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From the President

Prof Steve Robson
President

I hope you have all managed to stay warm and, hopefully, taken some time off with family or friends over winter. Spring is a time of hope and excitement, and this issue of *O&G Magazine* takes the very important area of paediatric and adolescent care as its theme. This is a fascinating area of practice – we commonly deal with vulnerable patients and anxious families, yet this is something many of us won't have a lot of experience in. As always, the editorial team has drawn together a group of experts and brought us a wonderful update on a critical area.

National Framework for Maternity Care

Over the first half of 2017, the Queensland Government Health Department, in conjunction with Deloitte, attempted to develop a National Framework for Maternity Care here in Australia. The project was characterised by a lack of consultation at every point, and the outcome was predictable. Over the course of the document's development, it became clear that the working party had achieved what I thought was completely impossible – uniting all the major 'stakeholders' in maternity care. Groups from across the spectrum, from your College to the AMA and groups such as Maternity Choices, were united in rejecting the process. That is quite an achievement. In previous columns I have raised significant concerns with the Framework project and so it was pleasing to see that the project has been scrapped – for now. So stunning was the rejection that it was reported across the media.

The entire process of the Framework development brought home a number of important points. It emphasised the critical importance of working with providers of maternity care, rather than trying to work around them, to achieve a political aim. It emphasised the importance of working to a goal: at no stage was it made clear exactly what the proposed Framework was meant to achieve. Perhaps most importantly for us, though, was the fact that the College did not have a single inclusive document that articulated a cohesive, evidence-based view of how we think maternity care should be provided. That became our project.

Over the first half of the year, in parallel with the Queensland Government's and Deloitte's processes, the College has begun working on its own framework document. We have done this in consultation with important providers of maternity care that had been overlooked by the Government. Contributors to this project have included the specialist colleges of anaesthetists, psychiatrists, rural and remote medicine, general practitioners, pathologists, and many more. By the time you read this, it should be possible to take a look at your own College document on our website. Let's keep our fingers crossed that the ill-fated Framework will have inspired a useful result in the end.

Mesh Inquiry

As many of you will know, the Australian Senate has been conducting an inquiry into the use of transvaginal mesh. It has been a highly politicised process, with use of mesh described as 'a medical scandal' and 'the new thalidomide' by some Senators. After an enormous effort by many Fellows, particularly Dr Peta Higgs and members of her Urogynaecology Subspecialty Committee, the College submission to the Inquiry was finalised. We were also able to work with Medibank Private to obtain data regarding long-term re-operation rates following use of transvaginal mesh. The College's submission and other information and resources in relation to pelvic mesh are available on the College website at www.ranzcog.edu.au/Mesh-Resources.

On 3 August, the first of the public hearings were held in Melbourne. It is likely that the College will be asked to appear before the Inquiry in the near future. I am not sure what the outcome of the Inquiry will be, but I am fervently hoping that the place of mid-urethral slings for stress urinary incontinence will be upheld, as the evidence clearly tells us it should be. As these events play out, I will keep you regularly updated.

Global Health

Our College is dedicated to the health of women in our region, and provides support in many ways. The Pacific Society for Reproductive Health held its conference in Vanuatu in July, and I will be spending time in Port Moresby in early September (about the time this issue of *O&G Magazine* arrives in your mailbox) along with the Presidents of RACS and ANZCA. High on the agenda of that visit will be how our College can further contribute to women's health across Papua New Guinea (PNG). In another role, I am on the Board of a maternal health charity (www.sendhope.org) that raises money to support projects in PNG and elsewhere. I recently had the pleasure of meeting with Australia's Foreign Minister, Hon Julie Bishop MP, to discuss Australia's role in the Pacific. Expect more about this over the coming year.

Revalidation

By the time you read this article, the Medical Board of Australia (MBA) will have released the first draft of its

Prof Robson with Australia's Foreign Minister, Hon Julie Bishop MP, at her Parliament House office. RANZCOG can play a key role in global women's health.

“By the time you read this, the MBA will have released the first draft of its recommendations for revalidation in Australia. Similar documents will be coming from the Medical Council of New Zealand.”

recommendations for revalidation in Australia. Similar documents will be coming from the Medical Council of New Zealand (MCNZ). It is expected that the College will take the lead in providing tools and processes for revalidation in both countries. I have met with the MBA Chair, Dr Joanna Flynn, a number of times about this, most recently in Canberra. One of the main aims of revalidation – identifying practitioners who are at risk of causing harm to patients – remains an elusive goal. I will keep you updated on the College’s response to proposals from both the MBA and MCNZ.

Professional Services Review

For much of its existence, the Professional Services Review (PSR) dealt largely with GPs who were thought to have unfairly accessed MBS item numbers through Medicare. However, the new Chair, Prof Julie Quinlivan, is a Fellow of our College. There is a new focus on specialist practice, and it is important that all Fellows and Diplomates of the College understand this. Medicare has new and sophisticated software that can identify doctors who are outliers in their use of MBS item numbers. Where there is a suspicion that MBS item numbers are being used inappropriately, the PSR can initiate an investigation and audit process. Your best protection against this is simple – rational, evidence-based, and fair use of MBS item numbers. I met with Prof Quinlivan and have invited her to promote the work of the PSR to our Fellowship – you will find an article on page 55.

It’s spring – forget the doom and gloom

I had the pleasure of visiting Cairns for the annual Queensland/New South Wales Regional Scientific Meeting. It was a warm and welcome respite from the unremitting cold of Canberra in the midwinter. The meeting was wonderful and it gave me the opportunity to speak with Fellows and trainees about the issues of importance to them. The viability of private practice, indemnity costs, our relationship with professional colleagues, such as midwives, procedural training for registrars... the list goes on. I’m pleased to say that I could reassure everyone I spoke to that the College is doing work in all of these areas. I hope that you all enjoy spring, and I look forward to writing again just before the Christmas break.

From the CEO

Alana Killen
CEO

Advocacy

In my last report, I discussed the role of RANZCOG as the entity representing women's health in Australia and New Zealand. Advocacy in health can mean a number of different things: advocating for a particular patient, a group of patients or advocating for social change for disadvantaged patients.

The goal of advocacy in health is to elicit improvements in health outcomes for those who may not necessarily have a voice or be appropriately represented in the broader policy debate. RANZCOG has a strong history of advocating for women's health in general, but also for supporting and representing those who may be experiencing disadvantage in particular. The College is in the privileged position of being able to draw on the knowledge and experience of many eminent practitioners who willingly contribute their time and considerable expertise in the pursuit of equitable health outcomes. Having recently attended the conference of the Pacific Society for Reproductive Health (PSRH), I was once more impressed by the generosity of many College Fellows and other health professionals who ran workshops and gave presentations during this meeting. While the disparity in health outcomes for women and babies in the Pacific region continues to pose significant challenges, the commitment and dedication shown by those involved was inspirational.

What can RANZCOG do?

The College's Foundation was originally established as a vehicle for disseminating funds for research and for the development and preservation of the College's historical collections. More recently, however, the scope of the Foundation has expanded to include indigenous and global health initiatives. The soon-to-be released Global Health Strategic Plan will outline the goals that RANZCOG has identified, in collaboration with various stakeholders, and will enable the College to attract and disburse funding for specific purposes aligned to the identified goals. It is an exciting time for the Foundation as it seeks to reposition itself within the College to become the philanthropic body responsible for supporting the global, indigenous and research goals of the organisation.

Consultation

RANZCOG receives regular requests for submissions and feedback on a variety of issues relating to women's health in Australia and New Zealand. As previously stated, RANZCOG is in the fortunate position of having many eminent experts in women's health as members and the College's views are often sought when government, agencies and other entities are developing policies, statements and guideline documents. Given the breadth and depth of knowledge residing within the membership, the Board has expressed a desire to draw upon this expertise in a more strategic manner. It is anticipated that by involving more of our members in the consultation process, it will not only enhance engagement, but also enhance the quality of the responses RANZCOG is able to provide.

In 2017 alone, RANZCOG has already provided more than 50 responses to requests for submissions or feedback and often the College needs to rely on a regular group of contributors who graciously give up their precious time for this endeavour.

In order to provide more opportunities for our members to participate in these consultations and to open the discussions to broader viewpoints, RANZCOG has a 'Public Consultation' page on the website where open consultations can be found. Members who wish to provide feedback to inform College submissions can do so by accessing this page via the link in *Collegiate*. Should you need assistance in locating this page, please contact Member Services, who will be happy to assist you.

Trainee welfare

An ongoing objective for the College is to enhance the support provided to trainees through developing actions and resources for this specific purpose. RANZCOG was fortunate to be provided with

a small grant through the STP project funding and has established the 'Respectful Workplaces' project. Part of this project includes the establishment of a Training Support Unit and the appointment of a Trainee Liaison Support Officer, with recruitment for this position underway. The Training Support Unit will provide enhanced support to trainees, supervisors and ITP Coordinators. The project has also seen the development of a number of online resources and associated face-to-face workshops, which will be rolled out later in the year.

The Respectful Workplaces program emphasises the need for mutual respect between all members of the team, patients and their families and this includes raising awareness about giving and receiving feedback. As the vast majority of all hospital complaints involve communication, it is critical that trainees are aware of the need to communicate effectively and this is a skill that needs to be developed. While many people are natural communicators; good listeners, empathetic and self-aware, the same can not be said for everyone and spending some time reflecting on these skills will be time well spent.

Membership and Marketing

The Membership and Marketing team have been very active in the redevelopment of the website, refreshing the appearance and layout of *ANZJOG* and *O&G Magazine* and redevelopment of the Guidance App, which now links directly to the RANZCOG website, ensuring that all updates are provided in real time. The team is currently working on the new *O&G Magazine* site to allow users to search articles from the magazine's archive and we hope to launch this at the ASM in Auckland. Over the coming months, the Member Services team will be transitioning responsibility from IT and Finance for managing most of the incoming queries regarding the use of My.RANZCOG. This will allow the team to begin the process of becoming a centralised area for service to all members and first port of call for all enquiries on a 1300 number. These activities are being developed to provide a better experience for our members so that you can access the information you need in a timely manner.

College House

Many of you may have viewed the President's video regarding accommodation at College House. As you are aware, the staffing needs of the College have outgrown the current accommodation and we are now considering the various options available. We are very mindful of the significance of College House to our members and, so, any decisions will be made prudently and with great care for the history and heritage of RANZCOG. We will be sure to keep you informed of the outcomes of any discussions as they emerge.

Editorial

Dr Bernadette White
FRANZCOG

One of the most rewarding aspects of being an O&G is the possibility of caring for women for extended periods of their life. This may start with seeing a young woman for contraceptive advice or pre-pregnancy counselling, caring for her during pregnancies and births, advising on gynaecological concerns, including menopause, and then seeing the baby that you helped at birth come with her mother as an adolescent with her own concerns. So we all need to have some understanding of the issues around paediatric and adolescent gynaecology.

Most of us will have little experience in the highly specialised area of paediatric gynaecology, involving congenital abnormalities, ambiguous genitalia and precocious puberty, and the articles by Asha Short, Angela Dunford and Fran Mouat provide a helpful overview of these complex topics.

Transgender issues have been very much in the news recently, in areas as diverse as education, the military, bullying and sexual harassment. Charlotte Elder's article helps us to understand the complexities of this area, including helpful advice on the appropriate use of language when referring to transgender individuals.

The issue of vulval cosmetic surgery has also been a subject for public discussion. While most would accept that there is a healthy diversity in body shape, size and appearance, there is strong media preference for an idealised female image. This has extended to a vulval appearance that only a minority of healthy women will posess. Alexandra McRae's article emphasises the importance of reassurance for adolescents about normal vulval anatomy and appearance.

Most gynaecologists would recognise the significant impact that primary dysmenorrhea can on have on a young woman's life. The article by Saman Moeed and Amy Mellor points out that 90 per cent of young women with dysmenorrhea will not have any serious underlying pathology. They stress both the importance of avoiding unnecessary invasive investigation by laparoscopy and of preventing abnormal illness behaviour in young women. They quote a study that showed, of the small proportion of adolescents who underwent laparoscopy for dysmenorrhea, two thirds had no underlying pelvic pathology.

It could hardly be possible to underestimate the importance of addressing unwanted sexual activity, safe sex and unplanned pregnancy for adolescents. Data collected by the Australian Research Centre in Sex, Health and Society indicate that about 25 per cent of Year 10 students and 50 per cent of Year 12 students have had vaginal intercourse. For about 10 per cent of teenagers, their most recent sexual encounter was with someone they had met for the first time. One in four teenagers have had intercourse without using a condom. One in four teenagers have had an unwanted sexual encounter. For over 20 per cent this will be in the setting of being drunk or having used recreational drugs. In 13 per cent it will be a consequence of pressure from their partner.[1] Articles by Jess McMicking and Natasha-ann Laidler address some of the issues around contraception and sexual abuse in adolescents. Rebecca Wright discusses how to approach indigenous adolescents and provides useful advice about the 'rules of engagement' with this group of women.

Pregnancy in adolescents, whether planned or not, has enormous consequences for young women in terms of education and their plans for the future. It raises the possibility of intergenerational disadvantage. Kirsty Lehmann discusses some of the issues of adolescent pregnancy.

Sukhwinder Sahota, Amy Jamieson and Alison Brand discuss some of the issues to do with gynaecological pathology in adolescence, both benign and malignant.

Rick Springfield said 'Other than dying, I think puberty is about as rough as it gets'. As a caring profession, we may be able to make a small difference in this exciting, but difficult, time in our patients' lives.

Reference

1. Better Health Channel. Teenagers and Sexual Issues. 2017. Available from: www.betterhealth.vic.gov.au/health/healthyliving/teenagers-and-sexual-issues.

Precocious puberty

Dr Fran Mouat
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The unusually early development of physical changes associated with puberty is known as precocious puberty. In girls, these changes are the development of breasts and pubic hair before eight years of age, or starting periods (menarche) before nine years of age. In boys, the changes are enlargement of the genitalia and development of pubic hair before nine years of age. Precocious puberty is thought to occur in 4–5 per cent of girls, but is much less common in boys.

Normal puberty

When a child's body is ready to begin puberty, a part of the brain called the hypothalamus releases gonadotropin-releasing hormone (GnRH). GnRH causes the pituitary gland to release two other hormones: luteinising hormone (LH) and follicle-stimulating hormone (FSH). LH and FSH stimulate the ovaries to produce oestrogen or the testes to produce testosterone, which lead to the changes you see during puberty. This process begins many years before secondary sexual characteristics first appear, which is usually between the ages of 10 and 13 years. In girls, the pubertal growth spurt occurs early in puberty, at the same time as breast development. In boys, the growth spurt does not occur until mid-puberty.

True precocious puberty

In true precocious puberty, sexual development shows a normal progression, but is earlier than usual. Children are taller than their peers due to the early pubertal growth spurt, and a bone age x-ray (x-ray of the left wrist and hand) will show advanced maturation of the skeleton as a result of increased oestrogen exposure (Figure 1). Although tall at presentation, these children may end up shorter than expected due to premature fusion of the long-bones and early completion of growth.

What causes precocious puberty?

There may be early activation of the neurons in the hypothalamus, resulting in increased production of GnRH or over-production of LH and FSH from the pituitary gland due to a pituitary tumour. The cause of early activation of the hypothalamus is generally unknown, although a structural brain abnormality is found rarely in girls and in approximately 50 per cent of boys. Causes may include hydrocephalus, benign and malignant tumors. Precocious puberty may be inherited; if a parent had precocious puberty, there is a strong chance that their child will show a similar pattern of development.

What investigations are indicated?

- A careful history and examination are essential. A growth assessment should include height, height velocity, weight and body proportions.
- A bone age x-ray should be done at the time of the first appointment to assess skeletal maturity.
- Baseline hormone measurements performed in the outpatient department should include thyroid function tests, prolactin, IGF-1, LH, FSH and oestradiol.
- A GnRH stimulation test is performed as a day case, with a stimulated LH >5IU/L being considered abnormal (sensitivity >98%, specificity 100%).
- In all girls, an ultrasound scan of the pelvis should be performed to assess uterine maturity and ovarian appearance.
- A magnetic resonance scan of the brain is routinely performed if precocious puberty is confirmed, although in children over eight years old the likelihood of finding any pathology is small. If there is a suggestion of an underlying disorder, additional tests may be required.

Figure 1. Bone age x-ray.

Who should be treated and why?

Endocrinologists have focused primarily on the impact of growth when considering treatment of precocious puberty. Using these criteria alone, not all children will require treatment as those with only slightly early puberty don't end up shorter than expected. However, there is increasing evidence to suggest that early exposure to sex hormones can result in altered body image, behavioural problems and significant emotional distress. Young children can become very distressed at looking different from their peers and worry that something is wrong with them. Bullying and risk-taking behaviour can be a significant issue. Puberty can be challenging enough when it occurs at the normal time; for much younger children, puberty can cause a great deal of anxiety and distress.

What treatment is available?

GnRH analogues, such as luprolide (Lucrin) and goserelin (Zoladex), suppress the natural GnRH production. This blocks the release of LH and FSH from the pituitary, stopping and reversing the physical and psychological changes seen in precocious puberty. They are given as an intramuscular injection (luprolide) or subcutaneous implant (goserelin) every three months. In our centre, monitoring is performed by three- to six-monthly clinical assessment of growth and pubertal stage, annual bone age x-ray and by measuring gonadotrophin levels one hour after depot injection annually. On treatment, a child's growth will slow to a normal prepubertal rate of approximately 5cm per year. Treatment can be continued until it is a more appropriate time for puberty to occur, generally between 10 and 11 years. Once the treatment is discontinued, puberty will progress normally and menarche is usually reached within 12–18 months.

Potential complications of treatment

Mild side-effects, such as headaches, mood changes, rashes and local irritation, are relatively common. Some girls may experience some vaginal bleeding early in the treatment as a result of oestrogen withdrawal. Weight gain and polycystic ovarian syndrome are more common in women with precocious puberty; however, there is some doubt as to whether this is due to the treatment or the condition itself.

Other common variants of pubertal development

Isolated early breast development (premature thelarche) commonly presents before the age of three years, with unilateral or bilateral breast development. Growth is normal and there is no other evidence of oestrogen excess. It is important to differentiate this from true precocious puberty as it is a harmless self-limiting condition that generally resolves within 1–2 years and requires no treatment.

Premature adrenarche occurs in girls and boys between six and nine years of age and presents with pubic hair. This is a common variant and affected children may have increased speed of growth and a slightly advanced bone age. This condition is occasionally due to underlying abnormalities of the adrenal gland, such as 21-hydroxylase deficiency, therefore investigations such as an androgen profile (including a 17 OHP level, DHEAS and testosterone) and a bone-age x-ray are indicated. Once pathology is excluded, the child and their family can be reassured that although the pubic hair will remain, the rest of puberty is likely to occur at the normal time.

Isolated premature menarche can occur at the onset of normal puberty, when small amounts of oestrogen are produced as the ovary switches on and off. Sometimes this can be enough to thicken the endometrium, which results in a withdrawal bleed when the ovary 'switches off'. In affected girls, growth is normal, with no advancement in bone age or other signs of oestrogen excess. Other endocrine and local causes of vaginal bleeding must be sought and a basic work-up may include a bone age x-ray, gonadotrophins and oestradiol, GnRH stimulation test (pre- and post-stimulation gonadotrophin and oestrogen levels), coagulation profile and a pelvic ultrasound. Long bone x-rays may be considered if there is clinical suspicion of McCune-Albright syndrome (gonadotrophin-independent autonomous ovarian function caused by an activating mutation of the GNAS1 gene). Most girls have a few isolated episodes of bleeding that stop spontaneously, although some may continue to have periods into adulthood. Unlike true precocious puberty, these children do not demonstrate an abnormally advanced bone age, and their final adult height is unaffected.

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Transgender healthcare

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Transgender issues have come to the fore of the public consciousness in the last few years – from the cover of *Vanity Fair* magazine to the desk of ABC TV's 'Q&A' current affairs program. As doctors, especially as those with knowledge and skills for taking care of reproductive organs and fertility, it is important to have at least a basic understanding of what being transgender actually means, how it can affect our patients and how to best care for transgender people. Being transgender means having a gender identity that is not concordant with the gender identity assigned based on genital appearance at birth.

What are sex and gender and how do they interact?

Sex is the sum of our biological traits that produces either a male or female phenotype. It is essentially constant and made up from our karyotype, gonads, hormones and anatomy. Typically, we think of sex as either male or female, but there are some individuals who have a mix of different sex-producing aspects. For example, a woman with complete androgen insensitivity syndrome has testes and male levels of testosterone, but female external genitalia. Some people with a mix of sex-determining features will prefer to be referred to as intersex; however, the majority prefer female or male. Intersex and transgender are two distinct entities. Most transgender people are not intersex and vice versa, but the two concepts are often confused.

Gender is considered to be the social construct of what is considered maleness and femaleness. It is shaped by societal norms, peers and family. Gender may be fluid and is changeable over time and circumstance. Gender is often discussed in terms of the inner, more personal aspect of gender identity and the public, more visible gender role.

Gender identity is a person's own sense of how female, male or in-between they feel. It is deeply personal and, for the majority of people, unquestioned. This can make it hard for non-transgender people (cis-gendered) to understand how someone could feel female if they have typically male biological traits and vice versa. Young children may believe that gender identity is transient and changing, but older children, teens and adults generally feel it is more permanent. Most transgender adults describe knowing they were transgender from a young age, but may not have shared this with others because of societal pressures. Gender identity is independent from sexual preference.

Gender role is the outward manifestation of maleness, femaleness or androgyny. It is expressed through behaviours, speech, clothing, toy and game preferences, fantasies, role playing, peer selection and interests. Gender role is a more adaptable and controllable characteristic. Gender role often changes depending on the circumstances – for example, some transgender people feel comfortable using a gender-appropriate name with friends, but may not use it with older relatives. Cis-gendered people will often vary their gender role – for example, a young woman may wear a dress when going to dinner at her grandmother's house, but cargo pants and a hoody the rest of the time.

Some people will identify as transgender and some will identify as being both male and female or neither male nor female. This is often termed as being bigender for identifying as both genders, or agender if a person identifies as neither. An umbrella term for these identities is gender diverse. Often the term trans* is used as an inclusive term for all people on the transgender and gender-diverse spectrum.

What is gender dysphoria?

Being transgender is not a mental illness. In the DSM-III in 1980, 'gender identity disorder' was listed under psychosexual disorders. This remained through the DSM-IV and ICD-10 until it was renamed 'gender dysphoria' in the DSM-V. Gender dysphoria refers to the distress that may accompany discordance between one's gender identity and assigned gender. Gender dysphoria can be very intense and may be associated with depression, anxiety and suicidality. Not all people who identify as transgender will have gender dysphoria. Gender dysphoria can often be alleviated or lessened through gender-affirming healthcare.

How many people are transgender?

There is no clear answer to this question. A UK Equal Opportunity Commission survey from 1981 reported that 1.4 per cent of the population identified as transgender or gender diverse. A New Zealand survey of 8500 teens in 2012 reported that 1.2 per cent identified as trans* and a further 2.5 per cent were unsure of their gender, while 1.7 per cent didn't understand that question. Data from the US are mostly relating to who has sought gender affirmation surgery, which is likely an underestimate.

There is no Australian adult data on this question and the Royal Children's Hospital, Melbourne, estimates around 1 per cent of children and adolescents will experience gender-identity issues, but not all of these will continue to adulthood.

Transgender people's health and wellbeing

While being transgender is not a mental illness, transgender people have worse levels of physical and mental health and general wellbeing. These problems are not inherently associated with being transgender, but stem from discrimination, stigma, social exclusion, bullying, rejection by family and friends, and experiencing barriers to timely, personalised transition (if desired). Suicide attempts are reported in about one third of transgender young Australians. This makes caring appropriately for transgender people a potential lifesaving measure. There is consistent evidence across many cultures of improved markers of physical and mental health and wellbeing for transgender people when appropriate social and healthcare support is provided.

Language use

Being misgendered or referred to by the wrong pronouns and/or name is offensive and unfortunately happens often, even by well-meaning care providers. I initially found it difficult to get my head around using a masculine pronoun when I had been using she/her for all of my patients for years, but after a few consultations it became second nature. Ask your patient what pronoun they would prefer – she/her, he/him or they/them – and use it. If you make a mistake, apologise and correct yourself. Some transgender people will use the title Mx and/or may have changed their name from the one given at birth. Try to avoid phrases like, 'most women notice...' or 'often women find...' and instead say, 'most people find this... or 'often people feel cramping after the procedure'.

Gender-affirming healthcare and transitioning

Gender-affirming healthcare is the provision of healthcare to allow a person to express their gender. It can vary from person to person and over someone's life course. Gender-affirming healthcare can include hormonal therapies, surgery, psychological support and speech therapy. The aim of gender-affirming healthcare is to treat or reduce the dysphoria through provision of personalised care.

Transitioning is the act of changing from one's assigned gender at birth to one's affirmed gender. Again, transitioning is personal and not all people will transition in the same way or to the same extent. Some people will choose to socially transition, but not use hormonal medication or surgery. Social transitioning often includes changing one's name and/or pronouns and physical changes such as wearing clothes, choosing a haircut or makeup use consistent with their affirmed gender.

Hormonal therapy used for transgender people includes GnRH agonists used to block puberty or suppress the hypothalamic-pituitary-ovarian axis, oestrogen, anti-androgens such as cyproterone acetate or spironolactone, and testosterone. Most patients have their hormone therapy commenced and monitored by an experienced GP. Thrombosis and metabolic changes increasing the risk of ischemic heart disease (such as hypercholesterolaemia) are the main concerning potential complications of this therapy.

Surgery is often referred to as 'top' or 'bottom'. 'Top' surgery refers to mastectomy or breast augmentation and is a more common procedure. 'Bottom' surgery involves a much wider range of procedures, such as hysterectomy, oopherectomy, orchidectomy, feminising genitoplasty, metoidoplasty or phalloplasty. Most of these procedures are not readily available in Australia or are only available through the private system. For this reason, many people will travel overseas for surgery and, as such, may have limited or no follow-up care if there are complications. Australian gynaecologists are often involved with care for neo-vaginal stenosis, granulation tissue and revision introitoplasties. This can get quite complicated if the patient is on warfarin after a DVT from the plane trip home from Thailand!

The World Professional Association for Transgender Health (WPATH) publishes 'Standards of Care for Gender Identity Disorders', which is a document summarising professional consensus around gender-affirming heathcare and providing a guide for clinicians. It provides direction for how to safely provide cross-hormone treatment and advice on what information should be sought prior to irreversible surgical procedures. In general, it is recommended that someone have psychologist or psychiatrist review to confirm their affirmed gender, socially transition and use hormone therapy prior to any irreversible surgical procedure.

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Congenital anomalies of the female genital tract

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Congenital anomalies of the female genital tract are rare, but important, diagnoses that may present during childhood or adolescence. Abnormalities of the external genitalia, such as common urogenital sinus, cloaca or ambiguous genitalia, tend to be diagnosed at birth or shortly thereafter. These will be managed by a multidisciplinary team of paediatric surgeons, physicians and paediatric gynaecologists. A general practitioner or gynaecologist is more likely to be involved in the diagnosis and care of a Müllerian anomaly; presenting in adolescence with menstrual abnormalities or pain, or during childbearing years with fertility concerns.

Müllerian anomalies occur in approximately 7 per cent of girls[1] and result from abnormal fusion or canalisation of the Müllerian ducts. Both environmental and genetic factors are proposed causes, but these have not been proven.[1] Current literature does not support the risk of offspring transmission of isolated Müllerian anomalies.[2]

Development of the reproductive tract

The presence or absence of the sex-determining gene (SRY) on the Y chromosome, leads to differentiation of the indifferent gonad and formation of external genitalia to either a female or male phenotype. When the SRY gene is not present the indifferent gonad forms an ovary and anti-Müllerian hormone (AMH), produced by the fetal testis, is not released. The lack of AMH leads to the development of the Müllerian ducts and regression of the Wolffian (mesonephric) ducts. The Müllerian ducts fuse from approximately six weeks gestation. Once fusion is complete, canalisation occurs to form the uterine cavity. The developing vagina fuses with the urogenital sinus at the vaginal plate (sinovaginal bulb) and then canalises to form the functional vaginal canal by the third trimester. This process results in the upper two thirds of the vagina originating from the Müllerian ducts and the lower third from the urogenital sinus (Figure 1).

Anomalies of development can occur at any point during the fusion and canalisation process. Due to the wide variation in potential anomalies, multiple classification systems have been developed, with the most commonly used system devised by the American Society of Reproductive Medicine (ASRM) (Figure 2). For clinical purposes, Müllerian anomalies can also be divided into either obstructive or non-obstructive anomalies.

Müllerian anomalies have a high rate of concomitant renal (40 per cent) and spinal (10–20 per cent) anomalies.[2] Renal anomalies may include unilateral agenesis, a horseshoe kidney or a pelvic kidney. It is important that assessment for these associated anomalies occur when indicated.

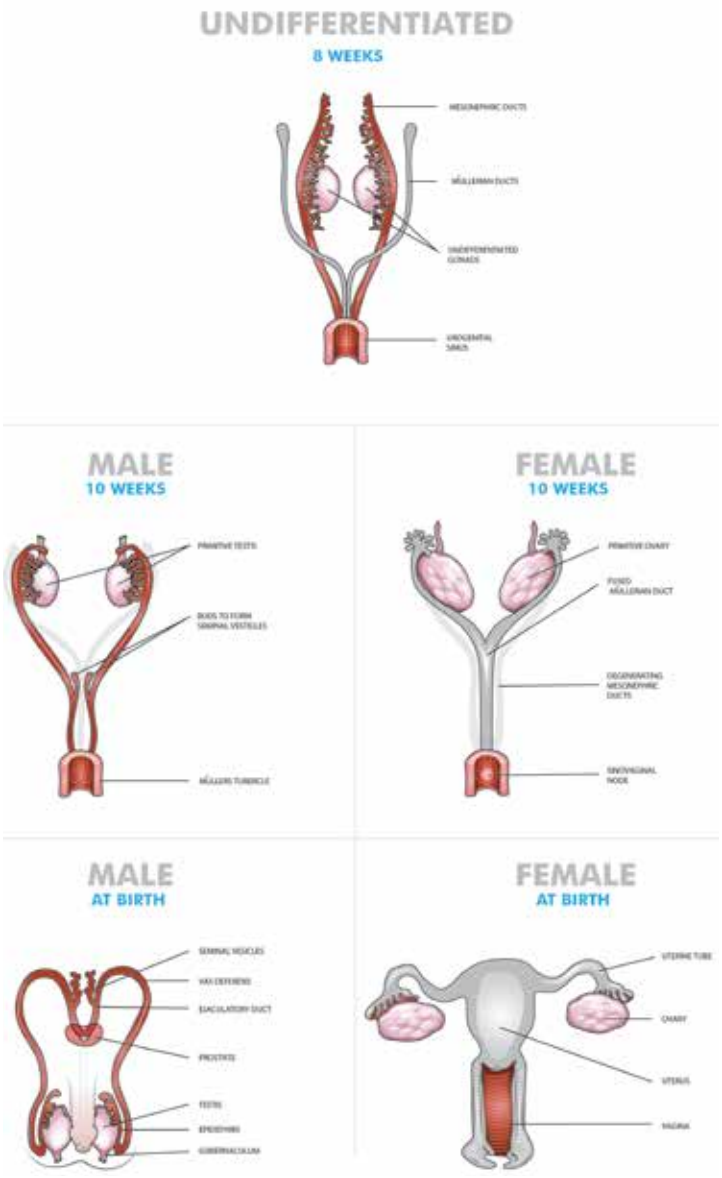

Figure 1. Development of the female genital tract.

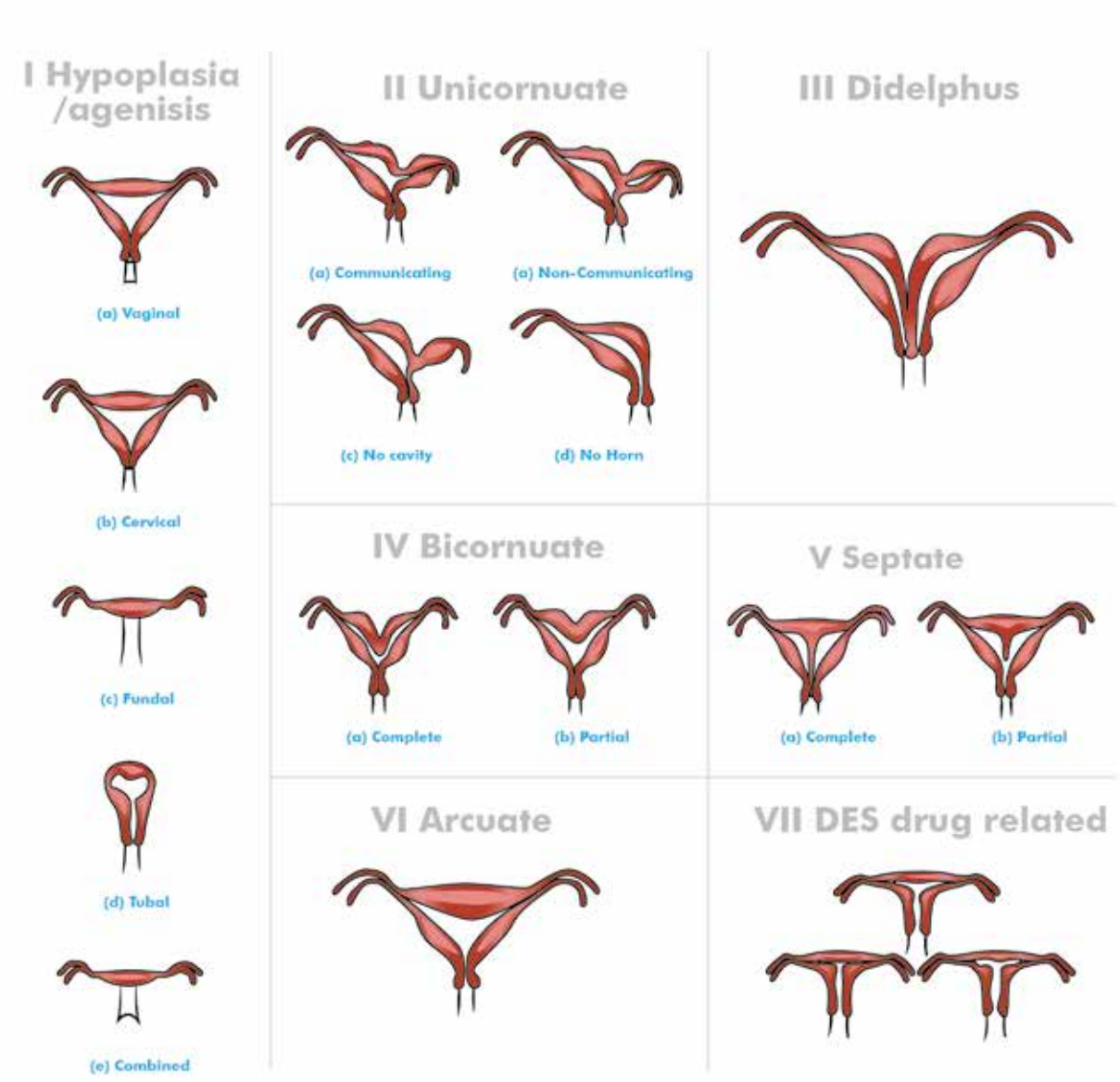

Figure 2. ASRM classification system for mullerian anomalies.

Obstructive anomalies

Obstructive anomalies present in two ways: in adolescents with primary amenorrhoea and cyclical pain, or as progressively worsening dysmenorrhoea with normal menstruation.

Obstruction with primary amenorrhoea and cyclical pain

These anomalies are generally diagnosed in early puberty, after investigation for cyclical pain in the absence of menarche. Due to irregular cycles in adolescence, the pain may not occur monthly, thus diagnosis can be delayed. The outflow tract obstruction leads to a build-up of menstrual blood in the vagina (haematocolpos) or the uterus (haematometra). With a normally functioning uterus and ovaries, this obstruction can occur at any level in the vagina or cervix.

The most common obstructive anomaly is an imperforate hymen, occurring in 1/2000 young women.[2] Girls will present with pain secondary to a haematometracolpos. When severe, they may even experience urinary retention or bowel complaints. The mass may be palpable abdominally and vulval inspection will often show a bulging bluish hymenal membrane. This may be diagnosed clinically or confirmed with a pelvic ultrasound.

Transverse vaginal septum is a much rarer condition, occurring in 1/2100–72,000.[2] The obstruction can occur at any level along the vagina, most commonly (40 per cent) in the upper third of the vagina.[2] The vaginal septum may be thin or thick. More extensive segments of obstructed vagina represent either partial or complete vaginal agenesis. Girls will present in the same manner as an imperforate hymen. However, on examination of the vulva, a normal hymenal opening will be visible without a bulging membrane. Imaging with a pelvic/translabial/rectal ultrasound and MRI are required to assess the extent and location of the transverse septum.

Cervical agenesis or dysgenesis with a normally functioning uterus is a rare condition with an unknown incidence. It will usually present earlier due to pain from the haematometra. Up to 50 per cent will have concomitant vaginal agenesis and 33 per cent have other associated Müllerian anomalies.[2] Specialist care and advice is required to determine whether the cervix can be functional in the future, providing potential to maintain fertility.

Obstruction with normal menstruation and worsening dysmenorrhoea

Up to 94 per cent of adolescents experience dysmenorrhoea.[3] Most do not have a Müllerian anomaly, but rather have either primary dysmenorrhoea or another cause of secondary dysmenorrhoea. A partially obstructed Müllerian tract should be considered and excluded for girls with worsening symptoms despite conservative treatments (pain medication or cyclical hormonal therapy).[2] The most common anomaly is an obstructed hemivagina with complete duplication of the uterus, cervix and upper vagina. Examination may be normal or show an abdominal mass. A digital vaginal examination may be attempted in older/sexually active girls, showing a lateral vaginal mass. Imaging should include a pelvic and renal ultrasound and pelvic MRI.

An obstructed or non-communicating uterine horn will present in a similar fashion as an obstructed hemivagina, but usually at an earlier stage. Examination will show a normal vulva and vagina with a single cervix. Investigation should include a pelvic and renal ultrasound and pelvic MRI.

Management of an obstructive anomaly

Prompt management of an obstructed outflow tract is important due to the risk of endometriosis, pelvic inflammatory disease and haematosalpinx. Hormonal suppression can be instituted while obtaining an accurate diagnosis or if there will be a delay in accessing definitive surgical management. Menstrual suppression is also recommended in cases where pre- or postoperative vaginal dilation will be required, giving time until the child is of an age to undertake the treatment. Suppression options include continuous progesterone (oral/depot), continuous combined oestrogen and progesterone contraceptive pill or gonadotropin releasing hormone (GnRH) agonist. If menstruation is not suppressed, or there is ongoing pain, surgery is indicated.

An imperforate hymen needs to be treated surgically with excision of the hymen under general anaesthesia as an urgent case. Knowledge of the exact location and thickness of a transverse vaginal septum is a vital part of preoperative planning. A thin septum may be excised with direct closure of the vaginal walls, whereas a thick septum or atretic segments may require flaps or skin grafting. There is a significant risk of vaginal stenosis and dilators may be required postoperatively.

Table 1. Investigations for suspected uterovaginal agenesis.

Investigation	Rationale
Pelvic ultrasound	Assess presence of pelvic organs
MRI pelvis	To confirm anatomy
Renal ultrasound	For associated renal anomalies
Hormone profile + androgens	Assess gonadal function
Karyotype	To exclude complete androgen insensitivity syndrome or gonadal dysgenesis
Vertebral X-ray/hearing/cardiac screening	Assessing for associated complications if symptomatic

An obstructed hemivagina requires surgical excision of the vaginal septum and anastomosis of the vaginal mucosa to close the defect between the two vaginal sections. A non-communicating uterine horn can be removed laparoscopically with good outcomes.

Non-obstructive anomalies

Non-obstructive anomalies of the female genital tract are often asymptomatic and not associated with abnormalities of the external genitalia. A diagnosis may be made when the girl or young woman presents with primary amenorrhoea, dyspareunia, recurrent miscarriage or pregnancy complications.

Uterovaginal agenesis

Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome is uterovaginal agenesis due to failure of the Müllerian ducts to develop. It is a rare condition affecting 1/4500–5000 girls and presents in adolescence with primary amenorrhoea but normal secondary sexual characteristics. A pelvic examination will show normal external genitalia with a normal hymen and a variable length vaginal dimple proximal to the hymen. Investigations should be arranged to confirm the diagnosis and exclude other differentials (Table 1).

The main differential diagnosis for uterovaginal agenesis is complete androgen insensitivity syndrome (CAIS), an X-linked recessive condition affecting the androgen receptor gene resulting in an inability of the tissues to respond to testosterone and dihydrotestosterone, with a prevalence of 1 in 20,000–64,000.[4] Girls will be phenotypically female with normal breast development but sparse pubic hair and present with primary amenorrhoea. Due to the 46XY karyotype, the testis will produce normal amounts of AMH resulting in regression of the Müllerian ducts. However, as the tissues do not respond to androgens, female external genitalia will develop and aromatisation of testosterone to oestrogen will result in breast development at puberty. Examination will show a normal vulva with a typically short vaginal dimple proximal to the hymen.

The initial treatment of MRKH and CAIS involves the thoughtful disclosure of the diagnosis to the adolescent and her family and providing appropriate support. Ongoing psychological support from specialists trained in this area can be invaluable. Once the young woman is psychologically ready, further discussion and management can be instituted. The creation of a functional vagina can often be achieved through progressive vaginal dilation, which is considered the first-line option with high success rates (90–92 per cent)[1,4] and minimal complications. Dilation is performed daily and can take multiple months to reach a normal size, after which maintenance dilation or regular sexual intercourse is required to maintain the vagina. Surgical neovagina creation is reserved for women who are unable or unsuccessful with vaginal dilation. Many different techniques exist for the creation of a neovagina, including surgically assisted dilation (Vecchietti procedure), vaginoplasty with grafting of split thickness skin or amnion (McIndoe procedure) or pelvic peritoneum (Davydov procedure), intestinal vaginoplasty (commonly using sigmoid colon), or creation of a perineal pouch with skin flaps from the labia.[1] No matter which surgical procedure is performed, the woman may need to continue regular dilation or sexual intercourse to maintain the vagina.

A discussion of future fertility should occur when the young woman is ready. Women with MRKH can

Table 2. Pregnancy complications associated with Müllerian anomalies.[1,6]

	Pregnancy complications	Rate
Unification errors		
Unicornuate, bicornuate, didelphys	Malpresentation – typically breech Preterm birth Fetal growth restriction Caesarean section	25–50% 33–50% 18–50% 64%
Communicating horns	Rupture of rudimentary horn	67%
Canalisation errors		
Arcuate	Nil Classified as variant of normal	
Sub-septate, septate	First trimester miscarriage Malpresentation Preterm birth Fetal growth restriction Caesarean section	44% 16% 25% 6–12% 45%
Longitudinal vaginal septum	Second stage dystocia Laceration/bleeding from septum during birth	

have biological children through oocyte collection and surrogacy. There is the potential for uterine transplantation in the future; however, this is currently still in research. Women with CAIS will not be able to have biological children, but can still be a parent through surrogacy with donated oocytes or adoption. In addition, there is a risk of gonadal malignancy, which is small during childhood (~5 per cent) and increases during adulthood (~14 per cent), and so discussion of gonadectomy in early adulthood (16–25 years) should occur.[4,5]

Longitudinal vaginal septum

Longitudinal vaginal septum occurs as a result of failed fusion of the Müllerian ducts and is typically associated with uterine didelphys due to the failed fusion. Women may present with dyspareunia, leaking when using tampons or be diagnosed at the time of a routine Pap smear. Vaginal septum need only be removed if they are symptomatic or in preparation for an attempted vaginal delivery.

Congenital uterine anomalies

Uterine anomalies occur due to either a unification error (failure of the Müllerian ducts to fuse) or a canalisation error (failure of resorption of the midline fused portion of the Müllerian ducts).[5] Variations of uterine anatomy are asymptomatic, but may have the potential to cause pregnancy complications. Table 2 summarises the associations.

Diagnosis of uterine anomalies can be via imaging with hysterosalpingogram (HSG), hystero-contrast-sonography (HyCoSy), MRI or 3D pelvic ultrasound; or via hysteroscopy and laparoscopy to directly visualise the pelvic organs.

Surgical management of septate uteri is controversial, some gynaecologists recommend immediate resection of the septum, while others only resect the septum if complications such as recurrent miscarriage occur. Most women with septate uteri (75–80 per cent) will have normal reproductive function.[1]

Rudimentary uterine horns are difficult to diagnose, but should be removed due to the high rate of rupture if a pregnancy occurs in the horn.

Conclusion

Congenital anomalies of the female genital tract are rare, but important, diagnoses in the adolescent population. Young women may be asymptomatic or present with primary amenorrhoea, signs of obstructed menstruation, dyspareunia or fertility issues. A thorough history, examination and appropriate investigations are critical before planning definitive management so that the appropriate procedure and expertise are available. Obstructed menstruation should to be treated urgently by either medical or surgical means to prevent future complications, such as endometriosis or infection. A diagnosis of MRKH or CAIS requires careful disclosure in a sensitive manner with appropriate psychological support. Many of these women can attain a functional vagina through progressive vaginal dilation, with only a few women requiring surgical management. Uterine Müllerian anomalies are associated with adverse pregnancy outcomes, including first trimester miscarriage, preterm birth, malpresentation, fetal growth restriction and caesarean section. Young women with congenital anomalies of the genital tract should be cared for in a specialised multidisciplinary team with surgical, medical and psychological expertise.

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Aboriginal and Torres Strait Islander adolescents

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In Australia, the Aboriginal and Torres Strait Islander population is proportionately younger, meaning a greater percentage are adolescents. In the WHO 2014 report titled 'Health for the world's adolescents – a second chance in a second decade',[1] the growing sense of urgency to address health in this stage of life is highlighted as one that has been somewhat neglected by policy makers and in the public health arena. The report emphasises the difference that adolescent health makes to the future of any society or community. It examines how the wider social context determines the varying experiences of this stage in life, despite it being biologically very similar worldwide. 'Adolescents experience similar biological, cognitive, psychosocial and developmental processes – the timing and influence of these processes depend upon the environments in which they live, learn, play and work.'[1]

Many social factors are of particular importance during the period of adolescence: family; the environment; behavioural norms of peers; what happens at school; gender and sexual norms within communities; and other significant adults of influence in their lives. Sir Michael Marmot addressed Australians last year: 'what happens to children has a profound affect on their life as adults, and hence their health. A poor start affects everything that happens subsequently.'[2] Never has a truer statement been made when it comes to our indigenous young people here in Australia.

Any initiation of health-compromising behaviours in adolescence, such as using alcohol and drugs and taking sexual risks, will have not only immediate effects on health, but may also accumulate into longer term ill health in adulthood. This really highlights how important it is to get it right when adolescents may be malleable and more able to be positively influenced; getting this right in a culturally appropriate way, even more so.

Indigenous adolescents also face the challenge of growing up in two cultures – struggling to understand their own cultural identity and definitions of health, and facing the demands of

the Western culture with its expectations and sometimes conflicting ideas about health. When it comes to approaching the Aboriginal Australian adolescent, (especially in relation to sexual health and pregnancy, risk-taking behaviours, menstrual and pubertal problems), it is important to provide culturally appropriate care, which starts with an understanding of the social context in which they live, and the cultural background that influences their behaviour and beliefs.

A review of the resources and literature available has provided great insight and has aligned with what has been my own experience over the last 10 years working in regional and remote Aboriginal communities in Far North Queensland.

The context

The concept of shame

- Shame refers to a sense of embarrassment, but more than that, a deep sense of inadequacy and disempowerment that accompanies it. It occurs in circumstances where the person's dignity is targeted. It can occur in situations where cultural norms or taboos are breached, or felt when the person is not respected. When felt, it can be overwhelming for the person.[3]
- Due to this concept, sexuality and related matters are rarely openly talked about. Elders and parents may not discuss these matters with their adolescent daughters. Patients may have less understanding regarding sexual health issues and are far less likely to disclose these during consultation. Examination may be perceived as shameful and embarrassing. Shame may affect any young person agreeing to seek help for these issues in the first place.[4]

Health literacy and educational status

- In my experience, there is a lower level of knowledge of the normal pubertal changes and female anatomy in these young women. This may firstly deter women seeking help for gynaecological problems and, secondly, it may prevent understanding of required treatments and the purposes of such treatments. Assuming a basic knowledge of female anatomy and sex education during consultation may lead to a very unproductive appointment. The patient often will not disclose if they do not understand, leaving dissatisfied and unlikely to return.
- Levels of sex and contraceptive education in schools may be 'too little, too late', and some may not attend these sessions due to shame.[5]
- Leaving school before 18 has been shown to be associated with sexual activity and teenage pregnancy. Consistent themes surrounding lack of engagement with education have arisen in reviews into health in this age group.[6]

Box 1. How to approach Aboriginal and Torres Strait Islander adolescents.

Rules of engagement

Culturally appropriate, community-driven and community-developed programs for adolescent health have been advocated by reviewers in this field for a long time. As an individual gynaecologist delivering care to Aboriginal and Torres Strait Islander adolescents, there are some key 'rules of engagement' one should consider in light of the above:

- Know something about the community the adolescent is from. Ask the patient if you don't know, this 'breaks the ice'. When Aboriginal people introduce themselves they often refer to their background, their land or their country. In turn, you may like to introduce yourself and try to do so in a non-threatening way, without using formal titles.
- Recognise your own values and cultural background, being careful not to impose your own ideology on to the teenager. Don't make any assumptions about the patient, their beliefs or practices.
- Allow an opportunity for the patient to be accompanied by an Aboriginal/Torres Strait Islander health worker. Ask if they would like to have a family member or friend join them. Allow a chance to speak in their language if this is preferred. Give the option to see someone of the same gender.
- Build a relationship with your patient: ask them about themselves and use their name. Family and kinship are very important to Aboriginal and Torres Strait Islander peoples. Knowing about the young person's family situation will help you understand the context in which they live as well as their influences.
- Approach sensitive subjects by asking permission to move into discussing them. Be aware that often the patient who often presents for another reason when they really have a private issue that they want to discuss and may take some time to disclose this.
- Don't be uncomfortable with silence. Patients need time to think about what has been said and are much more likely to enter discussion if they are not pressured to tell you their story or feel they are being interrupted.
- Ensure privacy and be respectful and mindful of the concept of shame. Be aware of the fear of community gossip (Murri grapevine) and ensure that confidentiality is impeccably maintained. This can be of considerable importance in small communities. Disclose legal responsibilities when it comes to privacy.
- Use the right language and avoid medical jargon. Explain things simply and use visual aids and culturally appropriate pictures/resources to aid in explanations. If you realise the person does not understand, change tack.
- Use body language effectively. Aboriginal people are very good at reading body language and it will greatly influence how they feel, whether they disclose information and whether they return to see you again. If the patient is not making eye contact, respect this. Be sensitive and adjust your body language if you can see what you are doing is making that person uncomfortable. Do not sit too close or touch the patient during the history part of the consultation as they may feel uncomfortable with this.
- Ask about cultural beliefs and traditions. This will help greatly in understanding certain behaviours and will make it less likely that your own ideologies will be imposed, even if well intentioned. Examples of this are talking about sex, beliefs about contraception, termination, or pregnancy at an earlier age. You may need to ask how the patient would feel about a pregnancy, and what that would mean for her and her family. You may need to ask the reasons for not wanting an Implanon in the light of certain stigma in communities with regards to the device.
- Involve the adolescent in decisions; be engaging rather than dictatorial.

Gender roles, inequalities and identity

- A systematic review of the social determinants of sexual health in adolescent Aboriginal Australians in 2016 summarises these issues very well.[6] Recurring themes within the reviewed literature include power imbalances in sexual relationships between young men and women and gendered violence. It also discusses the peer influence to maintain a sexual relationship as part of status within the group, irrespective of potential dangers, such as male dissatisfaction of condom use and sometimes assault.
- Identity formation in young Aboriginal adolescents has been reported to focus on sexual engagement and even early parenthood, particularly in more isolated places where there is little opportunity for employment or career. Parenthood is seen as a pathway to adulthood. Many teenage Aboriginal mothers in one study described their pregnancies as a 'transformative event' motivating them to make entirely positive changes to their life.[5]

Risk-taking behaviour

- One of the biggest influences on the sexual health of young Aboriginal people is the role of substance abuse.

Intergenerational trauma

- Previous experiences of the treatment of Aboriginal peoples in Australia have led to mistrust of the Western medical care providers. Many teenagers are likely to look to their friends for advice and other family members for help before engaging with the medical service.[4]
- Studies have examined how 'entrenched social disadvantages stemming from historical inequalities, continue to impact young people's health.'[6]

Conclusion

There is a remarkable opportunity within the adolescent years to positively influence and motivate our patients. There are many guidelines for managing clinical encounters with adolescents, such as the well-known HEADSS tool.[7] It is important to approach any consultation with an adolescent with these basic strategies in mind, but these must also be incorporated into the social and cultural context of the Aboriginal and Torres Strait Islander young person.

As a gynaecologist, among the most challenging consultations with my Aboriginal adolescent patients have been how to explain those curly diagnoses such as androgen sensitivity syndrome or precocious puberty. Though it can be more challenging to approach all the common issues – such as abnormal bleeding, contraception, STI, PCOS – in a way the patient understands, in a way that motivates and empowers them to manage their condition, while also embracing their cultural background and integrating it into their experience of adolescence in a positive and meaningful way.

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Contraception in adolescents

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As a gynaecologist, one of the most challenging consultations is addressing contraception in our adolescent population. Recent Australian data has revealed that the majority of teenage girls have engaged in sexual intercourse by the end of their secondary schooling, with exact statistics hard to quantify given the challenges of accurate data collection.[1] In 2016, the teenage fertility rate had continued to decline and was 11.9 births per 1000 teenage girls, compared to 34 births per 1000 in 2010.[2]

Although these rates suggest a step in the right direction, contraception in adolescents remains a very important topic to address. The younger the age one commences sexual activity, the greater the risk of sexually transmitted infections (STIs), unintended pregnancy, termination of pregnancy or early parenthood.[3] Adolescent pregnancies are associated with increased levels of morbidity, such as minimal antenatal care or delay in accessing antenatal care, higher rates of urinary tract infections and hypertensive disorders, preterm birth and lower birthweight.[1,3,4] In addition, the pregnancy can have an effect on personal, social and educational life, with higher rates of mental health disorders, lower socioeconomic status and lower levels of employment.[5] The offspring of an adolescent is also more likely to become a teenage parent as part of the intergenerational phenomenon.[3]

Consequently, contraception is a very important issue as it is a key element in the prevention of adolescent pregnancies. This article aims to highlight the range of contraceptive options available, as well as important aspects to consider for this group of patients.

Best practices in prescribing contraception

When prescribing contraception to adolescents, healthcare providers must take the opportunity to provide a more holistic approach to the consultation. It is vital to explore their personal psychosocial circumstances, take a thorough sexual health history, screen for pregnancy and STIs, promote safer sex practices, as well as counsel and provide suitable contraceptive options.[4] One must keep in mind that, aside from permanent sterilisation, all methods for adult contraception are physically safe and appropriate for our adolescent counterparts. It is also important to inform the young adolescent of the law in relation to sexual activity and assess their competence to consent to treatment.[10]

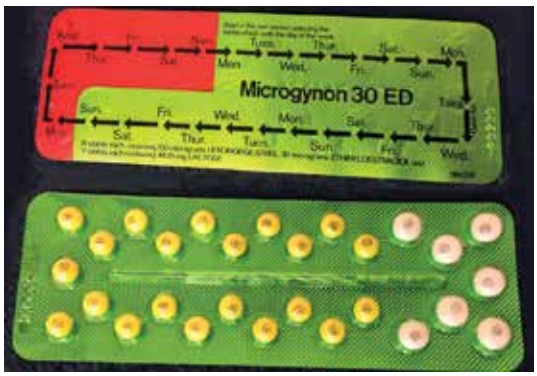
Challenges that providers may face during the consultation include the adolescent's attitude to confidentiality, the accessibility and affordability of methods, barriers in communication, as well as geographical difficulties for those in rural and regional areas.[1,3] The counselling should also be developmentally targeted, as the contraceptive needs differ between early, middle and late adolescent females. Finally, it is important to consider the pregnancy rates with 'perfect use' versus 'typical use' of the various contraceptive methods, as 'typical use' is often more reflective of adolescent practices.[1]

Long-acting reversible contraceptives

Long-acting reversible contraceptives (LARC) are the most effective forms of contraception available, owing to high continuation rates that eliminate the daily adherence challenge, as well as being reversible, cost effective and maintaining high satisfaction rates.[6] Only a minority of the female adolescent population is currently using LARC; however, there is a trend towards increasing use.[10]

The Mirena intrauterine system (IUS) is a very effective form of contraception, releasing levonorgestrel continuously over a five-year period.[6] Contrary to perceptions regarding its use, the IUS is a safe method for adolescents and has a low failure rate of 0.8 pregnancies per 100 women in the first 12 months of use.[4,6] The IUS can safely be inserted in the primary healthcare setting, and importantly, in adolescents there is no increased risk of insertion complications, such as uterine perforation.[3] The risk of pelvic infection following insertion is minimal, due to the protective effect of cervical mucus; however, it may be higher in particular subset groups of adolescents who are at high risk of STIs, which can have implications on fertility if not promptly diagnosed and managed.[4] The uptake rate in adolescents is surprisingly low at 7.5 per cent; possible explanations for this include misperceptions about suitability and side effects of the IUS, and accessibility of a skilled clinician for insertion.[4]

The Implanon implantable device is another type of LARC. It is a flexible plastic rod about the size of a matchstick, inserted in the inner upper arm, continually releasing etonorgestrel for three years.[2] The failure rate for typical use is impeccably low at 0.1



pregnancies per 100 women.[4] Its high effectiveness, long duration and easy compliance are all important advantages.[2,4] One of the major disadvantages, however, is irregular vaginal bleeding, usually within the first 3–6 months following insertion, which can deter adolescents from its use.[2]

The injectable contraception Depo-Provera contains medroxyprogesterone acetate and is given every 12 weeks. It is an effective form of contraception, although the typical use failure rate varies between 1–8 pregnancies per 100 women due to non-compliance with repeating the injection.[4] One major side effect is irregular bleeding patterns that occur once commenced, which have been reported to be as high as 30 per cent among users. There can also be a delay in the return of fertility from the last injection and loss of bone mineral density with long-term use, which does resolve once discontinued.[2,10]

Combined oral contraceptive pill

The combined oral contraceptive pill (COCP) is an effective method of preventing pregnancy through inhibition of ovulation and thickening of cervical mucus. It also carries multiple non-contraceptive benefits, such as regulating the menstrual cycle, reducing dysmenorrhoea and heavy menstrual bleeding, improving acne and hirsutism. However, the typical use failure rate is high, due to the compliance challenges associated with daily administration, reporting 6–8 pregnancies per 100 women in the first 12 months of use.[4] Discontinuation of use is more commonly due to irregular bleeding in the first few months, though this usually corrects itself with time.[7] Other common side effects include nausea, breast tenderness and headaches. There are different formulations of the COCP available, with the compositions of hormones varying slightly to help target specific areas such as weight and acne, which can be chosen to best suit the teenager.

Barrier contraception

The most common and effective type of barrier contraception is the male condom. The greatest advantages are the accessibility and cost, as well as the additional benefit of protection against STIs, which is particularly beneficial in this age group.[4] One of the big pitfalls of the male condom is that the failure rates are higher, especially in adolescents versus adults.[4] This is due to the difficulty in correct and timely application, as well as the need for adolescents to be comfortable and familiar with their bodies. Typical failure rates can range as high as 14 pregnancies per 100 women.[4]

Emergency contraception

This method is administered in the immediate time period following unprotected sexual intercourse (UPSI) to prevent pregnancy. Different treatments include selective progesterone receptor modulator (ulipristal acetate 30mg), levonorgestrel-only regime (Plan B), and high-dose combined pill (Yuzpe), as well as the copper intrauterine device.[4] Ulipristal acetate has proven higher efficacy then the other methods, especially if taken within the first 24 hours of USPI, and is effective for up to five days. On the other hand, levonorgestrel-only regime will prevent 85 per cent of pregnancies up to three days after UPSI, and Yuzpe 75 per cent.[8] The side effects of these drugs can also be an issue due to the high dose of hormones in their composition, which can alter the bioavailability of the drug.[8] The effect is only transitory; the return of fertility will be immediate and therefore a long-term treatment plan with the adolescent must be initiated. Alternatively, the copper intrauterine device can be inserted up to five days following UPSI, and has the added advantage of long-term contraception. Access to emergency contraception is just as important as the efficacy of these methods, as the success will decrease with time elapsed from UPSI. Adolescents must be made aware of the different methods available and where to source them. Pregnancy status must also be confirmed 3–4 weeks after initiation to verify success of treatment.

Other options

There are a variety of other contraceptive methods available, although these are less suitable to the adolescent cohort. The female condom is one example, where correct application is often a very difficult challenge and therefore not recommended.[4] Others include spermicides, vaginal ring and progesterone pill.[4] The progesterone pill is not favoured, particularly in this age group, given adherence is mandatory in order to be effective, with only a small window of opportunity if a pill is missed.[4]

Conclusion

Contraception in adolescents is an important topic and as gynaecologists we must consider the entire clinical picture when approaching each individual to ensure the most suited method is chosen. As good practice, once the contraception plan has been established, a follow-up appointment within three months should be made. This allows for monitoring to ensure correct use of contraception as well as confirming that the adolescent is satisfied with the outcome.

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Understanding the barriers: managing adolescent pregnancy

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Adolescence is a time of 'finding yourself'; exploring the type of person you want to be and future you want to have. As a result, many adolescents are influenced by their peers and partake in risk-taking behaviours, some of which include substance abuse and unprotected sex. Teenagers from lower socioeconomic backgrounds are six times more likely to become pregnant and less likely to opt to terminate the pregnancy, due to financial constraints and lack of family support.[1,2] This is a time of pivotal change for young women who, by deciding to continue with the pregnancy, may accept that there is a heightened need to discontinue risk-taking behaviours.[3] It is therefore important that these women receive supported care and referral to allied health services as needed.[1,4]

Managing adolescent pregnancy involves providing tailored, holistic care that addresses the current issues affecting young women, free from societal stigma and judgment.[1,2] The ideal way to improve patient attendance and engagement involves minimising barriers, by ensuring services are easily accessible and free of charge.[2] Issues faced by young women include increased exposure to domestic violence and family abuse, bullying through social media, mental illness, self-harm, substance abuse, sexually transmitted infections, financial stress and homelessness.[1,3,4,5] Given the significance of these various psychosocial issues, it is imperative to provide a place of acceptance and belonging.

Studies have found that community-based group antenatal care empowers young women and thus improves their wellbeing through continuity of care, peer support and easy access to allied health professionals.[6,7] This, in turn, reduces feelings of isolation and improves emotional wellbeing and mental health outcomes. With the right antenatal and postnatal support within a community setting, these young women can demonstrate their ability to transform into attentive and effective mothers.

Domestic violence and abuse

Many young pregnant women have been further disadvantaged by prejudicial childhoods, including childhood abuse and poor parental role modelling. Evidence reports that adolescent mothers are more susceptible than older women to domestic violence from intimate partners.[2,4,5] It is therefore imperative that antenatal care includes screening for domestic violence and ensures that there are available and accessible services in place to respond to safety needs. Children born to young mothers are more vulnerable to neglect or poor living conditions due to a range of risk factors and are less likely to establish independence and financial security to provide for themselves, as they are less likely to complete their education.[1] This is often in addition to domestic violence, including family conflict, unstable housing, poverty, mental illness and low socioeconomic backgrounds.[4,5] 'To the young teenage mother, life course outcomes tend to be characterised by negative public attitudes, social isolation, poverty and prolonged welfare dependence.'[8] While there are financial costs associated with the provision of community-based antenatal care, this is more than offset by the substantial social and economic savings to the wider community.[2,7]

Social media and mental illness

Adolescents are now faced with social media concerns unique to previous generations. They are more vulnerable to new forms of bullying and they cannot escape the opinions of others around them. Many adolescents perceive their self-worth and self-image via social media platforms and by how many likes or comments they receive when posting on social media.[9]

Young pregnant women have an increased vulnerability to mental illness.[7,10] Depression, anxiety and borderline personality disorders are now more common and are often multifaceted.[1] Unplanned pregnancy challenges the woman's idea of who she is and what she wanted her life to become, including career, travel, friendships and relationships. She experiences grief around these lifestyle changes, subsequently impacting on her mental health and view of herself. Many young women have thoughts of self-harm or a history of self-harm attempts. There is evidence to suggest that young women are more likely to develop postnatal depression than older mothers.[1,7,10] Therefore, mental health intervention may be required and young women benefit from community linking, such as child health and mother's groups with peers.

Substance abuse

There is also a greater risk for substance abuse within this age group.[1,5] Common examples of this include alcohol, smoking cigarettes and/or cannabis and the use of amphetamines, such as ice. Many of their peers continue to party on the weekends, and to escape the habits or addiction, young women are often forced to discontinue their friendships and social behaviours, which can result in social isolation. In the absence of new positive peer relationships, young women are at risk of relapsing to previous substance use. This highlights the need for community-based and peer-responsive care.

Sexually transmitted diseases

Adolescents are less likely to practise safe sex and are at an increased risk of developing sexually transmitted infections.[8] For example, chlamydia is much more prevalent in this age group.[2] Therefore, routine care should incorporate screening for these infections.

Financial stress

Financial stress is a huge concern for many young pregnant women. The WHO states that the adolescent mother often lacks knowledge, education, experience, income and power relative to older mothers.[4] Due to their lack of education, income and maturity, young women can lack budgeting and financial management skills.[3] Financial stress and instability can lead to poor financial decision-making, such as engaging in pay day loans to meet their immediate needs. Subsequently, debt is increased at an exorbitant interest rate that they cannot afford. This is further compounded by lack of family support, which forces young women into homelessness and 'couch surfing' between friends. Possessions are often removed due to the ongoing repayment cost of keeping them in storage containers. Lack of funds for fuel and public transport makes it difficult for young women to attend appointments and lack of credit on their phones means they are difficult to contact. Financial restraints also impact on weekly groceries and they are more prone to poor diets and cannot afford to take pregnancy multivitamin supplements, resulting in an increased risk of having a baby with low birth weight.[1,2,7]

Group antenatal care

Unless young pregnant women are meeting their basic needs of food, housing, safety and security, they are unable to see beyond these needs to receive any antenatal education. Therefore, the significance of multidisciplinary care cannot be overstated.[2]

Evidence strongly indicates the significance of community-based care when working with adolescent pregnant women.[6] Community-based antenatal education recognises that approximately 50 per cent of young women will not have a male partner when their baby is born and the inclusion of other support people is essential.[1] Many young women will attend the groups with either their partner, mother, friend, family member or on their own. This education is aimed at facilitating optimal growth in anticipation for parenting as stigma can affect the way a young mother feels about her capacity to parent. Young pregnant women are reluctant to attend hospital-based care due to financial restraints, transport issues and societal stigma associated with being young and pregnant. This is made more difficult by having to navigate a complex healthcare system that is inflexible, with power imbalances commonly evident between health professionals and young patients.

The benefits of antenatal care within the community have been widely documented and include increased rates of attendance, relationship-based care and a sense of community and belonging.[7] Furthermore, improved psychosocial functioning, higher rates of satisfaction with care and exclusive breastfeeding in the first six months are evident in women who have been assigned group antenatal care during pregnancy.[6]

The strength of antenatal education within a group setting with peers is that it provides a point of connection between peers and facilitates a sense of belonging. It also promotes the potential for young women to develop healthier positive behaviours as they become parents. Continuity of care with the same midwives at each appointment who already know the women's history, assists with developing rapport and trust. Consequently, they are more engaged within the group and committed to maintaining their appointments.[6] Research states that young pregnant women benefit from targeted interactive education appropriate to their developmental needs.[1] The key to its success is that this care is given by health professionals that are non-judgemental and aware of the issues relevant to these young women and their families.[1,2,7] Empowering young women in this environment transforms not only the mother, but also through continued support within the community, provides a positive impact on the child's future.

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Adolescent sexual health and STIs

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The WHO defines sexual health as, 'a state of physical, emotional, mental, and social wellbeing in relation to sexuality; it is not merely the absence of disease, dysfunction, or infirmity.'[1] It is helpful to keep this definition in mind when discussing sexual health for young people, so that their right to wellbeing is the focus, rather than merely the presence or absence of disease.

Young people are both biologically and cognitively susceptible to acquiring STIs and this is reflected in the higher infection rates seen in those aged less than 25 years in New Zealand (NZ)[2] and Australia.[3] Research that seeks to understand the resilience factors associated with reducing STI risk behaviour, such as delaying the start of sex, using condoms and limiting the number of sexual partners, hypothesises that behaviour change may be related to improving protective factors for young people. Thus, the increase in NZ secondary school students delaying initiation of sexual behaviour compared to a decade ago may be related to the reported improvement in protective factors over the same time period, such as stronger family and school connections.[4] Consistent condom use among Māori males in NZ was associated with good family relationships.[5] Such findings indicate the importance of the wider determinants of sexual health and support the need for comprehensive psychosocial assessments, such as HEADSSS,[7] that identify risk and protective factors in order to improve sexual health outcomes for our patients.

Good sexual health consultations for our adolescent patients are rewarding. A non-judgemental and collaborative approach is helpful and it is important to be aware of the following key components for consultations involving young people.

Negotiate to see the young person alone

Privacy and confidentiality are crucial components for healthcare consultations involving young people. Informing young people of the right to privacy for their healthcare information will result in more honest sharing of information and greater participation in follow-up care.[6]

Yet, while the importance of this is acknowledged in guidelines,[8] young people tell us it isn't happening for them. A NZ secondary school survey noted that while 83 per cent of students had accessed healthcare within the preceding 12 months, only 27 per cent of them reported receiving both private and confidential healthcare. Furthermore, students were less likely to receive private and confidential healthcare in settings such as hospital emergency departments compared to school clinics and sexual health clinics.[6]

Making it your routine practice to see young people on their own for part of most consultations can be helped by the following tips:

- Outline the plan for the consultation at the beginning and explain that after an initial discussion, you will spend some time alone with the young person before regrouping to discuss what comes next.
- Spell out the rules around confidentiality before separating so that both the young person and the parent/guardian(s) are clear that while all people have a right to privacy around their health information, any disclosures involving harm from others, harm to self or harm to others will need to be discussed further and likely involve other parties to ensure safety. Practice this until it feels natural and reflects your own style.
- Listen and acknowledge any parental concerns before separating and at the end of your time alone with the young person agree on what will be discussed with their parent/guardian(s), identifying if any areas are off limits.

Taking a sexual health history with adolescents

Spend some time with the young person establishing a rapport. When asking about sexual activity, it is often helpful to provide a rationale for your questions; for example, 'these symptoms can sometimes be caused by an STI like chlamydia. Can I ask you some questions to see if you are at risk of that?' Be calm and demonstrate comfort in discussing the topic.

Establish whether any sexual activity is taking place. Sometimes young people can be at risk of acquiring infections without having penetrative sex; for example, when very close genital-to-genital skin contact occurs, so it can help to explain this.

Be aware that exploring gender and sexual identity is all part of a healthy development; the array of possible combinations is limitless and can be fluid and change over time. Thus, do not presume anything – don't ask about boyfriends, but instead ask whether they are attracted to males, females or both and about their sexual partners. Do ask the age of sexual partners and how they met, including online.

Ask about symptoms, including a recent change in vaginal discharge, vulval or genital skin problems, dysuria, lower abdominal pain, changes in menstrual cycle, irregular bleeding or postcoital bleeding. Explain that it is important to know what sexual contact is occurring to guide sexual health testing.

Discuss with young people that sexual activity should be pleasurable and they should not feel pressured or find the experience unpleasant. Do ask if there has ever been any non-consensual sexual contact; for example, 'have you ever been touched in a sexual way that you didn't want'. Be prepared for a disclosure – acknowledge the bravery in disclosing, validate that what happened was not okay and that it wasn't their fault. If a recent sexual assault is disclosed, be mindful of the need to preserve forensic evidence and consult urgently with specialist sexual assault services. Consider child protection issues and mandatory reporting requirements in your jurisdiction. Know your local referral pathways and be prepared to consult.

Sexual health testing

A full genital examination is important to evaluate a symptomatic patient. This includes using a good light source to examine the genital skin and palpate for inguinal lymphadenopathy. A speculum examination is required if symptoms of vaginal discharge, abnormal bleeding or pelvic pain are present. In addition, a bimanual examination is indicated if pain is present.

A low threshold of suspicion for pelvic inflammatory disease (PID) is important, as the severity of symptoms can vary. New onset of pelvic pain in a young woman is highly predictive of PID, provided surgical emergencies are excluded.[9] The diagnosis is clinical and treatment should not be delayed.

Vaginal swabs are more sensitive than urine samples for diagnosing infections in females[10] and most laboratories now use multiplex NAAT platforms to diagnose chlamydia, gonorrhoea and trichomoniasis. Be aware that false-positive results for gonorrhoea are possible using NAAT tests in low prevalence populations.[11] If taking a swab to culture gonorrhoea, an endocervical swab is required. High vaginal culture swabs are still required to diagnose bacterial vaginosis, candida and trichomonas if no NAAT test is available. Check with your local laboratory to see which tests are available. For young women who are asymptomatic or decline examination, a self-collected vulvovaginal swab to test for chlamydia and gonorrhoea (and possibly trichomonas, depending on local prevalence) is the preferred method for female screening and has been shown to be acceptable.[10]

Table 1. STI treatment.

STI	Treatment
Chlamydia	Oral azithromycin 1g stat or doxycycline 100mg twice daily for 7 days
Gonorrhoea	Ceftriaxone 500mg IM stat in 2ml 1% lignocaine PLUS oral azithromycin 1g stat
Trichomoniasis	Oral metronidazole 2g stat or 400mg twice daily for 5–7 days

Genital herpes is under-recognised as minor lesions are common. Consider a viral swab for any recurring localised anogenital lesions. HSV-1 has been increasingly associated with genital infection, particularly among younger women.[12] For patients with lesions suggestive of a first episode of genital herpes, oral antiviral treatment should always be given, regardless of the time of symptom onset. Treat with oral valaciclovir 500mg twice daily for seven days and provide supportive care, including topical anaesthetic creams and advice on salt water bathing.[9,11] The NZ Herpes Foundation website provides excellent information for the public and professionals.[13] Genital warts are diagnosed clinically; however, significant decreases of 83.4 per cent[14] and 92.6 per cent[15] in genital warts diagnoses for young women in NZ and Australia, respectively, have been seen five years into the quadrivalent HPV vaccination programs of both countries.

Offer blood tests for HIV, syphilis and hepatitis B. Universal vaccination for hepatitis B has reduced the risk of this infection, but young people born elsewhere may be at increased risk. Be aware that syphilis and HIV rates are rising, resulting in increased risks overall. Offer a test for hepatitis C if there is a history of injecting drug use.

Establish how results will be given and ensure contact details are accurate. Repeat infections following a diagnosis of a bacterial STI are common and retesting three months post-treatment is recommended.[11] NAAT testing should not be performed any sooner than approximately one month post-infection as residual DNA may persist despite adequate treatment.[10] Educate about negotiating safe sex, how to use condoms and risk minimisation. When appropriate, address contraception needs.

Positive results

The NZ Sexual Health Society Best Practice Guidelines[11] and Australian STI Management guidelines[9] provide up-to-date treatment information.

Chlamydia is still the most common bacterial STI, with the highest rates seen in 15- to 19-year-old girls (4774 and 2069 per 100,000 for NZ and Australia, respectively, 2014),[2,3] with both countries reporting a steady decline in rates for this group since 2010. Testing rates are high in NZ, with 34.5 per cent of 15 to 19-year-old girls having a chlamydia test in 2014.[2]

Gonorrhoea rates for 15- to 19-year-old girls in 2014 were 383 and 144 per 100,000 for NZ and Australia, respectively.[2,3] Because of concerns regarding emerging antibiotic resistance, dual antibiotic treatment for gonorrhoea is now recommended.

Supporting contact tracing

Providing antibiotics to treat a bacterial STI is only the first part of successful treatment. Unless sexual contacts are treated at the same time, the risk of reinfection from an untreated partner is high, so partner notification is an essential part of STI management. It is your role to encourage and support your patient to notify their contacts.

Identify how many sexual contacts in the past two months for gonorrhoea, or six months for chlamydia. Check Australian STI management guidelines or NZ sexual health guidelines for advice on the recommended look-back period for each infection. Contact tracing is not required for diagnoses of herpes or genital warts.

Check how many of the sexual contacts are contactable and discuss the preferred method of partner notification (face-to-face, texting, phone). Be mindful of any potential risk of violence for young people; sexual health clinics can provide support for contact tracing if needed.

Many young people will prefer to talk to their sexual contacts in person and providing tips can increase their confidence; for example 'don't put off talking to sexual contacts as the longer you delay the harder it gets' and 'most people find talking to their contacts easier than they thought it was going to be'. Encourage young people to plan what they are going to say. Role playing can help confidence, 'my doctor just told me my chlamydia test was positive, so that means you might be at risk. You need to go and have a check up and get some treatment.' This can help avoid inflammatory statements such as 'you gave me chlamydia!' It helps to provide written information on the infection diagnosed, highlighting important information, such as that many people with infections have no symptoms.

Follow up with your patient, either in person or by telephone conversation, a week later to ascertain that treatment was taken correctly, that your patient abstained from sex for a week following their treatment and that no sexual contact occurred with an untreated contact. Lastly, enjoy your adolescent patients, providing good health experiences for young people and improving their health literacy is hugely satisfying.

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Assessment of sexual abuse in adolescents

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This article will deal primarily with the medical assessment of alleged sexual abuse in female adolescents; however, there are many similar considerations when assessing male adolescents. It can be confronting to treat adolescents who have experienced sexual abuse and the clinician should aim to reduce further harm to the young person. In addition, opportunistic healthcare should be provided, if possible.

In many centres, there are specific services for child and adolescent victims of sexual abuse, with appropriate clinical and forensic expertise. General clinicians should contact their local service for advice; often the young person is referred onwards to these services for forensic assessment.

Sexual abuse includes a broad collection of acts, including fondling, other non-penetrating acts, sexual exploitation and penetrating acts. Adolescence can be a vulnerable period of life, and there are certain groups of adolescents who are particularly at risk of sexual abuse (including, but not limited to, homeless young people, adolescents in residential care and adolescents with substance use disorders).

Mandatory reporting

In regards to sexual abuse, sexual assault and intimate partner violence, mandatory reporting is an important consideration. In all Australian states, doctors are considered mandatory reporters. The age at which an adolescent is considered a 'child' varies between states, therefore it is best to talk to child protective services and police in your state if you are not sure.

Confidentiality and approach

A respectful and non-judgmental approach should be used when providing medical care for adolescent patients. Introduce yourself and explain your role. Maintaining confidentiality is essential; explain what this means. Young people have the legal right to confidential healthcare unless they cannot be considered a mature minor and/or there is a significant concern of risk, such as harm to self, threat of homicide or physical or sexual abuse. The young person may have a support person present; in most cases a counsellor from a sexual assault support service should attend. Document who is present for history-taking and examination.
A group of patients that may seek medical care for the assessment of alleged sexual abuse are those in the care of child protective services. This may be a young person in foster care or residential care. Child protective services should be notified if the patient arrives unaccompanied, but only given information if the young person explicitly gives permission or suggests it (this does not exclude concerns regarding risk, such as in the case of sexual abuse).

Consent

Before taking a history of the alleged sexual abuse or examination, the doctor must take informed consent. 'It is generally accepted that most young people over 16 are capable of giving their own informed consent. Those younger may sometimes be considered mature minors. The mature minor principle has been confirmed in Australian common law, such that minors (< 18 years) may be able to give informed consent if they have sufficient understanding and intelligence to enable full understanding of what is proposed.'[1] One way to ensure this process is clear is to use a consent form specifically for adolescents (including the explanation of the term 'mature minor'). Talk about what will happen during the anogenital examination, requirements of mandatory reporting (including the provision of a report to child protective services and the police), the provision of forensic specimens to the police (often these cannot be 'retracted' once given as evidence) and, in some cases, video recording for peer review and the likelihood of ongoing medical care and treatment.

When taking informed consent, remember to consider whether the young person is able to give consent if affected by drugs or alcohol. Another consideration is the young person's mental health. Persons with mental health conditions who require involuntary admission to a mental health facility are still able to consent to medical procedures in most cases, but should understand the assessment as per informed consent principles. Likewise, some young people may wish not to proceed with the history and examination process. Rather than causing more distress in an already vulnerable and distressed young person, offer medical care.

History

Taking a history is usually the next step in the process. In some cases, police officers may have already interviewed the young person and can provide details pertinent to the collection of forensic specimens. It is not the role of the doctor to investigate the circumstances of the alleged sexual assault, but knowing when the alleged assault

occurred and where on the body forensic specimens will need to be collected is important to forensic specimen collection.

Ensure that the young person is not suffering injuries that need urgent attention (such as serious bleeding) as treating these needs to be prioritised. Apart from the where, when and what of an alleged sexual assault, document what the adolescent says in their own words. Often this requires writing as the history is taken, which can be off-putting. There are time limits for the appropriateness of certain forensic specimens. Determine whether or not the patient has washed, changed clothes, is menstruating, passed urine, defecated, brushed teeth and last had sexual intercourse.

Often young people who have experienced sexual abuse are vulnerable in other aspects of their wellbeing and may not seek medical attention apart from this interaction. I usually begin a medical history by documenting who the young person lives with, including siblings and parents. Past medical history, allergies and immunisation status should be documented. Adolescents who have complex psychosocial situations may miss immunisations. A menstrual history should be taken, including onset of menses, regularity, heavy or painful periods, day of cycle, contraception use.

HEADSSS screen (psychosocial screen)

Taking a psychosocial history is an important aspect of interacting with young people. Be upfront that you will be asking these questions and will respect the principles of confidentiality.

Home – who, where, recent moves, relationships, violence
Education and employment – where, attendance, year, performance, relationships, bullying
Eating – weight, dieting
Activities – sport, groups, clubs, parties, screen use and social media safety
Drugs and alcohol – cigarettes, alcohol and illicit drug use, how these are financed
Sexuality – close relationships, sexual experiences, current partners
Suicide, depression and self-harm – include other aspects of mental health such as anxiety, current risk of suicide and self-harm, any input such as psychologist or school psychologist
Safety from injury and violence – including criminal behaviours, exposure to violence in relationships[1]

Often the adolescent may not wish to discuss aspects of the HEADSSS screen when their parent or guardian is present and it is important to provide them with an opportunity for privacy.

Anogenital exam and forensic specimen collection

Occasionally, anogenital examination and/or forensic specimen collection may not be required. If you have concerns regarding this, there are tertiary on-call services for paediatric sexual assault who you can discuss the case with before proceeding with examination. As for adult forensic specimen collection, document who is in the 'clean room'. A chaperone of the adolescent's choosing should be present. The anogenital exam is a particularly triggering process for most young people who have been sexually assaulted.

Inform the young person that they have the right to end the examination at any point. Begin with forensic specimen collection. There are various kits used for this and it is important to maintain DNA integrity throughout the process (gowns, changing gloves with each specimen collected and documentation of each specimen). There are a number of sites on the body and mouth from which specimens are collected. Clothes are often collected as evidence and the adolescent should be offered clothing (usually kept in most sexual assault clinic rooms) to wear following the examination.

Collecting forensic specimens from the anogenital region is generally performed prior to video recording to assess injuries. In most adolescents, speculums are not used as they are not well tolerated. Occasionally, speculum use should be attempted if a cervical specimen is required (for example, if it is more than 72 hours following the alleged sexual assault). In younger adolescents, be mindful that touching the hymen with swabs may be painful and it may not be possible to perform high vaginal swabs in this case.

Once forensic specimens are collected, proceed to assessing the adolescent for anogenital injuries. A video-colposcope is helpful to provide lighting, magnification and recording the examination findings for peer review. A helpful article outlining the significance of findings, in particular, normal variants is referenced.[2] Look for bruising, petechiae, erythema, abrasions, the appearance of the hymen (including deep notches) and tears. These can be documented on body diagrams that may be supplied in some forensic kits or downloaded (the Victorian Forensic Paediatric Medical Service has these available on their departmental site accessible to the public).[3] Many adolescents have fears regarding being 'damaged' or no longer being 'normal'; this can be alleviated by a caring medical professional explaining the findings of the anogenital examination to them. It is also important to explain that not finding injuries does not mean that a sexual assault has not occurred. An alleged sexual assault may be drug-facilitated, in which case urine and blood toxicology samples should be provided to the police.

Management and follow up

Once the examination is complete, offer urine and blood testing for pregnancy and STI screening (include hepatitis B immunisation status). Provide STI prophylaxis (azithromycin 1g), pregnancy prophylaxis if within 72 hours of sexual contact (Postinor) and HIV prophylaxis for high-risk sexual contacts. Consider offering hepatitis B immunisation. Follow-up pregnancy testing and STI testing should be arranged.

Ensure the young person's mental health and wellbeing is considered following your assessment and refer to appropriate services when necessary. It may be appropriate to get consent to contact the adolescent's general practitioner for follow-up testing. Any other injuries should be documented, photographed if necessary and treated. Make sure the adolescent is going in to a safe environment following your assessment.

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Gynaecological malignancies

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Malignancies of the female genital tract in children and adolescents are rare, with consequent potential delays in diagnosis and treatment.[1] Care of children and adolescents with gynaecological malignancies is challenging and should involve a multidisciplinary approach including paediatricians, gynaecologic oncologists and/or paediatric surgeons, and other oncologists as needed. Treatment must always aim to preserve reproductive capacity.

The most common gynaecological malignancies in children or adolescents are either ovarian malignancies or vaginal tumours. Symptoms may include development of an abdominal mass (in the case of an ovarian malignancy) or vaginal bleeding or discharge. Vaginal bleeding in children often has a benign cause; however, it can be due to local malignancy or ovarian malignancy with hormonal production.[1] Of all ovarian masses in children and adolescents, 10–20 per cent are malignant.[2]

Ovarian germ cell tumours

Ovarian germ cell tumours are the most common gynaecological tumours in children and adolescents. They are derived from the primordial germ cells of the ovary and can be benign or malignant. The most common malignant ovarian germ cell tumours (in order of frequency) are, dysgerminoma, immature teratoma, yolk sac tumours and mixed germ cell tumours, which together make up 90 per cent of cases.[2] Embryonal carcinoma, polyembryoma and non-gestational choriocarcinomas are very rare.

Germ cell ovarian tumours tend to grow rapidly, with the most common presentation being abdominal pain and a palpable abdominopelvic mass.[2] Approximately 10 per cent of patients present acutely with cyst rupture, haemorrhage or torsion.[2] Initial work up should include transabdominal ultrasound scan (USS) and tumour markers. USS typically shows a large ovarian mass that is predominately solid.[2] Tumour markers that may be elevated in germ cell tumours include AFP, LDH and bHCG (Table 1). CA-125 (a nonspecific marker for non-mucinous epithelial adenocarcinomas) may be elevated simply due to inflammation or irritation of the peritoneal lining, secondary to the tumour mass. Mixed germ cell tumours (more common with germ cell tumours other than dysgerminoma) may have several elevated tumour markers, depending on their composition. Pure immature teratomas often do not have elevated tumour markers at all, reflecting the immature development of their composite cells. If a dysgerminoma is diagnosed in a prepubertal girl, the work-up should include a karyotype, as dysgerminomas are associated with gonadal dysgenesis and androgen insensitivity syndrome.

The primary treatment of ovarian germ cell tumours is surgery, both to confirm the diagnosis and for definitive treatment. Fertility preservation is almost always possible, due to the exquisite sensitivity of these tumours to chemotherapy. Surgery should include unilateral salpingo-oophorectomy (USO), washings, omental biopsy and careful inspection of the contralateral ovary and all peritoneal surfaces, with debulking of any obvious disease. Alternatively, cystectomy, without spillage, can be performed first if the diagnosis is uncertain, with a plan for intra-operative frozen section. The one exception to USO is with dysgerminoma and a karyotype showing 46XY. In this situation, both ovaries should be removed due to the risk of developing malignancy in the remaining ovary.

In the case of an unexpected finding at laparoscopy, the paramount responsibility of the surgeon is to first do no harm. In this case, an intra-operative phone call to your local gynaecological oncologist for advice is probably the best option to prevent inappropriate surgery (either too much or too little).

Germ cell ovarian malignancies are highly chemosensitive tumours. Three to four cycles of BEP (bleomycin, etoposide, cisplatin) chemotherapy is usually recommended as adjuvant treatment following surgery. The exception is for stage 1A dysgerminomas or stage 1A low-grade immature teratomas, which can usually be managed with clinical follow up alone.[3]

Sex cord stromal tumours of the ovary

Ten per cent of ovarian neoplasms in childhood and

adolescents are sex cord stromal tumours,[3] with juvenile type granulosa cell tumours of the ovary being the most common. A retrospective review found 44 per cent of cases were diagnosed prior to the age of 10 years old.[4] Seventy-five per cent of prepubertal girls with juvenile type granulosa cell tumours present with features of precocious puberty, as these are oestrogen-secreting tumours.[5] However, the most consistent finding at diagnosis is a history of increased abdominal girth and palpation of an abdominopelvic mass.[4] Sertoli-Leydig cell tumours are the next most common sex cord stromal tumours found in children and adolescents. Due to androgen secretion of these tumours, up to 85 per cent will present with virilisation. This may include acne, hirsutism, deepening voice or clitoromegaly.[6] Pre-operative imaging usually reveals a mixed solid and cystic ovarian mass.

The tumour marker inhibin B is commonly elevated with granulosa cell tumours; however, the cost (it is not an insured item on the Australian Medicare Benefits Scheme) and delay in obtaining this result makes it impractical for diagnostic purposes. Fortunately, most sex cord stromal tumours are stage 1 at diagnosis, which makes them curable with surgery alone. Surgery, as with germ cell tumours, should be fertility preserving and include USO, washings, omental biopsy and careful inspection of the contralateral ovary and all peritoneal surfaces.

Genital tract rhabdomyosarcoma

Rhabdomyosarcomas are the most common malignant soft tissue tumours in children and adolescents.[7] Rhabdomyosarcomas of the female genital tract can occur in the vagina, vulva, cervix or uterus. The most common histological subtype affecting the female genital tract is sarcoma botryoides; named due to the grape-like appearance of the tumour.[8] The vagina is the most frequent site affected, with the median age of diagnosis being 2–3 years old.[8,9] The presentation is usually of a polypoid mass extruding from the vagina, or vaginal bleeding/blood-stained vaginal discharge.[9] Biopsy is required for histological diagnosis.

Treatment of localised rhabdomyosarcomas of the female genital tract has changed drastically over the past 40 years. Previously, radical surgery including pelvic exenteration was advised. Nowadays, organ-preserving treatment is the norm, due to the use of multiagent chemotherapy with good response rates. Surgical excision is reserved for persistent tumour after treatment.[10]

Table 1. Ovarian germ cell tumour markers.

	Tumour marker		
	LDH	bHCG	AFP
Dysgerminoma	+++	-	-
Immature teratoma*	-	-	-
Yolk sac	-	-	+++
Choriocarcinoma	-	+++	-
Embryonal	-	++	+
Polyembryoma	-	++	+

* may have positive tumour markers if mixed tumour
+++ almost always elevated; ++ often elevated;
+ sometimes elevated; - usually not elevated

The use of adjuvant radiotherapy has also declined, given that young children are particularly susceptible to the long-term complications of radiotherapy.[8] Radiotherapy is usually only given to patients with residual disease after surgery and brachytherapy is preferred over external beam pelvic radiation.[11] These conservative treatment options for localised disease have a high chance of cure.[9]

Diethylstilbestrol-exposure related cancers

Diethylstilbestrol (DES), a nonsteroidal oestrogen, was used during pregnancy to prevent miscarriage and preterm delivery from the 1940s until the 1970s.[12] Girls who were exposed to DES in utero have a 40-fold increased risk of developing vaginal or cervical clear cell adenocarcinoma. The most common age at diagnosis is late teens or early 20s.[12] Given that DES use during pregnancy ceased worldwide in the early 1980s, vaginal or cervical clear cell adenocarcinomas should fortunately no longer be seen in adolescent girls.

Outcomes and follow up

Follow up of children and adolescents after a gynaecological malignancy should be for a minimum of five years, and should include a gynaecologic oncologist who, along with other specialists, can offer advice regarding contraception, fertility and the long-term sequelae of cancer treatment.

A diagnosis of malignancy in childhood or adolescence can obviously have a devastating effect on the patient and her family. Psychological support and management of any sequelae of treatment may be needed for an extended period, for both child and parents. However, in general, most malignancies of the female genital tract in children and adolescents have a good prognosis, without loss of fertility, if managed appropriately.

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Dysmenorrhoea in adolescents

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Young women can experience significant dysmenorrhoea in the first years after menarche, which may have a considerable negative effect on their ability to attend school and participate in other activities. While the prevalence of adolescent dysmenorrhoea is hard to quantify, it has been reported to affect 60–70 per cent of young women, with up to 15 per cent stating that it interferes with daily activities. School absenteeism and inability to participate in extracurricular activities are frequently reported by young women with dysmenorrhoea. The majority of adolescents with painful periods experience primary dysmenorrhoea, with structural genital tract anomalies and endometriosis accounting for approximately 10 per cent of cases of adolescent dysmenorrhoea.[1]

Characteristics of primary dysmenorrhoea

Primary dysmenorrhoea typically presents 6–24 months post-menarche with a predictable pattern, starting prior to or with menses, lasting up to 72 hours, sometimes with associated symptoms such as headache, breast tenderness, diarrhoea, nausea or vomiting. After menarche, it takes on average 1–2 years (though may take up to five years) for the hypothalamic-pituitary-ovarian axis to mature, resulting in regular, ovulatory menstrual cycles. In general, a later onset of menarche is associated with a longer period of time before cycles are ovulatory. Primary dysmenorrhoea is believed to arise from high concentrations of uterine prostaglandins, which are produced as part of the process to precipitate sloughing of the endometrium, resulting in increased myometrial contractility, followed by ischaemia and hypoxia of the myometrium, causing pain. The decline in progesterone levels in the luteal phase also contributes to elevated prostaglandin levels via the arachidonic acid cascade.[2]

Diagnosis

In adolescents, a careful history alone is usually sufficient to establish the diagnosis of primary dysmenorrhoea and to initiate treatment. Ultrasound scans are frequently performed in the primary care setting and can provide reassurance that the uterus is structurally normal. However, increased anxiety can be caused by the finding of 'polycystic ovaries' on ultrasound scans in adolescents. While not the focus of this article, diagnostic criteria for polycystic ovaries in adolescents differ from those in adult women, and the finding of multicystic ovaries in the adolescent is entirely normal. Other differential diagnoses include ovarian cysts and non-gynaecological conditions, such as inflammatory bowel disease, irritable bowel syndrome and painful bladder syndrome; although a cyclical pattern of pain is most typical of primary dysmenorrhoea.

Management approach

First-line treatment of adolescent dysmenorrhoea is to commence the combined oral contraceptive pill (COCP), with the addition of non-steroidal analgesia. Cyclical use of the COCP can reduce dysmenorrhoea by a reduction in prostaglandin load through suppression of ovulation and by lessening myometrium contractility through reduced menstrual flow. Continuous use of the COCP may be first-line management in the setting of significant dysmenorrhoea. When starting the COCP in adolescents, a 30µg pill (for example, Levlen ED, Microgynon 30, Ava 30 ED) is recommended. A withdrawal bleed should be scheduled at the end of the first pill packet, followed by continuous use of the active pills. The pill can be taken continuously until breakthrough bleeding occurs, or a withdrawal bleed can be scheduled at the patient's convenience. A four-day hormone pill break is sufficient to allow for a full withdrawal bleed.[3]

Non-steroidal anti-inflammatory drugs (NSAIDs), such as mefanamic acid, should be commenced 2–3 days prior to withdrawal bleeds, as they can act to lower circulating prostaglandin levels and also reduce menstrual flow by up to 30 per cent.[1] Tranexamic acid may result in a reduction of menstrual loss of up to 50 per cent, so can be used in conjunction with other NSAIDS for dysmenorrhoea primarily

related to heavy menstrual flow. The pattern of pain in this setting is often different to dysmenorrhoea related to prostaglandins, as pain correlates with the days of heaviest flow, (for example, days 1–3) rather than premenstrually when the prostaglandin load is highest. Other prostaglandin-related symptoms, such as nausea, diarrhoea and dizziness, may be absent where pain is primarily related to heavy flow.

The aim of continuous COCP use is to achieve amenorrhoea with resulting improvement and resolution of primary dysmenorrhoea. The pill dose can be increased to 35 or 50µg of ethinyl oestradiol (Brevinor, Brevinor-1, Microgynon 50) with supplementary oral progesterone, if needed.

The levonorgestrel-releasing intrauterine system (Mirena) can be offered for management of adolescent dysmenorrhoea when oestrogen is contraindicated or poorly tolerated. An ultrasound scan to measure the length of the endometrial cavity is not required as a standard-sized Mirena can be safely used in any uterus post-menarche, regardless of age. The Mirena is effective for the treatment of dysmenorrhoea through menstrual suppression, resulting in amenorrhoea or a reduction in menstrual loss of at least 90 per cent by 12 months post-insertion. Insertion in a young woman who is not yet sexually active is performed under general anaesthetic or sedation.

Laparoscopy can be considered if there is ongoing pain with significant impact on quality of life, particularly school attendance and participation in extracurricular activities, but this should ideally be deferred until at least six months of amenorrhoea is achieved. The reason for this is twofold:

1. To ensure an adequate trial of menstrual suppression.
2. To have a plan for hormonal suppression post-laparoscopy if endometriosis is discovered.

Secondary dysmenorrhoea (for example, due to endometriosis) is much less common than primary dysmenorrhoea in adolescents. Experience from a tertiary paediatric and adolescent gynaecology service has shown that of a cohort of adolescents presenting with dysmenorrhoea, 90 per cent received first-line treatment with the COCP. Of the 8 per cent that underwent laparoscopy for ongoing pain, two thirds had no pelvic pathology identified. Ten- to 15-year follow-up data showed no increase in rates of endometriosis and no impact on fertility compared with controls.[4] While laparoscopy is minimally invasive, it does carry risks.

Chronic pelvic pain

Our understanding of pain sensitivity in women with dysmenorrhoea continues to evolve. Persistent dysmenorrhoea may result in central sensitisation, typically demonstrated as hypersensitivity to pain. Menstrual suppression, combined with use of non-steroidal analgesia, aims to reduce the noxious stimulation of the central nervous system and reduce the risk of developing central sensitisation. The approach to chronic pelvic pain is multidisciplinary, with a combination of hormonal menstrual suppression, pain modulator medication, physiotherapy and psychology. Repeated laparoscopies should be avoided in this setting.

Conclusion

First-line treatment for adolescent dysmenorrhoea should be medical rather than surgical, with a focus on improvement in quality of life. This is most readily achieved with hormonal menstrual suppression and the use of non-steroidal analgesia.

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Ovarian complications in adolescents

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Adolescence is defined as the time between puberty and adulthood. Ovarian complications in adolescents have a similar underlying pathology to their paediatric and/or adult counterparts. Ovarian problems in this age group may be associated with congenital disorders, benign or neoplastic transformation, infection, inflammatory or normal physiological changes. This article aims to review the presentation, investigation and pathology of ovarian complications in adolescents. Detailed management is beyond the scope of this article.

Presentation

The majority of patients identified with an ovarian pathology present with lower abdominal or pelvic pain. This commonly occurs as chronic pain, but acute presentations contribute significantly to emergency surgeries for a pelvic mass or acute abdominal pain.[1] In a study of 130 cases of children and adolescents treated surgically for ovarian lesions, approximately 52 per cent presented with chronic abdominal pain and a further 25 per cent presented with acute abdominal pain.[1] Patients may complain of intermittent or cyclical pain. Chronic pain with increasing abdominal girth may be associated with large adnexal cysts or neoplasms;[2] the pain may be unilateral or bilateral. The pain associated with malignant tumours tends towards a chronic unilateral pain on presentation.[3] Right iliac fossa pain is more common than left, which overlaps with the presentation of common gastrointestinal conditions, such as appendicitis.[4] A small, but significant, number of ovarian pathologies are identified incidentally on ultrasound scan (USS).[1,5]

Other presenting symptoms may include nausea, vomiting and/or fever.[2] Premenarchal girls may first be seen with precocious puberty, a feature of underlying functional cysts and hormone-producing neoplasms.[2] Girls may also present with abnormal uterine bleeding or dysmenorrhea.[6]

Diagnosis

It is important to obtain a thorough clinical history of the presenting complaint. The gynaecological history should be ascertained alongside a confidential sexual history. The physical examination should be tailored to the differential diagnosis for an adolescent presenting with symptoms associated with a suspected ovarian lesion. This could dissociate between gastrointestinal and ovarian pathology, but also guide subsequent investigations. Clinical examination should identify signs of precocious puberty such as breast, axillary and/or pubic hair development. Sensitivity is required, particularly when the adolescent is not sexually active. Large adnexal lesions may be palpable by abdominal examination, but a vaginal examination or, for the non-sexually active, a per rectum (PR) may be required for assessment.[2]

Common investigations in the adolescent presenting with lower abdominal pain include a full blood count, C-reactive protein and urinalysis, including for pregnancy. Tumour markers (AFP, beta HCG, LDH, CA-125, CEA, oestradiol, testosterone) may be required after clinical or radiological assessment. As with adults, transabdominal USS is useful in identifying lesions, but complex or solid lesions require further imaging such as CT or MRI.[7] MRI is more accurate (97 per cent) in identifying ovarian pathology than CT (87 per cent) or USS (77 per cent).[8] The latter is preferable as it provides an economical, low-risk (no sedation required) and non-ionising radiation modality. Although an initial vascular assessment with Doppler can be performed, USS has low specificity and sensitivity to detect ovarian torsion.[2] This is due to the intermittent nature of ovarian torsion and the presence of a collateral ovarian blood supply.[1]

Serum tumour markers can be increased in benign (non-neoplastic lesions and benign tumours) and malignant ovarian lesions.[1,6,9] Despite the high false-positive and false-negative results, tumour markers are a useful tool in identifying high-risk patients and planning their subsequent management.[3] One study identified the probability of malignancy to be 0.25 per cent post-testing in the presence of negative tumour markers and a tumour less than 10cm diameter with no solid components.[10]

Ovarian cyst rupture and mittelshmerz

Simple cysts are the commonest adnexal findings in paediatric patients.[2] In comparison to premenstrual girls, menstruating females have a higher incidence of ovarian cysts, which are also larger due to endogenous hormone production. Ovarian cysts in this group usually grow to 2–5cm and then resolve spontaneously, allowing for conservative management.[2] Mittelschmerz syndrome is pain on follicular rupture at ovulation. It may be due to a small haemorrhage at this time causing peritoneal irritation. Pain is typically mild, mid-cycle and unilateral. It may occur as a sporadic event or less commonly, chronically.

Benign cystic lesions are largely asymptomatic, but carry the risk of rupture, haemorrhage or torsion, particularly if large.[11] They may present with pain requiring surgical intervention, particularly if the cyst persists or grows. They occur due to the lack of involution of ovarian follicles, which subsequently develop into corpus luteal or functional cysts. Prepubertal girls may develop ovarian cysts as a result of intermittent gonadotrophin production from the

maturing pituitary. It is uncommon for these cysts to grow over 2cm and most spontaneously resolve requiring no follow up.[2] Haemorrhagic corpus luteal cysts are difficult to differentiate on USS from complex ovarian masses or tubo-ovarian abscesses (TOA).[4,5]

Polycystic ovary syndrome

Polycystic ovary syndrome (PCOS) is a complex multifactorial disorder that may first present in adolescence.[12] It is diagnosed using the Rotterdam criteria by the presence of two of the three signs: clinical and/or biochemical signs of hyperandrogenaemia, anovulation and/or polycystic ovaries.[12] Its aetiology is related to the disorder of hypothalamic-pituitary-ovarian axis and, although benign, is related to extensive physical and mental morbidity.[12] In particular, the associated symptoms of obesity, hirsutism and acne are psychologically difficult. The biochemical sequelae of PCOS are now known to be related to an increased risk of endometrial cancer and cardiovascular disease in later life.

Endometrioma

Endometriomas are associated with adult females with a history of chronic pelvic pain and endometriosis. They may, however, first be diagnosed in adolescence, with one report of an 11-year-old premenstrual girl with an ovarian endometrioma.[2] Endometriomas are identified on USS and treatment is usually laparoscopic ovarian-preserving surgery.

Ovarian torsion

Ovarian torsion has an incidence of approximately 4.9 per 100,000 girls aged 1–20 years old[13] and accounts for 3 per cent of acute cases of lower abdominal pain in this group.[14] It is uncommon, but requires early diagnosis and prompt treatment to preserve the ovary. Ovarian torsion is associated with acute pelvic pain,[2] but chronic cyclical pain may indicate an intermittent mass torsion. It occurs more frequently on the right than left (3:2), possibly due the stabilising effect of the sigmoid on the left or the mobile caecum on the right allowing greater movement of the right ovary.[14]

Ovarian torsion may occur in normal ovaries as well as with large ovarian cysts.[15] Up to half of children with ovarian torsion will have normal ovaries.[1,2] Benign teratomas, tubal cysts, follicular or corpus luteum cysts and serous or mucinous cystadenomas are the most common lesions associated with torsion. Malignant lesions are a less common cause for torsion (2–4 per cent), possibly due to the stabilising effect of inflammatory adhesions.[1,2,9,16]

Ovarian neoplasms

Neoplastic lesions of the ovary can be either benign or malignant. Benign neoplastic ovarian masses are the second commonest ovarian lesions found in paediatric age groups. They are usually cystic, although solid lesions do occur. The incidence of ovarian neoplasms in children and adolescents is approximately 2.6 per 100,000 girls.[3] Ovarian tumours contribute to 1 per cent of childhood cancers, but account for approximately 10 per cent of malignancies.[2] The main ovarian tumour cell types are germ cell, stromal and epithelial cell tumours. In children and adolescents, germ cell tumours are the most common neoplasm and 70 per cent are mature cystic teratomas (dermoid cyst).[2] Mature teratomas require surgical intervention and up to 15 per cent may be bilateral.[17] Unfortunately, they may recur in the ipsilateral ovary after cystectomy, especially in the presence of a few tumours or rupture.[11] Benign neoplastic lesions recur more frequently than non-neoplastic lesions.[1] In paediatric patients with recurrent, multiple or bilateral mature cystic teratomas, there is a 2–3 per cent incidence of the development of germ cell tumours.[2] There is also a risk of malignant transformation in later life.

Malignant germ cell tumours in adolescents include immature teratomas, dysgerminoma and yolk sac tumours. They may present with precocious puberty, as a result of oestrogen and βHCG production.[1] Dysgerminomas represent approximately 1 per cent of all ovarian cancers and up to 30 per cent of malignant ovarian germ cell tumours. A small, but significant, number (5 per cent) may undergo trophoblastic change and secrete βHCG and LDH.[2] Yolk sac tumours may be associated with increased βHCG and AFP. Gonadal dysgenesis is associated with a rare germ cell tumour known as gonadoblastoma. Due to the high risk of malignancy in such patients, gonadectomy is recommended, particularly in pure gonadal dysgenesis (46XY) or girls with mosaic Turner's syndrome (46X/46XY).[2]

Benign stromal tumours (for example, thecomas and fibromas) are uncommon in children and adolescents, representing only 1.5 per cent of ovarian neoplasms. Malignant stromal tumours, such as juvenile granulosa cell tumours, are associated with precocious puberty and 80 per cent are diagnosed before the age of 20.[2] Sertoli-Leydig tumours are rare and present before the age of 30, with symptoms of hyperandrogenism such as hirsutism, amenorrhoea, hoarse voice and clitoromegaly.

Benign epithelial tumours are uncommon in adolescents. They may be an incidental finding or present with abdominal pain or menstrual disorders.[2] These tumours may be serous, mucinous or mixed with endometroid. The risk of malignancy is up to 16 per cent and, therefore, requires close surveillance post-surgery. Up to 40 per cent are considered borderline epithelial tumours and these may present with similar symptoms as well as abdominal distension. Surgical treatment is much like the adult female, with emphasis on preservation of fertility. FIGO stage I borderline tumours have a good prognosis, but risk of recurrence may be up to 60 per cent with stage II-IV disease.[18]

Ovarian ectopic pregnancy

Primary ovarian ectopic pregnancy contributes to 0.5–3 per cent of all ectopic pregnancies.[19] It is rare in adolescence, but must be included in the differential diagnosis of a pubertal girl who presents with lower abdominal pain and/or vaginal bleeding. Risk factors, such as pelvic inflammatory disease (PID) and smoking, are more prevalent in this age group.[19] Management is similar to adults and attempts should be made towards ovarian-tissue-sparing techniques to preserve fertility.

PID and tubo-ovarian abscesses

Approximately half of adolescent females are sexually active and 20 per cent of PID cases occur in girls less than 19 years old.[20] Therefore, the age-related risk of developing PID in adolescence is much higher than for older women. Unfortunately, there are inadequate rates of testing for STIs in this vulnerable group, which may lead to further complications, such as tubo-ovarian abscesses, chronic pelvic pain and infertility. One study showed that approximately one fifth of adolescents with PID presented to hospital with tubo-ovarian abscess with an acute abdomen.[21]

Ovarian complications in adolescents are uncommon, but they have an important impact on the physical and mental health of the developing girl. This is further confounded by issues surrounding body image and sexuality. Ovarian disorders in adolescents require prompt diagnosis and management to prevent future complications, including consideration of fertility-sparing treatments.

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The adolescent vulva: what's 'normal'?

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Adolescence is a time of significant psychological, physiological and anatomical change. Exploring sexuality, a changing body image, the importance of peer acceptance and increasing desire for independence from parents can make this a very turbulent time. The normal, but dramatic, transformation in vulval appearance and physiology from that of a prepubertal girl to a adult woman can lead to undue distress and anxiety.

Menarche and the use of menstrual hygiene products; pubic hair growth and the various removal techniques for unwanted hair; and the onset of sexual activity with possible exposure to STIs, lubricants, semen and contraceptive products, such as latex condoms and spermicides, expand the possibilities for vulval and vaginal pathology enormously, but can be anticipated.

Diagnosis and management of disease is our primary objective as clinicians; however, should none be found after comprehensive examination and history (including exposure to potential irritants and allergens) a sensitive, informative gynaecological review can in itself be valuable in reassuring and educating adolescent patients and preventing unnecessary and potentially harmful future beliefs and interventions.

Prepubertal vulval examination notably reveals a reddish vaginal epithelium and hymen, thin short labia minora and an absence of labial fat pads and pubic hair on the labia majora. The vaginal epithelium is not oestrogenised and lacks glycogen and lactobacilli and has a more neutral or alkaline pH.

Exposure to endogenous oestrogen preceding the onset of menarche will lead to vaginal mucosa becoming a more pale pink colour and the occurrence of acidic (pH less than 4.5) vaginal secretions, secondary to natural desquamation of vaginal epithelial cells and the presence of lactobacilli in the vaginal flora metabolising the glycogen in the oestrogenised epithelial cells.

This clear-to-white mucoid vaginal discharge may bleach the gusset of coloured underpants and cause concern. This physiologic discharge should not be itchy or malodourous. Young women may notice cyclical variations with the establishment of ovulatory menstrual cycles, which is good for them to know is normal.

Depending on the clinical presentation, acidic pH testing and microscopic examination of the discharge should reveal lactobacilli and normal vaginal epithelial cells. Negative testing for chlamydia and gonorrhoea, if historically appropriate, should confirm the diagnosis. Simple reassurance and explanation of physiology, in addition to education regarding simple healthy vulval hygiene measures (such as, regular bathing, avoiding vaginal douches, perfumed or strong soaps to clean the vulval area, wearing cotton underpants) will go a long way in achieving lifelong vulval health. The occasional use of panty liners or tampons midcycle if discharge is particularly heavy and problematic can be recommended. Aim to avoid pathologising physiological discharge and overtreatment with unnecessary antibiotic creams, pessaries and cervical diathermy.

Pubic hair development has traditionally been used to stage pubertal progression, but many girls are now undertaking hair-removal strategies well before achieving Tanner stage 5.[11] The current fashion for extensive pubic hair removal can lead to significant vulval irritation. Depending on the method chosen and the technique in which it is attended, pubic hair removal can lead to thermal or chemical burns, atopic dermatitis, mechanical and infective folliculitis, cellulitis, auto-inoculation with herpes simplex virus, molluscum contagiosum or human papillomavirus, pigmentation and scarring.[1] This can come as a great surprise to adolescents who may have a belief that hair removal is a necessary part of vulval hygiene and not personal choice. Suggesting a modification in grooming strategies, such as clipping hair rather than shaving, and improving technique if required (even simple advice regarding avoiding dry shaving or using a blunt razor, shaving with the direction of the hair and not sharing razors) can alleviate a great deal of suffering.[2] Pubic hair removal additionally results in increased visibility of the vulva. Mobile phones with cameras can be used for greater self-examination and comparison and concerns with the appearance of the vulva (or more specifically, the labia) due to size, physiological pigmentation, the presence of papillae or sebaceous glands are not uncommon and can result in a great deal of emotional distress.

Limited exposure to the wide variation in normal adult vulval appearance by the general population and an abundance of accessible advertising for labial cosmetic procedures showing an idealised vulval appearance may exacerbate women's vulval dissatisfaction and undermine body confidence. Adolescents may be particularly vulnerable to these factors, which are proposed to be contributing to an increase in requests for cosmetic vulval surgery and labial reduction surgery.[4]

A sensitively performed, confident examination, explanation and reassurance of vulval health and 'normality' from a gynaecologist may alleviate many girls' concerns and be therapeutic. Directing them to more realistic representation of the wide variety of adult vulval appearances can also be helpful.[5] An Australian website affiliated with Women's Health Victoria, labialibrary.org.au, is a good adolescent-friendly option with a photo gallery. A sensitive and sensible, but nonmedical, blog labiaproject.com, is also quite good and has lots of pictures. For traditionalists, Femalia, edited by Joani Blank, is a famous collection of vulval photographs you may like to purchase for your bookshelf.

Vestibular papillomatosis is a descriptive term for the presence of multiple papillae 1–3mm of the epithelial lining of the inner surface of the labia minora that is the result of hormonal stimulation of puberty and common in the later stages of pregnancy.[3] These papillae can be pigmented similarly to the patient's general pigmentation. It is a variant of normal that is sometimes confused with multiple HPV lesions.[1,2]

The sebaceous glands on the inner aspect of the labia majora and both the medial and lateral aspects of the labia minora can vary in prominence, colour and number between individuals and be a cause of concern. Also known as Fordyce spots, their function is to secrete sebum to help lubricate and protect the genital skin.[1-3]

Lengthening and changes in pigmentation of the labia minora with pubertal progression may happen in an asymmetrical pattern over years, leading to distress and requests for surgical intervention. Reassurance that a degree of asymmetry is entirely normal and advice that time is likely all that is required to achieve greater symmetry should be given sensitively at first review.[5]

There is a wide variation in the size of normal labial minora and there are no agreed standards for normal labial width. UpToDate authors[8] suggest a labial stretch width of greater than 6cm (measurement performed after gently extending the labia minora in the medial-lateral axis from the midline to the lateral free edge) as generally consistent with labial hypertrophy and should be accompanied by the presence of symptoms and or distress to make a clinical diagnosis of labial hypertrophy.

Girls requesting surgery, as well as their parent/guardian(s) should be advised of the role of the labia in enclosing and protecting the vagina and urethral orifice and the significant contribution of the highly innervated labia minora in the female sexual pleasure response, in addition to the possible risks of labial reduction surgery, including infection, wound dehiscence, scarring, chronic vulval pain, loss of sexual sensation, dyspareunia and, ironically, dissatisfaction with the postsurgical cosmetic appearance.[5,7] Cosmetic labial surgery in adolescents is best delayed until completion of pubertal development to minimise risks of a poor long-term cosmetic result and structural problems with continued labial development, as this is associated with an increased likelihood of revision procedures and the increased risks of scarring, pain or lack of sensation.[5,7]

A conservative approach – with education, simple measures to alleviate any reported vulval discomfort and psychological assessment and screening for body dysmorphic disorder or other factors that could be contributing to the level of distress and their management – is recommended by both the British Paediatric and Adolescent Gynaecological Society that recommends deferring surgery until at least 18 years of age[5] and the North American Paediatric and Adolescent Gynaecological society that are less prescriptive in minimum age limits, but generally recommend girls be at least 15 or 16 years of age.[4,7]

In summary

- Listen carefully to symptoms and concerns and recognise anxiety
- Be thorough in your history and examination (don't forget to examine the whole patient, not just the vulva, for helpful clues to diagnose dermatological complaints)
- Diagnose and treat pathology. Refer if unsure
- Remember to educate regarding the general principles of vulval care
- Don't be afraid to reassure and label normal what you know to be normal. You are the expert and reassurance of normality can be therapeutic and help to build a positive vulval body image at the beginning of their reproductive life and hopefully future psychological and sexual wellness

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Management of ambiguous genitalia

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The identification of ambiguous genitalia at birth is often the cause for significant distress and concern. It poses challenges for the health professional in the labour ward or in the operating theatre at the time of caesarean section, but, more importantly, it is the cause for significant distress to parents who are about to be asked by family and friends – did you have a girl or a boy?

The initial response by the health team is crucial for optimal outcomes, as this sets the tone for management and future parental attitudes, with an impact extending beyond the parents and on to their child.

Ambiguous genitalia can be the earliest feature of a Disorder of Sex Development (DSD), which covers a wide range of conditions where the chromosomal, gonadal or genital development is atypical.[1] In general, 1:4500 babies will be born with atypical genital appearance.[1,2] The incidence of ambiguous genitalia differs according to the definition used. As clinicians involved in the care of pregnant women and neonates, we need to have an awareness of underlying cause and the ability to manage or refer with confidence.

Although the commonest cause for ambiguous genitalia is congenital adrenal hyperplasia (CAH) in 46XX individuals, the diagnosis and management of patients with ambiguous genitalia can nevertheless be challenging and will require a multidisciplinary approach. This is an area fraught with emotional and management challenges for the clinician and family alike, both of whom may not have encountered this issue before.

There is a growing cohort of patients who are now being identified antenatally; both with the use of careful ultrasound scan (USS) where genital variations and anomalies may be noted, and with non-invasive prenatal testing (NIPT). One such example of a prenatal DSD now being diagnosed at birth is the phenotypically female baby with a known 46XY karyotype – a girl with 46XY complete gonadal dysgenesis, who more commonly would have come to medical attention with delayed puberty.

Additionally, there are baby girls being identified on ultrasonography with what appears to be a prominent clitoris, raising suspicions of CAH.

We have designed this to be a simple guide to the approach, diagnosis and early management of neonates with ambiguous genitalia. We have intentionally omitted a detailed outline of genital embryology or the pathophysiology of the various DSDs.

When the USS identifies clitoromegaly

Referral for discussion with a paediatric endocrinologist with a simultaneous referral to a DSD coordinator or social worker for support would be appropriate. The identification of a potential problem in the infant will provoke anxiety in the parents and early intervention and support is best-practice care. (See further management at birth below).

First encounter – how to respond and what you shouldn't miss

This situation usually arises immediately after the birth of a newborn. Despite huge social pressure, care providers should avoid the temptation to assign sex when there is any ambiguity present. The language we use is vitally important and it can take time and practice for all staff to be comfortable with use of 'they' (when referring to the baby) or 'your baby' rather than he or she.

Examination and diagnostic investigations

Detailed family and prenatal history, followed by thorough physical examination for associated dysmorphic features, pigmentation, palpable gonad(s) and external genitalia appearance (including symmetry of the genitals, the site of the urethral opening, the presence of a hymen and vaginal opening or the presence of a urogenital opening) is required.

Samples for karyotype and fluorescent in situ hybridisation (FISH) testing should be sent immediately, as this rapidly helps to sort out potential diagnoses. Electrolytes and 17-OHP can be sent on day one or two as blood is being taken, but the 17-OH progesterone is best on day three and electrolytes are most important on day five. If they are done on day one to three, they may be normal, and will need to be repeated. In many cases the FISH result will be back within 24–48 hours, and if the result reveals an XY karyotype, then you will no longer be chasing a diagnosis of CAH with its incumbent risk of a life-threatening adrenal crisis.

Hormone panels (FHS, LH, oestradiol, testosterone and AMH) are useful for determining function of the gonadal tissue. Further investigations depend on results and will be tailored towards defining the most likely cause.

Pelvic USS can give an indication of location of gonads. It should be mentioned that neonatal uteruses and gonads are more easily identified earlier on,

although some care in making decisions based on this is always warranted. Occasionally, a laparoscopy is required for gonadal biopsy and more detailed examination of internal and external anatomy.

Most common causes

Figure 1 gives possibilities for diagnosis divided by karyotype. Physical examination, history, biochemical testing and laparoscopy (if indicated) help to differentiate between diagnoses. Details of each specific condition are beyond the intended scope of this article.

Early management

A multidisciplinary approach, with clear communication to the family, is essential. Neonates presenting with ambiguous genitalia should be referred to paediatric endocrinology, paediatric surgery and, if necessary, paediatric gynaecology, for investigative planning.[4] These teams should have psychological supports available for the family, although local social work support may also be appropriate.

The management of ambiguous genitalia has changed over time. Many more babies are raised male now, where there has been under-virilisation of a 46XY baby. Considerable debate continues regarding undertaking feminising genitoplasty, but extensive discussion with the family is likely to occur between the DSD team and the parents.

The removal of gonads has also shifted substantially, with efforts now to define the malignancy risk, often with biopsy looking for some specific genetic markers. For gonads that are non-functioning, with no fertility potential and a malignancy risk, removal remains appropriate (for example, 46XY GD, 45XO/46XY with a female phenotype). However, the testes in someone with complete androgen insensitivity are usually left in situ today as they are hormonally active (producing testosterone that is

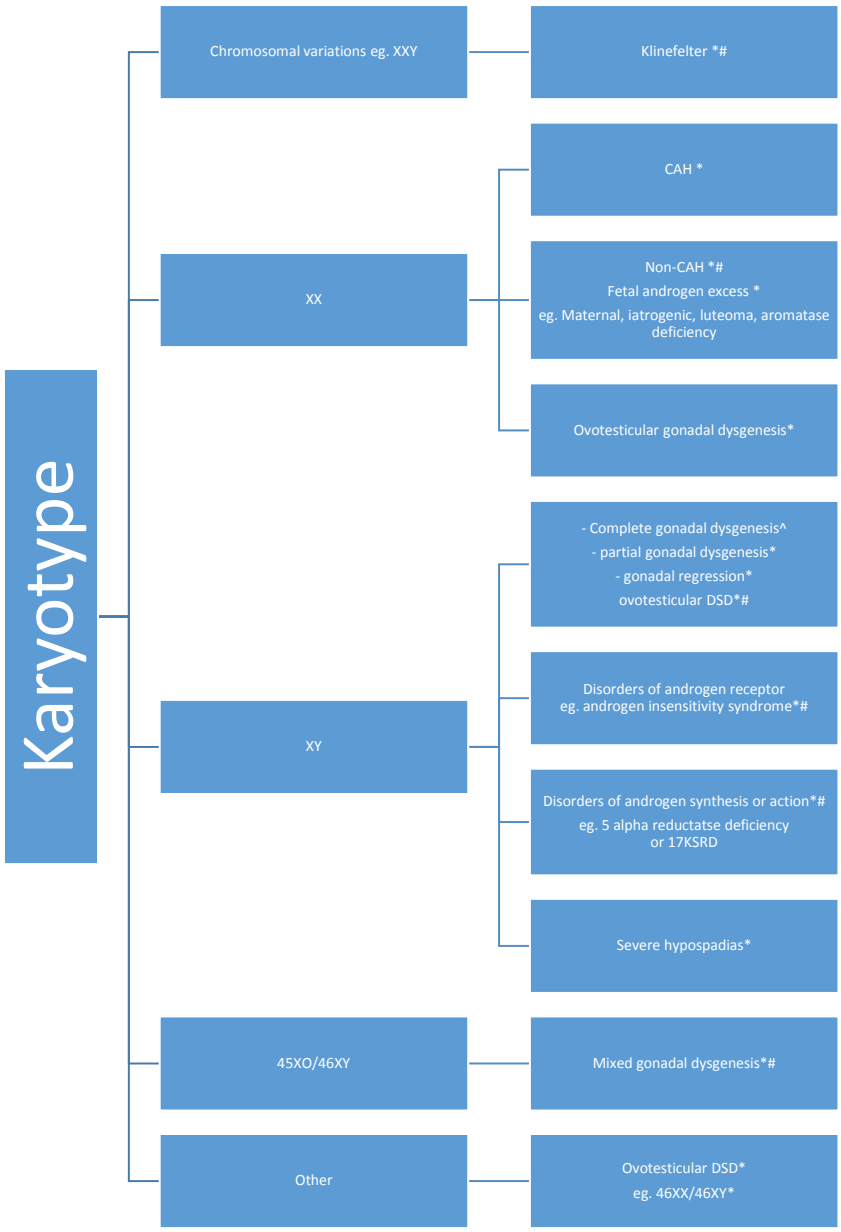

Figure 1. DSD causes associated with ambiguous genitalia grouped by karyotype (this is not an exhaustive list).
^ Antenatal NIPT with discrepancy of phenotype at birth (no ambiguity)
* Ambiguous genitalia at birth
# Virilisation at puberty

converted into oestrogens at puberty) and removal is only considered after puberty; and even then, there is the option of monitoring the testes for change, rather than removing. Removal of testes in a girl presenting at puberty with virilisation is also not a decision to be fast-tracked; the process of using GnRH agonist while careful consideration and discussion between the young person and the DSD team is the more appropriate approach today, allowing for time for the individual to be mature enough to be involved in the decision-making process.

For more information on this topic, Department of Health Victoria has a wonderful, user-friendly guide to the management of ambiguous genitalia in neonates. It can be found at www2.health.vic.gov.au/hospitals-and-health-services/patient-care/perinatal-reproductive/neonatal-ehandbook/congenital-abnormalities/ambiguous-genitalia.

Presentation in childhood

Some children's genital ambiguity is not detected until later in infancy or childhood. Sometimes this is because the changes were subtle and not recognised, other times it may be due to poor access to healthcare.

Care needs to be taken regarding language. Again, karyotype, 17 OH progesterone, FSH, oestrogen, testosterone and AMH are a good start, along with referral to a specialist team for assessment and care. A USS or MRI reporting on the presence or absence of a uterus in this age is very unreliable.

Presentation at puberty

Young women with non-classical CAH may present with some virilisation, acne and amenorrhoea, although may also present with infertility and minimal virilisation. In conditions where there is some testicular tissue present, the onset of puberty-increased production of testosterone will cause virilisation (in association with amenorrhoea). Conditions such as partial androgen insensitivity syndrome, 5α-reductase deficiency and 17 KSRD are the most likely. Your choice of words here will be critically important. Referral to a multidisciplinary team, where full discussions regarding decisions and options can be undertaken, is appropriate.
For young women, there is mounting evidence that support groups are very helpful. Most DSD teams will have appropriate links available for young women.

Conclusion

Your language and response as the first clinician involved with the family, baby, child or teenager is vitally important. Our society continues to place a lot of emphasis on gender. The family will need your supportive care in those first few days of uncertainty. Clear and open communication is essential. We have found that the vast majority of families with a child or adolescent who has ambiguous genitalia manage this uncertainty well when they are provided adequate support through each step of the process.

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Primary amenorrhoea

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Menarche is an important milestone of pubertal transition and has been widely viewed as a sign of physical and emotional health.[1] Timely onset of menstrual flow indicates functioning neuroendocrine-reproductive system and often reassures that other physiological changes of puberty progress normally. Unsurprisingly, teenage girls and their guardians tend to get worried about delayed onset of menses.

Primary amenorrhea is defined as a failure to reach menarche. The estimated incidence is 0.1–0.3 per cent and is far less common than that of secondary amenorrhoea (3–4 per cent).[2]

When to evaluate?

Menarche usually occurs at around 12–13 years of age, within three years of breast development when most girls have Tanner breast stage IV. By age 15, up to 98 per cent will have had menses.[3,4] Evaluation is indicated when any of the following criteria are met:[5-7]

- Absence of menarche by age 15 years in the presence of normal secondary sexual characteristics (2.5 standard deviations (SD) above the mean of 13 years)
- Menarche has not occurred within three years of breast development
- Menarche has not started by age 14 years in the presence of hirsutism, excessive exercise or clinical suspicion of eating disorder or outflow tract obstruction
- No breast development by age 13 years (2.5 SD above the mean of 10 years)

Assessment

Most causes of primary and secondary amenorrhoea are similar and both conditions should be approached in the same way.[7] All evaluations should begin with exclusion of pregnancy, regardless of the sexual history.

History should focus on chronology of pubertal changes, eating and exercise patterns, weight change, chronic illness, medication use, sexual activity and symptoms of galactorrhea, thyroid dysfunction and androgen excess. Family history should include age at menarche and menopause, genetic disorders and developmental delay. Physical examination includes assessment of habitus, breast development, hirsutism, Turner stigmata, thyroid palpation and examination of genitalia.

The initial evaluations include transabdominal ultrasound and serum FSH, E2, TSH and prolactin.

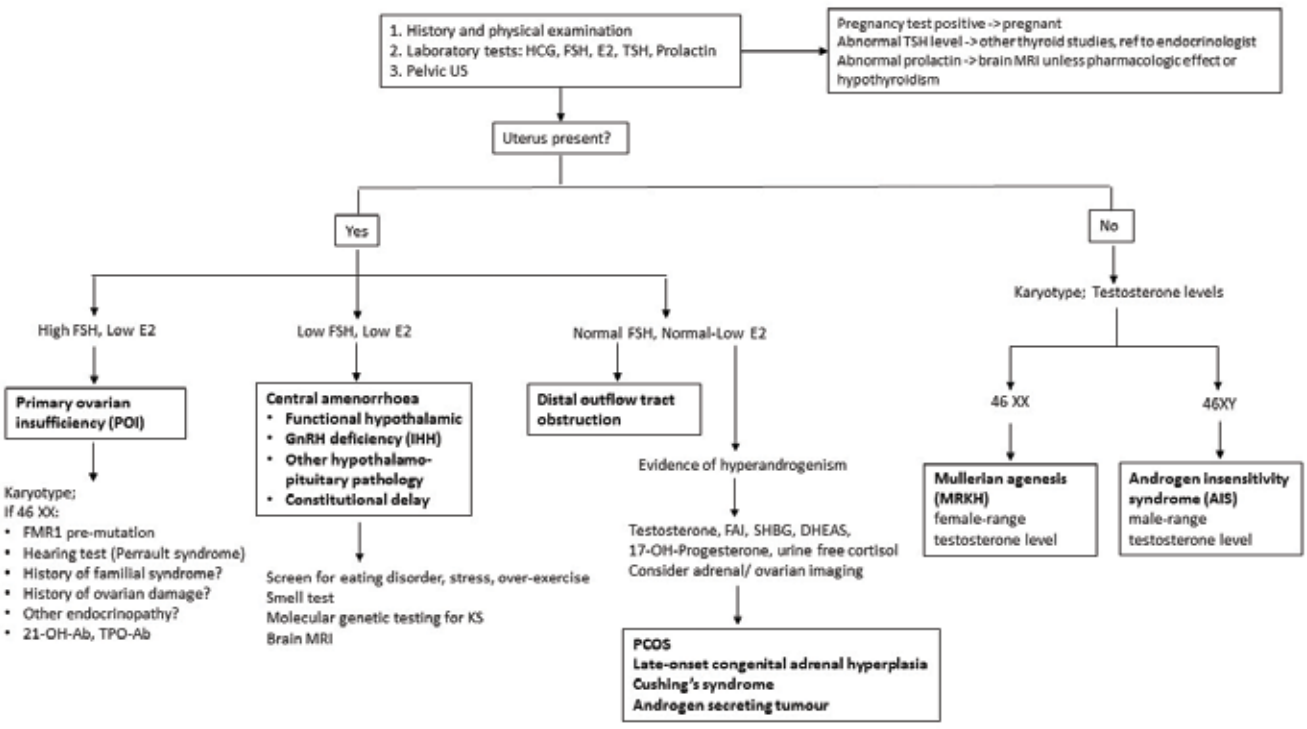

Figure 1. Diagnosis of primary amenorrhoea.

Table 1. Common causes of primary amenorrhoea.

1. Anomalies of outflow tract – 20% Normal FSH and E2; Normal pubertal development
a. Distal obstruction i. Imperforate hymen ii. Transvaginal septum b. Lack of Müllerian structures i. Müllerian dysgenesis (MRKH syndrome) ii. Complete androgen insensitivity syndrome (AIS)
2. Primary ovarian insufficiency – 40% High FSH, low E2; Absent secondary sex characteristics
a. Chromosomal abnormalities i. 45XO (Turner syndrome) – Classical 45XO and mosaics: 45X/46XX or 45X/46XY ii. X-structural anomalies (deletions, ring-chromosomes, iso-chromosomes, X-autosome translocations) iii. 46XY (Swyer syndrome) iv. 46XX (Pure gonadal dysgenesis) b. Single gene mutations i. Syndromic POI 1. Fragile X syndrome premutation 2. Blepharophimosis-ptosis-epicanthus syndrome 3. Galactosemia 4. Perrault syndrome (sensorineural deafness) ii. Non-syndromic POI (multiple candidate genes, minority validated) c. Enzymatic deficiency i. 17α-hydroxylase/ 17,20-lyase deficiency (CYP17A1) ii. 20,22-desmolase deficiency (CYP11A1) iii. Aromatase deficiency (CYP19A1) d. Autoimmune disorders i. Autoimmune thyroiditis ii. Autoimmune lymphocytic oophoritis iii. Component of polyglandular syndrome e. Injury i. Chemotherapy/radiation ii. Mumps oophoritis
3. Central anomalies – 35% Low-normal FSH, low-normal E2; Range of phenotypes
a. Hypothalamic causes i. Functional (eating disorders, malnutrition, excessive exercise, stress) ii. Idiopathic hypogonadotropic hypogonadism (IHH) 1. Kallmann syndrome 2. Normosmic IHH iii. Tumour (craniopharyngioma) iv. Other (infection, trauma, cranial radiation, chronic disease) b. Pituitary causes i. Hyperprolactinaemia 1. Idiopathic 2. Medications (opioids, serotonin, norepinephrine, phenothiazines, monoamine oxidase inhibitors) 3. Prolactinoma 4. Other causing stalk compression or damage (tumours, empty sella, stalk resection, inflammation/infiltration) 5. Systemic disorders (hypothyroidism, chronic renal failure, Cushing disease) ii. Inflammatory/infiltrative (hemochromatosis, sarcoidosis, lymphocytic hypophysitis, tuberculosis) c. Constitutional delay
4. Other endocrine disorders – 5% Low-normal FSH, low-normal E2 ± hyperandrogenaemia; Range of phenotypes
a. PCOS b. Adrenal disease i. Late onset congenital adrenal hyperplasia ii. Cushing's syndrome c. Thyroid disease: hypo- or hyperthyroidism

Subsequent investigations largely depend on presence of the uterus and FSH/E2 levels (Figure 1).

Causes of primary amenorrhoea

Amenorrhoea may result from an abnormality at any level of the reproductive tract and there is a long list of potential causes (Table 1). It is useful to think about four broad categories:

1. Anomalies of the outflow tract
2. Primary ovarian insufficiency
3. Central anomalies (hypothalamic-pituitary)
4. Other endocrine disorders

Anomalies of the outflow tract

Anatomical defects represent 20 per cent of the causes of primary amenorrhoea and are manifested by normal pubertal development. Distal obstruction (imperforate hymen and transverse vaginal septum) commonly presents with cyclic pelvic pain due to hematocolpos. The diagnosis is made on examination. Surgical resection is a definite treatment and fertility is not compromised.

Lack of Müllerian structures is another group of outflow tract anomalies, which includes Mayer-Rokitansky-Kuster-Hauser syndrome (MRKH) and androgen insensitivity syndrome (AIS). MRKH (1:4500 women) is a multifactorial genetic syndrome, featured by vaginal agenesis and uterine maldevelopment from a rudimentary to an absent uterus. Associated skeletal, renal and auditory anomalies are common.[8] Diagnosis is possible with ultrasound or MRI. AIS (1:20,400 newborn males) is caused by end-organ insensitivity to androgens in genetical males with functioning testes. Both conditions share common clinical features; the differential diagnosis is made by karyotype. Management includes psychosocial counselling, creation of neovagina, removal of uterine remnants with active endometrium (MRKH) or gonadectomy due to risk of malignancy in undescended testes (AIS). Fertility interventions include surrogacy (MPKH) and surrogacy plus oocyte donation (AIS).

Primary ovarian insufficiency

Primary ovarian insufficiency (POI) or hypergonadotropic hypogonadism is characterised by gonadal dysfunction due to abnormal migration or rapid depletion of germ cells. Main features are high FSH, low E2 and abnormal pubertal development.

Chromosomal derangements are a well-recognised cause of POI in adolescents, of which Turner syndrome is the most common (1:2000–1:4000 live born girls). Classical monosomy (45XO) accounts for 50–60 per cent of karyotypes and is commonly diagnosed before puberty due to distinctive characteristics (short stature, webbed neck, low hairline and shield chest). Turner mosaics have broad phenotypic variations and are more likely to be discovered during evaluation of amenorrhoea.[9] Common health issues include cardiac and kidney anomalies, autoimmune disorders (diabetes and thyroiditis), obesity, strabismus and cataract. 46XY (Swyer syndrome) is featured by non-functional gonads that don't produce anti-Müllerian hormone or androgens. The affected individuals have normal female phenotype and intact Müllerian structures. Other chromosomal abnormalities and 46XX pure gonadal dysgenesis are far less common.

Multiple genes on X chromosome, autosomes and mitochondria have been proposed as candidate markers of POI, although only a few were functionally validated.[10] The most common single-gene disorder linked with POI is Fragile X premutation, caused by a higher number (54–200) of CGG repeats on FMR1 gene. POI is not observed with full mutation. It occurs in 15–20 per cent of FMR1 premutation carriers after the age of 18 in association with secondary amenorrhoea, although the pubertal phenotypes in adolescent carriers are still poorly addressed.[11]

Uncommon presentations in adolescents include deficiencies in steroidogenic pathway enzymes, autoimmune conditions and iatrogenic causes related to surgery, chemo- and radiotherapy.

All individuals with non-iatrogenic POI should have chromosomal analysis. In patients with Turner syndrome, additional evaluations include echocardiogram, eye test, renal imaging, thyroid studies and diabetes screen. FMR1 premutation testing is considered if normal karyotype. Other genetic testing is not indicated, unless specific syndrome is suspected.[12] There is no validated marker to confirm diagnosis of immune POI. Testing of 21OH-Ab (adreno-cortical antibodies) and thyroid TPO-Ab can be considered if the cause of POI is unclear or when immune condition is suspected.[12]

Induction of puberty in adolescents with gonadal failure includes low-dose oestrogen from age 12, with a gradual increase over 2–3 years. Cyclic progestogen is added two years later upon completion of breast development, to avoid misshapen tubular breasts. Adequate oestrogen-progestin replacement throughout the reproductive years is recommended to prevent osteoporosis, reduce risk of cardiovascular disease, normalise sexual function and reduce possible risk of cognitive impairment.[12] The data to support androgen replacement is limited.[12] Gonadectomy is recommended in individuals with Y chromosome due to 20–30 per cent risk of malignancy. Psychosocial support and monitoring of bone health are important. Oocyte donation remains the main option for fertility in these women.

Central amenorrhoea

Hypothalamic disorders are featured by hypogonadotropic hypogonadism due to abnormal secretion or inhibition of gonadotrophin-releasing hormone (GnRH).

Functional hypothalamic amenorrhea is common in adolescents and occurs when the hypothalamic-

Box 1. Summary

The key practice points in approach to primary amenorrhoea:

- Pregnancy should be excluded in all patients who present with amenorrhoea
- The initial investigations include FSH, TSH, prolactin and pelvic ultrasound
- Karyotype should be considered in individuals with absent uterus or POI
- In patients with 46XY, intra-abdominal gonads have malignant potential and need to be removed
- Combined OCP are contra-indicated for induction of puberty
- Patients with persistent hypoestrogenism are at risk for osteoporosis and should be screened with DEXA and treated with vitamin D, calcium and oestrogen therapy where appropriate
- In patients with functional hypothalamic amenorrhea, COCP does not improve bone density unless nutritional deficiencies are corrected
- Differentiation of hypothalamic amenorrhoea from PCOS depends on clinical judgement and presence of hyperandrogenism

pituitary-ovarian axis is suppressed due to an energy deficit caused by weight loss, excessive exercise or stress.[13] These patients should be screened for eating disorders and malabsorption syndromes (coeliac disease). Good nutrition, optimal body weight and stress reduction are primary treatment goals. Menses commonly restore at 90 per cent of ideal body weight. Bone density evaluation and calcium/vitamin D supplements are important. Combined oral contraceptive pills (COCP) restore menses, but don't improve bone density without adequate nutritional rehabilitation.

More rare causes include congenital GnRH deficiencies, comprising a heterogeneous group of isolated hypogonadotropic hypogonadism (IHH). The condition may be sporadic, autosomal dominant or X-linked recessive disorder with varying phenotypes.[14] Kallmann syndrome (1:120,000 females), a form of IHH featured by anosmia, is caused by abnormal migration of GnRH and olfactory neurons. The most common genes implicated in the disorder include ANOS1 (KAL1), CHD7, FGF8, FGFR1, PROK2, or PROKR2. Other, normosmic forms, are linked with mutations in genes responsible for GnRH production and secretion, although full molecular pathogenesis of the disorder is unclear.[14] The diagnosis is clinical. Negative molecular genetic testing will not rule out a possible diagnosis, as many associated genes are still unknown. The management is induction of puberty and long-term oestrogen-progestin replacement. Ovulation induction with exogenous gonadotrophins is a first-line reproductive option.

Prolactin inhibits secretion of pituitary gonadotrophins and can be elevated because of medications, pituitary adenoma, hypothyroidism or pituitary stalk compression when inhibition by hypothalamic dopamine is compromised. Hyperprolactinaemia, unless related to primary hypothyroidism or medications, warrants MRI of pituitary. Dopamine agonists are the first-line management.[7] Other disorders include tumours, empty sella syndrome, infection, trauma or autoimmune destruction of the pituitary, but these are relatively uncommon in adolescents.

Constitutional delay, when patients will have a later onset of normal puberty, is seen more commonly in boys. This is a diagnosis of exclusion and family history of late menarche is common.[15]

Other endocrine disorders

Polycystic ovary syndrome (PCOS) is a common endocrine condition affecting 12–21 per cent of reproductive-aged women.[16] The Rotterdam diagnostic criteria require presence of two of the following: oligo-ovulation, clinical/biochemical hyperandrogenism or polycystic ovaries on ultrasound, after excluding other aetiologies. Importantly, polycystic ovarian morphology on ultrasound is not specific in adolescents and is not recommended criterion in this age group.[16] While typically associated with secondary amenorrhoea, PCOS can manifest with primary amenorrhoea in adolescents with higher levels of circulating androgens. Cardiometabolic risk screening with OGTT and fasting lipids, along with assessment of blood pressure, BMI and waist circumference is recommended in all women with PCOS regardless of age. This should be repeated annually in overweight/obese individuals and every two years in those with normal BMI.[16] Initial management includes lifestyle modifications, restoring menstrual cyclicity, managing symptoms of androgen excess and psychological support. COCP is commonly considered in women not planning pregnancy. Ovulation induction with clomiphene or letrozole is fertility treatment of choice in anovulatory women with PCOS.[16]

Androgen-producing tumour, late-onset congenital adrenal hyperplasia and Cushing's syndrome are uncommon, but should be considered and distinguished from PCOS in the evaluation of hyperandrogenic amenorrhea. Both hypo- and hyperthyroidism cause menstrual abnormalities, while more severe forms may result in amenorrhoea. Timely referral to an endocrinologist and correction of underlying endocrinopathy is commonly sufficient for maintaining normal menstrual and reproductive function.

Conclusion

Amenorrhea is a symptom, not a disease. Depending on its cause, failure to attain menarche may lead to varying clinical sequalae. Timely evaluation and consideration of a broad differential diagnosis have important implications for emotional, physical and reproductive health in young women.

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Q&A

For the broader O&G Magazine readership, balanced answers to those curly-yet-common questions in obstetrics and gynaecology.

Q The MBS Review and Choosing Wisely, have much in common: each has the objective of the best-possible patient care within the available resources of the health system. In both cases, it has been necessary to invoke the concept of 'good-value care'. Does this test or treatment represent the best possible use of limited public-health funding?

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A

Right at the heart of this concept of 'good value care' sits the routine pathology and imaging investigations requested in early pregnancy. Already the patient receives more from the MBS for pathology and imaging in the year of a pregnancy than she does for the clinical care received. It would not be too difficult to spend the entire obstetric budget on blood tests and imaging as the list with 'some value' is almost endless. It is not unusual for a patient to arrive for her first antenatal visit armed with an extensive, but quite bizarre, collection of 'screening tests' – usually still omitting some that are actually needed.

So what is a 'good value' test? In order to assess value, the following should be considered:

- Likelihood of a positive finding
- Severity of harm if not diagnosed
- Ability of any consequent therapy to avoid harm
- Cost
- Other strategies that might be as good (or almost so) at lesser cost

Routine testing

Blood tests and an urine analysis

The following are generally agreed as routine antenatal blood tests at the first antenatal visit and are recommended in the College Guideline:

- Full blood examination
- Blood group and antibody screen
- Serology for: rubella, varicella (in absence of known immunity), hepatitis B, hepatitis C, HIV and syphilis
- Midstream urine urinalysis for microscopy, culture and sensitivities

Syphilis testing is surprisingly controversial for some clinicians, but given that it is a very serious condition with an effective simple treatment, screening remains warranted despite its infrequency. Such is the broad acceptance of these tests that the MBS Review Obstetric Clinical Committee has advised that they be grouped together as a single MBS item: 'routine early pregnancy tests'.

NIPT versus combined screening for chromosomal anomalies

This subject is beyond the scope of this article, but is extensively covered in RANZCOG Statements 35, 59 and 60. This is a particularly difficult area for the clinician because of the cost implications for the patient. MBS funding is urgently needed for non-invasive perinatal testing (NIPT), but may initially be 'contingent' on an elevated *a priori* risk by virtue of age or combined screening.

Screening for genetic carrier status

Genetic carrier status screening (for example, cystic fibrosis) is also difficult because of the cost to the patient that must be weighed against a low, but very significant, risk. These are decisions for the patient to make and all need to be aware of the availability of these tests. Frequently, the patient will look to the clinician for advice, 'What would you do, doctor?' The honest answer may be, 'That would depend on how much money I have.'

Mid-trimester 'morphology' scan

A referred ultrasound is indicated for the 20-week 'morphology' scan. Cervical length assessment is now routinely recommended at the time of the

mid-trimester morphology ultrasound (RANZCOG Statement C-Obs-61).

Tests that should not be 'routine'

Vitamin D, TSH, ferritin and other biochemical tests

Vitamin D is an expensive test for the taxpayer; many millions for low benefit. Although minor degrees of deficiency are very common, few will have seriously low vitamin D levels that lead to clinical complications. Only those at high risk for serious deficiency should be tested. Similarly, routine screening for thyroid disease cannot be regarded as 'good-value care' on current evidence and is not recommended. Ferritin testing also should not be performed routinely, but is recommended where there is a high risk of deficiency.

The list of other biochemical tests that are sometimes performed is extraordinary. Can any medical practitioner genuinely believe that routine urea and electrolytes, liver function tests, cholesterol or lipids represent good-value care for the taxpayer?

Serology for parvovirus (B19), cytomegalovirus, toxoplasmosis and other serology

Screening for parvovirus, cytomegalovirus (CMV) and toxoplasmosis is only indicated if there are specific indications in pregnancy and should not be performed as a routine. A prominent obstetrician informed me, 'I like to know if they are parvovirus immune so I can reassure them immediately later in pregnancy if they phone me after contact with a child with slapped cheek, without having to test then.' Good-value care? I think not. CMV causes long term sequelae for 1 in 1000 Australian children. Diagnosis can be difficult and treatment controversial. An effective CMV vaccine is urgently needed but population screening is not currently recommended. Routine testing for toxoplasmosis is appropriate in areas of high incidence (for example, France) but the incidence is much too low in Australia to represent good-value care.

Routine screening by serology for other infections in early pregnancy is not indicated and wastes precious health resources.

Referred 'dating' ultrasounds in the first trimester

Point-of-care ultrasound (performed within the GP or specialist obstetrician's rooms or clinic) will usually be sufficient to confirm viability and date a first trimester pregnancy. Where the point-of-care ultrasound is technically difficult or produces uncertain results, a referred ultrasound is appropriate. Point-of-care ultrasound in pregnancy is often particularly 'good-value care' and it is inexplicable that it is currently so poorly funded.

Further reading

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The Professional Services Review: what you need to know

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The Professional Services Review (PSR) is a Commonwealth agency whose role is to safeguard the Australian public from the risk and cost of inappropriate practice within the Medicare Program and Pharmaceutical Benefits Scheme (PBS). The PSR Scheme was introduced in 1994. The agency is headed by a director, supported by multidisciplinary clinicians who are appointed as PSR Committee members and who provide peer review of those individuals referred.

Why might a clinician be investigated by Medicare?

The PSR does not initiate investigations; investigations are initiated by medical staff in the compliance branch of the Department of Health.

A clinician may come to the attention of compliance staff because of a complaint received from a member of the public, a clinician's employee or a patient. However, the majority of cases arise from data analysis that demonstrates a deviation in MBS billing or PBS prescribing patterns that cannot be explained by patient numbers or demographics. As data analytic software becomes 'cleverer', deviations can be detected with greater ease. The Department plans to progressively enhance its analytic capacity.

A clinician identified through one of these processes is contacted by compliance staff and asked for an explanation of any concerns. In many cases, the explanations provided by the clinician are sufficient and the matter is resolved. In cases where the explanation does not resolve concerns, a clinician may be directly referred to the PSR (usually where a serious concern exists in relation to prescribing), or may be offered a period of time to reflect and change their behaviour. A repeat review is undertaken six or 12 months later. If concerns persist following the review period, a referral may be made to the Director of the PSR.

What happens if a referral is made to the Director of the PSR?

The Director of the PSR receives a referral from the Chief Executive of Medicare. Referrals are detailed and outline concerns in relation to claiming and prescribing by the clinician. The Director reads the referral and supporting data and decides whether to undertake a review.

If the Director decides to undertake a review, Medicare is asked to provide a random sample of services rendered or initiated as particular MBS or PBS items of concern, and the Director asks the clinician under review to provide the records of these cases. The number of records required depends upon the number of separate concerns in relation to billing or prescribing.

The PSR Scheme is based on a peer-review process. Therefore, when the records are available for review, the Director contracts with a peer clinician to read the records and provide a report. After receipt of this report, the Director will usually visit the clinician under review and outline the concerns raised in the referral to the Director and the reviewing consultant. Of note, the Director is not obligated to visit the clinician and may elect to miss this step. If concerns remain after the Director has visited the clinician, the Director then writes a letter to the clinician under review outlining all concerns. The clinician under review has a month to respond to the Director's letter.

Once the Director receives the clinician's response, the Director makes one of three decisions. These are:

1. The review should end as it is unlikely there will be a finding of inappropriate practice.
2. The review can be resolved by negotiated agreement. In this case, the clinician under review voluntarily acknowledges they acted inappropriately in regard to the MBS or PBS and accepts a reprimand from the Director. A repayment order or partial disqualification from MBS or PBS will be negotiated, based on the findings of the review. Negotiated agreements might be offered to clinicians who express insight, a willingness to change practice behaviour and co-operate with the PSR process.
3. The matter may be referred to a Committee.

Of note, once a decision has been made by the Director to refer to a Committee, the opportunity for a negotiated agreement is lost.

What happens if a clinician is referred to a Committee?

The Director of the PSR will establish a Committee of peers. A Committee usually consists of three members: a Deputy Director who acts as Chair, and two members who are peers of the clinician under review. For example, if the clinician under review was an O&G, then the Deputy Director might be a general practitioner and the two members peer O&Gs.

For every MBS item of concern that a Committee decides to examine, a random selection of services are identified by Medicare and up to 30 sets of records are obtained. PSR uses a random sampling and extrapolation methodology. This means that findings in relation to the sampled services are extrapolated across the entire billing for the year under review.

Committee hearings are formal and evidence is given under oath or affirmation. The PSR Committee members have access to independent legal advice and the clinician under review is strongly encouraged to also have legal representation. This is because the PSR process can have significant outcomes. Serious outcomes can include:

1. Repayment order – an order for a clinician to repay Medicare benefits that they received or caused to be paid.
2. Partial/full disqualification from Medicare – a disqualification of up to three years (or five years in some circumstances) from some or all MBS items. This means the services provided to patients will not attract a Medicare benefit.
3. Disqualification from the PBS – a disqualification of up to three years from prescribing or dispensing PBS items to patients.

The Committee will systematically discuss every medical record with the clinician under review. Hearings typically run for a total of six to eight days. To enable the clinician under review to have a break, hearings may be broken into two-day blocks. Following the hearing, the Committee prepares a draft report setting out its preliminary findings with regard to whether inappropriate practice occurred in relation to each service reviewed.

A transcript of proceedings is obtained and a report generated of the Committee's findings. The clinician under review has the opportunity to comment on the draft report. If findings of inappropriate practice are made, the final report then goes to a separate body called the Determining Authority, which determines the consequences that should flow from the Committee's findings of inappropriate practice.

Why might a finding of inappropriate practice be made?

In determining whether a clinician has engaged in inappropriate practice, a decision is made whether the conduct when providing or initiating MBS or PBS services would be unacceptable to the general body of a clinician's peers.

A decision in regard to inappropriate practice might be made if any of the following occur:

- The clinician has not demonstrated the clinical relevance of the service or prescription
- The clinician has not demonstrated the service provided was clinically adequate
- The clinician cannot demonstrate they performed the service instead of another person (for example, nurse or registrar)
- The clinician failed to keep adequate and contemporaneous records. This can mean a number of things, including that their records
  - are illegible
  - have inadequate detail to explain the condition and/or treatment
  - do not demonstrate the clinical relevance of the service (that is, that the service provided was clinically necessary or justified)
- The clinician's conduct when prescribing or dispensing PBS medicines would be unacceptable to a body of peers.
- Consent was not documented when indicated.
- The specific requirements of a MBS or PBS were not fulfilled.

The process for conducting PSR reviews is set out in Part VAA of the *Health Insurance Act 1973.*

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Case report

Hysterectomy with Müllerian duct anomaly

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A 67-year-old woman was referred to the gynaecological oncology service with a history of postmenopausal bleeding (PMB) and thickened endometrium on pelvic ultrasonography. The referring gynaecologist was unable to perform endometrial sampling. A review of magnetic resonance imaging (MRI) of the pelvis revealed a septate uterus with thickened endometrium (Figure 1). Clinical examination revealed a narrow-calibre vagina, but no other abnormalities were identified. In view of PMB and abnormal endometrium with a failure to obtain endometrial sample, definitive management in the form of total laparoscopic hysterectomy and bilateral salpingo-oophorectomy was offered, which the patient accepted.

In the operating theatre after surgical preparation and draping, a vaginal fold was noted. On probing, a second very-small-calibre vagina on the left side was noted, separated from the main vagina on the right by a thick septum that ended 1cm short of the introitus. On examination with a paediatric speculum, a smaller cervix was noted on the patient's left side in addition to the more prominent cervix on the right side. In view of these findings, a laparoscopic hysterectomy was deemed unsafe, since the septum and a duplicated cervix would preclude placement of the colpotomy cup in the fornices needed to allow safe division of the uterine arteries and the vault.

A decision was made to proceed with hysterectomy and bilateral salpingo-oophorectomy via a midline laparotomy in modified Lloyd-Davies position, which allowed easy access for vaginal instrumentation during the procedure, should that become necessary. We had not previously obtained dedicated imaging of the renal tract to rule out urinary tract abnormalities that may be associated with congenital Müllerian duct anomalies (MDAs).

During surgery, the pelvic side wall (PSW) was dissected and both ureters were identified in the PSW and traced down from the pelvic brim to the ureteric tunnel. Due to distorted anatomy at the vaginal angles, the decision was made to open the vagina anteriorly to allow division of the superior end of the septum as well as securing the vaginal angles under vision on either side to avoid ureteric injury. To facilitate this, we used two Hasson 'S' shaped retractors that are usually used for open laparoscopy. The narrow retractors could be introduced simultaneously from either side of the septum and allowed the vagina to be opened anteriorly to identify the thick vascular septum in the middle (Figure 2). The septum was divided above a clamp and the edge sutured for haemostasis. The vault angles were secured on either side. The hysterectomy was completed and the vault was closed with interrupted absorbable sutures incorporating the edge of the septum. The decision was made not to divide the septum at this surgery due to its size and because the patient had not been counselled about the additional procedure.

The patient made an uneventful recovery and was informed of the intra-operative findings. Intravenous pyelogram was requested prior to discharge from the hospital and was normal. On final histology, the body of the uterus showed two endometrial cavities separated by a thin, complete septum. There were, however, two distinct cervices with patent endocervical canals. Subsequently, the patient elected to undergo division of the septum. The procedure was carried out eight weeks from the first surgery as a day case and she made an uneventful recovery from the same.

Discussion

This case reflects on the surgical challenge raised by an unusual spectrum of MDAs presenting as a combination of septate uterus, double cervix and vaginal septum that falls outside the existing classification system.[1] Cervical duplication is usually

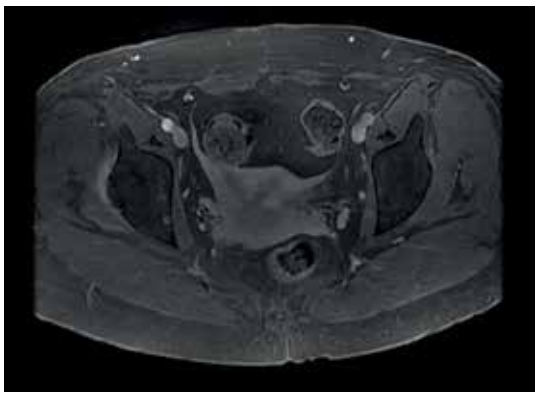

Figure 1. Preoperative MRI showing septate uterus with a smooth uterine fundus.

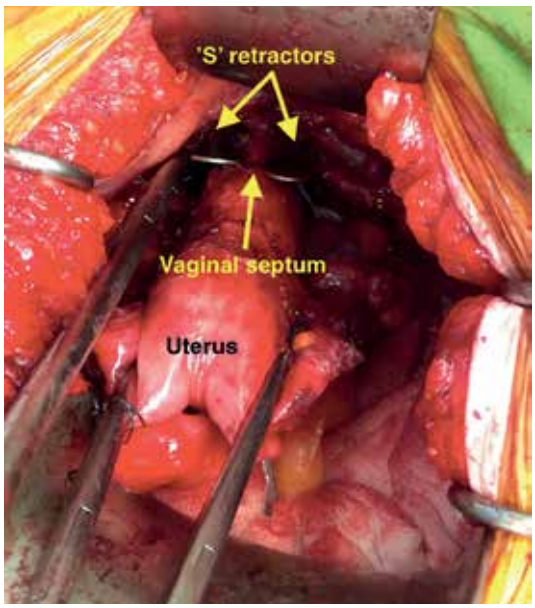

Figure 2. Hysterectomy technique using two 'S' retractors to outline the vagina on either side of the septum.

associated with uterus didelphys. This triad was first described in 1994, and more recently has been described in just over 20 cases in the English literature by several authors.[2-4] This case was also unique in that the patient was diagnosed in the seventh decade when she sought medical opinion for postmenopausal bleeding; all previous case reports were of women in the reproductive age group.

This anomaly calls into question the classic theory of unidirectional caudal to cranial Müllerian duct fusion.[5] In their proposed classification, Buttram and Gibbons do note that a vaginal septum may be present with didelphys, bicornuate or septate uterus (see page 19, Figure 2), but felt that the inclusion of vaginal septum in the proposed classification would only complicate matters.[6] In 1967, Muller proposed an alternative hypothesis stating that the fusion of the Müllerian ducts may start in the region of uterine isthmus and then proceed in both cranial and caudal directions.[3] This theory may explain the more recent observations of the unusual spectrum of congenital anomalies of Müllerian duct development.

Complex developmental anomalies of the Müllerian ducts that do not fit the existing classification system are being increasingly recognised, as is evident from the attempts to reclassify and standardise the nomenclature of these abnormalities by the CONUTA working group.[7] The proposed classification allows for recording abnormalities and makes provisions for variations in each anatomical structure of the female genital tract.

With reported diagnostic accuracy of up to 100 per cent, MRI is currently the modality of choice for characterising and evaluating MDAs.[8] The clinical correlation between the MRI and surgical findings are reported to be as high as 90 per cent.[9] However, the reported high accuracy of MRI has also been challenged. Economy et al reported in 2002 that MRI had a sensitivity of 53 per cent for accurately detecting uterine anomalies confirmed on laparoscopy.[10] A radiologist specialising in gynaecological imaging reviewed the patient's MRI images as a part of surgical planning. While the MRI identified the uterine abnormality, it failed to identify the complex spectrum of developmental anomaly of the urogenital tract.

Renal and urinary tract abnormalities are a significant concern in women with developmental anomalies of the Müllerian duct, with the most common abnormality being unilateral renal agenesis, occurring in about 30 per cent of patients.[11] Abnormalities of the renal tract, such as ectopic insertion of ureters, tend to be associated with renal agenesis. The data from the above series would suggest that most renal abnormalities are associated with agenesis, uterus didelphys or unicornuate uterus. Dedicated imaging of the renal tract was not performed prior to the surgery since the severity of MDA was not suspected. Accurate knowledge of the ureteric course is essential for surgeons embarking on complex laparoscopic, open and vaginal surgery. In this case, bilateral kidneys had been identified, there was a clinical need for urgent management as malignancy was suspected, and the surgical team was confident of retroperitoneal dissection and the ability to trace the course of the ureters. Even so, there is a risk of injuring the ureter at the level of its course in the parametrial planes just prior to insertion into the bladder at the time of hysterectomy. Hence, the approach of opening the vagina anteriorly to place a clamp across the vaginal angle in the lateral fornix on either side to obtain a pedicle that was well medial to the course of the ureter. Interestingly, no urological abnormalities were identified in any of the case series or case reports in the literature detailing this unusual anomaly. A postoperative intravenous pyelogram study did not reveal any urological abnormality in our patient.

Conclusion

Current accepted embryological theories do not explain this case of cervical duplication, septate uterus and longitudinal vaginal septum. The current evidence also challenges the accuracy of MRI in definitive diagnosis of MDAs. The use of the proposed ESHRE/ESGE classification system by both clinicians and radiologists may increase the awareness of unusual patterns of MDAs. Knowledge of the patient's anatomy, especially the urogenital anatomy, is essential for surgeons to safely perform complex gynaecological surgery.

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Obstetric fistula: a public health issue

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BMedSc

Poor reproductive health outcomes in developing nations, particularly in Africa, are the result of the culmination of many contributing factors. These include gender inequality, poor provision of education and inadequate infrastructure, causing suboptimal access and quality of health systems, thus leading to the unnecessary rates of maternal mortality and morbidity. Hundreds of women die in childbirth or from arising complications, each day.[1] In addition, for every maternal death, 20–30 women fall victim to serious childbirth-related injuries.[2] An example of such injury is an obstetric fistula (OF), which is the presence of a hole between a woman's genital tract and urinary tract, or between the genital tract and the intestines.[3] This injury occurs during obstructed labour, rendering a woman incontinent of urine and/or faeces.[4] It currently affects 2 million women and there are approximately 100,000 emerging cases annually.[5] The additional physical effects secondary to OFs are often devastating, including atrophied limbs and foot drop secondary to perineal and sciatic nerve damage.[6] Worsening the impact of physical trauma is the psychological trauma associated with OFs. Babies born to a mother with an OF are stillborn in 93 per cent of cases, as a result of obstructed labour.[4] Mothers with an OF routinely experience social rejection from their communities, families and husbands.[7] Often, they are completely socially isolated, spending most of their days alone, which leads to malnutrition and worsening poverty.[8] OFs seldom occur in developed nations as they are entirely preventable; rigorous education on childbirth and comprehensive healthcare systems work to ensure adequate reproductive health outcomes.[1] Thus, it is necessary to investigate the determinants of OFs and their genesis to lessen their overall burden in developing nations. Addressing this issue from a public health perspective highlights the scope of the problem, allowing for the betterment of preventative strategies and highlighting the increased need to mobilise resources.[9]

Determinants

Women aged 10–19 constitute 50 per cent of OF cases, due to the reproductive immaturity that is attributable to low childbearing age. Evidence suggests that three years post-menarche the birth canal is narrower than at age 18.[6] Malnutrition contributes to stunted bone growth, resulting in pelvic immaturity. Pelvic immaturity and poor reproductive development are positively correlated with obstructed labour, and, thus, the occurrence of an OF.[6]

Low parity between genders also contributes to the incidence of OFs. This includes social practices such as childhood marriage that are correlated to low education and rural settings.[10] In Ethiopia, two-fifths of girls are married before they are 18 and nearly one-fifth before age 15.[11] Childhood marriage facilitates early childbearing age, which is an aforementioned risk factor for OF.

Social stigma increases the risk of OF. Due to the marginalisation of its victims, important conversations pertaining to prevention and treatment are neglected. Surveys carried out on public perception of OFs conclude that societies think of them as an untreatable curse or punishment for sinning.[12] Thus, a vicious cycle ensues: the issues are ignored and victims are ostracised, unable to share their stories and frequently unaware of treatment options.[13]

Young women are often prevented from making decisions regarding their own birth experience due to their disempowerment. Husbands and mature women in the community act as surrogates for decision-making, but their lack of education on childbirth risks and their minimal first-hand experience (particularly husbands, as OFs primarily affect primiparous women) means they are unable to make informed decisions.[14] They often wait too long for the progression of labour before acting in emergency situations, while rural settings and distance from hospitals and emergency services make timely health interventions frequently unobtainable.[15]

Strategies changing social outcomes to prevent OF

To prevent OF, it is imperative to reduce social factors contributing to early childbearing. An important step is to abolish child marriage. Determinants of child marriage include poverty, lack of access to education and lack of economic autonomy. Studies into childhood marriage prevention indicate several effective methods. In communities where education for girls (12–14 years) was offered, they were 94 per cent less likely to be married. Furthermore, when they were offered a means to independence (chickens, providing food and economic security) girls (15–17 years) were 50 per cent less likely to get married.[16] Another measure that worked well was the initiation of conversations about the harmful and inappropriate nature of childhood marriage. In communities that participated in such conversations, two-thirds of girls were less likely to be married.[16]

Another initiative that aims to promote gender parity to prevent poor health outcomes is the United Nations Leave No Woman Behind (LNWB) program. It responds with a holistic approach of interventions, incorporating economic empowerment, access to health services, education and behavioural change at the local level.[17] LNWB objectives focus on strengthening regional efforts to combat gender inequalities while increasing women's power to achieve economic and education goals.

The program partnered with many keen stakeholders, predominantly NGOs, that work to implement initiatives into government systems to ensure program sustainability. The program developed at a community level by producing interactive discussions about social norms and values and providing a platform to advocate the dangers of child marriage. Furthermore, LNWB supported local schools through its provision of literacy programs and learning tools. It also provided adolescent girls with sanitary items to ensure school attendance, as poor attendance is a key risk factor of OF. The program supported local authorities to purchase obstetric equipment and key reproductive health materials to spread provision of services and improve their quality. From 2009–12 the LNWB achieved many tangible outcomes, including: reduced child marriage; an increase in births attended by health professionals; an increase of women using family planning, pre-and postnatal care; and increased attendance at supported schools.[17]

Timely access to appropriate healthcare services

Access to reproductive health services is a key strategy in preventing the occurrence of OF. This can be achieved in two ways: advocacy pertaining to accessing health services and strengthening presence of local healthcare providers. As OFs most often occur rurally, it is difficult to educate women about prospective treatment options. To overcome this barrier, several interventions have been put in place. Radio announcements, theatre, media and community education messages all play an important role to inform women about prevention methods and OF treatment options.[14] Furthermore, a hotline service funded by the Freedom from Fistula Foundation (FFF) allows women to seek information about appropriate medical treatment. If a woman calling the hotline is symptomatic, she is referred to a hospital specialising in OF repairs.[18]

Dr Catherine Hamlin, a pioneer in OF treatment, highlights the importance of the provision of birth attendance by professionals in mitigating poor birth outcomes. Ethiopia alone has a population of more than 90 million, yet there are only 7000 trained midwives. Thus, she established the Hamlin College of Midwives. Since 2007, 105 midwives have graduated from this college, 34 of whom have gone on to work in rural midwife centres. To date, there have been no maternal deaths from births attended by graduates.[19]

A key resource in treatment and rehabilitation of OF

The Addis Ababa Fistula Hospital was the first of its kind exclusively dedicated to treating OFs. It has the capacity to treat 2000 patients per year and has thus far treated 50,000. Dr Muleta, former director of the hospital, is optimistic about the future directions of OF prevention. She states, 'the government is taking the issue seriously now. At the policy level women's issues are a priority for the government, and there is work to improve maternal health. Regional and federal government is talking about fistula, and they are giving us land so that we can build regional fistula centres'.[12]

Future directions of OF detection

Ultrasound technology has been promoted as a prospective detection and diagnostic tool. With a transvaginal approach, there is a reported 100 per cent successful retrieval rate of OF detection. It is portable, which is important in a rural setting and is battery operated, thus low cost. Ultrasounds can be set up in rural areas; however, there is currently little funding for this intervention.[20]

Conclusion

There are several effective strategies, programs and resources to lessen the prevalence and incidence of OF in developing nations. However, the barriers to the comprehensive delivery of preventative and surgical measures to treat OF remain challenging. These barriers include social factors, poor infrastructure and inadequate healthcare systems. Interventions show promising results with regards to barriers. Therefore, despite the complexity of the issue, it remains possible to eradicate OF.

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The leg-up

Your regular legal update to keep you informed on current medicolegal issues in the practice of obstetrics and gynaecology

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Adolescent sexting: inside and outside of romantic relationships

The production and sharing of pornography has a long history, since humans first learned how to capture and distribute images. The development of technology, with ready access to mobile phones and the internet, has led to the phenomenon of sexting. Adolescent girls remain particularly vulnerable to the lure and negative effects of sexting.

The law in Australia has recently struggled to balance the use of sexting by teenagers in romantic relationships with the protection of minors from predatory adults. Essentially, there are Commonwealth and State criminal laws that can apply to sexting, resulting in penalties for intentionally sending intimate images, child pornography offences and listing on a Sex Offender Register. Recent legal changes were passed (Sex Offenders Registration Amendment [Miscellaneous] Bill 2017) to allow appeals for removal of sex offenders' registers for 18- and 19-year-olds involved in sexting in 'consensual relationships' with teenagers a few years their junior.

Ouytsel et al from Belgium studied adolescent engagement in sexting, within and outside of a 'romantic relationship'. They acknowledge the research exploring the negative aspects of sexting, including the coercion of girls and reputational damage from online forwarding of sexual images. Although sexting is often viewed as deviant behaviour, they assert that 'sexting can play a role in adolescent development as it can help young people to explore their sexuality and develop their sexual identity'. As a novel approach, they were keen to view the possible criminality of sexting behaviour in light of the motives for sexting depending on the relationship between the sender and respondent.

Social learning theory attempts to explain that criminal or deviant behaviour is learned through exposure and imitation of role models, such as parents and peers. Adolescents' sexting behaviour is highly influenced by peer group approval of sexting and approval of sexual activity by family and friends. Peer group attitudes are thought to be more determinant than the effect of an adolescent's own attitudes towards sexting. Differential reinforcement where rewards outweigh punishment carries import if one views adolescent sexting as deviant behaviour. The thrill of the activity and desire for popularity is weighed up against the perceived risk from shaming and the punishment for being caught.

Senior high school students with no previous formal education on sexting prevention or awareness were anonymously surveyed about their sexting behaviour within and outside of romantic relationships.

Sexting in romantic relationships was associated with self-perceived definitions of acceptable behaviour, influenced to some extent by peer approval. Sexting outside of romantic relationships involved a high degree of thrill seeking. The perceived opinions of peers, the perceived opinions of parents, the perceived positive social reinforcement and learning of engagement in sexting behaviour by peers or through the media do not influence one's chances to engage in sexting. The authors conclude, the social learning theory, developed to explain deviant or criminal behaviour appears best suited to the sexting outside of a romantic relationship, the relatively more risky behaviour of the two sexting behaviours studied.

Future studies and legislation will need to investigate if the previously found correlations between general measures of sexting and different types of risk behaviours (for example, sexual risk behaviour and substance abuse) and health outcomes (for example, feeling sad or hopeless and suicidal thoughts) would hold if one would take into account whether they engaged in sexting within or outside of a romantic relationship.

Further reading

Ouytsel JV, Ponnet K, Walrave M, d'Haenens L. Adolescent sexting from a social learning perspective. *Telematics and Informatics*. 2017;34:287-98.

Clinical guidelines: damned if you do, damned if you don't

The hallmark of evidence-based practice has been the development of clinical guidelines and unit policies. Clinicians who have questioned the legitimacy of their institution's guidelines have taken some small solace in the belief that adherence to a protocol conferred some protection against medical negligence claims. Until now.

In Gould v South Western Sydney Local Health District [2017] NSWDC 67, the District Court of NSW examined the care provided to an eight-year-old boy with a crush finger injury following a fall on wet concrete. In August of 2011, the boy was transferred from Campbelltown Hospital to Liverpool Hospital for the management of a crush injury to the left thumb and another injury to the left third digit. Following assessment, surgical washout, wound exploration and repair were arranged and booked for the same day.

Prophylactic antibiotics were prescribed in accordance with hospital policy and the Therapeutic Guideline: Antibiotics. The recommended antibiotic was intravenous flucloxacillin. Expert witness for the case, A/Prof Barrie Gatus (infectious diseases physician) also testified that this was the most appropriate treatment in the circumstances, as most infections were due to Staphylococcus aureus. He further noted the risk of ototoxicity with gentamycin administration and concluded that it would not be appropriate for initial treatment in this case.

Meanwhile, A/Prof John Raftos (emergency physician) stated that gentamycin should have been prescribed to the patient in addition to flucloxacillin because of the contaminated nature of the injury.

In awarding $240,930.10 to the plaintiff, His Honour Judge Levy SC held that the hospital had breached its duty of care to the patient and that gentamycin should have been administered. His Honour made note that A/Prof Gatus' view (and the guidelines) were constructed with an 'emphasis upon... antibiotic stewardship' rather than care of the individual patient.

As an aside, it is also interesting to note that the patient was scheduled for surgery later that night, but was delayed from accessing theatre due to other emergency cases. He underwent surgery the following morning and His Honour held that the patient should have been operated upon within six hours of presentation. The hospital could have demonstrated limited public hospital resources and mounted a defence pursuant to Part 5 of the Civil Liability Act 2002 (NSW) (CLA). They chose not to.

The case provides our readership with a stark reminder that courts seem to favour expert peer opinion over clinical guideline and, hence, the latter should be used to guide practice rather than mandate it.

Special medical treatment for adolescents: stringent tests for consent

Guardianship Board applications by carers and doctors of disabled adolescent girls for consent to special medical treatment can illustrate the dilemma Tribunals face in making these emotionally charged decisions. The catchphrase for the legal test is 'whether the treatment is necessary to save the patient's life or to prevent serious damage to the patient's health'. A NSW case illustrates the stringent requirements in obtaining consent for hysterectomies in disabled adolescents in Australia.

In the first Tribunal decision, NXM [2014] NSWCATGD 52, the application by parents for a hysterectomy with ovarian conservation as treatment for a severely disabled 18 year old with menorrhagia was dismissed.

Miss NXM had a severe intellectual disability with autistic traits with a chromosome 17 duplication and Charcot Maries Tooth Syndrome. She was non-verbal and the Tribunal agreed that she could not consent to treatment.

Miss NXM lived with her parents who were her fulltime carers. Her menorrhagia caused her extreme distress that affected her quality of life. This included abdominal discomfort, vomiting, diarrhoea, anorexia and continual removal of clothing and sanitary pads in public, with blood soiling of clothing and bedlinen. Her double incontinence resulted in mixed soiling, with resultant risks to her hygiene. In addition, she became very anxious, which limited her participation and enjoyment in any community activities or public life. The significant issues of anaemia, infection risk and psychological distress were reported by her parents, her GP (experienced in care for the disabled), her gynaecologist and her respite carers and teachers.

Her doctors outlined the difficulty in alternative treatments:

1. Miss NXM required all medication in liquid form, which was not an appropriate delivery for OCP for ovarian suppression. Furthermore, OCP had increased risks for thromboembolism as she was immobile.
2. Miss NXM was very distressed when approached for medical examination and three-monthly injections of Depo-Provera would be strongly resisted and require forcibly holding her down to receive the injection. Additionally, there was a risk of erratic bleeding, and Depo-Provera was not recommended due to Miss NXM's low bone density.
3. Use of an IUD or endometrial ablation was not supported as it required a general anaesthetic and there was no guarantee it would stop the periods. Miss NXM had already had 12 anaesthetics in her 18 years and her parents would not consent to another if it were not for a permanent solution. Miss NXM had a small uterus with a high likelihood of rejection of an IUD and any spotting of menstrual blood still caused severe psychological reactions.

Her parents had gone to enormous effort to deal with the issues (including psychological attempts at desensitisation to menstrual blood), and believed that the proposed hysterectomy was an important procedure for the maintenance of Miss NXM's dignity.

The Special Representative appointed by the Tribunal for Miss NXM did not support the application and felt that a Mirena IUD should be trialled. She was not convinced that the psychological behaviours were attributed solely to menstruation.

The Tribunal concluded that it was satisfied that hysterectomy was the most appropriate treatment for stopping the periods. However, it stated that it was not convinced that her psychological issues were of such magnitude to require a treatment of 'last resort' to prevent 'serious damage' to Miss NXM's health.

A second application was made 11 months later for the same consent to special medical treatment; NXM (No 2) [2014] NSWCA TGD 53. It differed with regard to: legal representation for the parents, the Special Representative for Miss NXM was a legal practitioner who supported the application and a consultant psychiatrist and endocrinologist gave compelling evidence of the psychological and physical effects of menstruation on Miss NXM. The Tribunal accepted that Miss NXM's disabilities were such that she could not ever exercise her reproductive capacity and consent was given for the hysterectomy.

WOMEN'S HEALTH

Journal Club

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

Treatment of cholestasis of preganancy

Pruritus is encountered in many pregnancies. When a rash is present, a common diagnosis is pruritic urticarial papule and plaques of pregnancy (PUPPS), without a rash, intrahepatic cholestasis should be considered. Intrahepatic cholestasis occurs in about 1 per cent of pregnancies, generally developing in the late second or third trimesters, and is characterised by intense itching without rash, often on the palms of the hands and soles of the feet; deranged liver enzymes, including the transaminases; and increased serum bile acids. In addition to maternal discomfort from severe itching, cholestasis of pregnancy increases the risk of premature delivery, meconium-stained liquor and fetal demise.[1] The physiological basis of obstetric cholestasis is unclear, but it is thought that pregnancy hormones and their metabolites may, in genetically susceptible women, result in cholestasis through mechanisms including reduced uptake of bile acids by hepatocytes.

Pharmacological treatment of cholestasis of pregnancy currently includes the use of ursodeoxycholic acid (UDCA) and/or S-adenosylmethionine (SAMe). UDCA is a hydrophilic bile acid that detoxifies hydrophobic bile acids, preventing injury to the bile ducts. SAMe is involved in the synthesis of phosphatidylcholine and influences the composition and fluidity of hepatocyte plasma membranes and the biliary excretion of hormone metabolites. Previous observational and clinical studies have shown that UDCA and SAMe can reduce pruritus and improve liver function indices and perinatal outcomes.[1] A recent meta-analysis included five randomised controlled trials of the effect of UDCA, SAMe or a combination of both on maternal, clinical and biochemical responses, including pruritus scores, total bile acids and liver function tests. Obstetric outcomes, including preterm delivery, caesarean section and meconium-stained liquor, were also analysed. The results indicated that UDCA was more effective than SAMe in reducing pruritus and the levels of total bile acids and alanine aminotransferase (ALT). Treatment with UDCA was also associated with significantly lower preterm delivery rates than treatment with SAMe. Interestingly, combination therapy with both agents significantly reduced total bilirubin, aspartate aminotransferase (AST), and the rate of preterm delivery in comparison with either drug administered alone, although not for other parameters.[1] The authors suggest that UDCA is more effective than SAMe monotherapy and should be the first-line treatment for obstetric cholestasis, although there is some evidence for considering combination therapy. While UDCA is the main pharmacological therapy for obstetric cholestasis, a recent case report raises the possibility of metformin as an additional treatment option. In this case, a woman affected with obstetric cholestasis in four previous pregnancies was treated with metformin for gestational diabetes in her fifth pregnancy, with the observation that her bile acids and liver enzymes were improved in comparison with her previous pregnancies.[2]

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2. Elfituri A, Ali A, Shehata H. Managing Recurring Obstetric Cholestasis with Metformin. *Obstet Gynecol*. 2016;128(6):1320-23

Radio frequency ablation for fibroids

Uterine fibroids are very common and present in over 60 per cent of women by the age of 50. Treatments include medical therapy and procedural methods, such as hysterectomy, myomectomy and uterine artery embolisation. The authors of this review assert that the current techniques may not be accessible, effective or acceptable for all women and propose laparoscopic radio frequency ablation (RFA) as a minimally invasive option for treatment of fibroids. RFA applies an alternating current in the range of 300–500kHz directly into the fibroid tissue via electrodes. This current causes an increase in temperature that destroys the myoma cells. With current equipment, ablation of fibroids of up to 7cm has been reported. The authors report using a laparoscopic RFA probe inserted into the myoma under both laparoscopic vision and ultrasound control and report 15 pregnancies and 13 live births following RFA ablation of fibroids in their series. The authors further describe a number of previous studies reporting encouraging results with RFA in terms of reduction in uterine volume, bleeding as well as improved quality of life and acceptability of the treatment to the patients. While RFA for fibroids remains an uncommon treatment in Australia and New Zealand, this article provides an up-to-date summary of the technology and previous research in this area.

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ANZJOG

From the editor's desk

Prof Caroline de Costa
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The June issue of *ANZJOG* will be with RANZCOG members by the time you read these words. A large and interesting range of research articles is included in this.

The issue continues the *ANZJOG* series of Current Controversies in obstetrics and gynaecology, with two opinion pieces from experts on the subject of planned vaginal breech birth. Andrew Bisits argues that 'There is a place in current obstetric practice for planned vaginal breech birth '[1] and carefully discusses the advantages and risks involved, and the information that should be given to women contemplating an attempt at vaginal birth when breech is diagnosed. On the other hand, Sean Seeho and Tanya Nippita ask 'Term breech delivery – is recommending vaginal birth a breach of best practice?'[2] and in a meticulous dissection of current evidence come to the conclusion that planned vaginal birth should not be recommended. In the August issue, each side of the discussion has a right of reply; there is agreement between them on the nature of the evidence available, and on the need for women faced with this decision to be supplied with full and informed evidence about risks, but they continue to differ on the implications for women making a decision about planned vaginal breech birth. Together the four (referenced and peer-reviewed) opinion pieces give an excellent and up-to-date overview of this whole debate.

Online access for College members

RANZCOG Fellows, FRANZCOG trainees and Diplomates can access Early View articles, the current issue and the full *ANZJOG* archive online via the my.RANZCOG.edu.au member portal. Simply login with your RANZCOG member ID and click on the resources tab to access the *Journal*.

Also in the June issue, Goldstone et al report their findings from an observational cohort study of more than 13,000 women who underwent early medical abortion (EMA) using oral mifepristone and buccal misoprostol through the Marie Stopes group of clinics.[3] This is the second large study from this group who have thus provided extremely valuable information about the practice of EMA in Australia since mifepristone became more widely available to women. Their findings – of low rates of serious adverse effects and continuing pregnancy – are very comparable to those of overseas studies; they demonstrate that EMA is a safe and effective alternative to surgical abortion for those Australian women who are able to access it. In an accompanying editorial, Black and Bateson address the question of the continuing barriers some Australian women do face when trying to access EMA;[4] there is a need, they state, for more GPs and public hospitals to become involved in EMA provision. These authors also discuss the particular difficulties of access faced by women in rural and remote areas; their needs are, however, being met to an increasing extent through the provision of telemedicine by the Tabbot Foundation and some individual providers.

There are 16 original research articles on obstetric topics included in the June issue, reflecting the bias towards obstetrics in the submissions to *ANZJOG*. Topics include diabetes in pregnancy (three articles), hypertensive disorders, first- and third-stage management, medicine and diet in pregnancy, and questions regarding caesarean section (two articles). Among the original articles in gynaecology, Chuah et al discuss the 'common, emotive and sometimes controversial' topic of menstrual management and menstrual suppression in developmentally delayed young women;[5] Bonner and Boyle look at specialist services managing female urinary incontinence in the Northern Territory, and find a need for greater service provision;[6] and Petersen et al describe an algorithm developed to reliably predict treatment outcomes of medical management of missed miscarriage.[7]

We have received some preliminary figures from our publishers, Wiley, on *ANZJOG*'s performance in 2016. Somewhat disappointedly, I must report a slight fall in the Journal's Impact Factor (IF) from 1.738 to 1.607; *ANZJOG* is now number 48 in the ranking of 80 journals in our discipline. Hopefully, the inclusion of some important and controversial topics in the latter part of 2016 will see the IF rise again in 2017.

We are certainly receiving a large number of submissions for *ANZJOG*; at the current rate, we will be close to 500 submissions by the end of the year. To cope with the subsequent increased numbers of high-quality accepted research articles, I have decided to include letters to the editor in the e-pages of the *Journal*, to enable them to be published as soon as possible following the appearance of the *ANZJOG* article to which it refers. These items still appear in the full table of contents of the print issue of the *Journal* together with a link to where they can be accessed online.

The August and September issues of *ANZJOG* will be reviewed in the Summer issue of *O&G Magazine*.

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Doctors in denial: a book review

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Prof Ronald Jones gives a detailed account of the 'unfortunate experiment' (as it came to be known in the lay press internationally) from Herb Green's initial decision in the 1960s to leave carcinoma in situ of the cervix untreated, through to its ramifications today. Having grown up during the saga and knowing many of those involved, I had trouble putting the book down. I deem this book compulsory reading for all O&Gs. We are privileged to have this first-hand account of an embarrassing era in our history from our colleague, Ron Jones. I still remember reading Herb Green's article as a trainee and thinking 'Hang on, this doesn't add up'.

The title says it all; for the past half century, groups of senior doctors have denied the harm arising from the 'unfortunate experiment', forgetting the plight of the victims. The events described by Jones are incredible and have been played out during the working lives of many of us. Were New Zealand's relative geographical isolation and the reputation and dominance of the postgraduate school of obstetrics and gynaecology factors? It is astonishing that the experiment was approved in the first place and that it was not stopped when the first cancers began to appear. Concerns were raised to an in-house investigating committee and the silence when the world was informed of the outcome of the experiment in the 1984 paper of Jones et al, implicates us all.

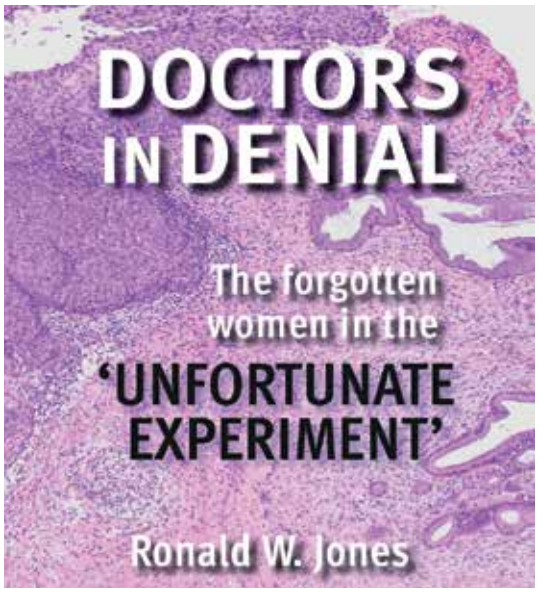
The two case histories described in the book clearly point to Green's disordered thinking and his quixotic attitude towards his patients' wellbeing. Difficulties inevitably arise with colleagues who hold differing views, those with personality disorders, those with power complexes and those who are not team players.

While the responsibility for the 'unfortunate experiment' clearly lay with the senior members of the academic staff and three senior medical administrators who elected not to become involved, Jones points out that this was a systemic failure involving Green's hospital colleagues, and human frailties – a cogent warning for those involved in medical practice today. A particularly sad aspect of this story is the admission by Green's close friend and colleague, Sir Mont Liggins, that he and Sir William Liley – both pioneers in the field of perinatal research – '....understood about scientific research and hypotheses at the time but chose not to intervene but to turn a blind eye'.

One of Jones' phrases continues to resonate: 'This is a story of two cancers – one physical and one moral.' The intellectual and clinical attributes of the men (and they were all men) have never been in question, but the moral compass is repeatedly questioned throughout the book. There is no doubt that medical power and a well-established hierarchy, strong personalities and intimidation were used to bolster the positions of those who were best placed to stop the experiment, a situation that could be repeated.

The role of various Royal Colleges and their members during this long saga warrants comment. In 1975, respected senior New Zealand Fellows of the Royal College of Obstetricians and Gynaecologists were asked to investigate cases of Green's patients developing cancer. They avoided addressing the harms arising from the experiment which, as a consequence, was allowed to continue. In 1988, the Royal New Zealand College of Obstetricians and Gynaecologists failed to apologise to the victims after the release of the Report of the Cervical Cancer (Cartwright) Inquiry – indeed, some senior Fellows continued to undermine it and support 'revisionism'. In addition, the College declined to offer an apology to the patients. By contrast, the current RANZCOG Council took advice from senior College Fellows and deserves credit for the unqualified apology it gave to the victims at the time Jones' book was launched.

For years I have wanted to write an article on mindsets in medical practice, having witnessed the harm that can result from this psychopathology, Ron Jones has saved me the trouble.



Letters to the Editor

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At last, a timely reminder in the 'Hands off the breech' article by Dr Polly Weston (*O&G Magazine* Vol. 19 No. 2 Winter 2017 p33–5) about the inevitable occurrence of vaginal breech deliveries.

Managing the 'unexpected singleton breech delivery' is, as she points out, an ever-present possibility. Inevitably, it will confront every delivery suite practitioner if he or she continues long enough in the craft. The ability to complete a vaginal breech birth safely must be part of the skill set for everyone in that situation.

Polly most likely had the good fortune to be exposed to obstetrics in the UK's National Health Service during her MRCOG training; an exposure that would have given her more practice in breech delivery than the average trainee in Australia. She has proposed a sensible and practical approach to management, with an instructively illustrated description of the traditional method of accomplishing delivery with the woman in the prone position. Lovset, Mauriceau-Smellie-Veit and Burns-Marshall manoeuvres are carefully explained, and they will all be taught to trainees as a fundamental part of their obstetric experience.

What of midwifery training? PROMPT courses include midwives, but there will always be those who have never had breech delivery training, or even have seen a vaginal breech birth. It is unreasonable to expect every midwife to know what to do. So, how will the untutored midwife cope if they are confronted with a rapidly progressing breech delivery while the obstetrician is still on the road?

Early one morning in 1990 I was called in by my Base Hospital midwives to attend a fully dilated patient. The breech presentation had just been discovered. When I arrived, I found the patient kneeling on the delivery suite bed, draped over a bean bag, buttocks in the air and gasping on the nitrous. I told her that she would need to turn over on to her back. Her refusal was unprintable. We had no choice, but to leave her as she was and await events.

With the end of the bed removed, I sat on a stool with her distending introitus at eye level. Keeping in mind the instruction of my teachers to keep my hands off the breech, reiterated so forcefully by Polly Weston, I watched with fascination as the baby, fully flexed, slid unaided into my waiting hands. I felt just like Adam Gilchrist taking a catch behind the stumps! The Apgars were 8 and 9. The happy mother smiled a wry 'Told you so!' at me.

Over the decade of the '90s my colleague, John Currie, and I performed more than 40 such prone breech deliveries. There was one unrelated intrapartum fetal death. The Apgars were consistently better than our previous supine breech delivery babies. The series abruptly ceased with the publication of the Term Breech Trial; but what persisted was the experience gained by our midwives who were able to watch the technique over that decade. Since then several of those midwives have been confronted with the need to deliver breeches. Their observational experience stood them in very good stead.

I believe that this technique is safe for breech delivery, especially in situations of rapid progress where more experienced help has not yet arrived. Indeed, it might be considered as the first-line method, especially as it follows the longstanding 'hands-off' dictum, almost to the last moment. Occasionally we had to flip out a leg or an arm. Almost always, the fully flexed undisturbed fetus emerged spontaneously, pink and vigorous.

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Having had a long-time interest in vaginal breech delivery – an obstetric art rapidly falling into disrepute due to the modern trend of delivering the breech presentation by caesarean section.[1] – I noted the recent article, 'Hands off the Breech' (*O&G Magazine* Vol. 19 No. 2 Winter 2017 p33–5). This once again disappointingly details the whole gamut of the standard manual manipulations taught as the old-style technique of 'Liverpool' vaginal breech delivery, falling into the usual trap of not keeping their hands off and 'doing something' such as pressure in the fetal popliteal fossa, fetal body at 45 degrees to the horizontal, the Lovset manoeuvre and so on.

Whether vaginal term birth, rather than caesarean birth, is a breach of best practice.[2] I suggest that there may still be a place in present-day obstetrics for a planned vaginal breech birth.[3] It becomes indicated in, say, an emergency situation or in a well progressing undiagnosed breech in a multi-labour with a full understanding of the pros and cons. Overlooked completely, however, is the significantly less traumatic technique of the Bracht method of breech delivery. This technique is a great deal more than the described supra-pubic pressure or what Bracht himself called the 'handgriff' to release the after-coming head. I respectfully draw attention to my paper[4] describing and illustrating this spontaneous, non-interference delivery of the fetus presenting breech, in which the obstetrician is an educated observer supervising a natural process, rather than an active participant with a compulsion to 'do something'. This technique was first described by the Berlin obstetrician, Erich Bracht (1882–1969) at a meeting in 1935, but discussed little in the English obstetric literature.

Nowadays there are registrars and even younger consultants who have never delivered a vaginal breech; therefore, allow me to remind the readership again of the Bracht manoeuvre in which the breech is allowed to deliver spontaneously to the umbilicus. If the mother is supine, the baby and its extended legs are held upwards by the operator, gently maintaining the spontaneous upward and anterior rotation of the body continuing this position, only counteracting gravity with uterine contractions together with the occasional supra-pubic pressure by an assistant (the handgriff previously mentioned). The delivery then completes by the feet passing over the perineum, releasing spontaneously, followed by elbows, hands, arms and shoulders. As extreme extension continues to be produced, the after-coming head delivers either spontaneously or by the old Mauriceau-Smellie-Veit finger in the mouth technique, (or, occasionally, requires protective lift-out Wrigley's forceps delivery). This upward sweeping spontaneous delivery (in lithotomy) is well demonstrated in the illustrations accompanying the paper of years ago on this subject.[4] Having watched competent obstetricians struggling to 'pull out' a baby by the breech at caesarean section, the same technique may also be readily employed at abdominal delivery.

In these days of more freedom in the delivery suite, I would suggest that this procedure could best be undertaken with the mother in the genu-pectoral position, allowing the fetus to deliver spontaneously in the correct direction. Interestingly, this delivery method mimics the delivery of a spontaneous miscarriage, which usually arches upwards or imitates quadruped mammals such as horses delivering standing-up or South African Bantu tribeswomen squatting, leaning forward and delivering by arching and lifting the fetus up towards themselves, or Polynesians lying prone across a delivery pole to deliver.

Permit me to reiterate that the Bracht manoeuvre is suggested for student, resident, registrar, consultant and/or midwife teaching[5] if vaginal delivery becomes indicated; a no-interference method of breech confinement, rather than using the older style multiple manipulations of yesteryear postulated in this recent paper.

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Vic

I'd like to comment on three articles.

The first is the straightforward article on eclampsia (*O&G Magazine* Vol. 19 No. 2 Winter 2017 p18–21). It's comprehensive, but I'm a bit disappointed they didn't use the expression 'hypertensive encephalopathy', which is succinct, yet accurately descriptive.

The second is re Ian Pettigrew's article on shoulder dystocia (*O&G Magazine* Vol. 19 No. 2 Winter 2017 p36–7). I've known Ian personally for many years. He mentions doing an episiotomy in passing, but makes no justification for it. Shoulder dystocia is a bony physical obstruction, not a soft tissue one. The perineum has already passed the head, proving its elasticity, so apart from possibly providing easier manual access for the usual stepwise manoeuvres (and that's debatable), what does an episiotomy do to assist delivery of the shoulders? I congratulate him for even achieving that in a woman that size on all fours, on the floor.

The third item is the extremely disturbing report of the bureaucrat reporting a Fellow to AHPRA (*O&G Magazine* Vol. 19 No. 2 Winter 2017 p73–5) when the colleague concerned had already taken every reasonable step to comply with the law. This is outrageous and I hope the Fellow sued for compensation for losses and stresses incurred. This is where we need test cases to better strike a balance between 'professional responsibility' and exposure to this sort of politically motivated attack, often made by people whose thinking has no basis in rational science.

I had a similar experience in Western NSW some years ago when, as a locum, I casually checked the PPH box in the delivery suite and discovered there was no misoprostol. I was informed it had been removed by the bureaucracy. There was no F2a to replace it. I was directed to the area office some 500km east of where I was, to be told the directive came from Sydney. I spoke to the chief pharmacist of NSW, after speaking to Sydney colleagues, who assured me no such directive had been made.

I was lied to by the area health office and it interfered with my safe practice. I complained, when presented with a 17-year-old G1P0 for suction curettage, that the lack of misoprostol had increased the risk of the procedure greatly. This was before Mr Abbott was overturned by the Parliament on the misoprostol access debate. At one point in my attempts at cervical dilatation, I was faced with the choice of waking her and sending her to Adelaide, or carrying on. After a brief wait, I was able to dilate the cervix enough to complete the procedure. When I went to a pharmacy in town and obtained supplies, I was threatened with sacking by the CEO if I brought that medication into his hospital. This case also highlights how political interference in medical practice, without scientific basis, is an ongoing hazard. The state law in Qld and NSW remains in the 19th century, due again to politicians with mindsets having no basis in rational science. I note that the President of RCOG has just written to the PM in London expressing concern about the Democratic Unionist Party's attitude to abortion services. I hope she receives a measured response.

Thanks for the opportunity to vent.

Educating O&Gs in Laos: RANZCOG helps

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There are many barriers to teaching obstetrics and gynaecology in Laos. The basic educational level of those entering medical schools is low by Western standards and medical education is also far from satisfactory, particularly given the magnitude of the challenges facing doctors here.

At Setthathirath Hospital, one of the four teaching hospitals in Vientiane, we have been involved in small-group teaching of postgraduate trainees and undergraduate students for about 45 minutes each weekday morning for the past seven years. We have also taught many of the modules that are central to the postgraduate course, and conducted and participated in journal clubs and other educational activities. Visiting teachers, even some with considerable experience in Laos, often complain that our trainees are not intelligent enough for specialist training, but we do not agree. We see a series of barriers to learning, arising from both teachers and students. A common problem is experts who show their expertise by teaching at a far higher level than needed in the circumstances here: the postgraduate modules developed by a largely German consortium fall into this trap. We try to emphasise to visiting teachers that their expertise is best shown by looking at what needs to be learned and teaching that, rather than what they think could be learned. It must be recognised that one cannot build a skyscraper without foundations and, at present, our postgraduate trainees lack the foundations on which postgraduate medical education in the West is built. It is all too easy to mistake lack of knowledge for lack of intelligence, and teaching or demonstrating through an interpreter can compound this misconception.

We have found that one of the greatest challenges in teaching is engaging the learners in the educational process. Lack of engagement is caused by many factors here. Sometimes it is because the material being taught is beyond the capacity of the learners. Another factor is the fear of being wrong, and 'losing face', which is a greater problem in this culture than it is in Western societies. Traditionally, teaching in Laos has been didactic, with little or no chance for learners to interact constructively with teachers who are viewed as important authority figures. Some teachers actively discourage interaction, lest a good question they have trouble answering causes them to lose face! Even in Laos, social media is an ever present reality, with teachers constantly challenged to draw students' attention away from their phone.

Over the last seven years we have striven to find ways to increase the involvement of our trainees in the learning process. We have a rule that only the person designated by the teacher can answer a question, and that 'I don't know' is not an acceptable answer; however, keeping the rest of the group involved during the often painfully slow process of drawing out an answer is difficult.

In 2016, Dr Rupert Sherwood was a guest speaker at our ASM, and he brought 50 transponder units with him on loan from RANZCOG. We wanted speakers to provide pre- and post-talk questions for the audience, but that proved too difficult to organise at late notice. Instead, we held a quiz on general obstetrics and gynaecology at the plenary meeting using the transponders, which was a great success.

Some of the faculty and audience after the final workshop.

Dr Rupert Sherwood gives the transponders to Dr Anan Sacdpraseuth, President of the Lao Association of Obstetricians and Gynecologists.

Those using the transponders were excited, and others in the audience found the revelation of the range of answers fascinating, with some who had taught on the subjects only weeks before seriously embarrassed! We had a full-day seminar as a post-meeting activity for trainees and recently qualified specialists and used the transponders throughout. Many of the senior teachers were present to observe. The exercise was assessed a great success by all present, with the 50 or so participants feeling fully involved in the learning experience.

In 2017, the College generously donated 100 transponders and the 'Turning Point' program to the Lao Association of Obstetricians and Gynaecologists for use in educational activities. A local expatriate church, the Church of the Holy Spirit, complemented the gift by donating a laptop computer to support the program. The gifts were accepted by the Chair of the Association, Dr Anan Sacdpraseuth, at the opening ceremony of the annual meeting in late May, with more than 150 local specialists and other interested parties present.

The authors had arranged three one-day workshops using the transponders, primarily targeted at trainees and recent graduates. The first workshop attracted more than 80 attendees, and even the third, on a hot Friday afternoon, had more than 60 present – a remarkable achievement in Laos! Each of the authors spoke and we had two other invited guests from Australia, Profs Richard Millard and Michael Campion, to contribute sessions on a range of topics. For each presentation we spent considerable time developing questions to reinforce important points and to keep the audience involved. On the afternoon of the final day we devised a series of questions relating to the main content of each of the workshops and used these to guide an interactive forum between the speakers and the audience, which proved to be most effective.

Our plan is to hold teaching sessions using the transponders for trainees every two months covering important topics. We are also looking at special case-based teaching for the trainees in their third and final year addressing, in particular, differential diagnosis and clinical decision-making; two areas in which specialists here are particularly poor. So far we have only used the equipment to poll the opinions of groups, believing that approach avoids embarrassing those with poor answers, but in smaller group work we intend to use the ability of the software to identify individual responses, both to assess knowledge and progress and to guide individual teaching and learning efforts.

The beginning of this collaboration between RANZCOG and the Lao Association of Obstetricians and Gynecologists is most welcome and we, as a core teaching group, will be encouraging some of our Australasian colleagues to participate in future meetings in Vientiane. We are convinced that success will be determined as much by how we teach as what we teach. The approach to teaching here must be designed to encourage good learning habits in those being taught, while at the same time, conveying important knowledge.

2017 AOFOG Young Gynaecologists Program

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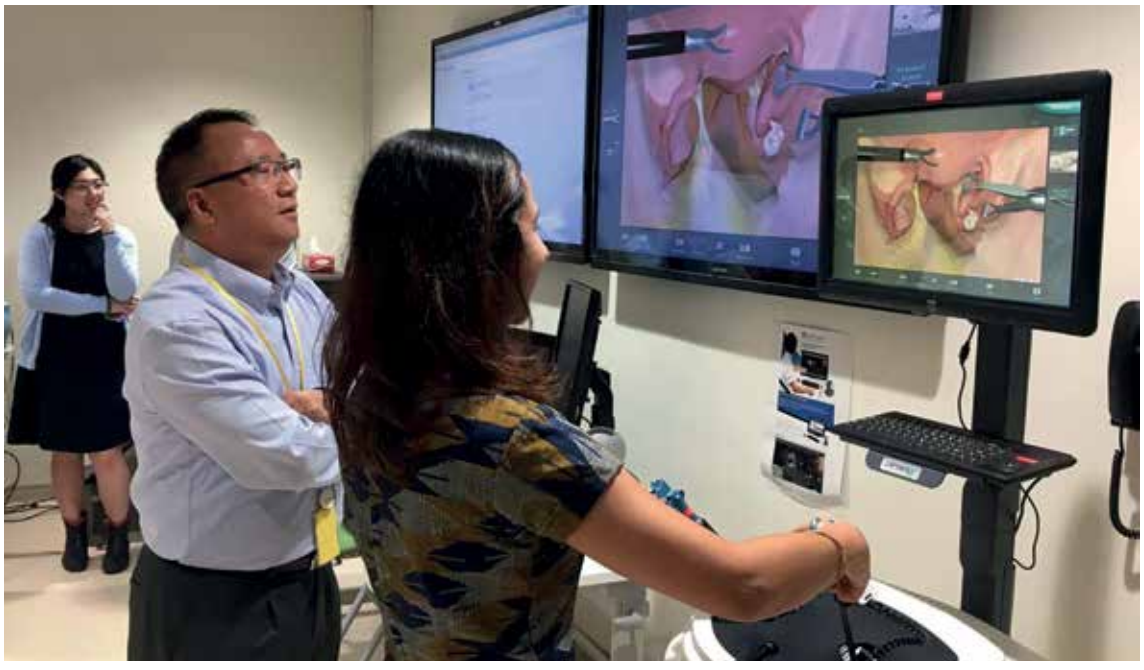
The authors were fortunate enough to be awarded the Shan S Ratnam Young Gynaecologist Award (YGA) 2017 for New Zealand (NZ) and Australia respectively. This award, first initiated in 1991, was the brainchild of Prof Masahiko Mizuno, then President of Asia and Oceania Federation of Obstetricians and Gynaecologists (AOFOG) and was subsequently renamed the Shan S Ratnam YGA in memory of Emeritus Prof SS Ratnam, who was the President Elect of the AOFOG at the time of his death in 2001. The aim of the YGA was to help in the collaboration and development of the next generation of leaders in O&G in the Asia and Oceania region.

As YGA recipients, we were provided the opportunity to attend the 25th AOFOG congress in Hong Kong (HK), as well as be involved in a fabulous pre-congress program. This enabled us to experience a new health system, reflect on our own clinical practices and comprehend the differing obstetric and gynaecological needs of nations in the Asia and Oceania region. Our program in HK, attended by 22 YGAs from 18 countries, was brilliantly organised by Dr Vincent Cheung, with support from the Hong Kong College of Obstetricians and Gynaecologists (HKCOG).

During our eight-day pre-congress program, we had the opportunity to be immersed in various aspects of O&G care in HK, including undertaking clinical observerships in five HK hospitals – the Pamela Youde Memorial Hospital; Queen Mary Hospital; Prince of Wales Hospital; HK Sanatorium and Hospital; and the Kwong Wah Hospital. In general, HK has a very similar system of O&G practice to Australia and NZ, reflective of a common Commonwealth past and continued modelling of practice to the NICE and RCOG guidelines. Public care in O&G is the norm, with the vast majority of HK residents accessing this system. Private care is not as prevalent as in Australia, primarily due to the inability for specialists to be simultaneously involved in both public and private models of care. Clients in HK can also refer themselves directly to O&G services without the need for primary care referrals; a significant difference to our models of care, where primary care providers are the 'gate keepers' to specialist referrals. There are also no independent midwifery models of maternity care as are present in NZ.



Simulation training at the HK Jockey Club Innovation Learning Centre for Medicine.

Within the hospital, O&G clinical practice and hierarchy is very similar to Australia and NZ, with all clinical levels of staff involved in duties, including daily ward rounds, antenatal and gynaecology clinics, operating lists, early pregnancy clinics and subspecialty-related care. Despite the many similarities, some differences in clinical practice were evident, such as the lack of routine HPV screening and HPV vaccination programs (additional cost to the patient of $HK50 per Pap smear and $HK1000 per vaccine), while robotic surgery was extensively used even in smaller hospital centres. However, two particular aspects of practice stood out as unique – first, the extensive use of simulation technology in training; and, secondly, the incorporation of Traditional Chinese Medicine (TCM) in the care of patients.

Our tour to the Pok Oi Chinese Medicine Hospital provided a fascinating insight into the world of TCM and the esteem in which it is held among the local populace in HK. The demand for and use of TCM has led to the formalised development of TCM institutes and university programs, with graduates of both Western and Chinese medicine trained in the provision of TCM. Some examples in O&G include the provision of acupuncture for chronic pelvic pain and pain relief in labour and the prescription of herbal remedies for menorrhagia and menopausal symptoms, among many others. As TCM is increasingly being incorporated into practice, there is also a greater emphasis on research, with TCM undergoing the rigours of Western evidence-based trials to conform to modern medical practice. Some of our more adventurous colleagues were lucky enough to experience different therapies, including acupuncture and cupping during our visit.

Another interesting aspect was the extensive use of a simulation centres for training and continued skill development. Our visit to the state-of-the-art HK Jockey Club Innovation Learning Centre for Medicine (HKJCILCM) was captivating. Equipped with skill-training simulators (such as laparoscopic trainers, TV ultrasound) and high-fidelity human patient simulators (Sim Mum) in a facility that can simulate different clinical settings (including operating theatres, clinical wards and obstetric labour room), provided the reality of simulation training in O&G. Additionally, the presence of a virtual reality room with a 360-degree panoramic screen allowed training for major medical emergencies and public relations management. Though simulation training is already present in certain facilities in Australia and NZ, the emphasis of simulation as part of O&G training and its use for regular drills by clinical staff is significantly more prevalent in HK and reflects a growing trend in developed clinical settings where stringent simulation training is mandated before involvement with clinical cases.

In addition to our visits around HK, we were given a rare opportunity to visit the recently built University of HK – Shenzen (HKU-Shenzen) hospital in Shenzen, China. This is a predominantly public hospital, with a private wing built from the collaboration between the University of HK and the local Shenzen Municipal government. This 3000 bed hospital, built to conform to international medical standards, is viewed in part as a push to reform the healthcare sector in China and provide patient-orientated care. From an obstetric perspective, maternity care for a public patient would cost approximately $A500 for a package comprising antenatal care, delivery and postnatal care. In contrast, private care is roughly $A5000 depending on the accommodation in the private wing, with costs of up to $30,000 per night for the use of the 'presidential' suite. Delivering here has become so popular that they now run a lottery to determine who will get the opportunity. The HKU-Shenzen hospital may be a glimpse of what is to come in China's push to reform its healthcare sector to meet international standards and local demands for patient-centred care.

The penultimate aspect of the YGA program was the receipt of certificates at the President's dinner and congratulations to the candidates involved. This was attended by many well-known figures, including Sir Sabaratnam Arulkumaran, Prof Purandare (President of FIGO), Prof Nam (President of AOFOG); the AOFOG committee and various prominent specialists from the many countries involved.

In addition to the immersion in the local health service, one of the main themes of the program was the interaction between the YGAs from various countries and the friendships and collegiality that developed during this time. This is in keeping with the 2017 theme of AOFOG Congress of 'unity and sharing' and will hopefully be continued for many years to come.

We now look forward to the next AOFOG meeting in Manila in 2019!

President's dinner presentation to the YGA recipients.

Volunteer diaries: Ethiopia

Dr Geoff Kelsey
FRANZCOG

My wife, Pam, and I flew into Addis Ababa on 25 May, en route to work for four weeks in the Vision Maternity Clinic at Bahir Dar in the Ethiopian highlands. Addis is a huge bustling shamble of a city of possibly five million people. Dusty smog rises high above the skyline of tower blocks under construction, hiding the mountains that surround the city. Four- and five-star apartments and offices are set incongruously adjacent to shacks of tin and cardboard with woven plant walls and roofs and dirt floors, homes or micro-enterprises; such is any African metropolis.

On this second visit to Ethiopia, we planned a stopover to allow time to visit Catherine and Reg Hamlin's iconic hospital by the river, the world's second dedicated fistula hospital (the first in New York in the late 1800s built by Marion Sims). No high-rise steel and glass complex, but mostly single-storey bungalow buildings set among trees and gardens, and pervaded by peace and spirituality. Patients support each other with quiet hope and humour. Catherine, now in her 90s, still walks through the wards each evening.

A one-hour flight onwards brought us to Bahir Dar; 600,000 thousand people living around the southern shore of Lake Tana (80km long and 60km wide), with a year-round pleasant climate. A boulevard centrally planted with tropical trees loops from the airport along the lakeside through the city and onwards towards the castles of Gondar and the Simian mountains (home of the cliff-top-dwelling, grass-eating gelada baboons).

Our new guesthouse was waiting, just 100m from the Vision Maternity clinic, with Meron, the part-time cook and cleaner, preparing a typical Ethiopian lunch with a base of injera, a fermented cooked type of pancake made from tef (the local grain now being recognised in the West as a superfood), and topped with spiced vegetables and lentils. The guesthouse now consists of a kitchen, two bedrooms, and lounge, all opening onto a covered concrete walkway. A real luxury is that bedrooms have ensuite bathrooms, and, to Pam's delight, a large vegetable garden already growing corn, carrots and tomatoes, for her to get her hands dirty.

I planned a quiet weekend, but somehow the word spread and my first call came on Sunday afternoon for a prolonged second stage requiring assessment and ventouse delivery. The clinic consists of a cluster of buildings connected by rough stone, gravel or concrete open paths, with antenatal, intrapartum and postnatal sections, and adjuvant facilities, such as a pharmacy and HIV clinic nearby. The centre of the complex is a long blue shed, constructed of galvanised corrugated iron walls and roof supported by roughly trimmed stout eucalypt timber. It has a concrete floor covered by well-worn lino. There is a nurses station at one end adjacent to a small room with two beds for high-dependency patients, then 10 ward beds. At the other end is a room with two delivery beds used only for difficult deliveries. There is sterile equipment, and basic resuscitation gear. There is no luxury or modern gadgetry here; the lighting is rather dim and privacy is obtained with threefold screens. Normal deliveries occur in the beds on the ward, adjacent to other patients in labour, breastfeeding mothers or antenatal women with the usual variety of complications. Yet, last year, the clinic was judged the safest place for a woman to give birth in Ethiopia, with no maternal deaths for the last three or four years. The heart of the clinic is the staff, made up of 10 dedicated and incredibly hard-working midwives (12-hour days, six days a week), and a number of associate nurses/cleaners. The midwives are very well trained to WHO-Ethiopian-Andrew Browning standards, commonly attending, at night, ventouse deliveries they judge to be safe, cephalic-presenting twins, and PPHs, without troubling the visiting doctor.

Andrew Browning is an Australian O&G who has taken on the mantle of Reg Hamlin (Catherine's husband). Now in his mid-40s, he is acclaimed as the world's finest fistula surgeon. Andrew first visited Ethiopia with his father in 1996 and was invited by Catherine Hamlin to join her, which he did after completing MRCOG training at St George, Kogarah. He remained for four years, operating, researching and teaching. He then moved to Bahir Dar as surgeon in charge of the first regional fistula hospital, while his wife Stephanie started a primary school. He remained six years, operating on patients to whom he administered spinal anaesthetics, eventually doing up to 700 cases a year. He was not blind to the need to improve maternity care to prevent appalling injuries and was rather troubled by practices and outcomes in the large local government hospital. In 2011, he therefore determined to build and attract volunteers to work in a clinic managed by his Australian umbrella foundation – the Barbara May foundation – and this became Vision Maternity. Ructions within management of the Addis Hamlin foundation, and concern for the future education for his two young boys, necessitated a

Special delivery suite in the current clinic.

General ward for antenatal, intrapartum and postnatals in the current clinic.

move from Ethiopia. He then found a rather neglected, poorly supervised maternity unit at Selian hospital on the outskirts of Arusha, Tanzania, where his proposal to set up another fistula service was welcomed.

My association with Andrew coincided with his move. With optimistic ignorance of my inexperience in fistula surgery (two or three in my then 30-year career), I had been offering my volunteer time and services to various fistula organisations without success. Andrew answered my 'cold call' email with a friendly 'come over and I'll find you a job'. I had a very enjoyable four-week visit, handling gynaecological outpatients and surgery, obstetric call when required by a wonderful South African midwife and her staff, and assisting Andrew with fistula work. He kindly assisted me with a small number of fistula cases, but I quickly realised that there is a significant learning curve to obtain best results, that I was working with a genius and could use my general skills to free him to perform miracles.

After two further annual six-week trips, Pam and I were preparing last year for our fourth to Tanzania, when an email from Andrew asked if we would consider instead doing maternity work in Bahir Dar, where a sole visiting obstetrician needed relief. The lifestyle was very different and less Western than Tanzania, but we enjoyed our time greatly and were happy to return this year.

My days began with an 8.30 handover attended by virtually all staff, which was an opportunity to question decisions and teach practical tips, followed by a ward round. A large part of the round is supervising progress of labour (for example, augmentation or rupture of membranes) according to the standard local protocol. I learned to bite my tongue regarding my habit of early rupture of membranes to encourage labour; the protocols are terribly important, contributing a great deal to the excellent outcomes in this clinic, which much of the time is without direct supervision. This means that midwife staff make decisions that in Australia would involve up to senior-registrar-level consultation. When no volunteer is available, staff are required to negotiate decisions and outcomes with doctors at the large government hospital. Patient transfer often involves a three-wheeled covered vehicle known as a bajaj, patient and relatives sitting in the back, certainly not ideal late in an obstructed labour.

I then had time off until patients booked for ultrasound examination, and for consultant clinical decision-making from the antenatal clinic arrived on the ward, usually about 10.30. Two midwives have been well trained to perform dating and fetal growth scans by retired Dutch professor Hans Wolf, a frequent volunteer who can conjure first-world images from an ancient black and white EDAN scanner. As the 'expert' (though not having been required to perform complicated obstetric scans in practice in Australia for many years due to the luxury of the availability of expert sonographers) I am asked to corroborate findings, explain reduced fetal movement, check fetal presentation, the quality of the placenta and amniotic fluid, without the benefit of the blood flow methods we have come to rely on in Western obstetrics.

I then relax, apart from booked caesarean sections, until a more clinical flow of patients come for assessment from the afternoon antenatal clinic from about 3–5pm. Most nights require at least one call in and, until I became more ruthless in taking time off, as the only supervising volunteer, I was certainly exceeding 'safety hours'. Of course, requests to intervene in labour may occur at any time throughout the day.

My tally with a week to go of my four-week visit was 10 ventouse deliveries, nine caesareans and three sets of twins. In the first 10 days, three 'sphincter tightening' shoulder dystocias occurred, with one neonatal death. Two intrapartum deaths occurred, one a premature twin with exomphalos. The other occurred to a mother who presented at the clinic and no fetal heartbeat was found. She was fully dilated and I found bradycardic cardiac activity with ultrasound, but had to leave delivery to a midwife as I had a patient anaesthetised for urgent delivery for an abruption. Cord asphyxia due to two knots in two nuchal loops of cord was found. Transfers to the major government hospital included a postnatal thyrotoxic crisis, several women with pneumonia, severe early pregnancy hypertension (the last pregnancy having required termination at 26 weeks). In one 12-hour period, patients included a 31-week placenta praevia patient bleeding, another primip with blood pressure of 240/160, and an unbooked walk-in patient with a fully dilated footling breech.

Simple practical points that have been accepted by staff have included; the ventouse works better when the patient is contracting efficiently, so augment if necessary in the second stage; and documenting the station of the head at abdominal palpation as well as vaginally assists in judging progress. A further manoeuvre I would like to demonstrate is the assisted squatting position for delayed delivery, rather than the upended turtle position, but that will become more practical in the new clinic.

This year, our travels have been curtailed, but Pam and I have enjoyed walks to the Nile Bridge to see hippos, climbed a nearby mountain for views of Bahir Dar and the lake, and walks along the lake shore. Pleasant coffee shops and restaurants are nearby.

We've had the privilege of discussions with volunteer 'Timberologist', Garry Turland, an eminent builder/developer with a great social conscience, from Bowral/Bondi NSW, who was here for a fortnight to supervise the final fit out of the brand-new maternity clinic, built over the last few years on land behind the blue shed. With at least four times the space of the present building, it is likely to set the standard for Africa and hopefully attract a new generation of volunteers willing to trust their clinical skills to save the lives of mothers and babies.

For more information on volunteering, please visit the Barbara May Foundation website at www.barbaramayfoundation.com.

College Statements update

July 2017

Revised College Statements

The following revised statements were approved by RANZCOG Council and Board in July 2017:

- **Measurement of cervical length in pregnancy for prediction of preterm birth (C-Obs 27)**

Revisions include:
1. A patient summary
2. A summary of recommendations
3. Strengthening of recommendations regarding cervical length assessment and measurement technique
4. Evidence that transabdominal assessment may be sufficient as a first-line screening test, potentially reducing the need for transvaginal assessment in a proportion of women

- **Progesterone use in the second trimester for prevention of preterm birth (C-Obs 29b)**

Revisions include:
1. Strengthening of evidence that vaginal progesterone reduces the risk of preterm birth

- **Maternity services in remote and rural communities (C-Obs 34)**

Revisions include:
1. Change of scope to include gynaecology services
2. Identifying community and workforce issues in rural and remote locations

- **Delivery of the fetus at caesarean section (C-Obs 37)**

Revisions include:
1. Highlighting clinician awareness to certain circumstances that can increase the risk of fetal injury at caesarean section, including presenting part is deep in the pelvis
2. Highlighting importance of applying evenly distributed pressure on the fetal skull when disimpacting from the pelvis, by hand or inflatable devices

- **Caesarean delivery on maternal request (C-Obs 39)**

Revisions include:
1. Recognising psychological factors that may heavily influence a woman's informed choice
2. Strengthening the evidence on the effect of caesarean delivery on breastfeeding
3. Strengthening the evidence on the effect of cesarean delivery on maternal request on subsequent pregnancies

- **Management of postpartum haemorrhage (C-Obs 43)**

Revisions include:
1. Addition of background physiology and aetiology
2. Addition of use of tranexamic acid and 'Point of Care' testing

- **Intrauterine contraception (C-Gyn 3)**

Revisions include:
1. Incorporation of the importance of a follow-up visit at 3–6 weeks to exclude infection, perforation or expulsion
2. Aligned with Faculty of Sexual & Reproductive Healthcare Clinical Guidance

- **Cervical Cancer Screening in Australia (C-Gyn 19)**

Revisions include:
1. Guidance on the Renewal of the National Cervical Screening Program

- **Long-acting reversible contraception (LARC) (C-Gyn 34)**

Revisions include:
1. A patient summary
2. Strengthening of evidence for the use of implants and intrauterine contraception in young and nulliparous women and those immediately postpartum

- **Patient record management on the discontinuation of practice (WPI 8)**

Revisions include:
1. Addition of state and territory regulatory and legislative requirements
2. Addition of 'good practice notes' regarding notice to patients and facilitating arrangements for ongoing care and transfer or management of records

A full list of College Statements can be viewed at www.ranzcog.edu.au/Statements-Guidelines.

RANZCOG Patient Information

There are currently 27 RANZCOG Patient Information Pamphlets available that can be viewed on the College website and ordered through a dedicated print store portal https://printstore.ranzcog.edu.au, with College members using their existing RANZCOG member number and registered email address.

The following new titles were approved for publication and are now available:
- Weight gain during pregnancy
- The first few weeks following birth
- Umbilical cord blood banking

Prof Yee Leung
Chair
RANZCOG Women's Health Committee
July 2017

Queen's Birthday Honours

Medal of the Order of Australia – OAM

The following RANZCOG members were awarded the Medal (OAM) of the Order of Australia in the General Division in the 2017 Queen's Birthday Honours List:

- Dr Scott Giltrap
  For service to medicine, particularly in regional areas

- A/Prof Thomas Jobling
  For service to medicine, particularly to ovarian cancer research

A letter has been sent to each of the above named individuals from the RANZCOG President, Prof Steve Robson, to congratulate them on their well-deserved award.

Notice of Deceased Fellows

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

Dr Robin Peter Hearnden, Qld, 22 June 2015
Dr Charles Roy Wilson, Qld, 2 September 2016
Dr Roger Geoffrey Foote, NZ, 21 March 2017
Dr Stewart James Hastie, NZ, 15 May 2017
Dr Glenn Christopher Lewis, WA, 16 June 2017
Dr Robert Charles Bunbury Miller, Qld, 14 July 2017