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Office gynaecology

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists

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Women's health

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From the President

Prof Michael Permezel
President

Given the forthcoming joint RANZCOG/RCOG Scientific Meeting in Brisbane, in April 2015, and the Sydney ASM, in late 2013, the decision was made not to have an Annual Scientific Meeting in 2014. This has led to an increased focus on the Regional Scientific Meetings in 2014: Provincial Fellows in Port Lincoln, Queensland-NSW on the Gold Coast, WA-SA in Broome and Victoria-Tasmania in Melbourne. These are all important events in the College calendar, with high-quality scientific content and great camaraderie among attendees. Each was superbly organised by Fellows, supported by College staff, with the best national speakers giving many superb talks. I encourage you all to support your regional meetings in the future – as well as the 2015 ASM in Brisbane.

Selection for specialist training

I write this on a fine Saturday morning, receiving news from our prospective Trainees as to whether they have or have not been invited to the interview stage of College selection for specialist training. This year there were more than 250 applicants for fewer than 80 positions in Australia (New Zealand completed their parallel process earlier). So many current Fellows, not least the author of these words, would have really struggled to achieve selection under such intense competition. Disappointment merges with incredulity when an outstanding doctor misses out on his/her ambition to begin a career in obstetrics and gynaecology. So what is the process?

In essence, selection for any position in the workforce must rely on a written application accompanied by a curriculum vitae, referee reports and an interview. The curriculum vitae is scored, but relatively little differentiates prospective Trainees. Rurality, Indigenous background or a brilliant academic record identify only a few. Almost all meet the criterion related to experience in obstetrics and gynaecology. Referee reports are highly structured,

but almost invariably the referees rate their prospective Trainees very highly across all areas. Challenging interview questions are developed by the selection subcommittee and are uniform across all interview panels.

Any selection process will never be perfect and the selection process of all the specialist colleges will inevitably come under increased scrutiny as the tsunami of young medical graduates seek specialist training in a competitive environment that can only be described as extreme. The College will strive to further improve its processes with the objective of being both fair and transparent – but also with the intention of trying to select the best possible future specialists in obstetrics and gynaecology.

> 'The College will strive to further improve its processes with the objective of being both fair and transparent – but also with the intention of trying to select the best possible future specialists in obstetrics and gynaecology.'

Women's health

Morcellation and mesh

Morcellation of fibroids and mesh for pelvic organ prolapse are two issues that have attracted much recent publicity. This is, in part, because of some adverse outcomes, but more particularly following news statements from the US Food and Drug Administration (FDA) such as: the 'FDA discourages use of laparoscopic power morcellation for removal of uterus or uterine fibroids.'

The College clearly has a role to play in communicating accurate information to Fellows through such avenues as its website, electronic newsletter (Collegiate), journals and scientific meetings. Importantly, there is also a role for the College in limiting unfounded alarm, such as when urinary continence procedures involving tape had been inappropriately grouped in the same context as mesh procedures for pelvic organ prolapse. The College is indebted to members of the Women's Health Committee and also to experts such as Prof Malcolm Frazer (Chair of the Urogynaecology Subspecialty Committee) and A/Prof Anusch Yazdani (Vice-President, AGES), who have greatly assisted in the development of College responses to these important issues.

National Cervical Screening Program

Members and Trainees are by now aware of the planned changes to the National Cervical Screening Program (NSCP). The Australian Medical Services Advisory Committee (MSAC) has recommended that the NCSP move to using a primary human papilloma virus (HPV) test to prevent cervical cancer (see article written by Prof Ian Hammond on p26).

Australia will be the second country (the Netherlands is to start in 2016) to make this decision, which is expected to further reduce incidence and mortality from cervical cancer. It is anticipated that

any changes will not be implemented before 2016; however, the key recommendation is five-yearly cervical screening using a primary (HPV) test, commencing at 25 years of age with exit testing of women at 70–74 years of age. Triage of positive HPV tests will occur through partial genotyping and liquid-based cytology. Australia has the second-lowest incidence and the lowest mortality rate from cervical cancer in the world. This new screening strategy (along with HPV vaccination) is predicted to further substantially reduce mortality and morbidity from cervical cancer by at least 15 per cent.

Pastoral care

Council acknowledges the importance of the College providing appropriate and adequate support for Trainees and Fellows in difficulty, whether as a result of events in one's personal or professional life, a College decision or other matter. There is, however, no easy solution and while the importance of colleagues and mentors cannot be overstated, the College remains open to suggestions of mechanisms that RANZCOG might establish to better provide pastoral support to its members.

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Liam Davison

All at the College were devastated to learn that one of our long-standing senior staff, Liam Davison, was, together with his wife, among those lost with Malaysian Airlines flight MH17. Liam made an enormous contribution to the College over almost eight years; most recently leading the online learning portfolio and CLIMATE development. He was always very generous with his time and had a great sense of humour. He will be greatly missed. See p71 for the tribute that Lyn Johnson delivered at the recent meeting of the College Council.

Council

July 2014 saw the last meeting of the Eighth RANZCOG Council. At the time of writing, elections for the Ninth Council are in process. It is timely for me to thank outstanding contributors who are leaving Council after many years of service. Dr Tony Frumar (NSW) has served seven years on Council and numerous College committees, Prof Sue Walker (Vic) for six years, with a particularly important contribution to the Women's Health Committee. In addition, Dr Amber Moore and A/Prof Beverley Vollenhoven have chosen not to re-nominate for Council after varying terms on Council and associated committees. Through their tireless *pro bono* work on College committees, these and all Councillors have made outstanding contributions to women's health, to training and the Fellowship. The gratitude of all the College goes with them.

Elections for the Board of the Ninth RANZCOG Council were conducted at the July 2014 meeting of Council. I am delighted to welcome two new members to the Board: Dr John Tait (Vice-President) and Prof Ian Symonds (non-Office Bearer); and the return of Dr Vijay Roach (Vice-President), A/Prof Steve Robson (Vice-President), Dr Martin Ritossa (Treasurer) and Dr Sarah Tout (non-Office Bearer). I would like to most sincerely thank Dr Gino Pecoraro who leaves the Board after six years of service and whose extensive contributions to the Board and Council have been greatly appreciated by all.

From the College

James McAdam
CEO

In my introductory piece for *O&G Magazine*, I indicated that it was my preference that the magazine be for the Fellows and members more broadly and therefore it was my intent that you hear less from me rather than more. Some nine months into the role, however, I think it is timely to update the membership on a two recent developments.

RANZCOG Foundation

The College has, for quite some time now, had a disparate approach to its philanthropy. The College has been active in a number of areas: research, scholarships, humanitarian aid in the Asia Pacific region, support for the Indigenous peoples of our two countries and the College Collection. All these activities are laudable; however, there has been a lack of co-ordination in the fundraising and philanthropy that support these important works.

As a result, in addition to the RANZCOG Research Foundation, a separate entity that sat outside the College, there are a number of other trusts and committees within the College that seek to raise funds to support their work. All these activities have, in effect, grown organically, creating a structure that is overly complex and sees unnecessary duplication of staff activity, multiple governance structures and other inefficiencies such as financial structures.

A College Foundation, acting as an umbrella for all our philanthropic endeavours, allows not only for enhanced governance structures and streamlined administration, but it also provides a mechanism for the co-ordination of our fundraising. More importantly, it also allows the Foundation to better engage with Fellows as potential donors and will seek to engender a 'culture of giving' within the College membership; where all College members feel connected with the aspirations of the foundation and many are inspired to donate.

Cognisant of the need to honour the memory of the benefactors and leaders of the past, after whom so many awards and funding streams have been named, the concept of a College Foundation was supported by the RANZCOG Board and, in turn, the Board of Directors of the RANZCOG Research Foundation. Following approval of Regulations establishing a College Foundation and Terms of Reference for the Management Committee, the membership of the RANZCOG Research Foundation voted to 'wind up' the activities of that Foundation, with its activities and assets to be transferred inside the College.

All existing scholarships and trusts administered by the RANZCOG Research Foundation are protected and will continue their mission and purpose within the College structure. The funds of these trusts and scholarships are protected inside the College accounts to only be used for the purposes for which they were endowed.

The Foundation Management Committee (RFMC) will operate under similar arrangements to the Board of Directors of the RANZCOG Research Foundation, albeit with expanded functions,

co-ordinating all College philanthropic activities. These expanded functions will include responsibility for fundraising for Indigenous women's health, Asia Pacific and global women's health, as well as the historical collections. In this work, the RFMC will work closely with the various College committees already involved in philanthropic activities, assisting them in their endeavours.

Financial consolidation

One of the challenges I encountered when starting at the College was the devolved manner in which the College's finances were handled and the need to provide a system that reduced risk, increased transparency and ensured the invested funds of the College were working to support the mission and purposes of the College.

With the regions currently retaining much responsibility for their financial matters, the College has six separate general ledger accounting systems and no common chart of accounts. There are also, across the organisation, multiple bank accounts and investment approaches. All of this culminates in unnecessary difficulty for the College's finance department in adequately accounting for assets and liabilities and revenue and expenditure.

Additionally, because of the variety of accounting packages in use, there are different processes and procedures for data back up and increased threat to data security owing to the age of unsupported systems. There is also reduced opportunity for savings and benefits from negotiating banking facilities centrally.

With the endorsement of the Board, a model has been put forward to the regions that will see all College funds consolidated. This will deliver greater transparency and afford improved oversight by the College Board. This consolidated model has the support of the Regional Committees.

Fellows are reassured that under this consolidated model, regional funds will be clearly identified and 'ring-fenced' in the College balance sheet, with Regional Committees retaining discretion over expenditure of their funds. Of note, regional cash in bank accounts and fixed-term deposits will be invested in accordance with the College's investment principles and, over the long term, are anticipated to deliver a much higher rate of return for the Regional Committees.

Importantly, the new consolidated model will continue to recognise the critical *pro bono* contribution made by Fellows to regional activities such as Regional Scientific Meetings, mock OSCEs and other educational activities, by ensuring that the regions retain a share of any surplus that results from these activities.

The new approach will be more cost effective and transparent for both the College Board and Regional Committees, while ensuring that risk is reduced. It will also encourage regions to consider ways in which the return on their invested funds can be used to further the purposes of the College in their region.

The Finance Department is going through a phase of transition at present, with a new Director of Finance and Infrastructure, Mr Paul Stathis, a new accounting system and several new staff. This has presented the department with some obvious challenges, which are taking some time to bed-down. On that basis, the consolidation is anticipated to occur in early 2015.

Both of the new measures described in this article represent a change to the way the College has traditionally operated. I firmly believe that both will position the College well for a strong performance into the future.

Editorial

Dr Brett Daniels
FRANZCOG

Office gynaecology is a mainstay of practice for many of the readers of *O&G Magazine* and may well become more important in the future, with pressure to deliver more care on an outpatient basis. While the topics covered by the articles in this issue may seem familiar, in each case there are advances in techniques, therapy and accepted practice that can add to the armoury of clinicians.

One theme of this issue is that procedures that may previously have been performed in the operating theatre are now available in the outpatient setting, especially in the case of hysteroscopy. Two articles, one by Khadoun Aweidah and another by Nomiko Kobayashi and Boon Lim, describe the equipment and practice of office hysteroscopy. Using small-diameter modern hysteroscopes and a non-speculum vaginoscopic entry technique, women can receive diagnostic and other hysteroscopic procedures without the need for a general anaesthetic. Astrid Budden reports on her experiences in outpatient hysteroscopic insertion of the Essure sterilisation device. She reports performing over 200 cases, mostly without anaesthesia, providing an alternative to laparoscopic sterilisation.

In addition to procedural articles, this issue further discusses common gynaecological consultations. There are excellent updates on the management of chronic pelvic pain, polycystic ovarian syndrome, contraception, infertility, vaginal discharge and other common presentations. Finally, there are two articles on cervical dysplasia. Louise Farrell provides an update on colposcopy while Ian Hammond gives a succinct summary of the impending changes in the Australian National Cervical Screening Program, proposed to begin in 2016. These changes represent a substantial change in screening frequency and technique with a two-yearly Pap smear being replaced by a five-yearly HPV test and are essential reading for anyone involved in cervical screening.

Contraception: a new focus

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The focus of contraceptive practice in Australia is changing[1] to highlight the benefits of long-acting reversible contraception.

There is strong evidence to prioritise long-acting reversible contraception (LARC) to reduce rates of unintended pregnancy.[2] By putting evidence into practice, a well-informed doctor can promote benefits of LARC and remove unnecessary barriers to their use.[3] In this article we also provide guidance on management of problematic bleeding on progestogen-only LARC and describe how to initiate contraception without delay.

LARC is considered the best first-line option for all women, particularly young women who have higher rates of fertility and unintended pregnancy.[4] LARC methods include hormonal IUD (Mirena®), copper IUDs and the contraceptive implant (Implanon NXT®). Contraception efficacy and continuation are important factors in reducing unintended pregnancy, with these methods rating highly on both.[5]

Table 1. The CHOICE Project: cumulative percentage of contraceptive failure at one, two or three years by contraceptive method.[6]

Cumulative failure rate	At one year	At two years	At three years
LARC	0.3%	0.6%	0.9%
Injection (DMPA)	0.1%	0.7%	0.7%
Pill, patch and ring	4.8%	7.8%	9.4%

Table 2. The CHOICE Project: continuation and satisfaction rates of LARC versus non-LARC.[5, 8]

	24 month continuation rates, all ages	24 month continuation rates, women 14–19 years	12 month satisfaction rates
LARC	76.6%	66.5%	83.7%
Non-LARC (DMPA, pill, patch and ring)	40.9%	36.6%	52.7%

A recent large prospective study in the USA, the Contraceptive CHOICE Project, reported on contractive failure, continuation and satisfaction rates (see Table 1, Table 2).[6] This study showed that women who used non-LARC were 20 times more likely to have an unintended pregnancy than those who used LARC [Adjusted Hazard Ratio 21.8: 95 per cent CI, 13.7 to 34.9].[6] Women using a non-LARC who are less than 21 years of age had almost double the risk of unintended pregnancy than older women.

The contraceptive injection DMPA (Depo Provera®, Depo Ralovera®) has efficacy rates comparable to other LARC, but a poor continuation rate (DMPA 38 per cent versus LARC 76.6 per cent continuation rates at 24 months).[5]

The CHOICE Project demonstrated reduction in unintended pregnancy, with a reduction in teenage birth rates to 6.3/1000 women in the study group compared with 34.3/1000 women in the US population. They also reported a decrease in the number of repeat abortions.[7] Reduction in unintended pregnancy and abortion rates has been achieved in the UK, coinciding with a national strategy promoting use of LARC.

LARC have few contraindications and the majority of women, including young women and nulliparous women, are eligible to use implants and IUDs.[9] LARC methods can have additional non-contraceptive benefits, such as reduction in dysmenorrhoea with the implant, and reduction in menstrual bleeding and dysmenorrhoea with the hormonal-IUD.[10] The copper IUD is the most effective reversible method for women who require or desire a non-hormonal method.

Despite the many advantages of LARC, the uptake in Australia is low.[1] The combined pill and condoms are the most commonly used reversible methods in Australia, with women having low awareness of the benefits of LARC. Data from 2003 shows relatively high termination of pregnancy rates in Australia at 19.7 per 1000 women aged 15–44 years, however, these rates may have changed since.[4] Two-thirds of teenage pregnancies are unintended and half of teenage pregnancies end in termination of pregnancy. Contraceptive implants can be initiated immediately postpartum and IUDs inserted within 48 hours of, or from four weeks after, childbirth including after lower segment caesarean section.[9] LARC initiation at the time of termination of pregnancy is more effective at reducing subsequent pregnancy than initiating other methods.[11]

Doctors may have a perceived risk of infection and infertility with IUDs[12] based on older devices and less effective chlamydia screening and thus limit their use for younger women. While there is a small increase in infection in the three weeks following IUD insertion (less than one in 300), there is no evidence of increased risk of pelvic infection after that time and no association with infertility.[13] Women diagnosed with an STI with an IUD in situ may often be managed with the IUD retained, unless they have pelvic inflammatory disease that fails to respond to antibiotics. Nulliparity

is not a contraindication to IUD insertion[9] and in most cases insertion is not technically difficult.

Frequent and/or prolonged bleeding with the contraceptive implant can be frustrating and is the most common reason for discontinuation of this method. However, around 75 per cent of women experience infrequent bleeding or amenorrhoea.[9,14] Patient satisfaction with amenorrhoea and light irregular bleeding may increase with explanation and reassurance about the safety of these patterns. Women need to attend their doctor for implant removal if they wish to discontinue, which may result in a perception bias by doctors who see these unsatisfied implant users. However, evidence shows excellent continuation rates with the implant compared to non-LARC methods.[5]

Bleeding problems with progestogen-containing LARCs

The progestogen-only IUD, implant and injection disrupt the regular menstrual cycle and change vaginal bleeding patterns.

In women with the contraceptive implant, around 20 per cent experience amenorrhoea and 20 per cent experience heavy/prolonged bleeding initially, with 50 per cent of these improving after three months.[14]

The progestogen-only IUD commonly causes initial frequent spotting/bleeding for three-to-five months with frequency of bleeding decreasing by six months, after which time around 50 per cent of women have amenorrhoea.[15]

Bleeding is the most frequent reason for discontinuation of progestogen-only LARC. Guidance is provided in the SH&FPA Joint Statement 'Bleeding pattern changes with progestogen-only LARC'.[16] Firstly consider the need to exclude pathology by taking a sexual history, excluding pregnancy, performing cervical screening, chlamydia testing and further gynaecological investigation as indicated. Women may be offered the following options (if no contraindications):

- Any combined hormonal contraception, cyclically or continuously for around three months.
- Five-day course of NSAID (mefenamic acid 500mg twice a day).
- Five-day course of tranexaminc acid 500mg twice a day.

Return of bleeding is likely when treatment is stopped. Evidence for long-term management is lacking. However, some women may choose to use these intermittently (or a combined hormonal contraceptive used continuously) to manage their bleeding.

On the horizon

A new progestogen-only IUD, Jaydess®, has received TGA approval and is undergoing evaluation for PBS listing. Jaydess contains a lower dose of progesterone and is smaller in size than the Mirena

Quick start

Tammy is a 20-year-old marketing student who presents to your GP clinic pleading for you to insert a contraceptive implant. For the last three months she has been trying to co-ordinate the insertion of the implant; however, the timing of her period, your clinic's hours and her study and part-time work commitments have never aligned. Tammy has been using condoms and three days ago the condom broke and she required emergency contraception. She knows that her period is at least another two weeks away, but she's desperate for reliable contraception. 'C'mon doc, can you help me?'

Traditionally, hormonal contraceptives are commenced early in the menstrual cycle (Day 1–5) to exclude the risk of pregnancy and ensure immediate contraception. Unfortunately, this requirement often delays administration of reliable contraception and also increases the risk that women may forget instructions. Subsequently, this may lead to increased rates of unplanned pregnancies.

Quick start refers to starting hormonal contraception outside the traditional recommended time. This allows improved uptake and immediate commencement of reliable contraception thus potentially preventing unwanted pregnancies. When using quick start, if pregnancy is first excluded (for example, a woman has a negative pregnancy test and hasn't had unprotected intercourse in the last three weeks or has not had sex since the beginning of her last normal menstrual period, or is within 21 days postpartum or five days after termination or miscarriage) all methods of contraception can be considered. If pregnancy cannot be excluded, all methods can be used except the copper or hormonal IUD, which are associated with potential pregnancy complications. The copper IUD can be used if emergency contraception is required.

Women need to be informed about the potential for an undiagnosed pregnancy at the time of quick start contraception. However, they should be reassured that hormonal contraceptives have not been associated with teratogenicity.[17] Unlike the traditional start, contraceptives are not immediately effective and use of condoms or abstinence is required for seven days (or three days in the case of the progesterone-only pill). Additionally, all women are advised that amenorrhoea and irregular bleeding are common with certain methods (for example, contraceptive implant or injection) and that their bleeding pattern should not be used as a reliable method of excluding pregnancy.

Follow up to exclude pregnancy requires a urine pregnancy test four weeks after the quick start method is commenced, regardless of any bleeding. Patients can elect to return to a practice or complete a home pregnancy test. To facilitate this last step, a standard SMS or letter recall system can be used and is strongly recommended for the implant or injection that may mask a pregnancy.

To Tammy's relief, you were able to insert the contraceptive implant that day following a negative urine pregnancy test. Following your advice about the potential risk of pregnancy and the possibility of the implant masking pregnancy, Tammy called four weeks later thrilled to report a negative pregnancy test.

To read SH&FPA guidance on bleeding pattern changes and download Family Planning Victoria's Quick Start consent form and protocol, visit: www.fpv.org.au/portals/health-practitioners-and-human-services/clinical-protocols/ .

Table 3. Comparison of Jaydess IUD and Mirena IUD.

	Levonorgestrel content	Levonorgestrel release	Device size	Inserter diameter	Duration
Mirena	52mg	20μg/day	32×32mm	4.75mm	5 years
Jaydess	13.5mg	12μg/day	28×28mm	3.80mm	3 years

(see Table 3).[19] Some women may favour the lower hormone dose; however, bleeding reduction may not be as significant.

Ulipristal acetate is a progesterone receptor modulator used for oral emergency contraception overseas and may be available in Australia in 2015. Ulipristal acetate works by delaying or inhibiting ovulation. Unlike the levonorgestrel emergency contraception (LNG-EC), it has a direct inhibition of follicular rupture and is more effective. Additionally, excessive body weight has less of an effect on Ulipristal compared to the LNG-EC. The most effective emergency contraception remains the copper IUD inserted within five days of unprotected sex.

Practice points

- IUDs and contraceptive implant have superior efficacy and continuation rates to other methods and should be recommended first line to all women seeking contraception, including young and nulliparous women.
- Attractive features of LARC for patients are that they are 'set and forget', are fully reversible without impacting on future fertility and have low cost for ongoing use.
- Women presenting for review of a non-LARC method such as the pill present an opportunity for a brief discussion of the benefits of LARC.
- Use of pictures, demonstration models (such as placebo implant and IUD) and counselling cards are a useful aid to increase patient understanding and confidence in LARC. For a useful efficacy counselling card and patient factsheet, visit: www.shfpa.org.au/resources-health-professionals.
- Initiation of contraception need not be delayed when using a 'quick start' protocol.

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Hysteroscopic sterilisation

Dr Astrid Budden
FRANZCOG

Lessons learned from using the Essure hysteroscopic sterilisation method in Auckland Hospital since 2010.

I became interested in the Essure® method as I work in diabetes antenatal clinic. Many women with diabetes are poor candidates for a laparoscopic sterilisation in view of their high BMI. We initially started with the procedure in a day-surgery setting, but moved it to our outpatient clinic a year ago. I have performed around 200 procedures, most of them without any anaesthetic. The patients had an average BMI of 30 with a maximum BMI of 60. The average 'scope time' (time from scope in to scope out) is five minutes. Overall, we have had excellent results with this method of sterilisation and find it works well for our population.

The method

In November 2002, Essure Permanent Birth Control System (Conceptus Inc, San Carlos, CA) became the first method of transcervical sterilisation approved by the US Food and Drug Administration (FDA) for use in the USA. It has been performed more than 650 000 times worldwide since.

The Essure device is a metal and polymer micro-insert 4cm long and 1–2mm wide when deployed. It consists of an inner coil of stainless steel and polyethylene terephthalate (PET) fibres and an outer coil of nickel-titanium (nitinol). It comes loaded in a single-use delivery system.

The device is placed in the proximal fallopian tube under hysteroscopic guidance. The coil initially is in a tightly wound state and then is deployed to an expanded state that anchors the insert in the tube. After placement, the PET fibres stimulate benign tissue growth, which surrounds and infiltrates the device over the course of several weeks, leading to tubal occlusion.[1]

Either an ultrasound scan or a hysterosalpingogram is performed 12 weeks later to confirm correct placement of the Essure devices.[2] Contraception must be used until satisfactory micro-insert location and bilateral tubal occlusion are confirmed.

Adiana, another hysteroscopic sterilisation device, was introduced in 2009, but taken off the market in 2012 by the manufacturer for business reasons.

Patient counselling

Inability to complete the procedure occurs in five per cent of cases (owing to inability to visualise ostia, unusual angle of fallopian tubes or blocked tubes). Common symptoms during or immediately after the procedure include mild to moderate cramping, nausea or vomiting, dizziness or light-headedness, and bleeding or spotting. Around two per cent of patients experience a vasovagal episode.[3]

Complications:

- Infection – the risk is similar to other hysteroscopic procedures, which is around 0.1–0.9 per cent.[4]
- Perforation – tubal or uterine perforation has been reported in one-to-three per cent of cases.[5] The perforation might be suspected at the time of the procedure owing to increased pain or unusual distal movement of the device intra-operatively. As the perforation can be asymptomatic it can also be picked up at the time of the follow-up test. A micro-insert that is protruding into or is free in the peritoneal cavity may need to be removed. The concern is significant adhesion formation resulting from the PET fibres.
- Expulsion – this occurs in less than one per cent of cases.[6] Most expulsions present in the first three months and are therefore picked up at the follow-up test. The expulsion can be either through the cervix or from the distal end of the Fallopian tube.
- Failure to prevent pregnancy – the occurrence is from 0.16–0.25 per cent. The risk of falling pregnant is similar to or better than other contraceptive methods. In a large study of 50 000 procedures, 64 patients fell pregnant. All of these cases involved protocol deviations.[7] Failures seem to be associated with pregnancy at time of placement, incorrect placement (perforation), non-compliance with follow-up instructions and misreading of imaging studies.
- Chronic pain – there are reports of chronic pelvic pain requiring removal of the devices, usually by laparoscopy.[8]

Patient satisfaction

A study by Duffy et al compared laparoscopic tubal ligation (Filshie clip) with Essure hysteroscopic sterilisation.[9] The results showed 82 per cent of Essure patients reported procedure tolerance as 'excellent

Advantages and disadvantages:

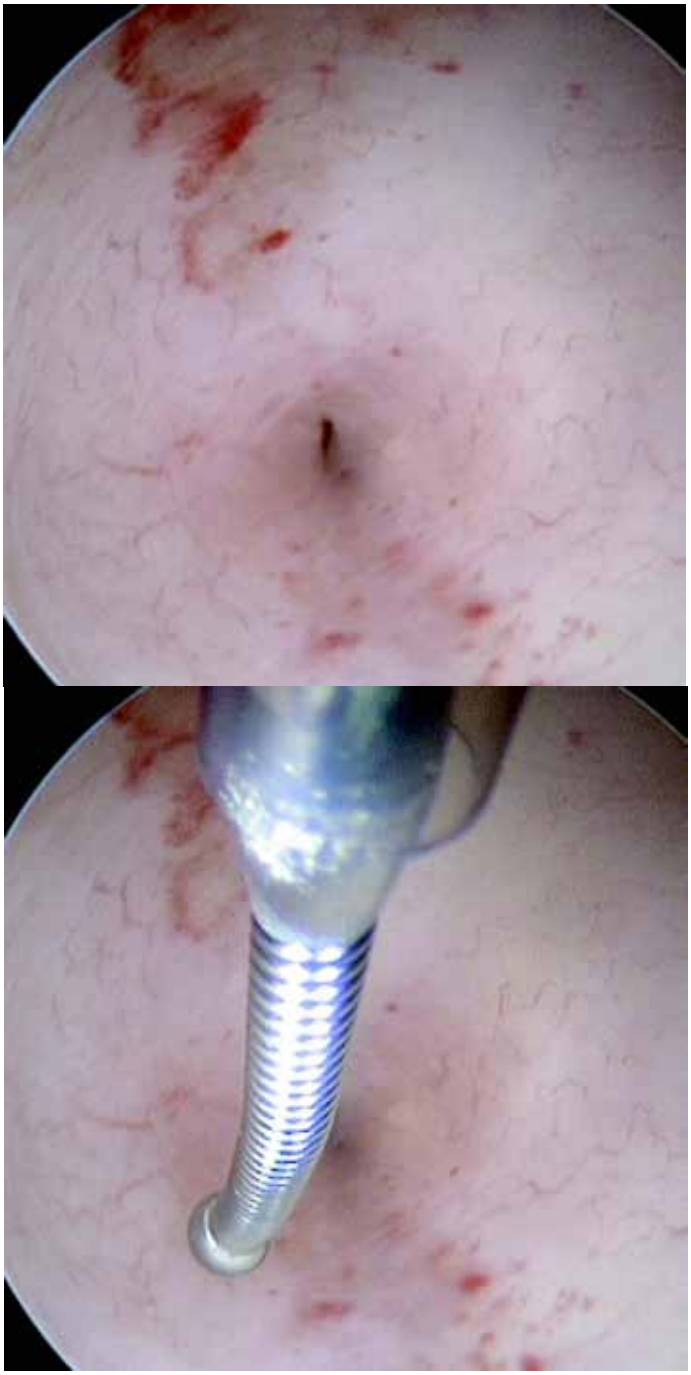
- no incisions;
- no need for general anaesthetic;
- less postoperative pain;
- faster postoperative recovery;
- need for follow-up imaging after three months; and
- need for continued use of contraception until satisfactory follow-up test.

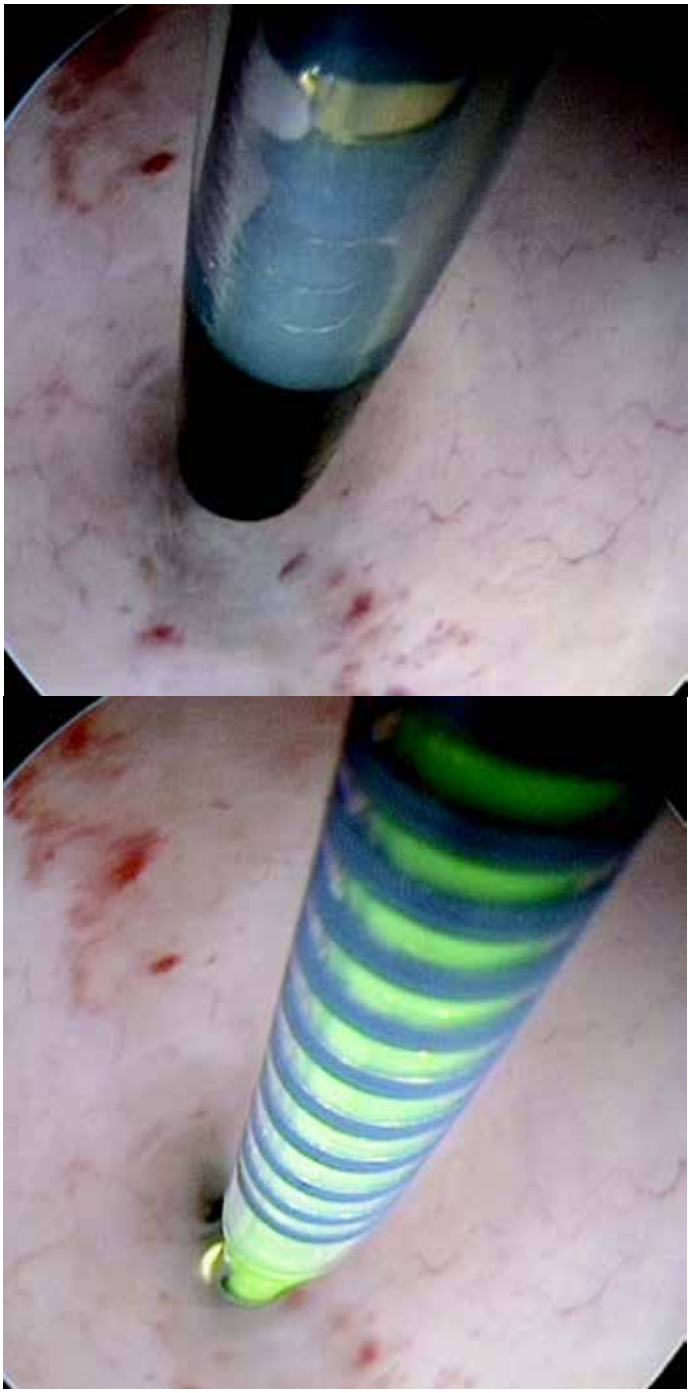
Contraindications:

- uncertainty about non-reversible sterilisation;
- pregnancy or suspected pregnancy;
- less than three months from pregnancy (including TOP/miscarriage);
- active or recent pelvic infection;
- known allergy to contrast media (unable to undergo HSG for confirmation test); and
- hypersensitivity reaction to nickel (however, in 2011, the FDA removed hypersensitivity reaction to nickel as a contraindication to the procedure as the number of adverse events reported had been extremely low (less than 1:5000).[12]

Post-procedure restrictions:

MRI is safe. Pelvic use of unipolar electrosurgery is contraindicated. The FDA has approved endometrial ablation using bipolar radiofrequency, a hot liquid filled balloon or circulating hot water (hydrothermal), as long as there is no reasonable concern that uterine perforation occurred during the sterilisation procedure.[13]





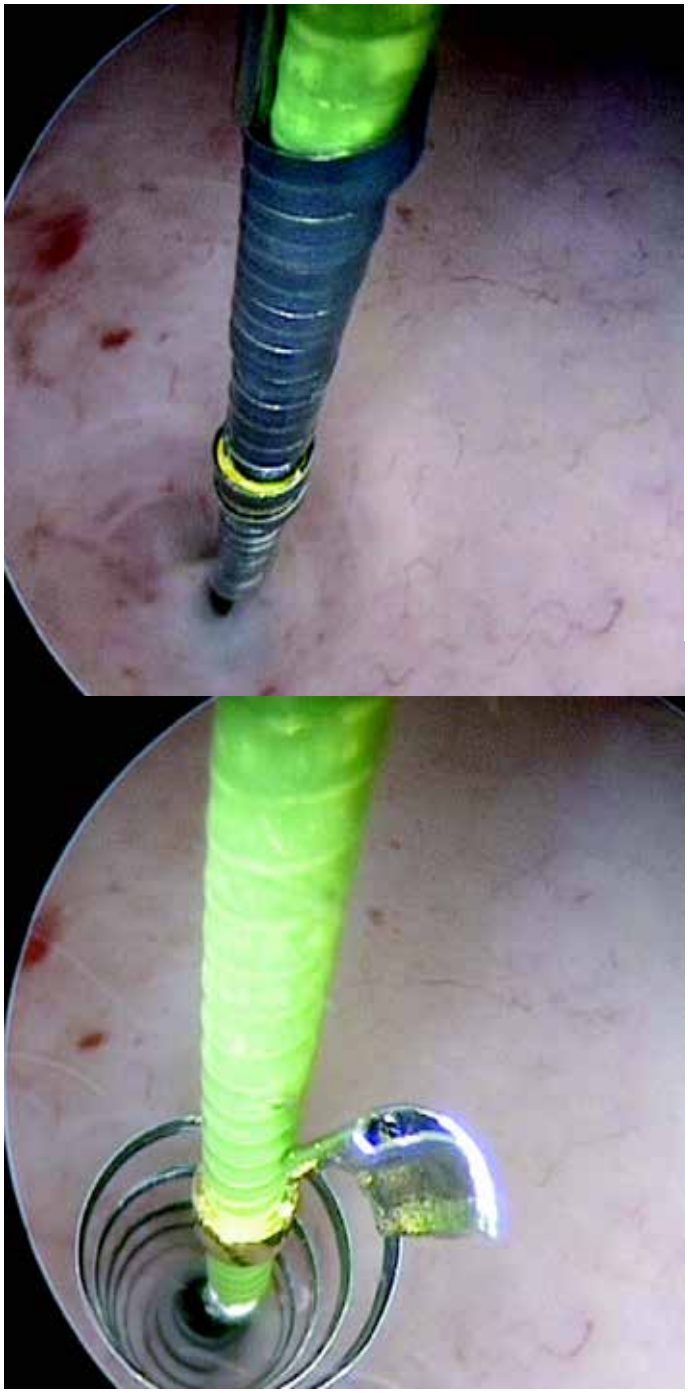
to good' compared with 41 per cent of patients who underwent laparoscopic tubal ligation. This study also evaluated patient satisfaction after a 90-day interval. Of the Essure patients, 100 per cent were satisfied with their recovery, compared with 80 per cent of the laparoscopic tubal ligation patients.

A 2010 publication by Levie et al specifically addressed the question of patient satisfaction with office-based Essure sterilisation.[10] The majority of these patients (70 per cent) rated procedure-associated pain as equal to or less than their typical menstrual pain. Their follow-up surveys were very positive in regard to patient satisfaction. Follow-up surveys were collected for 84 per cent of the study patients and, of these, 92 per cent preferred having the procedure done in the office, 98 per cent would recommend the procedure to a friend, and 93 per cent would undergo the procedure again if necessary. It is not surprising that higher satisfaction was significantly correlated with lower average pain scores.

How is the procedure done?

Timing of procedure and endometrial preparation

To achieve high successful placement rates it is essential to optimise the view of the ostia. The best views are obtained when the endometrium is thin. Ideally the procedure should be performed between days five and ten of the menstrual cycle; this also avoids early luteal phase pregnancies. In practice, we have found it works best to manipulate the period so that the procedure can be booked well in advance. We usually achieve this by either causing a withdrawal bleed after stopping the combined oral contraceptive pill or causing a withdrawal bleed after a five-day course of once-a-day 10mg oral medroxyprogesterone (Provera). Alternatively, we



Figures 1–8. Facing page top left, bottom left; top right, bottom right; this page top left, bottom left; top right, bottom right. Placement of the Essure device via the Bettochi hysterscopy approach.

use the progesterone-only pill for a at least a month. If the patient is amenorrhoeic postpartum, or has established use of Depo Provera or a progesterone implant, the procedure can be scheduled at any time.

Pre-operative

Pre-medication with non-steroidal anti-inflammatory drugs has been recommended to reduce tubal spasm. We use Voltaren SR 75mg an hour before the procedure.

Outpatient clinic set-up

Equipment required:

- Essure devices (good to have spare ones in case of technical difficulties);
- rigid hysteroscope with 5-French operating channel – approximately 3mm diameter with double current sheath (external diameter generally 5–5.5mm);
- hysteroscopic grasper; and
- warmed up normal saline one-litre bags – use sparingly as increased pressure increases patient discomfort and increases tissue oedema, which can make visualisation of the ostia difficult over time.

Personnel

A three-person team is ideal, including: the surgeon; a sterile assistant helping with insertion of introducer and Essure device in the operating channel; and a circulating nurse who can also attend to the patient's needs.

Procedure

Bettochi hysteroscopy approach, see Figures 1–8.

Who should perform Essure placement?

In March 2014, a study from Yale was published by Aileen Gariepy comparing probability of pregnancy after hysteroscopic sterilisation and two different types of laparoscopic tubal occlusion.[11] In their model, the hysteroscopic sterilisation had a higher failure rate compared to the laparoscopic approaches, however, this was owing to patients not completing all the steps of the procedure. The study highlights the discrepancy between 'perfect' and 'typical' use. In some cases financial issues, such as the patient's health insurance not necessarily covering the costs for the follow-up tests, were a factor.

This study supports my belief that the procedure should only be performed by doctors who do the procedure frequently, follow strict protocols, follow up every patient and audit their own results. In Auckland we had only one-to-two per cent of patients failing to return for follow up.

Conclusion

Essure is an effective and safe contraception option for women to consider, especially women with increased BMI. It is important Essure placement occurs in an appropriate setting and is performed by trained personnel.

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Mirena: modern-day miracle

Dr Edwina Morgan
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The Mirena is widely used to treat myriad women's health-related issues. With a flexible T-shaped plastic frame, it contains a cylinder of 52mg of levonorgestrel, which is released at small, metered doses of 12mcg daily for five years. It exerts its effect on the endometrium with minimal systemic progestogenic effects.

Use of the contraceptive intrauterine device (IUD), or variations thereof, dates back to the beginning of the 20th century. Dr Richter of Waldenberg, Germany, described the first genuine IUD in 1909. Two intricately woven strands of silkworm gut were capped with celluloid for intrauterine insertion to prevent injury to the endometrium. The threads at the vaginal end were bound by a thin bronze fragment to herald expulsion and to facilitate retrieval. In an era complicated by endemic gonorrhoea, and thus pelvic inflammatory disease (PID), with no adequate therapeutic treatment measures, IUDs were perceived to be considerable infection risks and hazardous methods of contraception.

The development of a more serviceable device was achieved in 1924, by Dr Ernst Grafenberg, a specialist obstetrician and gynaecologist. It was in the form of an IUD ring and was made of helically wound silver fragments. Damaging reports of IUD-associated PID later led to the German Congress of Gynaecology denouncing Grafenberg's achievements as a medically unacceptable method of birth control. Interesting times.

The device lay dormant for nearly four decades, plagued by its reputation as an inciter of PID, until the first copper-bearing IUD was introduced in 1969. This solved the spatial and painful incompatibilities of previous models, and the T-shape was born. The expulsion rate was radically reduced.

Despite these advances in development, the predominant complaint of menorrhagia remained unaddressed by the copper-bearing devices. This led to the birth of the third-generation, progesterone-releasing IUD in 1977, which revolutionised the world of IUDs with its effect on progesterone receptors in the endometrium.

How does Mirena work?

Continuous low-dose release of levonorgestrel (LNG) has progestogenic effects on the uterine cavity, leading to physical and morphological changes. Thickened cervical mucus provides a physical barrier to sperm penetration. It also inhibits sperm capacitation and survival. The morphological changes include stromal pseudo-decidualisation, glandular atrophy, leukocytic infiltration and a reduction in glandular and stromal mitoses.

Ovulation is maintained in approximately 85 per cent of women using the LNG-IUD. Complete ovulation suppression requires a daily intrauterine concentration of 50mcg LNG, significantly greater than the elution level of this device.

What are the indications?

International consensus has been achieved through multiple randomised control trials (RCTs) and systematic reviews in recognising the use of the LNG-IUD as an effective form of contraception. Published data reveal that the cumulative five-year pregnancy rate is 0.7 per cent, deeming the device as effective as male/female sterilisation techniques. RANZCOG endorses the use of the LNG-IUD as a safe and highly effective method of contraception for use in women of all ages and parity.

The use of the LNG-IUD in the treatment of menorrhagia enjoys statistically proven superiority in reducing 97 per cent of the mean menstrual blood loss (MBL). Comparable results are not achievable with alternative medical therapies, including tranexamic/mefenamic acid, combined oral contraceptive pill (COCP) or gonadotrophin releasing hormone (GnRH) analogues.

The LNG-IUD provides an effective option for the treatment of menorrhagia, with avoidance of the risks associated with a surgical procedure and without permanent loss of fertility.

The Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit (FFPRHC) in the UK provides guidance and information to clinicians and women on evidence-based practice in women's health. The recommendations regarding the LNG-IUD report it is as effective as conservative surgery (resection or ablation) in the management of menorrhagia after the first year of treatment.[2]

Other benefits

- Progestogenic HRT and effect on lipid metabolism in post-menopausal women: the LNG-IUD is effective in providing endometrial protection from stimulatory effects from oral and transdermal oestrogen, thereby reducing the risk of hyperplasia and malignancy.
- When used in conjunction with oestrodiol, it has proven cardio-protective qualities by maintaining baseline HDL levels after 12 months of treatment. Similarly LDL-cholesterol levels are reduced.
- Endometriosis: prospective studies report an 80 per cent reduction is primary dysmenorrhoea and MBL in women with a diagnosis of endometriosis.
- Fibroids: the LNG-IUD provides improvement in fibroid related menorrhagia and dysmenorrhoea, and also boasts a documented reduction in fibroid volume.
- Treatment of early endometrial hyperplasia: there is proven efficacy in treatment of endometrial hyperplasia owing to anti-proliferative and suppressive effects on the endometrium.
- Prevention of PID: a large European multi-study RCT (Luukainen, 1987) demonstrated a significantly lower incidence of PID and subsequent long-term protective effect in LNG IUD users than with other IUD users.
- Ectopic pregnancy: there is a reported annual incidence of 0.1 per cent ectopic pregnancy in women with a LNG IUD in situ. The use of the device is not contraindicated in women with a history of previous ectopic pregnancy as it does not increase the incidence of recurrence (WHO classification Category 1: Unrestricted use).

- It is safe for use in breastfeeding mothers after four weeks postpartum and beyond.
- Use in women with a history of migraine with focal symptoms also appears appropriate.
- As a long-acting reversible contraceptive (LARC), it carries a five-year licence.
- It is reversible and allows rapid return of fertility.
- There is no evidence of any detrimental effect on bone mineral density (BMD).

What are the contraindications and complications?

There are some contraindications to consider. They include:

- pregnancy;
- acute PID – it is imperative to ensure a minimum period of three months post effective treatment before insertion of the IUD;
- congenital or acquired distortions of the uterine cavity (fibroids, septae);
- postpartum endometritis after three months;
- uterine or cervical neoplasia;
- progestin-sensitive breast cancer;
- uterine bleeding of unknown aetiology;
- acute liver disease or liver tumour (benign or malignant);
- a previously inserted IUD that has not been removed; and
- a hypersensitivity reaction to IUD product components.

Patients should be counselled about the following possible complications:

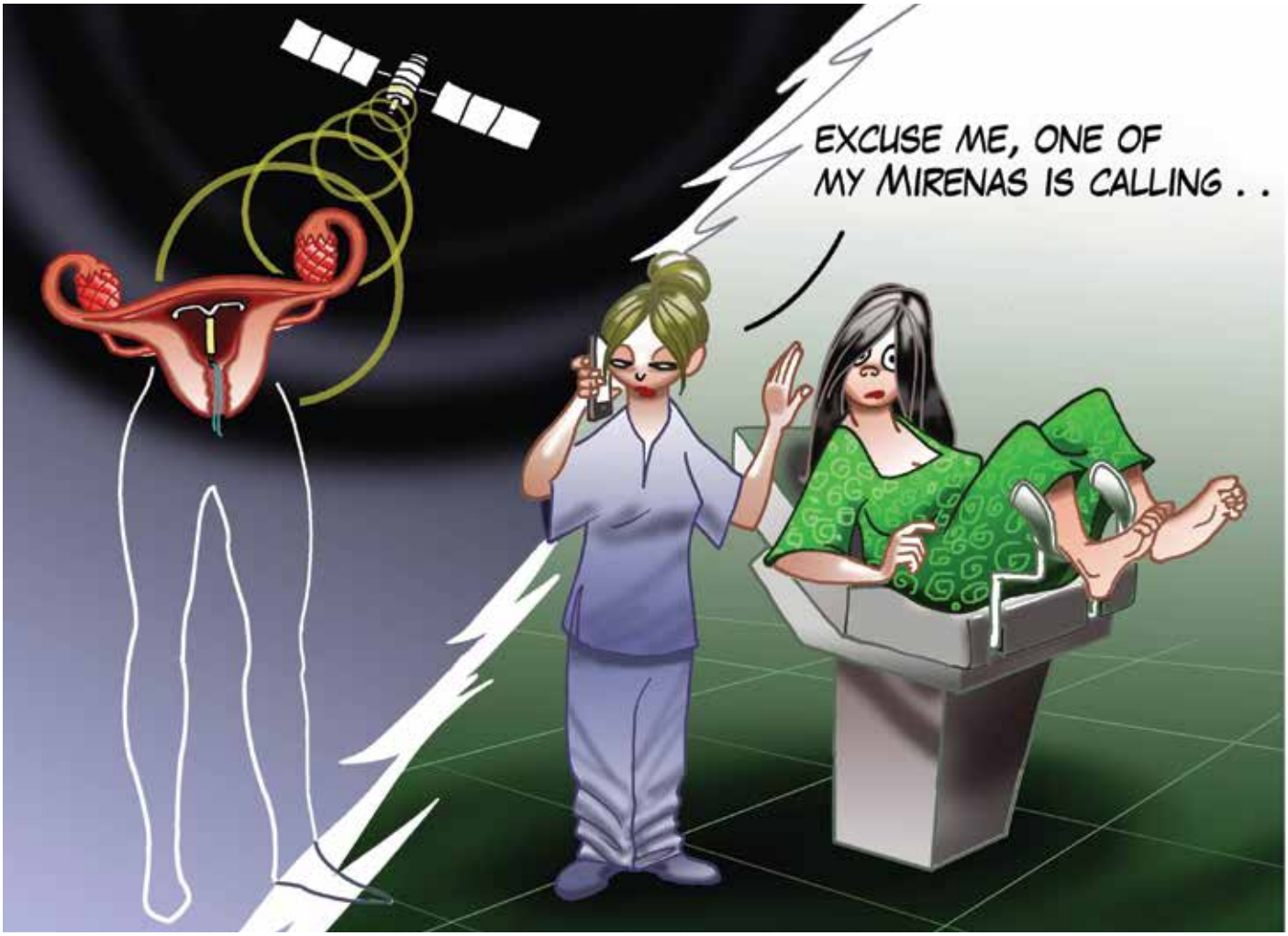
- Ovarian cysts: risk 1.2 per 100 women-years (eight per cent); 94 per cent are asymptomatic, small and self-resolving.
- Unscheduled vaginal bleeding: irregular bleeding/spotting in the first three-to-six months is common.
- Systemic hormonal side effects: oedema, weight gain, headache, acne, hirsutism and breast tenderness.
- Failure rate: less than one per 100 women years; 4.5 per cent risk of expulsion over five-year duration.
- Insertion complications; risk of uterine perforation <0.1 per cent; more difficult/uncomfortable insertion in nulliparous women (Society of Family Planning, 2009).
- Uterine abnormalities: not recommended if fibroids distort the uterine cavity or if a congenital abnormality of the uterus is known.

Is it cost effective?

Analyses of LARC measures have been conducted comparing the cost-effectiveness ratios of LNG-IUD, copper IUD, depot medroxyprogesterone acetate injection (DMPA) and oestrogen subdermal implant. These methods were also compared to the COCP and female sterilisation techniques.

The studies included contraceptive provision and equipment costs, health professionals' counselling, insertion and removal time. Consideration of the total number of unintended pregnancies resulting from contraceptive failure or discontinuation was similarly evaluated for each method.

LARC methods were proven to be more cost-effective than COCP, reducing the number of unintended pregnancies and thereby generating net cost-savings for up to six years. Beyond six years,



This scenario is not as far-fetched as it may, at first, seem.

female sterilisation procedures proved to be more cost effective than LARC methods as they provided 100 per cent compliance and a low failure rate.

The Mirena is PBS listed, at a cost of $36.90 for five years' duration. It is an extremely cost-effective means of contraception and control of dysfunctional uterine bleeding.

What does the future hold?

The UN strategy for Women and Children's Health was founded in 2012, and focuses on the global expansion and access to family planning services and facilities for women and girls in the developing world. Family Planning 2020 aims to build new partnerships and new commitments to enable an additional 120 million women from the world's poorest countries to access modern contraception by the year 2020. The introduction of the LNG-IUD to such outreach populations has the potential to offer long-lasting and highly effective means of contraception. Ensuring the supply of appropriate equipment, education and user-competency is essential in the success of such a project. These goals can be implemented through mobile outreach services including the Marie Stopes Foundation, which has access to highly populated sub-Saharan African communities.

Have you ever considered remotely controlled or monitored contraception? A 1.5cm-wide microchip housing reservoirs of the hormone LNG has been submitted for clinical testing in the USA. A small electric charge melts a thin seal housing the LNG, releasing a 30mcg daily dose. The microchip can remain in situ for a period of 16 years. Controlled remotely, it and can be activated and deactivated at times of convenience, particularly when planning a family.

Just imagine: you could receive encrypted data from your patient's IUD on your iPhone, warning of malfunction, impending failure or low elution levels. The future is both challenging and bright. Be sure to keep abreast.

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Colposcopy 2014

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FRANZCOG

Colposcopy itself is currently in a zone of transformation, with new technology and the Renewed National Cervical Screening Program both affecting practice.

Colposcopy is the visualisation of the cervix and vagina using a binocular microscope together with a bright light source and magnification. The purpose is to locate the transformation zone (TZ), characterise the type of TZ (1, 2 or 3), determine whether normal or abnormal and predict the grade of abnormality. It involves the subjective interpretation of pattern recognition that uses features such as size of TZ, vascular patterns, the type of acetowhitening, borders and iodine uptake. Colposcopy is used to direct both biopsies and treatment.

Indications for colposcopy

Currently colposcopy is needed in the following four situations:

1. for evaluation of a woman with a screen-detected abnormality;
2. follow up of woman (treated or untreated) with a screen-detected abnormality;
3. assessment of a woman with postcoital or other abnormal bleeding; and
4. women who have been exposed to diethylstilbestrol (DES) in utero.

The indications for colposcopy referral as a result of a screen-detected abnormality are comprehensively documented in the NH&MRC Guidelines published in 2006.[1]

Numbers of colposcopy procedures

Colposcopy is the most frequent office procedure in gynaecology. Following the introduction of the NH&MRC guidelines, in 2006, the number of colposcopies (MBS item 35614) fell from nearly 89 000 such items billed to Medicare in 2006–07 to a nadir of under 78 500 in 2010–11. It has slowly risen to nearly 83 000 in 2012–13.[2] These numbers do not include the colposcopy examinations that are not billed to Medicare, such as those done in public hospitals. However, these numbers do reflect trends in practice.

The introduction of the Renewed National Cervical Screening Program (NCSP) is predicted to see a rise of approximately 25 per cent in colposcopic examinations. Under the renewed program, women will be referred for colposcopy if they screen positive for HPV 16 or 18, irrespective of cytology, or as a result of abnormal cytology after a positive screen for one of the other high-risk HPV types, with the same cytological criteria as in current NHMRC guidelines.[3]

Colposcopy and anxiety

The current NCSP has resulted in Australia having one of the lowest incidence rates of cervical cancer in the world and the lowest mortality. This is an enviable record. However, each stage of the screening program is associated with anxiety for women.[4] Many studies have investigated the anxiety level of women on receipt of an abnormal Pap smear while awaiting colposcopy. They demonstrate that the level of anxiety is not related to the degree of cervical abnormality and strategies to diminish this anxiety have been evaluated. Minimising the waiting time for colposcopy will reduce anxiety. Colposcopy providers tend to triage patients with wait times related to the degree of abnormality. This may be difficult for those women with cytology results not deemed urgent.

Since 2006, Australian women with a single low-grade squamous cytology report have been recommended to have repeat cytology in 12 months. The Tombola study group looked at the psychological impact of different strategies of immediate colposcopy versus repeat cytology. It showed no clear difference in anxiety and depression between the two arms. Immediate colposcopy detected more HSIL at baseline, but little difference in the cumulative incidence by three years.[5]

The actual colposcopy procedure itself is a source of great concern to many women. A Cochrane review has reported on strategies for reducing anxiety during colposcopy.[6] It would be expected that providing information about colposcopy would reduce anxiety in women waiting for such an examination. However, studies have not confirmed this. Nevertheless, receiving such information is valued by women. An Australian study identified the highest needs while waiting for colposcopy were for information about risks of cancer,

The author in action.

reasons for needing a colposcopy and the colposcopy procedure.[7] A study from Hong Kong showed that listening to music during colposcopy was associated with a significant reduction in anxiety levels and pain compared to not listening to music.[8] This is a simple intervention and can be very low cost if women are asked to bring their own music.

Nursing assistance at colposcopy

I believe that one of the most important factors in providing a good colposcopy service is to have an interested and trained colposcopy nurse. This may prove to be an expensive adjunct in private practice, but a good assistant carries many benefits. The nurse can reassure the woman, make sure she is comfortably positioned on the bed, distract her with conversation and provide the colposcopist the assistance required to make the procedure as quick and efficient as possible. Fumbling around on your own, reaching for biopsy forceps and the formalin jar is possible, but not very elegant. During the examination it is not possible for the colposcopist to be fully aware of a woman's reaction to the procedure, but your nurse can.

Quality assurance and practice improvement

Another crucial part of good colposcopy practice is keeping abreast of current thinking and practice in colposcopy, which is a moving feast. Attending educational courses is a good way to update practice and is mandated in other countries in order to continue to practise colposcopy. Also having some kind of quality assurance built into your practice has always been desirable and will become mandatory under the Renewed NCSP. The other components of the screening program, in other words cytology and histology, have always been subject to strict quality assurance requirements. On the College website (www.ranzcog.edu.au) you can find the C-QuIP portal that enables you to easily log your colposcopic examinations and findings through a program provided by Solutions Plus.

Documentation and image capture

Documentation is essential and traditionally colposcopists have recorded their findings by a line drawing showing the topography of the TZ, its upper and lower extent and the site of any biopsies. This type of record is increasingly being replaced by image capture, this has many benefits, including:

- very accurate documentation;
- education and training;
- image comparison in follow up of lesions; and
- use in multidisciplinary team discussions.

Image capture is advantageous, but storage, labelling, privacy and consent issues must be addressed.

Scoring systems

One development that has resulted from image capture is the use of tools to improve colposcopic diagnosis. It is known that colposcopy is a subjective skill, has low specificity and sensitivity and low levels of intraobserver and interobserver concordance. Dynamic spectral imaging (DSI) has shown promising results in initial studies. It produces a user-independent quantitative measurement and mapping of the effects of acetic acid.[9]

Other ways to improve the sensitivity of colposcopic diagnosis has been the development of scoring systems. The Reid score has been around for many years and more recently has seen the development of the Swede scoring system, which recognises the importance of size of the TZ.[10] However, it is clear that the more biopsies that are taken at colposcopy improves the diagnostic rate of HSIL. A study from the USA showed, across various levels of training, the number of colposcopically directed biopsies taken is most strongly associated with sensitivity.[11]

Conclusion

The Renewal of the NCSP will bring major changes to the screening program in Australia. Initially, it is expected that there will be an increase in colposcopy numbers. This will prove challenging in the provision of sufficient services. It is important that we ensure Australian women are receiving excellence in their colposcopy services and all colposcopists are adequately trained. Awareness of the natural history of HPV-related cervico-vaginal disease, the latest concepts in management and treatment and new developments in improving accuracy of colposcopy, must be essential knowledge for all these practitioners.

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NCSP renewal: 2016

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Big changes are coming to cervical screening in Australia.

Pending policy approval, in 2016, it is anticipated that the cervical cancer screening test will transition from the two-yearly Pap smear for women aged 18–69, to a five-yearly human papilloma virus (HPV) test for women aged 25–74. An HPV test every five years is more effective, just as safe and saves more lives with fewer tests than the current program.

The Australian National Cervical Screening Program (NCSP) has been very successful. Since 1991, the incidence and mortality rates for cervical cancer have decreased by approximately 50 per cent, and are among the best in the world.

If we are doing so well, why change? The NCSP now operates in a markedly changed environment including:

- New knowledge about the natural history of cervical cancer.
- New evidence about the screening age range and interval.
- New tests such as liquid-based cytology (LBC) and HPV testing.
- The National Human Papilloma Virus (HPV) Vaccination Program commenced in 2007 for girls and 2013 for boys.

The Australian government commenced a 'Renewal' of the NCSP in late 2011, to ensure the continuing success of the program and that all Australian women, HPV vaccinated and unvaccinated, have access to a cervical screening program that is based on current evidence and best practice. After a rigorous and transparent process, the Australian Medical Services Advisory Committee (MSAC) considered the external Evidence and the Economic Modelling reports. Their recommendations were released on 28 April 2014:

- Five-yearly cervical screening using a primary HPV test with partial HPV genotyping and reflex LBC triage, for HPV vaccinated and unvaccinated women 25–69 years of age, with exit testing of women up to 74 years of age.
- Self-collection of an HPV sample, for an under-screened or never-screened woman, which has been facilitated by a medical or nurse practitioner (or on behalf of a medical practitioner) who also offers mainstream cervical screening.
- Invitations and reminders to be sent to women 25–69 years of age, and exit communications to be sent to women 70–74 years of age, to ensure the effectiveness of the program.
- Delisting of the existing cervical screening test MBS items over a six- to 12-month transition period.

What does this mean for health professionals and consumers?

- At least 15 per cent reduction in incidence and mortality from cervical cancer.
- A 20 per cent increase in colposcopy referrals, but no increase in treatments.
- Reduction in lifetime screening tests from 26 to nine or ten per woman.
- Women will still need a vaginal speculum examination to have a liquid-based sample taken from their cervix.
- Doctors will get a laboratory report giving HPV status, the result of reflex cytology where indicated and a single recommendation for action.

Changes to the NCSP will need careful communication and some potential concerns are discussed below.

Confidence in longer screening interval and new test

Women need to be confident that the new test is safe and effective. Numerous studies have demonstrated the increased sensitivity of the HPV test and that the likelihood of developing cervical cancer within five-to-six years of a negative HPV test is remote. A recent meta-analysis of four randomised controlled European trials of primary HPV testing has demonstrated 60–70 per cent greater protection against invasive cervical cancers than cytology, with improved prevention of adenocarcinomas.

Later age of onset of screening (≥25 years)

Cervical cancer is rare in young women but HPV infection is very common and usually resolves without intervention. Detection of HPV-related cytologic abnormalities in younger women has led to unnecessary investigation and treatment of women who are very unlikely to progress to cancer. Screening of women under 25 years of age has not changed the incidence or mortality from cervical cancer in this age group. In addition, HPV vaccination will continue to cause a significant fall in the number of HSIL abnormalities in young women, making screening of young women less effective.

Self-collection for under- and never-screened women

It is distressing to note that 80 per cent of cervical cancer cases occur in women who are under or never screened. Aboriginal and Torres Strait Islander women have three-times the incidence rate for cervical cancer than non-Indigenous women (AIHW 2004–08). Indigenous women, particularly those from rural and remote communities, represent a significant proportion of the under or never screened. It is hoped that 'self collection' under the supervision of a health professional will improve screening participation in groups of under-screened women.

The Renewal process now moves into the implementation phase that features: the development of improved data systems, including a possible registry system with one record for each woman; safety and quality management programs; workforce and practice changes; and communication and information resources for health professionals and women.

Important: no changes to the program will occur before 2016. So, until then, it is business as usual with Pap smears every two years, from age 18–69 years.

Further information on the MSAC recommendations and Renewal is available at: www.msac.gov.au and www.cancerscreening.gov.au .

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Investigating fertility

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A review of the basic fertility investigations for the general gynaecologist.

Some nine per cent of couples globally experience infertility.[1] Although there are many definitions, it is generally accepted that infertility is defined following 12 months duration of regular unprotected sexual intercourse without conception.[2] Where the woman is >35 years of age, six months duration is sufficient. Beyond this, it is encouraged that couples seek some basic assessment and investigations.

There is currently no Australian or New Zealand consensus guideline as to what investigations should be instituted. What is critical to consider is that the choice of investigations are cost effective (to patients and the health care system) and ensure a smooth and quick process of management for the couple for whom the process can be mentally and physically challenging.

History

It is important to see both partners. History from the couple should include information on her cycle and menstrual symptoms, past medical and surgical history for them both and significant family history and drug and occupational history. Time trying to conceive, frequency and timing of intercourse as well as sexual dysfunction is also important to ascertain. Specifically for a woman, it is important to check for an up-to-date Pap smear and she is on an appropriate folic acid supplement.[3]

Examination

The value of examining the female and male remains controversial. A UK survey found a lack of consensus among gynaecologists[4] and concluded that large prospective studies were required. Pelvic examination of the female may illicit signs of causes of infertility, including deep infiltrating endometriosis[5] or abnormal anatomy. For the male, studies suggest that routine urological examination may not contribute any additional information[6], particularly if semen analysis is normal. However, others argue that men who present with infertility have a higher incidence of pathology, including testicular cancer and certainly, in the hands of someone experienced, male urological examination may reveal important pathology such as testicular atrophy, varicocele or congenitally absent vas deferens.

Investigations

Pre-conception screening

An infertility work-up should include pre-conception screening and counselling (see RANZCOG guideline on Pre-pregnancy Counselling C-Obs 3 (a)).[3] For the woman, this includes rubella, HIV, hepatitis B and C and syphilis serology. Varicella and pertussis immunity and chlamydia screening should also be considered as per national guidelines. Discussion about healthy weight management and nutrition may also be salient. For the male, infectious diseases screening is also an important consideration (hepatitis B and C and HIV).

Female investigations

Ovarian reserve

A woman's ovarian reserve (OR) is their reproductive potential as a function of the number and quality of remaining oocytes.[7] Diminished ovarian reserve (DOR) is found in women whose response to stimulation or fecundity is reduced compared to women of similar age. There is great controversy in the literature as to whether ovarian reserve tests (ORT) can predict oocyte quality, quantity or fecundity and the goal of testing OR is to provide prognostic information on expected outcome in an assisted reproductive technology setting, as opposed to assessment of infertility.

Evidence of DOR does not necessarily equate with inability to conceive. Female age remains the best predictor of conception, ongoing pregnancy and live birth rates.[7]

Studies assessing the accuracy and reliability of various ORTs have been plagued by heterogeneity of populations and outcome measures as well as sensitivity/specificity of the tools.

Current research suggests antral follicle count on transvaginal ultrasound in the early follicular phase and serum anti-Müllerian hormone (AMH) levels are the most predictive of DOR, and consideration should be given to assessment of both, though perhaps only in the setting of planning for treatment and not as an initial assessment of infertility.

Ovulation

It is reasonable to think that a woman with regular cycles would be ovulatory; however, this is not always the case. Ovulatory disorders can be identified in 15–25 per cent of infertile couples[8], so a detailed history on menstrual cycle is important. It is suggested that an objective and reliable measure of ovulation (mid-luteal serum progesterone measurement) is useful in infertile women.[8] Serial basal body temperature (BBT) is simple and inexpensive, but owing to poor compliance and reliability is not recommended.[8]

'Ovulation predictor kits' using urinary LH determination of mid-cycle surge correlate well with peak serum LH; however, accuracy, ease of use and reliability may yield false-positive or false-negative results.[8] In women where simpler tests fail to yield a result, hormone tracking combined with transvaginal ultrasound follicle tracking provides the best assessment of ovulatory dysfunction; however, it should be reserved for those women who are already in a treatment setting. Women who have clear ovulatory dysfunction on history should be considered for directed assessment of conditions such as polycystic ovarian syndrome,

hyperprolactinemia, thyroid or other pituitary or hypothalamic disorders.

Hormones
In the setting of irregular or absent menstrual periods, it may be worth assessing for hyperprolactinemia; however, there is no evidence to suggest routine screening of serum prolactin levels in the asymptomatic female.[9]

It is recommended that thyroid function is assessed in infertile women.[10,11] Both overt and subclinical hypothyroidism are associated with an increased risk of unexplained subfertility as well as poorer late pregnancy outcomes. TPO antibody positive females also have a higher incidence of subfertility. In the context of a TSH >2.5mU/L and positive TPO antibody status, there is evidence that treatment with low dose levothyroxine improves pregnancy outcomes.[10]

Tubal patency
Tubal disease is an important cause of infertility and should be excluded. Laparoscopic tubal chromotubation is the gold standard for assessing tubal patency; however, it carries higher surgical morbidity. Other forms of specific tubal assessment include hysterosalpingogram (HSG) or hysterosalpingo contrast sonography (HyCoSy). With both of these, findings suggestive of proximal tubal obstruction require further evaluation to exclude a false positive result from transient tubal/myometrial contraction or incorrect catheter positioning.

Imaging
Transvaginal ultrasound can be used to assess for anatomical causes of female infertility, including endometriomas, ovarian cysts, hydrosalpinges, leiomyomas and endometrial polyps. Given that Müllerian anomalies are more prevalent in an infertile population (three to 13 per cent)[12], consideration should be given to a three-dimensional ultrasound for improved detection.[11] Saline sonohysterography can also be used for detection of intracavity anomalies.

Owing to the ready availability of transvaginal ultrasound services in Australia and New Zealand, baseline investigation of female infertility should include this.

Surgery
The role of surgical investigation (laparoscopy +/- hysteroscopy) for female infertility is controversial, but many pathologies contribute to infertility (endometriosis, polyps, submucosal fibroids, hydrosalpinges) and treatment can significantly improve outcomes.[13] Investigative surgery is most clearly indicated for those with symptoms, risk factors or abnormal imaging; its yield in asymptomatic women is low.[8] Primary infertility is a risk factor for endometriosis and surgical intervention is best suited to mild/minimal disease to improve spontaneous fertility outcomes.[14] A low threshold for undertaking surgical investigation may therefore be justified.

Genetic screening (male and/or female)
Cystic fibrosis (CF) is an autosomal recessive condition and has a carrier rate in Caucasian populations of one in 25, with a higher rate of carriage in an infertility population of one in 21.5.[15] CF gene mutations are associated with causes infertility, such as congenital absence of the vas deferens.

Although there are currently no Australian or New Zealand guidelines, the American Congress of Obstetrics and Gynecology recommends pan-ethic screening and counselling for CF mutations as part of pre-conception planning.[16] Consideration should also be given to screening of ethnic-specific gene mutations for disease such as sickle cell anaemia, α- and β-thalassemia and Tay Sachs disease; though some would argue that genetic screening may be best reserved for the treatment setting. A karyotype is not required in the initial assessment setting.

Male investigations
Semen analysis is the first-line investigation for the male and approximately one-third of infertility can be attributed to male factors alone.

The World Health Organisation's manual on semen analysis remains the definitive reference range for laboratories performing analyses. These guidelines have been recently updated[17] and results should be considered a guide only.

Table 1. The change in semen analysis parameters that has occurred from the original to the recent WHO manual.

Measured parameter	WHO 1980	WHO 2010
Semen volume (ml)	>2	>1.5
Sperm concentration (10^6/ml)	>20	>15
Progressive motility (%)	>50	>32
Normal forms (%)	>15	>4

Owing to the significant intra-individual variation, it is generally accepted that at least two semen analyses should be performed at least six weeks apart.

If persistent abnormal semen analyses are evident, consideration should be given to a baseline hormone profile (FSH, LH and testosterone) to indicate a central or peripheral cause that can then direct further investigation in a treatment setting.

Advanced sperm testing, including DNA integrity tests have limited prognostic value for natural or ART pregnancy. The American Society for Reproductive Medicine[18] does not advocate routine screening.

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Polycystic ovarian syndrome

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This review aims to provide an update of recent areas of discussion in the literature as well as a reminder of clinical management options.

Polycystic ovarian syndrome (PCOS) remains one of the most common disorders we all deal with in one of its many forms on a weekly basis. For our understanding of such a common condition to still be evolving in all areas (diagnosis, aetiology, investigation and management) is evidence of its complexity. Prevalence depends on diagnostic criteria used and the population studied, but is about 6–12 per cent of reproductive-aged women.

Diagnosis

The Rotterdam consensus criteria remain the most widely used diagnostic tool for PCOS. Patients must exhibit two of the following: biochemical/clinical signs of hyperandrogenism, oligomenorrhoea (fewer than nine periods/year) with no other cause and PCO morphology on ultrasound.[1] Ethnic variation is common. Asian women have fewer hyperandrogenic symptoms, but significant metabolic complications while Middle Eastern and Mediterranean women have more hirsutism.[2]

There is current uncertainty regarding the diagnosis of PCOS in adolescents. A Danish study described PCO morphology as per the Rotterdam criteria in 68 per cent of women age 19–21 years in community-based screening, suggesting we may have been over-interpreting ultrasound findings in adolescents.[3] Acne can be a normal phenomenon of adolescence. Care is needed in timing from menarche when diagnosing oligomenorrhoea. Most adolescents have a regular cycle two years postmenarche and 90 per cent of adolescents who remain oligomenorrhoeic at four years will have pathology.[4] Despite these concerns, there are no clear criteria for diagnosis in adolescents as yet. The Endocrine Society of America suggests hyperandrogenism and anovulatory symptoms abnormal for gynaecological age.[5] Other experts argue that ovarian enlargement should also be required.[6] Pragmatically, a careful explanation of these concerns to the patient with a plan to re-evaluate the diagnosis as adolescents move into their early 20s is sensible. Clinical aims of a normal body mass index (BMI) and control of both menstrual and hyperandrogenic symptoms can still be achieved. It is possible in the future that anti-Müllerian hormone maybe a diagnostic tool in this setting.[7]

In lean women with oligomenorrhoea, the differential diagnosis can be between hypothalamic amenorrhoea (HA) and PCOS. The two conditions are the opposite of each other (see Table 1). A careful history is vital – periods will improve with energy deficit in PCOS and deteriorate with HA. There is potential to have a mixed picture of pathology.[8] In women with a HA diagnosis who change their lifestyle and have menstrual resumption, periods may remain irregular and androgenic symptoms become more prominent. It is possible that these are the women with PCO morphology on original ultrasound, but longitudinal studies are needed.

Management

While a detailed description of the pathogenesis of PCOS is beyond the scope of this article, insulin resistance is likely to be central to aetiology.[9] A lifestyle assessment is mandatory for every woman presenting with PCOS. There is no good data suggesting any particular dietary regimen is superior to another. Sustainable long-term energy deficit is key to achieving weight loss and a multidisciplinary approach with dietician and psychology support is helpful. Fitness and achievement of a normal range BMI is without side effects and will help all areas of management. Remember ethnic appropriate BMI ranges. A BMI of 20–25 is appropriate for European people, but people from the Asian and Indian subcontinents should have a healthy BMI range of probably about 18–23.[10]

The combined contraceptive pill

For women who do not require immediate fertility, the combined oral contraceptive pill (COCP) remains the cornerstone of pharmacological management of PCOS. It provides endometrial protection, contraception and androgenic symptom control. The risk of venous thromboembolism (VTE) needs to be carefully considered. This risk is cumulative and other risk factors may encourage other medication choices – obesity, family history of VTE or smoking. Data is observational and mixed. Broadly absolute risk is 3/10 000 women years (WY) for non COCP users,

Table 1. A comparison of the characteristics of PCOS and HA.

Characteristic	Polycystic ovarian syndrome	Hypothalamic amenorrhoea
Menstruation	Improves with leanness and fitness	Improves with weight gain and stress relief
Clinical symptoms	Hyperandrogenic symptoms	If severe lanugo hair
Hormone tests	Elevated T, PRL, LH normal E	Low LH, E, T and sometimes low FSH
Ultrasound findings	Normal/thick endometrium, PCO morphology	Thin endometrium
Bone density	Normal	Lowered often in the spine relative to the hip

T - testosterone PRL - prolactin LH - luteinising hormone FSH - follicle stimulating hormone E - oestradiol

6/10 000 WY for COCP users. Levongesterol-containing COCPs carry approximately half the risk that drosperidone [rate ratio 1.64 (1.27–2.10)] and cyproterone acetate [rate ratio 1.88 (1.47–2.42)] containing COCPs do.[11] While the COCP may cause a small change in both insulin sensitivity and lipid profile, the clinical effect of this is marginal and outweighed by the multiple benefits the COCP provides for PCOS women.[12] Long-term outcome studies of COCP use have been extremely reassuring in terms of malignancy and cardiovascular risk. Hannaford and colleagues present a 40-year prospective cohort study following over 45 000 women.[13] Ever COCP users had a significantly lower mortality from all causes (relative risk 0.88 [CI 0.82-0.93]) than never COCP users. Other studies support these findings and suggest we can endorse COCP use with reassurance in most women.

Androgenic symptoms

The androgenic symptoms of acne, hirsutism and alopecia can be particularly distressing. Drosperidone or cyproterone acetate containing COCPs are very effective for androgenic symptom control. In women unable to take a COCP or if more potent androgenic control is required, options include:

1. Spirinolactone 100–200mg/day. Renal function and potassium should be monitored if using with a drosperidone COCP.
2. Cyproterone acetate 50–100mg ten days/month. Liver function tests should be monitored.
3. Flutamide 250mg oral dosing. Liver function tests must be monitored – liver failure has been reported.
4. Finasteride 2.5mg oral dosing may be helpful for androgenic alopecia.
5. Vaniqa – eflornithine hydrocholride a cream applied twice daily to prevent new hair growth.

It is important to explain acne control will take three-to-four months of medication, hirsutism control 9–12 months and alopecia 12–18 months. Contraception must be used in combination with any of these medications and in the absence of the COCP this could include a Mirena, Cerazette, Depo Provera or Jadelle.

Metabolic syndrome

Metabolic status should be assessed at diagnosis and every one-to-two years thereafter depending on other risk factors. Assessment should include BMI, waist circumference, blood pressure, HbA1c, liver function tests, fasting lipids and glucose. An oral glucose tolerance test (OGTT) should be done at diagnosis in all women and repeated annually in those with other risk factors – BMI >25, age >30, family member with type 2 diabetes or a history of gestational diabetes. An OGTT is the best screening test for impaired glucose tolerance. There is interest in whether women with all three Rotterdam criteria are at higher risk for metabolic syndrome.[14] Gastric bypass surgery has been found to be effective in managing PCOS symptoms for those that qualify.[15] There is good data supporting pregnancy safety post-bypass surgery after a waiting period of 12–18 months.[16]

Endometrial protection

PCOS is a hyperoestrogenic condition with comparatively low levels of progesterone secondary to annovulation. Therefore, women are considered to be at risk of endometrial hyperplasia and carcinoma; however, we do not have good trials supporting increased pathology or best management.[17] The number of periods required per year to provide reassurance is not well described. If women are consistently having periods less frequently, then six-weekly endometrial protection should be advised. Again the COCP is most commonly used and has good evidence for endometrial protection.[18] Other options include the Mirena IUD, Provera 10mg used for 21 days per month, Depo Provera or Jadelle. Despite reassuring data for these modalities, dysfunctional bleeding with any medication should still be assessed if other risk factors such as age or obesity are present.[19] Metformin is second-line treatment for endometrial protection as there are no good data supporting its use for this indication.

Fertility

Women with PCOS have a higher risk of gestational diabetes and pre-eclampsia during pregnancy[20]; risks which are minimised with achieving a non-smoking status and normal BMI pre-conception. For women with a normal BMI, clomiphene citrate remains first-line management for annovulatory PCOS. It is extremely effective – 60 per cent cumulative pregnancy rate over six months[21], cost effective and relatively non-invasive compared to other fertility treatments. Metformin is now only infrequently used to assist fertility. If clomiphene is unsuccessful in achieving pregnancy, further options include ovarian diathermy, ovulation induction with FSH or in vitro fertilisation.

Mood disorders

Adult women with PCOS have higher rates of depression standardised mean difference (SMD) 0.6 (95 per cent CI 0.47-0.73), anxiety SMD 0.49 (95 per cent CI 0.36-0.63) and eating disorders than control groups.[22] Adolescents with PCOS have not been as extensively studied and the data are not so clear.[23] However, all women with PCOS should be screened for mood change. A high level of suspicion for eating disorders should be held, especially as women lose weight. Early recognition and psychology support is likely to be beneficial in all of these areas.

Place of metformin

Metformin has been the gypsy of PCOS management for the last 20 years. The mechanism of action of metformin suggests that it should be widely used in management; unfortunately, both trial data and clinical experience have proved disappointing.

There are good data supporting metformin use in impaired glucose tolerance or type 2 diabetes.[24] For other manifestations of PCOS data is either not available or discouraging. About 50 per cent of women will have a more regular menstrual cycle on metformin than placebo.[25] While this is a second-line option for endometrial protection it maybe helpful for those of low risk, such as adolescent girls who are not sexually active and not wanting the COCP. Metformin is likely to help with conception, but it is clearly not as effective for live birth rate as clomiphene.[26] Metformin is a weak anti-androgen, but is safe to conceive on so is an option to treat acne in women actively trying to conceive.

Weight loss with metformin is widely discussed on the internet. Some studies do suggest a modest benefit. Gokcel and colleagues showed a 9–14 per cent reduction in BMI after six months of either metformin (850mg twice a day), sibutramine or olistat; with no significant difference between the three pharmacological options.[27] If using metformin for this indication, lifestyle counselling must also be given. Higher doses of metformin maybe more effective, but doses are often dictated by patient tolerance. There is some interest in using metformin prophylactically in young girls with both premature adrenarche and potential insulin resistance, but as yet there are no studies to support this approach.[28]

Conclusion

Ideally, a multidisciplinary approach is indicated for all women with PCOS. The general practitioner, endocrinologist, gynaecologist,

psychologist and dietician all have important roles to play. Resource scarcity means role blurring occurs and therefore an appreciation of broader issues with PCOS management is important for us all.

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Pelvic inflammatory disease

Treat early, treat well are the watch words for this condition.

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Pelvic inflammatory disease (PID) – inflammation of the upper genital tract – may include cervicitis, endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis. PID usually occurs from ascending micro-organisms from the vagina and cervix, although a causative organism is not always isolated.[1] PID may result from a sexually transmitted infection, infection post-gynaecological procedure, postnatally or, rarely, from haematological spread.[2] Early diagnosis and treatment reduces the risk of long-term sequelae, including chronic pelvic pain and tubal factor infertility.

Epidemiology

PID is not a notifiable condition and no national surveillance or reporting requirements exist. Estimates of PID incidence are limited and are largely based on hospital admission data, which only include complicated cases. Studies suggest most PID is treated in general practice and ambulatory settings.[2] Recent research indicates hospitalisation for PID has decreased over the last two decades, which may be associated with increased chlamydia screening and treatment in outpatient settings.[2]

Pathogenesis

Sexually transmitted organisms, particularly *Chlamydia trachomatis* and *Neisseria gonorrhoeae* account for the majority of PID infections, however PID is usually polymicrobial with other vaginal flora, including *Gardnerella vaginalis*, *Haemophilus influenzae*, enteric gram-negative rods and *Streptococcus agalactiae* implicated.[1] Additionally, *Mycoplasma genitalium*, cytomegalovirus (CMV), and *Ureaplasma urealyticum* have been associated with some cases of PID.[1] Ascending infection occurs when microbes spread along mucosal surfaces from the vagina and cervix through to the endometrial cavity, fallopian tubes and into the abdominal cavity. During post-infection repair processes, ingrowing fibroblasts cause scarring and tubal function impairment that may cause irreversible infertility.[3] While women may tolerate a range of symptoms for some months before seeking care, tubal infection and scarring can occur early, with inflammation occurring within hours for gonorrhoea and days for chlamydia.[3]

Risk factors for PID:

- young sexually active women;
- multiple partners or partner change;
- unprotected sex; and
- previous PID.[4]

Diagnosis

PID symptoms can be mild and it can be easy to overlook infection as a cause of pelvic pain, menstrual change or pain with intercourse. Women may attribute fluctuating symptoms to gastrointestinal difficulties, a change in hormonal contraception or the particular dynamics of intercourse with a new partner. Certainty of diagnosis can be frustrating for both patient and clinician: clinical symptoms and signs of PID lack sensitivity and specificity[1], and diagnostic rates for PID differ significantly between clinicians in specialist settings caring for similarly at-risk patients.[5]

Prompt antibiotic treatment is safe and effective. Given the risk of long-term sequelae, Australian and international clinical guidelines suggest clinicians maintain a high index of suspicion for diagnosis of PID, and a low threshold for treatment.[1,2,6]

> 'A diagnosis of PID, and empirical antibiotic treatment, should be considered and usually offered in any young (under 25) sexually active woman who has recent onset, bilateral lower abdominal pain associated with local tenderness on bimanual vaginal examination, in whom pregnancy has been excluded.'[6]

PID symptoms can vary significantly in both presence and severity. Key symptoms are:

- lower abdominal/pelvic pain;
- abnormal vaginal discharge;
- deep dyspareunia; and
- menstrual changes, including irregular bleeding, postcoital bleeding and increasing dysmenorrhoea/menhorrhagia.[1,3,6]

Addressing each of these manifestations, including enquiry about change over recent months, can help a woman describe her symptoms and assist in diagnosis. While the absence of one or more of these symptoms does not preclude diagnosis, the accurate documentation of symptoms before treatment provides the basis for review of treatment efficacy.

Signs of PID include the following:

- tenderness to palpation in the lower abdominal or pelvic region;
- abnormal cervical discharge;
- uterine, adnexal or cervical motion tenderness on bimanual examination; and
- fever >38°C in acute or severe PID.[1,3,6]

Again, the absence of one or more of these signs should not preclude a presumptive diagnosis of PID. If bimanual examination is declined, or is otherwise inappropriate, it is worth revisiting the history and in the absence of a plausible alternative diagnosis; a presumptive diagnosis of PID may still be warranted.

Perihepatitis, or Fitz-Hugh-Curtis syndrome, may complicate PID and presents as sharp, pleuritic right upper quadrant pain, with reproductive tract symptoms of varying severity.[7]

Laparoscopy is the 'gold standard' for diagnosing PID; however, endometritis and subtle fallopian tube inflammation may be missed during this procedure, and high cost, limited availability

and impracticality of laparoscopy in mild cases of PID means that diagnosis is almost always based on history and clinical examination findings.[1]

Given the role of sexually transmitted organisms in PID pathogenesis, young women presenting with a parent or carer benefit from the opportunity for private discussion of sexual activity at some point in their consultation; noting also that there are case reports of PID in young women who are not yet sexually active.[8]

Investigations
Pregnancy should be excluded in all women of reproductive age with lower pelvic pain.[6] On speculum examination, endocervical swabs should be collected for chlamydia and gonorrhoea PCR (multiplex PCR according to local protocols) as well as microscopy, culture and sensitivity.[6] Consider concurrent syphilis and HIV testing.

Is there a role for imaging at the time of PID diagnosis?
Transvaginal ultrasound has been shown to detect dilated tubes, thickening of the tubal wall and tubal fluid in mild PID, and it may be useful to assess the extent of damage in severe PID, when tuboovarian abscess, enlarged fallopian tubes and ovaries and excess fluid are present.[3] Transvaginal power Doppler sonography can detect all of the above, as well as hyperemia in women with acute PID, which is largely absent in women who do not have acute inflammation.[3] Although a useful tool to support diagnosis, empiric treatment of PID should not be delayed pending ultrasound nor withheld in view of normal ultrasound findings.

However, early pelvic ultrasound can be helpful if symptoms are atypical of PID and/or if there is right upper quadrant pain suggestive of Fitz-Hugh Curtis syndrome. Pelvic ultrasound is also indicated to evaluate symptoms that persist after PID treatment.

Differential diagnosis
The differential diagnosis of pelvic pain in women of reproductive age can include:
- ectopic pregnancy;
- appendicitis (usually associated with migration of pain, unilateral abdominal tenderness, and nausea and vomiting[9]);
- endometriosis;
- ovarian cyst;
- urinary tract infection; and
- functional pain.[4]

Management
Prompt treatment is necessary to decrease the risk of long-term complications, which include ectopic pregnancy, infertility and chronic pelvic pain.[2] Broad-spectrum antibiotic treatment is necessary to cover sexually transmitted infections and aerobic and anaerobic bacteria.

Outpatient treatment of PID is appropriate for women with mild to moderate PID.[6] Admission should be considered when a surgical emergency cannot be excluded, in clinically severe disease and when symptoms worsen despite treatment.[6]

Current Australian recommendations for treatment for mild to moderate sexually acquired PID are:
- metronidazole 400mg orally, twice a day for 14 days
  plus
- azithromycin 1g orally as a single dose
  plus either
- azithromycin 1g as a single dose one week later
  or
- doxycycline 100mg orally, twice a day for 14 days
  and, in patients in whom gonorrhoea is potentially a causative organism,
- ceftriaxone 500mg IM or IV, as a single dose.[10]

If a woman has an intrauterine device (IUD) in situ, PID treatment should still follow recommended regimes. Removal of the IUD needs to be balanced against the risk of pregnancy. Removal may improve short-term outcomes and should be considered if there is no clinical response within 72 hours of commencing treatment or if the woman requests removal.[11]

Patient information
Two weeks of oral antibiotic treatment can be challenging. An understanding of the rationale for both the diagnosis of PID and prolonged broad-spectrum antibiotic treatment can ease concern and support adherence.

Patient information should also include:
- treatment side effects;
- recommendation not to have sex until treatment is completed and partner(s) have also been treated;
- possibility of long-term complications of PID; and
- episodes of PID increase the risk of infertility, can be reduced by concurrent treatment of current partner(s), condom use with new partners and partner testing prior to unprotected sex.[6]

Contact tracing and partner treatment
All current and recent male sexual partners of women with suspected sexually acquired PID should be empirically treated with azithromycin 1g orally for chlamydia infection, with treatment for gonorrhoea dependant on regional prevalence, regardless of whether they are symptomatic or not.[3,12]

Follow up
Early review at 72 hours is recommended for moderate to severe clinical presentation; clinical symptoms and signs should show substantial improvement. Persistent symptoms suggest the need for further investigation, parenteral therapy or surgical intervention.[6]

Review at two-to-four weeks is useful to assess symptom resolution, check partners have been treated, repeat pregnancy testing if needed, and to discuss again PID and reduction of risk of further episodes.[6] A diagnosis of PID can be distressing and questions about the impact of infection on fertility can also be addressed.

If chlamydia or gonorrhoea infection is confirmed, further testing is recommended at three months to exclude reinfection.[1]

Summary
Clinical assessment remains the cornerstone of PID diagnosis. Maintaining a high index of suspicion for infection as the cause of pelvic pain and associated symptoms in women with risk factors supports early treatment. Scheduled follow up provides a safety net to ensure further investigation of persistent symptoms and signs; just as importantly, follow up provides an opportunity to check patient understanding, answer questions and to discuss prevention of further episodes of PID.

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Vulval pain: a registrar's view

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How much can be achieved in the office setting before referring to a specialist with an interest in this field?

Vulval pain as a presenting complaint is frequently frustrating for both patient and practitioner, owing to the difficulties in both identifying the cause of the pain and treating it. Many practitioners may not feel confident in managing this condition and patients have often seen many health professionals as they have been dissatisfied with their care.[1]

The prevalence of vulval pain in the Australasian population is currently unknown. A large study in a US population found a lifetime incidence rate of up to 16 per cent.[1] It is an important issue to address as it has been found, unsurprisingly, women with vulval pain report significantly lower quality of life, higher levels of distress related to sexual activities and lower levels of happiness in relationships than those without pain.[2] The type of vulval pain and symptoms can vary, but is often described as burning, stinging or itching. It is also important to address causes of acute vulval pain early as many of these are easily treatable (infection, contact dermatitis, other dermatoses) and early treatment may prevent the development of some forms of chronic vulval pain.

Classification

Many classifications have been used to try to describe and diagnose vulval pain. The International Society for the Study of Vulvovaginal Disease (ISSVD) introduced a classification framework in 2003 that is used by many specialists in vulval care (see Box 1).[3]

The specific disorder(s) causing vulval pain, once identified, often have an easy path of treatment to follow and may be managed by primary caregivers alone. Vulvodynia (typically described as burning pain) occurs in the absence of relevant clinical findings or a specific clinically identifiable neurologic disorder. If vulvodynia is identified, a multidisciplinary approach to treatment will improve outcomes for the patient.[4]

History

When taking a history of vulval pain, it is essential for the practitioner to build rapport with the patient. As very few causes of chronic vulval pain have a quick-fix solution, it is likely that the initial appointment is the first of many. A thorough history is vital in determining the potential cause of the pain. Both indirect (allowing the patient to tell their story) and direct questioning to clarify points is required.

Apart from the normal questions that comprise a pain history (type, frequency, duration, triggers and relievers), there are points specific to vulval pain that may help to differentiate the cause. These include:

- Pain with or after sex: superficial ('vestibulodynia', vulval dermatoses, levator ani hypertonicity, vaginismus, pudendal nerve neuralgia), deep (endometriosis, pudendal nerve neuralgia).
- History of dermatological conditions: allergic dermatitis, psoriasis, lichen planus.
- Medications: antibiotics (can predispose to recurrent candidiasis).
- Vaginal discharge: white (candidiasis, bacterial vaginosis [BV]), yellow (desquamative inflammatory vaginitis, sexually transmitted infections [STI], lichen planus, atrophic vaginitis), postcoital bleeding (STI, human papilloma virus causing cervical intraepithelial neoplasia [CIN] with or without vulval intraepithelial neoplasia [VIN]).
- Other pain syndromes: chronic pelvic pain, irritable bowel syndrome, painful bladder syndrome, endometriosis, fibromyalgia.[5]
- Trauma: obstetric trauma (prolonged second stage, instrumental or perineal injury may lead to pudendal nerve neuralgia or a neuroma), female genital mutilation.
- Low oestrogenic state: peri- or postmenopausal age or breastfeeding can result in pain from atrophic changes.

A vulval pain index similar to those existing for chronic pain is yet to be developed. However, the ISSVD website contains an extensive questionnaire to assist history taking and examination.

Examination

A thorough examination of the urogenital system is required. The external genitalia should be closely inspected for any lesions, scars, anatomical variations and structural changes.

A sensory examination (the Q-tip test) can help differentiate between generalised or localised provoked vulvodynia. A cotton bud is used to gently palpate the labia majora, perineum, clitoral hood, Skene's glands, labial sulci and labia minora. Neuropathic processes,

Box 1. Classification of vulval pain (ISSVD 2003)

Vulval pain related to a specific disorder
- Infectious (candidiasis, herpes)
- Inflammatory (lichen planus, lichen sclerosus, contact dermatitis)
- Neoplastic (VIN, squamous cell carcinoma)
- Neurologic (herpes neuralgia, nerve compression)

Vulvodynia
- Generalised
- Provoked (sexual, nonsexual, or both)
- Unprovoked

Mixed (provoked and unprovoked)
- Localised (eg vestibulodynia, clitorodynia, hemivulvodynia)
- Provoked (sexual, nonsexual or both)
- Unprovoked
- Mixed (provoked and unprovoked)

infection, dermatoses or generalised vulvodynia may contribute to pain in any of these areas. Then palpate around the vestibule in clockwise direction using the cotton bud, which may elicit a pain response inconsistent with the pressure applied (localised vulvodynia).

Speculum examination (if the patient can tolerate this) is also important to look for normal vaginal architecture (atrophy, erythema, erosions) and discharge. The cervix should also be assessed (Pap smear and STI screening performed as needed). Bimanual examination is performed for adnexal masses, nodules of endometriosis, levator ani muscle hypertonicity or tenderness, tenderness of the pudendal nerve near the ischial spine and along the pudendal canal.

Vulvoscopy (examination of the vulva with colposcope) is extremely useful in detecting subtle changes in architecture that may enable differentiation between dermatoses.

The focus of the examination is the external genitalia, but it is also important to examine other parts of the body. These include the scalp, extensor surfaces, natal cleft and buccal mucosa for various dermatoses (lichen planus, psoriasis).

Investigations

As always, the investigations of vulval pain are dictated by the findings on history and examination. Ensuring basic screening is up to date (Pap smear and STI screening) is a simple starting point. A vaginal microbial swab may show candida species or BV. A history of intermittent or cyclical pruritus may be a result of recurrent candidiasis. The suspicion of recurrent candidiasis must be confirmed with microscopy. Identification of the candida species (albicans, glabrata, krusei, tropicalis) is important to determine if treatment is necessary. Many species other than *C. albicans* are less responsive to antifungal therapies and there is much debate as to whether other species contribute to a symptomatic picture.

If vulval lesions are present, perform a viral swab to identify herpes simplex virus. Consider performing a vulval biopsy (4mm punch biopsy under local anaesthetic) if the lesion has an atypical appearance. VIN has a greatly varied presentation and any lesion that doesn't respond appropriately to treatment should be biopsied to exclude this diagnosis.

If there is a suspicion of concurrent pelvic pathology, an ultrasound scan of the pelvis is useful. Also, consider patch testing to determine the allergen contributing to vulval contact dermatitis if this is not apparent from the clinical picture.

Treatment

All patients should be educated in vulval hygiene. This includes: washing with water only or non-irritant cleansers; avoidance of potential irritants (soaps, creams, powders); and using cotton-based underwear or sanitary products. If avoidance of irritants is not possible (for instance, urinary incontinence or frequent sanitary pad use), introduce the regular use of a barrier to the vulva such as petroleum jelly. Use of lubricant (of which there are many) for sexual intercourse may also help patients with atrophy or provoked vulvodynia.

Infective causes should be treated with appropriate antimicrobials. Candidiasis should respond to a seven-day topical regimen or single dose oral preparation. Recurrent candidiasis requires a long-term eradication regimen of oral antifungal therapy (for example, 150–300mg fluconazole weekly for three-to-six months).
Many dermatoses (for example, contact or allergic dermatitis, lichen planus or lichen sclerosus) are primarily treated with topical steroids, such as Diprosone OV ointment, nightly until symptoms improve – usually one-to-four weeks and then maintenance treatment as required. If there is a poor response to primary treatment, referral to a vulval specialist should be considered.

Long-standing vulval pain is likely to require a multidisciplinary treatment approach. However, an initial trial of treatment may form part of your diagnosis and provide your patient with some relief of symptoms. Topical treatments to consider include: local anaesthetic ointment (such as lignocaine five per cent) or compounded topical treatments of other neuropathic medications (for example, amitriptyline). Systemic treatment with neuropathic pain medications (such as amitriptyline, pregabalin) have been shown to be a useful adjunct to other forms of therapy.[6] Surgery is rarely a treatment in managing vulval pain issues and is only suitable for carefully selected patients. If considered, a specialist with experience in the surgical management of vulval pain should be consulted.

A physiotherapist will be able to contribute with assessment of the pelvic floor and education in relaxation exercises in the case of levator ani hypertonicity or possible pudendal nerve entrapment. There is growing evidence that psychotherapy and behavioural therapy play a critical role in managing complex vulval pain.[7] Referral to a chronic pain unit may allow easier access to the many facets of the multidisciplinary care required.

The management of vulval pain may seem a daunting task, but a few simple measures may produce satisfying results for many patients.

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Resources

The Australian and New Zealand Vulvovaginal Society (ANZVS) website contains patient handouts, opportunities for further training and meetings. www.anzvs.org . The ISSVD website also contains patient information and practitioner references: www.issvd.org . The site www.caredownthere.com.au is an informative patient resource.

Medication management of chronic pelvic pain

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Women look to gynaecologists when they have pelvic pain and appreciate a complete care approach. By improving our own skills, the majority of cases can be managed without the need for pain specialist referral.

Chronic pain is pain that has been present on most days for more than three to six months. This fits easily with our patients who may have started with severe dysmenorrhoea in their teens, but who now have pain on most days through the month.

Another commonly used definition is pain that is still present after the time healing should have occurred, following trauma or surgery. This fits well with chronic pain post-childbirth or post-surgical pain.

Both situations represent a physical and chemical change in the way nerve pathways and the central nervous system function. Her pain is now both a peripheral (pelvic) and central (brain and spinal cord) condition. Considering only pelvic conditions is now less likely to successfully manage all her symptoms. Evidence for the presence of central changes in chronic pelvic pain is summarised in the recent article by Brawn et al.[1]

Why should gynaecologists manage this condition?
With so many girls and women affected, managing chronic pelvic pain becomes a workforce planning issue. There are far too many girls and women affected for everyone to attend a multidisciplinary pain unit and pain clinics rarely include gynaecological expertise.

Where pain remains unmanaged, an increasing number of our patients will be prescribed regular opioids by their general practitioner, who may perceive there are no alternative options. With opioid overdose deaths (often accidental using prescribed opioids) now outnumbering road deaths in Victoria[2], it is imperative that safer and more effective pain-management options be offered.

Non-medication options
Regular exercise should be considered essential rather than optional for any chronic pain patient. Pacing activity and starting with low intensity 'non-core' exercise is recommended. Where obturator internus spasm (sudden or stabbing pains in the side or back) is present, core exercises (Pilates, sit ups, planking) aggravate pain and should be avoided. Walking is a good choice and, even where relatively immobile, a ten-minute walk daily is not unreasonable. Exercise with a variety of different movements 'away from the core' (dancing, team sports) is usually better tolerated.

Pain psychology has been shown to reduce chronic pain and involvement in activities with 'high motivational value' for her will encourage participation. This might include volunteering at a school if she enjoys being with children, study in an area that interests her, or craft activities she has always enjoyed. Both exercise and enjoyable activities help make pain a smaller part of her life.

Neuropathic medications for chronic pelvic pain
Pain pathways involve a wide range of different receptors, so there are many medications of potential benefit. From a pelvic pain perspective, easily prescribed useful options include:

- a tricyclic, preferably amitriptyline, but also nortriptyline;
- a serotonin-norepinephrine reuptake inhibitor (SNRI) medication, such as duloxetine, venlafaxine or desvenlafaxine; and
- an anticonvulsant, such as pregabalin or gabapentin.

Explaining at the beginning that each of these medications suits around half of those who take it, and that we may need to try more than one before getting the right combination is advisable. Improved ways of determining which medication suits which patient are an active area of current worldwide research.

Most pain research has been done in either male rodents or male humans and we should not presume that either the pain pathways or the doses recommended are applicable to girls and women.[3] Generally, starting with a lower than usual dose and increasing at a slower than usual pace, to a lower than usual peak dose works best. A small acceptable dose with moderate benefit is better than a larger dose that is discontinued owing to side effects. In the absence of robust clinical trials of neuropathic pain medications in a pelvic pain population, the following recommendations are those we use for girls and women.

Amitriptyline
Amitriptyline is a good choice for an overactive bladder, poor sleep, pelvic muscle pain, headaches, bloated feelings, provoked vestibulodynia, loose bowels or tender points in muscles. It is inexpensive and easily available.

Starting with 5mg (half a blue tablet) early in the evening and increasing very slowly to between five and 25mg usually avoids too much morning sedation. Anecdotally, a small dose (10mg) each evening continued long term reduces pain recurrence over the longer term. When discontinued, she may feel well initially with recurrence of pain weeks or months later. If so, restarting amitriptyline is often effective.

Tricyclics should be avoided in women with glaucoma, a short QT interval on ECG, urinary retention, severe constipation or epilepsy. If sedation is a concern, then changing to the same dose of nortriptyline is often acceptable, but may not be as effective.

SNRIs
The majority of anti-anxiety medications have minimal impact on

chronic pain. However, those that have both serotonin-specific reuptake inhibitor (SSRI) and SNRI activity do help pain. SNRI medications include duloxetine, venlafaxine and desvenlafaxine. They are a good choice for women with anxiety, pain, fibromyalgia, pelvic muscle pain, weight concerns or low mood, and may also help an overactive bladder. Side effects include nausea, loss of appetite, looser bowels, weight loss, feeling more 'awake' and, in some women, difficulty with orgasm.

The normal dose for duloxetine is a 30mg capsule taken in the morning for two weeks then 60mg in the morning. However, it is better tolerated when started at 15mg every morning. This is achieved by opening the capsule, removing and discarding half the granules, and closing the capsule before taking it.

If sleep is poor on duloxetine, then adding 10mg of amitriptyline in the evening may improve sleep and further enhance pain management. Duloxetine is available as a PBS medication in patients with depression.

Pregabalin or gabapentin (alpha-2-delta ligands)
These medications are useful for pain generally and have been used particularly for post-herpetic neuralgia, diabetic neuropathy, pudendal neuralgia and neuropathic pain. Side effects include dizziness, drowsiness, confusion and weight gain.

Pregabalin is available in 25 and 75mg capsules. The normal starting dose recommended for chronic pain is 75mg twice a day. However, we initiate treatment using 25 or 37.5mg at night and increase slowly. Pregabalin is 100 per cent soluble in water, so a 75mg dose can be reduced by opening the capsule, dissolving the contents in water then drinking half (or a third) of the fluid. It is stable in water for 24 hours. Pregabalin is indicated in Australia for neuropathic pain as a streamlined 4172 authority script. These medications do not affect serotonin. Tricyclics, SNRIs and anticonvulsants are all Category C risk in pregnancy.

Regular opioids
Regular opioid use became popular with the rise of palliative care protocols, where the patients' condition was terminal. In our patients with benign long-term pain their regular use should be discouraged.[4]

Drug overdose deaths are now more likely to involve prescribed than illicit medications and are frequently accidental. Fentanyl supply increased 46 times between 1997 and 2012 in Australia and oxycodone is now the seventh-most commonly prescribed drug in Australian general practice.[5]

Of particular importance, there is increasing evidence that narcotics sensitise nerve pathways when used regularly.[6] Opioids thus contribute to the pain condition and worsen chronic pain when used regularly, rather than improve it.

In contrast, neuropathic medications are more effective, do not sensitise nerve pathways, can be used long term and may avoid the use of opioids. Improving our skills with regard to prescribing neuropathic medications may reduce the chance our patients become opioid dependent.

Serotonin syndrome
Serotonin syndrome is an uncommon, but possible, complication when combining certain medications. It is quite uncommon when using low-dose tricyclics with an SNRI – but possible any time the dose of either medication is increased. The risk of serotonin syndrome increases substantially if a third medication affecting serotonin is added and this situation should be avoided. Medications affecting serotonin include tramadol; monoamine oxidase inhibitors; illicit drugs, including amphetamines; St John's Wort; dextromethorphan (cough medicines); metoclopramide; and ondansetron.

Symptoms of serotonin syndrome include:
- agitation, confusion, headache;
- shivering, sweating, diarrhoea, high BP, rapid HR; and
- muscle rigidity, twitching, dilated pupils.

Treatment involves discontinuing medications, managing agitation with benzodiazepines and, if necessary, using the serotonin antagonist cyproheptadine (Periacten).

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Outpatient hysteroscopy

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Establishing an outpatient hysteroscopy service at the Royal Hobart Hospital has been a success story.

Hysteroscopic inspection and biopsy of the uterine cavity is important in the work up towards diagnosis of intrauterine abnormalities. Modern diagnostic hysteroscopy began in the 1970s, when the uterine cavity was seen clearly with the use of distension media.[1] Hysteroscopy can be performed in the outpatient setting or under general anaesthesia in the operating theatre. Outpatient hysteroscopy is a service gaining in popularity and acceptability from both a clinician and patient perspective.[2] This article outlines the steps the Royal Hobart Hospital (RHH) took to set up and offer a truly ambulatory service.

Background

The RHH is Australia's second-oldest hospital. It is Tasmania's largest hospital and it's major referral centre, serving a population of around 240 000 in the Southern region.[3] The gynaecology service receives just over 200 new referrals per month. Women are seen across six outpatient clinics by staff specialists and registrars.

Hysteroscopy was offered solely as an inpatient day case theatre procedure under general anaesthetic until 2014. In 2013, there were on average 22 hysteroscopies (range 15–25) performed each month. As gynaecology had one of the shortest waiting lists, and with pressure on other specialties to address their waiting lists, gynaecological operating lists were under constant threat of being reduced. There was an impetus to look at other ways of addressing the problem and freeing up capacity. It became obvious that by a process of clinical redesign, hysteroscopy could be offered on an outpatient basis, improving the patient journey and experience.

Clinical redesign and innovation

Clinical services redesign is defined as the application of robust analysis of the patient journey to assist in achieving the desired outcomes.[4] By moving hysteroscopies to the outpatient setting, capacity in the inpatient lists could be freed to allow for more major gynaecological operations to be performed. This also reduced the waiting times and improved access for investigation of women with abnormal uterine bleeding, especially postmenopausal bleeding. A case was made to the RHH Board under the Innovation Funds bid. The benefits of the clinical redesign for patients and the success of such units in overseas centres were demonstrated. On this basis, the department received the necessary funding to set up the service.

Stakeholders were invited to participate in a consultation process and a change management program was instituted. The working group consisted of key medical and nursing staff, the business manager of the department, GP liaison officers, the operating theatre manager,

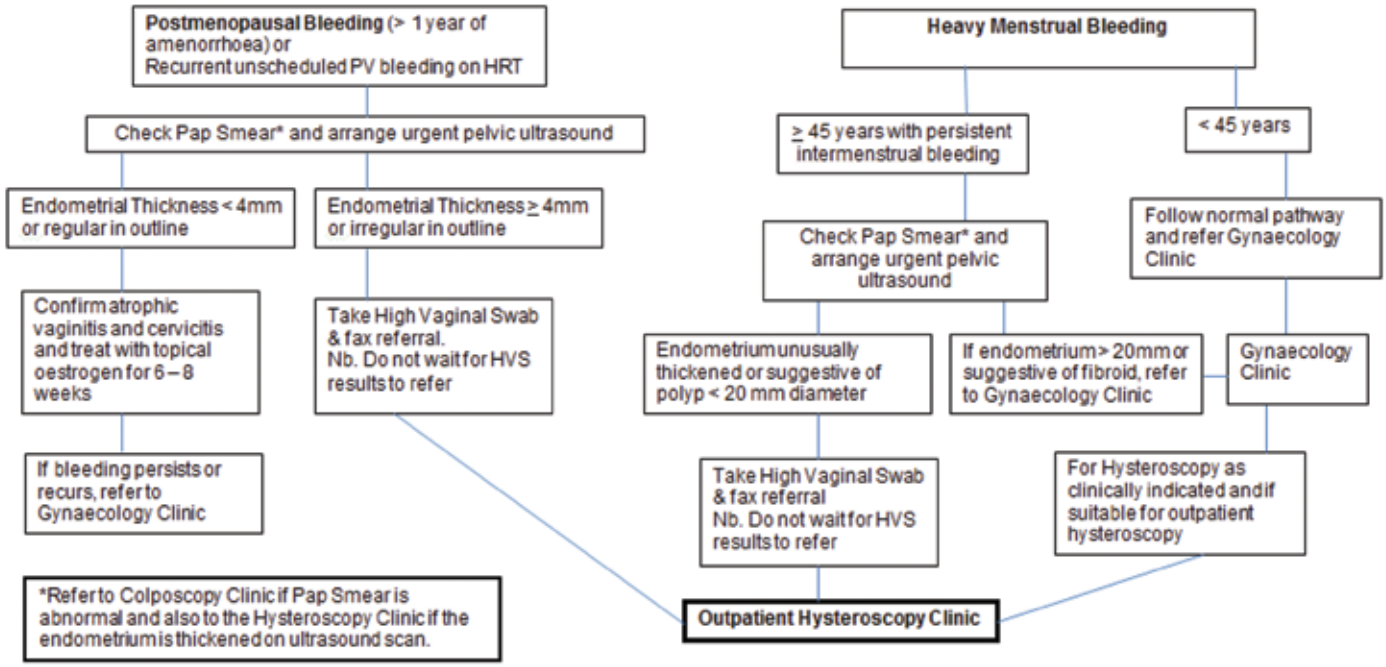


Figure 1. RHH pathways for referral to the outpatient hysteroscopy service.

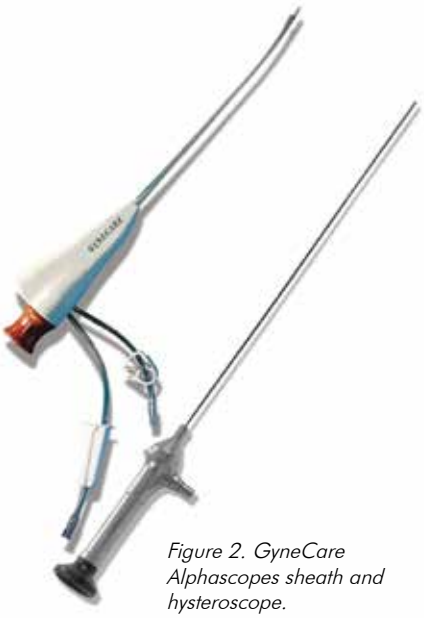


Figure 2. GyneCare Alphascopes sheath and hysteroscope.

infection control personnel and nurse educators.

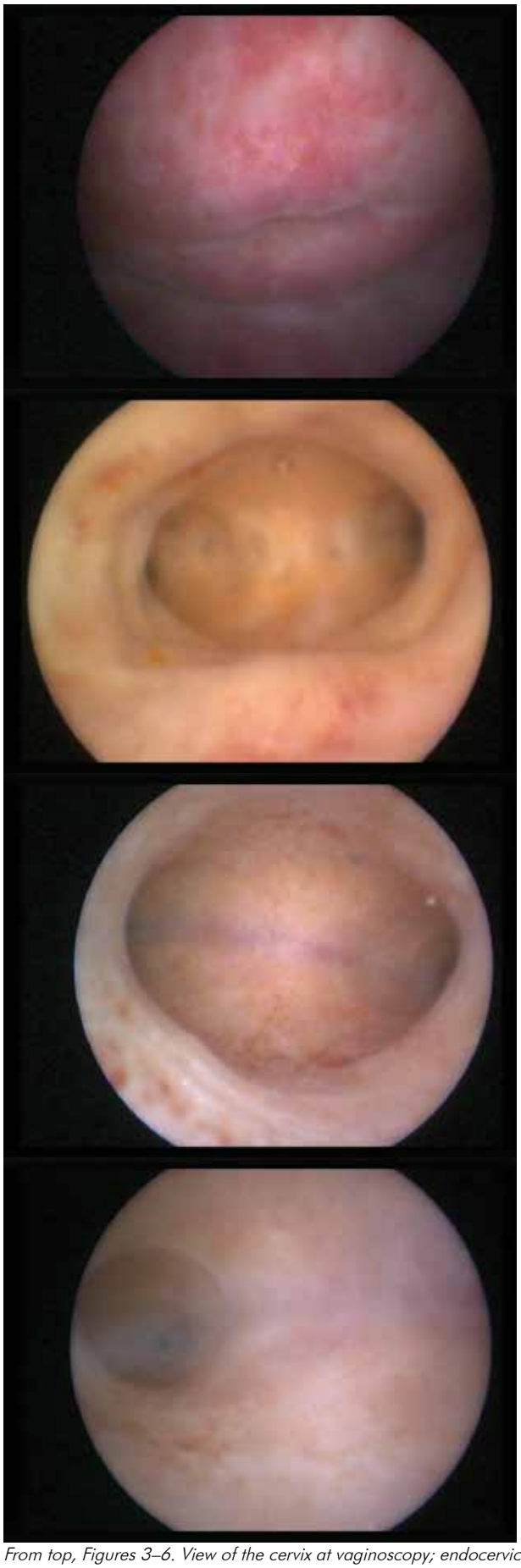
Guidelines from Australian and overseas centres were reviewed to help formulate our pathways. Although the initial outlay for establishing a new procedural clinic may be significant, the day-to-day running costs of this service will ensure long-term cost savings.[5] It was estimated the revenue generated per case of outpatient hysteroscopy under the current Medicare payment scheme would be cost neutral, but improved throughput for other inpatient gynaecological cases would be more efficient and could also increase net income.

The outpatient hysteroscopy procedure uses different hysteroscopes to those used in theatre. After extensive testing of several excellent makes of outpatient hysteroscopes, the GyneCare® Alphascopes (see Figure 2), the Aquilex® fluid management system and the Karl Storz Aida® image-capture systems were chosen.

Clinical pathway and current program

A patient will require a hysteroscopy for investigation of abnormal uterine bleeding and/or endometrial abnormalities. Our pathway is shown in Figure 1. A thorough work up for other causes of abnormal bleeding should be completed prior to hysteroscopy. Pap smears should be up to date and colposcopy done first, if necessary. Prior to hysteroscopy, a high vaginal swab is taken and infections (including thrush or bacterial vaginosis) treated. Pelvic ultrasound will help determine the necessity for hysteroscopy. This preparation can be performed by the GP so the service becomes a 'one-stop, see-and-treat' service.[6]

Patients are advised not to fast and to take simple analgesics around one hour before their appointment. The procedure involves vaginoscopy to guide the hysteroscope into the cervical canal.[7] The vaginoscopy or 'no touch' technique is atraumatic and further reduces patient pain.[8] This avoids the use of a speculum and tenaculum and involves saline distension of the vagina to find the cervix. It provides more manoeuvrability in patients where the uterus may be acutely flexed, in patients with a raised body mass index and in those who may not tolerate a speculum examination.[6] In most cases this has been successful.[9] Hydro-dilatation of the cervical canal is performed using normal saline, which has been shown to be more beneficial in terms of patient comfort, cost effectiveness and decreased post-procedure bleeding.[10] Good views of the cervix and endometrial cavity are obtained (see Figures 3–7). Biopsies or minor surgical procedures such as removal of polyps or small submucous fibroids with grasping forceps or the Twizzle® bipolar diathermy electrodes (see Figure 8) can be performed through the expandable operating sheath. The collapsible plastic operating channel can be used without removing the hysteroscope or dilating the cervix further. In our current clinical environment, if more extensive intrauterine procedures need



From top, Figures 3–6. View of the cervix at vaginoscopy; endocervical canal and internal os; endometrial cavity; right tubal ostium.

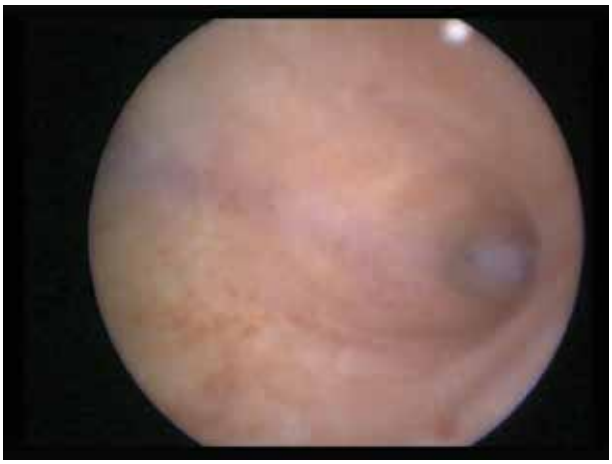


Figure 7. Left tubal ostium.
Clinical images reproduced with permission from the individual patients.

to be performed, hysteroscopy under general anaesthetic will be arranged. Hysteroscopy under general anaesthesia is still indicated if the outpatient setting has failed owing to patient discomfort or in cases of patient preference, virginal women and where a patient's cardiac conditions means normal responses to vaso-vagal reactions are blunted.[6] There is also a weight limitation of 170kg for our examination couches.

Up and running

The RHH outpatient hysteroscopy service saw its first patient on 31 January 2014. There are currently two consultant-led clinics per week with a dedicated gynaecology nurse and a training registrar rostered. The clinic sessions run at a maximum of five patients each allocated 45 minutes. After the procedure, there is a short period of observation. There is also resuscitation equipment available. A private area for the patient to change is also provided.

Clinical problem shooting

Pain

Studies show that although patients may be anxious initially, most patients will tolerate outpatient hysteroscopy.[2,5,11-12] In our clinic, simple analgesia is advised prior to the procedure. The diameter of the hysteroscope we use is 1.8mm and with the outer sheath, it becomes 3.5mm. This means that in most cases, there is no need to manually dilate the cervix. The presence of a nurse to talk to the patient or reassure her ('vocal anaesthesia') is important.

Vasovagal reaction

So far, only one patient required a longer period of observation post-procedure for a mild vasovagal response. This occurred several minutes after the procedure had been completed and resolved spontaneously. She had forgotten to take her pre-procedure analgesic. Vasovagal response to outpatient hysteroscopy is rare, but has been described.[13] Techniques to reduce anxiety, mentally prepare the patient and adequate analgesia are helpful.[13] Nevertheless, adequate resuscitation equipment and clinical vigilance are crucial.

Failed procedure

A failed outpatient hysteroscopy procedure is when the cervical canal cannot be entered or when an adequate view of the uterine cavity cannot be obtained. The use of the vaginoscopy technique, normal saline as the distension medium and use of the thinner hysteroscope are factors that improve success.[14] In the current literature, over 95 per cent of cases are successful.[8,13-15] Patient anxiety and emotional preparedness also influence success.[16]

Figure 8. Twizzle bipolar diathermy electrode. Reproduced with permission from Johnson & Johnson Pty. Ltd. Australia.

Patient feedback

Obtaining patient feedback has allowed us to improve our services and audit its acceptability. Some of the comments so far include:

- No bleeding at all, the discomfort was like period pain, and would go through it again. It was really good not to have an anaesthetic. Not as bad as having a pap smear. I had no soreness or pain after the procedure.
- It was good, no anaesthetic and no grogginess. The procedure was not uncomfortable; putting the Mirena in was the worst part. It is an excellent service.
- Back at work, had slight spotting after the procedure. During the procedure hardly any discomfort, things were explained really well and [the nurse] did an excellent job of distracting me. A bit concerning having so many people in the room.

The majority of patients have felt the discomfort was minimal and offering hysteroscopy in an outpatient setting results in faster recovery and less time away from work and home.

Future aims

The outpatient hysteroscopy clinic at RHH has been successful in providing a fast-tracked service for women with abnormal uterine bleeding. Nursing and medical staff have seen the benefits and acceptability of the procedure. Clinical expertise can be built upon with more training registrars becoming competent in this procedure. Possibilities for the future include operative procedures such as resection of fibroids, adhesions and septae, hysteroscopic tubal occlusion, infertility investigation and endometrial ablation.[6] We believe the outpatient hysteroscopy service is beneficial from an economic, evidence-based and patient perspective.

Acknowledgements

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Conflict of interest statement

The authors have no conflict of interest to declare.

Figure 9. The outpatient hysteroscopy clinic at RHH.

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Hysteroscopy: tools, tips, tricks

Dr Khaldoun Aweidah
FRANZCOG

As with any surgical procedure, office hysterscopy is easier when you have the right tools and a firm grasp of the techniques involved.

Hysteroscopy is a minimally invasive intervention that can be used to diagnose intrauterine and endocervical pathology. In addition to being used for diagnostic purposes, operative procedures such as tubal sterilisation, polypectomy and myomectomy, can easily be performed in a safe and efficacious manner.

A pioneer in the field of office hysteroscopy, Prof Bettocchi, in 2004 reported on 4863 operative hysteroscopic procedures where a vaginoscopic technique was used without analgesia or anaesthesia.[1] As technology has further advanced and hysteroscopes have reduced in size, office procedures have become even more feasible. There have also been improvements in energy sources such as bipolar (as opposed to monopolar) that have decreased complications related to the operative distension media[2], this has made operative hysteroscopy more acceptable. Furthermore, there are other equally compelling reasons for and advantages to performing office hysteroscopy. For example, it can be argued patients are more comfortable in an office setting. Moreover, by combining an immediate answer and treatment in a single visit, patient anxiety can be reduced. For the gynaecologist, there is satisfaction that the procedure is performed in an office, is cost effective and frees operating time for more complex procedures.

Hysteroscopes and sheaths

Most gynaecologists use rigid optical hysteroscopes, which offer wide-angle views of the uterine cavity and use fluid or gas as a distending media. The diameter of modern optical hysteroscopes that are used in office hysteroscopy is 2–2.9mm and these have different viewing angles; 30 degrees is most commonly used.

These optical diagnostic hysteroscopes are fitted with a sheath and have an outer diameter of between 2.5 and 5.5mm. Operative sheaths are also available with diameters of between 5.5 and 9.0mm (when using larger sizes a paracervical block or general anesthetic should be considered). These modern diagnostic and operative sheaths have isolated dual ports that provide continuous laminar flow of distending media, which improves operating vision.[3]

Operative instruments

Different instruments are available that were developed specifically for office hysteroscopic surgery. They tend to be semi-rigid, flexible and able to pass through a 3mm working channel. These include scissors, graspers and biopsy forceps. In addition, operating catheters can be passed through the hysteroscopic sheath as in Essure hysteroscopic sterilisation.[3]

Electrocautry and morcellation

Loop and needle electrodes, either monopolar or bipolar, can be used for office procedures. Loop devices are mainly used in resectoscopes. Modern loops are bipolar and so the distending media can be saline rather than glycine, although one problem with the use of bipolar is the generation of bubbles that can disturb operative vision.[3]

Tissue that is cut must be removed from the uterine cavity, which means taking the hysteroscope out after grasping the tissue. An advantage of this technique is that tissue is removed under direct vision, but the process can be long and arduous. One way around this to shorten operating time is to use morcellation. This has a short learning curve compared to standard cutting and retrieval of tissue. Different studies have been conducted; one such randomised controlled trial (RCT) compared conventional resectoscopy and morcellation among residents in training (Van Dongen et al). It found mean operating time for resectoscopy was 17.0 minutes (95 per cent CI 14.1 to 17.9 minutes) versus morcellation, which was 10.6 minutes (95 per cent CI 7.3 to 14.0 minutes). Furthermore, scores measuring the convenience of each technique on a visual analogue scale were in favour of morcellation. Examples of morcellation systems include Myosure from Hologic and Tuclear from Smith and Nephew.[3]

Office hysteroscopy procedure

The office procedure is similar to what we are all familiar with in the operating theatre, with passage of the hysteroscope through vagina and cervix to enable visualisation of the endometrial cavity. However, in reality there is more change to the office technique than just location. Primarily, the difference is that one has an awake and anxious patient and so the procedure must be completed in the shortest possible time with minimal discomfort. Therefore, one needs to reduce the learning curve associated with these procedures. I recommend starting this process of learning in the operating theatre with patients under general anaesthetic. The following points are important:

- Mastery of the 30-degree hysteroscope. One can then visualise the whole endometrial cavity with minimal movement just by moving the light lead. Furthermore, as anatomically the most sensitive part of the uterus is around the internal os and the isthmus, the use of angled hysteroscopy can avoid the fulcrum effect of the scope on that sensitive part of the uterus.
- Avoidance of cervical dilatation with dilators. The hysteroscope itself can be used to hydro-dilate the cervix. Once one is comfortable with the technique, the level of anaesthetic can be reduced to mimic office conditions and use instruments such those used in the office.
- Mastery of the vaginoscopic entry. At the beginning, one might need to use a speculum with or without a tenaculum, but with greater experience one could move towards vaginoscopy as it is the most comfortable technique to use in the office. Cooper et al compared direct vaginoscopy approach to the traditional approach of speculum/tenaculum. This study was a meta-analysis of six RCTs (n=1321) and used the patient's experience as the primary measure. It found that the vaginoscopic approach was less painful than the traditional

approach (standard mean difference -0.44, 95 per cent CI -0.65 to -0.22). There was no significant difference in the number of failed procedures between the two groups.[4]

Some pointers on the Bettochi vaginoscopic technique include:
1. Enter into the vagina, aiming for deep in the posterior fornix.
2. Initially place the hysteroscope light lead at 6 o'clock and try to localise the cervix.
3. Once through the external os, follow the endocervical canal (seen as a 'black hole'). At the internal os turn scope on its side by turning the light lead 90 degrees as this facilitates entry of scope into the uterine cavity.

Once one has confidence with the diagnostic part, then operative hysteroscopy should be the next step.

Preparation of the patient

Most women are anxious in lithotomy position and feel exposed. There should be protocols for dealing with this situation, as for any other intimate procedure. Firstly, patient educational materials should be provided. If the department policy is to see-and-treat, then patients should be given clear knowledge of this in advance with educational material so they can understand it. This facilitates the informed consent process.

The setting should be similar to current colposcopy clinics, with a lithotomy bed and change room within the procedure room. Gowns should be provided and there should be a nurse or a healthcare assistant present all the time to reassure patient and keep her calm. Everything should be set up prior to commencing the procedure so as to reduce operating time.

Pain management

1. Verbal analgesia or no medication. Verbal reassurance is paramount and the nurse sitting with the patient should take that lead role. The communication loop between surgeon, nurse and patient should be always maintained.
2. Oral analgesia. NSAIDs and paracetamol given one-to-two hours pre-procedure can be used. However, in a Cochrane review there was no evidence of a reduction in mean pain score.
3. Paracervical block. This is the only pharmacologic intervention that revealed significant reduction in mean pain score within 30 minutes of the procedure. Intracervical local anaesthetic and lignocaine cream showed no evidence in reduction of pain.
4. Sedation. There is no role for conscious sedation.

Cervical preparation

Access to the endometrial cavity requires insertion of the hysteroscope through the cervical canal. Changes occur at the cervical os as a result of age, null parity or pathological condition that result in stenosis which could preclude insertion, abandoning of the procedure and lead to increased complications, such as cervical tears and false passage formation.

Several agents have been tried with success, including laminera and prostaglandins, such as dinoprostone, which are expensive and need special storage conditions. Misoprostol is a synthetic PGE1 analogue now widely used in obstetrics and gynaecology. It is cheap and stable at room temperature; it can be delivered orally or vaginally.

A Cochrane review, not yet published, involving 16 RCTs comparing misoprostol with placebo (control), prostaglandin (dinoprostone) and osmotic dilators. Findings were: misoprostol was associated with greater ease of cervical dilatation, less abandonment and fewer complications when compared to no intervention. However, misoprostol was associated with significantly more side effects.

Compared to osmotic dilators, either natural or synthetic, misoprostol was associated with reduced cervical width and increased number of women requiring cervical dilation. Compared with dinoprostone, misoprostol was associated with a greater ease of cervical dilatation, fewer women requiring dilatation and fewer intraoperative complications Conclusion: misoprostol was superior to placebo or no treatment, but inferior to osmotic dilators when used for cervical ripening prior to operative hysteroscopy. It was associated with more side effects. Misoprostol was superior to prostaglandin.[6]

Misoprostol is not required in every patient, but should be considered in selective patients including postmenopausal patients, the nulliparous, patients who have had previous cervical surgery or where the procedure is assessed to be difficult in dilating cervix.

Antibiotics

Antibiotics are not recommended routinely. The exception is for women with cardiac disease, where surgical prophylaxis is indicated as per guidelines.

Office-based hysteroscopy is feasible with good evidence to support patient safety and satisfaction. Although technological improvements with small-diameter scopes make it more acceptable, skilled and motivated surgeons have also contributed in the advancement of this technique. Other advantages include reduction of multiple outpatient visits with a see-and-treat policy, avoiding use of general anaesthesia, cost-saving benefits and patient preference for the more familiar office environment.

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Stefano Salvatore is currently Professor of Urogynaecology at the San Raffaele Hospital and the University of Milan, Italy. He received his medical degree from the University of Pavia in 1989, where he subsequently obtained his specialty in Obstetrics and Gynecology. From 1995 to 1997 he was Lecturer at the Clinica Ostetrica e Ginecologica of the Insubria Univeristy in Varese. In 1999 he became consultant in urogynaecology at the Bassini Hospital, University of Milan Bicocca and then went to become consultant in urogynaecology at the Clinica Ostetrica e Ginecologica of the Insubria Univeristy in Varese.

Professor Salvatore is a member of The International Continence Society and the International Urogynecological Association. He is the Scientific Secretary of the Italian Society of Urodynamics. He also serves on the Editorial Boards of Neurourology and Urodynamics and of the International Urogynecological Journal. During his career Prof Salvatore has authored more than 50 articles in peer-reviewed international journals.

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Chronic vaginal discharge: causes and management

Dr Patricia Car
MBBS, DRANZCOG

The management of chronic vaginal discharge, owing to physiological, infective and non-infective causes, in the reproductive-aged woman.

Vaginal discharge varies between individuals in volume and consistency. The causes of increased or altered vaginal discharge can be organised into three groups based on the age group affected: pre-pubertal; reproductive; and post-menopausal. This article addresses the management of chronic vaginal discharge in the reproductive-aged woman and is further divided into physiological, infective (sexually and non-sexually transmitted infections [STI and NSTIs]) and non-infective categories.

Physiological

During the menstrual cycle, cervical mucous production varies with levels of oestrogen and progesterone. This mucous, in combination with sloughed epithelial cells and transudate from the vaginal squamous epithelium, makes up physiological discharge.

Mucous production steadily increases with oestrogen levels during the follicular phase, to a peak at ovulation. Consistency also changes throughout the cycle, from thick and sticky during the non-fertile phase to clearer, stretchy and slippery towards ovulation. During the luteal phase, secretion decreases and again becomes thick and sticky in consistency, owing to reducing levels of oestrogen and increasing levels of progesterone.

There are a range of commensal bacteria in the vagina of reproductive women, of which the most abundant is lactobacilli. Lactobacilli produce lactic acid via glycogen metabolism thereby maintaining vaginal pH <4.5 and thus protecting against ascending infections. The absence of lactobacilli is a well-recognised risk factor for genital infections and complications of pregnancy.[1]

Infective

Bacterial vaginosis – NSTI

Bacterial vaginosis (BV) is the most prevalent cause of infective vaginal discharge.[2] It results from a reduction in normal hydrogen peroxide-producing Lactobacillus species in the vagina that allows overgrowth of anaerobic and other fastidious bacteria. Organisms: *Gardenerella vaginalis* (40 per cent), others include species of *Prevotella*, *Mycoplasma*, *Mobiluncus* and *Peptostreptococcus*.[1]
Signs and symptoms include:

- thin white or grey discharge with offensive or fishy odour, worse after intercourse; and
- discharge coating the vagina.

However, 50 per cent cases are asymptomatic.[2]

Risk factors are as follows:

- early age at first intercourse; and
- risky sexual behaviour.

It is more common in smokers and those using intrauterine contraceptive devices.

Associations:

- Higher risk of acquiring STIs.
- Associated with adverse pregnancy outcome, pelvic inflammatory disease (PID), chorioamnionitis and endometritis.[3]

The Amsel Criteria[2] can be used for diagnosis (three of four criteria is diagnostic):

1. grey, white or yellow homogenous discharge;
2. vaginal pH >4.5;
3. fishy odour (after application of ten per cent potassium hydroxide); and
4. presence of at least 20 per cent clue cells (bacteria-coated vaginal epithelial cells).

The Nugent score is a gram stain scoring system from one to ten, based on the number of lactobacilli, gram-negative to gram-variable bacilli and gram negative curved bacilli. A score of seven or above indicates BV.[3]

The BV Blue test is a point-of-care test detecting the presence of sialidase activity. It provides presumptive diagnostic information to women with BV when used in conjunction with clinical information.[4]

Management[5]:

- Advise against douching and using feminine hygiene products, strong soaps and shower gel.
- Metronidazole 400mg orally twice a day for seven days or 0.75 per cent vaginal gel, one applicator-full intravaginally for five nights or clindamycin 300mg orally twice a day for seven days or two per cent vaginal cream, one applicator-full intravaginally, for seven nights.
- The cure rate is 70–80 per cent.
- Clindamycin is more effective against resistant anaerobes and is preferred in pregnancy.
- Success rates are similar between oral and vaginal application, but vaginal preparation has fewer systemic side effects.
- Infection may resolve spontaneously in 30 per cent of cases, however, treatment may reduce the risk acquiring STIs[1] or pregnancy complications.

Candida (NSTI)

Candida is the second most common cause of infective vaginal

discharge and is caused by overgrowth of vaginal yeasts. More than 75 per cent women suffer from vulvovaginitis during their lifetime[2], and approximately 20 per cent of cases are asymptomatic.[5] The organisms involved are: *Candida albicans* (80 per cent), *C. glabrata*, *C. tropicalis* and *C. krusei*.[1]

Signs of candida include vulval erythema, oedema, fissuring or satellite lesions (small white plaques) while the symptoms are:
- non-offensive thick and white discharge ('curdy');
- pruritus;
- superficial dyspareunia; and
- external dysuria.

The risk factors are pregnancy and being aged between 20 and 30 years.[2] Precipitating factors include: antibiotic treatment, steroid use, synthetic underwear, diabetes mellitus and pregnancy.

Diagnosis is largely based on clinical symptoms. Swab microscopy reveals spores and pseudohyphae. Sensitivity is 50–80 per cent, however, primary culture is rarely indicated.[4]

Management[5]:
- Vaginal imidazole (for example, clotrimazole ten per cent vaginal cream, one applicator-full intravaginally, as single dose at night or use two per cent vaginal cream for three nights or one per cent vaginal cream for six nights); or
- Nystatin 100 000 units/5g vaginal cream one applicator-full intravaginally twice a day for seven nights.
- Fluconazole 150mg orally as single dose if non-pregnant, intolerant to topical therapy or as personal preference.
- Local treatment is effective in at least 80 per cent women (to be avoided during menses).
- Nystatin, although less effective, is generally better tolerated.

If symptoms recur despite therapy then other causes should be sought, for example diabetes mellitus, *C. glabrata* infection (resistance to imidazoles frequent) or immunodeficiency[1].

Trichomonas vaginalis (STI)

Trichomonas vaginalis (TV) is a pathogenic flagellate, and is the most common STI worldwide, with an annual incidence of over 170 million cases.[6]

Signs:
- Blisters develop in a third of cases.[1]
- 'Strawberry' cervix: punctate haemorrhagic lesions.
- A pH of >4.5, (often exceeds 6.0).

Symptoms:
- 50–75 per cent infections are asymptomatic[1];
- classic discharge is profuse, yellowish-green and frothy;
- strong-smelling fishy odour;
- pruritus;
- dyspareunia; and
- dysuria.

Co-infection with other STIs is common.[6] Some studies indicate an association with premature rupture of membranes, preterm delivery and low birthweight.[1]

The gold standard for diagnosis is high vaginal swab culture. Microscopy of vaginal wet mount has sensitivity of 60–70 per cent. Flagellates are seen with pear-shaped morphology and whip-like processes (visible in 80 per cent).[1]

Management[5]:
- Metronidazole 2g orally, as single dose or metronidazole 400mg orally twice a day for five days for cases that relapse after single-dose treatment. This has a 90 per cent cure rate; or
- Tinidazole 2g orally, as single dose.
- Patients and partners should be treated regardless of symptoms.

Chlamydia trachomatis (STI)

The signs of chlamydia infection are vaginal discharge (owing to cervicitis) and abnormal bleeding (postcoital or intermenstrual). Studies show 50 per cent of infected women[1] are asymptomatic. Symptoms can include lower abdominal pain, dyspareunia or urethral infection causing dysuria.

The risk factors for chlamydia are <25 years of age and having had a new sexual partner or multiple sexual partners in a year. Infection is associated with the following:
- Recurrent infections associated with PID, infertility and chronic pelvic pain.
- Ophthalmia neonatorum: neonatal conjunctivitis from infection at birth.

Diagnosis is by endocervical swab for culture or enzyme-linked immunosorbent assay (ELISA) and nucleic acid amplification tests (NAAT) on first-catch urine.[6]

Management (for patient and partners)[5]:
- Azithromycin 1g orally, as a single dose; or
- Doxycycline 100mg orally twice a day for seven days.
- Abstinence from intercourse recommended during treatment.

Neisseria gonorrhoeae (STI)

The key sign of *Neisseria gonorrhoeae* is vaginal discharge in up to 50 per cent of cases (owing to cervicitis, rather than vaginitis).[7] However, up to 80 per cent of cases are asymptomatic.[8] Symptoms can include:
- dysuria;
- intermenstrual or postcoital bleeding;
- lower abdominal pain; and
- pruritus or burning sensation.

Infection is associated with co-existance with other infections as well as ophthalmia neonatorum. Recurrence is associated with PID, infertility and chronic pelvic pain.

The gold standard method of diagnosis is culture using chocolate agar from endocervical swabs. NAAT from mid-catch urine or cervical swab and ELISA of fluid sample from affected area.

Management[5], in urban areas where penicillin resistance is common:
- Ceftriaxone 500mg in 2ml of one per cent lignocaine IM, or 500mg IV, as single dose.
- If chlamydia infection has not been ruled out, also prescribe: azithromycin 1g orally, as single dose or doxycycline 100mg orally, twice a day for seven days.

Where penicillin resistance is less common (remote areas) prescribe:
- Amoxicillin 3g orally and Probenecid 1g orally, as single doses.

Non-infective

Foreign bodies can be associated with persistent, foul-smelling vaginal discharge, bleeding and/or pelvic pressure. They are most

commonly seen in children and in these cases abuse must be considered.[9] Forgotten tampons or condom pieces are common culprits in reproductive-aged women. Speculum examination and/or examination under anaesthesia may be required for visualisation and removal. Chronic sequelae can include embedding of objects in the vaginal wall, dysparunia or development of fistulae between the bladder, rectum or peritoneal cavity.[2]

Fistulae can result in chronic, foul or faeculent vaginal discharge and are usually managed surgically. There is often a history of trauma or previous surgery and recurrent urinary tract infections if the bladder is involved.

Cervical polyps occur in approximately four per cent women of reproductive age, most commonly in multiparous women aged 40–50 and in pregnancy.[2] Polyps (usually benign) may cause increased vaginal discharge, post coital or intermenstural bleeding or menorrhagia. They can be removed manually or through ablative methods (liquid nitrogen or electrocautery), once a biopsy has been taken to rule out malignancy, to prevent regrowth.

Genital tract malignancy can cause blood-stained discharge. More advanced cancers may have a secondary infection leading to frank bloody, purulent and foul-smelling discharge and can be associated with pelvic pain. Visual inspection, cytologic smears and colposcopy are usually adequate for diagnosis of cervical lesions, however, pelvic ultrasound and/or tissue samples from hysteroscopy or diagnostic laparoscopy may be needed to help identify lesions higher in the pelvis (uterus, fallopian tubes and ovaries). Genital tract malignancies usually require excision and/or chemotherapy/radiotherapy.

Allergic reaction is most commonly secondary to synthetic products (condoms, tampons, douches and so forth) and, rarely, can be owing to proteins within semen. Symptoms include discharge, pruritus and burning of the vagina and these can be relieved by antihistamines or topical steroids. Removing the causative agent is curative.

Psychosocial distress, such as abuse, has been shown to cause an increase in vaginal discharge. Appropriate counselling and support are required for these women.[10]

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Heavy and painful periods

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Menstrual disturbances account for a large number of presentations to the primary care physician as well as the specialist; this article will focus on heavy menstrual bleeding and dysmenorrhoea.

Heavy menstrual bleeding (HMB) is defined as excessive menstrual blood loss (MBL) that interferes with a woman's social, physical, emotional and/or material quality of life. HMB accounts for around one-fifth of gynaecologist visits. A quantitative definition of 80ml of menstrual blood loss or more per period is sometimes used, usually in a research setting.[1] HMB has replaced the term 'menorrhagia' after the FIGO classification system (see Table 1) was published in 2012. This system also provides a simple framework by which to recall the causes of abnormal uterine bleeding in the form of the acronym 'PALM-COEIN'.[2] It must be remembered that these pathological processes can cause abnormal bleeding patterns other than HMB, such as intermenstrual or postmenopausal bleeding. Nonetheless, the acronym provides the clinician with a sound structure upon which to base the history, examination and investigations.

It should be borne in mind that 80 per cent of women with HMB do not have an anatomical pathology. In these women, higher concentrations of endometrial prostaglandins such as $PgF_2\alpha$ and PgE_2 have been found.[3]

Dysmenorrhoea can be regarded as primary and secondary. Primary dysmenorrhoea refers to pain that is not related to organic disease and is characteristically cramping lower abdominal pain radiating to the back and thighs. It can be associated with gastrointestinal or neurological symptoms. A recent Canadian study found that 60 per cent of women experience dysmenorrhoea. One fifth of these women need time off work/study to cope.[4] Despite how common it is, most women do not seek medical attention. The pathogenesis of dysmenorrhoea has been well studied and is believed to be mediated by the cyclical production of prostaglandins leading to uterine hypercontractility, ischaemic-related pain caused by reduced pelvic blood flow and increased peripheral nerve hypersensitivity.

Secondary dysmenorrhoea is menstrual pain caused by an identifiable pelvic pathology. It is often associated with dyspareunia and can precede the onset of bleeding by a few days. There is an overlap between causes of secondary dysmenorrhoea and chronic pelvic pain (see Table 2).[5]

A full medical, gynaecological and family history should be taken. The gynaecological history should include menstrual frequency, volume as quantified by number of pads/tampons changed per day, presence of flooding or clots and symptoms of anaemia. Menstrual pain should be assessed in terms of disturbance to activities of daily living, need for analgesics and associate symptoms, which may include dyschezia, dyspareunia and mood disturbances. A general medical and surgical history may also illuminate other causative factors such as coagulopathy and risk factors for malignancy. Medication history, such as use of anticoagulants and iron supplementation, is important.

Table 1. The FIGO classification system.

Structural abnormalities	Non-structural abnormalities
P – polyps	C – coagulopathy
A – adenomyosis	O – ovulatory dysfunction
L – leiomyoma	E – endometrial
M – malignancy and hyperplasia	I – iatrogenic
	N – not yet classified

Examination can give important clues about causative factors. A large fibroid uterus is often palpable abdominally. Speculum examination allows assessment of ongoing blood loss and may reveal cervical causes of bleeding. Asking women to document the number of pads used and the degree of staining is helpful. A bimanual examination in a woman with endometriosis may elicit hyperalgesia and may reveal the presence of uterosacral nodules or fixation of the uterus. Although up to 47 per cent of women with endometriosis on laparoscopy have normal pelvic examinations, the finding of nodular disease can help with planning surgical management.[6]

The investigation of women with heavy and/or painful menstrual periods should include: bHCG; Pap smear; pelvic ultrasound scan (USS) and HyCoSy can be considered if USS shows evidence of an endometrial polyp; full blood count; iron studies; and clotting studies if indicated on history.

Antifibrinolytic agents and non-steroidal anti-inflammatory drugs (NSAIDs) are first-line agents. Both should be used only during menstruation. In a systematic review, tranexamic acid was found to be significantly more effective at reducing MBL than any NSAID. Differences between NSAIDs were studied in the same review, which found there was no significant difference between mefenamic acid and naproxen. Despite concerns, there is no evidence that long-term use of antifibrinolytics increase the risk of venous thrombosis.[7]

The combined oral contraceptive pill (COCP) is a good choice for women who are also seeking contraception. One non-randomised study reported a 53 per cent decrease in MBL. The COCP is also an option for older women who are non-smokers without risk factors for thromboembolic disease.[8]

Table 2. Causes of pelvic pain in women undergoing diagnostic laparoscopy for pelvic pain

Cause	Percentage
Normal findings	35
Endometriosis	33
Adhesions	24
Chronic pelvic inflammatory disease	5
Ovarian cyst	3
Pelvic varicosities	1
Fibroids	1
Other	4

Cyclical progestogens are often used during episodes of HMB as they oppose the proliferative effects of oestrogen on the endometrium. Norethisterone 5mg or medroxyprogesterone acetate 10mg, both used three times daily during 21 days of a 28 day cycle, have been shown to be effective at reducing MBL.[9]

The levonorgestrel-releasing intrauterine system (LNG-IUS) exposes the endometrium to continuous progestogen, hence causing atrophy and a reduction in menstrual bleeding of up to 80 per cent at six months and over 90 per cent by 12 months. Gupta et al found that the LNG-IUS was significantly more effective than the usual treatment, which included a combination of NSAIDs and hormonal treatment. When compared to other medical therapies, women using the LNG-IUS were more likely to cancel their planned hysterectomies.[8]

Endometrial ablation is suitable for women who have completed their family as pregnancy, while rare after endometrial ablation, carries serious health risks. Ablation can be performed either hysteroscopically or with various proprietary systems using thermal, radio-frequency (RF) or microwave energy. It is a good option for women with HMB, benign endometrium and a cavity that is not distorted by fibroids. The RF endometrial ablation system produces a significant reduction in MBL or amenorrhoea in 90 per cent of users. In a systematic review, women who underwent endometrial ablation were more likely to be dissatisfied than those who had had a hysterectomy, though the latter group took longer to get back to their daily routine. When compared with the LNG-IUS, the pictorial blood loss assessment chart score was significantly lower in the endometrial ablation group and fewer women had side effects a year after treatment than the LNG-IUS group.

The LNG-IUS and hysterectomy have been compared in a systematic review that found health-related quality of life at 12 months was higher in both groups, with no significant difference observed between groups. Pain, however, was significantly higher in the LNG-IUS group. With longer follow-up periods, more and more women initially treated with LNG-IUS seek further therapy. In a large hospital-based Finnish study comparing LNG-IUS to hysterectomy after five years of follow up, 42 per cent of women in the LNG-IUS group had undergone hysterectomy. This figure was much lower in a recent UK study comparing LNG-IUS to medical management that found at two years of follow up only six per cent of women in each group had undergone hysterectomy. The differences may reflect the different follow-up periods or the different study settings.[10]

In women whose HMB is caused by fibroids, surgical management is more likely to be required. Surgical options include myomectomy or hysterectomy, depending on the woman's preferences and desire for future fertility. In women who have completed their family and desire to avoid hysterectomy, uterine artery embolisation (UAE) can be considered. Among a register of 1387 patients who underwent the procedure, 83 per cent stated an improvement in their symptoms at two years. However, in a randomised trial, 28 per cent of women undergoing UAE required hysterectomy at five years of follow up.[11]

Although the management of primary dysmenorrhoea is the focus of the discussion below, most of these treatments are also appropriate in the first-line management of secondary dysmenorrhoea. NSAIDs have been shown in a systematic review to be effective in the treatment of primary dysmenorrhoea. In this review, ibuprofen had the most favourable profile in terms of side effects and efficacy. NSAIDs can be used alone or with other analgesics, such as paracetamol and codeine.

The COCP is a useful option for women who have pain refractory to simple analgesics. They operate by inhibition of ovulation. A systematic review has concluded that COCPs are significantly more effective than placebo for pain relief. There is some evidence that monophasic preparations are more effective for the treatment of dysmenorrhoea than multiphasic preparations.[5]

It is unusual for primary dysmenorrhoea to require treatment more intensive than the above. Secondary dysmenorrhoea caused by endometriosis can be amenable to other hormonal therapies such as high-dose progestogens, androgens and GNRH analogues. The levonorgesterel-releasing intrauterine system (LNG-IUS) can also be used for treatment of adenomyosis and endometriosis pain.

Medical treatments are successful in the treatment of 70–75 per cent of women with dysmenorrhoea. In those with refractory pain, surgical treatments focused on interrupting sensory nerve pathways have been developed. Presacral neurectomy (PSN) involves removal of nerves from the hypogastric plexus. This has traditionally been done by laparotomy, although laparoscopic techniques are evolving. Uterine nerve ablation (UNA) involves division of the uterosacral ligaments and can be done laparoscopically (LUNA).[12]

The utility of alternative therapies in the treatment of dysmenorrhoea has been the subject of several systematic reviews. Spinal manipulation has been shown to be ineffective. Magnesium and Vitamin B1 show some benefit in the relief of dysmenorrhoea.[5]

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Postmenopausal bleeding

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As a Trainee, postmenopausal bleeding is considered a bread-and-butter topic, as the investigation and management is relatively straightforward. Interestingly, there is a paucity of guidelines worldwide. However, most importantly, any bleeding postmenopause necessitates further evaluation and referral.

Postmenopausal bleeding (PMB) accounts for five per cent of office gynaecology presentations.[1] Its definition is self-explanatory, as any bleeding from the genital tract occurring in the postmenopausal period, arising after 12 months of amenorrhoea in a women of menopausal age.[2] Generally, four to 11 per cent of postmenopausal women will experience bleeding.[1] The chance of this occurring reduces as time since menopause increases.[1]

Aetiology

While the most common cause for PMB is atrophy, the diagnostic algorithm for PMB is designed to detect cancer, particularly endometrial cancer.[1] Vaginal, endometrial and urogenital atrophy is par for the course with postmenopausal hypoestrogenism.[1] Atrophy accounts for 60–80 per cent of all causes of PMB, while endometrial hyperplasia and cancer each account for ten per cent of cases.[1,3]

The remaining causes are attributed to endometrial or cervical polyps (two to 12 per cent); exogenous oestrogen (15–25 per cent); cervical cancer (one per cent) and factors such as vaginal trauma, anticoagulants and bleeding from non-gynaecological sites.[1,3] See Table 1 for a summary of these causes.

Table 1. Origin of PMB incidence.

Atrophy	60–80%
Exogenous oestrogen	15–25%
Polyps (endometrial/cervical)	2–12%
Endometrial hyperplasia	10%
Endometrial cancer	10%
Cervical cancer	<1%

Modified from Goodman A. Postmenopausal bleeding. UpToDate Accessed June 2014 and Brand A. The women with postmenopausal bleeding. *Aust Family Physician* 2007.

History and examination

Like any other presentation in gynaecology, and more broadly medicine, the evaluation of PMB starts with a thorough history and physical examination. This will usually be first encountered with a presentation to a patient's general practitioner; however, presentations to emergency departments also occur.

Salient history surrounding the bleeding includes: when it started, duration, pattern, amount, frequency and any associated trauma.[1] Changes in bladder or bowel function and associated factors such as pain and weight loss are also important to ascertain.[1]

It is imperative to determine the use of hormone replacement therapy (HRT), the type of HRT (continuous, cyclical, oestrogen and progesterone or oestrogen only), duration of use and whether the patient has had a hysterectomy. It cannot be highlighted too strongly that any woman who is on HRT and has a uterus requires progesterone for endometrial protection.

Details of the patient's past gynaecological, obstetric, medical, surgical, medication and family history are also essential.[1] In particular, and often forgotten, is a thorough list of all over-the-counter medications, especially phytoestrogens.[1,3] Phytoestrogens in brief are plant derivatives from, for example, soy, alfalfa and red clovers, that have an oestrogenic effect.[4] They are often taken to relieve vasomotor symptoms of menopause as an alternative to traditional HRT preparations.[4]

Tamoxifen, a medication used to reduce the risk of breast cancer recurrence in patients who have had breast cancer, is also worth a mention. Tamoxifen has been associated with changes to the endometrium including polyps, hyperplasia and cancer.[1,3,5] Thus it is important to establish a patient's personal history of breast cancer and treatments undertaken, as well as a family history of this disease and other cancers such as colon and endometrial.[1]

In terms of physical examination, this should begin with general appearance and establishing body mass index, as obesity is a well-recognised risk factor for the development of endometrial cancer.[1,3] An abdominal examination should focus on palpation for discernible masses.[1,3] A systematic pelvic examination may yield the cause of the PMB.[1] Examination should include a detailed inspection of the vulva and vagina, particularly looking for atrophy, suspicious lesions, trauma and a foreign body.[1] A speculum examination should be performed in order to evaluate the cervix for polyps and cancer.[3] It is imperative a pap smear is taken at this time.[3] A bimanual examination to evaluate uterine size, mobility and the adnexae as well as a rectal examination completes the assessment of the pelvis.[3]

Investigations

The investigation of PMB is relatively straightforward, involving a pelvic ultrasound and tissue biopsy.[1,3] Depending on the findings of physical examination, this biopsy may be from the vulva, vagina or cervix, but most commonly the evaluation needs to include an endometrial biopsy.[1,3] Women should be referred to a gynaecologist for ongoing investigation of PMB.[3]

Transvaginal ultrasound

The majority of women referred to outpatient gynaecological services have had pelvic ultrasound in order to evaluate the endometrial thickness and assess for pelvic pathology. Transvaginal ultrasound (TVUS) is considered an acceptable initial investigation in women with PMB.[1,6] In this group of women, as distinct from women with an incidental finding of thickened endometrium or fluid without bleeding, an endometrial thickness of 4–5mm typically correlates with low risk for endometrial disease.[7] As the endometrial thickness increases to 20mm so too does the risk of endometrial cancer.[7] It is important to remember that there is no accepted agreement on the cut-off for normal endometrial thickness and, thus, any women with risk factors and symptoms require endometrial sampling.[3]

There have been many studies looking at the sensitivity and

specificity of TVUS in detecting endometrial cancer in women with PMB.[7] This varies depending on the endometrial thickness used. For example, a sensitivity and specificity of 96 and 53 per cent respectively for an endometrial thickness of 4mm and 96 and 61 per cent respectively for endometrial thickness of 5mm.[7] It was the consensus of the UpToDate article that an endometrial thickness less than 5mm on TVUS usually excluded endometrial cancer, however solitary use of ultrasound is not recommended in the exclusion of cancer.[7]

Endometrial biopsy

An endometrial biopsy is considered the gold standard for evaluation of PMB.[3,7] Endometrial biopsy can be obtained with an endometrial pipelle in the outpatient setting, or by hysteroscopy and curettage (with or without dilatation) in either the outpatient or inpatient setting.[7]

Overall, the endometrial pipelle has been shown to adequately sample the endometrium.[7] It is considered the more sensitive device in identifying hyperplasia or cancer compared to other sampling devices.[7] The sensitivity of the pipelle endometrial sampling in the detection of endometrial hyperplasia and cancer was 99.6 and 81 per cent, respectively, in postmenopausal women.[7] It is important to remember pipelle sampling of the endometrium may miss pathology, as often less than 50 per cent of the endometrium is sampled, thus it is most useful with greater than 50 per cent of the endometrium is involved with disease.[7]

Potential complications of endometrial pipelle biopsy include uterine perforation and infection.[3] Patients should be counselled regarding the possibility of insufficient or non-diagnostic sampling, which may necessitate further investigation.

Hysteroscopy and curettage is typically saved for cases where office sampling was insufficient or not possible owing to patient discomfort or cervical stenosis.[3] The advantage to hysteroscopy is it provides the ability to see the entire endometrial cavity and is particularly useful in detecting and removing focal lesions such as polyps.[7] Again, this can be performed on an outpatient basis, avoiding the complications of general anaesthesia; however, appropriate patient selection is essential.[7] Risks involved in this procedure include infection, bleeding, uterine perforation and, again, insufficient sampling.[7]

Cervical cytology

A diagnostic Pap smear in any women presenting with PMB should also be undertaken.[1] This can help provide a differential between an endocervical and endometrial cause of PMB.[1]

Management

After a thorough evaluation for PMB and arrival at a diagnosis, the question arises as to what to do next. For women with cervical or endometrial cancer, prompt referral to the gynaecological oncology service is imperative for definitive management.[3] A gynaecologist in conjunction with the patient's general practitioner typically manages other causes. Causes such as cervical or endometrial polyps may have already been managed and removed in the work up of PMB. As long as benign histopathology is confirmed, no further investigation or treatment is required. In such situations, patient education is paramount, as patients should be informed that any further episodes of PMB require re-evaluation.

Atrophy

A diagnosis of vulvovaginal or urogenital atrophy is not cause for treatment unless women are experiencing symptoms.[8] Additionally, treatment of atrophy may be recommended in the context of vulvovaginal surgery or in cases of pelvic organ prolapse and urinary incontinence.[8] Aside from vaginal bleeding or spotting, symptoms of atrophy typically include vaginal dryness, burning, pruritis and dyspareunia.[8]

An approach to management of vulvovaginal atrophy includes vaginal moisturisers and lubricants, as well as topical vaginal oestrogens.[8] Generally, topical vaginal oestrogen is more successful than vaginal moisturisers and lubricants.[8] Topical vaginal oestrogen preparations in Australia include Vagifem (oestradiol) and Ovestin (oestriol). A typical regimen for these products is daily for two weeks, then twice weekly thereafter.[8] Topical vaginal oestrogen is the treatment of choice over systemic HRT for women where atrophy is the predominant symptom.[8]

There are many preparations of commercially available vaginal moisturisers and lubricants, including products such as Replens and Sylk.[8] These are designed for regular use, typically a few times per week, not just at the time of sexual intercourse.[8] The composition of vaginal moisturisers and lubricants can vary, including water, silicone and oil, and there can be some trial and error until a patient finds the product to suit their requirements.[8]

Endometrial hyperplasia

Endometrial hyperplasia is defined as proliferation of endometrial glands and consequentially an increased gland to stroma ratio.[9] Endometrial hyperplasia can be sub-classified into simple or complex with or without atypia.[9] The importance of endometrial hyperplasia is each sub-category has a corresponding risk of progression to endometrial cancer for simple or complex hyperplasia with or without atypia the risks are one, three, eight and 29 per cent, respectively.[9] An overview to the management of endometrial hyperplasia in postmenopausal women can be summarised into treatment with progestins or hysterectomy.[10] The decision of treatment modality is usually based upon the presence of atypia, as this increases the risk of progression to endometrial cancer.[10]

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Letter to the editor

Nausea and vomiting in pregnancy

For several years now I have been particularly interested in the management of nausea and vomiting in pregnancy (NVP). This interest was sparked by the fact that there seemed to be too large a number of admissions to our hospital for management of hyperemesis gravidarum (HG). A similar rise in admissions for HG was reported in the UK – three-fold in the 15 years from 1990 to 2005. It seemed likely that the reason was inadequate early management of 'morning sickness' resulting in deterioration to the point of ketosis and dehydration, in other words, HG. On checking what these unfortunate women had been treated with before admission, it became strikingly clear that, almost without exception, they had been on metoclopramide. This suggested to me that metoclopramide was not particularly good at treating the problem. I found, on asking patients who had been prescribed it what they thought of metoclopramide, that their assessment was quite low and that frequently they had given up on it altogether.

Pregnancy Sickness Support, an association in the UK, to do what its name suggests, advises on its website that first steps should be to use a phenothiazine combined with pyridoxine and specifically mention cyclizine and promethazine. They also point out that American and Canadian guidelines suggest doxylamine and pyridoxine as the first step. Once we started to use doxylamine with pyridoxine we found excellent results, which seemed to make a difference to the rates of admission – from about 45 per cent of presenters to the emergency department down to about 25 per cent. The rationale for using doxylamine is that it was one of the ingredients of the best treatment for NVP of all time, Debendox, and is now available in combination with pyridoxine, as Diclectin, or separately as Restavit.

I carried out a survey of prescribing habits for NVP with the results published in *ANZJOG*.[1] The number-one choice for NVP, whether mild or severe, was metoclopramide – even ranking ahead of pyridoxine. For HG it was even more stark – first was metoclopramide and second choice was ondansetron. This seems to suggest that my colleagues have been prescribing irrationally and by rote. Because metoclopramide enhances gastric emptying, and NVP is worse when the stomach is empty, it doesn't seem logical to use it at all.

As for steroids, one good double blind trial[2] showed they were no better than a placebo. There was, however, an improvement in sense of well-being. Another study[3] claimed that a short course of methylprednisolone was better than promethazine, despite the fact that three in the steroid group failed to stop vomiting in two days, versus two in the promethazine group. Nevertheless, there have certainly been some rapid improvements reported anecdotally. I have never used dexamethasone as I have found phenothiazines quite satisfactory even in the severe end of HG. As a general principle, by the time you get there you are likely to need a combination anyway and prochlorperazine with ondansetron has not failed me.

Drs Lakhdir and McDougall, in their article in *O&G Magazine* Vol 16 No 2 25–26, mention metoclopramide first in their list of drugs to be considered and don't mention doxylamine at all. They quote the National Women's Hospital guideline as saying metoclopramide is a first-line choice. This is a surprising claim in view of the guidelines from the USA, Canada and the UK that do not mention metoclopramide until at least the second line. I challenge the authors of the article, the authors of the National Women's guideline and, indeed, all *O&G Magazine* readers to run a little comparison on their next few sufferers of NVP to see which is more effective, Maxolon (metoclopramide) or Restavit (doxylamine) and it is my prediction that it will become obvious quickly that metoclopramide is inferior. Indeed, the widespread use of it may well be responsible for the rise in admissions for treatment of HG that has characterised the last two decades.

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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.

Caesarean wound closure

With approximately 30 per cent of births in Australia by caesarean section (CS), research into technique and complications of a common operation are of interest to most obstetricians. Mackeen et al recently reported a randomised trial comparing wound complications for different skin closure methods.[1] In the trial, 746 women having a low transverse incision for CS, were randomised to have skin closure with either stainless steel staples or subcuticular 4-0 polyglactin or poliglecaprone suture. Staples were removed between four and ten days after surgery at the surgeon's discretion. The percentage of women having at least one wound complication (infection, haematoma, seroma, wound separation) was 4.9 per cent for the suture group and 10.6 per cent for the staple group (OR=0.43 [0.23-0.78]). The result was most marked for wound separation, 1.6 per cent in the suture group and 7.4 per cent in the staple group, respectively (OR=0.20 [0.07-0.51]). A previous review by the same primary author reported wound separation with staples increased if staples were removed on day four rather than later.[2] The current study further found the time for skin closure with sutures was significantly longer than with staples (median duration 15 and six minutes, respectively). It may be that many obstetricians will be prepared to take the extra time for suture skin closure to achieve the reduction in complications demonstrated in this paper.

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Nursing staffing and mortality

Many readers will have experienced first hand the effect of budgetary constraints on staffing within their hospitals. This may be in terms of absolute staff numbers or in the replacement of some staff with less-qualified and cheaper alternative workers. This phenomenon is not limited to Australia and New Zealand and European countries are subject to the same pressures. This large retrospective study analysed the discharge data for more than 400 000 patients having common general, orthopaedic or vascular surgeries in 300 hospitals across nine European countries (Belgium, Finland, Ireland, the Netherlands, Norway, Spain, Sweden, Switzerland and the UK). The results of the study showed that both nursing staffing levels and level of nursing education were significantly associated with mortality. With the dependent variable being likelihood of an inpatient dying within 30 days of admission for surgery, the authors found that an increase in nursing workload by one patient per nurse increased the mortality rate by seven per cent, while increasing the number of degree-qualified nurses by ten per cent decreased this likelihood by seven per cent. For example, hospitals in which 60 per cent of nurses had degrees and cared for an average of six patients would have a 30 per cent lower mortality than hospitals in which only 30 per cent of nurses had degrees and cared for an average of eight patients. While this result may not well be completely generalisable to local conditions, it remains a cautionary analysis of how seemingly small changes in staffing can adversely affect patient safety.

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HRT and cerebral function

A 2011 report estimated that there will be more than 380 000 Australians suffering from dementia by 2020, and more than 500 000 by 2030[1], with the result that the prevention of dementia is likely to become a major health issue in the coming decades. Previous studies of the effect of oestrogen hormone replacement therapy (HRT) on dementia have generally not been encouraging, with the Women's Health Initiative Memory Study (WHIMS) reporting an increased risk of dementia with oestrogen HRT compared to placebo.[2]

This small trial used fluorodeoxyglucose-18 positron emission tomography (FDG-PET) to examine brain metabolism changes in women randomised to either continue or cease using oestrogen HRT after approximately ten years of use, either with or without progestin.[3] In the trial, 64 eligible women were randomised to either continue their HRT for two further years or cease; 45 women were available for follow up. The primary outcome measure was brain metabolism measured by FDG-PET. Analyses showed a significant decrease in metabolism in the medial frontal cortex, an area reportedly important in cognitive decline, in women who ceased HRT compared to the women who continued. Interestingly, this effect was only observed in women who continued on 17-beta oestradiol-based HRT. Women who either discontinued HRT, or continued on conjugated equine oestrogen-based HRT both had a decline in brain metabolism over the two-year period. The addition of concurrent progestin to the HRT also resulted in decline over the two-year period.

The authors concluded that continuation of unopposed 17-beta-oestradiol-based HRT over the two-year period resulted in less brain decline than either ceasing HRT or other forms of HRT. There are many caveats to this study, including small sample size, and the relevance of gross brain metabolism to cognitive decline, but studies like this are likely to be of greater relevance as the population ages.

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Expecting the unexpected

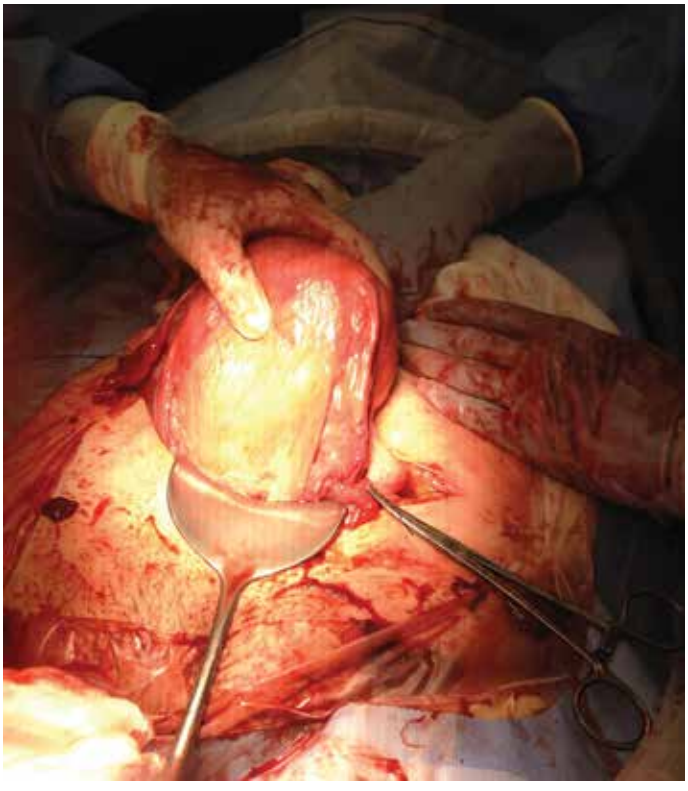
Dr Kellie Wight
FRANZCOG Trainee

Uterine torsion is a rare obstetric complication that is almost always identified perioperatively. Clinicians should consider it as a differential diagnosis in the presence of uterine malformation or the presence of fibroids.

Uterine torsion is an uncommon obstetric finding and is considered to be pathological at greater than 45 degrees rotation along the long axis. There are relatively few documented cases of levorotation of the uterus. Contributing factors such as maternal trauma, fetal malpresentation, ovarian tumours and uterine abnormalities are recurringly identified. A recent incident of uterine torsion was identified intraoperatively in an outlying metropolitan hospital, which is discussed below.

A 29-year-old patient had been seen throughout her pregnancy without any major concerns until she was admitted for an induction at six days post-term, after being identified as having an unstable fetal lie.

Her obstetric history included three previous pregnancies – all resulting in vaginal deliveries – that had been induced for gestational hypertension between 38 and 39 weeks gestation each time. Her current pregnancy had not been complicated by gestational hypertension or any other specific concerns, despite having the same partner. On review of her handheld record it was noted that fetal lie had continued to alternate between antenatal visits.



Anterior surface after detorsion.

On the eve of induction the baby was noted to be cephalic with head at station -3. Overnight, palpation showed baby to be transverse, but by morning baby was cephalic again. The patient was fully informed of the risk of cord prolapse and need for emergency caesarean section, and the decision was made to proceed with induction in business hours to minimise risks. Following a reassuring cardiotocograph (CTG), an artificial rupture of membranes was attempted by the birth suite registrar. The vaginal examination was noted to be particularly difficult, with the registrar unable to palpate through the internal os. The consultant on call was asked to attend and review. The consultant confirmed the fetus was cephalic with a bedside ultrasound and with the assistance of fundal pressure; rupture of membranes was performed with a fetal scalp electrode. This was a very technically difficult procedure with the head noted to be at station -4 and at times impossible to feel at all vaginally. The cervix was noted to be 2cm long and quite firm.

The fetus continued to be very active during this process. After descent of fetal head with draining of liquor, and with the reassurance of an exemplary CTG, the decision was made to start syntocinon and proceed with the induction as per protocol with repeat vaginal examination in two hours or as indicated.

After 40 minutes, the birth suite registrar was asked to attend to review an abdominal palpation after a particularly vigorous bout of fetal movement. It was felt that the baby was now transverse, which was confirmed by the registrar on bedside ultrasound. A vaginal examination was performed and no cord or fetal parts were palpated; again the registrar was unable to palpate through the internal os, which was again noted to be particularly tight given the parity and gestation.

An emergency caesarean section was called, for the now-significant risk of cord prolapse. In the operating theatre, a spinal anaesthetic was placed and pfennensteil entry commenced. At the uterus, the fallopian tube, ovary and engorged pampiniform plexus were noted to be overlying the uterus diagonally from the right iliac fossa to the left fundal surface, continuing posteriorly. This was thought to be the left tube with acute dextorotation so was accordingly semi-corrected with difficulty. At examination of the exposed uterine surface, the lower segment was poorly formed and the bladder was unidentifiable. Ongoing fetal movement throughout the entry resulted in the fetal head being oblique at the time of transverse uterine incision. The fetus was manipulated internally, as it remained very active, and was delivered cephalic. The placenta was delivered without incident.

At uterine closure, the anatomy was noted to continue to be unusual. The uterus was exteriorised and it became obvious that the uterus was levorotated to 270 degrees and the uterine incision

had been made on the posterior aspect of the uterus. The incision was closed in double layers and the uterus was rotated back 270 degrees on the cervix to normalise anatomy. The uterus appeared to be fully perfused with no evidence of necrosis. The mother and baby both recovered well.

Discussion

Uterine torsion is rare and reported only as case studies. Some degree of uterine rotation is quite normal in term pregnancies, but rotation greater than 45 degrees is considered pathological.[2] The case studies available since the first reported case in 1876, describe torsion between 60 to 720 degrees with outcomes ranging from live, well mother and baby to peripartum hysterectomy and fetal demise and maternal death. Torsion is clockwise in two-thirds of cases. It is associated with malpresentation of the fetus, maternal trauma and, in a third of cases, uterine tumour or mobile uterine fibroid during pregnancy.

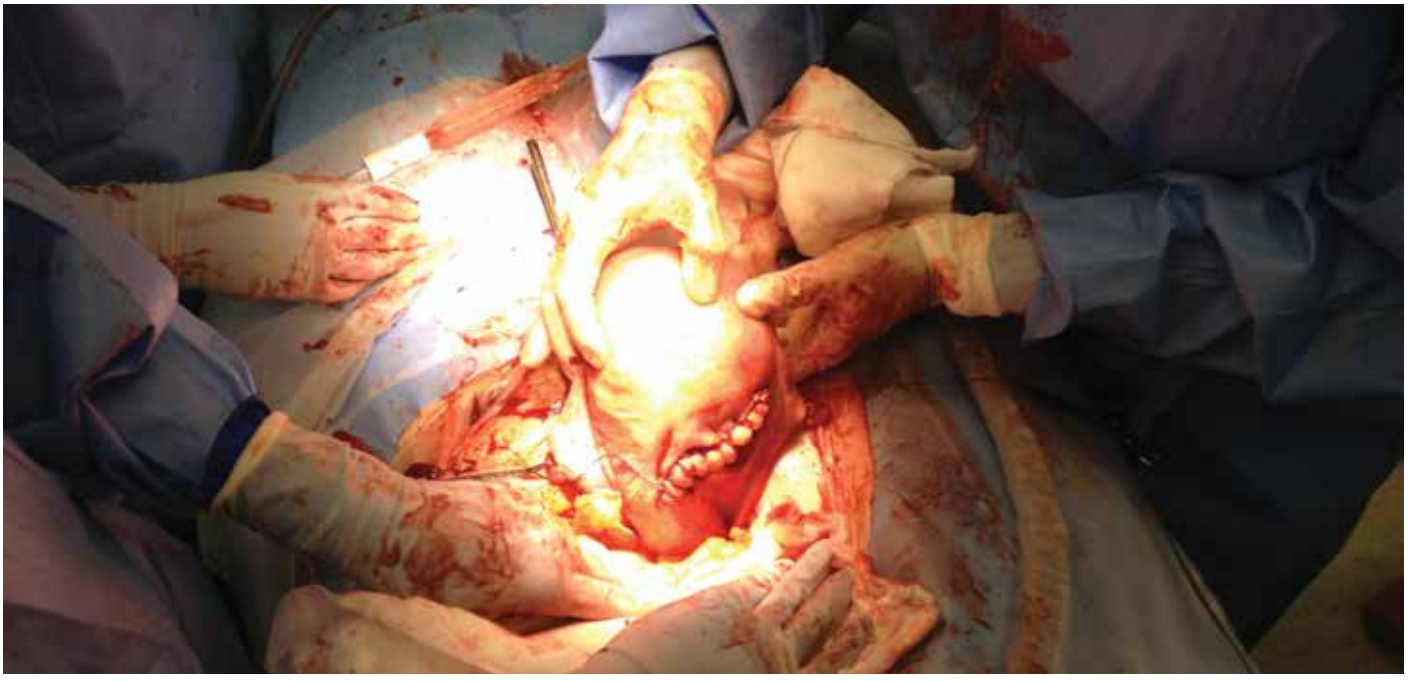
Prolonged torsion results in constriction of the uterine vessels to ultimately include uterine artery occlusion. As obstructed outflow increases pressure within the placental cotyledons, fetal distress becomes apparent and the risk of placental abruption significantly increases. Necrosis of the uterus has also been identified in several case studies. Uterine torsion is rarely diagnosed prior to emergency caesarean section.[3] It was originally theorised that torsion only occurred in the presence of uterine tumours: 'no tumour, no torsion'. Over time this understanding has been modified to include uterine abnormality until now when it is understood that most cases occur in normal anatomy, though causative factors are identified as repeat offenders in case reports. These include uterine myomata (31.8 per cent), congenital uterine abnormalities, mostly bicornuate uteruses (14.9 per cent), pelvic adhesions (8.4 per cent), ovarian cysts (seven per cent) and fetal malpresentation (two per cent). Single cases of external cephalic version and maternal trauma have been reported as causative factors.[3]

There are 212 documented cases in literature to date, the first of which was reported in 1876.[4] Differential diagnosis is usually obstructed labour, placental abruption, uterine rupture or fibroid degeneration as symptoms include intense colicky abdominal pain that progresses to severe generalised abdominal pain and is associated with eventual fetal compromise. Vaginal bleeding, urinary or bowel disturbances are also regularly described, along with fetal arrhythmias in cases with prolonged torsion. Symptoms usually present unexpectedly and acutely in labour and occasionally, antenatally. Cases have been identified in all age groups, and at all gestations, but most occur in the third trimester.[2,4]

Torsion is almost always misdiagnosed and then identified unexpectedly at emergency caesarean section, but can be identified antentally. An example of antenatal diagnosis was described by Wilson et al when an abnormal vaginal examination prompted an MRI, which identified torsion by demonstrating an 'X' shaped shadowing at the level of the vagina where a 'H' shaped shadowing would normally be seen.[2,4] However, MRI diagnosis has also been documented to fail to identify torsion in a case where the images were not taken specifically at the level of the vagina, as symptoms indicated an acute abdomen, and therefore failed to identify the tell-tale 'X'.[3] Ultrasound has also been used to identify a change in position of a previously documented uterine fibroid or placenta as a diagnostic tool.[6] Presentation is generally acute with severe abdominal pain and signs of pregnancy compromise in the third trimester, so an MRI or ultrasound may not the most appropriate diagnostic tool.

Once symptoms are identified and a differential diagnosis made, pregnancies at, or close to, term are delivered by emergency caesarean section.

If diagnosed in the second trimester of the pregnancy, laparoscopic reversal of the torsion can be attempted, though is associated with significant risk to the pregnancy, with 13 per cent perinatal mortality.[3] Some sources recommend plication of the round or uterosacral ligaments to prevent repeat torsion of the gravid uterus.[7,8] Closer to term, or at term, delivery by caesarean section can be undertaken, usually with minimal risk, though in the presence of necrosis, hysterectomy may be recommended. Depending on the degree and duration of torsion, anatomy can



Posterior surface after detorsion.

be grossly distorted and oedematous, making identification of landmark structures difficult. The lower segment and bladder may not be identifiable at all increasing risk of maternal injury.[4] In many cases, torsion is not recognised, or is too difficult to reverse prior to delivery; however, the position of the uterus should be deliniated as much as possible prior to uterine incision and the bladder reflected if possible to avoid damage to uterine arteries, ligaments, tubes and uterine vessels. Caesarean delivery through the lower posterior surface of the uterus has been reported in a number of cases[5,9] as occurred in the above case.

Across all reported cases, maternal mortality is 13–18 per cent.[4] Further advanced pregnancies have higher mortality, with 18.5 per cent at term, though this number is skewed by the majority of cases reported being in the third trimester. Rotations of higher than 180 degrees are associated with a mortality rate of 50 per cent. There have been no reported cases of lovorotation greater than 270 degrees since 1985.

Since 1976, 12 per cent of cases report fetal demise and no cases report maternal demise.[4] The outcomes are not always congruent with the degree of torsion or the severity of the symptoms, with 11 per cent of documented cases being asymptomatic, as in this case.[4] Most reported cases have a positive outcome for both mother and baby; however, before 1976, there are reported cases of maternal death and two cases of peripartum hysterectomy for ascending necrosis secondary to torsion.

In the case presented at the beginning of this article, both patients remained asymptomatic throughout. The emergency caesarean section was performed for the high risk of cord prolapse not for a suspected torsion of the uterus. Given the urgency of the delivery, diagnosis was not made until exteriorisation of the uterus following delivery. As discussed, it was only upon more detailed examination of the exposed uterus that the engorged left fallopian tube and paminiform plexus were identified as the structures diagonally crossing the uterus and the oedematous bladder was noted deep in the pouch of Douglas on the rotated anterior surface of the uterus.

The risks of recurrent torsion are unknown and recommendations for future pregnancies vary, so it was recommended to the mother that clinically she could attempt a vaginal birth; however, an elective caesarean section was appropriate and should certainly be seriously considered should there be a failure of the fetal head to appropriately engage in a future pregnancy.

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Further reading

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Alcohol and pregnancy

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According to a recent survey, 97 per cent of Australian women want to be asked about alcohol use during pregnancy.

A new Australian public-health initiative, Women Want to Know, was recently launched with RANZCOG involvement. It was developed by the Foundation for Alcohol Research and Education (FARE) with funding from the Australian Government. The campaign encourages health professionals to discuss the risks of consuming alcohol during pregnancy with women who are pregnant or planning pregnancy. RANZCOG has also developed an online-learning course that attracts CPD points.

Women Want to Know promotes the 2009 National Health and Medical Research Council's Australian Guidelines to Reduce Health Risks from Drinking Alcohol (NHMRC Alcohol Guidelines). These are carefully worded and specify 'Maternal alcohol consumption can harm the developing fetus or breastfeeding baby', furthermore: for women who are pregnant or planning a pregnancy, not drinking is the safest option; and for women who are breastfeeding, not drinking is the safest option.[1]

In developing the campaign, a survey was undertaken to establish current practice and awareness of the NHMRC Alcohol Guidelines by health professionals. Only the results from obstetricians and gynaecologists are reported here. Between August and November 2013, an online survey, conducted by IPSOS Social Research Institute, was distributed by RANZCOG. In total, 209 obstetricians and gynaecologists (respondents) completed the survey, receiving one CPD point for their participation. The results were as follows:

- The majority (85 per cent) of respondents believed that a pregnant woman cannot drink any alcohol without risk to the fetus, 11 per cent said that a pregnant woman could consume one or two standard drinks per day and four per cent said they did not know.
- 24 per cent of respondents said that they had never heard of the NHMRC Alcohol Guidelines; 29 per cent had heard of them, but were unfamiliar with their content. Only seven per cent said they were very familiar with the content.
- 77 per cent of respondents indicated they discuss alcohol consumption with women who are pregnant for the first time, but only 62 per cent discuss alcohol with a woman who was pregnant for the second or subsequent time.
- When asked about their concerns in discussing alcohol, 16 per cent said they were concerned about the woman's comfort and 16 per cent said they were concerned about a lack of referral options available. However, 51 per cent of respondents also said they were unfamiliar with referral pathways available to them to assist pregnant women experiencing problems with alcohol.

Respondents were also asked about the advice they provided to women about alcohol consumption during pregnancy, 74 per cent recommended abstinence, but other statements included:

- no more than two drinks per day;
- avoid spirits;
- avoid excessive use;
- no alcohol in first trimester;
- keep third trimester alcohol to an absolute minimum;
- permitted to have one glass of wine with main meal, usually with dinner once per day as a maximum;
- one drink a day or five a week is acceptable, moderation is the key, never be unable to legally drive, and
- should be safe with less than nine drinks per week.

These responses demonstrate the range of messages that women receive. However, the NHMRC Alcohol Guidelines clearly state that no alcohol consumption is the safest option for women who are pregnant, planning pregnancy and breastfeeding. These guidelines are supported by evidence from systematic reviews and prospective cohort studies. No studies have definitively established a safe level of alcohol consumption and no level of alcohol consumption has been found where damage to the fetus will not occur.[2,3] It is known that at a cellular level, even very low levels of alcohol exposure may cause damage.[4] This does not mean that low levels of exposure have been proven to damage the fetus, rather reflecting the uncertainly and the difficulty in proving such a link in population studies. It is important to reassure women and provide ongoing education if there is inadvertent exposure to alcohol.

One-in-five Australian women continue to drink after becoming aware of their pregnancy.[5] Therefore, health professionals need to provide women with clear advice that no alcohol consumption is the safest choice during pregnancy. The course on alcohol and pregnancy is available at www.climate.edu.au/login/index.php and a range of resources that can be used in practice, including leaflets for women, can be ordered from www.alcohol.gov.au .

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Partogram or instagram?

Dr Leo Leader
FRANZCOG

The aim of the partogram is to provide a pictorial overview of labour to alert midwives and obstetricians to deviations in the progress of labour as well as fetal and maternal well-being.

The partogram was thought to be one of the most important advances in modern obstetric care.[1] Charts usually contain pre-printed alert and action lines. The alert line usually represents the slowest ten per cent of primigravid women's progress in labour. A parallel action line is usually placed, a number of hours to the right of the alert line, to prompt effective management of slow progress of labour.

A number of authors[2-4] have questioned the rate of progress expected in labour, suggesting that the current value of 1cm an hour in the active phase of labour is too quick and leads to unnecessary intervention. A more alarming trend by some obstetric care providers is to ignore the guidelines completely and to encourage women to labour in the face of what is a clearly obstructed labour. Ignoring guidelines that have been shown to reduce morbidity to both mother and baby is risky. Taking a snapshot and going with the moment and their maternal instincts is potentially exposing labouring women to serious complications, in particular, postpartum haemorrhage (PPH) and birth trauma. These women may ultimately reach full dilatation, but then have a very difficult delivery.

History

Friedman[5] was the first obstetrician to graph the progress of labour. He studied 100 African primigravid patients in labour and recorded their progress in centimetres per hour. He produced a graph resembling a sigmoid curve. This became known as a cervicogram. The slowest ten per cent of women progressed at 1.2cm per hour.

Philpott[6] was the first to realise the value of graphic records of labour. They are more efficient than lengthy written notes and the pictorial display provides a practical tool, recording all the intrapartum details, to immediately alert staff to abnormal developments. The partogram was first introduced into Harare Hospital in Rhodesia (now Zimbabwe) in 1972.

The vast majority of the 30 000 patients under Philpott's care delivered at midwife units peripheral to the main obstetric hospital. Working with extremely limited resources, in a hospital that dealt with 70 new obstetric fistulas a year, Philpott and his staff attempted to reduce obstetric morbidity (PPH, obstructed labours, ruptured uteruses).

In a study of African primigravid patients[7], Philpott and Castle established that the slowest ten per cent of women dilated at 1cm per hour once they were in the active phase of labour (defined as being more than 3cm dilated). They drew an alert line representing dilatation of 1cm an hour once the patient reached 3cm of dilatation. In the initial publication the alert line started at 1cm of dilatation (see Figure 1a). This allows for different degrees of cervical effacement. In most other publications, the alert line starts at 3cm (see Figure 1b).

In a prospective study of 624 patients, Philpott and Castle[8] trained midwifery staff in the peripheral units to do four-hourly cervical assessments. If the rate of progress of patients in the active phase crossed the alert line, they were transferred to the main hospital. A parallel action line was drawn four hours to the right of the alert line. Once in hospital, patients who crossed the alert line were examined after a further two hours. No intervention was required in those who had progressed satisfactorily. Those who crossed the action line were critically assessed to exclude obvious

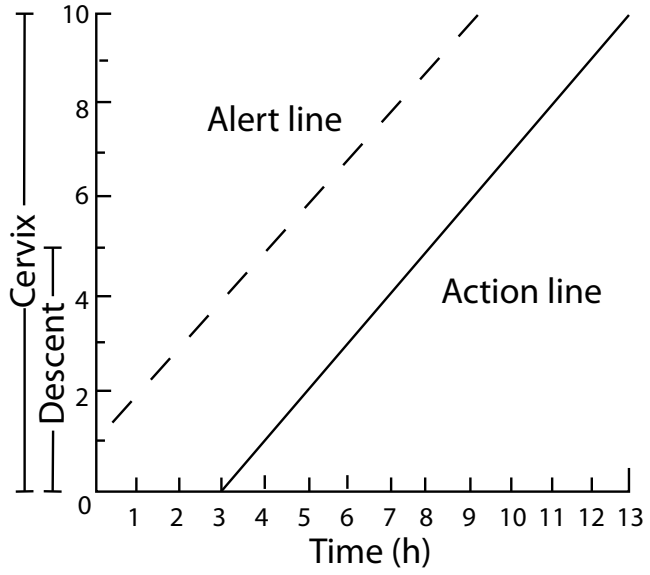

Figure 1a. Alert and action line on cervicograph. Graphic records in labour. Philpott R. British Medical Journal *4 (5833): 163-5, 1972.*

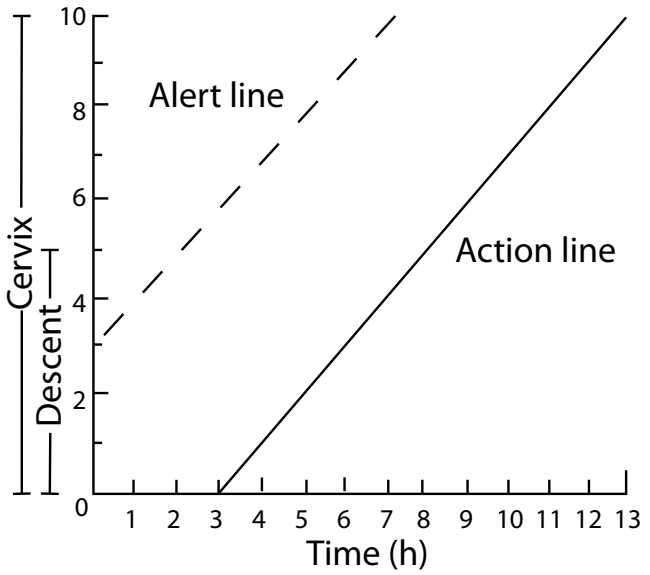

Figure 1b. Partogram with the alert line starting at 3cm.

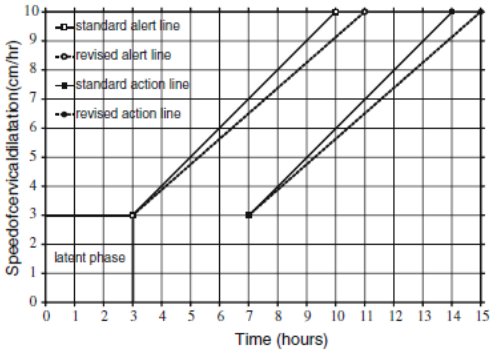

Figure 2. This shows the standard Philpott partogram and the revised one from Van Bogaert. Revising the primigravid partogram: does it make any difference? Archives of Gynecology and Obstetrics *279 (5): 643-7, 2009.*

cephalo-pelvic disproportion (CPD). They were given an epidural block for analgesia, intravenous fluids and an oxytocin infusion if the contractions were thought to be inadequate. The fetus was carefully monitored. They were then allowed to labour for a further six hours provided adequate progress was being made in labour.

Seventy eight per cent of patients didn't cross the alert line and 99 per cent of these had a vaginal delivery. Of the 22 per cent who crossed the alert line and were transferred to hospital, 11 per cent progressed satisfactorily and had a vaginal birth. Only 11 per cent of patients crossed the action line, of these: 28 per cent delivered spontaneously, 20.5 per cent required a ventouse delivery and 51.5 per cent a caesarean section. Simply triaging patients using a partogram had a huge impact on reducing the morbidity associated with childbirth in their community.

Current practice

Most obstetrical units today use a locally adapted form of partogram. The use of partograms to monitor labour is recommended by the World Health Organization.[9] There is no doubt they are of great value in under-developed countries that don't have sufficient well-trained obstetric care providers to allow early identification and transfer of patients who are likely to develop complications.

A Cochrane review[10] concluded that there is insufficient evidence to recommend routine use of partograms as part of standard labour ward management. Finding a proper control group is very difficult. All of the randomised studies in the review use control groups whose care is provided by staff who have been trained to use the partogram. They are undoubtedly influenced by the fact that they know that the slowest tenth percentile of primigravida patients should progress at 1cm per hour in the active phase of labour. This will influence their management decisions.

Most studies quote the rate of dilatation in labour in the active phase used by Friedman[5] of 1.2cm per hour rather than the rate used by Philpott and Castle of 1cm per hour.[7] A number of authors have questioned whether these rates are too optimistic and lead to unnecessary interventions. A review by Neal et al[2] of 18 studies in low-risk nulliparous patients found that the average linear rate of dilatation was 1.2cm per hour. The statistical limit (two standard deviations from the mean) was 0.6cm per hour.

Van Bogaert[11] argued that the original study by Philpott was based on only 100 patients therefore the slowest ten per cent represented ten patients. He analysed the rate of progress of 1592 nulliparous patients in a South African district hospital and found that the slowest ten per cent progressed at 0.86cm per hour. The slowest ten per cent of those progressed at 0.63cm per hour, a figure similar to Neal's statistical limit. By using a revised alert line, in his partogram (see Figure 2), he found that 72.5 per cent of patients stayed on the left of the alert line, compared to 56.1 per cent using the standard alert line on 1cm per hour.

A later study of 1398[12] multiparous women also examined two-hourly in labour found that the slowest ten per cent dilated at 1.7cm per hour.

Where to draw the line

There is also no consensus as to where the action line should be drawn. The original action line used by Philpott and Castle[8] chose four hours as that was the maximum time it took to transport patients from the furthest midwifery birthing unit. The Cochrane review[9] reviewed studies using an action line drawn

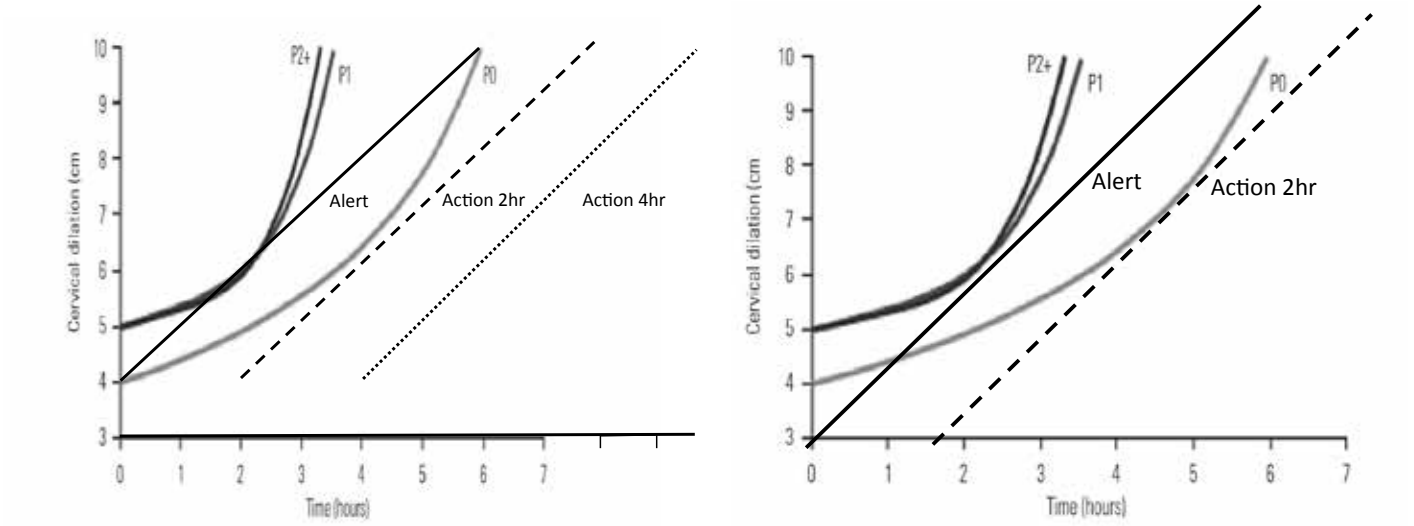

Figure 3. Average labour by parity in singleton pregnancies with spontaneous onset of labour, vaginal delivery and normal neonatal outcome. Abbreviations: PO, Nulliparous women; P1, women of parity 1; P2, women of parity 2+. Modified from Obstetric care consensus. Obstet Gynecol *2014; 123:693-711. Figure 3a shows nulliparous women whose dilatation started at 4 cm. Figure 3b shows multiparous women whose dilatation started at 5cm.*

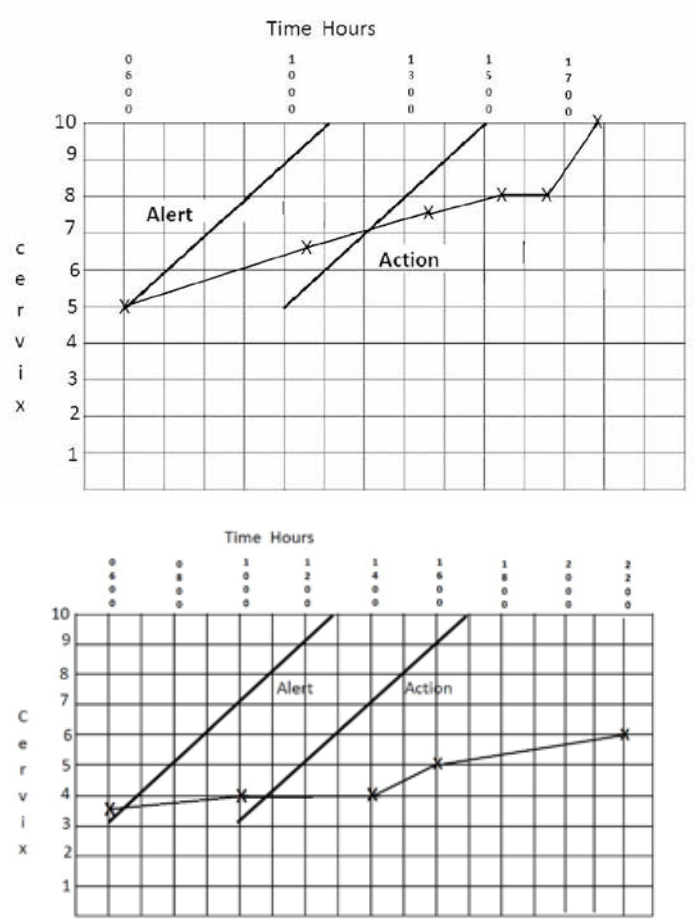

Figure 4a (top) and 4b (bottom). The partograms of two women who were allowed to labour on despite the lack of progress on their partograms.

after two, three or four hours. There are no consistent differences in outcomes. If it is drawn after two hours instead of four, it leads to more use of oxytocin, but the caesarean section remains unchanged. There were also no differences in the incidence of PPH.[13] Pattinson et al[14], in his study of 694 labouring nulliparous women in South Africa, found that women who received early intervention (two hours after no progress), had fewer caesarean deliveries (16 per cent) than those with expectant management (23.4 per cent, intervention after four hours without progress). That study was complicated as patients didn't routinely have their membranes ruptured because of the high risk of HIV infection.

When does the active phase of labour start?

There is some controversy as to when the active phase of labour starts. Most studies use 3cm as the start. The NICE guidelines[15] recommend that the partogram be started once a woman reaches 4cm of dilatation. A recent obstetric care consensus developed by the American Congress of Obstetricians and Gynecologists and the Society for Maternal Fetal Medicine recommended that 6cm should be considered as the start of the active phase of labour. They used the data presented by Zhang et al[16], which used statistical modelling to construct rates of progress in labour, and proposed a partogram based on these figures. The rates of progress in labour described by van Bogaert[11,12] were obtained by examining each patient every two hours and calculating the mean and slowest tenth percentile of patients.

Figure 3 shows modified averaged labour curves by parity from Zang et al.[16] These data were used in the Consensus Statement[4] to support the argument that the active phase of labour should start at 6cm. It was suggested that using this figure would lead to less obstetrical intervention. Adding an alert line (calculated at 1cm per hour) and starting at 4cm (see Figure 3a) and a two and four hour action line to the data show that none of the nulliparous patients (P0) cross either of the action lines. In the multiparous groups P1 and P2+ (see Figure 3b) none of the patients crossed a two-hour action line so would not receive an intervention either.

Plotting alert and action lines on a partogram can alert obstetric caregivers to deviations from the expected rate of progress and allow them to pay more attention to those patients. Patients who progress to the left of an alert line are unlikely to develop an obstructed labour.

Perils of ignoring the partogram

Ignoring partograms completely as shown by the following examples is risky and resulted in potentially life-threatening situations. Both patients ultimately had caesarean sections. The patient in Figure 4a had a significant PPH. The baby born to the patient in 4b weighed 4.7kg and needed resuscitation at birth. Both these outcomes could have been avoided by heeding the partogram. There is no doubt that the proper use of partograms in under-developed countries has led to a significant reduction in maternal and fetal mortality and morbidity.

PPH may be another consequence of allowing labours to continue without regard to the partogram. PPH rates worldwide in developed countries have increased significantly over the last ten years.[17-20] Most studies do not test to see if the length of the active phase of labour is a risk factor. Since 2010, at the Royal Hospital for Women, Randwick, some obstetric caregivers have ignored the standard rates of progress in labour as determined by the partogram alert and action lines and allowed patients to labour on (for example, Figures 4a and b). Coincidently, the incidence of blood transfusion associated with PPH for vaginal birth has increased threefold from 0.79 per cent to 2.16 per cent over one year.[21] Transfusions in association with caesarean sections have also doubled, from 0.99 per cent to 2.09 per cent, over the same timeframe.[21] This trend continued in 2011, and similar trends are occurring in a number of public hospitals in New South Wales. Further research is required to see if there is a link between the two events.

Until there is clear evidence that it is safe to ignore progress in labour, women should be examined every four hours in the active phase of labour. Data show that about ten per cent of patients will cross the alert line. Once this happens, they should be examined after a further two hours. If they have not made satisfactory progress, they should be examined by an experienced obstetrician. The aim is to exclude obvious cephalopelvic disproportion and to plan a management strategy to achieve an optimal outcome rather than be allowed to go with the instant and labour on and on.

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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 *'The work up of an ovarian cyst always involves an estimation of the risk of malignancy. However, how should I incorporate newer tests and algorithms into existing practice?'*

a

Dr Adam Pendlebury
FRANZCOG, CGO Trainee

The risk of malignancy index (RMI) is a well-established risk-stratification tool that may be used to identify which patients should be referred to a subspecialist gynae-oncologist to allow appropriate surgical staging or cytoreduction should a mass prove to be malignant intraoperatively.

Cancer antigen 125 (CA-125) is a component of the risk of malignancy index and is used alone as a marker for ovarian cancer. The specific shortcomings of CA-125 include its lack of sensitivity for early stage disease and poor specificity, especially in premenopausal women.

Human epididymis protein 4 (HE4) has increasingly been recognised as a marker in ovarian cancer and also endometrial cancer.

The risk of ovarian malignancy algorithm (ROMA) incorporates CA-125 and HE4 in an attempt to overcome the shortcomings of each test. The calculation of ROMA takes into account the natural log of CA-125 and HE4 and is adjusted for menopausal status. It issues a high or low risk of malignancy based on set cutoffs.

What is HE4?

HE4 is a protein expressed in normal tissues and in specific malignancies. It is expressed in normal tissue in the lung, kidney, salivary glands, epididymis, prostate, endometrium and breast. HE4 is among the most frequently upregulated genes in epithelial ovarian cancer.

CA-125 tends to decrease with age, specifically postmenopause. HE4 tends to increase with age. The commonest cause of a false positive HE4 is renal failure where creatinine >115μmol/L. HE4 can also be increased with other benign conditions, including body cavity effusions, lung disease and liver disease, albeit less commonly than CA-125. HE4 is also elevated in other malignancies, especially lung, endometrial and endocervical adenocarcinomas.

How does HE4 and ROMA compare to CA-125 alone?

Multiple studies have evaluated the sensitivity, specificity and receiver operating characteristic for HE4, ROMA and CA-125 for identifying ovarian cancer compared to healthy controls and those with benign masses.[1,3,4,5,7] CA-125 generally outperforms on sensitivity, but its main shortcoming is a lack of specificity owing to frequent elevations in benign conditions. It was hoped that by combining HE4 and CA-125 in ROMA that sensitivity and diagnostic accuracy could be improved. Published studies are conflicting as to whether there is a significant improvement with the addition of HE4 and ROMA to traditional approaches with CA-125. Jacob et al caution against the simultaneous use of CA-125, HE4 and ROMA as a routine practice as is will cause an unnecessary rise in costs for minimal benefit.

Screening asymptomatic women for ovarian cancer, by any method, is not proven and not justifiable. HE4 and ROMA, like CA-125, have no role in screening for ovarian cancer.

What is the current role for HE4 and ROMA?

Benign conditions, such as endometriosis and fibroids are frequently associated with an increase in CA-125. Multiple studies have shown that HE4 is very uncommonly elevated in healthy controls or patients with benign gynaecological conditions. Therefore, the most useful role for HE4 and ROMA in current practice is its performance following an elevated CA-125 in a premenopausal patient with a pelvic mass. Where the HE4 is not elevated, the risk of malignancy is low and more limited surgery can be safely performed.

Other potential uses of HE4?

In a large population-based study on women with endometrial cancer, Brennan et al recently demonstrated the utility of HE4 in predicting deep myometrial invasion as an aid in deciding on whether to perform lymphadenectomy. This was superior to more expensive alternatives such MRI. They were also able to determine which patients were at greatest risk of recurrence.

Bandiera et al demonstrated that high levels of HE4, ROMA and CA-125, as opposed to low levels, correlated with worsening overall survival, disease-free survival and progression-free survival in epithelial ovarian cancer.

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RANZCOG members are invited to submit questions, tips or interesting cases to *Q&a*.
Please send entries to *Q&a* @ *O&G Magazine* via:
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(fax) +61 3 9419 0672
(mail) 254-260 Albert Street, East Melbourne, VIC, Australia 3002

Visitors from the Pacific

Carmel Walker
Senior Coordinator,
Asia-Pacific Services

Two past fellows of a midwifery leadership program administered by RANZCOG visited College House to explain to staff the value of the initiative.

As part of the College's work in contributing to capacity building for the reproductive health workforce in the Pacific, RANZCOG provides around 16–18 fellowships, annually, for Pacific midwives to undertake clinical leadership placements in Liverpool and Nepean Hospitals, Sydney, and Middlemore Hospital, Auckland. These fellowships were started with funding from the Brian Spurrett Foundation, in 2004, and have received substantial support from the Australian Government, through Australia Awards Fellowships, since 2010. The goal of the Australia Awards is for partner countries to achieve their development goals through professional experience and networking relationships with Australian counterparts, thereby contributing to security and economic growth in our region. Solid outcomes in terms of capacity building and results are emerging from the Pacific Midwifery Leadership Fellowship Program and RANZCOG will report on these to key stakeholders.

In June, a golden opportunity arose for staff to hear about the College's work in strengthening clinical midwifery leadership in the Pacific islands through a visit by two past recipients of midwifery leadership fellowships to College House for a presentation and morning tea. It was valuable for staff to hear about this aspect of RANZCOG's contribution to improving women's health in our region. The College's training, education and fellowship programs for the Pacific support a range of health worker cadres; recognising the role of teamwork, supporting and valuing the contribution of all members of the team, and strengthening and upskilling the reproductive health workforce as a whole. Communication and professional leadership are vital, no matter where you work, and the talks from our visiting Pacific midwives explored the differences and highlighted the similarities we have in our professional lives.

Staff provided a warm welcome to Ms Chandra Dayal, midwifery tutor at the Fiji School of Nursing, Suva Fiji, and Ms Paula Zebedee, senior midwife from Mount Hagen Hospital, in the Western Highlands Province of Papua New Guinea (PNG). Both midwives provided an overview of their work and hospital environment, as well as what they have done and hope to do since their RANZCOG fellowship. Ms Dayal had undertaken a Brian Spurrett fellowship in Liverpool Hospital, Sydney, as one of the first awardees of a fellowship, in 2008. Since then, and particularly over the past 18 months, Ms Dayal has continued her studies.

Ms Dayal said of her fellowship, 'It was a big boost in opening my eyes to further opportunities for me to develop my leadership potential as a contributor to women's health in Fiji. As a result of my fellowship, my career has taken several new pathways and I've now just completed my Masters in Clinical Midwifery at Monash University, through an AusAID scholarship. This has enabled me to learn how to conduct and collaborate with others on research interests, and identify areas where evidence-based research is needed in my own setting. My research topic is on nuchal cord management.

Paula Zebedee (far right) with participants of the Pacific Midwifery Leadership Fellowship Program, Liverpool and Nepean Hospitals, June 2014

Left to right: Paula Zebedee (PNG) and Chandra Dayal, Fiji, at College House, Melbourne.

'The Pacific Midwifery Leadership program in Sydney is a wonderful opportunity for Pacific midwives to see best practice, ask questions and think about practice in their own hospital settings. I was impressed by the professional language and behaviour that the Sydney midwives use to engage with labouring mothers and how they develop a meaningful relationship with their mothers, we can learn from this attitude. Overall, the fellowship teaches us now to become better leaders – a leader who has a shared vision with staff, students and colleagues and will help them feel engaged, important and a valuable member of the team. Also, the opportunity to build networks within the midwifery profession and with RANZCOG has been a great support in my career. I am truly grateful for the support of RANZCOG and the Fiji Ministry of Health.'

Paula Zebedee completed a Brian Spurrett fellowship at Nepean Hospital, Penrith, in June 2014, together with seven ALA fellows – three midwives from Solomon Islands, two from Vanuatu and two from Fiji. Ms Zebedee, whose husband has also undertaken an AusAID scholarship at Flinders University in the area of public health, returned to PNG shortly after her visit to the College to take up a newly created position in midwifery education at her hospital. Here, she hopes to implement a new approach thanks to insights gained during her fellowship. As part of her fellowship requirements, she prepared a proposal for a Practice Improvement Project involving the preparation and promotion of pamphlets to provide evidence-based preventative information to reduce puerperal sepsis, with a view to reducing re-admission rates of puerperal sepsis and its consequences.

Speaking of her experience in Nepean Hospital, Ms Zebedee said, 'I am keen to take back what I've learned and see what I can put into practice. I've learned many things through observation and by asking questions. I think the most practical and valuable areas were in skill development; how to become a competent leader and mentor at different levels of management; and the importance of effective communication across the entire health system.

'In Sydney, they have a lot of resources that we don't have; however, by asking questions, I learned other methods and ways to address the gaps with the limited resources that we do have to come up with same outcome. Development of my Practice Improvement Project, under the guidance of an experienced midwifery researcher and with the support of my supervisor and colleagues, was a new experience and I look forward to developing and sharing this initiative.

'On behalf of the eight midwives in our group in Sydney, I am sure I can express our heartfelt appreciation to RANZCOG, the Nepean Hospital, Nepean Blue Mountains Local Health District, the Liverpool Hospital, South West Sydney Local Health District, our respective Ministries or Departments of Health and the Australian Government for giving us this wonderful opportunity for professional networking between our midwifery colleagues in Australia, between our Pacific islands, and through the Alumni of Past Fellows.'

Notice of Deceased Fellows

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

Dr Robert James Furlong McInerney, NSW, on 25 May 2014
Dr Ian Alexander MacIsaac, Vic, on 20 June 2014
Dr Nic David Jools, NSW, on 25 June 2014
Prof Robert Paul Siebrand Jansen, NSW, on 14 July 2014
Dr Daniel Thomas O'Connor, Qld, on 27 July 2014
Dr Malcolm James Lee Stening, NSW, on 28 July 2014

Staff news

Liam and Frankie Davison

Lyn Johnson, Director of Education & Training, delivered the following tribute at the July meeting of the College Council.

Liam and Frankie Davison met, lived and worked on the Mornington Peninsula for much of their lives, but also had a passion for travel and a love of life that took them to places around the world. Married for 30 years, they travelled widely in Europe as well as Vietnam, Cambodia, India and Sri Lanka. In their most recent trip, a few weeks ago, they'd walked 230km of the Camino de Compostela in Spain and then took the opportunity to meet up with their son Sam, who is based in Berlin, joined by their daughter Milly, who is an Honours student at RMIT. It was a very happy week-long reunion, particularly as it was the first time they had all been together as a family in over 18 months.

Liam, who was born in 1958, grew up in Bentleigh, attended St Bedes College and undertook teacher training at Melbourne State College. He taught English, history and literature in several schools, including Karingal High School and Brentwood High School, before taking up a role teaching creative writing at Frankston TAFE, where he inspired his students with his deep knowledge of the craft of writing.

However, Liam's knowledge of writing was not gained secondhand. He is widely recognised as a fine novelist and short story writer and had five published novels: The Velodrome (1988), Soundings (1993), The White Woman (1994), The Betrayal (1999) and Florilegium (2001) as well as two collections of short stories: The Shipwreck Party (1988) and Collected Stories (2001). He also co-wrote The Spirit of Rural Australia (1999) with photographer Jim Conquest. Much of Liam's writing is set in and around the Mornington Peninsula, particularly the landscape of Western Port and the wetlands that fascinated him.

Liam received a number of awards for his writing. In 1983, he won The Canberra Times National Short Story Competition and his first novel, The Velodrome, was shortlisted for the Australian/Vogel Award in 1987. Soundings won the National Book Council Banjo Award for Fiction in 1993, while Soundings and The White Woman were shortlisted for the Victorian Premier's Award and The Age Book of the Year Award. He won the James Joyce Foundation Suspended Sentence Award in 1999, and was the recipient of grants from the Australia Council and a Marten Bequest Travelling Scholarship. As part of this latter scholarship, the family lived in the Dordogne region in France and a life-long love of France was instilled in them. Liam eventually left TAFE teaching and, for the last eight years, worked for RANZCOG; starting as senior education co-ordinator before becoming eLearning Manager, responsible for the College's LMS platform and online learning environment.

However, Liam always continued to write and publish, and was particularly well regarded in recent years for his short stories, which have been regularly anthologised in collections such as Best Australian Stories (2011, 2012, 2013) and for his insightful book reviews which were mostly published in *The Australian*. His most recent creative work, Map for a Vanished Landscape was published in The Griffith Review earlier this year and spoke of Liam's lifetime interest in landscape, cycling and how we come to know and understand the world.

A keen surfer in his 20s, Liam became an even keener cyclist; racing and enjoying mass cycling events as a member of Southern Vets Cycling Club, the Mornington Cycling Group and Cycling Victoria. He regularly cycle-commuted from his home in Mount Eliza to RANZCOG in Melbourne.

Francesca (Frankie) Davison (nee White) was born in Denmark, of English parents, who moved to the Australia when she was very young. Educated at Karingal High School, she undertook teacher training at Melbourne State College. She taught English, literature and history at Toorak College for 28 years and was a long-time Head of Year 8, leading students through the challenges of that year with compassion and wisdom.

An opera-lover, life-long reader, art lover and excellent cook, Frankie had a profound influence on thousands of students during her teaching career. A reflective and inspiring teacher, Frankie instilled a strong social conscience and a love of reading and learning in all she taught.

Liam and Frankie Davison lived life fully and committed themselves to their family, their work and their community. They are survived by their two children, Sam and Milly.

New appointment

Driena McPhee joined the College in early July, as the buildings and facilities co-ordinator at College House, Melbourne. Previously, she worked within a body corporate maintenance department, servicing more than 4000 high-rise apartments in the city and surrounding areas. She was responsible for a combination of old and new buildings, including Willsmere in Kew and the majority of the high-rise apartments built in Southbank over the last 15 years. She has also worked within events management for the past two decades, dealing with everything from marketing to hosting international guests.

Departures

Sarah Kavanagh left from her position as CPD officer to join her family's business. We thank her for her contribution to the CPD team and wish her every success.

Andreana Newson resigned from her position as senior assessment co-ordinator to take up a position at Swinburne University as manager of assessment and student progression. We wish Andreana all the best in her new role.

Sara Menzies resigned from her position in the NSW Regional Office. Sara is moving to Geneva, Switzerland, with her family. We wish Sara all the best with her move and exciting travels.

Obituaries

Dr Timothy Jeffrey Sutton
1949 – 2014

Tim Sutton was born in Sydney in 1949, and educated at Scotch College, Melbourne, and Monash University, gaining MBBS with B Med Sci in 1975. After internship at Prince Henry's Hospital, he and his wife, Kaye, went to the UK in 1978, where he worked as senior house officer at the West Middlesex Hospital and began specialising in obstetrics and gynaecology. He returned to Melbourne for training at the Queen Victoria Hospital, Peter MacCallum Clinic and the Royal Melbourne Hospital. From 1982 to 1984 he and his family went to Exeter, UK, and he gained his FRACOG in June 1984.

On returning to Australia, he moved to Tasmania where he worked as a specialist from 1984 until 2005, when had to cease work prematurely owing to illness. Initially he took up a locum position in Devonport, but stayed on there until he moved to Launceston in 1987. He was a visiting medical officer at the Devonport Women's Hospital, then the Queen Victoria Hospital, Launceston General Hospital (LGH), St Luke's and St Vincent's Hospitals in Launceston.

Well liked and respected by his patients, colleagues, Trainees, nursing staff and medical students he was a generalist, but developed skills in advanced laparoscopic surgery and passed these on to his Trainees and colleagues. He also worked with Sydney IVF that at the time provided services in Launceston.

He held appointments as Sessional Specialist, Clinical Senior Lecturer (UTAS) and Acting Director of O and G at the LGH.

Tim was active in RACOG and RANZCOG and served on the Tasmanian State Committee 1987–98 (Secretary 1988–91, Chair 1995–97), was a Training Supervisor 1998–99, and State representative on the Provincial Fellows Committee 1998–2002. He was always keen to promote excellence in women's health services, especially in the provincial centres and worked hard and effectively towards this end.

His interests included reading, fly fishing, fine wine and food and family. Tim had a lifelong interest in philosophy and, in 2002, gained a BA with Honours from the University of Tasmania, majoring in this subject.

He was diagnosed with a lymphoma in 1999, and received treatment. To begin with, he was able to continue working, but when he had to cease clinical work, in 2004, he continued teaching and as Acting Director until 2005.

A year later his work in Tasmania was complete and he moved back to Melbourne where he lived peacefully, still pursuing his interests in philosophy, church, beach walking and family until he died on 4 May 2014. He leaves his wife, Kaye, children Meredith, Hilary and Guy, many friends, ex-students and grateful patients. A life well lived.

Dr Graham Standen
FRANZCOG
Tas

Dr Aldo Vacca
1941 – 2014

Aldo Vacca was born in Ingham, Queensland, on 28 August 1941, and graduated in medicine from the University of Queensland in 1965. His adventurous spirit took him to Papua New Guinea, where he gained the Diploma in Obstetrics and Gynaecology. While there, he developed an appreciation of the clinical skills required for maternity care in remote areas and at that time he saw the enormous potential of the vacuum extractor as a safer method of assisting women in the second stage of labour.

Aldo completed his MRCOG training in the UK in 1982, and was the principal investigator in the pioneering 'Portsmouth operative delivery trial' (1983), one of the landmark randomised trials in obstetrics. He became a Fellow of the RACOG in 1982, and was elevated to Fellowship of the RCOG in 1991.

On returning to Australia, as Director of Obstetrics at the Mater Hospital in Brisbane, he developed practical training sessions and teaching tools for the safe use of the vacuum extractor and soon established a reputation as an expert in operative obstetrics.

In the 1990s, he co-designed and developed the Kiwi OmniCup, and a reuseable version for use in low-resource countries, including a teaching manikin that simulates vacuum delivery with a high degree of realism. Aldo, assisted by his wife Jan who was trained as midwife, then embarked on a career as a travelling teacher, providing practical demonstrations throughout hospitals in Australia and in many overseas countries.

In June 2007, Aldo was honoured with the Medal of the Order of Australia 'for service to medicine in the field of obstetrics and gynaecology, particularly through the research and promotion of the technique of vacuum extraction delivery in obstetric practice'. In 2011, he was awarded the RANZCOG Distinguished Service Medal.

His colleagues knew him to be an exemplary obstetrician, an exceptionally dedicated and talented teacher, and a warm and loyal friend. Trainees at all levels are the beneficiaries of his enthusiastic practical demonstrations, which never lacked his oft-repeated mantra (referring to the sometimes elusive optimal occipital application point): 'it's always more posterior than you think'. Most importantly, Aldo's main beneficiaries are the women and babies who have benefited from his unique obstetrical skills, which he was so eager to share generously throughout the world.

Dr Aldo Vacca passed away on 16 March 2014.

A/Prof James Forrester King
FRANZCOG
Vic