

Ethically we can no longer sit on the fence?

To the Editor: We would like to comment on the review article by Shuttleworth-Edwards *et al.* 'Ethically we can no longer sit on the fence – a neuropsychological perspective on the cerebrally hazardous contact sports', published in the July edition of your *Journal*.

Overall, this article is well researched and written. However, as well as highlighting a number of important observations made in this article, we would like to emphasise the progress that has been made in developing a community-based return-to-play concussion programme in South Africa, thus illustrating that a high level of care can be sourced for patients with concussion wishing to return safely to collision and contact sports.

1. It must be noted that computerised and detailed neurocognitive assessment has no role to play in the prevention of head injury in sport. Athletes participating in contact or collision sports are at risk of head injury and the role of mouthguards and headgear is controversial in head injury prevention. Neurocognitive assessment does, however, form a component of the return-to-play management of the injured patient.
2. Due to a paucity of clinical signs, concussion management and return to play must focus on the cognitive, emotional and behavioural effects of the injury, emphasising again the significant individual variation to this injury. It is also well illustrated how gender differences too are an important consideration, in addition to underlying genetic factors. We would agree with the authors that attributing the social ills of society to mild traumatic brain injury on a cause and effect basis would not be reasonable.
3. The cognitive reserve theory could be a reasonable way of explaining the individual variant in recovery time after injury.
4. We have refined our clinical approach, based on research and our experience in managing this injury that encompasses individual differences in response to concussion. By focussing on serial symptom analyses, clinical evaluations, neurocognitive testing – both computerised screening and detailed clinical assessments – and then finally an exercise challenge, we believe we would be in the best position to support a decision for the patient to return to sport. The third component of exercise challenge has been very important and provides support for the 'hypoxic theory' as detailed by Ewing *et al.*¹ The proposal of informed consent is an excellent one and should be incorporated into any sports education programme and certainly into a return-to-play concussion programme.
5. Finally, and most importantly, we wish to illustrate that, as sports physicians who come into contact with mild traumatic brain injury on a weekly and often daily basis, we

believe that we are incorporating the latest in international clinical consensus⁵⁻⁷ together with computerised neurocognitive assessments and individualised return-to-play guidelines in a cost-effective, pragmatic model. In the last 3 years, we have developed a community-based concussion programme, incorporating satellite return-to-play concussion centres, under the banner of the Pharos Schools Concussion programme and Sports Concussion South Africa.²⁻⁴ The programme has a number of equally important foci:

- Education – this we believe to be key; if the sporting public are aware of the significance of concussion and its potential consequences, we believe the risks to be significantly reduced; to this end, the website www.sportsconcussion.co.za has become the central reference tool aiming at educating the public and medical fraternity alike; in addition we have a concerted programme of lectures to schools and clubs aimed at educating pupils, parents and coaches; a campaign to utilise various media including the press, radio and television is also launched annually at the beginning of the schools' rugby season; at this stage of the season we would also introduce the concept of computerised neuropsychological testing and stress the significance of obtaining baseline data.
- Acute management – identifying a concussed player, removing them from the field of play and conducting an initial analysis are important first steps; the Pharos Programme incorporates this by distributing modified versions of the Sports Concussion Assessment Tool (SCAT) to participating schools; the helpline 084-BRAIN24 launched in conjunction with an emergency service call centre advises as to where to obtain medical assistance and the importance of clinical follow-up.
- Serial clinical assessment – once a case of concussion has been identified, this is an essential step in determining return to play; players undergo a thorough symptom analysis and trends in symptom resolution are tracked; a neurological assessment including verbal cognitive and balance tests is conducted; finally, if appropriate, computerised neuropsychological tests are conducted and compared with baseline or age-appropriate norms; we concur with the view of the American College of Sports Medicine that computerised neuropsychological testing is *desirable* in concussion management rather than *essential*;⁷ moreover, contrary to Shuttleworth-Edwards and Whitefields' assertion that 'for best practice in the implementation of return-to-play ... decisions... registered psychologists are called for...', we believe this to be impractical, both due to the scarcity and inaccessibility of such resources and the fact that computerised test batteries are designed for team physicians to implement and integrate into their management protocol of a concussed player.⁸

- Return-to-play – this is conducted in a progressive fashion using graded exercise stress to confirm complete resolution of pathology before full sports participation; again the progress will be individualised and poor prognostic indicators such as previous concussions and co-morbid pathology taken into account.

In summary, we acknowledge the impetus that computerised neuropsychological testing has given to sports concussion management and research. Realistically and practically though, this can only form one part of a clinically orientated serial assessment of the concussed athlete that takes cognisance of both those that have access to this facility and the many (particularly in South Africa) that don't. As sports physicians we see ourselves as foot soldiers in the educational drive and clinical facilitation process of managing mild traumatic brain injury in sport. We are determined to drive a nationally focussed programme of international calibre. The last thing we will do is sit on the fence.

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Jon Patricios

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Optimal application of neurocognitive testing in concussion management: A professional dilemma

To the Editor: We appreciate the response of sports physicians Kohler and Patricios to our review article 'Ethically we can no longer sit on the fence: A neuropsychological perspective on the cerebrally hazardous contact sports.'⁸ They have clearly articulated a position in respect of optimal concussion management that in broad terms is highly commensurate with the recommendations arising out of our review. Abreast of our own country-wide initiative, we are strongly supportive of their determination 'to drive a nationally-focussed programme of international calibre'. Indeed we are aware that they are providing a crucial educative role concerning the utility of computerised neuropsychological testing and the importance of obtaining baseline data in the South African sports concussion arena. The last thing they are doing is sitting on the fence.

There is, however, a contentious issue raised by these practitioners that warrants further elaboration, and where we consider there has been a level of misrepresentation. Kohler *et al.* state that 'contrary to Shuttleworth-Edwards and Whitefields' assertion that "for best practice in the implementation of return-to-play ... decisions... registered psychologists are called for...", we believe this to be impractical, both due to the scarcity and inaccessibility of such resources and the fact that computerised test batteries are designed for team physicians to implement and integrate into their management protocol of a concussed player.'

In response to the above we suggest as follows:

1. The manner in which we have been cited implies that registered psychologists are claiming a central role in return-to-play decisions *per se*, whereas we only claim more specifically to provide an important *contribution* to the decision via expertise in psychometric testing. We are entirely in agreement that computerised test batteries only form *part* of a clinically-oriented assessment of the concussed athlete by a medical doctor who makes the overall management recommendation. This is clear if our statement is cited more appropriately in full as follows: 'For best practice in the implementation of such return-to-play and termination decisions using computerised psychometric instruments, registered psychologists with training in clinical neuropsychology are called for, and have an important *complementary* role to play' (p. 37, new emphasis added).
2. In light of the broad infrastructure of our own national sports concussion initiative (*NSCI*), we do not believe that a scarcity of psychological resources for the purposes

of facilitating concussion management can be claimed within the South African context. Furthermore we do not consider this to be a sound professional basis on which to argue for failure to employ an appropriate resource.

3. Whereas computerised test batteries are certainly designed for team physicians to *integrate* into their management protocol of concussed athletes, we believe that to suggest that they are also specifically designed for team physicians to *implement* is highly problematic. This raises a professional dilemma in need of further elaboration, as follows.

Professional parameters in the implementation of computerised neuropsychological assessment

On the one hand there is the argument presented by Collie and Maruff² that has been reiterated in the Kohler *et al.* letter to the editor, in which it is suggested that neuropsychologists are not necessary to interpret the results of automated computerised reports derived in sports concussion context. A core basis for this claim is the rationale that, because exceedingly large numbers of athletes need to be evaluated, it is not practical to involve neuropsychologists exclusively. Implicit in this line of reasoning, which, from the professional standpoint, is highly questionable, is that neuropsychologists are in relatively short supply and/or that their services are too expensive and will render this kind of assessment unaffordable. It is of interest that in contravention of this argument, an earlier paper by Collie *et al.*¹ suggests that one of the most attractive features of the computerised cognitive tests in the sports context is that they allow for the possibility of electronic submission of data in a matter of seconds, and hence those data may be collated and interpreted by a desk-bound neuropsychologist for immediate interpretation and resubmission back to a trainer or physician at a sporting arena in a matter of minutes. Indeed, we are providing concussion management for a leading UK soccer team on this basis!

In contrast to those who suggest that computer-based tests circumvent the need for neuropsychologists, others have expressed concern about the potential for misuse of neuropsychological tests with psychometric properties if they become separated from their professional – i.e. neuropsychological – source.⁶ It is pointed out that the ease with which computerised tests can be administered, and automatic reports generated, may cause non-psychologists to fall into the trap of construing that the scores derived can be used simplistically as a type of ‘yes’ or ‘no’ litmus paper test for making decisions about the presence or absence of cerebral dysfunction in the individual case, with the potential for misdiagnosis. With this attitude there is a danger of reverting to the dark ages of an early actuarial approach to neuropsychological evaluation that has subsequently been abandoned in favour of a syndrome analysis model of assessment that requires the intricate interpretation of individualised differences in relation to patterns of psychometric test findings.^{4,10} Assessment in South Africa is complicated by the multi-cultural nature of the clientele, and

localised research is needed to confirm normative data for use of particular psychometric instruments in this context.⁷ Cross-cultural effects need to be considered in conjunction with a multitude of other possible contributing factors to variations in cognitive test performance in the cerebrally compromised individual.⁹ In our clinical experience in the concussion evaluation area, there are subtleties involved in making sense out of psychometric test scores arising out of serial testing, which make the neurodiagnostic process challenging even for the psychologist with extensive training in psychometrics and expertise in brain-behaviour relations.

In accordance with this more circumscribed professional outlook, the necessary role of the psychologist in terms of psychometric test usage is advocated in position statements in both the USA³ and in South Africa.⁵ Specifically, the Health Professions Council for South Africa (HPCSA) has presented its position on the issue as follows: ‘The Professional Board for Psychology is greatly concerned about the growing inappropriate use of psychometric tests..... Psychological tests have to be administered, scored, interpreted and reported on by registered persons, who have recognised and appropriate education and training in the field of psychometry’.⁵ An exception is not made in respect of computerised psychometric tests, and these require administration and interpretation at the very least under the supervised instruction of the registered psychologist. Psychologists with a training in psychometry are the only qualified professionals in a position to evaluate the relative validity of such tests. Accordingly, all psychometric tests (including computerised neurocognitive tests) require approval on the basis of an expert review, and formal registration with the HPCSA for their legitimate use in this country.⁵

Nevertheless, it appears that in a number of instances including the USA and South Africa, the computerised neuropsychological evaluation is being conducted by sports medicine clinicians without the involvement of psychologists. Where there is a real problem of limited access to specialist services and/or internet facilities, this kind of practice might be professionally defensible. However, we believe that for the most part where this approach is currently being advocated this is probably not the case. The position is made even less acceptable, in terms of what is condoned by the HPCSA, when there is the use of unregistered tests.⁵ A concern we have is that these kinds of arguments being advanced by Kohler *et al.* in their letter, are being used spuriously to defend a position which allows medical doctors to perform skills which they are not trained in and which are the province of the specialist training of psychologists.

In the final analysis it is our contention that the need for the neuropsychologist’s contribution in the process needs to be acknowledged and made use of, especially for the interpretation of test data.^{3,6} As indicated above, accessibility to specialist involvement of this type is greatly facilitated through internet facilities and can usefully be encouraged.¹ Furthermore, with specific reference to the South African context, we would like to highlight the professional dilemma



of failing to comply with the injunctions of the HPCSA (as cited above)⁵ in respect of the appropriate approval and implementation of psychometric tests that is considered to be the specialist realm of the registered psychologist. Within the current understanding of best practice in the health professions, there is an obligation on practitioners to provide services that stand up to scientific examination in terms of the current literature. Especially it is expected that practitioners should operate strictly within the scope of their experience and training. Under medicolegal scrutiny, the argument of scarcity of appropriate resources (especially when this is not strictly the case) may not be accepted as a basis for justifying less than optimal parameters for professional practice.

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Notes:

In South Africa there is no specialist registration for clinical neuropsychology and hence the term 'neuropsychologist' in the South African professional setting refers to a registered psychologist who has developed a special interest area and expertise in neuropsychology.

The authors are commercially involved in the development of neurocognitive screening as a component of sports concussion management in South Africa and Britain, using the ImPACT programme in collaboration with the University of Pittsburgh Medical Centre Sports Concussion Programme, USA. The ImPACT programme, available in English and Afrikaans, is registered with the HPCSA as an approved test for use by licensed psychologists in this country.

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