“SINK OR SWIM”

Drown-proofing teaching methodologies

Evidence pro or against drown-proofing a child is necessary, but it would be unethical to subject babies and toddlers to these methods to assess the methodology.

This report titled ‘Sink or Swim’, which is supported by all the leading organisations involved in the UK baby swimming industry argues the case **against** drown-proofing teaching methodologies based on authoritative scientific research.

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Science-based early years swimming and water safety: happy and compassionate learning is a right of all babies and young children in the 21st century.

Saving the lives of babies and children, preventing tragic accidents and protecting little ones by carefully developing their awareness of danger is a universal feature of parenting, not just among humans but among all beings who care for their young. We are terrestrial mammals, even though our aquatic past has now shown to be real. We have in-built mechanisms for diving, but only for a short time unless we develop them further in late childhood and adulthood. Teaching young children to swim early, and, even before swimming is mastered, acquiring water safety skills, has been a growing trend in swim schools in the last decades of the twentieth century. After the Second World War, technological advances in water treatment allowed the development of swimming pools and water sports worldwide. In warm climes, many people enjoyed having their own backyard pools, increasing the risks of drowning for young children. The two main approaches to protecting children: developing playful ways for teaching swimming in early years and drown-proofing techniques, have existed side by side since the 1950s. These approaches are not only different in the practices they advocate but they also correspond to contrasting views about how young children learn, with little overlap between them. [1]It took the bold vision and talent of Virginia Hunt Newman in Los Angeles in the late 1950s to show the world that not just the children of Hollywood stars but any child could achieve water safety around home pools through learning to swim early with a loving relaxed teaching style.

At the turn of the millennium, baby swimming was already a worldwide activity that drew practitioners from over 70 countries to the World Aquatic Babies Association's (later known as WABC) international conferences. It rapidly became a cultural must of early parenting in the affluent world and drew fathers to pools in increasing numbers as they became more involved in the care of their babies. In the process, baby swimming became an industry: classes became more structured, involving groups of parents and babies in short sessions with set protocols that vary across cultures in design, philosophy, content and scope. In

[1] Conditioning relies on the older "reptilian" brain's survival response to threat. It is associated with emotional states of hostility, anger and anxiety, in contrast with the integration of cognitive functions in the three main parts of the brain in child-led learning. At the first sign of anxiety the brain shifts its function from the prefrontal lobes to the old defenses of the reptilian brain. Emotional well-being and social competence are now seen as the foundation of early learning and the bricks and mortar of brain architecture.

some cases, the initial objective of early swimming has now taken second place to the shared enjoyable activities of parents and babies in water. Yet many parents watch the YouTube clips of small prodigies crossing pools with glee at age one, and the images of underwater baby swimming, as illusory as they have always been, keep their irresistible lure. After three years of assiduous baby swimming classes, some parents wonder why their children not only cannot swim but sometimes cease to like being in water, and may not perform better than their peers as they join standard swimming classes at age four/five. These are important questions all of us teaching infant aquatics need to pay attention to.

More recently, following videos being uploaded to YouTube that show parents in the USA using baby drown-proofing methods, many after sadly losing children to drowning, there has been an increasing amount of media attention about this teaching methodology in the UK. These popular US-based programmes for water "survival", actively promote the de-risking of drowning accidents for toddlers through classes in which babies are taught to float on their backs. Unlike the earlier versions of floating for survival, in these programmes, after achieving back floating, toddlers are also taught to swim from rolling to their front and propelling themselves through the water, rotating into a back float for breathing.

Any parent's heart goes out with empathy to those who have tragically lost a loved one to drowning. Their grief has naturally prompted them to seek ways to prevent other drowning accidents. But before teachers get trained in "survival" learn to swim methods and parents sign their babies up in the UK, there is an urgent need to examine the view that the prescriptive conditioning of back-float promoted to parents as insurance for their children's water safety is safe, acceptable and effective. This must be based on current scientific research – and not on the views of parenting experts who are not recognized scientists. It also seems worth asking ourselves, as baby swimming teachers, whether water safety should be imparted effectively by gentle methods in the early years.

The warning issued by the Canadian Red Cross,[2] however, is worth taking on board: confidence imparted by either baby swimming classes or water survival techniques cannot substitute parental supervision, particularly in the first three years, but both can be combined for optimal outcomes.[3]

[2] 2007. Parental supervision is paramount to protect babies and young children from drowning.

[3] The recently launched Safety Around Water (SAW) program drills into children from age 2 the importance of notifying a supervising adult before taking a dip (with one three years old already saved) in combination with jump-push up-turn-grab and swim-float-swim skills.

The most popular drown-proofing method is currently the roll-on-the-back-to-float, developed as a learn to swim method in Australia in the 1960s. I became aware of it personally through Australian parents who trained their babies in the UK with this method in the late 1970s. They were very nice parents indeed. Yet the amount of stress they inflicted on their babies to have them floating on their backs in the name of water safety struck me as violent and morally unacceptable, not unlike the 'sink or swim' ways that senior citizens in the UK joke about when recalling how they were thrown in rivers or canals and hopefully would grab a pole held on to them as they surfaced. Two aspects of the drown-proofing method as it has been developed in various modalities for over fifty years, mostly in the USA, continue to prevail: 1. It is based on a conditioning that is necessarily violent because it interferes with babies' innate survival responses (reach out for loving parents' arms for comfort) and superimposes other autonomic responses (muscular tension, shallow breathing, suppression of crying for help). 2. It is exclusive of alternative progressions through which babies spontaneously develop movements in water, with possible detrimental implications.

Evidence pro or against drown-proofing is necessarily limited. It would be unethical to submit babies and toddlers to drown-proofing to assess this methodology. The arguments used in this article are drawn from authoritative research on the conditions necessary for optimal neuro-developmental pathways in infants and on the damage known to be caused by specific kinds of interference.

Forceful conditioning is harmful to infants' delicate developing brains

There is no parenting without conditioning. We need to impact on young children that they must wait before crossing roads, and wait on the edge of pools or walls before jumping. Learning to ride a bicycle requires initial support to gain balance. It is well known that learning to swim in early years demands considerable patience and perseverance from parents and teachers. Yet there is a continuum of conditioning. No one would support the beating of children into achievement, condoned in the "civilized" world in the nineteenth century. Enforced aquatic practices on babies who clearly protest, time after time, until they realize that protest is futile and eventually comply with the enforced practice, are equally questionable.

Conditioning a baby or toddler to float relies on an extreme form of the mechanism known as 'habituation'. Habituation is very helpful to keep babies asleep while ignoring other stimuli such as ambient noise. Yet creating neuro-pathways of habituation, such as ignoring something painful to the point that it becomes an ingrained behavior, verges on pathology. No amount of praise will compensate for the memory of inflicted pain. It just gets pushed in

the recesses of our brain, where it is recorded. While some children will escape unscathed, for others, the trauma may resurface in later years. We do not know who is at risk, so is it worth doing?

No. The answer is clear on two counts: scientific evidence and statistics. Even before the development of brain-imaging technologies, eminent pediatricians and infant psychologists engaged in pioneering research about early brain development highlighted sensitive mechanisms and their long-term implications, with revolutionary implications for parenting. In a nutshell, this research showed how the affective context of early learning is paramount. As Sue Gerhardt highlighted in her book entitled "Love matters" (2004) infants need a supportive learning environment to regulate their affects. One complex issue of drown-proofing is its ambivalence. While parents entrust their infants to trainers with loving intent, the experience of enforced conditioning does not match this loving intent for the child. The contradictions inherent in receiving praise and rewards at the cost of inflicted pain are known to those who study child abuse. For a young child, being thrown into the water and struggling to keep afloat under the loving gaze of his parents simply does not amount to the perception of the world as a safe place.

How much violence has been inflicted on babies under the pretext that it is for their good? The case made for saving infants' life is indubitably the most powerful justification of all. Desmond Morris wrote books on babies out of his near-death experience with pneumonia developed from exposure to cold English winter weather when left in his pram in the garden, a Victorian practice seen as invigorating. Many of us frown upon the repetitive submersion techniques of Igor Tjarkovsky, also deemed to strengthen babies (once their screaming protests are stifled). There is a clear difference in body language between common babies' bouts of crying and toddlers' temper tantrums, and the distress crying or screaming of infants who use these to communicate situations they perceive as intolerable. Parents must not be fobbed off by the casual dismissing of this difference in recent promotion posts on drown-proofing. It is real. We can't go back to past ignorance. Safeguarding the fundamental means by which vulnerable infants communicate their needs is a moral duty for all those working with parents and infants. [4]

[4] This is made explicit in the UN Convention on the Rights of the Child. The UK is a signatory. Only two countries, the USA and Somalia, are non-signatories. https://downloads.unicef.org.uk/wp-content/uploads/2010/05/UNCRC_summary-1.pdf?_ga=2.41759141.62319348. Article 19.

Survival techniques impart in infants the perception of water as a medium in which it is unsafe to relax and play. While they may not affect all infants negatively, at least some of them will find it difficult to erase early memories of distress associated with water training.

Recent discoveries have been made about the development of memory through the experimental visual recording of the effects of emotional responses on babies' brains. They offer irrefutable evidence that violence, in the sense of something done against babies' fledgling will, expressed through distressed crying (and later through refusal), is harmful in the short, medium and long term. When babies' signals are ignored and violated at the pre-verbal stages of development, the hypothalamus, that acts as a control center for stress, regulates the release of cortisol while the amygdala evaluates threats. Since cortisol thresholds are set for life in infancy, if extreme stress is repeated, the practice may result in raised cortisol levels, known to increase feelings of anxiety later in life.[5]

In learning by conditioning, the training process is initiated by the trainer, and the babies or children's usual response mechanisms are ignored. Reciprocal dynamic interactions shown to be essential for healthy brain development in the first two years, as the foundations of "executive function" and "self-regulation", are dismissed for the sake of survival training. Is this an acceptable trade-off?

When the prevention of early drowning is at stake, are the neurologically harmful practices of forceful conditioning justifiable to save the lives of young children who accidentally slip in the bath or fall into deep water? Let's look at national available figures on drowning fatalities among infants aged 0 to 4 years. Clearly, the flip and float technique has limited relevance for safety in home baths. In relation to accidental falls into deep water, to which most promotion of "survival" is directed, drown-proofing needs to be proven safe and effective. If it is not a safe approach from a neurological developmental viewpoint, has it however been shown to be effective?

In the UK in 2015, there were four deaths of 0-4 years old babies/children by drowning. Two were in home baths and two were in ponds. No details are supplied on the ages of the children. The ratio of 0-4 year olds drowning in home baths in the USA is also comparable with those drowning in home pools. In the European Union, aggregated numbers of

[5] Center on the Developing Child at Harvard University (2016). *From Best Practices to Breakthrough Impacts: A Science-Based Approach to Building a More Promising Future for Young Children and Families.* Retrieved from www.developingchild.harvard.edu.

drowning are low in the 1- 4 years old group compared with numbers of drowning among older children[6].

It is remarkable that in the countries of the European Union, water safety/drowning prevention scores (life guarding and legal enforcement of fences around home pools) 'did not correspond to drowning deaths for all countries with no clear pattern of reduced mortality for those countries with higher water safety scores'.

With a heart-felt acknowledgement of how devastating it is for parents to lose a child by drowning, a striking aspect of these national statistics is the very small number of drowning fatalities among 0-4 year's old children, in relation to the potential damage risked by inflicting harmful techniques on a high number of children in the population. Epidemiologically, this ratio requires careful consideration based not only the number of children at risk of drowning but on the circumstances of drowning. [7]

As far as I know, there is no quantitative research demonstrating general efficacy in a way that makes drown-proofing justifiable from implementation as a policy for the prevention of death by drowning in the 0-4 year children population. We have anecdotal evidence and spectacular clips of babies and toddlers able to float for up to three minutes while waiting to be rescued after being thrown in deep water with clothes on. While this level of achievement can appeal to parents seeking demonstrations of efficacy, how generalized is this performance in cohorts of babies and young children attending specific programs? The argument may be comparable to baby swimming schools which present clips of star performers while most class participants cannot swim independently in their third and even fourth years. Given the impossibility of conducting randomized controlled trials on practices that are preventive, both on ethical grounds and due to the very low statistical ratio of drownings, neither drown-proofing nor gentle baby swimming methods can be proven to

[6] Source: WHO European Detailed Mortality Database (EDMD) 2008-2010 (0-1 year: 0.35 per 100,000 female babies, 0.4 male babies; 1-4 years: 0.7 per 100,000 female children, 1.7 males). The UK has the lowest overall mortality from drowning in the 0-4 population in the EU but no details are provided about the circumstances of drowning.

[7] As pointed by Clare Haskett from Turtle Swim School 'Even a competent swimmer can lose their lives in the water - whether it's due to a bump on the head as they fall, or because they fall into cold water. There isn't any way to make a person completely drown-proof, so there's no reason to adopt extreme methods for the "just in case" scenario that the child happens to fall into the water in favourable circumstances'. May 16th, 2016. http://www.turtlesswimschool.co.uk/single-post/2016/05/16/Drownproofing-methods

make a significant difference in eliminating or even reducing the incidence of drowning in early years. In the absence of evidence, the rule of “do no harm” seems to be paramount.

In the light of both research showing that violent conditioning is detrimental to early brain development, potentially causing trauma to sensitive infants, and the unproven outcomes of drown-proofing methods in statistically reducing drowning fatalities among the 0-4 year children population, forcefully training large numbers of infants to roll over and back float is therefore not socially commendable. The policy statement issued by the Australian Association of Infant Mental Health about controlled crying –leaving babies to cry to sleep unattended- may apply to drown-proofing: (it) ‘is not consistent with what infants need for their optimal emotional and psychological health, and may have unintended negative consequences’.[8]

Rotations to back float enforced on infants differ from spontaneous rotations developed by infants in the progression to unaided swimming and hinder free movement that is key to early learning.

A second claim made by drown-proofing schools is that their methods provide a foundation for early swimming. One of the tenets of back-float enforcement, since its Australian early forms, is that learning to swim is best achieved in a horizontal position and that this needs to be secured at all costs, as early as possible. Let’s look at this statement carefully because enforced back float may interfere with the normal integration of primitive and postural reflexes if done during sensitive developmental windows.

As soon as babies have gained head control, their next obsession is to develop muscles that will help them to sit up half way through their first year and then, progressively, to stand up at the end of their first year. Any baby swimming teacher knows the frustration of a baby who has developed a righting reflex ahead of his or her happily back floating peers in a class. Frantic kicking and uncoordinated movements aim at resuming a preferred upright posture, after which smiles are returned because needs are fulfilled. Forcing a baby to float on her back in the second half of the first year is acting against the developmental drive of human posture, the primal aim of which is to attain verticality in a top-down spinal developmental sequence. For babies forced to float on their backs, the development and then the integration of the righting reflex are suppressed at a time when they are crucial to the

[8] http://www.naturalchild.org/guest/pinky_mckay.html

integration of both primitive and postural reflexes most particularly the Symmetrical Tonic Neck Reflex.

As Shawn Tomlinson from Birthlight points out, 'The primitive Asymmetrical Tonic Neck Reflex[9] focuses on integrating the lateral sides of the body while securing head control, which of course provides optimum breathing positions. Moreover, the Symmetrical Tonic Neck Reflex, which is a postural reflex, ensures the integration of the upper and lower halves of the body as infants activate them in their desire to turn and rotate. These movements can only happen fluidly because of previous movement and practice of the more primitive movements'. Toddlers who have been encouraged early to rotate from prone to supine supported positions in their parents' arms in the water favor rotation to back float among other options to surface to breathe when they start propelling themselves in water. While some toddlers who have been trained to roll over and back float may well progress to elective rotations using voluntary movements, others are likely to be impeded in this progression due to early enforced back floating.

While it may gain a few precious minutes to allow babies' rescue after accidental falls in deep water, we need to consider the implications of survival back float for the vestibular system, their self-perception in space and overall sense of balance. We cannot ignore the important research showing that that motor planning involves the entire brain. The cerebellum, identified as the "movement centre" has recently been shown to be connected to the cortex (cognition centre) through a neurological cable of 40 million nerve fibres feeding information both ways, with implications for emotional balance and memory retrieval[10]. Lots of active movement and varied sensory experience in water are conducive to child-controlled motor planning as something highly enjoyable. Oxytocin and endorphins, the 'feel good' hormone, are triggered by free movement, in contrast with cortisol in the stress-inducing survival learn to swim methods.[11]

[9] The ATNR is important for developing homolateral one-sided movements. When the infant turns his head to one side, the arm and leg of that side automatically extend.

[10] Masten, A.S. 2012. Risk and resilience in development. In P.D. Zelazo ed. The Oxford Handbook of Developmental Psychology Vol.2. New York: Oxford University Press.

[11] In a longitudinal study, Dr. Liselott Diem and her colleagues reported that children who had taken part in baby swimming lessons from the age of 2 months to 4 years were better adapted to new situations and had more self-confidence and independence than non-swimmers. Diem, Undeutsch, Lehr, Olbrich, "Early Motor Stimulation and Personal Development: a study of four to six year old German Children." *Extract by Editor. Swimming World* 21 (12):14, 1980.

At Birthlight we encourage rotation with various practices that correspond to developmental stages and the known healthy and timely integration of primitive and postural reflexes in early years to develop the bilateral cross patterning movements of swimming that are uniquely helpful in activating both brain hemispheres and all four lobes simultaneously, increasing the ease of learning.[12] Our vision is that of a water-safe but bold three-year old little swimmer who loves flipping, rolling, tumbling and finding his or her own unique progression for surfacing to breathe. This takes place through a playful lengthening and strengthening of movements initiated in the core body, precisely those movements impeded by enforced back floating.

Due to the heavier heads of babies under one in relation to their bodies, a lot of external stimulation is necessary to over-develop the cervical muscles needed to keep the face above water in back-floating. In my personal observation of Australian drown-proofed babies, only those close to one year achieved this without strain and considerable spluttering and swallowing water. From a long experience of assisting the progression of babies to spontaneous unaided swimming, and from watching Amazonian young children learning to swim with bits of balsa wood as floating aids, I would say that the most common transition is from a semi-vertical to a near horizontal body-balance. This takes place at some point in the third year, often closer to four than to two years old. Unlike older children who until not so long ago were encouraged to learn to swim without having their faces in water, toddlers gain their horizontal balance through the strengthening of leg, then arm movements that - as they soon find out from experience - are easier just under the water surface. While I would agree with proponents of the roll-on-back-to-float method that a body rotation for surfacing to breathe is preferable to lifting the head to breathe, toddlers initially go for one or the other - and it is not easy to convince them otherwise. Eventually, all start rotating without being taught as they extend their doggy paddle to something closer to freestyle. Parents who are told that their infants MUST first acquire a horizontal position in the water to learn to swim successfully are simply misled. As much as this applies to older children, it is detrimental in the case of infants. Parents must be reassured that infants' optimal body balance in the water evolves as they develop strength in their arm movements usually in their third year, in few cases earlier.

[12] Katy Bowman. *Alignment Matters: The First Five Years of Katy Says*. Propriometrics Press, 2013. Guertin, Pierre A. Central Pattern Generator for Locomotion: Anatomical, Physiological, and Pathophysiological Considerations. *Frontiers in Neurology*. 2012;3: 183. (Research on generation and modulation of rhythmic locomotor patterns.)

Little mention has been made of breathing in the discussion of drown-proofing methods. Breathing ease, however, is key to successful swimming with the ability of slowly release carbon dioxide, often through the mouth rather than through the nose, in the rhythm of self-propelling movements. It is well known that extended exhalations produce endorphins as they involve the parasympathetic nervous system, which may explain why even fast swimmers competing in short distances find swimming relaxing. Infants breathe in rapid cycles. They only learn to blow bubbles, a key skill to extend their exhalation in water, towards the end of their first year and through their second year. At Birthlight, we have found that once infants become breath-aware, there is no need to worry about signalling to them that they must close their mouths to avoid swallowing water and hold their breath. The 'gag reflex', active in the first ten months, progressively gives way to the diving response that is, at least partly, consciously mediated. Since infants' breathing rhythms respond to "entrainment" with parents or very close adults, blowing bubbles with them in the water is not just a game but an empowering training through which breath control is acquired individually, rather than following vocal cues dictated by adults.

Strong vocal commands or even cues used in drown-proofing and in submersion trainings, cause infants to hold their breath artificially. Yet once infants take charge of their breathing, whether they enjoy going under or not, they are infallible with the coordination of breath and movements in water, knowing when to dive and when to surface within their exact limits. Relaxed back floating without movement is difficult to achieve before the third year due to the lingering righting reflex and infants' body weight distribution. In contrast, back floating sustained by leg and arm movements relies on rapid shallow breathing due to the strain, at least in the early phases of learning. In the best circumstances, averting the unpleasant effects of a sinking face is associated with anxiety and the release of adrenalin and stress-related hormones reinforcing shallow breathing. For children with a propensity to asthma, or who need extra reassurance in life, being supported in finding their breathing rhythm in water promotes a relaxed way that is conducive to find their buoyancy in their own terms.

To promote water safety and to enhance young children's chances of survival if they accidentally fall in water, back floating need to be placed in a context of multiple body rotations rather than be singled out as a static life-saving strategy.[13] While a baby under 24

[13] 'We argue that a greater understanding of which types of swimming programme and water-survival skill training are most effective in preventing drowning will further aid drowning prevention efforts. Swimming skills are just one potential prevention strategy that must be considered in the context of a multifaceted approach that includes effective barriers, appropriate adult supervision and training in CPR'.
Eurosafe evidence statement: Water skills training (formal swimming lessons) to reduce the risk and/or occurrence of drowning.http://www.eurosafe.eu.com/csi/eurosafe2006.nsf/wwwVwContent/8814C527AFCE120BC125785B002C8885?o

months cannot easily propel himself back to the water edge after falling in, games of turning around and reaching a pool bar, a gully or edge may impart potentially life-saving behaviors. The self-confidence of an infant who has already learnt to assess risks and to respond to a variety of playful challenges in water compares favorably with the automated response of back-floating. No situation is a text book one. Since we know that many accidents happen in water where infants could stand up if they did not panic, apart from body rotations, learning to regain footing is the most fundamental water safety practice. In most parts of the world where children learn to swim early as part of a traditional life-style, confidence with crawling and standing up in shallow water are the first basic skills. Anecdotal evidence of toddlers who acquired water safety skills in gentle ways and used these skills successfully after falling in garden ponds or even in rivers match the claims made by drown-proofing schools.

Can early swimming to help save lives be achieved without resorting to forceful roll over and back float survival techniques? Yes, absolutely. Moreover, this is something that all young children, everywhere in the world, would benefit from. For Scandinavian children, swimming competence is mandatory at primary school age yet within the European Union, there has been a decline in school-based swimming lessons since the 1990s. The World Health Organization is considering a global call to action.[14][15]

Why not consider a greater focus on early water safety skills within gentle swimming approaches, with the objective of making a statistical difference in the successful prevention of drowning in early years, at least in the 2-4 years' age group? Confidence in regaining footing, the habit of turning around after jumping in, and the ability to swim five meters and grab the water edge or a buoyancy aid are water safety skills that can be effective to save lives while being easily imparted to infants in a playful and highly enjoyable way. Admittedly, regular attendance in classes does require a level of parental involvement that may not be realistic given the limited availability of pools, the costs of access and the demands that life makes on most parents. Yet baby swimming is a popular activity many parents invest in. All

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pendocument&context=611D07E20DBA3DE3C12573070039B17E. quoted in ROSPA: Delivering accident prevention at local level in the new public health system, Accident prevention in practice Part 2,WS1.

[14] "Drowning is a highly preventable public health challenge that has never been targeted by a global strategic prevention effort. The report sets out current knowledge about drowning and drowning prevention, and calls for a substantial scaling up of comprehensive efforts and resources to reduce what is an intolerable death toll, particularly among children and adolescents," said Dr Margaret Chan, Director-General of WHO.

[15] See Dr Ruth Brenner's investigation at the NIH (National Institute of Health) in the USA (*Archives of Paediatrics and Adolescent Medicine* 2009; 163(3):203-210), showing that swimming lessons provided 88% reduction in the risk of drowning for ages 1-4. Initiatives relying on gentle swimming methods for drowning prevention in early years include: SWIMkids USA, Griffith University Early Years Swimming Research Project (Australia), Safer 3 Water Safety Foundation (USA).

respectable swim schools have children's water safety at heart and this is inscribed in the constitution of the Swimming Teachers' Association (STA).[16]

Given the recent increased visibility of drowning risks for infants in the UK, it seems timely to propose a national water safety education campaign for early years, imparting non-violent water safety techniques to parent/baby pairs. At a time when infants are increasingly constrained in car seats and other contraptions, free movement in water can be seen as an early years priority, both for overall development and for increasing chances of survival.[17] In this important campaign, drown-proofing methods have no place: their statistical benefits are unproven and their potential developmental risks are compelling. It is a moral duty for all aquatic teachers of parent/baby pairs to inform parents that drown-proofing methods have possible detrimental effects that disqualify them for application to the population at large from an epidemiological perspective. "Each child matters". In the promotion of water safety, this may be best served by ensuring the wellbeing of all children. Drown-proofing was developed at a time when we did not know much about babies' brains and their environment-sensitive development. It is time to apply cutting-edge science and an innovation mindset to the urgent task of creating the best practices of tomorrow.

[16] STA created in 1932 has water safety in several charitable objects: http://apps.charitycommission.gov.uk/Showcharity/RegisterOfCharities/CharityFramework.aspx?RegisteredCharityNumber=1051631&SubsidiaryNumber=0

[17] Dr Sigmundsson, Norwegian University of Science &Technology 2010 (better balance, movement and grasping skills than control group up to 5 years. Sigmundsson H., Hopkins B. "Baby Swimming Exploring the Effects of Early Intervention on Subsequent Motor Abilities." *Child: Care, Health and Development, Science Daily* 210, 36 (3): 428 sq. Melbourne AU study 2011 (early years swimmers have higher IQs). German Sports University Cologne 2012 (early water movement promoted better indicators of physical, mental and emotional development compared with a control group. World Aquatic Babies and Children Network, online-www.wabc.com. Zelazo P.R., Weiss M.J., "Infant Swimming Behaviors: Cognitive Control and Influence of Experience." *Journal of Cognitive Development* 7 (1); 2006: pp. 1-25. Whitehead L., 2012. "Scientific Benefits of a Baby Swim Lessons." Mesa, Arizona.

INDUSTRY SUPPORT

In support of this report all the major UK bodies involved in baby swimming have come together.

Dr Francoise Freedman, a medical anthropologist at the University of Cambridge and the founder of Birthlight, is considered one of the world's leading experts on baby swimming and she says in the report: "Drown-proofing methods through floating have been around for decades, but the techniques are becoming more prevalent and have recently caught widespread international attention – leading to us, uniting as an industry in the UK to speak out about our concerns."

Kaylë Burgham, Head of Aquatics at STA, the UK's leading experts in baby swimming teaching and a registered charity dedicated to the teaching of swimming and lifesaving skills, adds: "While we wholly agree that teaching water safety is essential – it's at the core of everything we do - we morally cannot agree with this drown-proofing methodology. There are far gentler child-focussed swimming teaching and water safety practices readily available that parents are advised to follow."

"For STA, the potential neurologically harmful practices of forceful conditioning, as outlined in the report, are simply not justifiable in any circumstance."

Michael Dunn, RLSS UK Deputy Director of Education and Research said: "As the drowning prevention charity, the Royal Life Saving Society UK advises against the use of these types of infant self-rescue or survival programmes. The RLSS UK has taken this position following close scrutiny of the evidence base which shows no proven drowning reduction benefit to the infant, and which has raised significant concerns nationally and internally about the potential for an increased risk of drowning during or following participation in these types of programmes.

The Society does support parent and baby sessions, and basic water safety and swimming lessons for children starting whenever the child is developmentally ready to engage with the activities fully and comfortably."

Swim England Learn to Swim Director Jon Glenn, said: "A child's first experience of water and the pool environment should be positive, fun and memorable. It is important that children become comfortable and safe in the water at an early age, but any form of forced techniques are unacceptable. Not only can these be physically harmful, they may also result in children being put off going in the water, leading them to miss out on a lifetime of fun that learning to swim can bring. This is such an important area that it is good to see the whole sector coming together to support this report."

The UK's leading baby swimming providers' Water Babies, Puddle Ducks and Turtle Tots also support the publication.

Paul Thompson, Co-Founder of Water Babies, said: "We are fully aware of the distress to children the self-rescue technique can cause and regard it as an aggressive, unproven method to make babies 'drown-proof'. Parents who choose this method are well-intentioned, but have unfortunately been misguided. We practice a much gentler, nurturing and holistic approach that enables little ones to develop physically, emotionally and cognitively at an appropriate rate. We have had clients come to Water Babies having used the self-rescue technique and in many cases the children are petrified of water. Instead, we teach safety, but also encourage children to enjoy the sheer fun of swimming with their family for the long-term."

Ali Beckman, Technical Director of Puddle Ducks, says: "Personal survival skills should be an integral part of all swimming lessons but there are ways to do this without forcing a child to go through these methods which not only lead to trauma but also a fear of water in general. Forcing rotation movements can also have an impact on a child's physical development as it can interfere with the natural development of postural reflexes. There are

proven safe, effective and enjoyable teaching methods to allow children to learn how to save themselves, which will also help promote a love of swimming for life."

Gabrielle Lixton, Founder of Turtle Tots, said: "'At Turtle Tots we fully endorse and promote a gentle, child focussed, child led philosophy. This is the bedrock of our beliefs and all teaching practices, including the teaching of life saving and water safety skills. We believe that teaching our babies and children to swim should be an enjoyable bonding experience. We do not morally agree with the technique of drown proofing and it is the polar opposite of our methodology. Drown proofing is a conditioning technique that is both dramatic and traumatic for a child which is totally unnecessary in teaching water safety skills. We are passionate about teaching babies to swim and water safety skills within a safe, happy and child focussed environment.'

References:

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