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FITNESS TO DIVE

Panel discussion with audience participation

Chairman Guy Williams
Panel members David Elliott (Guest Speaker), Robyn Walker, Des Gorman and Vanessa Haller

Key Words
Diving medicals, fitness to dive, medical conditions and problems, questionnaires, risk

Guy Williams (Chairman)

This is a summary session and perhaps we may be able to produce a policy statement or other statement on fitness to dive.

David Elliott

Hidden amongst all the information presented this week are one or two things which I consider to be important.

When it comes to reviewing fitness to dive, remember that instructors and dive guides are occupational divers and they require a different examination to that of recreational divers.

My concern with the idea of using informed consent to pass anybody who turns up, is what to do with the paranoid schizophrenic who wants to be your buddy.

I have no problem with solo divers. Nobody is going to find them anyway so putting the buddy at risk is not a problem.

Why are we so fanatical about health in diving when brain and equipment failure actually kill more people than pre-existing medical problems? It is because not just the diver is put at risk, there is the buddy and the others who may become involved in the rescue. It is true that some diving fatalities have been found at post mortem to have had medical problems, but these findings had no proven relevance to the cause or mode of death. So let us not get too influenced by a history of asthma.

SPUMS is involved with recreational diving. It is important for the Society to consider the definitions of recreational diving. I consider that we should exclude rebreathers and mixed gases at this time. This equipment may be used for recreational purposes but its safe use requires considerable further training beyond the basic Open Water Diver. So we will focus on open circuit scuba using air or nitrox. Nitrox has depth limitations in order to avoid cerebral oxygen toxicity but can be used safely with attention to remaining above the danger depth. A lot of people dive to 60 m or so on air and experienced people might do it safely. I suggest that we call such diving "deep recreational diving". The idiots are those people who go to 80 or 90 m or even deeper ("extreme air diving"). Possible SPUMS definitions of recreational diving using open-circuit scuba are shown in Table 1.

TABLE 1

RECREATIONAL SCUBA DIVING

Description	Breathing gas	Depth range
Normal	Air	Depth to 40 m
	Nitrox	Depth limited to PO_2 1.4 bar
Deep Air	Air	Between 40 and 60 m
Extreme Air	Air	Below 60 m

Des Gorman has made some very important points about the validity of self-assessment forms and I think we really must take more notice of that. The most important medical anybody ever has is the one before they start diving. That is the one time we can stop candidates from diving and they can go and take up something else, probably just as happily.

The other important medical is the review required after some significant illness. Our medical intervention is needed there and it has to be done by a doctor who is competent. It can never be done by prescriptive rules.

I would like us to consider, if we have time, what to do with people who do not easily fit into the conventional recreational envelope. During the week we have considered that and decided that people, even if they are stable asthmatics, can be fit for independent unrestricted diving within the envelope under certain circumstances. If they are fit to dive, then they can do anything within that envelope.

Some people will have self-imposed shallow diving restrictions, such as those who have had a previous bend with probable scarring. They might like to dive on enriched

air nitrox (EAN_X) or do something sensible like that. Or they may choose to for broke and not bother. That is entirely up to them. It is self-imposed and I think that those people should be able to dive at any conventional dive shop. They just stay above their personal set limit.

Then we come to the people in whom diving is definitely restricted and there are those who need some in-water support. They may not be able to help anybody else and they may need a second buddy. These include amputees, double amputees and particularly paraplegics. Diving quadriplegics are a good example of divers who are totally dependent on a support team. I would include the diabetic diver in the restricted category. They must have a support team that knows what is going on and what to do. The above is a precis of my formal presentations, goodbye and thank you for having me.

Guy Williams (Chairman)

I hope people will comment from the floor or from the panel. I think that as a result of the five days of meetings, most of us would agree that there is a need for fitness to dive assessment. Table 2 shows some of the choices. Should fitness be assessed by doctors with training in diving medicine? That is certainly SPUMS policy. Or should we just assess those identified by initial screening. That is certainly not SPUMS policy. Other matters to consider are reviewing divers after a diving incident and whether divers should be medically examined periodically.

TABLE 2

FITNESS TO DIVE ASSESSMENTS

1	PADI RSTC questionnaire or similar where certain responses lead to referral for a medical opinion.
2	Medical examination by any doctor.
3	Medical examination by a doctor trained in diving medicine. (SPUMS Policy)
4	Review after incidents by a doctor trained in diving medicine. (SPUMS Policy)
5	Periodic reviews are they value for money ?

Kim Bannister, Auckland

I am a GP. Should the candidate's GP or a doctor trained in diving medicine do the pre-diving assessments? Is a doctor who is trained in all aspects of what the hazards are for diving more important than the understanding of the patient that the regular GP brings? During the week there have been quite a few examples where screening by the RSTC form missed things. I have done the Navy course and I found that useful. However, I think it would be very hard for patients to pull the wool over their own doctor's eyes when they fill in the forms. When dealing with diabetics, epileptics and quite a number of other examples, knowledge of the patient might be useful. I wonder whether assessment might be best done by a GP with the option to refer on to somebody trained in diving medicine.

David Elliott

In the UK a report from the GP may be requested by the examining doctor for candidate occupational divers.

John Knight, Melbourne

After much effort, I persuaded the Australian Medical Association, which believes that doctors should act ethically, that it is unethical for a doctor with no knowledge of diving medicine and no training in how to examine divers, to do a diving medical. Now I do not know what the NZ Medical Association's attitude to ethics is, but the Australian/New Zealand Standards Committee SF17, of which I am now the Chairman, believes that it is ethical and essential that any diving medical should be done by a doctor with training in underwater medicine. I do not think we should agree that we should only assess those identified by screening. We should assess every person who is going to use compressed air, or any other breathing medium, under water. It is the first dive that really matters.

David Elliott

Medical services differ around the world. In countries where there are no diving doctors, we should acknowledge that the RSTC form and other questionnaires have improved the situation and there is a benefit from them. But in countries where there are diving doctors such as Australia, New Zealand and much of Europe then I think we can be a little bit more rigorous.

Des Gorman

Dr Bannister has the advantage of being both the family doctor of the patients who see him for their diving medicals and having had training during the Naval course. Our audit suggests, without doubt, that there is a significant difference between the quality of assessment done by the trained and the untrained doctor. It is quite right that the GP is the only person who actually knows comprehensively what is wrong with that patient. But there are other pressures such as patient retention, patient compliance and other issues which make for very complex outcomes. That is certainly true in Worker's Compensation issues. It is not quite as simple as the GP knows more about that patient than somebody else. What David Elliott has just described, where there is a report from the GP and the assessment is done by a trained doctor, is a bet both ways. That is an approach which would, I suspect, satisfy your concerns.

Michael Logan, Dubbo

I am on the SPUMS diving doctors list and I live in Dubbo which is 400 kms inland. Port Macquarie Divers come to Dubbo and train people in the local swimming pool and then take them over to the coast for their open water dives on one weekend. A lot of GPs are now conscious of diving requirements but there are many doctors who have got no concept about diving at all. For them to give

somebody an OK to go diving is quite ridiculous. The last two people who came to see me for a diving medical had gone to their local doctor who said, "Oh, you play football do you?" and he said "Yes". The doctor then said "You're fit to dive". When the patient rang up Port Macquarie Divers the instructor said "Probably you should see somebody who knows more about diving than somebody who said that because you play football you will be fit to dive".

Guy Williams (Chairman)

I think most of us would probably agree then that fitness to dive should be assessed, in an ideal world, by a doctor with training in diving medicine, and that has been the SPUMS policy for some time.

Drew Richardson, PADI

Are we suggesting primary assessment by a physician with diving medicine training when we have, during the week, seen that New Zealand and the United Kingdom, even with a medical referee, are going to questionnaires? The RSTC system has been in use for nearly 11 years with 8 million assessments. I do not really see the problem we are trying to solve. PADI believes that a well developed screening (RSTC) test, as a primary assessment, works and has worked for some time. With this, when a client ticks an affirmative, he or she is told see a medico with some diving medicine expertise.

Are we suggesting that this Society should recommend that all candidates, whether it be a resort try dive or diver training certification, should go to a diving doctor before they take a breath off scuba?

Guy Williams (Chairman)

Am I right, Des, that your paper about the NZ system was about review surveillance and that all your commercial divers had their first medical by a diving doctor?[1]

Des Gorman

That is the system at the moment. We are now testing the predictive power of the fifth yearly medicals and I am going to test the predictive power of the initial assessment as well. In terms of screening, we will wait and see how effective our screening tool is, but Drew makes a point which needs to be addressed which is that they have had a screening tool in place for 11 years, so there is a performance record in place. I think the reason why it works Drew is most of the assessments for fitness for diving has got little to do with doctors.

Unknown speaker

I think that doctor assessment and re-assessment have a role in the occupational field. For recreational diving in its increasingly diverse forms we know that there are few fatal incidents with acknowledged medical precursors. We know that people are either opting in or opting out of the medical examination system worldwide and we do not have evidence that suggests any relative advantages. We know that if there is not a local doctor then it probably really does not make much difference. When do we reach the point that it really is worthwhile?

Des Gorman

There needs to be a system to weed out those who may come to harm. The more important thing is that the doctor involved be trained in diving medicine. As we move to a more mature approach to health surveillance and as we put more emphasis on individuals, including the dive schools and employers, taking responsibility, the need for a trained doctor becomes a significantly more important. There is only one role for an untrained doctor, and that is if one can write a prescription for fitness. There is no such prescription for fitness. It is a nonsense. I think the need for training for doctors increases under the scheme that I described to you. It does not decrease, because what it is all about is quality of risk information.

Drew Richardson, PADI

I think you may have missed the point I was trying to make. I am not denying the need for the trained doctor and the very important role for the trained doctor in assessing conditions that have been raised by the questionnaire. However the debate seems to be focussed on whether every recreational diver should see a trained doctor for an assessment before being allowed to get in the water. I do not think that attitude has much validity because of what is going on around the world.

Des Gorman

To be honest I do not see the difference. We had a debate in Auckland with the Department of Labour and some of the recreational diving organisations about stratifying standards for diving fitness which I think is nonsense.

It is risk that is stratified. For example we have heard that some abalone divers now wear a full face mask, have hard wire communications, a bail out bottle, two divers and two stand-by people in the boat.

In more conventional occupational diving I am on the bottom wearing boots. I have a bail out bottle, a helmet, a side block, an emergency gas supply, an umbilical bringing down breathing gas, communications and warm water. As well, I have a diver dressed and on stand-by to rescue me. I have someone controlling the divers, a supervisor. I am cutting, drilling or blasting. I have a known level of risk.

Let us now take the recreational diving instructor who is free swimming with 4 or 5 novices. Which of those two divers has the greatest need for sustained awareness? The occupational diver, whose private risk is one and public risk zero, and for whom there are all sorts of support contingencies in place. Or the free swimming recreational diving instructor. If one is going to stratify risk the free swimming recreational diving instructor has a greater need for help, not a lesser need. There is need for good advice

about occupation. In this context occupation is something someone does, not necessarily for money. The minute we exchange money, a duty of care is imposed by legislation, but the need for risk decision making is no different. In my opinion, a free swimming, unbuddied, which is what you have if you are not holding hands or using a buddy line, diver has a very real need for substantive health advice. So I do not draw the sorts of distinctions other people make.

Henrik Staunstrup, Denmark

Taking a world wide view we can see areas where the screening method is absolutely essential as there are no diving doctors around. Assessment of fitness to dive by doctors who are trained in diving medicine is only available in certain areas. It is true that RTSC form has worked well but it has not been used all over the world and medical assessment has worked well in areas of the world.

The system Des has introduced in New Zealand is for divers who all had a medical before they started diving and it is for occupational divers. The employers are really very interested that their divers are in good health. I see it quite differently with recreation divers and I can only agree with David Elliott that we have two situations in the world and what we should recommend is a really good standard. We have to serve the community well with doctors who are trained in diving medicine. Then where this is not possible self assessment is OK for me. If you have a better way, why not use it?

David Elliott

Perhaps the better way is to follow the UK where there is a combination of two philosophies. They are using a screen which does not involve doctors for about 90 odd percent of divers. When there are affirmative answers the diver goes to see a medical referee, who is trained in diving medicine. That model is perhaps a more pragmatic and efficient system if you want to make a statement that would work around the world.

Paul Langton, Perth

I want to challenge the assumption that the PADI type questionnaire works and it has been useful for years. We do not actually know that and I would argue that we have got some data to say that it does not work. Also I do not think the dive medical necessarily works, because we know that diver candidates are not always truthful. Both methods assume a level of honesty. If we are going to change the system either way and focus on risk assessment using a screening questionnaire, it must be with the clear understanding that if the candidate ticks a "Yes" they will not be automatically knocked out. It must be made clear that they just need further risk assessment. Otherwise they will continue to lie and say "No". As we know that in Western Australia 90% of diving candidates are getting dive medicals anyhow, even having done the PADI questionnaire we probably should support a statement like, "Ideally diving candidates should be assessed by a doctor trained in diving medicine". This may be more practical than saying they must be assessed by a doctor trained in diving medicine.

Cathy Meehan, Cairns

I agree with Paul. The medical screening form is a very good option when there is nothing else available. However on many occasions when face to face and asked questions, people actually do admit that they have had some problems that they had not ticked.

Guy Williams (Chairman)

I think that SPUMS should be aiming for best practice and, in my opinion, best practice is to have diving medical candidates examined by a doctor with training in diving medicine. It might not always be appropriate but I think that best practice is what this Society has been endeavouring to promote for some time. It is certainly what we endeavour to do with the SPUMS diving medical, which was distributed to you all, and that states that it should be performed by a doctor with training in diving medicine.

Jürg Wendling, Switzerland

I consider that the primary assessment is done by a doctor. One of the most important questions is the motivation of the candidate. On many occasions I have had a candidate who has said "My husband wants me to dive with him but I am very frightened of diving." So there are occasions where I discourage diving, without even examining the person. There are many similar occasions. They have had an incident. They do not say it. It's not one of the questions in the questionnaire and it is our task to help these people get away from diving.

Mike Davis, Christchurch

Worldwide the screening form is clearly the way the majority of people get into sport diving. One of the issues that has been raised is that where screening questionnaires are used in health assessment, that screening is enhanced if the candidate is taken through the questionnaire by somebody who has some knowledge in the area. Perhaps visiting your GP's rooms but going through the questionnaire with his nurse might be better than nothing. But in most situations around the world, the most knowledgeable person around the intended sport diving candidate is the dive instructor. I have often wondered why it is that the dive instructor who is going to look after the pupil, or someone from the shop who has some education in diving medical problems from his own training, does not go through those questions over a 5 or 10 minute period with the candidate. I am suggesting someone who can explain the questions that the diving candidate does not understand. That might well enhance the quality of the screening process without necessarily placing an additional legal onus on the dive instructor.

Des Gorman

We should put things in perspective. There are very few beaches in the world where dead divers are washed

ashore on a regular basis. The mortality from diving is exceptionally low. We have had a very bad year in New Zealand. Deaths were about one in 50,000 exposures which is still a lot better than driving on the roads. The risk of decompression in Western Australia given the best data we have, is probably one in every 7,500 hours of exposure which again is better than driving on the roads.

What I am arguing for is assessment of risk. Assessment which improves the quality of people's decision making to undertake a particular activity. Never forget that divers die because of human error, 99 times out of 100. They do not die because of health problems. They die because they make dumb decisions and usually several of them in sequence. They are dumb, they die because they go where they should not go diving. They dive in conditions where they should have made a decision about their own health in terms of ability to undertake a particular dive. That is not a health problem in my opinion. That is a decision making problem. That is human error and is that surprising?

In every industry I have ever studied, 95+ percent of accidents and incidents are due to human error, not equipment failure and not to human body failure. The point is that, in terms of screening procedures, there are some data that suggest that whatever we are doing may be making no difference at all. In fact the human health factors are dwarfed by the human error factors. We cannot create a system which will either halve or double deaths. We are on the flat part of the curve for most recreational divers in terms of risk exposure and shifting backwards and forwards really does not make any difference. The important thing is to make sure that people decide to do something with sufficient information to make an informed decision. That is what it is all about as far as I am concerned. I know the major cause of deaths in diving is human error in New Zealand and around the world. Diving deaths are very rarely predominantly due to health problems.

Deborah Yates, Sydney

It seems to me that there is an extremely good screening system and you have an excellent training system but what you are missing is education. The point that has just been made, that the majority of problems come from human error, demonstrates the fact that the difficulty is that people do not understand the risks they take. That is really the huge problem that occurs with the recreational divers.

I suggest that we move on to considering what sort of manoeuvres can be put in place for enhancing understanding. Not only of risk in diving but of reminding people about what are the appropriate things. And when I say people, I do not just mean recreational divers. I include all medical practitioners, so that the awareness overall of the medical aspects of diving is enhanced. It is very true that people who are not regularly involved in diving are not appreciative of the risks involved. I think the Society would probably do well by producing some educational videos which can be made available to the Colleges and placed on the SPUMS and other websites. I think that, on the whole, you have got a very good system already in place and you do not need to complicate it much more. It is already much better than for most sports.

Guy Williams (Chairman)

David Elliott mentioned the concept of reviewing fitness status. At the moment in Australia the situation is that once you have been certified fit at the beginning of training the only time you are likely to have another diving medical is when you are doing some more advanced course and it has been more than a certain time since your last medical. If you have been certified for a couple of years and want to do a cave diving course, you are likely to be required to have another diving medical .

But for people who have not done further courses, their last diving medical may have been when they started and that might have been 25 years ago. David suggested that perhaps after the age of 45 people should be reviewed every 5 years and after 60 every year. Perhaps it may not be a bad idea for the certifying agencies, who have records of divers to be, to send out, when the diver hits say 45, a health screening form.

David Elliott

I think if you make periodic surveys cheap enough then you could make them no longer an issue. The reason why recreational divers do not have an annual medical is because it is expensive. Make it cheap. Put in place a system which is easily accessible then I am sure many people would take advantage of that and have their health surveyed.

Chairman (Guy Williams)

Robyn Walker, as President and official spokesperson for SPUMS, should we be recommending that fitness status be reviewed? At the moment we do not recommend this.

Robyn Walker

We know that some divers will lie on their questionnaires or their screening questionnaires. That is not my problem. It is that individual's problem. We should be screening or discussing diving issues with every diver who comes to see us. We should be encouraging people to do that and we should encourage people whether they are pregnant, whether they develop some inter-current health condition, whether they are just aging to discuss their diving with us. I am more than happy to discuss issues with anybody who has an interest to listen.

But it is not our role to be police. I think we should be recommending that people have their fitness to dive reviewed from time to time but it should include their general health. We can recommend but we can do no more.

Bill Brogan, Perth.

I think David Elliott hit the mark in his first lecture

when he said "Are we in the business of regulating and why should this sport be regulated by doctors rather than any other sport?" I think Des reinforced that in saying that human error is the main cause of diving accidents. Not always human error of the diver. Sometimes the dive master makes an error. Sometimes the training organisations make the error. The last two people to die in the water in Western Australia, had, or were alleged to have, advanced open water diving certificates. To achieve this higher qualification one had done 9 dives in all and the other 11 dives. That to me is insane. To let anybody proceed to higher training before they have done at least 50 dives is crazy. I think guidelines to prevent these sort of accidents should be given by SPUMS.

David Elliott

One of the best documents is the Project Stickybeak report of 300 consecutive fatalities and if you look at the first year and you look at the final year, 20 years later, there is still no change over those 20 years.[2] The deaths are more than 50% stupidity, they were diving beyond their competence. That is what needs to be hit and the difficulty with your suggestion is the need to change the training provided by the training agencies.

Guy Williams (Chairman)

We should be offering advice. We are in the business of providing the best risk assessment for people and we should be doing that. But it is not our responsibility to say what makes an "advanced diver". We made a rod for our own backs years ago by saying that a person is "fit to dive".

Now when there is an accident, blame is often directed back to the medical practitioner. We do not have to accept that. What we now tell the person this is the risk if you go diving. And then they accept the risk and it is up to the training agency to accept that risk. That is where we are heading. We are not in the business of telling people what makes an advanced diver. There are some people who will never be an advanced diver, but that is not our role.

Henrik Staunstrup, Denmark

In Denmark we tell divers about the risks. We are not policemen. We do not regulate how people dive. I never tell prospective divers yes or no, but I explain the risks and I think I know better than an instructor. I feel that diving doctors are the best to inform divers about the risks and for that reason I think divers should be seen by diving doctors whenever possible.

Guy Williams (Chairman)

The current SPUMS policy is that insulin dependent and those diabetics on oral hypoglycaemic agents are unfit for scuba diving, even though we all know that plenty of them are diving. Drs Taylor and Mitchell discussed diabetics diving earlier in the week. Has anyone any comments on diabetes and diving? It is likely that SPUMS will to be asked by the Diabetic Association for an opinion on diabetics and diving.

Des Gorman

Considering the data reviewed one has to be careful of selection bias. Self selected, self reporting data bases are generally biased by the healthy diver effect so one has to be careful of survival bias. As a result I have no confidence in the diabetic data that I see, and that is particularly true for the BSAC data which is a self selected, self identified, survivor population. One cannot extrapolate from that community in any shape or form.

To me the idea that we cannot express an opinion about insulin dependent diabetes in general is like arguing the need for randomised control prospective study of expired air resuscitation and the apnoeic. There are some things which you do not necessarily need to put to that level of test because they are reasonably obvious. The fact is that an insulin dependent diabetic should be advised strongly about the risks of insulin dependent diabetes and diving. As an instructor I certainly would not teach one of them to dive, although I am not an instructor. As an employer I would go to the disability court and say listen, this person has unreliable awareness and state of consciousness. I am not going to employ them. I reckon I would survive that test to be honest. So I am not sure that the data are available. They show that a population of diabetics can dive, and that is all they show.

Simon Mitchell, Brisbane

Diving for diabetics is a handicapped diving procedure.

Jürg Wendling, Switzerland

As I explained during my presentation, I would let diabetics dive under certain conditions. But I would only let them dive in a diabetic diver program which continues after training to cover all their diving. I think they need a doctor as adviser during all their diving career.

Simon Mitchell, Brisbane

The data from Chris Edge's study, which was a prospectively followed group of diabetics, do show that focussed, well trained, and properly supported diabetics can dive. And that is precisely the sort of program that we are proposing we teach.

Alan Walley, Christmas Island

I certainly will not be getting involved in teaching diabetics to dive. Many of us in isolated places do not want a bar of that. I think we would like to have crystal clear guidelines so that when people go in the water we can be fairly sure that they will come out of the water. Associated with special programs for diabetic divers I can visualise a headline in the Medical Journal of Australia saying that diabetics can dive. All the Mickey Mouse doctors would see the headline but they would not read the article. We might create a problem of the poorly controlled diabetics who want to dive on a good day. I think we have just got to be very careful.

Cathy Meehan, Cairns.

The SPUMS dive medical and the Australian Standard say that corrected vision has to be adequate to look at your gauges and to be able to surface and see your boat. Yet blind people dive very successfully. There are other situations where people with medical conditions and physical problems can dive, as long as all the necessary precautions are taken into consideration. These people are not fit for diving according to AS4005.1. They need to be diving according to very strict guidelines set out by the International Association of Handicapped Divers, or some other Association, that is set up to provide guidelines for safe diving for such people.

Simon Mitchell, Brisbane

I would like to remind you all that we were clearly not saying that diabetics will be able to go and get a medical to dive and just go down to their local dive shop and sign up. Not many instructors would have an interest in becoming a specialty diabetic diver instructor and it may be that we would not consider some instructors qualified to do it. We were quite specific that the instructors would need to be selected, the diabetics would need to be selected, the courses would be very carefully structured. Until there is a simultaneous recognition that this can happen, from both the training agencies and the medical community, it will not be able to be done properly. It does need to be done properly. You are absolutely right about that.

Robyn Walker

At the beginning of this week I said we hoped that there would be interesting discussion. I think that tonight we have proved that we are going to have continued debate for many years to come over how we practice diving medicine. We all have to be responsible for the way we practice and if we practice within the limits of our knowledge and are able to defend our actions, then we are always going to survive whatever challenges come.

In closing I would like to thank David Elliott, our guest speaker, and all the other speakers for what has been an excellent meeting.

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Professor David H Elliott has been a guest speakers at a number of SPUMS Annual Scientific Meetings. He is Co-Editor of The Physiology and Medicine of Diving, which was first published in 1969, with the most recent edition in 1993 and is also the civilian consultant in diving medicine to the Royal Navy. His address is 40 Petworth Road, Haslemere, Surrey GU27 2HX, United Kingdom. Fax + 44-1428-658-678. E-mail <Davidelliott001@cs.com>.

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