Children and diving

Children and diving: a review of SPUMS articles

Carl Edmonds

Key words
Children, recreational diving, scuba

Abstract
(Edmonds C. Children and diving: a review of SPUMS articles. SPUMS J 2003; 33: 206-211)
This review of recent articles relating to scuba training of children published in the SPUMS Journal counterbalances some of the perceived bias of the diving industry organisations and affiliates. Additional case reports are supplied and factual information regarding diving deaths is related to the specific limitations imposed by childhood. The legal and moral implications are discussed and proposals are made to ensure that safe scuba diving experience is made available to children who are medically fit to undertake this.

Introduction
I was saddened to read the latest SPUMS Journal articles on children scuba diving.1-8 Because of the apparent absence of critical editorial or peer review, I felt obliged to respond to the Editor’s request for debate and share some facts and opinions contrary to the tenor of the publication.

I have tried, as far as possible, to restrict my comments to information now available in the Australian literature. As the original much-debated decision of SPUMS was to treat all divers below the age of 16 as children, requiring independent guardianship, and as it has some basis in law, I have persisted with this definition.

Case histories
Three previously published cases are selected to illustrate several important issues.9-12

CASE ONE
In 1971 I assisted at an autopsy on a previously healthy 14-year-old boy who drowned while under scuba instruction and performing shallow-water training exercises. On the surface, he cried out for help and appeared to be panicking just prior to disappearing. His body was recovered in 9 m of water. There were signs of facial and upper respiratory tract barotrauma, indicating that he was alive but possibly unconscious as he sank.13 He died of drowning, aggravated by over-weighting and panic.

CASE TWO
Another 14-year-old diver was trained in that same year, but presented a year later after acquiring reasonable experience. He was on an organised club boat training/excursion and became seasick and vomited before diving.

During a dive to 13 m, he lost contact with his more experienced adult buddy on the ascent and died from drowning, probably secondary to pulmonary barotrauma.

CASE THREE
The third case was certified as an open water diver at 12 years of age, and was very conscientious in her post-qualification training. Eight hours after a routine three-monthly dive at Manly, to 6 m for 37 minutes, her father drove her home over the Blue Mountains. Aware of the precipitation of decompression sickness (DCS) with altitude, symptoms started to develop. They got worse as the father and the daughter sought reassurance from each other. They managed to contact the Diver Emergency Service in Adelaide, and were diverted to Westmead Hospital for intravenous infusion and finally ended up in a hyperbaric chamber, where she really was in a very disturbed state. The anxiety, dyspnoea, hyperventilation, numbness, paraesthesias and confusional state, aggravated by the protracted assessments and treatments, were all totally identifiable as an acute psychological reaction. The whole family ended up with post-traumatic anxiety problems.

Clinical commentary
Why mention these three cases? Because they complement Walker’s cases5 and illustrate some situations in which children are more vulnerable than adults to diving problems. They also illustrate the inadequacy of the ‘diving limitations’ for children divers to be discussed later.

In Case One, the effect on the parents, the instructor and the other students was catastrophic. It also had a profound effect on this observer and instigated a career-long drive to reduce diver deaths, especially in the young. The instructor was equally devastated.
The youngest scuba diving death I am aware of was aged by most psychiatrists. There were a few asthmatics. classified as normal developmental problems of immaturity problems presenting during diving. The latter would be barotraumas (sinus and ear) or psychological-based the majority presented for either upper respiratory tract have treated only a few dozen children scuba divers, and During my years as a specialist diving physician, I would psychiatrically-aware doctors. unrecognisable by most dive instructors or non- This is a normal development, unrecognised and probably for this syndrome is part of early adolescent development. induced hyperventilation syndrome. The emotional basis Case Three was a normal 13-year-old female with a psychological profile of obsessionality and an anxiety- induced hyperventilation syndrome. The emotional basis for this syndrome is part of early adolescent development. This is a normal development, unrecognised and probably unrecognisable by most dive instructors or non-psychiatrically-aware doctors.

During my years as a specialist diving physician, I would have treated only a few dozen children scuba divers, and the majority presented for either upper respiratory tract barotraumas (sinus and ear) or psychological-based problems presenting during diving. The latter would be classified as normal developmental problems of immaturity by most psychiatrists. There were a few asthmatics.

The youngest scuba diving death I am aware of was aged seven years, although the University of Rhode Island did state that the 10- to 15-year age group represented 7.8% of the diving deaths in 1970. Child diving had a burst of popularity around those years, which may have explained this high incidence, not evident in the intervening years.

Review of SPUMS papers

There are some comments that are general and were not refuted in the papers published recently:

• Scuba kids are here to stay. Corollary: One can still rely on experience and case reports to illustrate the type of problems that exist and the means of prevention.

• Scuba kids are here to stay. Corollary: So is dental caries. This does not mean that one should not try to prevent pathology.

• Strong emphasis on snorkelling skills is needed. Corollary: We should encourage safety-orientated swimming and snorkelling training by qualified instructors. Medical fitness for snorkelling is described elsewhere.

• Industry-based figures for accidents suffer from under-reporting.

Corollary: All statistics should be critically evaluated before publication, especially those that look too good to be true.

• Children are less physically powerful (most authors).

Corollary: Aquatic/physical fitness standards should be applied, as tidal currents are not influenced by the age of the diver. A 200 m unassisted swim in less than five minutes is a reasonable prerequisite.

• Children are emotionally immature (most authors).

Corollary: Age is the best correlate with maturity. Vigilant supervision of children and competent ‘duty of care’ is obligatory. They need to be genuinely supervised while diving, not just have a companion.

• Children are not little adults.

Corollary: Then let us not treat them like little adults.

Taking the specific presentations in order:

THE EDITOR’S OFFERING

The editor made his views clear. If SPUMS and specifically its president, Dr Walker, refuse to change their recommendations to comply with the diving industry’s wishes, they will be seen as dinosaurs. His praise of the diving instructor organisations’ (DIOs) “well-designed training programmes”, “clear limitations” and “tightly controlled parameters set by the training agencies” both in his editorial and case report leave no doubt where his inclinations lie. His endorsements will be greatly appreciated by the marketing branches of the DIOs. But is the SPUMS Journal the place for them?

The Editor gave unqualified praise to the Belgium paper, which finds no problems with children scuba diving, and expresses regret that this decade-old study has not been previously published in the medical literature. One possible explanation could be the quality of the data and therefore its conclusions. He also delegated the responsibility of scuba training decisions to the parents/guardian who, unless they have comprehensive knowledge of medical and diving problems, will make uninformed judgments.

As the Editor, it is his privilege to agree or disagree with specific contributions. Nevertheless his endorsements are unsupported by argument, and conflict with the case reports supplied later in the Journal, the thoughtful guest editorial and previous contributions to the SPUMS Journal.

CHILDREN AND DIVING: MEDICAL ASPECTS (BELGIUM STUDY)

Its methodology and design need to be elaborated and defined before credence is given to this study, performed by a sports physician, an engineer and a nurse.

A prospective eight-year follow up of 234 children trained with scuba sounds impressive. However, questions relate to this population sample. The six- to 13-year-olds seem to not reflect the Belgian community, with an asthma prevalence of less than one fifth the normal. No other cardiac or respiratory problems, no grommets, no epilepsy and no emotional limitations were apparent in these children, influencing their fitness to dive. This is either a highly selected group, or it suffers from inadequate assessment or poor documentation. Such options can also be considered in appraising the rest of the clinical data and ‘statistics’.

The series of 205 children extended over an average of five years, but with different children. It was not 205 children for five years. The drop-out rate, for a variety of reasons, was 25% per year! ‘Drop-offs’ were replaced. This is not a population survey; it is a survivor survey. Thus, it will predictably under-report morbidity and virtually exclude mortality. The study is not dissimilar to the misrepresentation of asthma and diabetes surveys also used to market the concept of scuba safety.
Exercise ECGs and EEGs were performed on all candidates. The latter were performed to assess psychological maturity. This is not a well-established method in the English-speaking world. Will the proponents of child diver training in Australia and USA now recommend exercise ECGs and EEGs for children under 16? I was not, then, surprised to find that “hyperventilation is prohibited before the age of 10 years and strictly limited before the age of 14 years”. Water temperature greater than 12°C is classified as warm.

There seems to be a discrepancy between Belgium, in its diving medical knowledge and culture, and Australia. This requires clarification and extends to the fields of psychology, electroencephalography and population statistics. I am not sure about New Zealand.

No incidents or accidents occurred during the children’s 2216 open water dives. Not even ear equalisation problems (which they do define as incidents). The reporting procedure, if one existed, was not specified. To my knowledge, no other group has ever achieved such a spectacular safety record, except for the 800 pregnant women exposed to hyperbaric oxygenation in the USSR. They also had no complaints recorded.

CHILDRen AND DIVING EDITORIAL

Cvitanovich and Langton gave a measured and informative resume of the problems of exposing children to hazardous situations, and especially a child’s different emotional capability in handling stress, problem-solving and responsibility. They warned of the unpredictability of behaviour in 10- to 15-year-olds. They re-asserted that supervision by an adult needs to be close supervision, not merely accompaniment by an adult ‘buddy’. Also, they stressed that informed consent of a child, even as they approach 15 years of age, can be a difficult issue. They gave references to the “well-documented risk of death and permanent disability” that can occur during dive training and that a small, prospective theoretical risk will almost certainly be viewed differently with the benefit of hindsight.

DCS IN 14-YEAR-OLD DIVER

Davis presented an informative DCS case report illustrating “what can go wrong if the tightly controlled parameters set by the training agencies are ignored”. What this article did not address is what can happen even if the parameters are followed. Fortunately, Walker’s case reports and my own cases add this dimension.

I agree with his comment that “post-traumatic stress problems are not uncommon” after these injuries. If this paediatric patient had had a less satisfactory response, with permanent neurological or psychological damage, there would be an excellent case in law questioning the fullness of the disclosure and understanding of the dangers of scuba by the client against his guardian, the instructor and his original medical examiner (not Dr Davis). Because of the statute of limitations as applied to children, this remains a possibility at least for a decade after the accident, until he reaches the age of 24 years, in most Australian states. I would also question the duty of care supplied by each of these potential defendants.

HOW OLD IS OLD ENOUGH?

Dr Robyn Walker, president of SPUMS, documented the current (1992) policy, which is far more lenient than the previous one requiring a minimum age of 16 years before certification and the presence of a parent/guardian at the medical examination until the age of 18 years. SPUMS requirements were not relaxed on the basis of any data, but to comply with the Australian Standards. It may not be wise to allow commerce to dictate to medicine, but it did.

Walker, in her usual sensible manner, described nine paediatric deaths related to scuba diving. Of relevance in these cases was that:

• at least four were diving with their father;
• two were under training at the time (both died from pulmonary barotrauma with CAGE, probably initiated by panic);
• six died at depths less than 10 m;
• most drowned.

One of my three cases was under training at the time of death, at least two had panicked, and one was with her father. The two deaths occurred at a depth of less than 13 m, one from pulmonary barotrauma, and one from drowning. None of the combined 11 deaths died from DCS. These factual data should be kept in mind when assessing the DIOs’ safety recommendations (“limitations”).

Prudent general advice was given about the problems relating to equipment, environment and rescue requirements and how these related to the physical and emotional limitations of childhood. Walker was also the only contributor to the debate who actually extracted case records of scuba child deaths and reviewed them.

HOW YOUNG IS TOO YOUNG?

A dive instructor, technical and deep diver and diving physician, Mitchell’s presentation was originally written for PADI diving instructors, so perhaps the absence of case material was to be expected. He states that the figures supplied from CMAS and PADI indicate that the risk of serious injury is low, but these are likely to suffer from under-reporting.

RECREATIONAL DIVING TRAINING PERSPECTIVE

Richardson uses diving-industry-generated data to promote the commercially valuable concept of children becoming scuba qualified. DIO figures have always been treated with suspicion and were refuted by Monaghan, a population statistician and one of PADI’s own instructors, in the
Richardson in a previous article in this journal used highly selective figures indicating scuba diving to be safer than swimming (hard to understand as one does both during diving) and bowls!23

He now quotes figures of 3.5 million open water exposures with SNUBA, to depths up to 6 m, without incident! Those perennial problems that beset young adults learning to dive, such as claustrophobia and panic, aspiration of water, ear and sinus barotraumas, etc., were allegedly absent from his 3.5 million SNUBA experiences. This is surprising when all the other authors seemed to infer that children were more vulnerable to upper respiratory problems and emotional lability than adults.

Search of the internet site that he quoted in support of these figures, revealed not only no statistics on SNUBA, but no reference to SNUBA at all. I know only one child who used SNUBA, and he burst his tympanic membrane.

If one assumes that the reference quoted is an unfortunate typographical error and one searches the internet for information on SNUBA and SNUBA accidents, it becomes apparent that some commercial groups claim more than three million SNUBA exposures without a (legal) insurance claim against the company (internet search, followed by personal communication, Sub Sea Systems Inc, dated 19 August 2003). This is not the same as three million clinically injury-free dives!

Even if we restrict the 3.5 million dives as being free of ‘legal or insurance-claim injuries’, there are two provisos of note. Firstly, the legal waiver of responsibility for accidents, which according to the commercial web sites must be signed before exposure and indemnifies the operator, mitigates against any legal claims. Why would they need this if the activity is so safe? Also, perusal of some web sites demonstrates that litigation for such accidents has occurred.24

I deduce that it all depends on where you get your figures from, on how you re-define and collect incidents, or how truthful you wish to be in their presentation.

Richardson uses the same distraction techniques in this article that are often employed by DIOs. Despite knowledge of the child deaths described in his references, he spends most of his extensive report arguing 11 Dorothy Dix questions. He refers to these as “the main issues...in considering children and scuba diving”. DCS, not a major cause of recreational diving deaths, dominates his discussion (five questions). He also deals with other less relevant or easily coped with conditions, such as oxygen toxicity, thermal protection and developmental factors such as patent foramen ovale and respiratory physiology.

Using this approach, the most common cause of death in children divers, drowning, is ignored, whilst the major contributors to death, such as panic (mentioned only in association with asthma, which excludes diving) and pulmonary barotrauma (reduced by not accepting anyone below the age of 10) are dismissed. This is a disingenuous approach that avoids tackling the real problems. He quotes two irrelevant projects that do not in any way bear on the genuine psychological immaturity problems described by Walker, Cвитанович and Langton.3,5

Richardson does, however, succinctly and openly describe the PADI programme and the safety limitations it employs.

• PADI junior open water scuba divers aged 10-11 are limited to 12 m depth and may dive only with a PADI professional or a parent/guardian who is a certified diver;
• PADI junior divers, aged 12–15, may dive to 18 m or 21 m if doing a PADI course, and must dive with a certified adult scuba diver.

These ‘limitations’ on junior divers, even if applied, would not prevent most child deaths. They are minimalist standards that equally apply to adults and do not address most of the genuine ‘immaturity’ concerns defined elsewhere.

Legal implications

In an increasingly litigious society, one can anticipate that morbidity and mortality are now likely to be followed by demands for compensation for an unfortunate outcome. This is especially so with injury to children. The medical examiner, for pecuniary reasons, is a more vulnerable target for litigation than the less affluent dive instructor.

The most obvious cause for action will be the death of a child. More frequent, but still very serious, are the problems of hypoxic encephalopathy of near drowning, hearing loss from barotrauma, chronic sinusitis and a prolific myriad of psychological reactions.25 In the case of children there is an automatic extension of damages resulting from interruption to education, limitation of occupational potential and interference with social functioning.

One of these problems has been addressed by Davis.4 After the age of 24 years, it becomes more difficult for the diver described to take action for injuries caused whilst a child, but often the statute of limitations can be circumvented. For the medical examiner to demonstrate that the child was fully cognisant of the dangers is unlikely to be given credence once damage is experienced. The claimant will have logic as well as sympathy on his or her side. There is considerable doubt that a child can be held to understand the full implications of hazardous exposures, or be expected to behave in a mature manner during this stress, to avoid being injured.

Above the age of 16 to 18 years, most teenagers are considered to develop this responsibility. Thus they can then drive cars, fly planes, become surf life-savers, make financial commitments, etc. Scuba diving is not the exception that makes children act like adults. Most dive
instructors and doctors cannot accurately predict a child’s maturity, and especially how they will react to life-threatening stress in the absence of expert supervision.

Diving limitations for children

In assessing these proposals, one must appreciate the motivation of the proponents. If it is a genuine health issue, then health professionals experienced in diving medicine should be involved. If a commercial DIO is involved, then allowance must be made for their pecuniary interests. A survey of 35 diving physicians conducted by Professor Taylor at the World Congress on Drowning, incorporated eight paediatric specialists and a wide spectrum of other medical specialists. It disclosed the following. The minimum age recommended for diving by this group was 14.9 years (mean) or 16 years (median). For those whose children were already diving, the age of commencement was 15.7 years mean and 16 years median, suggesting that their own practice was even more conservative than their recommendations.

Some advisers, be they medically qualified or diving enthusiasts or both, are risk takers. Of these, some will restrict their risk-taking behaviour to themselves, in which case they are not much of a danger to others. Some risk takers will promote their behaviour to others, and this is a particular concern if the others are children, whose capability to comprehend and counter the danger they may face, or its sequelae, is limited. The other wild-card proponent is the ‘wanna-be’ expert who, in the absence of experience or genuine contributions, relies on being avant-garde and fashionable.

Despite the rhetoric of both the physicians and the DIO affiliates, PADI requires only that their 12- to 15-year-old diver needs to dive in the ocean with ‘a certified diver’. The latter may have achieved this certification with less than a handful of open water dives. That is not an adequate supervisor, whether a parent or not. That is someone who themselves needs supervision. It certainly does not fulfil the requirements for supervision and guardianship of a child.

The most common contributors to scuba diving deaths are panic (39%), aspiration of water (37%) and fatigue (28%). The most common ultimate pathological causes of death in younger divers are drowning and pulmonary barotrauma. The acclaimed ‘limitations’ on children divers will have little influence on these causes, and indeed they are virtually ignored in the propaganda campaign run by the DIOs.

It is my opinion that a child under the age of 16 should only have ‘dive experiences’ under the following, moderately safe, conditions:

- They want to, without parental, peer or promotional pressure;
- They are medically fit to do so;
- They are trained by and dive with a qualified instructor, and under the personal and total control of that instructor (i.e., not three or four trainees together).
- They dive to a maximum depth of 9 m.
- The nine-metre depth will certainly not prevent a child from developing pulmonary barotrauma, cerebral arterial gas embolism, any of the other respiratory tract barotraumas or anxiety reactions. It will, however, usually prevent decompression sickness.

The child should not have the responsibility of rescuing others (such as a diver-parent). Unfortunately some have already experienced their parent’s demise while diving. Irrespective of the child’s total innocence, subsequent guilt can be catastrophic in these cases.

Giving a dive certificate to children under the age of 16, other than one that stipulates diving under the above very special conditions is, in my opinion, both courageous and irresponsible. I would be interested in all the contributors’ responses, but especially those of the Editor, and Drs Walker, Cvitanovich and Langton on these safety recommendations.

This may make me a dinosaur, but I believe that a more accurate analogy for Dr Walker is a tall poppy being hacked at by commerce and fashion.

References

1 Davis M. The editor’s offering. SPUMS J 2003; 33: 61
3 Cvitanovich A, Langton P. Editorial. SPUMS J 2003; 33: 74-75
4 Davis M. Decompression sickness in a 14-year-old diver. SPUMS J 2003; 33: 75-76
5 Walker R. How old is enough? SPUMS J 2003; 33: 78-80
6 Mitchell S. Children in diving: how young is too young? SPUMS J 2003; 33: 81-83
7 Richardson D. Children and diving: the recreational-diving training perspective. SPUMS J 2003; 33: 83-89
8 Taylor L. Children and scuba diving: a resource guide for instructors and parents. SPUMS J 2003; 33: 90
Dr Vandenhoven replies:

Dear Editor,

Thank you for the opportunity to respond to Dr Edmonds’ criticisms of our study.1 Evaluation of prospective paediatric divers in this study was based largely on medical opinion, as there was only limited information in the literature and no adequate evidence-based medical data available in the mid-1980s.

To establish and assess a system of scuba diving initiation for children with a focus on safety and prevention of diving or other injuries, we undertook a prospective study in the first children’s diving club in Belgium.

Two hundred and thirty four children between the ages of six and 13 years entered the study over an eight-year period. The average follow up was five years, with a range between one and eight years. The drop-out rate in this study reflects a real-life situation in different diving organisations throughout the world (CMAS, PADI, etc., since many divers, adults and or children, discontinue their diving activities after one or more years for different reasons. If one of the 205 children approved for scuba training discontinued diving activities, the reason(s) for this discontinuation was/were recorded as described in our paper. If the child was still diving, a phone survey of each child was performed by a registered recreational dive instructor using a structured questionnaire in order to avoid loss to follow up and eventual under-reporting of diving accidents and fatalities. No diving accidents were recorded in the above-mentioned group during the eight-year period of the study.

The study population sample is a highly selected group of Belgian and other European children living in Brussels. Potential paediatric scuba divers and their parents were first informed by the registered recreational instructors of the Brussels children’s diving club of major contra-indications, such as asthma, epilepsy, etc. At that time, all divers in the Belgian diving federation (FEBRAS/BEFOS, a member of CMAS) had to undergo a mandatory, annual medical fitness-to-dive evaluation including resting and exercise ECGs and an EEG during the initial medical check. The children of this scuba diving club underwent the same medical evaluations. Therefore, the children in this study had a much lower incidence of asthma, epilepsy and other medical problems due to pre-selection as is commonplace before sports and diving medicine evaluation in Belgium. In other words, a high standard of medical evaluation of sports divers was and is required in our country.

EEGs were performed to exclude previously undiagnosed epilepsy in these paediatric divers, and not to assess psychological maturity as suggested by Edmonds. EEGs were mandatory for initial fitness-to-dive evaluation in Belgium until the mid-1990s. Presently a yearly sports medical evaluation is still mandatory, but an EEG is at the discretion of the evaluating physician.
Dr Richardson replies:

Dear Editor,

Thank you for the opportunity to respond to the comments of Dr Carl Edmonds. Despite his personal and historical bias against ‘DIOs’ such as PADI, I believe Dr Edmonds reinforces a vital message for diving safety and the importance of addressing complacency in avoiding morbidity and mortality in divers. Even though the tragic case studies he uses are thirty years old, from an era when diving standards and practice were not as well developed as today, they serve to reinforce the importance of vigilance when it comes to diving safety and supervision, especially for young divers. As programme and standards developers, my colleagues and I share a personal commitment to this end in our professional practice.

Dr Edmonds may be surprised to learn that we have more in common than he thinks. However, his allegation that we have taken a minimalist approach to the topic of diving programmes for children is simply ludicrous. Had he taken the time to read our publication Children and scuba diving: a resource guide for instructors and parents,¹ and the extensive body of PADI standards and educational material addressing this topic, he would find that many of his criticisms and concerns are actively addressed in detail. Given his lack of background and experience in instructional design, training and education, I find it disappointing that he persists in ignoring or dismissing out of hand sophisticated programmes, methods and techniques of the modern educational approach to diver education. Rather, he seems stuck with his pre-existing, and very dated, negative perceptions. His comments, that PADI programme and safety limitations on junior divers “even if applied would not prevent child deaths”, are not supported by empirical data and therefore purely speculative.

References

and reflective of his negative bias. Further to this, it would appear that Dr Edmonds might believe that introducing young people to scuba diving is a new development lacking an empirical experience base, which it is not.

Does scuba diving have risks for children? In the event that he misunderstood my arguments, or felt I was overwhelmed with pecuniary interest, let me be clear – yes, it does. Considering that it has risks for adults, obviously scuba diving has many potential risks, which include drowning, lung over-expansion injuries, decompression sickness and middle ear injuries. There are also some theoretical concerns presented specific to children scuba diving because they are still growing.

The article I submitted to the SPUMS Journal attempted to provide a rationale for the programmes that PADI has recently introduced to mitigate these risks, not eliminate or understate them. Safety is the very basis for diver training and, to be fair, the outcomes of poorly organised diver training in the 1960s and 1970s were much worse than those from today’s training paradigms. Even by the crudest indicator, diver mortality data are supportive of this fact. Each year, millions of scuba exposures occur, far more than did in the ‘old days’. There are far more participants, far more exposures, and fatalities are not increasing. In short, modern diver training, education, supervision and practice are a vast improvement over the past.2

Anyone involved in scuba diving, adult or child, faces some risk of death or permanent, debilitating injury. Nothing aside from abstinence from diving can eliminate these risks, yet we believe that scuba diving is a reasonably safe activity. Assuming that abstinence is an unrealistic option, we have attempted to put together a comprehensive and incremental age-based programme of guided experiences for younger people. It is common sense that, while scuba has a lower accident rate compared to certain other sport and adventure activities, the potential severity were an accident to occur is much greater.

Children interested in diving, and their parents, need to accept these risks before they participate. PADI and other organisations such as SSI have created educational materials and videos such as the ‘Youth Diving: Responsibility and Risk’ programme to explain these risks so both parents and children can decide for themselves whether to accept them.

When faced with potential risks and hazards, the easiest answer may appear to be ‘no’, but that may not always be the best answer. The truth is, there is no way to protect children from all risks they face in life. Children will grow up to be adults who face risks. Establishing responsible boundaries and monitoring a child’s behaviour are important in order to avoid disaster. PADI programmes involving children handle the potential risks the same way. Limiting depths, requiring specific adult supervision and setting minimum ages for differing activities effectively manages and mitigates the potential risks of diving, including those unique to children. Parental involvement helps ensure that children respect and stay within these limits. Establishing a link between scuba instruction and a child’s broader world requires communication between the instructor and parent. Parents participate in the instruction process, either as students in the same class, or by interacting with the child and study materials. Is this disingenuous? I think not.

The fact is, thousands of youngsters enjoy diving every year and have done so for decades. Dr Edmonds chooses to ignore the long-standing empirical database of the CMAS, and other similar programmes cited in my article, and focuses extensively on my reference to SNUBA, demonstrating a selective bias in his arguments. It is interesting that he spends four of his eight paragraphs of critique of my article of over 60 paragraphs refuting a point made regarding SNUBA, which was all of three sentences long. If one discounts the brief discussion of SNUBA from my article and the safety record that company claims, my arguments and rationale stand.

That said, even with proper supervision and within limits, accidents happen, but they are rare. In perspective, one need only look at other activities children enjoy that carry the potential for severe injury, permanent disability and death. These do not dissuade children from these activities, nor their parents from allowing them to participate. Their lack of adult learning skills and behaviours doesn’t exclude children from learning to dive, any more than it excluded children from learning to ski, target shoot or play football. To the contrary, various diving experiences and programmes foster overall learning and growth and ask for reasonably mature behaviour, rudimentary mastery of physical and scientific principles, attention to following rules and guidelines, self-control and motor-skill mastery.

As for my utilising “distraction techniques” to argue 11 “Dorothy Dix questions”, these questions were framed by the diving medical personnel at DAN when consulted on the matter and do not reflect a selection bias on the part of this author. Finally, I must correct Dr Edmonds and state that PADI requires all children to dive under the supervision of a dive professional, adult or parent, period.

Drew Richardson, AS, BS(hons), MBA, DEd, President, PADI Worldwide E-mail: <drewr@padi.com>

References


The Editor replies:

Most importantly, Dr Edmonds criticises what he sees as a failure of peer review for the “Children and scuba diving” issue. The editorial intention was to provide a wide range of perspectives to stimulate critical debate on this important issue. The opinions of the authors were their own. As long as they were argued reasonably then these were not subject to ‘peer review’ in its full definition. One omission was not to identify Dr Taylor as a PADI instructor rather than simply a diving instructor in her book review. Both she and I considered this irrelevant, but the potential conflict of interest should have been acknowledged.

As a general principle, publication of material in this journal is NOT an endorsement by SPUMS (see “Disclaimer” on inside back cover). Any attempt by commercial enterprises to claim such would be regarded in the worst possible light inside back cover). The opinions of the authors were their own. As long as they were argued reasonably then these were not subject to ‘peer review’ in its full definition. One omission was not to identify Dr Taylor as a PADI instructor rather than simply a diving instructor in her book review. Both she and I considered this irrelevant, but the potential conflict of interest should have been acknowledged.

The only new data provided by any of the writers, including Dr Edmonds, were those of Vandenhoven et al. Dr Edmonds is correct that this paper was subject only to the Editor’s review (which was extensive) and was not sent out for additional commentary prior to publication. The reason for this is worth noting. Vandenhoven et al’s paper was received only shortly before that issue’s publication deadline. The original intention had been to reproduce the abstract of their paper from the proceedings of the 2002 European Undersea Baromedical Society meeting. As a moderate-sized single cohort prospective study it is the only research I have seen that actually looks at what really happens from a medical standpoint with teaching young children to dive. As such, I took the decision to publish based on my peer review alone, and I make no apology for having done so.

“Unqualified praise” of the Belgians’ paper was not given. Indeed, my comment regarding their failure to publish their work earlier should be taken as a strong criticism, one that Vandenhoven accepts. It is of little use if studies are undertaken then not submitted promptly for peer review and publication. Having said that, these data had been presented verbally at various medical forums in Europe over several years.

Dr Edmonds has chosen to misinterpret my editorial in a number of ways. I did not make my views clear, as he supposes. In fact, they fall very much in line with the policy of the Society as presented by Robyn Walker. Like Bill Douglas’s, my children did not learn to scuba dive till over the age of 16, though they were all proficient swimmers and snorkellers long before then, hence my comment regarding the need for a stronger emphasis on these skills by the training agencies. This is a criticism of the DIOs, not an endorsement. Also, I would point out that the case report was carefully chosen to add caution to the arguments, and that I contributed New Zealand data to Robyn Walker’s paper. These are not the actions of a biased editor.

It is regrettable that the “dinosaur” comment has been so misinterpreted, especially that the President regarded it as a personal attack. This was not meant to be so. The point is that the commercial training agencies have moved on to new markets without a body of medical knowledge to underpin the safety of that decision. Few doctors, apart from Vandenhoven’s group, have made any real attempt to conduct prospective research in this area, but rather have chosen to pontificate based on theory. In this respect, we have indeed been left behind and it is now, in my opinion, too late to close the door.

In Europe, physicians have been more closely involved with the development of children’s diving programmes than in the United States or Australasia. The model we take is from PADI and SSI, the USA-based companies that dominate the Australasian market. If Dr Edmonds read carefully the criteria proposed by Vandenhoven, he would find that these are remarkably similar to his own.

Interestingly, the British Sub-Aqua Club at their 2002 annual general meeting defeated a motion to reduce the age limit for its young branch divers from 14 to 12, but only on a technicality. Those who campaigned for the age reduction feared that failure to change would encourage continuation of an existing trend for parents to switch to other agencies so that their children can learn to dive, even if it means paying for the service. One of the campaigners for the change was quoted as saying “what parents want is to be made aware of the risks and then allowed to make their own decision with their child”. There is indeed a market out there and the training agencies have gone for it. As a profession, we have not provided sufficient evidence on which to say whether they are right or wrong. Thus far, what evidence there is suggests scuba diving is no more dangerous for young teenagers than for adults.

It was this evidence, collated by Diver Alert Network (DAN) medical advisers, as well as knowing about Vandenhoven’s study, that the PADI decisions were based upon, utilising the best available evidence at the time. PADI should not be criticised for this. However, Edmonds rightly argues that no evidence does not mean the same as negative evidence. SPUMS, and its Editor, would continue to urge caution.

Nearly 50 years ago Jacques Cousteau published a now famous photo of himself scuba diving with his wife and young teenage children. The debate remains open within the covers of this Journal for the time being. It would be helpful if this were supported by scientific research from all parties to the debate rather than mere opinion.

References
2 Anonymous. BSAC rejects bid to lower age limit. *Diver* 2002; August issue.