



O&G

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Pain



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O&G Magazine Advisory Group

Prof Caroline de Costa Council Rep, QLD
 Dr Sarah Tout Council Rep, New Zealand
 A/Prof Stephen Robson Fellows Rep, ACT
 Dr John Schibeci Diplomates Rep, NSW
 Dr Brett Daniels Trainee Rep, TAS

O&G Magazine Editors

Penelope Griffiths
 Julia Serafin
 Peter White
 Lisa Westhaven

Designer and Production Editor

Lisa Westhaven

Editorial Communications

O&G Magazine Advisory Group, RANZCOG
 254-260 Albert Street
 EAST MELBOURNE, VIC 3002 Australia
 (t) +61 3 9417 1699
 (f) +61 3 9419 0672
 (e) ranzcog@ranzcog.edu.au

Advertising Sales

Bill Minnis Director
 Minnis Communications
 (t) +61 3 9824 5241
 (f) +61 3 9824 5247
 (e) billm@minnisjournals.com.au

Printer

Highway Press
 (t) +61 3 9887 1388
 (f) +61 3 9800 2270

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RANZCOG Regional Committees

New Zealand

Dr John Tait Chair
Kate Bell Executive Officer
Level 3, Alan Burns Insurances House
69 Boulcott Street/PO Box 10 611
WELLINGTON, NEW ZEALAND
+64 4 472 4608 (t)
+64 4 472 4609 (f)
kate.bell@ranzco.org.nz (e)

Australian Capital Territory

Dr Andrew Foote Chair
Deakin Gynaecology Centre
39 Grey Street
DEAKIN, ACT 2600
+61 2 6273 3102 (t)
+61 2 6273 3002 (f)
muttons@dynamite.com.au (e)

New South Wales

Professor Alec Welsh Chair
Lee Dawson Executive Officer
Suite 4, Level 5, 69 Christie Street
ST LEONARDS, NSW 2065
+61 2 9436 1688 (t)
+61 2 9436 4166 (f)
admin@ranzco.nsw.edu.au (e)

Queensland

Dr Paul Howat Chair
Lee-Anne Harris Executive Officer
Unit 22, Level 3, 17 Bowen Bridge Road
HERSTON, QLD 4006
+61 7 3252 3073 (t)
+61 7 3257 2370 (f)
lharris@ranzco.edu.au (e)

South Australia/Northern Territory

Dr Rosalie Grivell Chair
Tania Back Executive Officer
1-54 Palmer Place/PO Box 767
NORTH ADELAIDE, SA 5006
+61 8 8267 4377 (t)
+61 8 8267 5700 (f)
ranzco.sa.nt@internode.on.net (e)

Tasmania

Dr Stephen Raymond Chair
Hobart Urogynaecology & Incontinence Clinic
4/44 Argyle Street
HOBART, TAS 7008
+61 3 6223 1596 (t)
+61 3 6223 5281 (f)
rfullert@tassie.net.au (e)

Victoria

Dr Elizabeth Uren Chair
Fran Watson Executive Officer
8 Latrobe Street
MELBOURNE, VIC 3000
+61 3 9663 5606 (t)
+61 3 9662 3908 (f)
vsc@ranzco.edu.au (e)

Western Australia

Dr Tamara Walters Chair
Janet Davidson Executive Officer
Level 1, 44 Kings Park Road
WEST PERTH, WA 6005/PO Box 6258
EAST PERTH, WA 6892
+61 8 9322 1051 (t)
+61 8 6263 4432 (f)
ranzco.wa@westnet.com.au (e)

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists



College House
254-260 Albert Street
EAST MELBOURNE, VIC 3002
+61 3 9417 1699 (t)
+61 3 9417 0672 (f)
ranzco@ranzco.edu.au (e)
www.ranzco.edu.au (w)

President

Dr Rupert Sherwood

Vice Presidents

Prof Michael Permezel
Dr Louise Farrell
Dr Digby Ngan Kee

Board Members

A/Prof Stephen Robson
Dr Gino Pecorano

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From the President



Dr Rupert Sherwood
President

Welcome to the Autumn edition of *O&G Magazine*. It was with some surprise that I received an email from the editorial staff asking for this column and, with it, came the realisation that three months have passed already in my term as President. Re-reading my contribution in the summer journal I note a commitment to report on progress with respect to the Strategic Plan, which is the second part of this article.

Firstly to recent climatic events, particularly in South-East and Far

North Queensland and Victoria, where devastating natural disasters have caused so much disruption and harm; including, tragically, loss of life. As well as offering our collegiate support to RANZCOG members, their families and all those affected by these events, I have authorised a donation of AUS \$5000 from RANZCOG to the Qld Flood Appeal; in addition to which I am sure many members of the College have made their own personal contribution. My understanding is that delivery of maternity services was minimally disrupted (although complete evacuation of hospitals in FNQ probably exceeds 'minimal'). Reports of several births in FNQ that coincided with the 'eye' of Cyclone Yasi received significant publicity and were welcome good news among such devastation and misery. The onset of parturition, while incompletely understood by clinicians and scientists alike, is obviously not delayed by extremes of weather.

As this edition of *O&G Magazine* goes to press we are confronted with another catastrophic natural event in the Christchurch earthquake. I have sent an offer of help of any type required by the New Zealand Fellowship and the thoughts of all College members are with those affected by this tragedy.

This edition of *O&G Magazine* is themed 'Pain' and represents a substantial, but digestible, summary of a topic that is an integral part of the working life of every Fellow, Diplomate and Trainee in O and G. It would be a fair assessment that, to date, structured teaching in the management of pain has been less than that required to fully equip our graduates to manage these sometimes very complicated and invariably multifactorial clinical situations. This edition provides a very good basis on which to begin an appreciation of the breadth and scope of the discipline of pain management. Contributions include a paper from Dr Michael Paech, an anaesthetist who is also an Honorary Fellow of RANZCOG. His Honorary Fellowship was awarded for his extensive research in the areas of pain management in the delivery suite and perioperative analgesia.

From the community perspective, there exists a disconnection between the approaches to pain management in the two parts of our profession. While I envisage no public support for a minimalist approach to pain relief in postoperative care or, say, cancer management, the same cannot be said for the delivery suite. Those women who attain the often unrealistic goal of 'drug-free' childbirth are put forward as successful while those who chose analgesia are sometimes made to feel a sense of having 'failed' in some way. In

this era of women's autonomy and engagement in their own care, obstetricians – and indeed all members of the maternity care team – should support women and their partners in whatever choices they make with respect to safe birth options and, particularly, in regard to choice of pain management. All obstetricians will be interested to see an article on the subject of fetal and neonatal pain, broadening our usual focus on intrapartum pain relief for the mother.

The cost to the community of chronic pain in women from the condition of endometriosis alone is of enormous significance in terms of lost productivity, quality of life and health dollars. Professor Ian Fraser's contribution on this condition complements the writings on pain management. Professor Fraser is an internationally recognised expert in this field and his research has cast new light on the origins of the pain that is so much part of this condition.

On a survey of the patient list at the beginning of a session in rooms or clinic, chronic pain – be it pelvic pain, dysmenorrhoea or dyspareunia – has the capacity to cause the working clinician's heart to sink. This is almost certainly because many of us trained in the 'find the problem, fix it' school of medicine lack a clear systematic approach to our patients with chronic pain. Recognition of pain management as a discipline in its own right will inevitably make us better doctors.

The College of Anaesthetists in Australia and New Zealand (ANZCA) has a Faculty of Pain Management. Elevation to the Faculty of Pain Management (FPM) is either by two years of study and assessment or by election on the basis of a substantial contribution in the field. RANZCOG is very fortunate to have three Fellows who hold the FPM qualification: Wayne Gillett in Dunedin, New Zealand; and Thierry Vancaille and Susan Evans in Australia. These clinicians have a very strong commitment to improving our understanding of pain management. In addition, better training for our graduates and Fellows in this discipline is a central tenet of the Faculty's strategy. This represents an excellent example of how inter-collegiate cooperation can benefit patient care.

Moving to College activities and the issues that have kept the Board and new Council members occupied and my email inbox near to capacity:

- The Training Program Review Working Party (TPRWP), chaired by Ted Weaver, has exchanged steady stream of email and documents, held several teleconferences and will have met face to face by the time this edition goes to press. Many good ideas about improving the training program have been proposed and the real task will be, as always, to transform those ideas into practical reforms without disadvantaging any current Trainees, while using the resources available. The Working Party reports regularly to the Council and Board to ensure the widest consultation and input. Please respond favourably if you get a 'shoulder tap' for a contribution, as it is no exaggeration to state that this is the future of our profession.
- The Maternity Reform Agenda, enabling eligible midwives to have rights to Medicare refunds for their patients, order diagnostic tests and have limited prescribing rights, came into effect on 1 November 2010. I am seeking feedback from the Fellowship and Diplomates as to how these reforms have been put into effect, particularly with respect to collaborative care agreements with either individual practitioners or, perhaps more importantly, with hospital managements.

- The new Diploma training program is nearing completion. It includes an extensive online component to guide learning in all three components of the revised curriculum. E-learning and online resources for both Trainees and College members are a major focus for RANZCOG during my term as President. We will regularly update the membership as to how they can access, and benefit from, this exciting area of College activity. A revamped and more user-friendly College website, due to be launched in May, will complement this increased use of electronic media for training and CPD.
- Entry into the RANZCOG training program in 2012 will be under a national selection process, with uniform formats for referee reporting, application and CV scoring and interviews of the shortlisted applicants. An enormous amount of work and effort has gone into achieving this outcome, recognising that two countries and six States/Territories inevitably have a diverse range of opinion as to the 'ideal' entrant to our training program. I am confident the process will work well and meet all the essential criteria of high standards, fairness, transparency and robustness required by both the RANZCOG Fellowship and external agencies such as the Australian Medical Council and the ACCC.
- Intellectual property (IP) and how the College manages the large amount of material provided from diverse sources that constitutes the basis of RANZCOG's role as the training and accreditation body in Australia and New Zealand is currently being addressed by the Board and Council.
- Strengthening the links and maintaining good communication between the College in Melbourne and the regional committees is another part of the strategic plan for this 7th Council term. I met with the New South Wales committee in February and also attended the Western Australia Annual Scientific Meeting in Busselton. The September board meeting will be held in Hobart to give the Tasmanian membership an opportunity to meet the Board members. Each Council meeting has as a standing agenda item a report from each region and I encourage all members to raise any issues of concern with their representative.
- Engaging with other organisations that represent various aspects of College endeavour – both clinical and political – is another aim of the Board. We held joint Executive meetings with both Australasian Gynaecological Endoscopy and Surgery Society and the National Association of Specialist Obstetricians and Gynaecologists at the end of February, to progress and promote common aims that can benefit both our membership and the community we serve.

The Australia Day and New Zealand New Year Honours saw four Fellows of our College receive much-deserved awards and I extend congratulations from all RANZCOG members to:

- Mr Arthur Day AM
- Prof Andrew Korda AM
- Prof Alastair H MacLennan AO
- A/Prof Lesley McGowan NZMO

Finally, I would like to conclude my report with congratulations to Dr Emma Parry from Auckland, New Zealand, who was named the *Next Magazine* 'Woman of the Year'. This was in recognition of her work in the area of maternal fetal medicine and particularly her ability to engage a wide audience in promoting the best of care for women and their babies.

I am sure you will enjoy this excellent edition of *O&G Magazine*.

As always, I welcome your comments on any of the issues discussed above, or any other College matters. I can be contacted via the email address: president@ranzcog.edu.au.

From the CEO



Dr Peter White
Chief Executive Officer

In writing this contribution to the Autumn 2011 edition of *O&G Magazine*, which deals with the theme of 'Pain', I reflected on the corresponding column in 2009 – in which I spoke of the flood crises in Queensland and New South Wales that had just occurred – as well as the unprecedented, tragic bushfire events in Victoria that followed shortly thereafter. Recent media coverage around the second anniversary of the Victorian fires has focused on the renewal that has occurred in the two years since, both in environmental and human terms; however, no

one needs reminding of the fact that all three States along the Eastern seaboard of mainland Australia have again experienced the distress that accompanies significant events of nature over which we have only limited control. Having been in New Zealand at the time of the tragedy of the Pike River Coal Mine explosion and having watched from across the Tasman as earthquakes wrought loss and destruction in the Christchurch region, there is the realisation that not all such events are foreseeable or, indeed, able to be managed in such a way that eradicates or minimises the associated pain in a minimal timeframe. These are times when the essence of humanity is searched for and, thankfully, frequently found in ordinary communities subjected to extraordinary events.

'The matter of Overseas Trained Doctors (OTDs) and International Medical Graduates (IMGs) is one of significant importance for both Australian and New Zealand communities...'

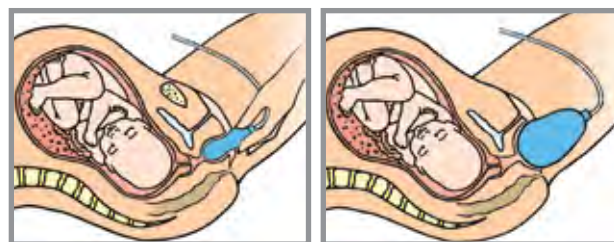
As always, there is much happening at a College governance and administration level. On both sides of the Tasman Sea there continues to be considerable activity in regards to workforce planning and maternity services policy development and the College is attempting to be as proactively involved in these areas as possible through the relevant avenues available. The move to a national system of registration of health practitioners in Australia has been the subject of recent media coverage and I would again urge all College members who have not transacted all necessary requirements with the Australian Health Practitioner Regulatory Agency (AHPRA) / Medical Board of Australia (MBA), or who wish to check their registration details, to do so via the AHPRA website: <http://www.ahpra.gov.au>.

The matter of Overseas Trained Doctors (OTDs) and International Medical Graduates (IMGs) is one of significant importance for both Australian and New Zealand communities, with the medical workforces of both countries reliant to a significant extent on doctors whose primary and/or specialist medical qualifications

were not obtained in Australia or New Zealand. In Australia, the College is accredited by the Australian Medical Council (AMC) to undertake the requisite training and assessment of doctors to enable recognition as a specialist obstetrician and gynaecologist, with Fellowship of the College (FRANZCOG), the qualification recognised by AHPRA to enable inclusion on the specialist register of the MBA in the field of obstetrics and gynaecology.

The College is also the body formally recognised by the MBA to conduct assessments of OTDs who possess overseas specialist qualifications in obstetrics and gynaecology and who wish to be recognised as a specialist in this field in Australia. The College also undertakes such assessments in New Zealand for the Medical Council of New Zealand in the capacity of a Branch Advisory Body (BAB) to the Council. It undertakes these functions acutely aware of its associated responsibilities to a range of stakeholders, including (and most notably) the OTDs and the communities that they are seeking to serve, cognisant at all times of the need to deliver high-standard, safe and effective healthcare to the Australian and New Zealand public.

In December 2010, the College received correspondence from the Australian Government House of Representatives indicating



that, following a reference from the Commonwealth Minister of Health and Ageing, the House of Representatives Standing Committee on Health and Ageing was to conduct an inquiry into and report on the registration processes and support available for OTDs in Australia. As would be expected from a consideration of the functions and activities of RANZCOG, the submission from the College focused primarily on matters relating to the subset of OTDs seeking to practise as O and G specialists in Australia, although some aspects were pertinent to those also seeking to practise in the category of general registration through attainment of the AMC Certificate and the multiple pathways available to accomplish this. This is particularly so in regard to the multiple requirements and agencies with which OTDs must interact and the need for clear, accurate information to be available and accessible.

'The work of the FRANZCOG Training Review Working Party is now well underway, with Fellows and trainees having been invited to provide input...'

The College sees it as necessary to contribute to inquiries such as this that relate to areas that are extremely important in the

context of overall College functions and the sustainability of a safe and effective medical workforce, and which also are occasionally subject to misinformation in the public arena due to their complexity and importance. Information in relation to the inquiry can be found at <http://www.apph.gov.au/house/committee/haa/overseasdoctors/index.htm>. The College looks forward to the outcomes and any recommendations from the inquiry.

In recent previous editions of *O&G Magazine*, I have written about a number of strategic initiatives that were being actively progressed across a range of areas in the College. These included the review and revision of training curricula associated with the FRANZCOG training program and the DRANZCOG and DRANZCOG Advanced training programs and the trial of a revised structure to the College Continuing Professional Development (CPD) program; all of these three items are of considerable importance, relating as they do to core aspects of the College's business.

The work of the FRANZCOG Training Review Working Party is now well underway, with Fellows and trainees having been invited to provide input to inform its deliberations as part of a wide-ranging consultation process. Members of the Working Party are well aware of the critical importance of the work that the group – with the Immediate Past-President, Dr Ted Weaver, as Chair – is undertaking and I am certain that all College members, as well as external stakeholders will read with interest further updates from the group as they appear in College communications throughout this year.

'The new [CPD] program will be supplemented by an effective online capacity...and represents a step forward...'

As all will no doubt be aware, the Conjoint Committee for Obstetrics and Gynaecology (CCDOG) is the body that has replaced the Joint Consultative Committee on Obstetrics (JCCO) to oversee the operations of the DRANZCOG and DRANZCOG Advanced qualifications, as well as develop revised curricula for these programs, along with the regulatory and administrative aspects that will underpin these revised programs. The development work for the revised curricula is now nearing completion, with a three-tier system of qualifications, involving a new initial Certificate of Women's Health, having been developed and approved for implementation. Current work is attending to the development of the online educational modules that will underpin the three qualifications, with the 'new' programs intended to be operational before the middle of this year. Further detail relating to the structure of the programs can be found in the article by Prof Ajay Rane (Chair of the CCDOG), Mr Julian Cross and Mrs Anna Kaider in this issue of *O&G Magazine*.

The report of the trial of a revised structure to the College CPD program was presented to the CPD Committee at its most recent meeting and was positively received. As a result, the RANZCOG Board approved the implementation of the program, with endorsement from the RANZCOG Council being sought in March in order to ensure that the move has the support of the widest possible cross-section of the College Fellowship. The new program will be supplemented by an effective online capacity



so as to enable Fellows to conduct their activity CPD program activity electronically and represents a step forward for the College CPD program in acknowledging the wide range of both clinical and non-clinical activities in which Fellows participate that can be meaningful from a CPD perspective, as well as the various stages through which a Fellow's career may evolve. This latter aspect is enabled through the new program being aligned, at an underpinning framework level, with the RANZCOG Training Curriculum and will be of particular assistance to Fellows who have moved significantly into the area of medical administration over time.

At a governance level, the new arrangements under the auspices of a College Board supported by a Council are being well received and ensuring that those who are accountable for the decisions of the organisation are properly informed so as to enable appropriate decision-making to occur. As Fellows will be aware, the new structure of the RANZCOG Council includes the appointment of a Community Representative to ensure a full range of views is considered by the Council during its decision-making processes. It is hoped that the appointment process will be completed to enable the next issue of *O&G Magazine* to feature a profile of the individual appointed to this important position.

'There is a need for the profession and organisations such as the specialist Colleges to demonstrate that they can continue to be entrusted with the responsibilities that they have...'

You will have noted the enclosure of a hard copy of RANZCOG's Strategic Plan with this issue of *O&G Magazine*, which will guide the major avenues of activity of the College through to November 2012. Both the President and I have undertaken to regularly inform the College membership of progress in relation to the objectives and associated strategies described in this document, which is underpinned by more detailed operational considerations that will enable the necessary work in relation to the measurable outcomes to be effected.

The College continues to explore and progress new initiatives in the area of information and communication technology to assist all members in their interactions with the College, be it in relation to education and training opportunities or to support administrative requirements. The development of an online CPD facility in conjunction with a revised CPD program is one such example. In all areas the input and contribution of the membership is essential; I have written many times of the 'partnership' between College members and College staff that results in benefits for all. As such, I would draw the attention of members to the call for contributions to assist with material to aid the construction of the new College website that is currently under development. Similarly, I draw the attention of members to the call for expressions of interest in the position of Honorary Curator of the College Collection to fill the role made vacant by the retirement of Prof Geoffrey Bishop AM.

It is always with some incredulity that I approach the need to compose the contents of this column, with 'It can't possibly be that time again' the dominant initial reaction. There is much

that happens through the days that could be communicated in a column such as this, but there is never sufficient space to do so with justice for the target readership or the subject matter, and decisions need to be taken to communicate to members details of matters that seem most pertinent at the time in the context of overall College activities.

As an organisation, the College continues to expand, rather than contract; the activities that it is undertaking and the efforts of all involved are never taken for granted. For those of you reading this edition of *O&G Magazine* who do not have a formal active involvement with the College, I would once again like to take this opportunity to encourage you to do so. New hands to help meet the requirements of a never-diminishing agenda are always welcome; with your efforts supported by a committed staff. Increasingly, there is a need for the profession and organisations such as the specialist Colleges to demonstrate that they can continue to be entrusted with the responsibilities that they have and contributing to the work of the College is one small way in which this can be accomplished. It may actually also be one that is pain free and has rewards not anticipated in advance.



Pain



Dr Brett Daniels
RANZCOG Trainee

Pain is a thread that runs through many of our interactions with the women we care for. In gynaecological practice, there is the cyclical pain of dysmenorrhea and endometriosis or the acute pain of ovarian torsion. Perhaps there is pain where there was no pain before, nibbling at the patient's peace of mind – 'is it a cancer?' – until they can delay assessment no more.

Early in pregnancy, pain may be the harbinger of miscarriage, later on it may signal abruption or preterm labour. Occasionally, pain is awaited eagerly. We nod approvingly at 'good strong contractions', replacing the tightenings of early labour. Most often, we seek to give relief from the burden of pain. From well-chosen words, through gentle touch or warmth to the anaesthetist's drugs and needles, or the surgeon's knife, our patients seek our help to relieve their pain.

The theme of this issue of *O&G Magazine* is pain. Among the articles is an up-to-date review of analgesia in labour by Prof Michael Paech, and Honorary Fellow of RANZCOG This article, and others, including those on dyspareunia and chronic pelvic pain,

will be of practical interest to the readers of *O&G Magazine* and further our ability to help our patients.

'From well-chosen words, through gentle touch or warmth to the anaesthetist's drugs and needles, or the surgeon's knife, our patients seek our help to relieve their pain.'

Broadening this issue's focus on pain is an attempt to answer a question that I imagine has crossed many of our minds – does a fetus feel pain? In labour at term it seems intuitively likely that the fetus feels pain. Babies cry as they receive a vitamin K injection after birth; it seems unlikely that they did not feel the fetal scalp electrode placed an hour before. What about earlier in pregnancy? Does a ten-week fetus feel pain or a 20-week one? Even if they withdraw from noxious stimuli, does a fetus experience pain in the same way as a neonate, or an older child? Luke la Hausse de Lalouvière, provides a thought-provoking account of research into this question. Whether or not readers agree with the conclusions drawn from this research, the article allows us to ponder the question armed with scientific evidence that may be new to many of us.

Pain relief in pregnancy



A/Prof Stephen Robson
FRANZCOG

Symptoms of pain, such as headache and musculoskeletal discomfort, are common during pregnancy. Women and their doctors are often nervous about the use of analgesics during pregnancy and frequently seek advice about their safety.

The efficacy of most drugs is directly related to the concentration of the drug in the plasma. In turn, the plasma concentration of drugs is ultimately determined by the absorption of the drug, its distribution through the body and eventual elimination.

These considerations thus influence the dosing (both amount and frequency of doses) and the route of administration. The aim of drug use is to achieve an effective plasma concentration, enough to achieve the desired therapeutic effect, yet reduce the potential for any toxicities as much as possible.

When drugs are taken orally, passive diffusion across the small intestinal wall is the primary route of absorption. Once absorbed, the drug will pass through the hepatic microcirculation in the first instance. Some drugs are strongly affected by this 'first pass' effect. Once into the systemic circulation, drugs are then distributed through the intravascular, interstitial and intracellular spaces. Drugs with a large molecular weight, such as heparin, are confined to the intravascular space, whereas lipophilic drugs will be widely distributed through all of the compartments.

'Pregnancy increases the activity of cytochromes in the liver, leading to an increased rate of metabolism and elimination of drugs.'

As the drugs circulate, they will be subject to elimination. Polar drugs are commonly eliminated through the kidneys, whereas lipophilic drugs mostly undergo metabolism in the liver and the metabolites are cleared by the kidney on subsequent passes. Most drugs have a relatively constant rate of clearance that is not dependent upon the plasma concentration. This is a process known as linear kinetics and this allows accurate estimation of plasma concentrations of a drug to be made for the time after administration. However, notable exceptions include alcohol (if you consider alcohol a drug!) and some anticonvulsants.

For most drugs, those that follow linear kinetics, the plasma concentration will rise after administration, to reach a peak and then fall predictably. The time for the plasma concentration to fall by 50 per cent is called the 'half life'. Drugs that are administered by a regular dosage schedule will usually rise over about three half-lives to reach a steady state concentration. Where it is important to reach a therapeutic plasma concentration promptly, a loading dose of the medication may be given.

Pregnancy imposes physiological changes that begin very early, during the first trimester. Gastric emptying and small intestine motility are delayed in pregnancy. This is likely to be the effect of progesterone. As well, changes in gastric pH and mucus production can alter ionisation of weak acids and reduce their absorption. This is not commonly a problem with repeated dosage schedules, but can certainly affect single-dose drugs such as analgesics or anti-nauseants. To make matters worse, vomiting and anorexia often lead to loss of part or all of a drug dose, or to postponement of doses.

'Cells in the fetal liver and placental tissues can metabolise drugs, but fetal cells are immature and the ductus venosus directs much incoming fetal blood past the liver directly to the fetal heart and brain.'

The well-known increase in intravascular volume contributes to a total increase in body fluid of up to ten litres in some women. The effect can be complex with changes in protein binding, since haemodilution can reduce plasma albumen concentrations. To further complicate things, steroid hormones (present in high concentration in some pregnant women) may displace drugs from binding sites on proteins. This can result in increased concentrations of some drugs that are normally bound to proteins. Although free drugs are more promptly metabolised and excreted, meaning that clinical effects are not necessarily altered, monitoring of drug concentrations can be difficult and misleading.

Pregnancy increases the activity of cytochromes in the liver, leading to an increased rate of metabolism and elimination of drugs. At the same time, steroid hormones can inhibit elimination through other isoenzyme systems. Blood flow through the kidneys increases, increasing by up to two thirds, with a resultant increase in glomerular filtration rates. Drugs – such as some antibiotics that are excreted essentially unchanged – are thus removed much more quickly and have lower steady state concentrations.

Diffusion across the maternal-fetal interface in the placenta favours lipophilic drugs, but this is rate limited by the blood flow to the placenta. Large drug molecules, such as heparin, and strongly protein-bound drugs, such as insulin, cannot cross the placenta. Analgesics readily cross the placenta to the fetus. Cells in the fetal liver and placental tissues can metabolise drugs, but fetal cells are immature and the ductus venosus directs much incoming fetal blood past the liver directly to the fetal heart and brain.

Table 1. Commonly prescribed analgesics and their effects in pregnancy.

Drug	Category	Description
Paracetamol	A	Paracetamol is widely available and is the treatment of choice for pain at any stage of pregnancy. Remarkably, the mechanism of action of paracetamol remains unclear, but it probably acts by inhibition of prostaglandin synthesis in the central nervous system. It undergoes hepatic metabolism to inactive, but toxic, metabolites. Fortunately, these toxic metabolites are present in relatively low concentration and are removed by glutathione conjugation. Pharmacokinetic studies of paracetamol in pregnancy have suggested a reduced half life and increased clearance rate. A large body of evidence to date is reassuring, suggesting that paracetamol use, in standard dosages, has no adverse effect on the fetus at any stage of pregnancy. However, some data just published from Denmark suggest a possible link between paracetamol and cryptorchidism in the newborn: clinicians are urged to monitor this association.
Codeine	A	Codeine is used to treat moderate pain in pregnancy. It is metabolised by hepatic cytochromes to produce morphine and it is the morphine that likely yields the analgesic effect. Codeine is thus a relatively weak opioid, with about ten per cent of a dose of codeine converted to morphine. Again, codeine can be used at any stage of pregnancy, usually where use of paracetamol alone has not provided the desired analgesia. Use of large doses of codeine during pregnancy has been associated with neonatal withdrawal symptoms, such as poor feeding, tremor and diarrhoea. Large doses also pose a small risk of respiratory depression in the neonate.
Tramadol	C	Tramadol is an opioid analogue that is synthetic. It is roughly the equivalent of codeine in strength. Tramadol acts on serotonin and noradrenalin receptors as well as opioid receptors, and so has an effect on the descending inhibitory pain pathways in the spinal cord. There are few data concerning the use of tramadol in early pregnancy. If for no other reason than the lack of data, tramadol should be avoided during pregnancy without a strong clinical reason to use it.
Dextropropoxyphene	C	Dextropropoxyphene, like codeine, is a weak opioid, acting as a μ -opioid receptor agonist. It is usually combined with paracetamol in medications such as Di-gesic™. Dextropropoxyphene has been associated with dependency and prolonged use in the third trimester has been known to cause respiratory depression in the neonate and possibly a withdrawal syndrome. It should be noted that propoxyphene has just been withdrawn in the United States due to a potential association with cardiac arrhythmia.
NSAIDs	C	Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen and indomethacin, are prostaglandin synthetase inhibitors. It is well known that the use of NSAIDs in the third trimester has been associated with adverse fetal effects. These include premature closure of the ductus arteriosus with neonatal pulmonary hypertension. Use of NSAIDs has also been associated with a fetal renal effect, resulting in oligohydramnios. This particular effect has sometimes been used for therapeutic purposes in management of polyhydramnios. NSAIDs are also known to inhibit uterine contractions, hence their use as tocolytics. Fortunately, use in the second trimester does not appear to cause any adverse effects.
Oxycodone	C	Oxycodone is a semi-synthetic opioid, with a chemical structure very similar to codeine. It is thought to act as an agonist at both κ - and μ -opioid receptor sites. Like all opiates, there is a potential for respiratory depression in the neonate.
Morphine and pethidine	C	Morphine and pethidine are strong opiates and work by binding to endorphin receptors in the central nervous system: morphine binds to μ -receptors, while the synthetic opiate pethidine binds to κ -receptors. Their use is usually reserved for severe pain where paracetamol and codeine have been ineffective. There are no reports of congenital abnormalities when used during pregnancy. However, it goes without saying that repeated use near birth has been associated with neonatal respiratory depression. Pethidine has a unique metabolite, norpethidine, that can cause specific symptoms including seizures, delirium and mood disturbance. This toxicity is more likely with renal impairment, so use of pethidine is relatively contraindicated in conditions such as severe pre-eclampsia.

The fetus eliminates drugs mostly by diffusion back across the placenta. Since many drug metabolites are polar, the metabolites will build up in the fetal compartments. Elimination through the kidneys sees these accumulate in the amniotic fluid and thus may be re-ingested by the fetus.

In summary, pharmacokinetic changes in pregnancy are complex. Furthermore, there is an understandable hesitancy by researchers and pharmacology companies to undertake the relevant drug studies in pregnant women. The data that do exist are usually from small studies and do not take into account the differences at different gestations.

The pharmacology and pharmacokinetics of the common analgesics are little-studied in pregnancy. Fortunately, most have

a good safety profile if used for brief periods in healthy pregnant women. There are few incentives for pharmaceutical companies to undertake large scale studies of drugs in pregnancy so don't hold your breath for more information to arrive any time soon.

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Pregnancy-related pelvic girdle pain



Jill Depledge
Physiotherapist

Pregnancy-related pelvic girdle pain is a very common problem affecting the sacroiliac joints and/or the symphysis pubis.

Pregnancy-related pelvic girdle pain (PPGP) is related to poor stability of the pelvic girdle joints and women present at all stages of pregnancy. Generally, the pain is not constant and is aggravated by changing position, walking and sustained sitting or standing. The woman may describe a sharp stabbing pain deep in the region of the sacroiliac joint/s and bilateral ache across the low back region, with pain also sometimes felt

in one or both legs. Symphysis pubis pain tends to be localised anteriorly over the joint and may refer pain into the groin. The pain ranges from being annoying during everyday activities to having a huge effect on the woman's lifestyle. For a small group of women, the problem is very serious, affecting all aspects of life and causing long-lasting (sometimes permanent) effects on the pelvic joints. Around 20 per cent of women have PPGP needing treatment^{1,2} – fortunately, most women recover within three months of delivery, although between five and seven per cent of women with PPGP have ongoing problems.⁴

PPGP occurs due to a combination of factors – primarily hormonal changes that result in increased joint laxity, the increasing weight of the fetus and placenta, and altered centre of gravity due to distension of the abdomen. The degree of actual movement of the joints is debatable¹, but in the sacroiliac joints it is likely the hypermobility results in counternutation (anterior rotation of the ilium relative to the sacrum) – this is very small movement (normal motion is 2° but can be up to 4°)¹, but can have a large effect on function.

There is considerable debate in the literature about risk factors, but previous low back pain and/or previous trauma to the pelvis are the most likely risk factors for developing PPGP during pregnancy; other possible factors being high workload and multiparity. Non-risk factors are contraceptive pills, time since last pregnancy, height, weight, smoking and age.¹

Diagnosis of PPGP is primarily made by subjective pain history and clinical examination. The recommended tests for sacroiliac joint pain are the posterior pelvic pain provocation (P4) test, Patrick's test, FABER (flexion abduction external rotation) test, palpation of the long dorsal sacroiliac joint ligament and Gaenslen's test. The symphysis pubis is assessed by palpation and a modified Trendelenberg test; and the active straight leg raise is a good functional test. Diagnostic imaging is generally not useful as there is little evidence to suggest that joint movement is related to severity of pain.¹

For most women, the treatment for PPGP is reasonably straightforward provided they present early. An individualised

exercise programme to improve core stability and advice on posture and modifications to daily activities are very effective. It is also important to correct the position of the joint if counternutation is suspected – this can be done by a simple exercise or using manual therapy and can greatly ease pain, particularly on first rising out of a chair or bed. Other treatments likely to be useful in the treatment of PPGP are aquatherapy (walking or exercising in water) and acupuncture. The use of a support belt can be a useful adjunct to treatment, but is not the primary focus of treatment.³

'Pregnancy-related pelvic girdle pain varies greatly in presentation and severity. Women should be referred to a physiotherapist early in the presentation of symptoms...to obtain the optimal outcome.'

The women who are most severely affected by PPGP may experience difficulty walking and performing simple daily activities. For these women a multidisciplinary approach is vital. Women are far more likely to achieve successful outcomes when they feel that they are being overseen by a number of different health professionals – including physiotherapists, obstetricians, midwives, pain team, psychologists and social workers. These women can end up housebound, using crutches to ambulate and being hospitalised for parts of their pregnancy.

Pregnancy-related pelvic girdle pain varies greatly in presentation and severity. Women should be referred to a physiotherapist early in the presentation of symptoms in order to obtain the optimal outcome from treatment. In many cases, only a single treatment session is required with these women and they experience minimal further discomfort during the pregnancy.

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A surgical consultation for abdominal pain in the second and third trimesters

Abdominal pain is very much the home territory of the general surgeon. This review will apply a contemporary framework to the management of the pregnant patient with abdominal pain presenting in the second and third trimesters.

Alan de Costa
FRACS, Associate
Professor of Surgery
James Cook
University School
of Medicine and
Dentistry

When a pregnant patient requires surgical consultation it may be in several different settings: the clinic, the emergency room, the intensive care unit or the operating theatre. Whatever the situation, it mandates a team approach, where surgeons, obstetricians, anaesthetists, paediatricians and,

occasionally, radiologists have to work closely together to provide the best care for mother and fetus. Moreover, time is often the enemy of a good result. Diagnosis should be prompt and treatment, including surgical treatment, should not be delayed.

Ectopic pregnancy and other conditions typically presenting in the first trimester are not considered in this brief review.

Several difficulties arise when surgical intervention is contemplated in pregnancy:

1. All interventions carry a risk to the fetus. Premature labour and the risk of miscarriage or delivery of an immature fetus are primary concerns.
2. The physiology of pregnancy has an impact on symptoms, signs and the interpretation of routinely performed tests in patients with abdominal pain.
3. Imaging studies, particularly where radiation is used, have been regarded as posing unsupportable risks to the fetus.
4. The use of medications has to have due regard to the risk of fetal injury.

A cumulative literature has placed restrictions on the timing of surgical interventions in pregnancy to reduce the incidence of premature labour. In general terms, expeditious treatment of the mother always benefits the fetus. There are few exceptions to this rule, but grave ethical issues, with legal implications that will try the resources of individuals and institutions, arise rarely.

Over the last decade or so, there has been a gradual review of the accumulated wisdom of the previous half century. This relates mainly to the timing of surgical interventions in the different trimesters of pregnancy, the use of x rays as an adjunct to diagnosis and the place of laparoscopy. Further, accurate peri-operative monitoring of mother and fetus is now widely available and allows timely correction of abnormalities, particularly the prevention of premature labour with the use of tocolytics.

Physiological changes

As the uterus enlarges it occupies the pelvis and becomes an abdominal organ by 14 weeks, pushing the caecum upward and laterally, but the appendix tends to rotate medial and away from the abdominal wall. The latter begins to stretch and the usually reliable sign of guarding and rigidity may be attenuated, though localised tenderness over the area of an inflamed viscus will remain.

Progesterone causes hypotonia and visceral dilatation, affecting the function of the stomach, colon and gall-bladder. Gastric emptying is delayed and gastro-oesophageal reflux increased; constipation is a frequent accompaniment. The ureters dilate, which is worsened by the direct weight of the enlarging uterus and fetal head. Asymptomatic bacteriuria and pyuria occur in up to five per cent of normal pregnancies and may herald pyelonephritis if not vigorously treated. The bile becomes more lithogenic and the incidence of gall stones increases with pregnancy and parity.¹⁻³

The circulation becomes hyperdynamic, with resting tachycardia, widened pulse pressure, raised blood volume and increased cardiac output. As the uterus enlarges, diaphragmatic function is impeded and functional residual capacity and vital capacity decrease. Mucosal immunity may be decreased. Pregnancy is considered a thrombogenic state, with a predisposition to deep vein thrombosis and pulmonary embolus.

Imaging in pregnancy

Ultrasound (US) is the baseline investigation in most pregnant patients with abdominal pain.⁴ It is generally available at short notice in most hospitals and there is no evidence of it causing harmful effects to the fetus. It has good levels of sensitivity and specificity in the diagnosis of many causes of abdominal pain, in both the realm of gynaecologist and surgeon. However, US is operator dependent and it is sometimes useful for the surgeon to be present at the examination to assess the response of the patient to pressure by the US probe over an area of US-demonstrated abnormality. This information alone may be sufficient to make or exclude a diagnosis.

Ionising radiation

Uppermost in the minds of pregnant women that are recommended diagnostic radiology are the risks of:

1. Early abortion and miscarriage, with a background frequency of this occurring of between three and 15 per cent;
2. Physical and intellectual developmental delay, with a background frequency of between one and three per cent; and
3. Childhood cancer, with a background frequency of this occurring of between 0.2 and 0.3 per cent.

There seems little doubt that significant radiation exposure can contribute to any of these adverse outcomes, and both radiation dose and gestational age are relevant. The risk of fetal loss is highest in the first two weeks after conception, the teratogenic and intellectual developmental delay risks are maximal between weeks eight and 17, and radiation in the third trimester may increase the risks of childhood malignancy.⁵⁻⁷ However, in the usual doses associated with medical imaging, these risks are considered to be extremely low.

Much of the medical literature on radiation dose refers to rads or

milirads. The rad represents the absorbed dose of energy in Joules /Kg, 1 Gray (Gy) is equivalent to 100 rad. The biological effect of this energy is derived by multiplying absorbed dose (rads or Gy) by a quality factor varying with different tissues to give an overall value, the 'effective dose', measured in Sieverts, Sv. One Sv is equal to 1000 mSv in the usual way, and 1 mSv is equal to 100 mrem. I will confine my remarks to these units (there are several others, unfortunately). Useful resources for patients may be found at the websites of the Health Physics Society: <http://hps.org> and the American College of Radiology: <http://radiologyinfo.org>.

The annual dose of background radiation is usually given as 300 mrem, 3 mSv, but can vary with place and altitude. A single chest x ray delivers 10 mrem, 0.1 mSv, three per cent of the background annual dose. An abdomino-pelvic CT scan may deliver 15 mSv, (and sometimes considerably more, depending on equipment and technique), which amounts to five years' worth of background radiation. This will increase the above risks to the fetus of about one extra case in 6000 exposures, which is considered acceptable.

The onus then is very much on the attending clinician's judgement on the requirement for an abdomino-pelvic CT scan. If there are important threats to the mother and a CT will facilitate and expedite treatment, it should be recommended after appropriate discussion with the mother. Neither should this be a routine request to the radiology department; there should be detailed discussion between clinician and radiologist regarding the minimisation of the radiation risk, the use of contrast and positioning.

Most guidelines suggest a radiation dose of 5 rad at any one study in pregnancy is acceptable (in other words, approximately one abdomino-pelvic CT scan), and a maximum of 20 rads during the course of a pregnancy, in exceptional circumstances. Beyond this level the accumulated radiation doses become 'significant' and the hazard to the fetus unacceptable.⁵⁻⁷

Fluoroscopy

The estimated radiation dose of fluoroscopy is approximately 20 rad per minute. The common indications for fluoroscopy in this setting will be operative or endoscopic cholangiography. The fetus can be appropriately shielded during these interventions to reduce this further. Most such procedures can be completed with an exposure of 1 rad.

Magnetic resonance imaging

High-quality images are possible with this modality, which does not use or produce ionising radiation. Recent reports have shown that magnetic resonance imaging (MRI) can diagnose many sources of abdominal pain in pregnancy with high sensitivity and specificity. MRI has not been shown, so far, to have any effects on the fetus and the American College of Radiologists has recommended that this modality can be used in all stages of pregnancy in informed patients, but experience is limited. In selected cases, MRI can be offered to pregnant patients after appropriate counselling and documentation. Not enough is known about the MRI contrast agent Gadolinium and its effects on the fetus, and it cannot be recommended.⁹ Pregnant patients may have difficulty lying still for the time required for image acquisition, up to 20 minutes, and of course it is not suitable for unstable patients.

Laparoscopy in pregnancy

The explosion of laparoscopic applications in general surgery began in the early 1990s, but was not immediately mirrored in the management of pregnant patients. There were several reasons for this:

1. the risk of uterine injury during the induction of pneumoperitoneum;
2. the possibility of fetal acidosis;

3. the cardiovascular effects of pneumoperitoneum; and
4. concern about the gravid uterus impairing vision, particularly for lower abdominal procedures.

Several series of successful laparoscopy have now been reported, including complex laparoscopy in all trimesters of pregnancy, with all the benefits associated with the technique in non-pregnant patients. What has also become evident is that the proscriptions of surgery in the first and third trimesters may not apply to laparoscopy and may represent the atraumatic nature of well-performed keyhole surgery, minimising direct pressure on the gravid uterus. Neither has there been reported an increased incidence of adverse events in later childhood.

Series using Verres needle induction as well as open induction have been reported with no uterine injury. It does seem that the operator may apply his or her usual technique, having regard to the position of the uterus and the attenuation of the abdominal wall. The supine position in advanced pregnancy is tolerated poorly. Compression of the inferior vena cava (IVC) by the gravid uterus may be exacerbated by pneumoperitoneum, diminishing venous return, cardiac output and blood pressure. The patient should be tilted 15 degrees to the left to decrease pressure on the IVC, which allows induction and maintenance of pneumoperitoneum.

The relationship between maternal arterial pCO₂ and acidosis in the fetus during laparoscopy has been established in experimental animals. While a similar relationship is probable in humans, it does not appear to be a significant issue in clinical practice. End tidal CO₂ measured at intra-operative capnography is considered sufficient indication of arterial pCO₂ and continuous measurement of maternal arterial CO₂ is not thought necessary. Nonetheless, laparoscopy should be completed expeditiously by expert surgeons, supported by trained anaesthetists with full access to monitoring the anaesthetised pregnant patient.^{5 8 10}

Threatened labour in the postoperative pregnant patient with a viable fetus is an indication for monitoring and the use of tocolytics. There is no evidence to support prophylactic use of tocolytics in this setting.

Clinical scenarios

Right lower quadrant abdominal pain and tenderness¹¹

A considerable differential diagnosis is present (see Figure 1). Appendicitis can occur at all stages of pregnancy. It is the commonest cause for non-obstetric surgery and the diagnosis should be vigorously pursued. In uncomplicated appendicitis the rate of fetal wastage is up to two per cent, but increases to 30 per cent with perforation and peritonitis, with a real risk of maternal mortality. Fully a quarter of pregnant patients will have perforation at surgery. Most surgeons would arrange for US in the work-up, but exploratory surgery with a high index of suspicion, particularly if performed laparoscopically can be considered a diagnostic and therapeutic intervention. A negative appendectomy rate of 25 per cent is considered acceptable.

Table 1. Differential diagnosis of appendicitis in pregnancy

Adnexal pathology, including: ectopic pregnancy ruptured or twisted ovarian cyst, salpingitis
Uterine fibroid degeneration
Intestinal pathology: Crohn's Disease, Meckel's Diverticulum, diverticulitis including caecal diverticulitis.
Pyelonephritis
R sided ureterolithiasis
Intestinal obstruction
Cholecystitis

Many pregnant patients with appendicitis will have an abnormal urine and this should not reassure the surgeon. Other evidence should be sought, otherwise it is better to 'look and see' rather than 'wait and see'.

Differential diagnosis of RUQ pain and tenderness

Gall bladder pain and cholecystitis are common accompaniments of pregnancy. Expertly performed acute cholecystectomy with or without cholangiography as indicated is the appropriate treatment in all trimesters, conferring benefits on pregnant and non-pregnant patients alike.^{8, 10} Common sense suggests that the first month and the last month of pregnancy are best avoided. Two-thirds of patients continue to have symptoms of recurrent pain and cholecystitis with attendant morbidity, in addition to the risks of jaundice and pancreatitis occurring in patients managed expectantly. Not all patients with gall stones and RUQ pain will have symptomatic cholelithiasis. The US examination may provide clear evidence of this, but other pathology in the RUQ should be sought by the sonographer, particularly in the liver. Solid lesions in the liver, particularly those larger than 5 cm, may be a cause of pain and have important implications. Hepatic adenomas are associated with oral contraceptive use and their incidence is probably increasing. Their behaviour in pregnancy may be unpredictable and should be monitored with serial US, with the input of a liver surgeon.¹ The diagnosis of liver lesions may require CT with contrast and MRI, in order that prognosis be assessed. Radiation to the fetus can be minimised using a lead apron over the lower abdomen.

While reflux oesophagitis is common in pregnancy, gastric and duodenal ulcer is uncommon. Endoscopy is acceptable at all stages of pregnancy. The mainstay of treatment for reflux is antacids in addition to dietary and positional advice. Histamine receptor antagonists, ranitidine being the safest, may be required. Proton pump inhibitors (PPI) are best left in reserve for the most severe cases, though a recent meta-analysis of PPI use in pregnancy has been reassuring.¹²

Pancreatitis should be managed in the usual manner. Common bile duct stones should be sought, particularly in severe pancreatitis, and treated with expeditious endoscopic retrograde cholangiopancreatography (ERCP) and sphincterotomy. Pregnancy does not provide any protection from the high mortality rates associated with severe pancreatitis of up to ten per cent. Gallstone pancreatitis should be treated with cholecystectomy when the pancreatitis has settled and not deferred.¹³

Table 2. Differential diagnosis of RUQ pain and tenderness

Gallstones and cholecystitis
Pancreatitis, other pancreatic lesions
Peptic ulcer, gastritis, gastric tumours
Hepatic lesions: benign and malignant, haemangiomas, cysts and abscesses
Hepatitis
Renal lesions: pyelonephritis, urolithiasis, tumours
Intestinal obstruction, large and small, including volvulus
Referred pain from above the diaphragm
Pneumonia, shingles

After appendicitis and cholelithiasis, intestinal obstruction is the third most common cause for non-obstetric surgery in pregnancy. The commonest cause is small bowel obstruction (SBO) secondary to abdominal adhesions, and this is increasing in frequency.

SBO is maximal in the third trimester and puerperium as visceral relationships may suddenly change. The classical symptoms of abdominal pain, distension, vomiting and constipation may not be as obvious as in the non-pregnant and when the quality of the pain changes from moderate and colicky to continuous and severe, strangulation may be imminent. Localised tenderness may also point to operative intervention. A plain abdominal x ray may well make the diagnosis. If further prognostic information is required, gastrografen follow through, and abdominal CT scan may select those patients in whom resolution is unlikely. This combination of imaging could still be achieved within the 5 rad limit and if it enhances the rapidity of the diagnosis should be performed. The management of adhesional SBO is no different from that in the non-pregnant patient. Intravenous fluids, nasogastric suction, analgesia and prompt surgery where indicated will provide best outcomes for mother and fetus.

Abdominal catastrophes in pregnancy

Major bleeding in pregnancy is part of the grim routine of obstetricians; surgeons, fortunately, rarely need to get involved. Shock is often compounded by coagulopathy and careful and vigorous transfusion of blood products will be required as the patient is prepared for the operating theatre or delivery room. Haemorrhage from within the uterus may be associated with abruptio placentae and present with vaginal bleeding, abdominal pain and tenderness. This may occur in the setting of the patient with preeclampsia and fetal distress, and the decision may be taken for early caesarean section.

Table 3. Abdominal catastrophes in pregnancy

Obstetric causes	Non-obstetric causes
<ul style="list-style-type: none"> Placental abruption Preeclampsia HELLP syndrome Uterine rupture 	<ul style="list-style-type: none"> Liver lesions, including haematoma, tumour, haemangioma Splenic artery aneurysm rupture Spontaneous rupture of the spleen Trauma

In preeclamptic patients with major extra-uterine haemorrhage, the usual source is bleeding into the liver as part of the HELLP syndrome (H-haemolysis, EL-elevated liver enzymes, LP-low platelets), associated with considerable mortality rates for mother (one to two per cent) and fetus (up to 30 per cent). The priority is to deliver the fetus, which over a period of two or three days should allow the intravascular pathology associated with the syndrome to resolve. Subcapsular haematoma occurs in between one and two per cent of patients with HELLP syndrome and angiography and embolisation may allow control of continuing bleeding. Major rupture of the liver capsule may need laparotomy and skilled packing. Rarely, formal liver resection may be required to save life.

Major bleeding may also arise elsewhere in the abdomen. The patient should be rapidly resuscitated using the usual advanced trauma life support (ATLS) principles and limited imaging may be possible to help make a diagnosis. This may be a US scan to confirm intra-abdominal bleeding, but a CT scan if possible may be quite helpful to direct the surgeon. An assessment of the fetal heart can be made and if absent may not need to be repeated. The mother takes priority and whatever surgery is required should be performed promptly. Such surgery may involve splenectomy and aneurysmectomy for rupture of a splenic aneurysm, or spontaneous splenic rupture, or to pack or resect a lesion in the liver.^{3, 5} The fetus tolerates maternal hypotension poorly and a caesarean section may be appropriate, particularly if it is needed to improve access to the bleeding lesion in the abdomen. This may also enhance the vascular dynamics of venous return and cardiac output.

A brief word on trauma in pregnancy

Close to 50 per cent of all maternal deaths are related to trauma, arising from motor vehicle accidents, falls and assault. Trauma is the cause of up to five per cent of fetal mortality. The ATLS pattern is quickly initiated with a few important variations. An obstetrician is involved in the secondary survey to assess the gestational age and the condition of the fetus and the pregnancy. An US is part of this process and will demonstrate free intraperitoneal bleeding, if present, and may show an abruption, though clinical and vaginal examination may have already suggested this. Most abruptions will declare themselves in the first four hours post-trauma and fetal monitoring will be needed for this period. Ongoing monitoring will be a decision for the obstetrician. In advanced pregnancy blood volume and cardiac output may increase substantially and the first signs of major bleeding may be fetal distress. Whatever imaging is required and possible should be performed including abdomino-pelvic CT scans. The constraints above regarding radiation doses should be kept in mind and attempts to use shielding should be made where possible. If there are absolute indications for urgent laparotomy this should proceed. Strong indications for caesarean section may then exist, particularly if ongoing instability is expected, and will be issues that will exercise the minds of all clinicians involved.¹⁴

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Update on analgesia for labour and delivery



Prof Michael Paech
FRANZCOG (Hon)

The most popular drug for labour analgesia in Australia¹, nitrous oxide, is more than 150 years old. Its administration under patient control heralded the introduction of a similar approach for epidural analgesia in the 1980s.

In the 21st century, regional analgesia (epidural, combined spinal-epidural and, rarely, spinal or continuous spinal techniques) has reached its full gestation in Australasia. As the availability and popularity of epidural analgesia gradually increased through the 1970s and 1980s, anaesthetists lauded the quality of pain relief, but midwifery and obstetric

practice was burdened with, and the parturient suffered from, the undesirable consequences of the methods used to achieve the analgesic goals. Lower leg and abdominal weakness with loss of mobility, leg numbness and urinary retention were unwanted or detrimental, and controversy raged about the effect of the regional block on vaginal delivery, the fetus and the mother's back.

The introduction of so-called 'low-dose epidurals', containing local anaesthetic and opioid in the early 1980s, of patient-controlled delivery techniques a short time later, and of the (initially) motor-block-free 'combined spinal epidural' (CSE) analgesic technique in the mid-1990s, was followed by more rigorous scientific investigation and led to improved outcomes and resolved a number of disputes.² We now know regional analgesia does not increase the risk of a caesarean delivery or postpartum low back pain, that 'mobile' epidural approaches reduce the instrumental delivery rate and improve maternal satisfaction, and that epidurals are safe for the fetus (indeed preferable to one of the major alternatives, systemic opioid as intramuscular pethidine).

Given this information, it seems surprising that 25 per cent of Australian women in labour are still administered systemic opioids, predominantly intramuscular pethidine and morphine.¹ This method has low efficacy against contraction pain, but induces some useful euphoria and sedation in some situations, for example, painful spurious labour or the latent phase of labour. The opioid method of patient-controlled intravenous remifentanyl emerged in the 2000s, and interest has been strong.³ Remifentanyl is a highly potent mu-opioid agonist, which has an exceptionally short elimination half-time, making it suitable for patient-controlled delivery. It is, at worst, likely to cause only a very transient effect on the neonate. The 'off-label' use of this potentially dangerous drug has found a place because the quality of pain relief achieved is the next best to regional analgesia.

So while remifentanyl-based opioid analgesia is the most recent innovation, many experimental drugs are in the pipeline and regional analgesia has improved: safe 'epidural' services are widely available in Australia (except in small, and often rural, maternity units); and excellent pain relief can be achieved with

minimal impact on the progress of labour, the delivery mode (poorer analgesia from an epidural is a marker for higher risk of operative delivery), the fetus or the neonate. Some issues remain unresolved. Good bladder care and attentive fetal monitoring are still basic requirements and the potential effect of regional analgesia on the initiation or maintenance of breastfeeding threatens to be a story akin to that of the association between epidurals and caesarean section of 15–20 years ago.

So, what is new with regional analgesia?

Drugs and techniques

Anaesthetists continue to experiment with poly-pharmacy in epidural solutions, such that drugs like clonidine have found niche roles in combination with opioid, local anaesthetic or both.⁴ Epidural neostigmine, an anticholinesterase drug that is much more familiar to most doctors as 'reversal' for non-depolarising neuromuscular blocking drugs, is the latest adjunct to show promise. For maintenance of analgesia during labour, patient-controlled epidural drug delivery (PCEA) has gradually replaced epidural infusions in many units, based on established advantages including less motor block of the lower limbs, fewer staff interventions to supplement maintenance solutions and its psychological benefits.² The optimal combination of variables continues to be investigated and, in at least one country, has reached the sophisticated stage of computer-regulated control of drug delivery, based on patterns of demand.

The CSE technique has a number of advantages when initiating 'epidural' analgesia, in particular, the faster onset of pain relief, the lack of motor block, reliability in achieving pain-free labour once labour is progressing well and a reduction in subsequent epidural drug consumption.² It is particularly useful for multiparous women in established labour, parturients in late labour or parturients for whom assisted vaginal delivery is planned. It is surprising, therefore, that only 3.5 per cent of Australian women received CSE analgesia in 2007, with epidural approaches used by 28 per cent.¹ This may represent misreporting, but probably also reflects the conservatism of Australian obstetric anaesthetists – who almost 15 years after the introduction of CSE (also inappropriately called a 'walking epidural') are loath to change practice – rather than their concerns about safety, which has been clearly established.

Anaesthetists are currently dragging themselves into the world of ultrasonography, principally when performing peripheral nerve blocks. Advocates of pre-insertion scanning of the lumbar spine claim its benefits include better identification of the interspace to be used, fewer needle insertions in obese parturients and great promise for difficult patients with scoliosis or other deformities.⁵ These claims are starting to be systematically evaluated.

Altered fetal heart rate patterns

Plummeting maternal blood pressure after an initial epidural bolus and, concurrently, severe fetal bradycardia, was not an uncommon event 20 years ago, but is now much less frequent, largely because of the use of lower doses of local anaesthetic (plus opioid), attention to maternal positioning to avoid aortocaval compression and early treatment with potent vasopressor drugs. Similar patterns of fetal bradycardia, but without maternal blood pressure change, remain not infrequent following CSE analgesia. Both experimental animal and human evidence suggest the aetiology is secondary to a sudden reduction in myometrial tocolysis as serum adrenaline concentrations fall rapidly with pain relief.⁶ The intrathecal opioid dose also appears relevant, and trends toward use of smaller doses of intrathecal fentanyl and earlier administration of a tocolytic drug (intravenous or sublingual glyceryl trinitrate or subcutaneous terbutaline) should be encouraged, because these strategies reduce the risk of, or correct, worrisome fetal bradycardia in most cases.

Maternal urinary retention

With traditional high-concentration epidural solutions, the loss of the ability to void during labour is very high. When more modern 'low-dose' combination solutions are used, more women can void spontaneously, but intermittent catheterisation rates are still high.⁷ Fortunately, most women do not consider ability to void as important as retention of strength and mobility⁸, but good midwifery and nursing care of the bladder is an essential component of safe practice whenever regional analgesia is used.

Breastfeeding

The benefits of breastfeeding for both the mother and baby are substantial and life long. Allegations that regional analgesia for labour either impairs the initiation of breastfeeding or is causative in the earlier abandonment of breastfeeding have arisen in recent years. This is an emotive topic and a question anaesthetists have an obligation to address. To date, the evidence suggesting a causal link is extremely weak, but well publicised!⁹ Indeed, it is not plausible that a method that has no major impact on the neonate at birth should lead to cessation of infant breastfeeding activities weeks or months later. The best current evidence, although not watertight, indicates that, unlike systemic pethidine, there is no impact on the initiation of breastfeeding or reduction in its duration after regional analgesia for labour and delivery.¹⁰

Developments in alternative methods of analgesia

Non-pharmacological approaches to the management of labour pain continue to play a substantial role – 25 per cent of Australian women do not use analgesic drugs, although what proportion use non-pharmacological strategies is unknown. Meta-analysis confirms our suspicions – acupuncture does not have a useful effect¹¹, nor does transcutaneous electrical nerve stimulation¹², use of which anecdotally appears in the decline. Meanwhile, simple measures such as water baths are in vogue and lumbar water blocks for back pain¹³ have been embraced by a few. Time-honoured and safe methods, such as patient-controlled nitrous oxide analgesia, remain very popular and mu-opioid analgesics are used by a quarter of our labouring population.¹ Remifentanyl patient-controlled analgesia (PCA) appears the next most effective method after regional analgesia³ and low doses of intravenous ketamine show good efficacy, but have been inadequately investigated.¹⁴

In many units, remifentanyl PCA is now used for 'fall-back' when regional analgesia is contraindicated, although a few units make this method more freely available. The major drawback is the danger of profound maternal respiratory depression, even from a small overdose – this is why remifentanyl was only licensed for administration in highly monitored environments, such as

the operating room and an intensive care unit, where airway management and resuscitation facilities are optimal. In the delivery unit strict regimen protocols, monitoring policies and midwifery education are mandated. To date experience is good³, but the importance of vigilance and systems that minimise drug errors and other mishaps cannot be overemphasised.

And so to the future

Stargazing is a risky pastime! Research directions include the search for new effective, safe, long-acting analgesic drugs suitable for neuraxial administration, whether local anaesthetics or opioids in lipid-based emulsions or other vehicles that provide sustained drug release; or new therapeutic intrathecal analgesics, such as calcium-channel blockers, non-steroidal anti-inflammatory drugs, adrenaline-reuptake inhibitors; or new systemic analgesics such as kappa-opioid receptor agonists and dexmedetomidine. To date, none of these are approved for clinical use. Other paths of investigation are the prediction of those women most likely or least likely to need or benefit from regional analgesia, based on measurement of pain thresholds, endogenous opioid effects, genetic make up or psychometric testing.⁸

Is it possible that the days of catheterisation of the vertebral canal are numbered? Perhaps, but not in the near future. For those who want them, we should strive for the time being to improve the availability, safety and clinical utility of our most effective methods, namely epidural, spinal-epidural and remifentanyl analgesia.

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Pain and the fetus



Luke la Hausse de Lalouvière

MBPhD student
Medical School and Dept.
Neuroscience, Physiology and
Pharmacology, UCL

A brief outline of how the somatosensory system develops and what studies of developmental neurobiology can bring to bear on the questions of the pain experience as a fetus.

The 'feeling' of pain is simultaneously an intensely personal and yet universal part of human existence. Each of us, with few exceptions, will know when something is painful. It is a sense that is so fundamental to our conception of the world around

us that most would struggle to imagine a life without pain. Our pain 'faculties', however, have to come from somewhere. The ability to appreciate the sensuousness of silk or the irritating sting of a papercut derives from the intricate neural circuitry of the somatosensory system. With a growing number of extremely preterm infants enduring prolonged stays in intensive care, the need to understand how and when the ability to process pain develops in the fetal life has become more pressing.

The International Association for the Study of Pain (IASP) defines pain as, 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.' IASP goes on to say that the, 'inability to communicate verbally does not negate the possibility that an individual is experiencing pain and is in need of appropriate pain-relieving treatment.' In practice, therefore, whether the patient is a fully conscious adult, premature neonate or fetus, there is an obligation to assess and treat pain where it exists.

Neurodevelopment

Much of what is understood about normal human neural development has arisen from studies of the developing nervous systems of flies, frogs and rodents. Investigators have mapped out the origins and fate of immature neurones from the primitive neural plate to the adult spinal cord to better understand the complex web of cellular relationships that exist throughout our nervous tissue. Yet, in isolation, a single neurone cannot conduct the veritable symphony of activity required for the sensation of pain. From skin to cortex, signals conveying sensory information travel through multiple synapses. The development of these connections is outlined below.

In the periphery, a noxious stimulus is transduced into action potentials in the terminals of primary sensory neurones (free nerve endings) – present in the skin from approximately seven to 15 weeks gestation. These signals then pass through the dorsal root ganglion and on to the spinal cord, where they synapse on numerous neurones. This spinal cord circuit is an important site of integration and modulation of sensory signals before they are transmitted up to the brainstem and thalamus, which are further key supraspinal stations for control and distribution of sensory information. Output from these subcortical areas is then

transmitted to the cortex. Thalamo-cortical connections are first observed in a region just below the primitive cortex known as the subplate between 20 and 22 weeks and soon move into the immature cortex between 23 and 24 weeks.¹

'Feeling' pain, in adults at least, is not simply the result of activation in the somatosensory cortex. Numerous parts of the brain are involved in the full experience of pain. In addition to the salience, localisation and sensation of the noxious stimulus, there is an emotional component that, in the adult, is fundamental to the concept of pain. Together, these processes require both thalamo-cortical and intra-cortical connections. Current scientific evidence suggests that a functional cortex is a basic requirement for pain experience in the fetus.²

'Stress responses themselves, do not provide direct evidence of fetal pain. Instead, they are a demonstration of the fetus's neural response to threatening stimuli.'

Fetal reflexes and hormonal stress responses in early gestation have supported the hypothesis that pain may be felt before 24 weeks. A fetus is observed to withdraw from surgical tools in a reflex manner. Similarly, studies have shown that when transfusing the intra-hepatic vein a substantial stress response is mounted by the fetus.^{3,4} Beta-endorphin, an endogenous opioid, is released in response to needling as early as 18 weeks and cortisol responses to the procedure can be seen at 20 weeks. Additionally, stimulation can result in an increased heart rate and diversion of blood to the core away from the periphery accompanied by changes in plasma glucose, adrenaline and noradrenaline. Proponents of the idea that the fetus is sensitive earlier in development point to studies showing that stress responses can be attenuated with the use of fentanyl, an analgesic, in combination with a neuromuscular blocking agent and nitrous oxide.

Such responses, however, occur prior to the development of functional thalamo-cortical connections and, therefore, are likely to be mediated at the subcortical level. Movements in surgery can be fully explained by the presence of intact reflex arcs through the spinal cord, which develop between seven-and-a-half and 14 weeks, though specific responses to nociceptive stimuli do not appear until 19 weeks. Stress responses do not provide direct evidence of fetal pain. Instead, they are a demonstration of the fetus's neural response to threatening stimuli.

If we accept – in light of the neuroanatomical evidence above – that connections between the thalamus and the cortex are

necessary for pain, then the fetus is unlikely to experience pain before 24 weeks.

Awareness

Whether the fetus is conscious and therefore aware of pain is another factor that needs to be examined when determining the presence or absence of fetal 'feeling'. If consciousness is taken to mean a state of wakeful awareness, then one needs to establish that the fetus is both awake and aware of its surroundings. Being awake is not, in itself, a sign of consciousness, though one must be awake in order to be conscious.⁵

'Though it is understood that the fetus is unlikely to be aware in the womb, this does not mean that noxious stimulation in utero can be ignored.'

Wakefulness is coordinated at the level of the brainstem and, as such, requires no cortical activity. It is difficult to determine whether the fetus is in fact ever awake while in the womb. Through the use of EEG in the sheep fetus, investigators have shown evidence for the existence of two distinct sleep states, namely rapid-eye-movement (REM) sleep and non-REM (NREM) sleep. These are most developed in late gestation and are the forerunners of sleep states in the newborn. During REM sleep the fetus can be seen to make characteristic movements of the eyes, tongue and respiratory muscles; whereas, in contrast, there is substantially less movement in NREM sleep. Importantly, it is estimated that, as a fetus nears term, these sleep states account for approximately 95 per cent of EEG activity. In a recent review of the evidence of fetal awareness, Mellor and colleagues concluded 'there is no strong evidence that the fetus is awake, even transiently.'⁵ In short, the absence of wakefulness precludes consciousness in the fetus and, by extension, fetal pain.

Though it is understood that the fetus is unlikely to be aware in the womb, this does not mean that noxious stimulation in utero can be ignored. The central and peripheral nervous systems undergo profound changes throughout gestation and the normal maturation of the cortex relies, in part, on the signals it receives from the outside world and from movement in the womb. Cushioned by amniotic fluid and potentially kept in a sleep-like state, the fetus's exposure to noxious stimulation is very limited. In the case of extremely premature infants, as young as 23 weeks, the immature nervous system is thrown into a world of sensory information. Due to their immaturity, these infants are committed to prolonged stays in intensive care units. Within this setting, pain is a daily reality for these patients. Frequently performed procedures, such as heel lancing, intubation and cannulation, are both invasive and painful. The immaturity of the cortex brings the potential for cortical reorganisation and spinal sensitisation due to noxious input. As a result, clinicians have turned to analgesics to prevent the adverse consequences of painful interventions.

The mainstay of pain relief in neonates has been oral sucrose solution, given before a procedure. Sucrose has been convincingly shown in numerous studies to reduce facial (nasolabial furrow, eye squeeze and brow bulge) and physiological (heart rate, oxygen saturation) scores of pain – widely used to bridge the communication divide between physicians and babies. Interestingly, however, our group has recently shown that cortical

activation, measured by EEG, following clinically required noxious heel lance, is not significantly different from that in premature infants given water instead of sucrose.⁶ Thus, it would seem that the risk of exposure to repeated and painful interventions may remain in the presence of sucrose and we need to undertake further research into other, more effective forms of pain relief.⁷

Conclusion

As with most individuals who cannot communicate, it may never be possible to categorically determine when exactly the human fetus or neonate feels pain. The evidence for the existence of fetal pain is weak. Hormonal responses reflect the activity of areas other than the cortex and act as surrogate measures of arousal rather than pain. The neural building blocks that relay nerve impulses from the skin to the cortex are likely to be in place by at least 24 weeks gestation, but the intracortical connections required for the full pain experience take longer to become established. In addition, there is evidence that the fetus may not be conscious and therefore have no awareness during this time.

What cannot be ignored, however, is the profound ability of sensory information to shape the developing brain. Adverse noxious events both within the womb and beyond, in neonatal intensive care, may have detrimental effects upon the developing nervous system. Thus, effective analgesia in very immature infants could be viewed more as relief from future problems rather than from immediate pain.

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Chronic pelvic pain: a neuro-muscular approach

Dr Thierry Vancaillie
FRANZCOG, FFPMANZCA
Conjoint Professor of
Gynaecology
UNSW

Dealing with pain requires an open mind – there is more to the pelvis than the uterus and ovaries.

Despite the fact that management of pain is the first and foremost on Hippocrates's list of duties for physicians, we're not doing that well, I would say. A few basic points are worth discussing: first, the concept that pain is a normal experience. In parallel with 'normal' menstrual bleeding, there is what can be called 'normal pelvic pain'. Both concepts are subjective: what's normal for one individual is not necessarily normal for another. The main reason to emphasise this is that many health care providers will have a tendency to project their 'norms' on to their patients and get on to the wrong foot from the start, not willing to consider the complaints at hand as 'abnormal', or simply insisting on a set of standards, which don't really exist. For many colleagues, pelvic pain is mostly an expression of endometriosis and the variety of symptoms among patients is simply due to the variety of location and severity and so on. For many of us, endometriosis is pelvic pain, we're trained to remove it and we expect the patient to come back after surgery stating she has no more pain. I must admit, I was among this group of physicians for a long period of time. I was wrong. Endometriosis does not equal pain; neither does cystitis, haemorrhoids, fibroids and so on. Endometriosis is a stimulus that enters the nervous system and that may eventually contribute to a pain experience or not. Finally, and not surprisingly, gynaecologists have a tendency to focus on the uterus and ovaries, sometimes including the bladder, but rarely any other anatomic structure of the pelvis. When it comes to pain, however, there is certainly more to the pelvis than the uterus.

'We should understand that any and every bodily system participates in the generation of the pelvic pain experience and we should therefore be willing to revisit a diagnosis we thought was watertight.'

Current concepts in pain physiology

Perceiving pain is the result of a complex sequence of events. All events, external (for example, walking) as well as internal (for example, the filling of the bladder), generate a stimulus. There are thousands of stimuli generated every minute of the day. All stimuli enter our personal information processor, involving the spine and the lower centres of the brain. A multitude of modifiers influence the impact of each stimulus, mainly the co-existence of other events and the influence of the higher centres of the brain. The dominant influence is down regulation: stimuli are minimised and do not result in the perception of pain.

Differences among individuals are the result of differences in genome as well as variability in environmental factors, such as family, religion, country, presence or absence of war and so on. Our genome forms the roots, which grow a 'neuro-biologic' tree. Depending on the environment in which the tree grows, it will bear particular somatic fruit: certain individuals are prone to headaches; others tend to develop a sore back and so on.

Our information processor has a few bad habits: convergence and sensitisation. Convergence occurs when stimuli within one dermatome merge and become indiscriminate to source. The pudendal nerve, for instance, emerges from S2, S3 and S4. The S2 dermatome also involves the dorsal aspect of the leg down to the foot. Patients with pathology involving the pudendal nerve can therefore present with pain along the plantar aspect of the foot (no, they're not crazy). Sensitisation means that occurrence of one stimulus augments the strength of another. Menstruation, for instance, is a potent peripheral sensitiser. Any noxious stimulus will be perceived as 'worse' during menses, even if that stimulus is not within the pelvis. Oestrogen is a potent central sensitiser. Professor Karen Berkeley has spent decades of research demonstrating that oestrogen enhances the strength of noxious stimuli through direct influence on the brain. Her landmark publication *The Pains of Endometriosis* is a real eye opener.

Last, but not least, there is 'the fourth dimension': any pain experience will generate a musculo-skeletal response, a variation on the flight reflex: if it hurts, run away. Stimuli originating within the pelvis and resulting in pain will cause the pelvic floor muscles to contract. When a noxious stimulus persists, it is possible for the pelvic floor muscles to contract abnormally and thus become a further noxious stimulus.

As a result of the above concepts in pain physiology, we should understand there is no such thing as 'endometriosis pain', let's just call it pelvic pain, maybe the presence of endometriosis is a contributing factor. We should accept that the intensity of pain is variable from one day to another, without necessarily any of the stimuli being 'worse'. The offending stimulus may be 'better' and still the perception of pain is more intense. We should understand that any and every bodily system participates in the generation of the pelvic pain experience and we should therefore be willing to revisit a diagnosis we thought was watertight.

Once we understand these concepts, we're ready to examine the patient complaining of pelvic pain.

Physical examination of the patient with pelvic pain

With growing experience in dealing with patients complaining of pelvic pain, I have come to the conclusion that the uterus and ovaries are not the main stimulus generators resulting in pelvic pain. It is, I believe, the musculo-skeletal system that generates the largest pool of stimuli, eventually contributing to the perception

of pain. Unfortunately, most of us have not been exposed to examination of the musculo-skeletal system during our training. It takes some effort to include a minimum clinical examination and discern features that could potentially be a major contributor to the pain experience such as scoliosis, sacro-iliac joint tenderness and so on. At the least, a referral to a rheumatologist, sport physician, osteopath or physiatrist would be in order. Where we do have a major role to fulfil is in the identification of pelvic floor muscle dysfunction and pudendal nerve pathology. There is no other specialist to refer the patient to. We need to take on that responsibility. The levator and obturator internus muscles should be palpated during rest and during isometric contraction. If pain is generated with gentle digital pressure during isometric contraction, then the patient is said to have 'myalgia', which is essentially stating the muscle hurts. The pudendal nerve runs within the Alcock canal, which stretches from the ischial spine to the descending ramus of the pubic bone. The Alcock canal is formed by a duplication of the obturator internus fascia below the linea alba, site of insertion of the levator ani. This anatomic relationship immediately highlights the intimate relationship between the pelvic floor muscles and the pudendal nerve.

Pressure below the ischial spine, which corresponds to the entry into Alcock canal, sometimes reproduces the pain that the patient is complaining of (either immediately or with some delay). This is called 'Tinel's sign', after the French neurologist who described how pressure at the entry of the carpal tunnel reproduces pain in patients with carpal tunnel syndrome. Some will say that the presence of a 'Tinel's sign' at the entry of Alcock canal is an indicator of pudendal nerve entrapment. That correlation has not been subjected to scrutiny yet.

The objective of the examiner is to evaluate all major body systems (skin, nerves, vessels, muscle, bone, viscera) and to form a composite image of the stimulus pool for each particular patient, which I call a 'vario-gram'. This sort of exercise will avoid focusing on one and only one stimulus as the culprit for the pain syndrome. As for the term 'vario-gram', it emphasises the notion of variability of symptoms. This variability means symptoms and findings can change at any time. It

also means treatment, such as resection of endometriosis, will not necessarily result in the elimination of all symptoms.

Treatment of pelvic pain

Stating that treatment of pelvic pain should be a multidisciplinary effort must sound like a broken record by now. I prefer to say the gynaecologist should keep the driver's seat, but he/she needs to create a multidisciplinary mindset in his/her approach to treating patients. However, we are not trained to administer treatment modalities such as those mastered by the osteopath, physiotherapist, acupuncturist and psychologist. Complex pharmacological regimens also require input from other specialists and we should refer patients found to have auto-immune or other conditions with a pain component to the appropriate specialist. A multidisciplinary network does need to be in place when dealing with patients presenting with abnormal pelvic and perineal pain.

Laparoscopy and resection of endometriosis or other intervention, does remain an important part of our armamentarium in the fight against abnormal pain. Removing the noxious stimuli, endometriosis and others alike, results in marked improvement for the patient in the majority of cases. By no means should my position be interpreted as the demise of laparoscopy for the management of endometriosis – certainly not. On the other hand, a laparoscopy every other year is clearly not the answer to chronic pelvic pain.

In an ideal world, the gynaecologist is able to discern the various aspects that enter into the equation early on in the process and is therefore in a position to formulate an appropriate treatment plan. As the equation is complex, the task becomes far more achievable from the moment collaboration occurs between two or three individuals, such as a gynaecologist, physiotherapist and osteopath. The skill sets of these health-care providers are truly complimentary and therefore the chance of a better understanding of the patient's status greatly increases. It is difficult to identify and differentiate between signs such as myalgia, muscle over-contraction, wind-up, trigger point, Tinel's sign, tissue pliability, cervical motion tenderness, hyper-algesia and so on. A built-in second opinion is a valuable tool in the management of patients with abnormal pelvic pain, especially if the condition has been long-standing and refractory to treatment.

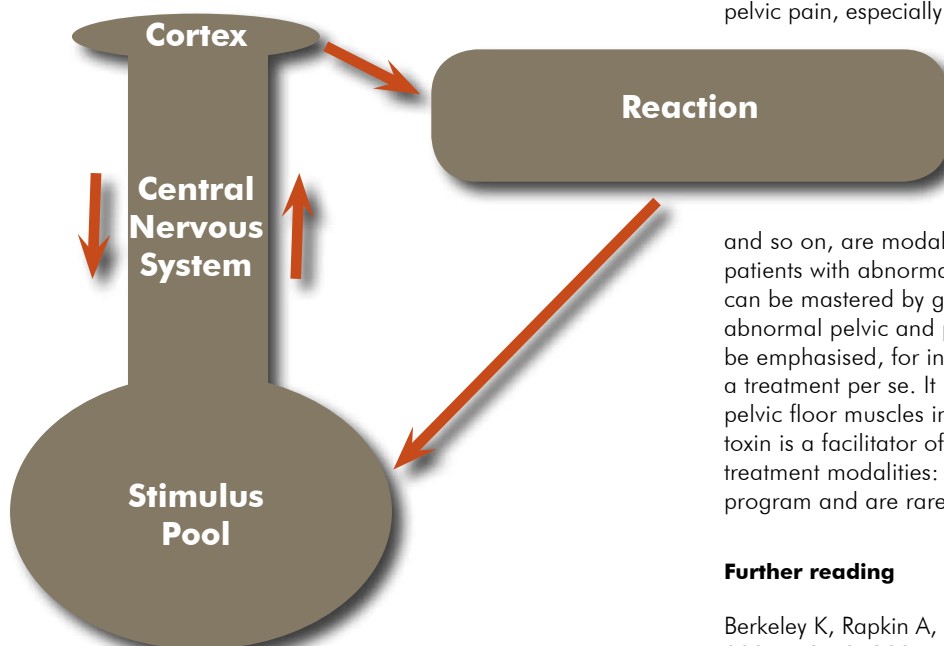


Figure 1. The four dimensions of pain: the stimulus pool; the 'information processor' in the spine and lower centres of the brain; the 'interpretation' at the level of the cortex; and the reaction to the pain experience that, in turn, can become a noxious stimulus.

Introducing medications such as Amitriptyline and Neurontin, identifying and treating painful scars, infiltrations of the pelvic floor muscles with botulinum toxin, performing pudendal nerve blocks

and so on, are modalities that contribute to the treatment of patients with abnormal pelvic and perineal pain. These modalities can be mastered by gynaecologists, if an interest in treating abnormal pelvic and perineal pain exists. However, it should also be emphasised, for instance, that injecting botulinum toxin is not a treatment per se. It is the physiotherapeutic re-education of the pelvic floor muscles in this instance, which is important. Botulinum toxin is a facilitator of that. The same applies to a number of other treatment modalities: they all need to form part of a treatment program and are rarely self-sufficient.

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Dyspareunia

Dr Jennifer Blasingame
FRANZCOG

One of the most complex and challenging complaints facing a gynaecology consultant is dyspareunia. Painful intercourse is a multifactorial complaint and we have to approach the problem in a logical and systematic manner in order to arrive at the aetiology of the pain.

Dyspareunia is a difficult subject for women to discuss with a health care provider and often goes unreported¹; however, the incidence is reported to be as high as 20 per cent.^{2,3} There is certainly nothing new about this complaint, but there are some new approaches being developed to help clinicians with the diagnosis and treatment of dyspareunia. It is tempting to attribute sexual pain to emotional and psychological issues and we cannot discount their impact, but the majority of cases have a physical basis. A concise and effective way⁴ to approach your patient is to divide the aetiologies into local causes (vulvar dermatoses, vaginitis, pelvic floor muscle dysfunction, obstetric trauma and so forth) and referred pain (disease in pelvic viscera, prolapse, neuropathy). Many women will have more than one cause of the pain and almost all will have psychosocial repercussions that impact on their relationships.

As with all pain disorders, it is necessary to obtain a detailed history of the pain, including onset, timing, quality, what makes it better or worse, associated symptoms and referred pain. History alone will help identify a cause in many cases. Women with vulval disease report itching, pain is superficial and worse overnight, and symptoms may be relieved by steroids. Women with a neuromuscular component to their pain will complain of stabbing, an electric or burning sensation, the pain will be gradual and chronic, often worse in evening and relieved by rest. When there is a deep dyspareunia, pain is localised to the pelvic viscera due to endometriosis, pelvic inflammatory disease (PID) or ovarian or uterine pathology.⁵

Associated symptoms, such as vaginal discharge, urinary frequency or incontinence and bowel dysfunction or faecal incontinence, are important to elicit. A lack of arousal accounts for pain due to a lack of lubrication so a sexual and relationship history is required.⁶ Medical problems such as asthma, psoriasis and diabetes can contribute as well as obstetric/gynaecologic history of trauma, lactation or menopause. A medication history is important as many women have tried multiple topical medications to attempt to relieve the pain. Some of these are common causes of contact dermatitis and include: benzocaine, diphenhydramine, neomycin, steroids and imidazoles as well as additives in creams such as ethylenediamine, parabens, chlorocresol and benzyl alcohol.⁶

Examining your patient can be challenging and may have to occur in stages. An abdominal exam can identify point tenderness, which can aid in the diagnosis of pelvic pathology. A visual exam can often point you in the right direction immediately. Look for skin fissures, discolouration, ulcers, changes in the anatomy and architecture of the vulva, erosions, erythema, excoriations and oedema. A sensory examination with a swab at the introitus can elicit neuropathic pain, which may persist after removal of the swab. A speculum exam is often impossible with dyspareunia, but a gentle digital exam may be acceptable to the woman. This can help localise the pain and the levator ani muscle can be assessed for tone, strength and tenderness. A speculum exam may be attempted, but in some cases may only be achieved after treatment with pelvic floor trainers.

Table 1. Dyspareunia: common causes and treatment.

	History	Exam findings	Treatment
Lichen sclerosis	Itching	White vulvar epithelium, atrophy, labia minora skin fissures	Clobetasol propionate .05% ointment bd until lesions resolve, then once weekly
Lichen simplex chronicus	Itching/scratching	Hyperkeratosis, oedema, fissures, excoriations	Antihistamines, SSRI, vulvar hygiene
Lichen planus (erosive)	Yellow discharge	Shiny white-topped papules, erosions, shedding of vaginal epithelium	Topical vaginal hydrocortisone Immune modulators (tacrolimus, pimecrolimus)
Atrophic vulvovaginitis	Postmenopausal, breastfeeding, Sjogren's syndrome	Pale, smooth skin, shrunken labia, narrowed introitus, skin fissures	Oestrogen pessaries or cream (ovestin), systemic hormone replacement
Contact or allergic dermatitis	Itching; history of: perfumed soap, toilet paper with bleach, detergents, creams, bath oils	Skin blistered, erythematous, oedematous, excoriations	Removal of irritant
Vulvar herpes simplex virus	Intermittent burning	Vesicular lesions and herpes simplex virus on viral swab	Antivirals (acyclovir)
Chronic candida vaginitis	Itching, vaginal discharge, diabetes	Local erythema, oedema, fissures, white vaginal discharge	Antifungals (topical/oral), boric acid (esp. non albicans spp.)
Pelvic muscle dysfunction/levator spasm, peripheral neuropathy	Burning/electric sensation, trauma (obstetric), diabetes	Sensory findings	Topical 2% xylocaine gel, anticonvulsants (gabapentin) tricyclic antidepressants physiotherapy
Endometriosis	Deep dyspareunia, dysmenorrhea	Lesions in posterior cul de sac on laparoscopy	Surgical excision, progesterone IUCD, combined oral contraceptives, GnRH agonist

The initial diagnostic studies are simple. Swabs should be taken of any vulvar ulcer, a high vaginal swab is necessary to rule out vaginitis and skin biopsy is indicated by the findings of a lesion on vulvar examination. Rarely is a pelvic ultrasound of any benefit in diagnosis unless there was a specific finding on abdominal or bimanual exam such as adnexal or uterine mass. Diagnostic laparoscopy may be used to exclude endometriosis when a patient complains of a deep dyspareunia.

Treatments for dyspareunia are as varied as the diagnoses. Local causes such as vulvar dermatoses and infections require localised or topical treatment. Pelvic floor dysfunction requires intense physiotherapy to retrain the pelvic floor muscles.^{7,8} This includes self-exploration and the use of graduated dilators with relaxation techniques, including the partner only when the woman is comfortable. Advances in this area include biofeedback and the use of botulinum toxin injected into the levator ani muscles to decrease muscle bulk and activity in order to allow easier use of vaginal dilators.^{9,10,11} Referred pain, such as neuropathic pain and deep pelvic pain that cannot be treated with hormonal treatment or surgery, can often be treated with anticonvulsants and antidepressants.¹² Table 1 provides many of the causes of dyspareunia and includes diagnostic clues from the history and examination as well as recommended treatments.^{13,14}

Dyspareunia is a non-specific symptom for a multitude of complex gynaecological problems. It often creates frustration in both the patient and the clinician, and treatment in many cases is not simply medical or surgical, but may require a long process of physical therapy. However, when time is taken to really tease out the underlying cause of the dyspareunia and treat it accordingly, it can be satisfying for the clinician and life-changing for your patient and her partner.

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Acute abdominal pain in a young woman: gynaecology or general surgery?

Dr Brett Daniels
RANZCOG Trainee

Dr Raymond Yap
General Surgery
Registrar
Austin Hospital

It's 9 pm when you answer the phone: 'Hello. I'm the emergency resident. We have a woman here that we would like you to review. Sarah is 22 years old with a four-hour history of lower abdominal pain. She has had a previous laparoscopy for endometriosis, but no other surgery.

She has vomited once, isn't bleeding and has some rebound tenderness. She has a negative pregnancy test. Can you please come and see her?'

This is not an uncommon presentation to the emergency department and often leads to review by the gynaecology and/or surgical team. Here, we present a review by registrars from both teams.

The O and G registrar

A busy registrar can sometimes become jaded and it can be tempting to hope that you can write 'no acute gynae problem' and suggest a surgical admission instead or, if you are truly over it, to suggest the patient is 'drug seeking'. While both conclusions are sometimes valid, there are some serious gynaecological conditions that must be excluded before you write those lines. Conversely, there are some gynaecological conditions that, while presenting with quite severe pain, can be managed conservatively and unnecessary surgery avoided. Complete assessment of these patients includes the following steps.

History

- Onset, character and location of the pain
- Associated symptoms: bleeding, discharge, anorexia, vomiting, diarrhoea, fever
- Gynaecological history including menstrual history, last period, sexual history, contraception, Pap smears, dyspareunia
- Obstetric, surgical and medical history

Examination

- General observation: is the patient septic or haemodynamically unstable?
- Abdominal examination: is there evidence of an 'acute abdomen'. Ask the woman to indicate with one finger the area of maximal tenderness. Can a mass be palpated?
- Pelvic examination: in most cases speculum and bimanual examination are indicated. Speculum examination will show the extent of bleeding or discharge and allow the collection of appropriate swabs. Bimanual examination is helpful in many cases. It is useful to ask the woman if the examination reaches the area of maximal tenderness, as ovarian, uterine or other pelvic pain will generally be palpable vaginally, while bowel or appendix pain will not. While women often find vaginal examination uncomfortable they can reliably differentiate between average discomfort and abnormal tenderness.

Investigations

Investigations should be guided by the history and examination. Most patients referred by the emergency department will already have had a full blood count, urea and electrolytes, pregnancy test and urinalysis before your arrival. If the pregnancy test is negative – and an ectopic pregnancy therefore excluded – ultrasound may be useful, especially if adnexal torsion is suspected. CT imaging, similarly may provide information regarding pelvic pathology and surgical conditions and is increasingly being used in this situation.

'Common causes of acute lower abdominal pain in non-pregnant young women include adnexal torsion, ovarian cyst rupture or haemorrhage, mittelschmerz, pelvic inflammatory disease, endometriosis and dysmenorrhea.'

Differential diagnoses and management

Common causes of acute lower abdominal pain in non-pregnant young women include adnexal torsion, ovarian cyst rupture or haemorrhage, mittelschmerz, pelvic inflammatory disease (PID), endometriosis and dysmenorrhea. Non-gynaecological causes include appendicitis, urinary tract infection, gastroenteritis and irritable bowel syndrome.

Adnexal torsion

Adnexal torsion is probably the most emergent of the gynaecological conditions listed above. If blood flow is not restored to the affected ovary promptly, then ovarian tissue may be lost. Women with adnexal torsion often have anorexia, nausea and vomiting associated with pain. The pain may be acute or intermittent with episodes of severe pain often reported. Pain may later decrease as affected nerves are damaged.¹ Risk factors for adnexal torsion include an enlarged ovary, generally from a cyst or hyperstimulation, and a long ovarian pedicle. Five centimetres is often given as a criterion for a significantly enlarged ovarian cyst.

In a study of 58 women with surgically confirmed adnexal torsion, the adnexal mass was seen on ultrasound in 65 per cent of cases, on CT in 87 per cent of cases and on MRI in 75 per cent of cases. Colour Doppler ultrasound may show a twisted pedicle, or reduced arterial or venous blood flow to the affected ovary. This has been reported in about two thirds of cases.¹

Timely laparoscopy provides both definitive diagnosis and treatment of adnexal torsion, with primary laparotomy being relatively

uncommon. Detorsion (untwisting of the pedicle), with or without cystectomy, drainage or oophoropexy is currently the mainstay of treatment for adnexal torsion, even if the ovary appears infarcted.¹

'Lower abdominal and pelvic pain can be diagnostically difficult and the borderline between gynaecological and general surgical issues is sometimes blurred.'

Ovarian cyst rupture and haemorrhage

Sometimes grouped with adnexal torsion as 'cyst accidents', ovarian cyst rupture and haemorrhage often present with a sudden onset of severe lower abdominal pain that slowly resolves. Mittelschmerz is generally mild pain associated with normal follicle rupture at ovulation. More severe cyst rupture is often associated with rupture of a corpus luteum between days 20–26 of the menstrual cycle. Pain from cyst rupture is due to peritoneal irritation while pain from cyst haemorrhage is thought to be due to stretching of the ovarian capsule.

Most women with a ruptured cyst are stable and require conservative management with adequate pain relief. Women with signs of excessive bleeding and hypovolaemia, or a history of coagulopathy, require closer monitoring and occasionally surgery to control bleeding. Ultrasound can be useful to exclude more serious pelvic pathology. In the case of a ruptured cyst, there may be some free fluid in the pelvis. A blood clot may be seen within a cyst in the case of a haemorrhagic cyst. A follow-up ultrasound six weeks later will confirm that the cyst has resolved.

PID

PID may present as pelvic pain, but is generally less acute in onset than cyst rupture or haemorrhage and less severe than in ovarian torsion. A history of vaginal discharge, fever, previous PID or a change in sexual partner or practice all make a diagnosis of PID more likely. Recent gynaecological procedures including D+C or insertion of an IUD are also relevant. On examination, there may be general lower abdominal pain in a haemodynamically stable patient. Speculum examination may reveal a vaginal discharge and allows the collection of vaginal and endocervical swabs. An endocervical swab may be replaced by a first pass urine for chlamydia PCR, if desired. It is important that PID is treated and that follow-up is arranged. In particular, chlamydia is increasingly common in Australia and can have long-term consequences for fertility if left untreated. If you are uncertain that the woman will attend follow-up then a one-off dose of azithromycin (1 g orally) is useful in treating chlamydia.

Endometriosis and dysmenorrhea

Some women presenting to hospital with acute pelvic and lower abdominal pain will have a history of endometriosis. Symptoms include dysmenorrhea, dyspareunia, dysuria and dyschezia. These women may have had previous medical and surgical treatment for endometriosis. While there may be severe pain associated with endometriosis, urgent surgical treatment is rarely required and analgesia is the primary management. Unless adnexal torsion or haemorrhage is suspected, imaging can be arranged electively. Similarly, women with severe dysmenorrhea may present to hospital for analgesia. Careful history taking and examination will often allow more emergent conditions to be excluded.

Non gynaecological causes

Urinary tract infection and renal colic may be referred to the

gynaecologist for assessment. Urinalysis should be performed on all women presenting with lower abdominal pain and any pathology treated or referred appropriately. Other surgical causes of abdominal pain will be discussed below.

The gynaecological conclusion

The care of women is the essence of our chosen specialty. Lower abdominal and pelvic pain can be diagnostically difficult and the borderline between gynaecological and general surgical issues is sometimes blurred. We should not try to make a black-and-white distinction where none actually exists. Serious conditions need to be excluded and each woman treated sensitively and safely.

The surgical registrar

This extremely common scenario can be a source of tension between general surgery, O and G and the emergency department, with no one willing to accept the patient. However, a diagnosis of appendicitis always needs to be excluded. This may mean admission for a period of observation and a laparoscopy if the patient deteriorates or the pain does not resolve. Patients whose likelihood of appendicitis is low, pain control adequate and who live close to the hospital with others, may be observed at home, with re-presentation if symptoms worsen. Other surgical differentials are possible; however, they are not as important, as explained below.

Appendicitis

A consultant once said to me, 'Never trust an appendix.' This statement reflects the presentation of appendicitis is not straightforward and can often come in a variety of ways. Nonetheless, there are features that make the condition more likely. On history, the most important features are related to the nature of the pain: increasing right iliac fossa (RIF) pain that may have moved from the umbilical region. Supporting symptoms include fever, nausea and vomiting and anorexia. A couple of loose stools do not exclude appendicitis – an inflamed appendix may cause decreased transit time. Watery, frequent diarrhoea is almost always inconsistent with appendicitis – think gastroenteritis. It is important to ensure the patient still has an appendix – there have been a number of times where I have been asked by the emergency department for a supposed appendicitis only to see a large gridiron incision from a previous appendicectomy.

Careful examination can often add much to the picture. Close attention to the exact location and nature of the patient's tenderness can be very helpful. Although the appendix does have a variety of different locations, tenderness over McBurney's point (one-third the distance between the anterior superior iliac spine and umbilicus) is surprisingly constant in appendicitis, although not definitive. Remember, on overweight and obese patients the umbilicus droops down and, correspondingly, the true location of McBurney's point may be higher than otherwise appreciated. Rebound tenderness is also useful – ask the question if the patient has more tenderness when you let go or press. Patients with appendicitis will complain that their pain is worse when you let go.

The most important investigations are of the white blood cell count (WBC) and C-reactive protein (CRP). Early stages of appendicitis may have a normal result for both; however, the number of times I can recall finding acute appendicitis when the WBC and CRP were normal are very few and far between. Almost certainly, if the patient has had pain for more than two days and the CRP is normal, the chances of appendicitis are almost nil, remembering that there is an up to 48-hour lag in the CRP rising in response to inflammation. Ultrasound, unfortunately, only has a 60–80 per cent sensitivity and specificity for acute appendicitis and cannot be relied upon. The report often states that they could not find anything in the RIF. Useful

aspects of ultrasound are to exclude ovarian pathology and that the lack of free fluid in the pelvis pushes the diagnosis away from appendicitis. Beware of the report that states a tubular structure can be seen – this is often reported as an acute appendicitis and, without correlating history and examination, can be misleading. CT has higher rates of sensitivity and specificity (80–90 per cent); however, again, a negative CT does not rule out appendicitis and it is undesirable to irradiate young women on a frequent basis. A useful score that is often quoted is the Alvarado score², which summarises the above points (see Table 1).

Table 1: The Alvarado score.

Symptom/Sign	Point value
Abdominal pain that migrates to RIF	1
Anorexia or ketones in the urine	1
Nausea or vomiting	1
Tenderness in the RIF	2
Rebound tenderness	1
Fever (T >37.3)	1
Leukocytosis	2
Neutrophilia	1

Interpretation of the score is as follows:

- 0–4 unlikely to be appendicitis
- 5–6 consistent with a diagnosis of appendicitis
- 7–8 probable appendicitis
- 9–10 very probable appendicitis

The Alvarado score has reasonable rates of sensitivity and specificity – multiple studies have shown that a score of between 0–4 make appendicitis very unlikely. However, the literature also suggests it is less reliable in young women.

In those patients where the diagnosis is unclear, a period of observation may be useful. If the patient deteriorates or the pain does not resolve or lessen, a diagnostic laparoscopy may be appropriate. Here coordination between the surgical and O and G teams can be helpful – it little matters who is doing the diagnostic laparoscopy as long as whatever problem is seen is dealt with appropriately.

Other surgical differentials

There are other differentials in the young woman with RIF pain. However, these can be easily ruled out, are uncommon or the management is very similar to appendicitis:

- An incarcerated inguinal or femoral hernia is very uncommon in this age group, but – if truly strangulated – a surgical emergency. Although you might think that it is an obvious and straightforward diagnosis, it is surprising how many doctors do not look for this.
- A first attack of Crohn's disease can often present with this picture. However, the lack of bloody or mucus-filled stool makes this very unlikely. Treatment usually is conservative until a diagnosis can be made on delayed colonoscopy.
- Mesenteric adenitis, although not common in this age group, is a differential. The lack of a raised WBC and a recent history of viral illness make this more likely. Treatment is conservative and patients need to be warned that the pain can last for a considerable time, although it should lessen.
- Meckel's diverticulum, as you may recall, is a true congenital diverticulum, appearing on the antimesenteric border of the distal ileum with its own mesentery. The common mnemonic is the rule of twos: two per cent of the population, two inches long, two feet from distal ileum, two-thirds true. However, its presentation is very similar to appendicitis and is often only

found during laparoscopy. If it appears normal, it is unlikely to be the cause of the pain. It is debatable if it should be removed if normal, but many argue that as it is likely to cause morbidity later, it should be removed if found.

'Appendicitis always needs to be carefully considered. Although the mortality from appendicitis is rare in the Western world...it is still a highly morbid condition, especially if the appendix perforates.'

The surgical conclusion

Appendicitis always needs to be carefully considered. Although the mortality from appendicitis is rare in the Western world, with good access to health care, it is still a highly morbid condition, especially if the appendix perforates. A period of observation can be useful +/- a diagnostic laparoscopy. Other surgical conditions need to be thought of; however, they can usually be easily excluded in this age group.

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Ovarian torsion – an overview

Dr Ujwala Parashar ITP Trainee
Dr Talat Uppal FRANZCOG
Ovarian torsion is an infrequent, but important, cause of acute abdomino-pelvic pain in women.

Ovarian torsion occurs far more commonly during pregnancy than in the non-pregnant state. Torsion of a 'normal' ovary is a rare event, mostly occurring in childhood.¹ The typical presentation is a unilateral torsion of a pathologically enlarged ovary.

Aetiology

Torsion is the total or partial rotation of the ovary around its vascular axis. In the early stages, continued arterial flow with blockade of the venous and lymphatic channels sometimes results in enlargement of the ovary and this can occasionally be massive. If the torsion remains undiagnosed or untreated, arterial stasis can lead to haemorrhagic infarction and necrosis of the ovary. Adnexal torsion almost always involves both the ovary and fallopian tube and isolated ovarian torsion is rare. The mobility of the left ovary tends to be limited by the sigmoid colon, hence about two thirds of adnexal torsions are right sided.^{1,2}

Certain anatomical variations and factors have been identified as indicative of risk for ovarian torsion. These include:

- Developmental abnormalities: an excessively long fallopian tube or absent mesosalpinx may predispose to torsion.²
- Ovarian masses: in over half of cases of ovarian torsion an

underlying ovarian tumour is present. Malignant tumours are less likely to undergo torsion due to the presence of cancerous adhesions that fix the ovary to the surrounding structures. Thus, tumours that have undergone torsion are most likely to be benign, with dermoid tumours the most commonly implicated.

- Pregnancy: enlarged corpus luteum cysts and the laxity of supporting structures in pregnancy predisposes to torsion. The rate of torsion increases by five times during pregnancy. The corpus luteum regresses in the second trimester, hence the risk of torsion is greatest in the first trimester and decreases thereafter.
- Assisted conception: the induction of ovulation during infertility treatment can lead to theca lutein cysts and expansion of the ovarian volume predisposing to torsion.
- Previous pelvic surgery: previous pelvic surgery, especially tubal ligation, can have an increased risk of torsion, although the mechanism for this remains unclear.

Incidence

American studies have reported that ovarian torsion is the fifth most common surgical emergency in gynaecology and most reported cases occur in the early reproductive years. The median age reported in a large review was 28 years and about three-quarters of patients were aged less than 30 years.² An Australian series of 52 cases, published in 2005, reported the median age of patient with confirmed ovarian torsion was 33 years.⁶

Clinical findings

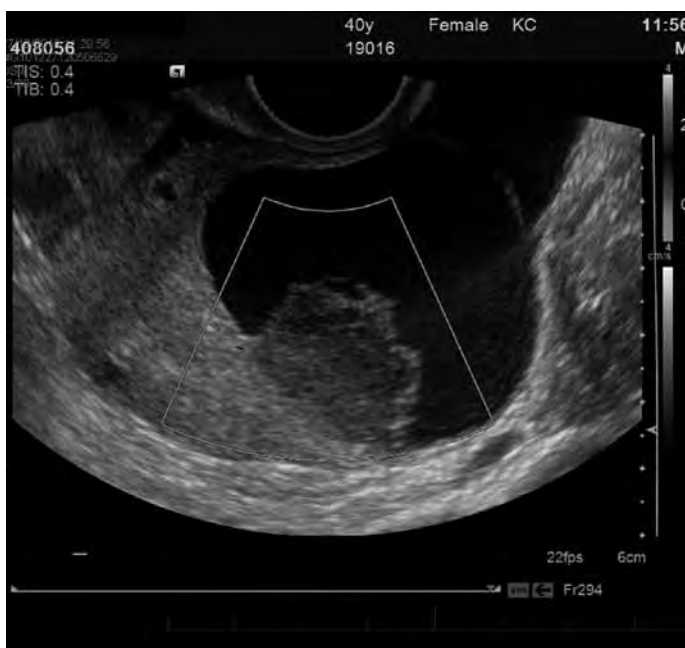
The typical clinical history in ovarian torsion is of the sudden onset of severe, unilateral, lower abdominal pain that worsens intermittently. About a quarter of patients report bilateral lower quadrant pain. Nausea and vomiting are seen in about 70 per cent of cases. Necrosis of the ovary may lead to late findings of pyrexia, tachycardia and hypotension.

Two-thirds of patients will have a unilateral adnexal mass on clinical examination with tenderness to palpation in a third of cases. However, the absence of tenderness does not rule out torsion. Peritoneal signs may indicate advanced disease and are found in under five per cent of cases.^{1,2}

Investigations

Ovarian torsion is primarily a clinical diagnosis based on a thorough history and meticulous examination. Maintaining a high index of suspicion is important.

Laboratory tests are often unhelpful in trying to verify a diagnosis of ovarian torsion. However, they can assist in ruling out alternative or co-existing diagnosis of lower abdominal or pelvic pain. Therefore, the following tests should be performed:



Transvaginal pelvic ultrasound images of a 40 yo patient with classic onset of severe left iliac fossa pain. Absence of arterial and venous flow on colour doppler imaging, in an enlarged ovarian mass, the lead point for the torsion. The histopathology confirmed a twisted ovary containing a benign simple cyst with marked oedema of the residual ovarian stroma.



Adjacent free fluid was present in this case.

- BetaHCG should be performed to diagnose a concomitant pregnancy.
- Full blood count: an elevated white cell count is a nonspecific finding and is rarely of value. Haemorrhage may result in anaemia.
- Electrolyte imbalances may be seen in severe cases where there has been persistent vomiting.

Some authors have also associated ovarian torsion with increased serum levels of interleukin-6, but further research is needed to establish this serum marker as a diagnostic tool.¹

Ultrasound is the most important investigation for patients with suspected ovarian torsion. However, in the second and third trimesters of pregnancy, it is sometimes difficult to visualise the ovaries as they are displaced from the pelvis by the enlarging uterus. Some of the pelvic sonographic features found in cases of ovarian torsion are:

- Heterogeneously enlarged ovary
- Presence of peripheral follicles
- Midline ovary
- Free fluid in pouch of Douglas
- Twisted pedicle leading to 'whirlpool sign' (uncommon)
- Asymmetric thickening of ovarian wall cysts

Colour Doppler in ultrasound is commonly used, but may not be diagnostic of torsion, depending on the degree of torsion and the sometimes subacute nature of the pathology. The presence of blood flow shows that the ovary may be still viable, but does not rule out ovarian torsion.

Greyscale assessment of the ovary combined with Doppler imaging may enhance the diagnostic accuracy. Colour Doppler

imaging often shows an enlarged ovary with absent parenchymal perfusion.² CT and MRI modalities have limited use in the diagnosis of torsion. They may demonstrate an adnexal mass or enlarged ovary, but provide no information on the blood flow to the involved ovary. However, they may be more helpful in ruling out other differentials of pelvic pain in case of diagnostic uncertainty and in the presence of pelvic mass.

Management

The main principle of treatment is timely surgical intervention to preserve ovarian function. Initial management involves stabilising the patient and ruling out other causes of acute abdomino-pelvic pain (such as ectopic pregnancy, pelvic inflammatory disease, pyelonephritis, appendicitis, endometriosis and, rarely, degenerating leiomyomata). A swift surgical evaluation is required in most of the cases presenting as acute abdomen. Salpingo-oophorectomy may be performed if tissue necrosis, severe vascular compromise or peritonitis is obvious.

Oophorectomy is not required in all cases, particularly when laparoscopic assessment is performed early. This approach has the potential to uncoil the torted ovary and anchor it with a possible oophoropexy. Some authors have suggested oophoropexy on the contralateral side might be considered in young patients needing oophorectomy for an ovarian torsion. Intra-operative assessment of the ovary in question is crucial in determining its potential viability. The determination of whether an acutely torted ovary is viable can be difficult. With the appropriate equipment, it is possible to use intravenous fluoresceine and to view the ovary with an ultraviolet light source. However, this is not possible with laparoscopy and remains a technique applicable only to open surgery. Early conservative management is preferred with the 'success' rate of ovarian preservation of 88 per cent reported by multiple studies.^{1,2} Management of torsion in pregnancy is similar to non-pregnant women, but often technically more difficult due to the mass effect of the gravid uterus.

Summary

Ovarian torsion is primarily a clinical diagnosis. The classical presentation is with acute pelvic pain associated with an adnexal mass. The combination of Doppler flow imaging and morphologic ultrasound assessment of the torted mass may improve the diagnostic accuracy. However, presence of blood flow to an ovary does not rule out torsion. Timely laparoscopic evaluation with the aim of preservation of ovarian function is the cornerstone of treatment. Conservative management is favoured early in the course of disease and consists of laparoscopy with uncoiling of the torted ovary and possible oophoropexy. Oophorectomy is obviously required in cases with ovarian tissue necrosis.

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Primary dysmenorrhoea



Dr Nichola Davis
James Cook
University School
of Medicine and
Dentistry



Prof Caroline de Costa
FRANZCOG

Primary dysmenorrhoea, usually presenting in the early teenage years, continues to be the province of the general practitioner. Effective treatments are available and the diagnosis should be reconsidered if there is limited or no response.

Primary dysmenorrhoea is characteristically described as colicky pain associated with menstruation, beginning on the first day of bleeding and usually most severe then and, on days two-three of the cycle, gradually tapering off towards the end of the menstrual flow. Pain is most commonly reported as central and suprapubic, although it may also radiate to the back and thighs. Primary dysmenorrhoea is usually first experienced some months or even one or two years following the menarche and is characteristically not present during anovulatory cycles preceding the onset of regular menstrual periods. Pain may be mild, moderate or severe, and may begin a few hours before or after the onset of vaginal bleeding, but its presentation tends to be similar from one cycle to another in the same individual. Primary

dysmenorrhoea may cause repeated absences from school, sporting and/or social activities and so may significantly impact on a young woman's education, sporting career and lifestyle.

Primary dysmenorrhoea is caused by myometrial contractions producing uterine ischaemia in response to elevated levels of prostaglandins E2 and F2α released from shedding secretory endometrium. Myometrial contractions can last several minutes, with uterine pressures of more than 60 mm of mercury, resulting in severe pain. Prostaglandins may also cause commonly associated symptoms, including nausea, vomiting, dizziness and faintness, and these also tend to recur from one cycle to the next. Though by definition 'primary' dysmenorrhoea is 'physiological', it is a common condition experienced in diverse populations around the world. It is also significantly under-reported by women suffering it and so an open-ended question about menstrual history is an essential part of any medical consultation with a young woman.

There are two common presentations of primary dysmenorrhoea in general practice. The first occurs in the early teenage years, typically 11–13 years age group, usually after a few months of established and fairly regular cycles. The girl may present with her mother and the complaint is usually straightforward – painful periods, often disrupting school and sporting attendance.

Part of the consultation should be spent with the girl alone –

provided she is agreeable to this – emphasising to the mother that this is normal practice. This enables the patient to express any concerns she may have that she does not wish to share with her mother; in particular, she may be sexually active or contemplating becoming so, which may affect decisions about management. From time to time, a mother may be excessively concerned about her daughter's condition, offering information about her own and her family menstrual history. While it is important that maternal or family history, particularly of endometriosis, is not overlooked, the view that even normal menstruation is a 'curse' still lingers with some mothers. It is an important part of the practitioner's role to ensure that the girl understands and does not come to see her normal physiology from a negative point of view. Describing a 'normal spectrum' of period pain, from mild to severe, asking her about her friends' experiences and placing herself and her friends on this spectrum, can help give her a balanced view of her condition, as can positive reassurance about the efficacy of available treatments.

'Several studies have shown that patients reporting they had found NSAIDs ineffective had, in fact, not taken them until many hours after the pain had begun.'

Younger teenagers should have an adequate history taken, but if they are in good general health, give a characteristic history of primary dysmenorrhoea and are not sexually active there is no indication for a vaginal examination or for pelvic ultrasound or other investigations, although clinical examination of the abdomen is essential. Abdominal examination can help exclude ovarian masses and also may identify constipation, which can mimic or indeed exacerbate dysmenorrhoea and is particularly prevalent in the young, slim picky eater.

The majority of patients with dysmenorrhoea will respond to non-steroidal anti-inflammatory drugs (NSAIDs) if these are taken correctly. These drugs are prostaglandin synthetase inhibitors, which act by inhibiting the cyclooxygenase enzymes (COX enzymes) hence preventing the formation of prostaglandins. They therefore *prevent* pain in the future but cannot *reverse* pain already present. It is essential that all women taking NSAIDs for primary dysmenorrhoea fully understand this concept if they are to benefit appropriately from their use. Several studies have shown that patients reporting they had found NSAIDs ineffective had, in fact, not taken them until many hours after the pain had begun.

There are more than 70 well-conducted randomised controlled trials (RCTs) testifying to the effectiveness of NSAIDs in the

prevention of primary dysmenorrhoea when compared to placebo and other treatments. Studies have also shown that no particular NSAID stands out as significantly more effective than any other. Naproxen, mefenamic acid and ibuprofen are those most commonly and effectively used in Australian practice at the present time and can be bought over the counter. One limiting factor is side effects, mostly gastro-intestinal; patients should be advised to take preparations with food or milk and to take them only as long as needed each cycle. Most young women quickly become aware of the systemic and pelvic symptoms of an incipient period, and will be helped by keeping a menstrual calendar, so that the chosen NSAID can then be taken at an appropriate time prior to the onset of pain. It is also useful to make practical suggestions to this younger age group and recommending that a couple of tablets are kept at hand in the school bag together with an emergency supply of sanitary products is often helpful. Many young girls either before their first period or in the first few years following menarche live in terror of leaving 'little red puddles' on clothing and so forth and are greatly reassured by such strategies.

'In general, a holistic approach to management should be taken, with attention to diet and lifestyle as well as prescription of medication.'

The second common presentation in general practice is of the slightly older teenager, who suffers similar pain and symptoms, and often has already tried NSAIDs. These young women are more likely to be sexually active than the first group, or to be contemplating becoming so, and this may be part of their motivation in presenting when they do. They are likely to be aware that the combined oral contraceptive pill (COCP) is a very effective treatment for dysmenorrhoea and may find that a prescription for COCP for dysmenorrhoea is more acceptable, to themselves and/or parents, than one intended purely for contraception. Certainly the COCP (in a monophasic formulation), which produces a thin atrophic endometrium and hence minimises prostaglandin production, may safely be prescribed as first-line treatment in any young woman with dysmenorrhoea who reports that she is sexually active, including younger teenagers. (Interestingly, there are few RCTs of COCP in the literature to support use for dysmenorrhoea although this is widespread and apparently effective practice.) Adolescents are also not infrequently troubled by moderate to severe acne, which may be trivialised by the girl's parent/s. An astute practitioner will enquire about these issues and discuss the well-documented benefits of some formulations of COCP in acne vulgaris.

A full medical history should be taken, to rule out any contra-indications to COCP. The decision to perform a vaginal examination at the first consult for dysmenorrhoea in this young age group is a difficult one and should be assessed on a case-by-case basis. Girls who give a history of being sexually active should be encouraged to have a vaginal examination, with Pap smear (following NHMRC Guidelines) and swabs for STIs if appropriate. Many of these patients are relieved and reassured to have a check up and STI screen. Those girls who have not yet commenced sexual activity do not require a vaginal examination, but should be informed of NHMRC guidelines and checkups discussed for the future. When prescribing COCP, even for young women who are not sexually active, information about side effects and the situations in which it may not be effective as a contraceptive should be provided and the woman made aware that it does not

protect against STIs. Parents' concerns regarding these detailed instructions are often allayed with gentle reassurance that it is important to know 'the proper way to take the medication'.

In women who continue to experience pain with withdrawal bleeds on COCP the active pills may be taken continuously for six months or more; women can be assured of the safety of this approach. The levonorgestrel rod and depot medroxyprogesterone acetate have also been demonstrated to be effective treatments for primary dysmenorrhoea as well as effective contraceptives. Interestingly, a considerable number of female teenagers unfortunately discount the rod through needle phobia.

In general, a holistic approach to management should be taken, with attention to diet and lifestyle as well as prescription of medication. Regular exercise has been demonstrated to reduce the severity of symptoms of dysmenorrhoea; both smoking and passive inhalation of cigarette smoke have been demonstrated to increase the severity of these symptoms. For women who wish to avoid conventional medication, acupuncture and acupressure have been shown to have limited success with symptoms; there is less demonstrable benefit from transcutaneous nerve stimulation (TENS) and Japanese and Chinese herbs, and none whatever from spinal manipulation.

Significant variations to either of these two common presentations should alert the practitioner to the possibility of underlying pathology. Period pain dating from the menarche may be the consequence of uncommon, but surgically correctable, malformations of the genital tract, leading to obstruction to the menstrual flow. Period pain commencing some years after the menarche should be regarded as secondary until conditions such as endometriosis, pelvic infection and intra-uterine polyps have been excluded. Women with an apparent diagnosis of primary dysmenorrhoea who do not respond to either NSAIDs or the COCP also should have the possibility of an underlying cause, in particular endometriosis, reconsidered. Laparoscopy, preferably by a practitioner experienced in the diagnosis of endometriosis in younger women (in whom red flame, white and clear lesions are more common than the darker lesions often found in older women), is essential for the diagnosis and may be accompanied by surgical treatment of the endometriosis.

Primary dysmenorrhoea is a common condition, known to be under-reported by women even when severe and still causing in Australia significant time out from school attendance, employment and social events, yet it is easily diagnosable and treatable by general practitioners. We urge our fellow practitioners to become more proactive in its detection and management.

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The distress of the long-distance flier



Dr Graeme Dennerstein
FRCOG, FRANZCOG

The pioneering aviator Amy Johnson was incapacitated by period pain; did she have endometriosis?

Last year, 2010, saw the 80th anniversary of Amy Johnson's incredible, first female, solo flight from the UK to Australia. She completed the trip in 19.5 days, departing 5 May 1930, in a De Havilland Gypsy Moth. There are some interesting gynaecological aspects of Amy's story that make her achievements, particularly this flight, even more remarkable.

The De Havilland Gypsy Moth cruised at 70 knots. It was a fabric-covered, open-cockpit biplane with only the bare essentials: no starter motor, navigational aids, autopilot or creature comforts and no brakes – just a tail skid. Moths are inherently unstable; the pilot dares not take his or her hand off the control column or eyes off the horizon for very long. The successor to the Gypsy Moth, the Tiger Moth was very similar. I speak from experience: nothing I know spins quite like a Tiger.

In 1929, aged 26, Amy had suffered some bitter disappointments, which may explain the enthusiasm with which she embraced aviation and the determination she exhibited in her subsequent record attempts. She had achieved a BA from Sheffield University, but missed out on getting honours and becoming a teacher. Hans, her lover of over four years, had left her and married a woman he had made pregnant. Amy's sister Irene had recently committed suicide. In spite of or because of these events, Amy gave up her job as a secretary to a law firm and not only worked on her flying lessons with a vengeance, but also became the first woman in the UK to achieve an aircraft maintenance engineer's licence.

The trip that made her a legend was all the more remarkable considering that, on departing England, she had less than 100 hours of flying experience in her log book. Grossly overloaded with fuel (to give her a 13-hour endurance) and equipment, Amy's plane staggered into the air on the second attempt. With reasonable weather and well-mapped country, the first two days were relatively uneventful. On the third day, she fell into the trap responsible for most light aircraft fatalities. Crossing the Taurus Mountains, part of the border between Turkey and Syria, she flew into cloud known in the game as a 'cumulo-granite'. Without appropriate instruments or training, she emerged from the bottom of the cloud in a 'graveyard spiral', her airspeed indicating over 120mph, compass spinning, and only just managed to avoid the rock face.

One close shave after another featured in the following fortnight, including a forced landing in the Persian desert in a storm and a crash landing in Burma. The latter would probably have ended her



Amy Johnson at Croydon, ready to depart on her flight to Australia.

trip had it not occurred next to the Government Technical Institute, with staff capable of repairing the aircraft in record time.

Amy dreaded crossing the shark-infested Timor Sea, the last leg of the trip. With only an inflatable air cushion for survival gear and no weather report, she departed Timor and managed to find an oil tanker positioned half way. The smoke from its funnel helped her correct her heading and she landed at Darwin, without incident, on 24 May 1930.

Amy became an international celebrity of extraordinary proportions, but the adulation, loss of privacy and demands on her time appeared to take a toll on her health. Having recovered in Darwin, the plan was to fly on to Brisbane, for a civic reception. At Longreach, she appeared decidedly unwell and confided in the De Havilland agent that she was exhausted and experiencing the 'usual feminine problem'. Her biographer, Midge Gillies, noted that: 'Amy had always suffered from the most extreme period pain; she had become used to being laid low every month, but the fact that she struggled with premenstrual symptoms, on top of all the other obstacles, makes her achievement even more staggering. The fact that this physical difficulty – unlike a problem with a magneto or monsoon – was unmentionable and misunderstood made it harder to bear.'

Her next stop was supposed to have been Charleville, where another official lunch was planned, but she diverted to Quilpie, 130 miles west of Charleville. She told the agent that her period pain, fatigue and headache were so oppressive that she could not face another crowd. She made it to Brisbane's Eagle Farm



Her solo flight to Australia made Amy Johnson an international celebrity.

aerodrome the next day. Landing off an unstable approach in front of a crowd of 20,000, she overshot the runway and smashed through the perimeter fence; the aircraft was a crumpled wreck. Fortunately, her seat belt held tight, she escaped significant injury and endured the subsequent procession through the city to Government House, where she stayed. She returned to England (by sea), received a CBE from King George V and went on to claim other records, including London to Cape Town and return.

At the beginning of 1932, Amy was rushed to hospital in London with an acute abdomen. The newspapers said it was appendicitis, but it was not. She had had enough of menstrual dysfunction and underwent a hysterectomy. She was 28 years old. Her desire for good health and the ability to continue long-distance flying records superseded her wish to retain her fertility.

When war broke out, she joined the Air Transport Auxiliary responsible for ferrying military aircraft around the UK. Late in 1940 she had what proved to be her last aircrew medical. Her examiner was Elliot Philipp FRCOG, who was a RAF medical officer at the time. In his autobiography, he pays tribute to Amy's charm and physical fitness, which surprised him because she had undergone appendicectomy only six weeks before his examination.

On 5 January 1941, in atrocious weather and against local advice, Amy took off from Squire's Gate in a new Airspeed Oxford. With no visual contact with the surface for a couple of hours, in icing conditions over fog and probably out of fuel, she bailed out into the Thames Estuary. She was heard to cry for help, but died before she could be rescued. Her body was never found.

Without the pathology report from Amy's hysterectomy, we will never know what caused her dysmenorrhea. However, her story is a reminder of the great advances our specialty has made in the medical and surgical treatments of similar 'feminine problems'.

References are available from the author upon request.

Acknowledgement

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Thinking of retiring from active practice?

If or when you do retire will you be:

- Completely and permanently retired from practice as a specialist obstetrician and/or gynaecologist?
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The sometimes painful history of the pouch of Douglas



Prof Caroline de Costa
FRANZCOG

Where the Peritoneum leaves the foreside of the Rectum, it makes an Angle, and changes its course upwards, and forwards over the Bladder; and a little above this Angle, there is a remarkable transverse Stricture or semioval fold of the Peritoneum, which I have constantly observed for many years past, especially in women.

James Douglas
Description of the Peritoneum, 1730

This 'Angle' is, of course, that portion of the female anatomy still widely known to medical practitioners, and especially gynaecologists, by its eponym the pouch of Douglas. While this original description by Douglas is perhaps more applicable to the male, the name has now

come to be restricted to the recto-uterine pouch in the female. And very handy this small cul-de-sac of peritoneum has proved to be in gynaecological practice – largely because anteriorly it is closely applied to the upper few centimetres of the posterior vaginal wall, thereby offering a discreet and convenient back door into the peritoneal cavity that can obviate a more formal entry via the abdominal wall.

James Douglas was born in 1675, at Baads outside Edinburgh in Scotland, the third of 12 children of a landowner of some means, whose sons went generally into the law or the church (the Presbyterian Church, that is, there were no Stuart sympathisers among the Douglasses). In his late teens, Douglas studied medicine in Utrecht in Holland, but probably he also studied in France as he took his degree from Reims in 1699. Even as a medical student, he seems to have had a lively interest in many non-medical subjects – there exists a catalogue of his personal library at the time he was in Utrecht that includes works on geography, theology and a copy of Cervantes' Don Quixote.

By 1700 he was in London, where for nearly a century the influence of William Harvey had been slowly bringing about a more scientific and systematic approach to the study and practice of medicine. His first London address was the Blue Boar in Fleet Street and he remained in central London for the rest of his life. His medical practice was always general, although he had a particular interest in the complications of pregnancy. The handwritten records still exist of more than 200 cases he managed between 1700 and 1712, many of them obstetric. He had a close professional relationship with members of the Chamberlen family, who devised the obstetric forceps, sometimes standing in for them when they were unavailable to attend women in obstructed labour. By the time Douglas began practice, the Chamberlens' 'secret' instrument was being widely used in England and elsewhere in Europe.

Once established in London, in addition to practising medicine, Douglas involved himself in the study of anatomy. From 1706, he was offering courses at the Blue Boar, for which he issued a prospectus: 'What Mr Douglas obliges himself to perform in a course of human and comparative anatomy'. Extensive, very accurate notes for this course survive in the Hunterian Museum

in Glasgow. He also performed hundreds of autopsies, for the purpose of anatomical dissection as much as for their pathological value, and wrote numerous papers and books on anatomical topics that were translated into Latin and Dutch. The Description of the Peritoneum was a small book, but widely admired by his peers; it contains many drawings of specimens prepared by Douglas himself. For his work in anatomy he was, in 1706, made a Fellow of the Royal Society; his admission was conducted by the President, Isaac Newton. In 1727, he was appointed by George II as Physician to the Queen, so he was clearly highly regarded in the London of his time.

Douglas had numerous interests outside medicine. He was fascinated by botany and published many descriptions of plants that added to the scientific study of botany. He was equally fascinated by language; he wrote treatises on the grammar and pronunciation of the five languages in which he was fluent: English, Dutch, French, Latin and Greek. This work also survives and his studies of English, in particular, form part of the foundation of the knowledge we have of how the language was spoken in the 18th century. He was a devotee of the Roman poet Horace, collecting hundreds of volumes of verse and writing comparisons of translations. This interest in Horace led to his friendship with the poet and satirist Alexander Pope, who immortalised Douglas in some lines of his epic the Dunciad:

'Where all the learned shall at labour stand
And Douglas lend his soft obstetric hand.'

Pope added the explanatory note that Douglas was: 'a physician of great learning and no less taste.'

In 1726, Douglas became involved in the medical farce of Mary Tofts, 'the rabbit woman of Godalming'. Mary claimed to have been startled by a rabbit while gardening; nine months later she supposedly gave birth to 12 rabbits. She managed to convince the King's Court anatomist, a Swiss named Nathaniel St André, of the truth of her story and the royal family took a keen interest in the case. St. André took it upon himself to produce a pamphlet, A short narrative of an extraordinary delivery of rabbits:

'I have taken or deliver'd the poor Woman of three more Rabbits, all three half grown, one of them a dunn Rabbet; the last leap'd twenty three Hours in the Uterus before it dy'd. As soon as the eleventh Rabbet was taken away, up leap'd the twelfth Rabbet, which is now leaping.'

Summoned to Godalming, outside London, Douglas stated tersely that he would only believe Mary's story when he saw rabbit parts 'actually extruding from the cervix' – whereupon rabbits stopped arriving and Mary confessed to inserting rabbit pieces into her vagina when no one was looking. History does not record the subsequent fate of St André...

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the two Incisions, the *Mesentery* forms a sort of longitudinal *Septum* going between the *Intestines* and *Peritonæum*, and likewise another narrower Portion round the Edges of the small Guts, which is chiefly between the *Peritonæum* and *Colon*, being that part of the *Mesentery* termed *Meso-Colon*. In this View of the *Peritonæum* we likewise perceive, that having reached as low down on the *Vertebrae* as the last of the *Loins*, it ceases to surround the *Intestinum Rectum*, or, perhaps, the End of the *Colon* intirely, the posteriour side thereof being covered only by Vesicular Substance; and this bare space increases in breadth as it descends; the anterior side of the *Intestine* remaining still covered by the *Peritonæum* all the way down to where it comes nearest to the *Vesiculæ Seminales*: below this it is intirely surrounded by a thick Vesicular Substance; which here, if any where, deserves the Name of *Membrana Adiposa*, because of the vast Quantity of Fat contained in it. Where the *Peritonæum* leaves the fore-side of the *Rectum*, it makes an Angle, and changes its Course upwards and forwards over the Bladder; and a little above this Angle, there

Page 37 of *Description of the Peritonæum*, 1730.

Douglas became the master of William Hunter when Hunter left the employ of the eminent English obstetrician William Smellie, in the autumn of 1741, and joined the Douglas household. However Douglas died less than a year later, in 1742, 'with his hand in William Hunter's'. In the short time he had with him, Hunter learned much that was to serve him in good stead as he pursued his later anatomical and physiological studies and became the greatest English physician of his day. It was said that had Douglas lived longer, 'the combined inquiring minds of the old anatomist and his talented young disciple would have engendered other and even greater works and discoveries.' Hunter continued to live on in the house of Mrs Douglas for seven years following her husband's death – she seems to have acted as a kind of foster-mother to the young medico. Hunter did not attempt to publish any of Douglas's work, but he was certainly inspired by it, particularly his studies of the placental circulation and the anatomy of the gravid uterus.

The usefulness of the pouch of Douglas in both the diagnosis and treatment of gynaecological conditions was increasingly recognised from the time of Douglas onwards. In his monumental *Treatise of Gynecology* of 1890, Samuel Pozzi, the 'father of French gynaecology', summarised the efforts of practitioners over the previous two centuries to safely drain pelvic abscesses by the vaginal route. Success was much more likely when fluctuation over the Pouch of Douglas was present, concluded Pozzi; care should be taken with the initial incision to avoid the ureters, antiseptic principles should be scrupulously observed, the abscess cavity should be gently but thoroughly explored, haemostasis should be achieved, and a rubber drain left for several days post-operatively;

principles that are still relevant to us today.

Pozzi also devoted several pages of his textbook to the clinical examination of the Pouch of Douglas; like many writers who followed him, he stressed the importance of examination by both vaginal and rectal routes. It was widely recognised by 19th and early 20th century gynaecologists that not only did fluids such as blood and pus gravitate to the Pouch, from which they could be aspirated by trocar or drained by incision, the adnexae, the uterine fundus, the bowel and even other structures could, when pathology was present, make their way into the Pouch, there to be palpated and assessed by the careful examining fingers of the astute clinician. In 1928, in a paper read to the Birmingham branch of the British Medical Association, gynaecologist Christopher Martin commented that, 'it is surprising how much information can be obtained by vaginal and rectal examination of the Pouch of Douglas.' The eminent Wilfred Shaw agreed, writing in 1941: 'the lower poles of ovarian tumours and adnexal inflammatory swellings can be felt in the pouch of Douglas, while the presence of discrete hard nodules is a characteristic finding in cases of malignant ovarian tumours.' Moreover, Shaw said, 'the swelling of diverticulitis can be felt in the Pouch on the left side, and it is usually possible to establish that such swellings are separate both from the uterus and from the left appendages.' Dugald Baird, in 1950, described 'the peculiar and characteristic sensation of a pelvic haematocoele', associated usually with a chronically bleeding ectopic pregnancy, to the examining fingers in the pouch of Douglas: 'the limits cannot be defined, and some parts are hard and others soft.' It was also noted that in cases of deep dyspareunia, endometriotic thickening of the utero-sacral ligaments was often palpable via the Pouch. Such digital expertise was essential for the practising clinician before the advent of the vaginal ultrasound probe. The Pouch also acted as an important landmark in the development of the operation of vaginal hysterectomy, and continues to do so in practice today.

'The term 'pouch of Douglas' was not used in Douglas's lifetime. It is likely that William Hunter referred to it thus, and that others followed him, although it does not appear in print until the second half of the 19th century.'

There was also the realisation, from the early 20th century, that the Pouch provided a potential route for the visual inspection of the contents of the pelvis and lower abdomen. In 1925, Henry Jellett described the technique of 'coeliotomy' through the posterior fornix and the 'recent contribution' of the use of air or CO₂ to separate organs although methods of illumination were primitive.

It was common practice in the first half of the last century to perform posterior colpotomy in cases where the diagnosis of ectopic pregnancy was equivocal. The posterior vaginal fornix was incised and the Pouch explored for the presence of blood and tubal swellings. In the 1962 edition of his famous *Principles of Gynaecology*, Norman Jeffcoate dismissed the technique mentioned by other authors of simply plunging a large-bore needle fitted to a syringe into the pouch through the posterior fornix, to see if blood could be obtained. This latter technique, he wrote, 'for which many claims are made, has proved unreliable

in my hands. I have seen blood obtained when the true diagnosis was salpingitis, and no blood when there was in fact a pregnancy in the tube.' Jeffcoate also mentions culdoscopy, although only briefly: under spinal or local anaesthesia, with the patient in the knee-chest position, carbon dioxide was introduced into the peritoneal cavity through a small incision via the posterior fornix, a direct-vision telescope was passed and 'easy visualisation' was obtained. Such diagnostic culdoscopy continued to be practised to some extent throughout the 1960s and 1970s, but much less so than laparoscopy. More recently, the posterior fornix has served as the entry point for a Veress needle/trocar system for insufflation as well as for access of both laparoscope and instruments. Complications of this route, including damage to adjacent organs, most seriously bowel and large vessels, have meant that, to date, the culdoscopic route has not been widely used in Australian practice. In 1975, Novak described the Decker culdoscopic procedure in which a Foley's catheter in the uterus was used to instil indigo-carmin while, via the pouch, the pelvis and lower abdomen were inspected for tubal patency and the presence of adhesions, but again such techniques have largely been overtaken by advances in laparoscopy. However, over the past two decades, as more and more gynaecological (and other) surgery has been performed laparoscopically, incidental use has certainly been made of the pouch of Douglas, for example as an exit route for fragments of uterine fibroid, fallopian tube and gallstones. Recently, with the development of 'natural orifice' endoscopic surgery, there has been renewed interest in culdoscopic surgery, and 'trans-Douglas' endoscopes are being designed for the performance of intra-abdominal surgery in women.

The term 'pouch of Douglas' was not used in Douglas's lifetime. It is likely that William Hunter referred to it thus, and that others followed him, although it does not appear in print until the second half of the 19th century. Following Douglas's death, Hunter arranged his hundreds of anatomical drawings in folders

and had them bound; they and many of Douglas's books can be found today in the Hunterian Museum. Douglas's collection of anatomical specimens, which was described by a contemporary in 1734 as 'the best collection of practically useful anatomical preparations (acquired, prepared and preserved at a vast expense, fatigue and care) that either is or ever was in the possession of any single man', undoubtedly formed the basis of William Hunter's collection, although remarkably Hunter never acknowledged this in any of his published works. Certainly, medical historians now agree, almost all Hunter's great medical work – on joints, lymphatic tissue, ligaments, herniae and, not least, the pregnant uterus – had its basis in the writings and drawings of James Douglas, so it is entirely appropriate that as students and practitioners of medicine we continue to maintain the eponymous memorial of the pouch of Douglas.

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Testing times ahead?



A/Prof Stephen Robson
FRANZCOG

Non-invasive fetal diagnosis might well become the 'greatest moral challenge of our generation'.

In December 2010, a group of scientists from the Li Ka Shing Institute of Health Sciences in Hong Kong, led by Professor Dennis Lo Yuk-Ming, announced in *Science Translational Medicine* that they had scanned the entire genome of a fetus using cell-free fetal DNA (cffDNA) isolated from the blood of a pregnant woman. The team had isolated

the fetal DNA from 'an ocean of maternal DNA molecules'. This task – identifying which fragments of DNA were fetal in origin and assembling them – was akin to: 'adding in tens of millions of pieces from another jigsaw puzzle and then trying to re-assemble the first one.' It is a breathtaking achievement.

A number of groups had previously published studies where cffDNA was isolated from maternal blood for the purposes of determination of fetal sex, detection of single gene disorders (such as Huntington's disease), aneuploidies (such as Down syndrome) and pregnancy-related disorders (such as Rhesus blood group diagnosis). However, the ability to isolate enough of the ragged pieces of fetal DNA from a maternal blood sample to piece together the entire fetal genome is orders of magnitude beyond this.

If the history of medical advance has taught us anything, it is that the pace of genetic research is staggering. Today's innovation is tomorrow's commonplace. When the Human Genome Project commenced in 1989, complete sequencing of a human's DNA was the medical equivalent of the manned moon landing. As you read this now in 2011, companies around the world are developing commercial sequencing systems that may offer a complete human DNA sequencing for as little as \$1000.

Fetal DNA in maternal blood

It has been recognised for more than a century that intact cells from the fetus circulate in the mother's blood. Such cells were first isolated about 20 years ago, but a large research effort yielded discouraging results. Fetal cells were rare, enrichment techniques were fraught and the nuclei of cells were commonly dense and proved difficult to analyse. Incredibly, it was recognised that some fetal cells could persist in maternal blood for many years.

Just after the Second World War, scientists discovered that fragments of DNA and RNA float freely in our blood. This observation was initially puzzling, but eventually the discovery of apoptosis – programmed cell death – by Brisbane pathologist Professor John Kerr revealed the source of the genetic material. As our cells die, the genetic material fragments and is ejected into the bloodstream. In 1997, Professor Lo's group published a paper in *The Lancet* detailing their discovery of fetal DNA fragments in the blood of pregnant women.

These bits of genetic material – free from the parent cells, hence the

term 'cell-free fetal DNA' – appear to arise from apoptotic processes in the placenta. It is likely that somewhere between three and six per cent of all free nucleic acid material in maternal blood is fetal in origin. The cffDNA can be reliably isolated from about seven weeks of gestation, reaching a peak in the third trimester. Whereas some fetal cells can persist for many years, cffDNA is rapidly cleared, with a half-life of about a quarter of an hour. It is undetectable by the time a baby has completed the first breast feed.

An ocean of DNA molecules

The task of picking which bits of DNA are fetal in origin is a daunting one. In general, the concentration of all cell-free DNA, be it maternal or fetal in origin, is very low. Of that tiny amount, only about one fragment in 20 comes from the fetus. Of the fetal component, it is important to remember that half comes from the mother anyway. A blood specimen is taken from the mother, then centrifuged. All the free DNA is isolated using a clever process now standardised by a workshop of experts headed by Tobias Legler of the University Medical Centre in Göttingen, Germany.

When the DNA fragments have been sufficiently purified, subtle differences between the genetic material of mother and fetus are sought. Most studies have used detection of sequences inherited from the father. These are detected using polymerase chain reaction (PCR). To circumvent this, a large amount of work is now being directed at finding specific 'fetal markers', perhaps looking at the differences in gene activation between mother and offspring.

'The technology underpinning the isolation and sequencing of cffDNA from maternal blood represents everything that is great about human achievement. It also has the potential to unleash everything that is dark in our nature.'

The present and the future

Women in Western countries are commonly offered either prenatal screening or prenatal diagnosis. A good example of screening is the combined first trimester test, where the nuchal fold thickness and serum biochemistry are analysed to assign a risk of trisomy 21. Invasive diagnostic tests, chorionic villus sampling or amniocentesis, can be undertaken from late in the first trimester. Their accuracy is close to perfect, but with accuracy this comes a risk that a healthy fetus may be lost as a complication of the test. Few who have been involved in counselling a woman and her partner before an invasive test would not be aware of the high level of anxiety these tests provoke. The screening tests pose no risk to mother or baby, but the cost is in accuracy. The diagnostic tests provide accuracy, but with risk.

How much better, then, to be able to offer a diagnostic test with no risk to mother or baby? Simply take a blood specimen and, at the same time that testing is undertaken for the blood group and haemoglobin values, isolate the cffDNA. The fetal DNA is present from about seven weeks, almost a month before chorionic villus sampling can be employed. In January of this year, Professor Chiu's group from Hong Kong reported the results of a study of over 1000 pregnancies using DNA in maternal blood to screen for trisomy 21. In their paper published in the *BMJ*, the group reported that use of multiplexed massively parallel sequencing of cffDNA diagnosed Down syndrome with a sensitivity of 100 per cent and a specificity of 97.9 per cent.

'The science of genetics advances rapidly. Society must be given the opportunity to consider the implications of these technologies before their use moves into the mainstream without regulation, fed by...commercial interests.'

The relentless quest for perfection

In his excellent book, *Designer Babies*, Roger Gosden quotes Charles Darwin's younger cousin, Sir Francis Galton, writing in 1896:

'If a twentieth part of the cost and pains were spent in measures for the improvement of the human race that is spent on the improvement of the breed of horses and cattle, what a galaxy of genius might we not create?'

Most women in Western countries will now have one or two children. In many parts of Europe, the number of babies being born is too low to replace the population and this demographic shift will bring with it profound changes. Couples commonly seek perfection in their offspring. In their systematic review, Mansfield and colleagues estimated that the rate of pregnancy termination after a diagnosis of Down syndrome is more than 90 per cent.

Anyone who is interested in their own genetics can seek the services of companies such as the Australian-owned easyDNA (<http://www.easydna.com.au>). DNA paternity testing is available for less than \$300, with results returned within a week. For those secure in their paternity, more comprehensive testing is available with the Genetic Predisposition DNA Health test. This provides a genetic analysis to quantify your predisposition to an array of common conditions, including macular degeneration, rheumatoid disease, migraine, obesity, diabetes, colorectal cancer and even psoriasis. easyDNA's website poses the question, 'Who should take this test?' Their answer? 'Everyone can benefit from taking control of his or her health in order to achieve the best possible health future.'

On the horizon is the possibility of women being offered access to blood sampling in very early pregnancy, with rapid and accurate genetic analysis of cffDNA to diagnose not only major genetic defects, but also conditions such as cancer predisposition that may not affect an individual until late in life. The rapid pace of genetic research means even trivial phenotypic considerations – height and hair colour – may be detectable in the near future. Termination of pregnancy can be undertaken successfully, with little risk of complications, using mifepristone (the anti-progesterone RU486) which is now widely available.

The use of genetic analysis of cffDNA could bring unimaginable benefits for many women, sparing them uncertainty and potentially risky invasive procedures. Yet, at the same time, if experience has taught us anything it is that the unscrupulous will prey on the vulnerable. Read the paper from Jha and colleagues, published in *The Lancet* in 2006: over 10 million female fetuses are unaccounted for in some overseas countries, presumably victims of the abhorrent practice of termination for no other reason than the fetus being female.

Lord Winston's Trojan Horse

The technology underpinning the isolation and sequencing of cffDNA from maternal blood represents everything that is great about human achievement. It also has the potential to unleash everything that is dark in our nature. In his book, *A Child Against all Odds*, the noted scientist Professor Lord Winston describes such technologies as Trojan Horses: on the surface a wonderful gift, but carrying a great threat within their bellies. Typically, such technological advances occur rapidly and before society as a whole has the opportunity to consider their implications. Lord Winston puts it this way:

'I do not think we have handled these issues well in our society; strict regulation without genuine consensus, and without the co-operation of the clever people who may outwit the regulators, may offer short-term safety but is certainly not going to do our society good in the longer term. What we need, above all, is to learn how to use our power with wisdom. We have dragged a Trojan horse into our citadel.'

We face the potential of commercial concerns offering (and thus promoting) cffDNA testing to women, long before they and their families have had any contact with their obstetric carers. This could alter the course of reproduction in developed countries profoundly. Yet to date, few of us who are involved in obstetric care have had the opportunity to learn about this technology and its implications, both medical and ethical.

The science of genetics advances rapidly. Society must be given the opportunity to consider the implications of these technologies before their use moves into the mainstream without regulation, fed by internet-based commercial interests. This is the 'profound moral challenge' that we may just have enough time to deal with before it is out of our hands.

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Management of acute uterine inversion

Dr Midia Alias
MRANZCOG

Uterine inversion – one of the uncommon, but dramatic complications of the third stage of labour – can be difficult to diagnose at times, owing to its relative rarity. It is an obstetric emergency as it is often accompanied by haemorrhage and shock.

The incidence of uterine inversion varies, with estimates ranging from 1/2000 to 1/20,000, although more recent reports suggest a value closer to 1/2500.¹ This wide range may be related to differences in definition of inversion, postpartum assessment of the uterus, patient populations, case ascertainment and routine obstetrical procedures.

Cases are classified using a variety of criteria. According to the time from delivery to diagnosis:

- Acute: within 24 hours of the birth of the baby;
- Subacute: from 24 hours after the birth to four weeks following confinement;
- Chronic: at least four weeks after confinement.

According to the pregnancy state:

- Puerperal: when associated with labour, miscarriage or terminations, or within six weeks of these events;
- Nonpuerperal: those involving a non-gravid uterus.

According to the anatomical extent of extrusion:

- Incomplete: fundus of uterus not extending beyond internal orifice of the uterus;
- Complete: when the fundus protrudes through the external orifice of the uterus;
- Prolapse: when the fundus protrudes out through the vagina, which itself gets inverted.

The causes of inversion remain undefined, but overly aggressive management of the third stage of labour is commonly described. This includes excessive fundal pressure (Crede manoeuvre) and cord traction, especially applied before signs of placental separation. Other possible risk factors include nulliparity, fundal placentation, macrosomic infants, magnesium sulphate, precipitous labour, uterine anomalies and adherent placenta/accreta.¹⁻⁵ Following the institution of active management of the third stage of labour, in 1988, the incidence of acute uterine inversion following vaginal delivery fell 4.4-fold.¹¹

Clinical features

The most common presentation of a uterine inversion is postpartum haemorrhage; classically described in the third stage of labour in women who suddenly collapse following birth of the baby. Less dramatic presentations are those in the subacute stage, where a recently pregnant woman may complain of chronic heavy lochia or leukorrhea. In chronic cases not associated with recent pregnancy, the clinical presentation is non-specific, occurs mostly in older women and varies. Abnormal uterine bleeding, dysuria, pelvic pain and leukorrhea have been described. Physical examination at that time reveals a mass in the vagina, which is, in fact, the fundus. Occasionally, the placenta may still be attached. Older literature suggested that the degree of shock that occurred was out of

proportion to the blood loss, but more recent reports do not support this conclusion.¹⁻³

Where uterine inversion has occurred per vaginam, the acute management has two objectives. The first is to re-place the uterus and the second is to treat the associated shock, initially with fluid resuscitation. Patients present with shock (hypotension and inadequate tissue perfusion). It has been postulated that shock is due to vagal stimulation caused by traction on ligaments supporting the uterus and can be associated with a bradycardia.²¹

Management

Management requires prompt recognition and concurrent actions.⁶ In acute cases, immediate anti-shock measures need to be commenced, especially when a diagnosis cannot be established in the presence of acute collapse. Successful correction depends on an early diagnosis once systemic stability has been achieved. The aim is to re-place the uterus as soon as possible. The siting of large-bore intravenous lines, effective analgesia, blood availability, catheterisation and mobilisation of the obstetric crash team is required. In cases where the placenta is still noted to be adherent (the diagnosis being evident) and after adequate analgesia and transient tocolysis is employed, manual replacement can be performed to relax the cervical ring and aid repositioning. Intravenous terbutaline has been used in a number of such cases – with and without a general anaesthetic – and is the agent of choice. Other tocolytics used are salbutamol, ritodrine, magnesium sulfate and halothane. Re-placement of the uterus cannot be delayed and must be concurrent with treating the shock, which may not be correctable until the inversion is reduced. Most often, this can be accomplished by applying pressure to the fundus with a vaginal hand directed toward the umbilicus, the Johnson manoeuvre. This procedure requires sustained pressure for at least five minutes and, hence, general anaesthesia is recommended. Some have advocated using ring forceps on the cervix for counter traction.^{1,2} Uterine relaxation, achieved with tocolytic therapy, can assist in restoration of the uterine fundus.^{5,7-9} O'Sullivan described, in 1945, a different vaginal approach, later modified by Antonelli and colleagues, using hydrostatic pressure to resolve the inversion.¹⁰ It consists of occluding the vulval introitus so as to allow gravity-aided infusion of warm saline to distend the vagina and thereby push the fundus back up with uniformly distributed pressure. It must be noted that copious amounts of saline can be required and a close watch must be placed on the volume infused and returned.

Hydrostatic reduction of acute uterine inversion can be considered if all other interventions have failed and surgical intervention is not possible.¹²⁻¹⁴ A bag of warmed fluid is hung above the patient and allowed to flow through tubing into the vagina using the physician's hand or a silastic ventouse cup to retain the water in the vagina and generate intravaginal hydrostatic pressure. This may force the inverted fundus back to its normal position.

Surgical intervention

If initial attempts at restoring the uterus to its normal position fail, general anesthesia may be required both to optimise uterine relaxation to aid in replacing the fundus from a vaginal approach and to be prepared for laparotomy to correct the inversion. Laparotomy is indicated when the uterus cannot be restored to its normal position using vaginal procedures. The most commonly described abdominal procedure is the Huntington technique. The cup in the uterine fundus formed by the inversion is located. The adnexa (ovary, fallopian tube, round ligament) are typically pulled into this depression. An Allis or Babcock clamp is placed on each round ligament about 2 cm deep in the cup. Gently pulling on the clamps exerts upward traction on the inverted fundus. Clamping and traction are repeated until the inversion is corrected. If available, a second operator with a hand in the vagina can apply upward pressure on the fundus to facilitate the procedure. A variant of this has been described using suction applied to the inverted fundus via a vacuum instrument.^{1,10}

If this is unsuccessful, the cervical ring may be incised using the Haultain technique, which involves incising the cervical ring posteriorly from an abdominal approach, followed by the Huntington technique to elevate the fundus. The advantage of the Haultain technique is that a posterior incision avoids potential trauma to the bladder, which might well be drawn along with the inverted uterus anteriorly. Secondly, the incision can be visualised in its entire length and extensions are more manageable, should traction on the often friable and congested fundus cause tears.

Management of the placenta

In cases where the placenta is still adherent, the inversion should be resolved before removal of the placenta to minimise further blood loss.⁶ Once the inversion has been corrected, the most conservative approach is to await spontaneous separation of the placenta. Alternatively, one may attempt manual removal, provided that the patient has proper analgesia and is haemodynamically stable. Manual removal should be performed in an operating room so that surgical intervention can be undertaken if complications occur. A hand is placed into the vagina, through the cervix and into the uterine cavity. The operator then attempts to develop a cleavage plane between the placenta and uterine wall. If this cannot be accomplished easily, or if bleeding increases, a repeat attempt may be supplemented with sponge-stick curettage or suction curettage. If the placenta remains attached, the possibility of placenta accreta should be considered. Exploration of the uterine cavity is warranted to assess for uterine perforation or adherent placenta. Furthermore, the vaginal cavity should be assessed for lacerations. Uterotonic therapy should be optimised once the inversion is corrected. The use of antibiotics is left to the discretion of the provider, since data from the literature do not mandate their use.

H Soleymani Majd, A Pilsniak and PW Reginald describe a case of recurrent uterine inversion managed with the insertion of a SOS Bakri balloon, which conformed to the contours of the uterine cavity to prevent re-inversion of the uterus. The cause of recurrent inversion was unclear except to speculate possible abnormality of the myometrium in the fundus, which prevented sustained contraction. This case describes the first use of the SOS Bakri balloon in the management of uterine inversion and allowed preservation of the patient's reproductive potential.

Acute uterine inversion at caesarean section is extremely rare; fewer than ten cases have been reported in the literature, although many may go unreported.¹³⁻²⁰ Of these case reports, only one was complicated by cardiac arrest.¹⁹

Recurrence

The risk of recurrence of uterine inversion in a future pregnancy is not

well defined. In one series of 40 cases of acute postpartum uterine inversion, there were no recurrences in 26 subsequent deliveries.¹¹

Summary

Uterine inversion remains a relatively rare entity and, hence, its diagnosis proves a challenge in all but the most dramatically evident obstetric cases. Chronic long-standing inverted uteri have been mistaken for large fibroid polyps and amputation has been disastrous. This life-threatening condition, occurring as a third-stage complication, merits early and aggressive management for a successful outcome. Recourse to a emergency laparotomy is justified in stable cases when manual methods fail, but conservative management is most successful when performed soon after the event. The old adage of unexplained shock must make an obstetrician suspect this possibility and exclude it immediately by doing a bimanual examination.

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Pelvic pain in endometriosis and its management

Prof Ian S Fraser
FRANZCOG
Professor in
Reproductive
Medicine, University
of Sydney

Although pain is a central feature of endometriosis, the patterns of pain are also highly variable in their presentation, severity, duration, cyclicality, associated features, response to treatment and likelihood of recurrence. Many endometriosis sufferers also exhibit hyperalgesia and allodynia, pointing to a lowered threshold for the central perception of pain.

Endometriosis is a condition of remarkable variability (see Table 1), which may present in many different ways. Hence, diagnosis is often greatly delayed.

There is increasing evidence that endometriosis is essentially an ‘endometrial disease’, with a strong familial component and less well-understood environmental and reproductive influences. Basic functions of the ‘eutopic’ endometrium (this is uterine endometrium in women with endometriosis in contrast to the ‘ectopic’ endometriotic tissue) that are disturbed in women with endometriosis, when compared with women without endometriosis, include increased aromatase enzyme activity (ability to make its own local oestrogen), increased angiogenesis (ability to grow new blood vessels), increased neurogenesis (ability to attract nerve fibres to grow in), increased cell adhesion molecules, increased proliferative activity and decreased apoptosis (accentuated viability of tissue fragments shed at menstruation) and greatly modified leukocyte presence and function (also apparently geared to support viability of shed tissue fragments). These disturbances all seem to point to exaggerated survival of cellular fragments shed at menstruation, with enhanced potential for adherence to peritoneum and subsequent growth.

Our research group was surprised to be able to demonstrate the presence of numerous nerve fibres in eutopic endometrium (and increased in myometrium), when the endometrium is a tissue that is not normally innervated. These nerve fibres are accompanied by a greatly enhanced presence of nerve growth factor (NGF)

and its receptor, and by other neurotrophins. NGF is a stimulator of pain sensation. The nerve fibres included sensory, sympathetic and parasympathetic axons and we found similar presence and density of these nerve fibres in the ectopic lesions. They were particularly frequent around deep invasive lesions close to or involving the rectum, which broadly correlates with the fact that these deep invasive lesions are among the most painful and tender of all endometriotic lesions. We have managed to identify, with considerable difficulty, a small number of women who have no pain symptoms whatsoever. Most women who are said to have no pain have just not complained and have learned to live with it. These women also have an extensive network of nerve fibres in the endometrium, myometrium and in lesions. The eutopic endometrium and ectopic lesions exhibit very disturbed leukocyte numbers and function – macrophages, uterine natural killer cells, dendritic cells and regulatory T cells appear to be particularly disturbed. There is a substantial ‘inflammatory’ component to the pathophysiology of endometriosis. Key factors involved in pain generation and perception are listed in Table 2.

Management of the pelvic pains of endometriosis
Effective management of pain requires definition of the symptoms experienced, characterisation of the anatomical extent of lesions and exploration of the patient’s lifestyle – and fertility wishes. Hence, individualisation of the therapeutic approach is becoming increasingly important. Nowadays, many patients are well informed of the options, especially from the internet.

Table 1. Endometriosis is a highly variable condition.

1	In its manner of presentation.
2	In age of symptom onset – frequently in adolescence.
3	In delay to diagnosis – especially in adolescence.
4	In the types of symptoms experienced – usually much more complex than just pain: infertility, menstrual bleeding patterns, exaggerated and painful abdominal bloating, other gastrointestinal symptoms, urinary symptoms, extreme lethargy.
5	In anatomical sites of ectopic lesions – are there different ‘phenotypes’ of endometriosis (peritoneal, ovarian endometriomas, deep invasive lesions) or are they variants of the same disease process?
6	In response to medical or surgical treatment.
7	In likelihood of early recurrence of disease.
8	In ‘natural’ history of the disease progress over years.

Approaches to management are simple in principle, but broad and complex in practice. For a comprehensive discussion the reader is referred to the documents listed under ‘further reading’. In principle, the focus remains directed to four overlapping approaches: good analgesic advice, medical management, surgical excision and sound information in regards to lifestyle management.

Analgesia begins with the traditional non-steroidal agents and paracetamol in effective doses, moving on to stronger agents such as tramadol, oxycodone and even occasional pethidine or morphine. Chronic pain with a neuropathic component may respond to gabapentin.

Medical therapy is based primarily on hormonal suppression. It does not make logical sense to treat women who have an oestrogen-sensitive disease with the combined pill, but it does work well for a minority of endometriosis sufferers. Most research points to the fact that progestogen-alone therapy is much more effective and may be continued over many years. There is a strong move towards the use of the delivery systems such as the

Table 2. Postulated factors and mechanisms influencing pain generation and perception.

1	The uterus (especially endometrium) is much more densely innervated than the normal pelvis, including sensory, sympathetic and parasympathetic nerve fibres.
2	Endometriotic lesions also have a dense nerve supply.
3	Endometriosis is an inflammatory condition with disturbances of numbers and function of most leukocytes.
4	Nerve growth factor (NGF) is intensely expressed in eutopic endometrium (endometrium of endometriosis sufferers) and in lesions. NGF is a potent sensitiser of pain fibres.
5	Many leukocytes present in eutopic endometrium and lesions synthesise and secrete nerve growth factor.
6	Prostaglandin metabolism is disturbed in eutopic endometrium and in lesions and some prostaglandins are potent stimulators of pain. Other inflammatory mediators may play a role.
7	Recent evidence suggests that many women with endometriosis have reduced thresholds for the perception of pain stimuli.
8	Some women with persistent pain following previous surgery have features suggestive of neuropathic pain.

levonorgestrel intrauterine system and the subdermal etonogestrel implant. We have been using a combination of these two systems with great effect in particularly resistant pain cases for the past five years. The place of therapies like gonadotrophin releasing-hormone analogues and danazol is decreasing.

The approaches to surgical excision of endometriosis have improved greatly in recent years and it is clear these procedures should generally be carried out by advanced laparoscopic surgeons with special experience in endometriosis. The best opportunity for complete excision is at the very first laparoscopy, but even then the recurrence rates are substantially higher than is generally recognised. Many patients will benefit from continuous progestogen therapy following surgery, in order to minimise recurrence.

There is a widespread awareness that many cases of endometriosis merit management in specialised clinics with availability of pain specialists, psychologists, reproductive endocrinologists, in addition to the gynaecologist and the gynaecological laparoscopic surgeon. Early diagnosis, awareness of the variability and individualisation of the therapies are keystones of effective management.

Conclusion

Many women in the community are now aware of 'endo' and are asking searching questions about management. This disease and its multiplicity of pain symptoms is going to remain as one of our biggest challenges for years to come.

Further reading

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Handover revisited



Dr Yvonne Li
RANZCOG Trainee

A review of clinical handover for acute women's health in Middlemore Hospital, Auckland, New Zealand; from the perspective of an experienced senior registrar.

Dr Celia Devenish's article in the last issue of *O&G Magazine* was both inspiring and interesting.¹ There is certainly much we can learn from her unit and it is also fascinating to see the differences in the handover practice in Dunedin Hospital when compared to Middlemore Hospital in South Auckland; both tertiary units providing mainly public health care.

The Assessment, Labour and Birthing Unit (ALBU) in Middlemore Hospital is a busy place that can change instantaneously by the sheer numbers of women presenting with a varying degree of antenatal care. There are around 8000 births each year and every day there is an average of 50 women being reviewed through ALBU. This includes an average of 25 births a day, with four or five women being admitted for elective induction of labour and the rest presenting for acute assessment for both antenatal and postnatal problems.

Time and location

The first medical handover of the day starts at 8 am sharp in the staff work station, a small room, 3.5 by 5 metres; just large enough to accommodate both the incoming and outgoing team. Midwifery handover has already taken place at 7 am, avoiding the clash of a large number of people. The doors are closed for privacy and quietness, but we remain in the centre of the busy delivery unit where emergency bells and lights can easily be seen and responded to immediately; which we often have to do.

Whiteboard

The meeting is based around the whiteboard. This is not only the centre of focus for the handover, but also throughout the day. It contains up-to-date information about each woman in all the ALBU rooms which includes the labouring women and those for induction. The board faces away from the public areas of ALBU and so confidential information is hidden from view.

In addition, outlying patients of concern are listed at the bottom of the board so they are not missed simply because of their location away from ALBU and not infrequently the women's health building. These patients include those admitted to medical or surgical wards with specific non-obstetric problems, but nonetheless still requiring obstetric input. It is also not uncommon for one of our women to be in ICU requiring more intensive care either antenatally or postnatally. High-risk cases in the antenatal ward, such as placenta accreta at risk of bleeding, are also listed. Finally, there is a list of elective induction cases for later in the day, so we can have a 'bird's eye view' of all the patients requiring obstetric input and plan ahead the day's resources and staffing accordingly. If only it were that easy; but it is of upmost importance to start with the corporate knowledge of those retiring from their shift.

Attendees

Handover is attended by the outgoing and incoming acute team, including the gynaecology and obstetric consultants, registrars, senior house officers and students. It is unofficially led by the incoming consultants, with the outgoing registrars presenting the cases. Patients with issues requiring urgent review and those who are particularly complicated or likely to become so are highlighted first. Such cases include concerning cardiotocographies, planned surgery and those requiring review sooner for slow progress who may require delivery by caesarean section. Then a concise summary of each patient on ALBU, under obstetric care, is given. The charge midwife on duty is usually also present and will contribute valuable information and, on occasions, insight into the dynamics in some of the rooms. She is also aware of the midwifery-only care cases and will alert the obstetric team if there are concerns.

Since the unit is so busy, it is tempting for us to break into small groups and start mini-handovers simultaneously; this can be noisy and less productive, and is discouraged. It is quite clear to me now that more time invested in an orderly handover is well worth it in the long run and, as a more senior member of the team, I can see how important it is to have an overview of everything going on.

Once the workload is covered, it is time to prioritise and decide which cases need to be attended to first, followed by those less urgent that can be dealt with a bit later on and, with all the team members present, delegation of jobs is very efficient. A similar handover also takes place for the gynaecology team and, as it is usually shorter, it will often occur first.

Our handover is mainly attended by the acute staff. It is not practical for all clinicians in the department to attend or to discuss all inpatients because of the large number of staff and patients. The clinicians will often also be off the acute site as our elective work is mainly at a separate building about 20 minutes' drive away and elective surgical lists will already be getting under way.

Written versus oral

Most of us are in the habit of writing handover information on a piece of paper as the details are presented and one of our registrars has produced an electronic template for a specific handover sheet for printing off and then writing on. This aids information retention and comprehension of the clinician situation as we heard from Dr Devenish¹ and more recently is supported by the RCOG guideline on improving patient handover.² It is not compulsory though and some clinicians find that this information on paper is less useful as it is not updated constantly with the changes that occur every minute in this busy unit. Written information or not, it is vital to frequently check the whiteboard for new admissions, progress in current labouring women and re-prioritise from then on.

Given the technology available, it is interesting that the handwritten whiteboard system has continued to work so fantastically well. The board is large enough for every team member to see clearly. The hospital midwives and the independent midwives are all in the habit of writing the details, risk factors and specific management instructions for their women on the board, and diligently updating the progress of labour while keeping the board clear of unnecessary clutter. See Table 1 for examples.

Table 1. Examples of whiteboard entries.

3	4/3	PN1	CU	IOL Heparin for PE. LSCS for abruption. EBL 4L. Art line. Hb 77 blood 0845 normal. Blood 1500
5	1/0	41+1	CU	PROM, 1100 6-7cm, 1200 5 cm ARM forewater, synto IV Fluid, 1530 fully

It is this habit that makes the whiteboard system work so well. Moreover, this system is not affected by computer system outage, which is not unheard of – particularly during night shifts!

The second handover of the day is a lot less formal. It occurs at around 4 to 5 pm, whenever the incoming registrar has finished their previous duty. Registrars and senior house officers handover independently, to their respective colleagues, as do the consultants due to arrival time variations – often they have been off site. Once the new team has taken over, phone contact is made with usually a face-to-face meeting once again at the whiteboard.

The final handover of the day occurs at 10 pm sharp, when the night team arrives and the evening team is very keen to go

home. Its structure is very similar to the morning handover. As with all handovers, it is also an opportunity for debriefing if the shift has been particularly busy, with multiple things happening at once, or if there has been a particular incident during the shift. In such cases there is also the opportunity for further discussion afterwards, with the charge midwife or the consultant on duty, or at a later date if more appropriate. For some cases, obviously handover is not the place for such a discussion. Sharing of the major day's events though is important for our personal continual development and learning as well as for the department as a whole. More often, though, it is a time for a pat on the shoulder for a case well handled, a word of encouragement when encouragement is needed and, finally, expressing our appreciation for looking after our busy unit for the day.

Middlemore hospital is a dynamic and busy facility and we are constantly looking at ways to improve. At present it is felt that our current handover practice serves our unit well, although I believe it is probably time to introduce a more formal handover pro forma for note taking.

I would like to thank my colleagues who join me at these handover meetings on a daily basis.

References

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- 2 RCOG Good Practice No.12 December 2010. 'Improving Patient Handover'.



The Assessment, Labour and Birthing Unit handover whiteboard in action at Middlemore Hospital. A busy unit, such as Middlemore Hospital, is the best place to learn prioritisation and delegation of jobs.

Q&A

Q&A attempts to provide balanced answers to those curly-yet-common questions in obstetrics and gynaecology for the broader *O&G Magazine* readership, including Diplomates, Trainees, medical students and other health professionals.

Q A 25-year-old woman with a history of endometriosis complains of long-term variable bowel symptoms that are aggravated by eating bread. There is no bleeding from the bowel, the symptoms have been present for some time without change and her dysmenorrhoea is no longer a problem. She asks you, 'Is this endometriosis or should I go gluten free?'

Dr Susan Evans
FRANZCOG

a When presented with this scenario, a number of conditions are possible culprits. Therefore, the best approach is to answer the following exploratory questions.

Does she have endometriosis involving the bowel?

Bowel symptoms are common in women with endometriosis, but this does not mean that there is endometriosis in or near the bowel wall. A study of 290 women with endometriosis in an advanced centre, by Maroun *et al*¹, found that while 90 per cent had bowel symptoms, only 7.6 per cent had endometriosis involving the bowel wall. Pain opening her bowel at period time or nodules palpable in the pouch of Douglas would be more suggestive of endometriosis.

Does she have coeliac disease?

One per cent of Caucasians have coeliac disease, with up to 75 per cent of cases remaining undiagnosed. A 'coeliac screen' blood test will pick up 90 per cent of cases, provided that she is currently eating a normal gluten-containing diet. Tests are negative on a gluten-free diet. If she has already started a gluten-free diet, options include the following:

1. Resuming gluten for at least six weeks before a coeliac screen. Most women will not be prepared to do this, as they know their symptoms will recur.
2. Genetic screen for coeliac disease. If she is positive for DQ2 or DQ8 (30 per cent of Caucasians) then it is genetically possible for her to develop coeliac disease, but she may not have the disease. If she is negative for DQ2 and DQ8 then coeliac disease can be excluded. In other words, the test is only useful if it is negative.

A woman with coeliac disease requires a life-long completely gluten-free diet. Just cutting down on wheat is insufficient for long-term health.

Does she have fructose malabsorption?

This is the most likely diagnosis. Fructose absorption from the small intestine is variable. In people who absorb fructose slowly, it reaches the large bowel unabsorbed and is fermented by bacteria to hydrogen, methane and irritating substances that cause pain or aggravate an irritable bowel. Fructose absorption in the small intestine is enhanced by glucose. Fruits with a higher glucose to fructose ratio cause fewer problems than fruits with relatively less glucose. Wheat is a fructan, which means that it releases

large quantities of fructose in the gut. A woman with fructose malabsorption requires a low-wheat rather than gluten-free diet. By going gluten free she has eliminated wheat from her diet. A low-wheat diet is much easier to maintain than going completely gluten free.

Other foods that can cause similar symptoms due to slow small bowel absorption are lactose, polyols (some natural foods and artificial sweeteners), or raffinose/galactans (Brussels sprouts, broccoli, beans). These types of foods are sometimes called FODMAPs. Best management for irritable bowel syndrome (IBS) may be a global diet low in all these types of foods.^{2,3}

Consider the following courses of action:

- Recommending a diet that is low wheat. There is a more detailed explanation of the management of bloating and/or IBS in Endometriosis and Pelvic Pain.⁵
- Breath tests for malabsorption of carbohydrates – including fructose, lactose, polyols, raffinose and galactans – if the diet issues are more complex.
- Referral to a dietitian.
- Recommending The Low FODMAP diet, Shopping Guide.⁴

Is there a neuropathic component to her bowel symptoms?

Usually there is, especially with the history of endometriosis. Neuropathic sensitisation of the bowel means that it overreacts to relatively minor dietary indiscretions. By reducing dietary aggravators, the underlying condition of neuropathic bowel sensitivity becomes less troublesome, but is not cured.

Treatment options to decrease bowel sensitivity include:

- Amitriptyline: 5–10 mg early evening, especially if there is a feeling of being bloated. This is the cheapest, easiest option.
- Iberogast, a herbal preparation from chemists: 20 drops twice daily drunk in warm water like a tea.
- Mintec or peppermint tea.

In summary

1. Exclude a pelvic mass with vaginal examination or ultrasound.
2. A coeliac screen blood test should be performed before any change in diet. For borderline results, request a coeliac genetic screen or refer to a gastroenterologist for endoscopy.
3. Recommend a low-wheat rather than gluten-free diet unless

coeliac disease is present. Consider involving a dietitian.

4. Treat the 'sensitised' bowel: low-dose amitriptyline, iberogast or mintec.
5. Laparoscopy only for specific symptoms suggestive of endometriosis involving the bowel, such as pain opening her bowel at period time. Endometriosis lesions in this area require advanced excisional techniques. If you are unable to offer advanced excisional surgery, then this patient should be referred to an advanced centre. Extra 'diagnostic' or 'cautery only' laparoscopies should be avoided.
6. Refer to a gastroenterologist for 'red flag' symptoms such as PR bleeding, fever, weight loss, steatorrhoea.

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- 1 Maroun P, Cooper MJ, Reid GD, Keirse MJ. Relevance of gastrointestinal symptoms in endometriosis. *Aust N Z J Obstet Gynaecol.* 2009 Aug;49(4): 411-4.
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- 3 Goldstein, R, Braverman D, Stankiewicz H. Carbohydrate malabsorption and the effect of dietary restriction of irritable bowel syndrome and functional bowel complaints. *Isr Med Assoc J.* 2000 Aug;2(8): 583-7.
- 4 Shepherd, S. The Low FODMAP diet, Shopping Guide. 5th Ed. Melbourne: Shepherd Works; 2010. Available from <http://www.shepherdworks.com.au>.
- 5 Evans S, Bush D. Endometriosis and Pelvic Pain. Available from: <http://www.drSusanEvans.com> or <http://www.nzendo.co.nz>.

RANZCOG members are invited to submit questions, tips or interesting cases to Q&A.

Please send entries to Q&A @ O&G Magazine via:

(email) ranzcog@ranzcog.edu.au

(fax) +61 3 9419 0672

(mail) 254-260 Albert Street, East Melbourne, VIC, Australia 3002

Journal Club



Had time to read the latest journals? Catch up on some recent O and G research by reading these mini-reviews by Dr Brett Daniels.

Clinical fraud

In 1998, Andrew Wakefield published an article in the *Lancet* linking the measles, mumps and rubella (MMR) vaccine to a syndrome of autism and bowel disease. I am sure many doctors have answered questions regarding the safety of childhood vaccination, with concerned parents

citing this link as one reason for their reticence to vaccinate. This enthralling series of commissioned articles in *BMJ*, written by journalist Brian Deer, pulls no punches in his analysis of this research as fraudulent. As well as individually interviewing the parents of a number of the 12 patients included in the study, Deer examines the funding of the research by legal aid and lawyers representing the parents, and the response by the *Lancet* when concerns with the research were presented to them. Both the *BMJ* editorial and Deer's articles are scathing in their criticism of Wakefield and his motivation for what appears to be falsified data. For the researchers among us, Godlee's editorial makes the interesting point that the paper had 12 co-authors. She suggests that the desire to add to your publication list should be weighed carefully against the risk in doing so if you are unable to check the original data to which you are putting your name.

Deer, B. 2011. How the case against the MMR vaccine was fixed. *BMJ*, 342, 77-82.

Deer, B. 2011. How the vaccine crisis was meant to make money. *BMJ*, 342, 136-142.

Deer, B. 2011. *The Lancet's* two days to bury bad news. *BMJ*, 342, 200-204.

Godlee, F., Smith, J., Marcovitch, H. 2011. Wakefield's article linking MMR vaccine and autism was fraudulent. *BMJ*, 342, 64-66.

Early detection of pre-eclampsia

There are many recent studies seeking a first trimester screening test for pre-eclampsia. Such a test would allow earlier monitoring and intervention in at-risk pregnancies. Early detection in nulliparous women would be particularly useful. Audibert et al. report a prospective cohort study of 1000 nulliparous women having Down syndrome screening between 11 and 13 weeks gestation. They performed Doppler studies on both uterine arteries and a set of serum measures consisting of pregnancy-associated plasma protein-A (PAPP-A), Inhibin-A, placental protein 13 (PP13), A disintegrin and metalloprotease 12 (ADAM-12), free β -hCG and placental growth factor (PIGF). 893 women remained in the study after exclusion for factors including multiparity or miscarriage. Of these, 20 women (2.2 per cent) developed gestational hypertension, 40 (4.5 per cent) had pre-eclampsia, including nine (1.0 per cent) with early-onset pre-eclampsia and 16 (1.8 per cent) with severe pre-eclampsia. The authors performed statistical analyses to formulate a model predictive of these outcomes. They report that a model including maternal characteristics (including BMI and ethnicity), PAPP-A, Inhibin-A and PIGF could detect 75 per cent of early-onset pre-eclampsia at a ten per cent false-positive rate. Adding in other serum markers or uterine artery Dopplers did not significantly improve the accuracy of the model. While it is perhaps surprising that uterine artery Doppler studies did not prove useful in this study, it seems likely that tests such as that proposed in this article will become clinically useful, perhaps in the not-too-distant future. Particularly for nulliparous women, this will be of relevance to their obstetric care.

Audibert, F., Boucoiran, I., An, N. 2010. Screening for preeclampsia using first-trimester serum markers and uterine artery Doppler in nulliparous women. *American Journal of Obstetrics and Gynecology*, 203, 383.e1-8.

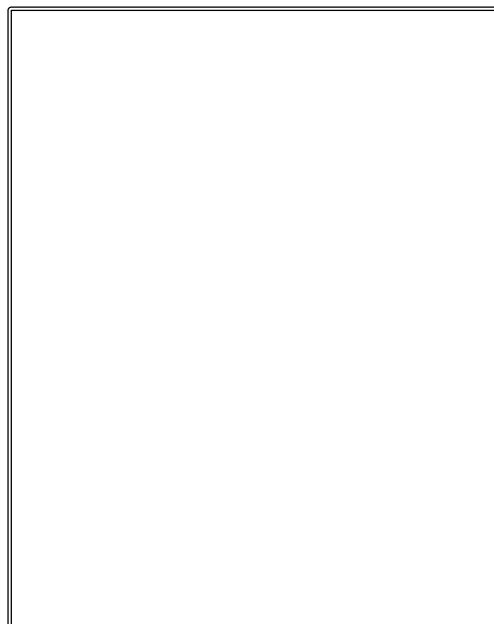
Ergonomics of laparoscopic surgery

If you have ever felt the urge to massage your shoulders or stretch your back after a busy period of surgery then you are not alone. Park et al. in the sensationally titled 'Patients Benefit While Surgeons Suffer: An Impending Epidemic', surveyed 317 American laparoscopic general surgeons about their demographics, surgical environment and workload as well as physical symptoms. They report that 272 (87 per cent) of the surgeons surveyed reported some physical symptoms or discomfort. These included hand, neck, shoulder, back and lower limb problems. The strongest predictor of symptoms was workload, while age and duration of practice were generally unrelated to symptoms. For surgeons and managers responsible for the design and layout of operating theatres, the paper by van Det et al. provides a detailed review of the ergonomic considerations inherent in laparoscopic surgery. In particular, they focus on alignment of the eye-hand-target as an important factor in both surgeon health and surgical efficiency. Finally, as readers will be aware, there is a recent innovation by some general surgeons toward Natural Orifice Transluminal Endoscopic Surgery (NOTES). Advocated by proponents (including the Natural Orifice Surgery Consortium for Assessment and Research-NOSCAR), NOTES involves avoiding abdominal scars by utilising such procedures as a transvaginal approach to cholecystectomy or appendectomy. Lee et al. performed study in which 14 surgeons performed simulated laparoscopic and NOTES surgical tasks. They report a six times increased muscular workload when performing the task with the NOTES equipment compared to the laparoscopic technique. While this is not directly involved in current gynaecological surgery, it highlights the need to properly evaluate the impact on the surgeon of new techniques and equipment.

Lee, G, Sutton, E, Clanton, T, et al. 2010. Higher physical workload risks with NOTES versus laparoscopy: a quantitative ergonomic assessment. *Surgical Endoscopy*, published online 3 November 2010.

Park, A, Lee, G, Seagull, FJ et al. 2010. Patients Benefit While Surgeons Suffer: An Impending Epidemic. *Journal of the American College of Surgery*, 210, 306-314.

Van Det, MJ, Meijerink, A, Hoff, A. et al. 2009. Optimal ergonomics for laparoscopic surgery in minimally invasive surgery suites: a review and guidelines. *Surgical Endoscopy*, 23, 1279-1285.



RANZCOG Fellow named Woman of the Year

Dr Emma Parry (FRANZCOG, CMFM) was named the inaugural *Next Magazine* Woman of the Year at a ceremony in Auckland, 12 August 2010. She was chosen from finalists in five categories: health and science, sports, arts and culture, business and community.

Emma is the clinical director of the National Women's Health Maternal Fetal Medicine Service in Auckland and the New Zealand Maternal Fetal Medicine Network (NZMFMN). Emma was recognised as having established the NZMFMN and introducing selective fetoscopic laser photocoagulation for twin to twin transfusion syndrome (TTTS) to New Zealand. In addition, she has been involved in establishing a perinatal service in Bhutan, a developing country in the Himalayas. She spent three months

there with her family and continues to have strong links with the department.

Emma has varied clinical interests, but is especially interested in complex multiple pregnancy, 3D scanning of fetal anomalies, information storage and retrieval and preterm labour.

Emma is a member of several committees both within Auckland City Hospital and New Zealand. She is a member of the CMFM subspecialty committee and organised the most recent bi-annual MFM Colloquium. Emma is a CMFM subspecialty examiner.

The College congratulates Emma on her award.



Training in Bhutan, where Emma helped to set up a perinatal service.



Emma with her daughter and niece in Bhutan.

Teaching O and G in a conservative Islamic State



Dr Peter Longmore
FRANZCOG

You know you are in the Middle East when your somewhat tired Mitsubishi Pajero is surrounded by the medical students' Ferraris, Lamborghinis, Porsches and Mercedes in the University car park – I clearly remember a student arriving in a new red Ferrari, only to be followed by his house-boy in a second car as there was no room in the Ferrari for his school books and laptop!

I relocated to the Middle East in January 2007¹ to take up the challenging role of Chief Medical Officer of the new Sharjah Teaching Hospital in Sharjah, UAE. Owing to the delay in the completion of the hospital, I was also asked to take up the inaugural role of Professor of Obstetrics and Gynaecology at Sharjah University. I had previously

been appointed Associate Professor of the Notre Dame Clinical School in Melbourne and held a Consultant A registration with the Ministry of Health in the UAE.

The medical course commenced in 2004, and was a problem-based learning (PBL) format, based on the Monash Medicine Curriculum. I was the only non-Arab head of a speciality in the University. The medical course lasts four years, following a foundation year that streams students into the different clinical disciplines of medicine, dentistry, pharmacy or other health sciences, depending on their academic performance. The merit of such a system is that, if a student is unsuccessful in achieving the standard for medicine, there is an opportunity to undertake another health-related discipline.

Students are students, or are they?

There is a major trend for UAE female nationals to undertake tertiary studies. The very strong family dynamics combined with the cultural requirements means they would normally not be allowed any social interaction with non-related males. However, attending a university course allows them to have significantly more social freedom. Many faculties at Sharjah University have gender separation, but the health sciences have no such restrictions.

Many of the female students are fully covered for cultural reasons. The UAE is a fairly modern Islamic society with what would be described as a relaxed approach to cultural differences. However, Sharjah is the most conservative of the seven Emirates and many female students have significant cultural restrictions – they cannot travel in a car with a male student, they cannot undertake clinical rounds after sunset and they are required to return home from their separated dorms on the weekends.

The students, both male and female, also have had a fairly sheltered upbringing by Western standards. By the very nature of the academic selection process for medicine and as this is a fairly expensive fee-paying course, many come from privileged backgrounds with multiple domestic helpers undertaking most of the household chores. In comparison, many medical courses in the Western world are postgraduate and often these students have significantly more life experience before entering medical school. Many Western students at a similar level would be self supporting through part-time jobs and living independently.

Different teaching styles

The teaching styles used reflect the students' upbringing and the cultural background. I have a Socratic approach to teaching, but many of the Arab and South Asian lecturers tend to favour a more didactic approach. There is always a very strong emphasis on religious values and the place these have in day-to-day interaction. This certainly affects teaching methods as there is not the same degree of flexibility in discussing social issues; for instance, a sexual relationship before marriage is forbidden so examples of sexual behaviour needs to be contextualised within a marital environment. Also, frankness in discussing sexual issues, completely natural in a Western culture, may result in embarrassment in a mixed-gender setting. I once had a complaint made about me to the University



Showing H.H. Sheikh Dr Sultan Bin Mohammed Al Qassimi, Member of the Supreme Council and Ruler of Sharjah, through his new University Hospital.



Graduation day for the first cohort of medical school graduates of Sharjah University. A hot 50°C!

department about what I was teaching in a contraception lecture. I thought the complaint had come from a female student, but was surprised it had come from a more religiously conservative male who felt that females should not know such intimate issues! The lesson here: know your audience as best as you can.

It is also important not to create an 'us and them' concept in regards to what happens in the Western world versus the Arab world. While many aspects of Western culture are applauded, other aspects can certainly be open to criticism and this maturation process for any Western lecturer is vital. Some Western lecturers may struggle to establish a balanced approach in this regard.

Teaching ethics needs to be undertaken cautiously and there are many issues that can be confronting to the lecturer as well as the students. Underage betrothals, a single woman becoming pregnant (illegal and the patient will be reported to the police and jailed) and incest are all very delicate topics that need a cautious approach. The best method is not to give an opinion, but set some clinical scenarios and let the debate flow with supervision. Generally, the longer they have been in their clerkship rotation, the more mature the students become and are more capable of critical analysis. However, always remember that open debate concerning anything to do with the Government, religion or family will not occur. There are serious risks (to the lecturer) if this is encouraged.

The clinical teaching environment is one of the greatest challenges in a culturally sensitive community. Men are not allowed into labour wards in Sharjah and generally do not examine women. When I commenced my involvement at the University, I had to develop a strategy to be able to teach O and G at the major Ministry of Health (MOH) hospital in Sharjah. Separation of women and men is not prescribed in the Holy Quran, but has more to do with cultural mores. Arab women in Egypt, Jordan, Turkey or Syria are used to having male gynaecologists. Emirati women are much more conservative in this regard. Therefore, gaining access to the labour ward required a delicate patience, with an acceptance that any change process would take time. Women are the best advocates for women and if you can get the nursing staff on side, a norm anywhere really, then the battle is half won. My presence in the labour ward now is barely of any concern and I also have male medical students examining patients. I would say this is one of the most satisfying achievements I have had in my teaching career; this gradual change in culture and perception. Most important, however, is that the cultural awkwardness between the sexes develops into sound clinical competence. This gender issue is not only confined to male students examining women, but also occurs with female medical students examining men, as culturally they should not touch unrelated men.

An important part of the O and G clerkship training is to learn to be able to perform a speculum and bimanual examination sensitively and gently. Owing to the restriction of access to female patients, the training sessions are performed on mannequins. I have learned to discuss with the female students the necessity of me positioning their hands to correct them when performing a bimanual or speculum examination. It allows them to raise any contact concerns so that embarrassment (generally to me) is avoided at the crucial time. It also helps all of us, in that they know I am aware of cultural issues, and often it becomes a non-issue, particularly in the educational setting.

What the teacher learns

Learning is by no means a one way street. I am sure there are so many cultural and behavioural issues that I have learned about, many by osmosis, and merely adapted my everyday behaviour to them. For Westerners, a common mistake is to offer their hand in greeting. Most conservative nationals will not accept your hand as for them it is inappropriate to shake a non-related person's hand. I am sure that if I



Discussing the use of forceps with a small group of students at Al Qassimi hospital, following a bedside teaching session.

tried to make a list, this article would be twice as long! Walking into a classroom, using some Arabic phrases and yet maintaining one's own identity is challenging and fun. It is also important to share some life experiences so that the students have at least a small insight into your life as they may only have had exposure to Arabic lecturers.

Would I recommend it? Of course I would. I almost cannot believe that I practised medicine for so long without an understanding of Arab and Islamic culture. The students are young and relatively naive and it is refreshing to see their enthusiasm for learning. Recently, I received a portfolio from one of the male students who was exceptionally shy and had difficulty with the gender aspect of O and G. However, he wrote in his portfolio:

'Finally, one day in the rotation in alQassimi hospitals I learned something it is difficult to learn it from a book! Because I see it from Dr Peter. He said to me: be the best doctor not with his knowledge and career but the greatest the ability interaction with his patients.'

This student appreciated the importance of emotional intelligence in being a good clinician – for that message to have been effectively received and appreciated in a different cultural and language setting was an incredibly poignant moment for me.

The society is culturally rich and it is a wonderful environment to have teenage children. There are excellent schools here (including an Australian International School as well as a Victorian International School) and the Islamic value system here removes many of the 'issues' facing teenage children in the West.

Most doctors work very long hours here for relatively poor remuneration, yet their dedication to patient care is exceptional. I would recommend it not only to Australian physicians who may have become a bit jaded with their private practice and its inevitable focus on income, but also to senior registrars of the specialist Colleges who will benefit from the varied clinical and cultural exposure of such a warm and embracing community.

Reference

1. On assignment in the United Arab Emirates. *O&G Magazine* Vol. 9 No. 3, Spring 2007

Celebrating five years of Diplomates Days

Mrs Val Spark

CPD Senior
Co-ordinator

Ms Kate Lawrey

Provincial Fellows and
Special Projects
Co-ordinator

to in my 30 years of O and G.' Similarly, another participant wrote: 'One of the best refresher days I have attended.'

Last year, 2010, was no exception to the Diplomates Day record of innovation and brought the following firsts:

- The first Diplomates Day for city-based GPs held in conjunction with RANZCOG Regional Committees ASM. This was held in June 2010, at the QLD/NSW Combined ASM.
- The first Rural Obstetrics Day held in conjunction with the Australian College of Rural and Remote Medicine (ACRRM) at Rural Medicine Australia Conference. This ran in October 2010, in Hobart, Tasmania.

The feedback from both events was overwhelmingly positive, with the following quote representative of the general tone: 'Great day. Broad ranging, but linked, topics kept it interesting. RANZCOG handouts look great. Thanks also to Jeff Taylor for his case presentations and frank honesty.'

So far, planning is underway for the following Diplomates Days to be held in 2011:

- 7–10 April Provincial Fellows ASM, Launceston, Tasmania
- 10–12 June NSW/QLD Regional ASM, Hunter Valley, New South Wales
- 26–30 November RANZCOG ASM, Melbourne, Victoria

How it all began

RANZCOG formed the GP Obstetrics Advisory (GPOA) Committee to facilitate the involvement and representation of Diplomates in College discussion and decision-making in relation to continuing professional development (CPD) and broader issues relating to obstetrics and gynaecology. The inaugural meeting of the GPOA Committee was held at College House, 19 August 2005. At this meeting all committee members agreed that there needed to be access to ongoing education sessions tailored to Diplomates. One suggestion was that satellite sessions be held in conjunction with the RANZCOG Annual Scientific Meetings (ASM) and so Diplomates Days were born.

As part of the criteria for the first Diplomates Day, it was decided that the activities should be structured to meet the requirements for Category 1 points in the Royal Australian College of General Practitioners (RACGP) QA&CPD Program. By structuring the Diplomates Days to the RACGP requirements for Category 1 points, clear learning objectives can be set. Providing these learning objectives to participants before the event, allows them to understand what areas are to be covered and to evaluate

the program effectively at the end of the workshop. The first Diplomates Day was held at the RANZCOG ASM in Perth, WA, in October 2006. The Diplomates Day attracted 49 participants and was extremely well received, with most delegates responding positively to the evaluation: 'Excellent Day, most relevant day of conference' and 'Do this each year with the ASM.'

'RANZCOG formed the GP Obstetrics Advisory Committee to facilitate the involvement and representation of Diplomates in College discussion and decision-making in relation to continuing professional development and broader issues...'

The evaluation of the Perth Diplomates Day enabled the College to obtain future topics of interest along with areas for improvement such as: 'Printed handouts would have been helpful with program and schedule.' Most importantly, the evaluation supported the need for the continuation of workshops like these to further support the continuing educational needs of Diplomates – with the request, via the feedback form, for more access to similar sessions. These comments were used as a focus in future planning.

Due to the popularity of the Diplomates Day in Perth, it was decided that two Diplomates Days would be trialled in conjunction with the 2007 RANZCOG ASM on the Gold Coast. The Diplomates Days were split into two streams: office obstetrics and office gynaecology. Both workshops ran at capacity and feedback received was extremely positive, providing evidence that this education is highly valued and sought after: 'Overall very good, staff very helpful.'

It was noted by the GPOA Committee that many Diplomates of the College were practicing in rural or remote areas and, therefore, it was suggested that the College look to provide continuing professional development in the form of rural Diplomates Days to support the needs of these rural and remote practitioners. To meet this need, it was decided to incorporate two Diplomates Days into the program of the Provincial Fellows ASM in 2008, held in Hervey Bay, Queensland.

An ultrasound workshop and a rural obstetrics Diplomates Day were trialled at this meeting, with both workshops running at capacity as well as having a significant waiting list. Holding the workshops in conjunction with the Provincial Fellows ASM provided the opportunity for rural and remote Diplomates to network

with their specialist colleagues, which was viewed as another important benefit to attending. Feedback from these events was overwhelmingly positive: 'Very practical and hands on workshop' and 'I have thoroughly enjoyed these two days and will definitely be back', were representative comments.

In 2008, the GPOA Committee suggested that Regional Committees consider the possibility of holding a Diplomates Day/s for city-based GPs in conjunction with their ASMs. This undertaking now forms part of the Regional ASM Guidelines.

'The GPOA Committee suggested that Regional Committees consider the possibility of holding a Diplomates Day/s for city-based GPs in conjunction with their ASMs. This undertaking now forms part of the Regional ASM Guidelines.'

The Diplomates Days program was further developed and refined in 2009, with two days (office obstetrics and office gynaecology) of high-quality education provided at the RANZCOG ASM in Auckland, New Zealand and two days of sessions (rural obstetrics and ultrasound) at the Provincial Fellows ASM in Broome, WA. Feedback from the Auckland Diplomates Days was positive, with the useful reminder to: 'tell speakers that they are speaking to a group of very experienced GPs – cases are very important.' While the education is of an extremely high quality and highly sought after by our Diploma holders, the location is also a significant drawback, which should be taken into account when developing educational days. Feedback, both positive and constructive, often focuses as much on the venue and the catering as the educational content: 'Excellent food, could have Q&A, cases were fantastic, room too cold, well-organised day, great venue and friendly staff.' In response, the team at the College continues to improve the Diplomates Day program.

In 2010, owing to the overwhelming response and the strong demand shown for the Diplomates Days, the GPOA Committee suggested that that RANZCOG consider holding a Diplomates Day at RACGP and ACRRM Conferences, in order to provide the education to a broader field of practitioners and increase the number of Diplomates Days held. The Council agreed and the RANZCOG President wrote to both Colleges detailing the suggestion, which received a positive response. As a result of this communication, the first Rural Obstetrics Day was held in October 2010, in conjunction with the ACRRM Rural Medicine Australia Conference in Hobart, Tasmania. The RACGP has expressed interest in holding a Diplomates Day in conjunction with their 2011 Conference. RANZCOG looks forward to working with both Colleges to provide further educational opportunities for our Diplomates.

RANZCOG welcomes any feedback and suggestions of topics to be covered at future Diplomates Days. Please direct any feedback to Val Spark vspark@ranzcog.edu.au or Kate Lawrey klawrey@ranzcog.edu.au. We look forward to your participation in future educational events.

Obituaries

Dr John Kenworthy Ogden

1920 – 2010

John Kenworthy Ogden was born in Barnsley, Yorkshire, UK, on 7 March 1920. He was educated at the Sandbach School, Cheshire. He studied medicine, graduating from Guy's Hospital Medical School, University of London, in 1943 with his MRCS, LRCP and MBBS. After completing house appointments in Guy's Hospital and associated wartime hospitals, John was commissioned into the Royal Army Medical Corps. He served with the elite Durham Light Infantry, the regiment was part of the historic D-Day landings in June 1944. His casualty clearing station was hit by German artillery fire and he sustained a significant blast injury to his left eardrum and middle ear. He continued at his post for some days, but unfortunately developed an acute mastoiditis, necessitating his evacuation to the UK. He was decorated for his military service.

Following his wartime service, John was appointed demonstrator in anatomy at University of Cambridge and a Fellow of Caius and Gonville College for a year in 1945. He then spent six months residency in O and G at North Middlesex Hospital, London and a year at Watford Maternity Hospital, where he obtained the D(Obst)RCOG.

In May 1947, John emigrated to Australia and spent three years as a GP in Warracknabeal, Victoria, and was a clinical assistant to Dr Kelvin Churches at the Royal Women's Hospital, Melbourne. He returned to the UK for a year in 1950, as junior registrar to Sir Charles Read at the Postgraduate Medical School, Hammersmith, and obtained the MRCOG in 1951.

On returning to Australia in 1951, he became part-time specialist in O and G at Toowoomba General Hospital. He became a Fellow of the International College of Surgeons (FICS) in 1952. John spent time in 1955 as full-time specialist in O and G at Royal Newcastle Hospital, NSW, while waiting for immigration formalities to be completed to take up an appointment in USA. He obtained the MD in 1955 and the American Boards in 1956. From 1959–60 John was Chief of Surgery and Medical Superintendent of the Central State Hospital in Richmond, Virginia, USA.

In 1960, he and his family returned to Australia and established a large general practice in Toowoomba, specialising in gynaecology. In 1975 he took a year off for postgraduate work, firstly in the USA and UK and the second half in Sydney, working with Dr Malcolm Coppleson at KGV Hospital, Dr Ian Cope at the Royal Women's Hospital, Paddington, and Professor Harvey Carey with steroids. John was elevated to FRCOG in 1977. He became a Foundation Fellow of the RACOG in 1978. He served on the advisory board of St Vincent's Hospital, Toowoomba.

John was instrumental in the establishment of the famous 'Argyle' cattle stud during the 1970s, when he was renowned for hasty dashes to the labour ward in his Rolls Royce. Ever the dapper gentleman, John was noted for his signature tailored safari suits, bow ties, elegant cigarette holders, his trim military moustache and his notable modesty.

In his latter years, John and his wife retired to the Gold Coast,

where he passed away on 21 April 2010. He is survived by his wife, Barbara, his daughter Jane, and his grandchildren and great-grandchildren. Two other children pre-deceased him.

He will be sadly missed.

Dr R Peter Hearnden

FRANZCOG

Toowoomba, Queensland



Dr Stanley Edward Reid AM

1927 – 2010

Stanley Edward Reid was born on 18 October 1927, in Malvern, Victoria. He was educated at St Bede's College, Mentone. Stan studied medicine at the University of Melbourne, graduating MBBS in 1950. He was Resident Medical Officer at Manly District Hospital,

New South Wales, for three years, and then at the Royal Women's Hospital, Melbourne, for two years. In 1954, he married his wife, Jacqui, and moved to Bairnsdale in Victoria to join a group of general practitioners. With his interest in obstetrics, he soon became the one in the group to take care of the births. He travelled to London to obtain his D(Obst)RCOG, in 1962.

In 1963, Stan moved to Papua New Guinea (PNG), where he was appointed Lecturer in O and G at the Papuan Medical College. While working in PNG he was awarded the WHO Travelling Fellowship for Developing Countries, Obstetrics and Gynaecology, which took him to Russia. He travelled to London to gain his MRCOG in 1966.

Stan and his family moved to Perth, Western Australia in 1968, where he became Senior Registrar in O and G, University of WA, at the King Edward Memorial Hospital (KEMH), under Prof John Martin. He later joined the private practice of Drs Archie Murray and Harry Cohen, but was attracted back to the KEMH and became Medical Director 1973–84. He appreciated the benefits the new area of ultrasound would bring expectant mothers and was sent to London to study it. Around this time a major extension was planned for KEMH and together with colleague, Peter Breidahl, he ensured floor space in the new building was reserved for ultrasound.

Stan became the inaugural head of the Ultrasound Department. He was a founding councillor and President of the Australian (later, Australasian) Society for Ultrasound in Medicine (ASUM). In 1984, Stan retired as Medical Director of KEMH, but continued in private ultrasound practice.

A keen yachtsman, Stan was a Life Member of the Royal Perth Yacht Club, serving on Committee and as Commodore from 1981 to 1983. He was Commodore during the preparations for the successful challenge for the America's Cup and escorted the Cup

back to Perth. He organised the defence of the America's Cup in 1987, and was invited by the Americans to organise their series of challenger races, known as the Challenger of Record, for the America's Cup in San Diego in 1992. Stan received the Citizen of the Year award in 1987, in the sport category, and became a Member of the Order of Australia (AM) in 1988, for services to yachting and to medicine. He was a life member of ASUM.

Stan suffered a catastrophic head injury when he fell on to concrete in 2004. The subsequent intracerebral bleed left him with persistent mental and personality changes. He was lovingly cared for at home by Jacqui. He sailed away 31 October 2010. He is survived by Jacqui and his children, Jane, Mark, John and Sarah. An infant Mary died soon after birth with a heart defect and daughter Kate was killed in a car crash in 1981.

Dr John Phillips

BE FRANZCOG COGU
Perth, WA

Dr Jeanette Barten

1923 – 2010

Dr Jeanette Barten was born in Amsterdam, the Netherlands, 2 August 1923, one of seven children. She grew up in Holland and began her medical training during the Second World War. She graduated in medicine from the University of Amsterdam in 1949. During her medical training she developed the Christian commitment that led to her to consider becoming a missionary doctor. After further postgraduate training she travelled to Sulawesi in Indonesia in 1951, and subsequently worked for a year in Ujung Pundung, followed by two years in Tomohon in a mission hospital. In 1955, she returned to Amsterdam and was awarded a PhD, based her work in North Sulawesi.

The profound obstetrical and gynaecological problems she encountered in those years made her determined to become a specialist in obstetrics and gynaecology. Her increasing commitment to her faith led her to enter a convent and become a nun, completing her three years of training in 1958. She became Sister Jeanette and one of the Medical Mission Sisters, founded by Dr Anna Dingle, dedicated to providing care in the developing world. Dr Barten completed her professional obstetric training at the University of Nijmegen over the next four years. Mission hospital work in Burma followed, where the desperate need for adequate family planning led her to challenge the rigid views of the Catholic Church on this issue, resulting in significant changes. In later years this allowed her to introduce a pragmatic and effective family planning program in every area where she worked, initially in South Sulawesi until 1972, and later at the 230-bed Gunung Maria Hospital in Tomohon, North Sulawesi. It was there that she spent the rest of her practising career.

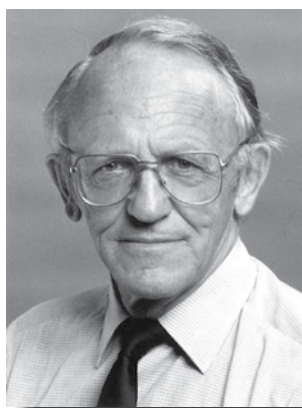
In 1978 and 1979, the Newcastle Obstetricians sent two aid teams to North Sulawesi, primarily to the Sam Ratulangi Medical School at Manado, which had been twinned with their new medical school. There they met Dr Barten, spent time at her hospital, and realised that they were in the presence of a highly intelligent, unique and dedicated person in the mould of Mother Theresa. She had mobilised a vast network of lay people across the whole province, covering more than 1.5 million people to provide family planning, post-delivery care, an infertility service and much more, across a network of collaborating hospitals.

She kept superb records and detailed follow-up in a service unparalleled in the developing world.

Dr Barten was fluent in Bahasa (and also English), and was highly regarded by the government of Indonesia. She was awarded the Karya Kencana Medal by the National Family Planning Programme in 1985, the Eykman Medal for the Care of Mother and Child in Indonesia by the Dutch Foundation in 1985, and made numerous contributions to medical literature on tropical diseases. She became a naturalised Indonesian citizen in 1984, culminating her lifelong love for the country. She was made an Honorary Fellow of the RACOG in 1985, in recognition of her enormous contribution to the specialty, the people of Indonesia and to the College's efforts to improve the standards of obstetric care in our nearest neighbour. She finally retired to her native Netherlands in 1998. Dr Barten died 21 November 2010. Her memorial will be the legacy of the lives saved by her selfless devotion to the people of North Sulawesi and the inspiration she provided to everyone she met during her lifetime.

Dr Alan Hewson

FRANZCOG
Merewether, NSW



**Sir Graham (Mont)
Liggins FRS,
FRANZCOG (Hon)**
1926 – 2010

It is difficult to explain what a scientific giant we have lost. I doubt that any New Zealand scientist who chose to do their research in New Zealand has had greater impact. On his return from the UK, where he gained his obstetrical qualification, Mont fell under the influence of Bill Lilley and turned towards academic life.

His early research was on the oral contraceptive; it was Mont who invented the idea of including the sugar pills in the packet – if the University had known about patenting at that time, it might now be considerably richer.

Mont turned his mind to the biggest issue in obstetrics: what causes premature labour? His research changed the way people thought about the initiation of labour, shifting the focus from the mother to the fetus. And in a set of absolutely brilliant and now famous experiments done first at Ruakura, then at University of California at Davis and then at National Women's Hospital, Mont demonstrated that it is the fetus and not the mother that controls the timing of birth. So much of our understanding of the birth process and the care of the premature infant and indeed much ongoing research is entirely based on this extraordinary set of experiments.

The experimental techniques he developed were extraordinary for the time. And he generously shared his expertise with others and laboratories around the world. These were signs of an extraordinary scientist, one informally trained in science, but who quickly developed the highest standards of experimental design, except for one frustrating thing: he was a most reluctant writer. The most annoying thing for me in the 1980s was that whenever I thought I had an idea for a new experiment, I would tell Mont and he would inevitably tell me, 'Oh, I did that years ago, I never wrote it up. I have some old note books somewhere, I will dig them out.' And sure enough he would and there would be the data!

But doing great experiments does not alone make a great scientist; it is recognising that within the unexpected result lies the most informative clues. In the late 1960s, following his earlier experimental line, Mont was giving hormones to pregnant sheep to accelerate birth, and he noted that the lambs that were born premature and should not have been able to breathe easily, could now do so. It was an accidental finding, but one of enormous importance. This was a eureka moment when, in one observation-driven instant, our view of the natural world was radically changed. At that time, to be born premature was often a death sentence – the lungs were too immature to stay distended and the air sacs were not properly developed. What Mont had discovered was that steroid hormones could accelerate the maturation of the lungs. So if he gave the fetus the hormone cortisol before the age at which the fetus would normally have made it, the lungs matured, the baby could be born prematurely and its lungs would work well enough for survival to become possible. And he realised that he could give a form of the hormone to the mother and it would cross to the fetus and also work.

With a speed that seems incredible by today's standards, Mont turned to the clinic. Together with Ross Howie he undertook a clinical trial of giving steroid hormones to mothers in premature labour. Again as in his animal work, the trial design was impeccable and still, almost 40 years later, is recognised as an example of best practice. The results,

published in 1972, radically changed the care of the premature newborn for all time – babies who would have died could now live if their mothers were given steroid hormones when in premature labour. Mont spent many years refining our understanding of how this therapy worked. Over time this therapy, first as Mont described it and then in multiple derivative ways, has meant that literally hundreds of thousands of people are alive today who otherwise would not be.

Honours flowed and in 1980 he received the award he was most proud of, he was elected a Fellow of the Royal Society of London. The obstetrical and paediatric community advocated strongly for the Nobel Prize. Mont retired early – not to leave the University as he continued to be active as a researcher – to avoid his biggest enemy, university bureaucracy.

There are many other aspects to Mont's scientific contributions – his fertility research, his research on how the placenta worked, his discovery of fetal breathing, his studies of diving seals in the Antarctic – all evidence of an extraordinary mind and an extraordinary man. Too often collegiality is not as intense in academia as we would like to claim. The imprint that Mont had left on San Francisco and elsewhere was one of intellectual and personal generosity. The same was true in Oxford, Cambridge, Melbourne and in many other places. I have never met a New Zealander held in such high regard across the world of science. His scientific competitors became his closest friends.

Mont also loved his life outside science: fishing, sailing, trees, Opahi, Rotoiti, his pipe, his dogs; but most of all he was a family man. His open love for Celia, his love for his children and grandchildren; they came through in every interaction one had with him. His last few years were not easy; Celia's long illness, her premature death, his son Graham's death, his slow decline as the battle with his many illnesses was finally lost. But as long as he could, he remained committed to his passion to see great science. He was often in the front row at seminars in the Liggins Institute asking an insightful question; the last time he was in the Institute was to award prizes to the students for their research presentations – he was in his element. Knowledge matters.

Mont has left his mark on the world in many ways: in how we think about the birth process, in allowing premature children to live, on how we study the fetus. And he has left his mark on me. In 1980 we started sharing pregnant sheep for our research, but in those days we did it all ourselves and we were no great farmers. One day we were in the paddocks: Mont, with pipe in mouth, doing vaginal examinations on sheep to see if they were pregnant; Mont, with pipe in mouth, putting identity tags in their ears while I held them. Except that morning Mont managed to miss the ear and tagged my hand instead – Mont's scar is on my right hand for life. As of course will be his wisdom, his advice, his extraordinary knowledge, his support, his passion for great science, his disdain of bureaucracy and his love for a good single malt.

New Zealand has lost a remarkable individual, the medical research community has lost an icon, his family and friends have lost someone irreplaceable. But, as a former vice president of the Royal Society of London wrote to me, 'What a sad loss, but what a great life.'

Prof Sir Peter Gluckman FRS

Auckland, New Zealand

This is an edited version of the eulogy given by Prof Sir Peter Gluckman FRS, 28 August 2010. The full text is available at: <http://www.liggins.auckland.ac.nz/webdav/site/liggins/shared/about/our-people/Docs/Eulogy-Sir%20Graham%20Liggins.pdf>. Reproduced with permission.

RANZCOG Women's Health Award 2010

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists has been proud to present the RANZCOG Women's Health Award for the sixth consecutive year, to outstanding university students in obstetrics and gynaecology from medical schools across Australia, New Zealand, Papua New Guinea and Fiji.

The College is committed to promoting the specialty of obstetrics and gynaecology as an exciting and valuable career option and anticipates that this award will help foster awareness of the specialty among medical students.

At the time of going to press, the RANZCOG Women's Health Award 2010, valued at \$AUD 500, has been received by the following successful awardees:

Catherine Reid
School of Paediatrics & Reproductive Health, University of Adelaide

Kalpa Jayanatha
University of Auckland

Peter Inglis
Faculty of Health Sciences, Flinders University

Rebecca Ryder
Griffith University

Jacqueline Brown, Sneha Kaushal, Angela Clarke, Baljinder Randhwa and Malcolm Forbes (\$100 each)
School of Medicine, James Cook University

Charmaine Tay
School of Medicine, University of Melbourne

Lisa Diana Tescher
Department of Obstetrics & Gynaecology, Monash University

Lauren Kalinowski
University of Newcastle

Jenny Lauschke
University of NSW

Nina Baker
School of Medicine, Dunedin Medical School, University of Otago

Elizabeth Goulding
University of Tasmania

Mohammad Khan
University of Notre Dame

Lipi Shukla
Bond University

Kathryn Stone
School of Clinical Medicine, Australian National University

Tim Sullivan, 2009 award recipient, writes
'I finished my MBBS at the University of Sydney at the end of 2009, and have spent the last year between Gosford Hospital and Wyong Hospital on the NSW Central Coast. Having overcome the initial terror, I have relished the increased responsibility and enjoyed the challenge of my intern year. I have an ongoing interest in paediatric and obstetric health.

'The RANZCOG Women's Health Award 2009 served as a catalyst to contemplate maternal mortality and subsequently provided a greater understanding, regarding both the magnitude of the problem and the resulting consequences. I am currently looking to publish an article on this topic. In the future, I hope to follow a career path that allows me to pursue these interests.'



The University of Melbourne's RANZCOG Women's Health Award recipient for 2010, Charmaine Tay.



Tim Sullivan, a 2009 prize recipient, with his RANZCOG Women's Health Award certificate.

From the Frank Forster Collection

Diane Horrigan

RANZCOG Librarian

The main focus of the Frank Forster Collection is its emphasis on the history of obstetrics and gynaecology, particularly in Australia but also worldwide. This collection of rare books and a wealth of peripheral material is what makes it stand as the best obstetrics and gynaecological collection in the southern hemisphere.

Frank Forster built the collection and was well known for collecting anything and everything. Some of the more unique items Frank acquired are described below. These are only a few of the titles that can be found in the library.



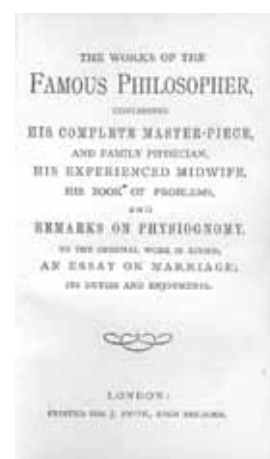
A cartoon guide to the Kinsey Report, edited by Charles Preston, Sydney: Baromor Publications, c1954.

Charles Preston was a noted cartoon editor for the *Wall Street Journal*. He provides a satirical 'illustrated' look at the average person's response to the Kinsey Report. The Kinsey Report was based on two books written on human sexual behaviour in 1948 and 1953, by Dr Alfred Kinsey. An American zoologist, he founded the Kinsey Institute, which focused on sex, gender and reproduction. These publications shocked the public as it challenged conventional beliefs about sexuality and talking about subjects that were once considered taboo.



Monk, Maria d. ca. 1850, Awful disclosures of Maria Monk or the hidden secrets of a nun's life in a convent exposed, Sydney Sir Robert Bear, 1897

This book was later exposed as a fraudulent work, supposedly based on the life of Maria Monk, born to a Protestant family in 1816 or 1817, who claimed that her 'time' spent in a nunnery in Montreal was sexual and violent. Maria suffered from a brain injury as a child, and was influenced by opportunistic 'Nativists', at a time when anti-Catholic literature became more widely available.



Aristotle's works. Illustrated...containing...the masterpiece. Directions for midwives, counsel and advice to child-bearing women. with various useful remedies., London, Milner and Co., Printer for the booksellers, 1819.

The works of Aristotle, the famous philosopher. The first part treats the manner and parts of generation in both sexes. The second part is wholly designed for the female sex, looking at the distempers of the womb, their causes and proper remedies for their cure. All the library's editions are pocket sized with some only having the text. One edition features the 'essay of marriage' as an additional text with illustrations.

Dr Edward Hon book wanted for the collection

The library is in the process of acquiring all published works by Dr Edward Hon, in regards to his work in the development of ultrasound. The following title is currently unavailable to purchase:

- Hon, Edward H, 1917 An atlas of fetal heart rate patterns, New Haven, Hart Press, 1968.

If you would like to donate a copy to the Library it would be greatly appreciated.

Book sale: The library will be publishing a list of titles for sale in the next issue of *O&G Magazine*.

New DRANZCOG curricula

Training in women's health

Prof Ajay Rane

Chair, Conjoint Committee for the Diploma of Obstetrics and Gynaecology FRANZCOG

Mrs Anna Kaider

Senior Diploma Coordinator

Mr Julian Cross

Director, Assessment and Development

RANZCOG, the Royal Australian College of General Practitioners (RACGP) and the Australian College of Rural and Remote Medicine (ACRRM) are committed to developing initiatives that facilitate access to high-quality health outcomes for the women of Australia and New Zealand, and their families.

With this commitment comes an acknowledgement that these services are delivered not only by specialists, but also a range of medical practitioners that require the knowledge, skills and professional qualities necessary to

provide these services with confidence. This is particularly the case in locations without a tertiary hospital or where specialist assistance is remote. For some time, one of the activities in which the three Colleges have cooperated to enable this commitment to become a reality has been the training of general practitioners and others to attain the DRANZCOG and DRANZCOG Advanced qualifications through the tripartite arrangement known as the Joint Consultative Committee on Obstetrics (JCCO).

As has been previously advised in *O&G Magazine* through columns by the RANZCOG President and CEO, in late 2008, the three Colleges signed a Memorandum of Understanding to disband the JCCO and replace it with a conjoint committee structure hosted by RANZCOG, known as the Conjoint Committee for the Diploma of Obstetrics and Gynaecology (CCDOG), to undertake the functions previously conducted by the JCCO under revised governance arrangements for the Diploma qualifications. As part of its activities since its inception, the CCDOG has undertaken a comprehensive process of review of the Diploma and Diploma Advanced training programs that has included extensive consultation with stakeholders and led to a revision of the Diploma curricula and training programs.

Review process

The CCDOG Education and Assessment (EA) Subcommittee, responsible for reviewing the curricula, sought specific feedback via online questionnaires and direct communication with key stakeholders involved in the DRANZCOG/DRANCOG Advanced training programs, including hospital Directors of Obstetrics and Gynaecology, Diploma Training Supervisors and Diplomates certified in the last five years. The EA Subcommittee also consulted widely with peak private and government health organisations, as well as community interest groups. The data collated were not only used to directly inform the curriculum review process, but also have led to important changes in the structure of the training programs, accreditation of hospitals and Training Supervisors and recertification of Diplomates made by the CCDOG Training, Accreditation and Recertification Subcommittee.

The three-tiered model

From the outset of the curriculum review, it was apparent that the

new structure would need to address three distinct levels of practice if it was to fully and effectively meet the needs of potential user groups. This recognition is reflected in the newly implemented three-tiered model that has been developed:

1. Certificate of Women's Health for practitioners who desire increased knowledge in women's health that centres primarily on office-based, non-procedural practice, including antenatal shared care.
2. Diploma for practitioners who wish to gain skills in intrapartum obstetrics to a level that will enable them to safely undertake non-complex deliveries.
3. Diploma Advanced for practitioners who have gained skills in obstetrics through the Diploma and wish to develop them to a level that will enable them to safely undertake complex deliveries and gynaecological emergencies. The new Diploma Advanced program also includes training in basic obstetric ultrasound skills required of practitioners working in relative isolation in rural and remote areas.

The knowledge and skill competencies of each qualification are organised into subject areas. Each subject area offers considerable breadth in terms of content and the depth of knowledge and skills that is acquired, with each higher qualification building on the previous one (see Table 1).

'The College has endeavoured to create a training program that... allows Trainees to flexibly achieve the knowledge, skills and professional abilities that are considered to be fundamental to the provision of high-quality women's health services across all communities in Australia.'

Fundamental to these qualifications is flexibility in completing training requirements: multiple pathways exist to achieve the desired outcome. Trainees are able to take advantage of a variety of relevant training opportunities and tailor their learning so as to best suit their competency development. Training may take the form of a blended experience gained in multiple sites, such as GP practices and hospitals accredited with RANZCOG for Certificate and Diploma training. These training arrangements enhance workforce flexibility, quality health service provision to women and training experiences simultaneously.

Learning support

While learning primarily occurs in the workplace with the support of a collaborative community of clinical educators, supervisors and

Qualification	Certificate in Women's Health	DRANZCOG	DRANZCOG Advanced
Requirements	CWH1: Basic skills CWH2: Introduction to Antenatal & Postnatal Care CWH3: Special topics in Antenatal & Postnatal Care CWH4: Introduction to Gynaecology CWH5: Special topics in Gynaecology	Certificate of Women's Health and DRAN1: Basic skills DRAN2: Antenatal care DRAN3: Labour DRAN4: Postnatal & Neonatal Care DRAN5: Procedural Gynaecology	DRANZCOG and DRAV1: Advanced Obstetrics DRAV2: Advanced Gynaecology DRAV3: Ultrasound
Assessment	1. Logbook 2. Three workplace-based validations 3. CWH 100 MCQ Written Examination	1. Logbook 2. Six workplace-based validations of clinical and procedural skills 3. DRANZCOG Written Examination 4. DRANZCOG Oral Examination	1. Logbook 2. Seven workplace-based validations of clinical and procedural skills 3. Five case syntheses on a range of obstetric cases

Table 1. Certificate in Women's Health, DRANZCOG and DRANZCOG Advanced structure.

peers, it is further supported by targeted face-to-face workshops and an integrated suite of 13 self-paced online modules. The online modules guide learners through the literature and provide access to a range of dynamic resources, active learning tasks and genuinely collaborative learning exercises to encourage peer networking and shared learning.

Online modules are mapped directly to the curricula, with clearly stated learning outcomes. They can be completed sequentially or non-sequentially at the learner's own pace according to their individual needs. Each online module guides the learner through selected resources that are tied to active learning tasks. Targeted discussion forums promote peer networking and collaboration. Pre- and post-test questions enable learners to test their own knowledge and direct their learning appropriately. The online modules are also designed to support clinical educators and Training Supervisors as well as Trainees and serve as a useful point of reference for appraisal and assessment.

Workplace-based validation of skills

The clinical encounters that Trainees face every day provide learning experiences that can also act as authentic assessment opportunities. The purpose of Workplace-based Validations is to assess Trainees at the time of doing, in real patient scenarios during normal everyday work. When a Trainee is involved in a clinical encounter or performing a procedure that may be assessed, a suitable Assessor utilises the relevant form to assess the Trainee's performance against the standards, or clinical anchors, described for each criterion. A suitable Assessor is one who has worked with the Trainee and who can make a balanced and informed judgement of the Trainee's performance; the Training Mentor, Training Supervisor or another 'teacher' who has guided and supported the Trainee's knowledge and skill development, namely other consultants or senior registrars (MRANZCOGs), who have been approved by the Training Supervisor to act as Assessors. Embedding this assessment process in the everyday work of Trainees formalises the learning opportunities that already exist with each clinical encounter, provides structure for feedback and learning, and enhances the overall training experience.

Recertification requirements

The RANZCOG Women's Health qualifications are re-certifiable and time-limited. This recertification is contingent on the Certificate

or Diploma holder accruing points in the RACGP QI&CPD or ACRRM PD Programs. By maintaining the currency of their qualification through ongoing professional development, doctors may then elect to undertake further training without the need to repeat the training requirements of their existing qualification.

Conclusion

Through the inception of the CCDOG and the review of Diploma program offerings, RANZCOG, in conjunction with the RACGP and ACRRM, has heeded the call for increased flexibility in training from Trainees, recently qualified Diplomates and training providers. Following comprehensive review of the existing curricula, the College has endeavoured to create a training program that is well resourced, supported and allows Trainees to flexibly achieve the knowledge, skills and professional abilities that are considered to be fundamental to the provision of high-quality women's health services across all communities in Australia.

For further information on the new Certificate and Diploma training programs, please contact Anna Kaider, Senior Diploma Coordinator: 03 9412 2982, akaider@ranzco.edu.au .

Notice of Deceased Fellows

The College was saddened to learn of the death of the following Fellows and Honorary Fellows:

Dr Kenneth Hugh Atkinson, NSW, on 25 November 2010
Dr Jeanette Barten*, Sulawesi, Indonesia, on 21 November 2010
Dr Malcolm Francis Catt, NSW, on 26 January 2011

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