPTH AFFECTS HEART RATE. RATE IS 8-11 BEATS/MIN LOWER IN CHEST DEEP WATER THAN IN WAIST DEEP WATER.

MUSCULOSKELETAL SYSTEM

- DECREASES EDEMA
- MUSCLE RELAXATION
- DECREASED JOINT COMPRESSION
- EASE OF MOVEMENT
- INCREASED BLOOD FLOW TO MUSCLES
- PAIN MANAGEMENT WITH HEAT OF WATER
- SOME INHIBITION OF SPASTIC MUSCLES

PULMONARY

- RESPIRATORY RATE INCREASES
- INCREASED OXYGEN CONSUMPTION
- INCREASED AIRWAY RESISTANCE

- WATER IS MORE STRESS ON PULMONARY AND HEART FUNCTION. IT IS BETTER TO WORK IN MORE SHALLOW WATER AS THERE IS LESS PESSURE ON CHEST.

RENAL

- INCREASES SODIUM EXCRETION, WHICH INCREASED BLOOD PRESSURE
- DIURESIS (RENAL PRESSURE) INCREASES WITH TIME AND DEPTH IN WATER.
- SUPPRESSION OF THIRST SO DRINK WHEN YOU GET OUT OF WATER OR DURING EXERCISES
- RENAL RESPONSES ARE GREATER WITH MORE ELDERLY

NERVOUS SYSTEM

- RELAXATION
- INCREASE IN PAIN THRESHOLD
- FEAR OF WATER COULD INCREASE NERVOUS SYSTEM. USE OF CORRECT EQUIPMENT CAN EASE FEAR.

ITEMS TO REMEMBER

- MAKES SKIN MORE FRAGILE. SALT WATER IS BETTER
- BODY TEMPERATURE MAY CHANGE DEPENDING ON THE TEMPERATURE OF THE WATER.
- EASY TO OVER EXERT. GENERAL TIME 30-45 MINUTES IN BEGINNING
- CHLORINE AND BROMINE CAN CAUSE SKIN AND RESPIRATORY PROBLEMS WITH CHRONIC LUNG PATIENTS

WEIGHT BEARING IN WATER

- 50% WEIGHT BEARING AT BELLY LEVEL
- 25-30 % AT MID CHEST LEVEL
- 10 % AT SHOULDER LEVEL
- TIPS: WEAR WATER SHOES OR WEIGHT ON ANKLES

CONTRAINDICATIONS

- FEVER OVER 100
- CARDIAC FATIGUE
- WOUNDS
- SEVERE URINARY TRACT INFECTION
- SEVERE RESPIRATORY INFECTIONS
- BLOOD INFECTION
- SEVERE RESPIRATORY DISEASE.
- INTRAVENOUS LINES

PROGRESSION OF A PROGRAM

- WARM UP ACTIVITIES
- STRETCHING
- STRENGTHENING, BALANCE, MOVEMENT AND TRANSITIONS
- COOL DOWN

HOW TO TEACH

- ONE ON ONE IS BEST FOR BEGINNING AND EVALUATION
- CLASS IS BEST FOR LEVELS, WHICH ARE SIMILAR
- CLASS IS BEST FOR SOCIALIZATION
- CLASS IS BEST FOR PATRONS TO ASSIST EACH OTHER
- WRITTEN, LAMINATED PROGRAMS WITH PICTURES ALLOW PATRONS TO COME ON THEIR OWN OR WITH A FAMILY MEMBER OR CAREGIVER

