

REVIEW ARTICLE

Obstacles to maintenance of advanced procedural skills for rural and remote medical practitioners in Australia

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ABSTRACT

Introduction: Most rural communities are too small and remote to sustain specialist services, and therefore some rural and remote doctors in Australia practice advanced procedural skills as part of their comprehensive care to underserved rural communities. The declining number of rural and remote procedural non-specialist doctors poses a problem in Australia. There is, at present, no comprehensive delineation of the obstacles Australian rural doctors face in trying to maintain their skills in the procedural areas of obstetrics, anaesthetics and surgery, nor of the solutions that may overcome the problems. This literature review addresses these two needs.

Methods: We interrogated the MEDLINE database to find articles about rural and remote medical education, with a specific focus on procedural skills. Other sources, including Google Scholar, were used to find relevant project and conference reports.

Results: The barriers to the maintenance of advanced procedural skills for rural and remote medical practitioners include: lack of opportunity; expense associated with remaining skilled in advanced procedural areas; lack of access to locum relief to attend educational sessions; lack of flexible options for education; lack of access to advanced procedural training; time constraints; multiple credentialing requirements from state health departments and joint consultative committees; family obstacles; and perceived medico-legal problems. Retention of rural doctors and the difficulties faced by them in maintaining advanced procedural skills are related. There is evidence that both these problems can be addressed, at least in part, by increased support for flexible



continuing medical education and professional development such as specific skills rural training programs, the availability of group practice opportunities, improved hospital facilities, reasonable workloads, financial incentives, locum assistance, improved housing quality, and better educational support for families. We also noted a positive association between dedicated rural training programs and the recruitment of rural doctors. Factors associated with these successful training programs include: rural fellowships, explicit rural mission, rural location, rural program directors, and procedural orientation.

Conclusion: The authors investigated the obstacles rural and remote doctors currently face in obtaining and remaining skilled in procedural medicine. The article describes the main barriers and presents some solutions from the literature. It also highlights the areas where work is being done and highlights the need for more quality research in this area.

Key words: advanced procedural skills, obstacles to rural medical practice, procedural medicine, rural and remote medical practice.

Introduction

People living in underserved rural communities in Australia rely on their local medical practitioners to provide them with a comprehensive medical service. Most rural communities are too small and remote to sustain specialist services, especially obstetric, surgical and anaesthetic services^{1,2}. Because of this, many rural and remote non-specialist doctors practice advanced procedural skills as part of the comprehensive medical care they offer their rural communities³. These skills are drawn from many fields including: anaesthetics, surgery, obstetrics, gynaecology, emergency medicine, radiology, radiography, ophthalmology, dermatology, psychiatry, paediatrics and ultrasonography.

The following definition of a rural and remote procedural GP was agreed on for the purpose of the Australian Government procedural incentive program, which is described later in this article.

*A rural or remote procedural GP provides non-referred services normally in a hospital theatre, maternity setting or other appropriately equipped facilities, that in urban areas are typically the province of a specific referral-based specialty. Most commonly, this refers to the fields of surgery, anaesthetics and obstetrics.*⁴

It is becoming increasingly difficult to replace these rural generalists as they retire or leave the bush⁵. This is partially due to an increase in the number of barriers to the maintenance of advanced procedural skills that have arisen over the last decade. Consequently, many non-specialist rural medical practitioners have stopped working in these specialized procedural areas³. This effect has been adverse for communities, because people are then faced with travelling long distances, potentially at great expense, to obtain specialised medical and obstetric care⁶.

The Australian Medical Workforce Advisory Committee describes the desired medical workforce as an adequate number of appropriately trained, highly qualified medical practitioners to meet the community's requirements through both the public and private sectors⁷. This still has not been achieved in rural areas of Australia, because many more appropriately trained rural doctors are still needed in the bush².

This review was undertaken to gain a greater understanding from the literature of the major obstacles and solutions to maintenance of advanced procedural skills, and the impact these have on recruitment and retention of rural doctors.



Methods

We reviewed the literature about rural and remote medical education, with a specific focus on procedural skills. MEDLINE was the main database used for the search. Search terms included: rural medical education, barriers to maintenance of procedural skills, rural retention, procedural medicine general practitioners/family physicians, procedural medicine non-specialist doctors and Australian rural medicine. Inclusion criteria included articles that were relevant to Australian rural non-specialist doctors, or rural doctors in other countries which have similar problems to Australia, such as Canada. Articles were included that discussed barriers and/or solutions to the problems of rural medical education, especially retention of procedural medical skills, rural retention and rural medical education. The literature search also included a number of relevant published and unpublished Australian and overseas reports, conference proceedings and discussion papers. These were obtained from private rural workforce agency collections, medical libraries and the internet. Some of the more recent reports were obtained by using the internet search engine Google Scholar.

Results

The search identified over 600 potential articles. Sixty-six articles and/or reports met the inclusion criteria and were included in this review. The main issues from these articles are discussed below.

Importance and scope of procedural practice to rural medical practice

There are rural medical workforce shortages all over the world⁸. Many countries, including Australia, have struggled to recruit and retain well qualified and experienced health professionals in rural areas⁵. For this reason, rural communities have always been disadvantaged in their access to health services.

There is an expectation that rural doctors maintain skills in many different procedural areas. The rural doctor is expected to possess sufficient knowledge and technical skill to provide a high level of acuity of care⁹ in a variety of clinical areas, particularly those related to rural medicine, including emergency medicine, obstetrics and anaesthesia¹⁰. Rural doctors practice family medicine, but also provide procedural care, and play an important role in public health¹¹. Therefore, it has been suggested that they require a more advanced skill set - a specialist's skill set - to meet this level of clinical responsibility¹².

It is evident from the literature that rural doctors, both within Australia^{3,13,14}, and overseas¹⁵, provide more procedural and other advanced care to their patients than urban and regional doctors. One of the most recent of the Australian studies¹⁴ showed that the proportion of GPs providing complex services increased with increasing rurality or remoteness, as well as demonstrating that rural and remote GPs were more likely to administer cytotoxic drugs, perform forensic examinations, stabilise injured patients pending retrieval, coordinate discharge planning and provide a higher level of management of myocardial infarction, than GPs working in larger rural and regional centres¹⁴. Even though rural doctors in Australia still provide more procedural services than urban doctors, consistent with the findings of others¹⁶⁻¹⁹, Britt and co-workers³ found that the number of procedural services had declined considerably over an eight-year period.

Canadian research showed that rural doctors were more likely to practise in emergency departments, hospital settings, and nursing homes and to provide obstetric deliveries⁹. This trend emerged despite strong evidence that, overall, primary care doctors have significantly reduced their participation in these activities, preferring instead to focus more on their office-based practices²⁰.

According to Rourke²¹, rural doctors require the knowledge and skills of family medicine and the ability to practise in a setting where access to high-tech facilities and specialist resources are distant and limited. In fact, it has been suggested that a doctor who does not have the skill and



confidence to handle a major trauma in an emergency department without specialist backup will avoid working in a rural area, irrespective of how much money is offered⁹.

Evidence for the safety of rural procedural practice

There has been concern in Australia and overseas about providing short training programs in surgical and technical skills, with the assumption that these procedures can only be performed safely by those with the broader base of training achieved in an extended residency program^{22,23}. The evolution of the delivery of medical care in rural settings challenges this concern.

Iglesias and Hutten-Czapski²⁴ identified research that showed that appropriately trained rural doctors are able to administer anaesthetic²⁵, manage trauma²⁶, and perform Caesarean sections²⁷. It is recognised that in clinical situations requiring technical/surgical skills in the rural setting, many cases are transferred to larger centres for specialist consultation or management, although some are handled locally. Available data are limited but show that these cases are handled well in rural settings in Australia^{28,29} and America²⁷. Thus, concern about the provision of high standards of care in advanced procedural skill areas by rural physicians may be unwarranted.

Safety of rural obstetric care: Research supports the safety of rural obstetric care. Woollard and Hays¹⁶ compared deliveries conducted by rural doctors with all deliveries conducted in New South Wales, Australia, and found no evidence that obstetric care was of less than acceptable standards.

In Canada, women in rural communities have been shown to achieve better outcomes when supported by local intrapartum care programs, even when there is no on-site access to operative birth²².

In Australia, Cameron documented birth outcomes from Atherton, Queensland, from 1981 to 1990²⁸ and 1991 to 2000²⁹. Atherton lacked specialist obstetricians, but had five

doctors with advanced training in operative births (diplomas in obstetrics). Of the 2883 births attended by 17 non-specialist doctors over 9 years, the Caesarean section rate was 13% (Queensland average 18.4%). The success rate of vaginal birth after Caesarean section trials was 58%. Gross perinatal mortality was 5.2/1000. By including those perinatal deaths that occurred in public patients who were transferred because of intrapartum complications such as premature labour or neonatal problems, the corrected perinatal mortality rate for the public patients was 9.6/1000, which compared favourably with rates for Queensland and the Far North Statistical Division in 1987 of 13.5/1000 and 16.9/1000, respectively²⁸.

There were also no maternal deaths in Atherton in the 20 years 1981 to 2000²⁸⁻²⁹. In the decade 1991-2000 there were 16 perinatal deaths (perinatal mortality rate 5.3/1000)²⁸⁻²⁹. This perinatal mortality rate compared very well with the Queensland (1994-1996) rate of 11.3/1000 and national (1995) rate of 10.5/1000²⁹.

Safety of anaesthetics: It was difficult to obtain any information on the outcomes of procedural non-specialist anaesthetics. A review of anaesthesia-related mortality in Australia in 2000-2002 showed that the majority of the 137 anaesthesia related deaths occurred in operating theatre precincts or in high dependency units. However there was concern that there were 21 deaths in a general ward area. The majority of anaesthesia-related deaths occurred in metropolitan teaching hospitals³⁰. Since anaesthesia-related coding has been introduced in Australia, it has become possible to estimate the total number of anaesthetics nationwide. This data showed there was an anaesthesia related mortality rate of about one death for every 56 000 anaesthetics, which is extremely low by international standards³⁰. The Australian and New Zealand College of Anaesthetists (ANZCA) report states that 25% of deaths occurred in cases undertaken by non-specialists and trainees, but there is no breakdown showing the number of deaths attributed to GP anaesthetists in comparison with trainee anaesthetic specialists. Four deaths occurred in patients for whom the anaesthetic was administered by the same person



performing the procedure, which is a very unsafe practice³⁰. One of the recommendations of the report was that:

*...there should be continued emphasis on maintenance of professional standards for specialists, appropriate supervision of trainees, and continuing professional development, training and credentialing for non-specialist medical practitioner anaesthetists.*³⁰

Watts and Bassham³¹ published on the safety of rural GP anaesthesia in South Australian GP anaesthetists. Seventy-six of the 92 practising South Australian rural GP anaesthetists responded to a questionnaire on anaesthetic training, skills and their approach to potentially difficult anaesthesia. A total of 11 400 anaesthetics were performed by 76 GPs in 1992 (average 152, range 2 to 1500). Forty-six per cent of GPs provided anaesthesia for the 0 to 12 month age group, and only 35% had regional skills to use in obstetric anaesthesia. Patients classified as ASA grade 3 to 5 disease states such as unstable angina, severe asthma, and risk factors such as skeletal myopathy, were avoided by most GPs. The failed intubation rate was 50/10 000. The conclusion was that South Australian GP anaesthetists exhibited a generally safe approach to selection of patients for anaesthesia, although in some instances the approach to potentially difficult anaesthesia should be more conservative³¹.

Safety of surgery: The literature showed that some types of surgery performed by non-specialist GP surgeons were safe³². Research in Canada by Iglesias *et al.* 2003 demonstrated that appendicectomies in rural hospitals were safe whether performed by a specialist or GP surgeon³². Two American studies also found that adequately trained family physicians were able to provide safe and technically competent colonoscopy in a rural setting, achieving results that compare favourably with the currently reported comparative benchmarks from other endoscopists^{33,34}.

Obstacles faced in acquiring procedural skills in the first place through training

Doctors who practise in rural areas, where subspecialty backup is less available, need special training to work more independently, to provide care for a broader range of illness and for sicker patients, and to perform more types of procedures. They also have to respond to the more demanding community aspects of practice^{13,35-37}.

It has been reported that physicians entering rural practice often do not feel sufficiently prepared in relevant clinical skills and procedures such as anaesthesia, obstetrics, surgery and emergency medicine³⁸⁻⁴⁰. Their training needs to be sufficient in order to develop these skills. Our review showed that there were problems accessing initial rural procedural training, and a number of authors who researched rural medical practice between 1980 and 1990 pointed out the seriousness of workforce shortages and blamed inadequate training programs for failing to provide sufficient numbers of confident, competent rural doctors^{5,41-43}.

Obstacles faced in maintaining procedural skills in practice

Rural proceduralists' perceived competence and confidence is linked to opportunities to practise and have access to appropriate continuing professional development. Maintaining these competencies is critical to doctors continuing their procedural practice^{17,43-45}.

The literature suggests that the continuing education and lifelong learning needs of rural doctors are greater than their urban counterparts because of the nature of rural medicine and the demands placed on rural practitioners¹². However, both non-procedural and procedural rural doctors have reported problems related to continuing medical education (CME) quality and access.

Research in South Australia identified the family, locum relief and availability of CME as the major obstacles to GPs undertaking education and training⁴⁶. The most common



reason cited for not attending hospital refresher courses was lack of time, followed by lack of locum relief. Other Australian research has shown that the considerable expense of training and loss of income are significant obstacles to GPs undertaking further education and training⁴⁷.

The very factors that characterise rural medicine also present significant barriers to participation in CME activities. Geographic distance contributes to the cost of attending CME activities and increases the time that doctors are required to be away from their family and practice¹². Arranging the necessary locum coverage for their practice and hospital responsibilities makes it difficult for rural medical practitioners to attend professional development activities¹².

A study by Blackwood and McNab⁴⁸ researched Canadian family physicians who lived and practised in rural areas. Thirty seven percent of the 582 respondents felt they were not adequately trained for rural practice, and 20% felt they were not adequately trained in obstetrics, emergency medicine, anaesthetics and surgery. Pathman and co-workers⁴⁹ reported that primary care physicians working in rural areas across the USA were dissatisfied with access to CME.

Rural doctors also reported a lack of access to the types of education they preferred such as: interactive learning methods; 'hands-on' procedural training; procedural skills; clinical attachments; individual experiential study programs; and self-directed learning instead of more structured CME programs¹³. Research by Booth and Lawrance⁵⁰ found that many rural doctors in Australia were unfamiliar with the types of education that have been shown to be more educationally effective (eg clinical audit and peer review). They also found that there were positive correlations between preference and familiarity with these methods⁵⁰.

The differences in the requirements of Australia's state health departments to enable rural doctors to practise procedural skills is yet another barrier to the maintenance of advanced procedural skills (ACRRM, unpubl. report, 2000).

In some Australian states there is a central clinical privileging committee, while in others each rural hospital has its own clinical privileging committee and the doctor has to apply to every hospital separately. Doctors moving between states and/or hospitals in these states have to re-apply for privileges at each hospital or state in which they practise.

In Australia there are Joint Consultative Committees (JCC) which consist of representatives from three colleges, including the Australian College of Rural and Remote Medicine (ACRRM), the Royal Australian College of General Practitioners (RACGP) and the relevant specialist college. The JCC requirements for procedural areas such as anaesthetics, surgery, obstetrics and gynaecology, paediatrics, emergency medicine and radiology are different for each speciality. Each JCC has its own maintenance of professional standards (MOPS) program, and many state hospitals are now requiring doctors to participate in these MOPS programs in order to obtain clinical privileging rights in that state or territory.

A further barrier to the maintenance of advanced procedural skills relates to rising professional indemnity premiums and increased litigation. This factor has had a considerable impact on the entire medical profession in Australia. In rural areas, the impact is heightened through older doctors choosing to retire rather than continuing to practise, doctors ceasing procedural work and a reduction in the complexity of rural-based surgical services offered by visiting surgeons⁵¹. A survey of procedural GPs in New South Wales reported that rising costs of indemnity cover and growing fear of litigation were to blame for doctors planning to cease advanced procedural work within the next 5 years⁵².

Relationship of these obstacles to recruitment and retention

There is a clear link between access to good quality education and training and the recruitment and retention of rural and remote doctors¹². Rurally accessible, relevant training and continuing professional development is vital to prevent rural doctors leaving rural areas. This has been demonstrated in Australia^{47,44} and overseas.



Procedural and hospital work were also identified as having a positive influence on retention of the rural medical workforce⁴⁷.

Allowing qualified rural and remote doctors to have access to maternity units, anaesthetic units and surgery operating theatres with appropriately trained nursing and allied health staff support enables them to maintain their skills and stay motivated to remain in rural areas.

Evidence based solutions to the problem of recruitment

Doctors who are prepared to be rural or remote practitioners, particularly those who are prepared for small-town living, stay longer in their rural practices. Residency rotations in rural areas are the best educational experiences both to prepare physicians for rural practice and to lengthen the time they stay there⁵³.

Many family practice training programs in Canada have initiated new efforts to ensure that more of their graduates are exposed to the unique and challenging circumstances of rural and remote practice⁹. This has also been happening in Australia. Australian General Practice Training (AGPT) has introduced an enhanced rural training framework which enables registrars to choose to work towards a postgraduate award in rural general practice (RACGP Graduate Diploma in Rural General Practice) and/or rural and remote medicine (Fellowship of ACRRM), during their vocational training⁵⁴. All trainee registrars in Australia, whether they choose the rural training pathway or not, have to spend 6 months in a rural area during their training⁵⁵.

Pathman and colleagues⁵³ concluded that residents in medicine, paediatrics and family practice who are interested in rural practice should receive part of their training in rural settings. Their study of 456 US rural physicians concluded that:

...all physicians who are headed for rural practices should learn how to provide care for a wide range of clinical conditions, become comfortable with

*outpatient medicine, become adept at making clinical decisions when busy and tired, become confident in emergency and non-urgent medical situations where consultants and advanced technology are not immediately available, and understand rural communities, rural patients, and the unique nature and rhythms of rural practice.*⁵³

Solutions to the problem of maintaining procedurally skilled rural doctors

Rourke⁵⁶ identified a number of factors that could be modified to keep physicians in rural communities. These include increased support for CME; the availability of group practice opportunities; improved hospital facilities; reasonable workloads and financial incentives.

Advanced skills will not solve occupational stress, medico-legal risk or budgetary considerations, but will improve confidence among rural maternity care providers, enabling doctors to continue to offer these services when local obstetric specialist care is not available³⁵.

Better managed skills training is one strategy which is likely to improve the retention of rural doctors. Facilitating outreach educational teams who could provide education onsite would assist in overcoming some of the distance problems associated with accessing CME. Exploring more use of communications technology for interactive audiovisual education such as that provided by the Remote Vocational Training Stream would also be helpful. This program uses web-based education combined with teletutorials to provide excellent education to remote medical practitioners. A further potential solution is ACRRM's rural and remote medical education online (RRMEO). This is a web-based system developed in response to the early identification of the need for an accessible and fast system of information distribution in the medical education and training fields⁵⁷. Web-based educational modules have been developed for RRMEO on a wide variety of topics relevant to rural and remote doctors. These include



dermatology, ultrasound, palliative care, women in rural practice, practice management, digital photography, mental health, paediatrics, radiology and clinical guidelines for use on digital personal assistant/palm pilot computers. These clinical guidelines are continually updated and currently cover the topics of adult internal medicine, anaesthetics, child and adolescent health, dermatology, emergency medicine, obstetrics and women's health, ophthalmology and palliative care.

New educational technologies are increasingly being used to overcome distance for rural and remote doctors. Telementoring has been used successfully to teach advanced laparoscopic skills to student surgeons both in the operating theatre and at a distance from the theatre, via the use of an operating room equipped with cameras. There were no differences in the performances of the surgeons between the different groups⁵⁸. Another innovative education technique for surgery is virtual reality, which allows individual doctors to be immersed in a dynamic computer-generated, three-dimensional environment which provides realistic simulations of surgical procedures⁵⁹. Many of these new technologies have the ability to train doctors in remote locations.

Simulation is currently available for anaesthetic, emergency medicine and ultrasound training^{60,61}. Other innovative options could be explored in virtual reality and telementoring.

Loss of income, travel and accommodation expenses and the cost of participating in educational programs are also significant barriers which may prevent rural doctors from participating in continuing education. In 2004, the Australian Government introduced a financial incentive scheme as part of a new Medicare package (the Training for Rural and Remote Procedural GPs Program⁴) to assist rural doctors to continue delivering procedural medical services in rural and remote areas, and encourage other rural doctors to begin providing these services⁶². Under the program, 1500 rural procedural GPs are able to access financial support to reduce the costs incurred in undertaking continuing professional development in procedural areas. The program pays a grant to rural and remote procedural GPs (RRMA 3-7) to attend training,

for up to 2 weeks, and includes the cost of the required locum relief, to a maximum of \$15 000 per GP per financial year. ACRRM and the RACGP are administering components of the program. By May 2006, 942 rural and remote doctors had registered for this incentive. An increase in accredited courses in procedural areas for rural and remote doctors is occurring as a direct response to this initiative.

In December 2005, the procedural incentive program was expanded to include emergency medicine⁶³. By May 2006, 314 doctors had registered for this component of the program, including 138 doctors who were not previously registered in the procedural component.

In Australia, some of the specialist colleges and other education providers are beginning to take their education programs to rural centres to improve the accessibility for their rural members who experience the same difficulties as rural non-specialist doctors in accessing good quality ongoing education. Some examples of these programs include the Royal Australian and New Zealand College of Obstetricians and Gynaecologists programs in early first trimester and gynaecology ultrasound, colposcopy and intrapartum fetal surveillance, the Royal Australasian College of Surgeons risk management for clinicians programs and early management of severe trauma courses, and the ANZCA effective management of anaesthetic crisis courses and thoracic, vascular and perfusion anaesthesia workshops⁵⁷. Many of these courses and programs are also open to non-specialist rural doctors.

Another barrier could be overcome by working with state-based credentialing committees, and state health departments to create a standardised system which would facilitate portability of credentials in advanced procedural skills areas between hospitals and states, for example in radiography. At present, each state's radiation branch requires remote operators to obtain a licence and complete a course, but there is no standardised course or licence to enable transferability of skills across states (R Glazebrook, unpubl. report, 2001).



Support could be given to assist rural doctors to deal with the perceived medico-legal problems of advanced procedural practice in areas such as obstetrics, surgery and anaesthetics, by providing legal education, negotiating with state governments on the issue of indemnity insurance cost subsidies and communication skills training.

Family support is crucial to rural medical retention in Australia⁴⁷ and overseas⁶⁴ and busy rural doctors wish to spend more of their spare time with their families. Further strategies to improve the retention of rural doctors identified in this review include locum relief, flexible delivery of continuing medical education, better-managed skills training, improved housing quality, and better educational support for families^{13,47}. The needs of the spouse must be addressed in the recruitment process and the needs of growing children also affect retention⁶⁴.

Discussion

This review demonstrates that Australia is still facing serious problems due to the declining number of non-specialist procedural rural doctors. Consequently, strategies to attract competent, highly skilled doctors to rural areas and encourage them to stay in rural practice are required as a matter of urgency.

Most rural and remote doctors have no choice but to practise advanced procedural skills because they are often isolated from specialist support, yet our review showed that there were problems accessing initial rural procedural training and CME for all rural doctors (including procedural and non-procedural doctors). Our review of the literature revealed an important link between good quality CME/professional development and the recruitment and retention of rural and remote doctors.

The main obstacles to the maintenance of advanced procedural skills for rural and remote Australian doctors are summarised (Fig 1).

The retention of rural doctors and the difficulties faced by them in maintaining advanced procedural skills are related. There is evidence that both these problems can be addressed, at least in part, by the strategies listed in Figure 2.

The literature also provided evidence of a positive association between dedicated rural training programs and producing rural doctors. Factors associated with successful programs generally included: rural fellowships, explicit rural mission, rural location, rural program directors and procedural orientation^{8,53}.

ACRRM, RACGP and others are well placed to assist in the maintenance of advanced procedural skills in rural and remote practice. They could work in conjunction with the specialist colleges to produce innovative and creative ways for rural and remote medical practitioners to maintain their competency in advanced procedural skills, by removing some of the current obstacles and barriers. Access to procedural skills training in rural areas via distance education modalities including satellite broadcasts, CD-ROMs, web-based education and visiting specialist onsite training could be improved. The development of a single clinical logbook with an electronic option which will cover all procedural speciality areas would be another way to assist rural doctors to maintain a record of their education and training and to assist them to identify gaps in their skills.

The Australian rural medical workforce also contains a large number of international medical graduates and many of these doctors have their own unique learning needs. More research could also be performed on ways to support these doctors' procedural skills.

This review identified one further crucial issue. Many of the medical education initiatives described in this review have not yet been subjected to the scrutiny of high quality evaluative research. This is an urgent need.



- Training
- Lack of opportunity
- Expense associated with remaining skilled in advanced procedural areas
- Recruitment and retention issues
- Multiple credentialing requirements of state health departments and joint consultative committees
- Financial, family and indemnity issues
- Lack of availability of locum relief to attend educational sessions
- Lack of flexible options for education
- Lack of access to advanced procedural training
- Time constraints
- Perceived medico-legal problems

Figure 1: Main obstacles to the maintenance of advanced procedural skills for rural and remote Australian doctors.

- Increased support for flexible continuing medical education and professional development such as:
- specific skills rural training programs
 - the availability of group practice opportunities
 - improved hospital facilities
 - reasonable workloads
 - financial incentives
 - locum assistance
 - improved housing quality
 - better educational support for families

Figure 2: Strategies to address the retention of rural doctors and the difficulties faced by them in maintaining advanced procedural skills.

Conclusion

There is an increasing burden on rural and remote doctors to maintain their advanced procedural skills. This article has investigated the current obstacles faced by rural doctors by reviewing the published literature, and the newly introduced incentive schemes. While many initiatives aimed at overcoming these obstacles have commenced, in order for rural doctors to provide the highest quality of medical care, more support is needed.

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