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Entry tests for graduate medical programs: is it time to re-think?

John E Marley

TO THE EDITOR: Whatever the method used to select medical students (whether academic, psychometric, or interview), the basic problem in assessing the method's predictive capability is that only candidates who perform at the higher levels in the assessment will be admitted. The only way to test the predictive validity of an assessment is to admit candidates from a much wider band of performance, creating a much less compressed score range for comparison. By definition, candidates with lower scores are excluded, thus making this analysis impossible.

The study by Groves et al had an overall response rate of 13.6%,¹ a rate at which no conclusions could, or should, be drawn.

Entry to medicine remains a highly charged and emotional subject. It is unfortunate that the press has drawn conclusions from a study from which conclusions cannot be drawn.

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1 Groves MA, Gordon J, Ryan G. Entry tests for graduate medical programs: is it time to re-think? *Med J Aust* 2007; 186: 120-123. □

Michele A Groves

IN REPLY: Marley makes an important point about the conclusions that can be drawn from our study on the effectiveness of medical school admissions tests. As acknowledged in our article, the size of the study and the restriction of range to which he refers do limit the strength of the findings. Nevertheless, it is precisely because admissions tests elicit such an emotional response from the general community, as well as being costly and stressful for both aspiring students and medical schools, that there is an urgent need for a large-scale multi-institutional evaluation of the process — a need that our results highlight.

It is reassuring that the Australian Council for Educational Research, the developers of the Graduate Australian Medical School Admissions Test (GAMSAT), is currently conducting one such study in conjunction with several Australian graduate-entry medical schools.

We hope that our study serves to stimulate still more discussion and analysis of medical student selection processes.

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Improving rural and remote health

John Wakerman, John S Humphreys, Robert W Wells, Pim Kuipers, Philip Entwistle and Judith Jones

TO THE EDITOR: We welcome your recent focus on rural and remote health. Kamien and Cameron's editorial addressed medical workforce supply issues,¹ and the accompanying article ranged across not only workforce supply issues, but also broader systemic issues, including the roles of different levels of government.² Coincidentally, the Australian Institute of Health and Welfare released its latest medical workforce report, which reported a rise in the number of doctors per head of population overall, particularly specialists, and particularly in urban areas, but decreased numbers of doctors in the bush, particularly in remote areas.³ Most of the media response ignored the contemporaneous nursing workforce report,⁴ which described a much more even geographical distribution of the nursing workforce — the largest health professional group.

We agree that access to health care is more than a workforce supply issue.² While we acknowledge the critical importance of general practice, perhaps part of the problem in improving access has been an almost exclusive policy focus on medical workforce supply issues, and not the broader consideration of a range of factors that will improve access to effective primary health care services for the 30% of Australians living in rural and remote areas.

Our recent systematic review of models of rural and remote primary health care service delivery in Australia identified a number of essential requirements of successful primary health care models.⁵ These inter-related requirements are adequate workforce supply; appropriate workforce organisation; adequate funding and appropriate financing; leadership, good management and governance; adequate infrastructure; and strong linkages — both internal and external. Successful models also exhibited an appropriate level of community participation.

There are a number of demonstrably successful rural and remote models, such as the Katherine West Health Board, an exemplary remote comprehensive primary health care service.⁵ To generalise these successful models and improve access, we need a rural and remote primary health care policy framework for Australia that coordinates national, state and territory resources to ensure that all of these essential requirements are systematically addressed.

We agree with Kamien and Cameron¹ that a solution will not be forthcoming until governments take a courageous stance in overcoming the implementation gap associated with translating research evidence into policies and programs. The time has never been riper for Commonwealth, state and territory governments to assume leadership and agree on an evidence-informed implementation strategy to assure rural and remote communities of accessible, high quality health care. Our systematic review⁵ provides a solid base to underpin such a response.

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- 1 Kamien M, Cameron WI. Solving the shortage of general practitioners in remote and rural Australia: a Sisyphean task [editorial]? *Med J Aust* 2006; 185: 652-653.
- 2 Gregory AT, Armstrong RM, Van Der Weyden MB. Rural and remote health in Australia: how to avert the deepening health care drought. *Med J Aust* 2006; 185: 654-660.
- 3 Australian Institute of Health and Welfare. Medical labour force 2004. National health labour force series no. 38. Canberra: AIHW, 2006. (AIHW Cat. No. HWL 39.) <http://www.aihw.gov.au/publications/hwl/mlf04/mlf04.pdf> (accessed Dec 2006).
- 4 Australian Institute of Health and Welfare. Nursing and midwifery labour force 2004. National health labour force series no. 37. Canberra: AIHW, 2006. (AIHW Cat. No. HWL 38.) <http://www.aihw.gov.au/publications/hwl/nmlf04/nmlf04.pdf> (accessed Dec 2006).
- 5 Wakerman J, Humphreys J, Wells R, et al. A systematic review of primary health care delivery models in rural and remote Australia 1993-2006. Canberra: Australian Primary Health Care Research Institute, 2006. http://www.anu.edu.au/aphcri/Domain/Rural-Remote/Final_25_Wakerman.pdf (accessed Dec 2006). □

Accidental death from acute selenium poisoning

Conor S Reilly

TO THE EDITOR: The report by See and colleagues on an accidental death from acute selenium poisoning¹ draws attention to a misconception among some health-conscious consumers that, because selenium is obtainable without a prescription, it is safe to take in high doses.

Selenium is available over the counter in tablets containing as much as 200 µg. The only advice printed on packs is not to exceed the recommended daily intake, which is not specified (the current Australian values are 70 µg and 60 µg per day for men and women, respectively). There is no mention of the upper limit of 400 µg, beyond which there is risk of toxicity.

Selenium supplements are consumed by many people worldwide. Up to 9% of adults in the United States use these supplements.² Consumption is much the same elsewhere in the Western world. They are used by many in the belief that their dietary intake of selenium is inadequate, and that the supplement will protect them against a variety of illnesses.

Consumers get information from several sources, not least the general media and the Internet. These sources can seriously mislead, especially when they misinterpret the results of clinical trials and make exaggerated claims of health benefits. Those who rely on such popular, but simplistic, information can reach false and sometimes dangerous conclusions.

Health advisors who become aware that patients are self-medicating with selenium need to point out the dangers. Unfortunately, after years of teaching students of medicine and other health-related fields about trace elements, I know that many graduates do not have enough knowledge in this area to provide accurate guidance. Even if they want to learn more by consulting current literature, the sheer volume of articles can deter them. It is for this reason that I wrote the book *Selenium in food and health*³ — to provide an up-to-date, scientifically based review of the nature and role of selenium in human health and metabolism. I hope that the book's readable and user-friendly style will make it easy for overburdened professionals to learn enough about this element to help prevent the sort of tragedy described by See and colleagues.

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- 1 See KA, Lavercombe PS, Dillon J, Ginsberg R. Accidental death from acute selenium poisoning. *Med J Aust* 2006; 185: 388-389.
- 2 Institute of Medicine. Dietary reference intakes for vitamin C, vitamin E, selenium, and carotenoids. Washington, DC: National Academies Press, 2000: 310-311. <http://www.nap.edu/books/0309069351/html/310.html> (accessed Aug 2006).
- 3 Reilly C. Selenium in food and health. 2nd ed. New York: Springer, 2006. □

Ian Brighthope

TO THE EDITOR: It is of great concern to me that the recent case report *Accidental death from acute selenium poisoning* by See and colleagues¹ inappropriately cast doubts on the safety of complementary and alternative medicines (CAM). This incident should be placed in its correct context.

The guidelines are clear for listed complementary medicines (ie, compounds or formulas registered and approved by the Australian Register of Therapeutic Goods for distribution in Australia).²

As a trace element, selenium is required in microgram amounts. The Therapeutic Goods Administration stringently regulates its use in nutritional supplements in Australia, with an allowed limit of 26 µg per daily dose (as selenomethionine) in unrestricted products, and 50 µg per daily dose (as selenite) in restricted, pharmacy-only supplements.

This is considerably less than the “no observed adverse effects level” for selenium, which is as high as 400 µg per day,³ as noted by See and colleagues. Furthermore, even at these low doses, CAM products that contain selenium must carry substantial “red flag” label warnings. Bulk sodium selenite powder — the form which led to this fatality — is definitely not dispensed as a complementary medicine.

Nevertheless, the authors of the case report conclude that “adverse outcomes of complementary and alternative medicines should be better publicised and more stringently reported to the Adverse Drug Reactions Advisory Committee (ADRAC)”.

While this may be a commendable recommendation, it is inappropriate and incongruous with the findings presented in this case report. Furthermore, the sodium selenite used by nutritional doctors is administered as a liquid at a dose of 50 µg per drop, and is a restricted S4 prescription-only product.

To achieve a dose of 10 g of sodium selenite, as taken by the reported patient, would require ingestion of 115 bottles of the registered S4 supplement or, even less plausibly, 400 000 doses of a listed CAM supple-

ment. Neither of these preparations was implicated in the reported case.

So why then are the authors of this case report asking for increased vigilance for complementary medicines? It is surely the interchange between the pharmacist and the customer that lies at the heart of this matter. Had a listed selenium product been dispensed, this poisoning would not have occurred.

Competing interests: I am the Managing Director of Nutrition Care Pharmaceuticals Pty Ltd, which manufactures “practitioner only” nutritional supplements.

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- 1 See KA, Lavercombe PS, Dillon J, Ginsberg R. Accidental death from acute selenium poisoning. *Med J Aust* 2006; 185: 388-389.
- 2 Australian Government Department of Health and Ageing, Therapeutic Goods Administration. Australian regulatory guidelines for complementary medicines (ARGCM). <http://www.tga.gov.au/docs/html/argcm.htm> (accessed Mar 2007).
- 3 Parizek J. Health effects of dietary selenium. *Food Chem Toxicol* 1990; 28: 763-765. □

Tony Lewis

TO THE EDITOR: I wish to address a statement made in a recent case report in the *Journal* entitled *Accidental death from acute selenium poisoning*.¹ The authors claim that the death of a 75-year-old man after ingesting 10 g of sodium selenite “exposes the myth that natural therapies are inherently safe”.

The patient actually purchased sodium selenite powder and tablets. This is a restricted substance and an industrial chemical which would certainly have been labelled a poison.

It should be noted that the maximum recommended daily dose of selenium in complementary medicines in Australia is 52 µg.² The authors of the case report do point out that the patient took more than 10 000 times the recommended dose of selenium which would be available from a medicine. (My calculations put this closer to 20 000 times.) An individual drinking more than 10 000 times even the daily recommended amount of water would probably not end up in much better shape. Is this evidence of an underlying agenda to discredit natural products?

The Complementary Healthcare Council of Australia recommends that consumers take steps to thoroughly inform themselves about products, preferably by asking their health care practitioner. We also urge them to inform their health care practitioner of which medi-

cines, complementary or otherwise, they are taking.

The incident involving the sodium selenite is regrettable, but for the authors to link the product and this case of fatal ingestion to exposing the myth that natural therapies are safe is, at best, ridiculous, with no foundation.

They also state that adverse reactions to complementary and alternative medicines should be better publicised and more stringently reported to the Adverse Drug Reactions Advisory Committee. Adverse reactions are routinely reported and publicised for all medicines, and have been for some time, as any check of the website of the Therapeutic Goods Administration will show.^{3,4}

I agree with the authors that the case highlights the dangers of consumers' reliance on the Internet. Local Internet sites that advertise therapeutic goods must conform to the requirements of the Therapeutic Goods Advertising Code, as well as the *Therapeutic Goods Act 1989* (Cwlth) and Regulations. However, overseas sites are not necessarily regulated or policed, and may provide inappropriate and misleading information. While our industry's products are low risk, they should be taken, like other medicines, with due care.

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1 See KA, Lavercombe PS, Dillon J, Ginsberg R. Accidental death from acute selenium poisoning. *Med J Aust* 2006; 185: 388-389.

2 Australian Government Department of Health and Ageing, Therapeutic Goods Administration. Substances that may be used in listed medicines in Australia. 30 Jun 2006. www.tga.gov.au/cm/list-subs.pdf (accessed Mar 2007).

3 Australian Government Department of Health and Ageing, Therapeutic Goods Administration. Information for health professionals. Adverse drug reactions: what to report. <http://www.tga.gov.au/adr/report.htm> (accessed Mar 2007).

4 Australian Government Department of Health and Ageing, Therapeutic Goods Administration. Guidelines on the reporting of adverse drug reactions by drug sponsors. <http://www.tga.gov.au/docs/html/adrguide.htm> (accessed Mar 2007). □

thousand times the maximum dose of "non-natural" remedies, because they recognise that all such remedies have side effects. Our patient's confidence that he could safely take such a huge dose was, we consider, at least partly a consequence of his belief in the myth that natural therapies are safe.

The fact that the dosage of selenium in nutritional supplements is strictly regulated does not prevent problems such as this — where patients obtain information of variable quality on the Internet, make their own arrangements to obtain the product, and then ingest a toxic amount.

Our article was in no way part of "an underlying agenda to discredit natural products"; it merely highlighted the risks inherent in self-medication based on information of variable quality obtained from the Internet, coupled with the impression that natural therapies are inherently safe. We hope that our call for adverse outcomes of complementary and alternative medicines to be better publicised will go some way to preventing such a tragic error occurring again.

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Peter S Lavercombe

IN REPLY: The myth we referred to is the commonly held misperception by a significant percentage of the population that natural therapies are inherently safe. As Lewis and Brighthope very correctly point out, the dose ingested by our patient was hugely in excess of any recommended maximum. We believe this is evidence of the misperception, as most patients would not dream of taking 10 or 20