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Postpartum haemorrhage occurrence and recurrence: a population-based study

Leslie A Woollard

To the Editor: The Rural Doctors Association (RDA) of New South Wales, of which I am President, has been involved in desperately trying to keep maternity units close to people's homes. The conclusion formed by Ford and colleagues in their recent report,[1] that women with a previous postpartum haemorrhage should only deliver in units with a blood transfusion service, appears extraordinary and contradictory to their own findings.

The authors based this conclusion on their finding that 5.8% of women had a postpartum haemorrhage in their first pregnancy, even though their definition of this was remarkably subjective and largely unscientific.

They recognised in their study that the incidence of postpartum haemorrhage requiring transfusion is only 0.7%. Therefore, 88% of women defined as having a postpartum haemorrhage do not require a blood transfusion. I am bemused why the authors think 88% of women who did not require a blood transfusion but had a "postpartum haemorrhage" should only deliver in a unit with blood transfusion services. I doubt any of my colleagues would wish to deliver women who required a blood transfusion for a previous postpartum haemorrhage in a small unit.

I refer Ford and colleagues, and readers, to a study by Tracy et al reported in January 2006.[2] This was a much larger study of 750 491 women giving birth during 1999–2001. This study concluded that "In Australia lower hospital volume is not associated with increased adverse outcomes for low risk women".

In the past 10 years, we have seen the loss of 50% of our maternity units in NSW, and the rest are under severe stress due to the lack of staffing. I doubt that the sort of extraordinary conclusion made by Ford and colleagues will help us maintain services in rural NSW.

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1 Ford JB, Robers CL, Bell JC, et al. Postpartum haemorrhage occurrence and recurrence: a population-based study. *Med J Aust* 2007; 187: 391-393.

2 Tracy SK, Sullivan E, Dahlen H, et al. Does size matter? A population-based study of birth in lower volume maternity hospitals for low risk women. *BJOG* 2006; 113: 86-96. ❑

Jane B Ford, Christine L Roberts, Jane C Bell, Charles S Algert and Jonathan M Morris

In reply: Safety and appropriateness are important principles underlying the provision of health care. Maternity care in Australia requires that women are offered care in an environment that is appropriate to their level of risk. Such a risk-management approach requires accurate data to inform the process, including accurate identification of women who may access local services as well as those who may benefit from higher levels of care. The aim of our study was to present risk estimates of recurrent postpartum haemorrhage (PPH) to better inform decision making by both clinicians and women about subsequent pregnancies.

While we are aware of the struggles faced by rural maternity units, we estimated that only 0.2% of women giving birth in New South Wales would be affected by our suggestion that women with a history of PPH *consider* delivering at a hospital with onsite cross-match facilities. The definition of PPH that we used is consistent with that of the International classification of diseases[1] and the NSW Department of Health's PPH policy;[2] this policy resulted from a review of hospital PPH policies sparked by a coronial inquest into a maternal death.[3]

In contrast to Tracy et al's study, which only considered low-risk women and had no maternal morbidity outcomes,[4] our study calculated risk among all women. Women with a PPH are at increased risk of transfusion, intensive care unit admission, unplanned procedure in the operating theatre, hysterectomy and major maternal morbidity.[3] Where we have information about an increased risk of a potentially life-threatening event, surely we should communicate and act on this knowledge to achieve the best possible outcome for women and babies.

In Canada, which has similar geographical challenges to those in Australia, it is recommended that where risk factors for PPH are identified, additional precautions such as intravenous access, coagulation studies, and availability of anaesthesia should also be considered.[5] The key to successful regionalised maternity care is ensuring that women give birth in risk-appropriate settings.

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2 NSW Department of Health. Postpartum haemorrhage (PPH) — framework for prevention, early recognition and management. Sydney: The Department, 2005. http://www5.health.nsw.gov.au/policies/PD/2005/PD2005_264.html (accessed Feb 2008).

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Rural maternity units: how will they have a future?

L Gay Hawksworth

To the Editor: Pesce's criticism of midwifery practice at Mareeba District Hospital[1] requires rebuttal. His implication that the service is inefficient or pandering to "the powerful sway of maternity care politics" is incorrect and insults those who struggle to provide woman-centred care in a system focused on doctors.

A private obstetrician in Sydney cannot understand midwifery workloads in a rural hospital without knowing the local environment and other impacts on the way clinicians work. The small group of midwives in Mareeba provide a highly valued service in their community, with few of the ancillary services taken for granted in metropolitan areas.

In routine antenatal care, Dr Pesce presumably orders blood tests and then reviews the results filed in the chart or placed on his desk. A Mareeba midwife providing the same service will also perform the venepuncture, prepare a slide and spin the blood, arrange transport to the laboratory, make the next appointment, and file the results in the chart.

A Mareeba midwife's workload includes, among other things:

- Comprehensive perinatal care of inpatient midwifery clients;

- Postnatal and neonatal transfers from Cairns Base Hospital (CBH) (eg, to establish breastfeeding for low birthweight babies);
- 35–40 paediatric admissions per month;
- Emergency stabilisation and transfer of high-risk presentations (eg, a woman planning delivery with a private obstetrician in Cairns will nevertheless present to Mareeba when in labour at 32 weeks);
- Follow-up of high-risk or disadvantaged women who should attend CBH, but won't for various social reasons;
- Lactation and parenting support for Mareeba women, regardless of where their deliveries occur;
- Pap smears and vaccinations; and
- Indirect care, including policy development, data collection, compilation of reports, professional development, inservice training and education.

Pesce also criticised the low level of epidural use at Mareeba, which he says reflects a lack of access. However, models that provide one-to-one care in labour and promote continuity of care have been shown to decrease all interventions and increase maternal satisfaction.[2,3] Perhaps the high use of epidurals and other interventions in modern tertiary units reflects a lack of access to such beneficial, woman-centred models of care.

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1 Pesce AF. Rural maternity units: how will they have a future [editorial]? *Med J Aust* 2008; 188: 70-71.
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3 Hodnett ED. Continuity of caregivers for care during pregnancy and childbirth. *Cochrane Database Syst Rev* 1998; (3): CD000062. ❑

Andrew F Pesce

In reply: I am surprised that Hawksworth feels my editorial[1] was critical of the Mareeba birth unit. There is no criticism of midwifery practice at Mareeba contained in the editorial.

Several midwives have commended me for my support of the need for rural maternity units to evolve sustainable models of care based on the local workforce and infrastructure. Conversely, I received a few snide remarks from some obstetricians who felt that I had been too supportive. I have usually felt that when one is criticised by both sides in a controversial debate, one's view is likely to be reasonable.

I stand by my comments that the resourcing of the unit, based on staff–patient ratios and the availability of a nearby alternative service, would be the envy of many rural medical, surgical or community health teams.

I also stand by my comments that a 1% rate of epidural use is more likely to reflect lack of access to an epidural service, rather than true patient preference. Reviews by a well known midwife of birth centre care and continuity of care confirm that these models of care decrease the use of epidural anaesthesia but are still associated with a 15% epidural rate.[2,3] I am certain that if an epidural service were available, at least some of the Mareeba women would be grateful to have access to it.

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2 Hodnett ED, Downe S, Edwards N, Walsh D. Home-like versus conventional institutional settings for birth. *Cochrane Database Syst Rev* 2005; (1): CD000012.
3 Hodnett ED. Continuity of caregivers for care during pregnancy and childbirth. *Cochrane Database Syst Rev* 1998; (3): CD000062. ❑

The national inpatient medication chart: critical audit of design and performance at a tertiary hospital

Ian D Coombes, Danielle A Stowasser, Carol M Reid and Charles A Mitchell

To the Editor: Millar and colleagues recently described their comparison of the national inpatient medication chart (NIMC) with 14 other medication charts.[1] They concluded that the NIMC contained design features that were adverse and therefore inferior to the medication chart previously used in their hospital. They also stated that the advantages expected by the Western Australian Director-General of Health in introducing the national chart were not experienced at their hospital.

Millar et al failed to mention that the NIMC underwent an extensive process of piloting and evaluation in over 30 sites across the country in a structured before-and-after study.[2] Failure to recognise (i) the benefits of standardisation as medical, nursing and pharmacy staff move between sites, (ii) the opportunities for structured safe medication practice training,[3] and (iii) the value of the collaborative methods used will inhibit the possibility of overcoming problems like those identified by Millar et al in future redesign processes. Millar and colleagues themselves noted that "marked heterogeneity of chart design has been abolished by the NIMC".

The national pilot study considered the entire medication management cycle using a broad definition of medication error ("A prescribing decision or prescription writing process that results in an unintentional, significant reduction in the probability of treatment being timely and effective or increases the risk of harm, when compared with generally accepted practice"[4]). The NIMC was designed to reduce the risk of errors that prescribers have identified with previous charts.[5] The NIMC also reduced the need for all staff to interpret unclear or incomplete prescriptions, thereby further reducing the risk of medication errors.[2]

We support the comments by Millar and colleagues that the process of implementing clinical practice change must involve significant buy-in and championing by clinicians. The implementation of the NIMC in Queensland recognised the importance of top-down support from senior health officials, combined with the need to increase clinicians' awareness of risks of current systems and the need for a clear demonstration of the benefits of a revised system to bring about any substantial change in behaviour.

We understand that the Australian Commission on Safety and Quality in Health Care has established a quality assurance process which operates at jurisdictional and national levels to adjust the NIMC on the basis of issues raised. This important platform will succeed in addressing the issues raised by Millar et al provided clinicians participate in this collaborative approach to medication safety. We have a rare opportunity, in which Australia is taking a leading role, to address one of the critical safety risks facing patients today. Let us all work together and criticise constructively within a framework of collaboration.

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J Alasdair Millar, Robyn C Silla, Glenda E Lee and Ann Berwick

In reply: It is understandable that the designers of the national inpatient medication chart (NIMC) should wish to defend it against criticism, especially after 5 or more years of hard work and the major administrative achievement represented by the "top-down" implementation. It is regrettable that the chart at the centre of this otherwise admirable activity turns out to have significant weaknesses compared with the previous medication chart used at Royal Perth Hospital, and that the designers acknowledge this only obliquely by allowing for "future redesign". Rather, they emphasise secondary outputs such as cross-border familiarity (which we discussed in our article[1]), "training in structured safe medication practice", and "collaborative methods". These supposed advantages are but small crumbs of comfort compared with the imposition of an unsatisfactory chart, loss of local autonomy and increased hazard for patients. There is no evidence that the NIMC has decreased medication errors, defined in relation to patient harm. There was indeed a pilot study, and we referred to it in two different contexts in our paper, but it assessed the chart on the basis of unsatisfactory process-based criteria similar to those employed after the chart was implemented. Perhaps a better indication of the problems of the pilot chart lies in the hundreds of suggested changes made from pilot sites to the NIMC Oversight Committee.[2]

We note that Coombes and colleagues do not dispute our scientific findings or the design faults we described. Their response repeats unverified claims of benefit that we discussed in our article, and seeks to reassure readers that a process is in place to "adjust the NIMC on the basis of issues raised", thus acknowledging that "issues" exist. However, readers should be aware that the process referred to is subject to a set of ground-rules which prohibit changes to several design aspects of the chart that we criticised (eg, the block design of the *pro re nata* [PRN] section).[3] Thus, the possibility that the NIMC will be substantially improved is remote. A more likely outcome is that Australia will be left with a chart that satisfies the superficial attraction of national standardisation but contains significant design flaws which represent a hazard to patients. A better approach would be to agree on binding national standard design elements and to restore to individual hospitals or health areas the right to design their own charts within these constraints — "think globally, act locally".[4]

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Methicillin-resistant *Staphylococcus aureus* (MRSA): "missing the wood for the trees"

Raymond C Chan

To the Editor: I wish to comment on Collignon's recent editorial on methicillin-resistant *Staphylococcus aureus* (MRSA).[1]

The crux of the piece is his argument that what we need is interventional studies, not more studies documenting the extent of environmental contamination. This echoes the sentiment held by me and other colleagues working in the areas of infectious disease, microbiology and infection control. We do need more research and we need good data to evaluate interventions. However, we need to go one step further — a step that can and should be taken now, across the country.

In 2006, I was part of a small team that reviewed the infection control program of a major teaching hospital in New South Wales. It became very clear that what is needed in infection control is a change in governance.

At present, there is little ownership of nosocomial infections by clinicians or hospital administrators. Infection control intervention is perceived as belonging to the infection control practitioners, and not really the business of the doctors, nurses and other health workers who are caring for the individual patient. At worst, this attitude regards the necessary barrier precautions as an annoying, meddlesome burden imposed by some external agency. Clearly, such an attitude is unlikely to result in good compliance with containment measures. Infection control units have a very important role in terms of providing advice, consultancy and monitoring. But as long as there remains a general perception that nosocomial infections are solely the province of these units, progress in control is likely to be slow.

One of the recommendations of our review was to change the governance structure as it relates to nosocomial infection. Elements of this included the following:

- Introducing infection control into the job descriptions of senior hospital executives and heads of departments;
- Conducting performance appraisals of these personnel to include infection control indicators;
- Seeking explicit agreement from all senior medical staff regarding compliance with infection control interventions;
- Requiring all departments to regularly and frequently review infection control indicators; and
- Requiring all departments to have regular, formal education sessions in infection control for all medical and nursing staff, including junior staff.

We need a change in the mindset of clinicians. They must accept responsibility for what happens to their patients, *including* MRSA infections. These complications are no different from any others their patients may experience during their encounter with the hospital system.

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1 Collignon PJ. Methicillin-resistant *Staphylococcus aureus* (MRSA): "missing the wood for the trees" [editorial]. *Med J Aust* 2008; 188: 3-4. ❑

Peter J Collignon

In reply: I heartily endorse Chan's comments. To control infections in our hospitals, we desperately need not only a change in governance, but also a change in attitude. Chief executives of all hospitals, as well as all clinicians (nurses and doctors), need to take personal responsibility for serious infections that occur frequently in our hospitals. To do so, they also need to know how often these infections occur. We need robust and transparent measures — for example, data on health care-associated *Staphylococcus aureus* bloodstream infections, including methicillin-resistant *S. aureus* (MRSA),[1] and deep-seated prosthetic joint infections.

In recent years, faced with rising numbers of health care-associated infections, especially MRSA infections, the United Kingdom embraced necessary changes in governance. These included the promotion and use of seven key actions,[2] with active surveillance and investigation being the first on the list. One of these mandatory surveillance measures was of all bloodstream infections caused by *S. aureus* (including MRSA)[2,3] and the investigation of all episodes caused by MRSA with a "root-cause analysis".[2,4] There are early indications that the changes have successfully reduced the number of MRSA infections: from a peak of 3955 episodes of MRSA bloodstream infection occurring between October 2003 and March 2004, the number had fallen by over 40% to 2376 episodes in the period April 2007 to September 2007.[3]

Prevention and control of health care-associated infections must be a core part of clinical governance and patient safety programs in all hospitals. Chief executives and all clinical directors need to be aware of the numerous factors that must be given careful attention in order to reduce health care-associated infections. More importantly, they need to ensure that all appropriate steps are taken to prevent infection. This includes basic issues such as making sure that surfaces in clinical areas are adequately cleaned[5] and that hand hygiene protocols are complied with — not just some of the time, but all of the time.

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Paragonimiasis: an unusual case of haemoptysis

Murad G Ibrahim, Richard Bunter, Stanley Rajasooriar and Francis Thien

To the Editor: Parasitic infections of the respiratory tract are rare causes of haemoptysis in Western communities, and are often clinically indistinguishable from pulmonary tuberculosis.[1]

We report a case of a 19-year-old Burmese factory worker who presented to our outpatients department with a history of haemoptysis for 4 years. He was born in Myanmar (Burma) and lived in Malaysia for 2 years before migrating to Australia. He had no past history of significance, and denied having any contacts with tuberculosis. He was a non-smoker and was taking no regular medications.

His haemoptysis started in Myanmar, but increased in frequency after he migrated to Australia. He coughed up both fresh and old blood mixed with some sputum, and complained of weight loss of 6 kg, intermittent chest pain and headaches. He had no fever, night sweats, shortness of breath, dysuria, or gastrointestinal or neurological symptoms. He appeared well, and findings of a general physical examination were unremarkable.

Chest x-rays from before this presentation, which included migrant screening x-rays, were normal, but his most recent chest x-ray revealed a round lesion posteriorly. A computed tomography scan organised by the patient's general practitioner showed an area of consolidation at the base of his left lung, not typical of tuberculosis which was the primary suspect in this case.

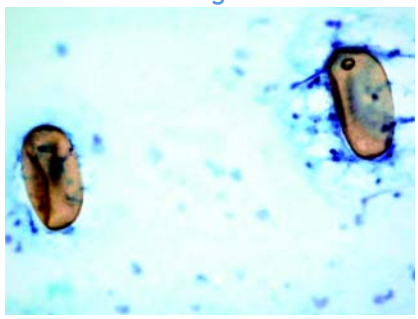
Blood tests showed a raised white cell count of 14.5×10^9/L (reference range [RR], $4.0–11.0 \times 10^9$/L) with a neutrophil count of 11.33×10^9/L (RR, $2.0–7.5 \times 10^9$/L) and an eosinophil count of 0.51×10^9/L (RR, $0.04–0.4 \times 10^9$/L), an erythrocyte sedimentation rate of 44 mm/h (RR, 1–10 mm/h) and C-reactive protein level of 20 mg/mL (RR, < 5 mg/mL). The result of a QuantiFERON-TB Gold test for tuberculosis was negative.

Attempts to obtain sputum samples were unsuccessful, and the patient underwent a bronchoscopy that revealed white milky mucous secretions within the lower lobe of the left lung, where a bronchial lavage was performed. Microscopy of bronchial washings revealed the presence of parasitic structures consistent with *Paragonimus westermani* (Box 1).

Therapy with praziquantel was initiated at a dose of 1200 mg orally, twice daily for 2 days. His condition improved quickly and, on review in the outpatients department 4 weeks later, he had no clinically or radiologically evident recurrence of infection.

Paragonimiasis is a common endemic infection in South-East and East Asia, particularly in India, China, Japan and the Philippines. Humans acquire the infection by eating raw or undercooked crayfish and freshwater crab, in which the metacercariae encyst. Once the organisms reach the duodenum, they excyst, penetrate the gut wall, and travel through the peritoneal cavity as immature flukes. They then migrate through the diaphragm and pleu-

1 *Paragonimus westermani* eggs detected on microscopy of bronchial washings



2 Similarities in the clinical pictures of paragonimiasis and tuberculosis

- Both are endemic in the same areas
- Neither responds to standard antibiotics
- Both produce chronic symptoms
- Symptoms of both include:
  - ➢ Haemoptysis
  - ➢ Weight loss
  - ➢ Pleural effusion
  - ➢ Chest pain ◆

ral space to reach the lungs, where they form adult worms.[2]

Early after infection, pleuritic chest pain may develop, in some cases accompanied by a pneumothorax or pleural effusion. Later, with invasion of the lung parenchyma, low-grade fever, cough or streaky haemoptysis may develop. Once the adult worms inhabit the lungs, usually after 2 months, recurrent haemoptysis becomes the cardinal symptom.[3]

Pulmonary paragonimiasis is most commonly misdiagnosed as tuberculosis, owing to many similarities in the clinical pictures of the two infections (Box 2).[4,5] In a patient from a known endemic area, differential diagnoses should be considered and every effort should be made to obtain sputum samples or bronchial washings to distinguish between these two conditions. Serological tests are available if sputum or washings cannot be obtained.

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Changing perceptions of solaria and cancer risk: the role of the media

Geoffrey Jalleh, Robert J Donovan, Chad Lin and Terry Slevin

To the Editor: In recent years, solaria have multiplied across Australia. Solaria can emit higher concentrations of ultraviolet radiation than the midday summer sun.[1] As exposure to ultraviolet radiation is a risk factor for skin cancer, including melanoma,[2] it is not surprising that there is mounting evidence that solarium use increases melanoma risk.[1,3-4]

Public attention to this issue increased following coverage of Clare Oliver's story in August 2007.[5] Clare was dying from melanoma, which she attributed to her use of solaria. In the last weeks before her death, Clare publicly warned of the dangers of solaria. She featured in a television advertisement promoting the message "No tan is worth dying for", launched nationally in February 2008.

There is evidence that public awareness of the cancer risk of solaria increased after this media coverage. We surveyed adult Western Australians in September 2006, and again in 2007, about their perceptions of cancer risk factors. The survey was conducted by computer-assisted telephone interviewing using random-digit dialling from the Perth White Pages (2006, $n = 196$; 2007, $n = 250$). Ethical approval was granted by the Curtin University of Technology Human Research Ethics Committee.

Participants were read a list of 16 factors (including solaria) and asked how each factor affected cancer risk (response categories: increase a lot; increase a little; decrease a little; decrease a lot; no effect). While risk perceptions for the other 15 factors remained constant, there was a substantial increase in the proportion of "increase a lot" responses for solaria (40% in 2006 v 72% in 2007; $P = 0.001$). Total "increase" responses were 71% in 2006 and 92% in 2007 ($P < 0.001$).

In addition, Clare's advocacy may have been a factor in increased regulation of the solarium industry. Until recently, the Australian solarium industry was unregulated, but operated under a voluntary code of practice. There is evidence that compliance with this code was lacking.[6] The Australian Government has explored making the code of practice mandatory. As of 1 February 2008, the Victorian Government enacted regulations to tighten the control of solaria under the *Radiation Act 2005* (Vic). Similar regulations were introduced in South Australia on 14 March 2008 and in Western Australia on 4 April 2008.

There have been no campaigns about the dangers of solarium use in the general population, so it is very likely that this increase is due to the media coverage of Clare's story. This and responses to other individuals' personal stories[7] provide evidence of how such stories can increase the community's awareness of a health issue and gain support for legislative change.

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National health reform needs strategic investment in health services research

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To the Editor: We were interested to read the article on health services research (HSR) in Australia,[1] and the previous editorial and articles on health technology assessment (HTA).[2-5]

In contrast to Australia's prominent role in applying HSR and HTA to new pharmaceuticals, there has been very little local development of these techniques in evaluating new diagnostic technologies.

The Quality Use of Diagnostic Imaging program of the Royal Australian and New Zealand College of Radiologists recently examined the introduction of new imaging technologies in Australia, with particular attention to Medicare Benefits Schedule funding. The major findings were:

- Delays of up to 7 years between the emergence of evidence for benefit from a new technology and Medicare listing. A large part of this delay was in the period before application to the Medical Services Advisory Committee (MSAC).
- A lack of significant permanent infrastructure for evidence-based assessment and priori-

tisation of new imaging technologies. This is in stark contrast to the situation for new pharmaceuticals and surgical procedures.

- Where some published evidence of clinical efficacy exists, but does not meet MSAC requirements, there is no mechanism to trigger targeted trials on questions of safety, efficacy, and cost-effectiveness.

The generation of such evidence is costly, but, arguably, cost-effective in the longer term. Data collection by the Australian and New Zealand Association of Physicians in Nuclear Medicine during the interim funding of positron emission tomography has cost $2.5 million. This "coverage with evidence" approach is used in other countries, like the United States and the United Kingdom, to generate relevant evidence about the performance of emerging technologies when this does not exist in the published literature The current restriction of MSAC reviews to examining existing evidence, rather than sponsoring projects designed to provide specific relevant evidence, ensures continuing delays in the approval of new technologies for Medicare funding.

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