

# Comparisons of land vs aquatic skills for 0 – 3 years

World Aquatic Baby Congress 2007

The brain, from birth, is constantly growing and developing. As the infant grows, land based skills are developed from reflexive movement into gross motor skills. Movement helps the brain to develop from infancy. These early experiences are critical as they shape and build the left and right side of the brain. The brain needs this movement to be active and grow.

Through social, emotional, physical and cognitive development the comparisons between land and water are significant. These critical periods of development along with added creativity, open new pathways for learning.

The medium of water however can encourage extra movement and stimuli which enables the infant to activate areas to enhance physical strength and cognitive ability. This is achieved due to the support and pressure of the water. The main focus that it being observed in this qualitative study is motor development. There are four major milestones discussed, the relation between the aquatic and land based skills is observed in each of these.

What is motor development and why is it important?

Motor skill development occurs due to maturation. **Maturation is development that reflects the gradual unfolding of one's genetic blueprint (Weiten 2004).** It is the progression of muscular co-ordination required for physical activities. The child will gain control of the upper body before the lower part of the body. Basic motor skills include sitting, crawling, reaching for objects and grasping. Development norms indicate the median age at which individuals display various behaviors. Whilst I discuss developmental norms throughout this presentation, please do not compare or expect all children at these ages to display the same level of skill.

Modern development has made our lives busier and the opportunity for prone exploration is reduced. Amongst the rush, children are carried, flexor and extensor muscles are under developed. (Flexor muscles up and down the front provide security, extensor muscles up and down the back assist posture.)

Upper body strength is only developed through initiative. This in turn creates exploration and autonomy. This environment needs to be created for the child to explore. As a result gross motor skills are developed which then allows fine motor skills to be enhanced. An aquatic environment heightens the stimulus for gross and fine motor skills due to submersion and free body action.

It is also important to note that the child's visual stimulation from birth is the key in "cementing a pathway for future recall". This allows the neurons to be activated and stimulated for growth and learning.

Through this study we have found the less is more principal has supported the belief that releasing the hold on the body activates neurons throughout the body. This results in a more active response and higher breath control skills allowing the infant to acquire and compound skill. It must be noted that these children are not displaying any signs of stress or anxiety before, during or after submersion. Facial expressions observed are either relaxed or positive.

What is observed on land is not necessarily what is observed in the water. Observations on land showed limited movement and support, vestibular senses were limited, self correction led to failure eg- standing with support was minimal compared to that in the aquatic environment. The body must feel the sensation of floating without aids in order for the brain to accurately respond, store and repeat the skill. Reinforcement of a positive i.e propulsive action is essential to build on top of the existing experience.

Observation, analysis and extension are integral components of accurately meeting the aquatic readiness of the child. Through all these skills the emotional need of the child is paramount to positive actions and response. Muscles will tense and the child may show stress if not managed professionally.

Infants have a 'radar' which will be displayed if there is unhappiness, which is counterproductive to the task at hand.

#### New Born

An underarm hold on land shows very little response in terms of movement of the torso and extremities. However the same hold in water shows immediate activation of the whole body, this spontaneous movement is due to reflexive responses.

Our observations showed that the infant will display a behavior or a reflexive action to the antecedent (stimulation). The consequence is one of gross motor response.

In land a similar response is displayed, however after much reinforcement of the antecedent, the range of reflexive response is reduced. The infant displays a more relaxed movement in the water. This then allows further extension of fundamental skill such as propulsion and the vestibular experience of floating. The release of the hold on the child activates the brain which responds in a positive way to seek propulsion, buoyancy and balance.

Active movements of the torso and extremities are shown for short period of time. This movement starts first from the body and legs. Little to no controlled movement is seen with the hands.

In some infants who are relaxed in the water, ( due to an increased breath hold) rolling is experienced yet they are unable to surface without assistance.

### Pre-Walking

Sitting on land they are able to stabilize by balancing their large head (by comparison to their body). When in the aquatic environment submersion clearly indicates the child is top heavy making independent propulsion limited. Postural control is important for stability and to promote fine motor skills.

As the child starts to rise up onto 'all fours' they gain more power this is due to muscles in the legs becoming stronger. The push and flex of the leg can also be seen in the water. A simultaneous kick combined with whole body action is apparent.

The body movement combined with kick, observed at this range is more vigorous than the early age group. Hand eye co ordination is becoming more apparent as the hands start to show more control.

When propelling through the water the extension of the arm and hand is not used for propulsion but for landing and assisting with the combined surfacing skill, with the caregiver/parent/teacher.

### Walking

As upper body strength is enhanced the vertical body position becomes more apparent. The spine moulds into the 'adult like' position with curves to reduce the shock of the heel strike impacting directly on the brain. The implications in an aquatic environment clearly display a more vertical position the spine encourages the body to be more vertical and not prone. It is also important to note that the vestibular senses are acute to falling forward. As part of the developmental stage of 'walking

exploration' the head flexes back as the child falls when encouraging a vertical position on land.

In an aquatic environment encouraging a feet together recovery or landing, as seen in a land based jump action, will assist in strengthening the gluteus maximus muscles. This is paramount for walking.

### Crossing Midlines

As the cortex grows from infant through early childhood, hemispheric asymmetry is developed by external stimulation. 'Swimming' assists in the acquisition of all three midlines, left/ right, top/ bottom and front/ back. These are incorporated in land based activities such as, walking, catching, throwing, running, climbing, hanging and swinging.

Bilateral coordination is important to allow both feet and hands to work together as well as developing fluid movements both in the water and on land.

Overall aquatic experience is supplementary to the child's development. In conjunction with land based experiences, water further enhances the sensory input allowing development of gross motor skills. Proprioceptive and vestibular senses are heightened, gross motor patterns are cemented through repetition and social and emotional support means the child is free to explore their bodies within the body, of water.

### References

**Weiten W. Psychology Themes and Variations, 6<sup>th</sup> ed, Wadsworth. Australia. 2004**