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 IMMERSED BODY
• AIDS IN RESOLUTION OF EDEMA
• HELPS OFFSET TENDENCY OF BLOOD TO POOL IN LOWER EXTREITIES
• EVENS TACTILE IMPUT WITH CONSTANT SENSORY IMPUT
• 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.
- Eddy drag along side of body.
- Quicker movement for greater turbulence.
- 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 PRESSURE ON CHEST.
RENAL

• INCREASES SODIUM EXCRETION, WHICH INCREASED BLOOD PRESSURE

• DIURESIS (RENAL PRESSURE) INCREASES WITH TIME AND DEPTH IN WATER.

• SUPRESSION 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