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STEM CELLS – WHERE DO WE STAND?

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Stem cells have come to represent the promise of cure in all fields of medicine, including obstetrics and gynaecology. In fact, perhaps the most versatile of all stem cells originate from within our own discipline – from within the young embyo, fetus or newborn. These are the 'reproductive stem cells', and demonstrate the spectrum of versatility from pluripotency to multipotency.

Of the many stem cell types, perhaps the most exciting are the embryonic stem cells (ESCs), the induced pluripotent stem cells (iPSCs), fetal mesenchymal and haematopoietic stem cells (fMSCs, fHSCs/umbilical cord HSCs) and Wharton jelly stem cells (WJSCs). Our groups have been working on all these stem cell types to study their biology and target their adaptation for cell-based therapy.

Some of these stem cells are likely to be used to study disease biology rather than for human cell therapy, whereas others with a lower propensity of tumorigenesis could be used in regenerative medicine and to treat monogenic disease *in utero*.

In this lecture, I will cover the history of stem cell science, discuss what is currently know about these cells, and attempt to give a glimpse as to where I believe this science will lead us.

CAN CERVICAL CANCER BE PREVENTED IN AFRICA?

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The incidence of cervical cancer in Africa in 2008 was equivalent to the incidence in Scandinavian countries before the implementation of cytology-based screening programmes in the early part of the 20th century. With the introduction of cytology-based programmes the incidence of and mortality from cervical cancer fell substantially, and today in the presence of well-organised screening programmes that function optimally, cervical cancer is a rare disease.

Sub-Saharan Africa has faced many challenges in the past 300 years, not the least being the long-term impact of colonialism, racist governments, and then after liberation the legacies of poor governance and lack of financial, human and many other resources. Because cervical cancer is a largely preventable disease, coupled with an awareness that cytology-based programmes are hard to initiate, implement and sustain, a concerted effort to find alternative screening tools and approaches has been attempted over the past 15 years. These studies have evaluated a range of alternative screening tests, including visual inspection methods, which have involved thousands of women in Africa, Asia and Latin America and have consistently shown the much greater sensitivity of molecular testing with human papillomavirus (HPV) DNA testing compared with cytology, but also a lower positive predictive value and specificity. However, the near 100% negative predictive value makes it an ideal test for settings where women will be screened, if at all, only once or twice in a lifetime. The most critical factor in setting up secondary prevention for cervical cancer is creation of an appropriate infrastructure and provision of adequate resources for the programme to function. While primary prevention of cervical cancer through HPV vaccination offers a whole new approach and opportunity to prevent cervical cancer by preventing infection with high-risk types of HPV known to be aetiologically associated with cervical cancer, implementing HPV vaccination is a relatively complex process in countries that lack immunisation programmes for adolescent/pubescent children. Vaccination has however proved to be a very successful public health intervention, and with the pressure of the Millennium Development Goals (MDGs), population coverage with other types of vaccines has improved significantly in developing countries, reaching over 90% in many areas.

Can cervical cancer be prevented in Africa? Yes it can, but whether resources will be allocated to these programmes will ultimately be decided by those in control of the resources (usually politicians). We need commitment and realisation from the governments of Africa that investing in the health of their women is cost-effective, reduces poverty, and uplifts the growth of nations at all levels. The MDGs have made women's health a priority. Cervical cancer fits into this paradigm.

HOW TO AVOID UNNECESSARY CAESAREAN SECTIONS

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Avoiding unnecessary ceasarean section (CS) is a powerful measure for limiting maternal morbidity in the index pregnancy and preventing disease in future pregnancies. Key drivers for CS include induction of labour, failure to progress in labour, and non-reassuring fetal status. Stringent indications for labour induction in the presence of a non-favourable cervix should be in place, and cervical ripening is indicated. Elective inductions should be avoided if the cervix is unfavorable. 'Failure to progess' should have a standard definition embracing current evidence that active labour does not start until a patient reaches 6 cm dilation. Intra-uterine resuscitation in pregnancies with non-reassuring fetal status should be considered before resorting to CS. Strategies will be discussed for patient care plans, including patient education, provider and nurse education, protocol development and peer review processes institutionally to avoid unnecessary CS. In addition, a review of the maternal and fetal morbidity associated with CS will be prevented.

A REVIEW OF FERTILITY-SPARING TREATMENT IN GYNAECOLOGICAL CANCER

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Objectives: To review the current fertility sparing treatments in young women with cancer who still want to have children, and to explore the historical events leading up to modern-day treatments.

Design & method: A review of the relevant literature.

Results: A paradigm shift from radical fertility-destroying treatment in gynaecological cancer to fertility-sparing treatment is taking place.

Conclusion: Fertility preservation is an exciting and challenging new field.

The literature currently shows that some 40% of carefully selected patients suffering from early cervical, endometrial or ovarian carcinoma treated with fertility-sparing methods have been able to give birth to a live child, with less than 5% succumbing to their disease in later years. Whatever the future developments in this field will be, it is clear that fertility preservation should be carefully considered in young patients undergoing treatment for gynaecological cancer.

INTRA-UTERINE DEVICE USE IN HIGH-RISK PATIENTS

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In the USA, intra-uterine devices (IUDs) were historically reserved for multiparous women in monogamous relationships owing to the perceived threat of ascending pelvic infections in women at risk of contracting sexually transmitted diseases. In addition, nulliparous women were counselled that placement of an IUD could increase their risk of tubal factor infertility. In this lecture I will review the existing medical evidence, which refutes these notions and provides support for the following:

- IUDs pose no additional risk of pelvic inflammatory disease (PID) compared with the general population.
- IUDs are not associated with subsequent infertility.
- IUDs have a high rate of acceptability and a low complication rate in women previously classified as 'high risk'.
- Administration of prophylactic antibiotics at the time of IUD insertion does not affect the rate of PID.
- Early postpartum placement of IUDs is associated with a high rate of

contraception and a low rate of expulsion, and should be recommended as the most cost-effective contraceptive choice.

CONTRACEPTION IN THE ERA OF HIV

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The use of contraception is one of public health's most powerful interventions. Contraceptive use reduces maternal mortality, improves infant and child outcomes and empowers women. In the era of HIV it is also one of the major interventions for reducing mother-to-child transmission. However, if the aim of family planning programmes is to allow modern contraceptives to become ubiquitous in their use by women of childbearing age, then the ongoing monitoring of their safety and effectiveness is of critical importance for the millions of users worldwide. In countries where the HIV epidemic puts women at risk of HIV infection, the interaction between contraceptive methods and HIV requires careful examination. For women using contraceptive methods in the context of significant HIV risk, there are four key questions that have formed the basis of an extensive research agenda over the past 15 years. These are: do methods increase or reduce the risk of HIV acquisition; do methods increase the risk of HIV transmission from an infected women to an uninfected partner; do methods have an impact on HIV disease progression; and are there drug interactions between hormonal methods and ARVs? Current publications on all these topics were discussed in a recent WHO consultation, resulting in intense debate over the interpretation of data and what this might mean for programmes in high HIV prevalence countries such as South Africa. In this presentation, the research on these issues will be summarised and the recommendations and potential impact of these research findings for individual women and for programmes will be discussed.

EVALUATION OF THE ROLE OF THE SURGICAL SALES REPRESENTATIVE IN UROGYNAECOLOGY

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The introduction of mesh 'kits' for the surgical management of pelvic organ prolapse has brought industry in close proximity to those performing pelvic floor reconstruction. In this lecture we will explore the ethics of new product introduction to the marketplace, the influence of the sales representatives, and the debate regarding appropriate education for new surgical devices. We will discuss the ethics of non-medical sales personnel being granted access to the operating theatre, and their role in the completion of surgical procedures. Examples of poor outcomes due to inadequate surgeon familiarity with new equipment will be presented.

LAPAROSCOPIC TRAINING IN ONCOLOGICAL FELLOWSHIP

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With the increasing role of minimally invasive surgery in gynaecological oncology, the importance of training the next generation in these minimally invasive surgical techniques has become critical. During this presentation we will discuss different modalities of teaching minimally invasive surgery, including simulation and animal labs. In addition, we will review the experiences of several large fellowship programmes and their incorporation of minimally invasive surgery into the fellow curriculum.

HPV VACCINATION: WHERE DO WE STAND?

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The availability of vaccines against high-risk HPV types is regarded as one of the big developments of our time. Currently there are two vaccines available, one against HPV 16 and 18 and one against HPV 16, 18, 6 and 11.

It is estimated that vaccination of a female child around puberty will protect up to 75% of vaccinated persons from developing cervical cancer in later life. Vaccines are safe, contain no live viruses, and may have cross-protection against other HPV strains as well.

The factors in favour of including HPV vaccination in the Expanded Program on Immunization (EPI) in South Africa are:
- to the best of current knowledge a 100% prevention rate
- excellent safety profile
- additional effectiveness against HPV strains causing genital condylomas.

The factors against such policy are:
- costs: the vaccines will have to be purchased
- setting up a vaccine cold chain and distribution system.

Factors still under debate are:
- vaccination of HIV- infected persons
- vaccination of boys
- longevity of the immunity
- length of the 'catch-up' immunisation of girls older than the target group.

Current policy proposals for the public sector include:
- vaccination of all girls between 9 and 12 years
- three doses to be given as per product schedule
- no difference between HIV-infected and non-HIV-infected persons (except for children with AIDS)
- screening required in later life.

Ethical issues that need to be resolved would be consent, marginalisation of those who decline vaccination, and the practicalities of HPV vaccination in the school milieu.

For the private sector the same age recommendations are valid, more boys are likely to be vaccinated, and the later surveillance is the same.

The proposal for managing the vaccination as part of the EPI and school system will be addressed during the presentation.

RADICAL HYSTERECTOMY IN MORBIDLY OBESE PATIENTS

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Morbid obesity is associated with an increased risk of surgical complications for most complex surgical procedures. The purpose of this presentation is to review the different approaches to radical hysterectomy, including abdominal, laparoscopic and robotic, to determine feasibility and safety of each of these techniques in women who are morbidly obese.

FDA RECOMMENDATIONS ON THE USE OF MESH IN PELVIC FLOOR RECONSTRUCTIVE SURGERY

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Introduction: Surgical mesh is used to repair weakened or damaged tissue. It is made from porous, biocompatible absorbable or non-absorbable synthetic material or absorbable biological material. In pelvic reconstructive procedures, surgical mesh is permanently implanted to reinforce weakened vaginal walls to repair pelvic organ prolapse, or to support the urethra to treat stress urinary incontinence.

Objective: The objective of this presentation is to discuss the 2011 recommendations for the transvaginal placement of surgical mesh for pelvic organ prolapse, of the US Food and Drug Administration (FDA) agency of the US Department of Health and Human Services (the latest update was published on 11 October 2011 and is available at http://www.fda.gov/medicaldevices/safety/alertsandnotices/ucm262435.htm).

The relevance of this recommendation will be tested by alluding to the 2010 Cochrane review (Maher C, Feiner B, Baessler K, Glazener CMA. Surgical management of pelvic organ prolapse in women. *Cochrane Database of Systematic Reviews* 2010), and the clinical use of mesh in practice in the UK (Jha S, Moran P. The UK national prolapse survey: 5 years on. *Int Urogynecol J* 2011;22:517-528).

Summary: In October 2008 the FDA issued a public health notification on the serious complications associated with the use of transvaginal placement of surgical mesh for pelvic organ prolapse (POP) and stress urinary incontinence (SUI).

The current review is an update and systematic evaluation of the scientific literature from 1996 to 2011, and shows that transvaginal POP repair with mesh does not improve symptomatic results or quality of life over traditional non-mesh repair. Four factors are of particular importance. First, mesh used in transvaginal POP repair introduces risks that were not present in traditional non-mesh surgery for POP. Second, mesh placed abdominally for POP repair resulted in lower rates of mesh-related complications compared with mesh placed transvaginally. Third, there was no evidence that transvaginal repair to support the top of the vagina (apical repair) or the back wall of the vagina (posterior repair) with mesh provided any added benefit compared with

traditional surgery without mesh. And fourth, although transvaginal repairs with mesh to correct weakened tissue between the bladder and the vagina (anterior repair) may provide an anatomical benefit compared with traditional POP repair without mesh, this anatomical benefit may not result in better symptomatic results.

The most frequently reported complications related to use of surgical mesh during POP repairs are mesh erosion or exposure through vaginal tissue, pain, infection, bleeding, pain during sexual intercourse, organ perforation from surgical tools during the procedure, and urinary problems. Recurrent prolapse, neuromuscular complications, vaginal shrinkage related to scarring or mesh contraction, and emotional problems were also reported. In some cases, additional surgeries or hospitalisations are required to manage complications or to attempt removal of the mesh.

A separate review of the use of mesh in the treatment of SUI was published on 9 September 2011. The reviewers looked at a total of 260 studies related to the safety of mesh use, of which 187 specifically evaluated meshes in the treatment of SUI. The most common adverse events reported in the literature for these procedures include erosion, dyspareunia, infection, pain, urinary problems (including new-onset SUI, urgency, frequency and overactive bladder), and re-operation.

Ultimately, the evidence seems to show that the risks outweigh any benefits in using surgical mesh as standard practice.

Conclusion: It behoves all medical practitioners to uphold the principles of good clinical practice at all times, and to practise according to the available evidence, personal expertise and patient preference. The use of surgical mesh in reconstructive pelvic surgery is very much a point in consideration.

INCIDENCE AND MANAGEMENT OF MESH COMPLICATIONS FOLLOWING PROLAPSE SURGERY

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Mesh procedures have been adopted by a large number of pelvic floor reconstructive surgeons. This is largely due to the perceived improvement in recurrence rates of pelvic organ prolapse following its surgical management. Unfortunately, the complications of these mesh procedures may have been underestimated and a number of women have experienced significant adverse outcomes following surgery using these devices.

Extrusion, which is the new term used to describe mesh that has become exposed in the vagina, is one of the more common complications associated with mesh use. Its incidence is approximately 10%. If a patient has developed an extrusion, management is determined by the size of the mesh that is exposed. If it is less than 5 mm, local oestrogen cream can be prescribed. If the mesh exposure is less than 10 mm, it can be excised in the office. Larger exposures should be removed in the operating theatre under anaesthesia.

A number of other complications following mesh procedures are described, including urinary voiding dysfunction, infection, granuloma formation and malposition. The most life-changing complication is undoubtedly the development of a pain syndrome. These complications may warrant removal of a large section of the mesh. This is potentially challenging surgery and should only be attempted by surgeons with significant experience in pelvic floor surgery.

Surgeons should make every effort to avoid mesh complications. This includes adhering to strict surgical principles when placing a mesh device. A full-thickness dissection should always be made, and care should be taken to leave the mesh without any tension. Surgeons should ensure that they have the appropriate training or supervision for every mesh device they place. It is important to consider a using a native tissue repair or an abdominal mesh procedure instead, since this will reduce the risk of mesh-related complications.

THE OVERACTIVE BLADDER: A PRACTICAL APPROACH

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Stellenbosch University

Introduction: The overactive bladder (OAB) syndrome is defined in 2002 by the ICS as urinary urgency, usually with frequency and nocturia in the absence of infection or pathology.

The OAB is a clinical syndrome and the focus is directed more towards the bothersome sensory symptoms. Detrusor overactivity focuses more on the motor aspects and is purely a diagnosis made by an urodynamic study.

There is a spectrum of OAB symptoms, which include groups of patients with mixed urinary incontinence, urgency incontinence and patients without urinary incontinence. In the presence of urgency incontinence it is called OAB 'wet', and in the absence of urinary incontinence OAB 'dry'.

The Epic study reported a prevalence of 11.8% of the study population of 58 139 adults aged 18 or older in the countries of Canada, Germany, Italy, Sweden and the UK. The prevalence in women was 12.8%, and 49.2% were incontinent of urine.

All OAB shows poor accommodation and filling of the bladder. The origin of the OAB is still unknown. Different hypotheses exist to explain the pathophysiology of the OAB and include the neurogenic autonomous bladder theory, the myogenic theory, the peripheral autonomy theory and the afferent theory.

Acetylcholine is the predominant neurotransmitter responsible for the detrusor contractions.

Aim: This presentation will focus on a practical and clinical approach to the management of women with symptoms of an overactive bladder.

Method: PubMed and a Cochrane database literature search were reviewed with the words: overactive bladder, women, approach & management.

Results: The Fourth International Consultation on Incontinence gives guidance towards the initial evaluation.

An accurate history taking is cornerstone in the diagnosis of the overactive bladder. There are other causes for urgency and frequency and therefore to be considered in the differential diagnosis. No specific clinical signs are associated with the OAB, but a gynaecological and appropriate neurological examination is still required.

The impact of the bother of the OAB symptomatology on quality of life needs to be assessed as it plays a fundamental role in the management decisions. Urine analysis is mandatory to exclude infection and haematuria.

For the uncomplicated untreated patient initial conservative treatment includes behavioral and/or pharmacotherapy. Various antimuscarinic treatment drugs are available with level 1 evidence and grade A recommendation (Table 1). Long-term compliance is a concern with discontinuation of medicine most commonly due to anticholinergic side-effects and mainly dry mouth. Recent flexible dose strategies which include drugs such as extended-release oxybutynin, darifenacin and solifenasin offer a relative simple strategy for the optimal management of the OAB syndrome with possible better compliance. In the Cochrane review of 13 trials, combination treatment with bladder training and antimuscarinic treatment was associated with more improvement than bladder training alone.

Refractory OAB requires review of the diagnosis and special investigation to include urodynamics. This may be of benefit to define underlying mechanisms and identify potential risk factors for adverse treatment outcome.

Neuromodulation is a treatment option before surgery is considered. Sacral nerve stimulation has been shown to be effective but is expensive and therefore not widely available. More recently percutaneous tibial nerve stimulation became available. It is well tolerated with demonstrated efficacy and few adverse events.

Intravesical botulinium toxin offers an alternative in women with intractable detrusor overactivity, but owing to lack of long-term data is not yet licensed for this indication.

Surgery includes augmentation cystoplasty with risk of renal impairment and bowel symptoms. Detrusor myomectomy results in a surgical diverticulum, and both surgical procedures usually require clean intermittent self-catherisation. Owing to the high morbidity and long-term complications, it should only be considered if all other treatment has failed.

Conclusion: The overactive bladder is a common disorder, which affects quality of life significantly. Once the clinical diagnosis of OAB is made the mainstay is conservative treatment, effective in most women. If therapy fails the diagnosis needs to be reviewed and urodynamics should be considered, after which neuromodulation and botulinium toxin can be used as alternative treatment modalities to surgery.

Table 1. Antimuscarinic drugs used in treatment of overactive bladder

Antimuscurinic	Level of evidence	Grade of recommendation
Darifenacin	1	A
Fesoterodine	1	A
Oxybutynin	1	A
Propiverine	1	A
Solifenacin	1	A
Tolterodine	1	A
Trospium	1	A

THE MATERNAL AND FETAL OUTCOMES OF HUMAN IMMUNODEFICIENCY VIRUS-INFECTED AND NON-INFECTED WOMEN ADMITTED TO INTENSIVE CARE UNITS IN THE PIETERMARITZBURG HOSPITAL COMPLEX

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Objectives: To determine the outcomes of HIV-infected (HIVp) and HIV-non-infected (HIVn) pregnant patients admitted to intensive care units (ICUs) in the Pietermaritzburg hospital complex in South Africa.

Design & method: Data were extracted prospectively from the medical records of 87 pregnant patients admitted to ICUs in a regional and a tertiary hospital over a 10-month period. Each patient was classified as having a low (<50%) or high (≥50%) GRAMPT risk of death stratification score. In each GRAMPT sub-category, HIV status, CD4 count and the outcomes of treatments were analysed descriptively.

The primary maternal outcome measure was maternal mortality. The primary fetal outcomes were the number of babies born alive, number of stillbirths, Apgar score at 5 minutes and birth weights. The secondary maternal outcomes were the duration of stay in ICU, the need for mechanical ventilation, duration of ventilation, use of inotropes and blood products, and whether the following occurred: tracheostomy, laparotomy/re-laparotomy, re-intubation, re-admission to ICU and renal replacement therapy. The secondary fetal outcome measure was whether delivery of the fetus was undertaken to facilitate maternal care.

Results: Preliminary analysis of 50 patients (8 antepartum and 42 postpartum) revealed that the patients were aged 15 - 43 years (mean 25.7; SD 7.56). HIV status was: HIVn 25 (50%), HIVp 17 (34%) and HIV unknown (HIVu) 8 (16%). The commonest pre-ICU admission diagnoses constituted pneumonia (23%) and pre-eclampsia/eclampsia (40%) among HIVp and HIVn, respectively. Haemorrhage (20% of HIVn and 35% of HIVp) and respiratory failure (35% of HIVp) comprised the commonest indications for ICU admission. The mean time lag (hours) between request for ICU admission and ICU admission was HIVn 2.68 (SD 2.7), HIVp 1.43 (SD 2.23) and HIVu 1.6 (SD 1.23).There were 4 (16%), 5 (29.4%) and 2 (25%) maternal deaths among HIVn, HIVp and HIVu, respectively. Mean length of stay (days) in the ICU was 4.89 (SD 6.07), 4.91 (SD 6.45) and 12.06 (SD 14.84) for HIVn, HIVp and HIVu, respectively. A more comprehensive analysis will be presented at the conference.

Conclusion: HIV serostatus may influence the outcomes of pregnant women admitted to an ICU.

ARE WOMEN WITH PRE-ECLAMPSIA LESS LIKELY TO BE AFFECTED BY HIV/AIDS? A RETROSPECTIVE CASE-CONTROL STUDY

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Objectives: To evaluate the prevalence of HIV/AIDS (and CD4 levels) in women with pre-eclampsia in comparison with a control group without pre-eclampsia.

Design: Retrospective case-control study.

Method: All women who delivered at two regional hospitals in the province of KwaZulu-Natal from 1 January 2008 to 30 June 2010 were included in the study. Birth registries were reviewed and women with a diagnosis of pre-eclampsia identified. For cases who met the inclusion criteria, the relevant information was entered in a structured data sheet. An equivalent number of controls were randomly selected by age category to match the cases.

Results: Among 492 cases of pre-eclampsia, 130 (26.4%) were HIV positive. In the control group, 183/500 (36.6%) were HIV positive (p=0.001, OR 0.62 with 95% CI 0.47 - 0.82). After adjustment to match the difference in age, p=0.005 and 0R 0.658; HIV-positive women were 34.2% less likely to develop pre-eclampsia than HIV uninfected women.

Conclusion: The prevalence of HIV/AIDS was significantly lower in women with pre-eclampsia when compared with the control group without pre-eclampsia.

TEENAGE PREGNANCY: A REVIEW OF PATIENTS ACCESSING OBSTETRIC CARE IN THE PENINSULA MATERNAL AND NEONATAL SERVICE

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Objectives: To evaluate the socio-demographic and family background of pregnant teenagers accessing our obstetric service, as well as their contraceptive use and knowledge, and to identify trends and risk factors that can be addressed in terms of preventive strategies, service provision and support.

Design & method: This was a cross-sectional observational study comprising 316 black and coloured pregnant teenagers, aged 16 - 19 years, attending obstetric services in the Peninsula Maternal and Neonatal Service area. Data were collected by means of an administered questionnaire consisting of social, demographic and family details as well as contraceptive use and knowledge. Ethics Commitee approval was obtained. Data were captured using Epidata, double-entered and checked, and statistical analysis was performed using STATA.

Results: 95.53% would have preferred to wait at least 5 years before their first pregnancy. Only 45.39% of patients came from nuclear families and 43.47% of patients interviewed had mothers who were pregnant as teenagers. 43.42% were attending school and 29.65% left due to pregnancy. Only 11.84% were using contraception at conception and contraceptive knowledge was poor. Of the patients interviewed, 92.76% would value more information about contraception and sexual and women's health. There were statistically significant differences between black and coloured patients (p<0.01)

Conclusion: This study shows that most teenage pregnancies are unplanned, with many patients coming from non-nuclear families with poor socio-economic circumstances and having left school as a result of their pregnancies. Contraceptive use is poor and patients feel that education about contraceptive and sexual health is lacking. This study allows us to formulate risk factors specific to our population and assist us in formulating intervention programmes as well as identifying deficits in the provision of contraception to young women.

BLOOD PRESSURE PATTERNS IN PREGNANT WOMEN WHO DEVELOPED PRE-ECLAMPSIA OR HYPERTENSION

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Objectives: Early recognition of pregnant women at risk of pre-eclampsia (PE) in developing countries is essential to ensure timely transfer to the appropriate level of care. Our aim was to determine the predictive value of blood pressure (BP) measurements taken in 4-week windows to identify women who will develop PE or new-onset hypertension (NOHPT).

Design & method: A prospective observational study. Women with one or more risk factors for PE presenting at a tertiary hospital for antenatal care before 14 weeks' gestation were approached to participate. After obtaining informed consent, a single researcher completed a comprehensive structured questionnaire regarding previous medical, pregnancy and contraceptive history, also including information about the patient's mother, siblings and father. Clinical findings and the results of routine antenatal tests were documented. Subsequent care was according to existing management policies. The primary outcome was the development of PE (ISSHP definition).

Results: We enrolled 318 women, 9 of whom had uncomplicated deliveries elsewhere. There were 35 cases (12.6%) of PE and 39 cases of NOHPT among women who delivered after 20 weeks' gestation. Systolic BP (SBP), diastolic BP (DBP), mean arterial pressure (MAP) and pulse pressure (PP) did not differ between groups at presentation. SBP was significantly higher in women in the PE group from 12 to 15 weeks' gestation (129.1±13.6 v. 115.9±16.1 mmHg) onwards, while the DBP became significantly higher from 24 to 27 weeks' gestation (84.0±13.3 v. 69.3 mmHg) onwards. MAP was also higher from 12 to

15 weeks' gestation (94.8±8.5 mmHg) onwards. PP was not of value. In women with NOHPT, SBP became significantly higher at 16 - 19 weeks' gestation (124.1±12.1 v. 118.4±14.6), MAP became significantly higher at 24 - 27 weeks' gestation (89.8±14.6 v. 85.7±11.3 mmHg) and DBP at 32 - 35 weeks' gestation (78.8±72 v. 72.1±10.9 mmHg). ROC curve analysis revealed poor ability of all four parameters to distinguish between women who will develop PE or NOHPT.

Conclusion: SBP, DBP and MAP increase earlier in women who will develop PE compared with those who develop NOHPT. In both groups SBP and MAP changed earlier than DBP. PP did not differ between the various groups. There is no specific cut-off value of any parameter that will predict disease without an accompanying high false-positive rate. SBP and DBP are only of clinical importance if specific threshold values as identified in existing classification systems are exceeded.

A COMPARISON OF CALCIUM LEVELS IN PRE-ECLAMPTIC AND NORMOTENSIVE PREGNANCIES

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Objectives: Pre-eclampsia is a leading cause of maternal mortality and morbidity in South Africa. Calcium supplementation of pregnant women at high risk of developing pre-eclampsia shows benefit in reducing the incidence. While serum calcium is an unreliable indicator of long-term calcium status, hair analysis is an accurate method of determining chronic micronutrient status. This study examined and compared serum and hair concentrations of calcium and magnesium between women with pre-eclampsia and normotensive matched controls.

Design & method: This observational case-controlled study recruited women who had delivered a single, live infant in a period not exceeding 96 hours from birth. A case was any woman with pre-eclampsia in the index pregnancy. A control was any woman with a healthy, normotensive pregnancy. Exclusion criteria included no antenatal care, multiple pregnancies, eclampsia, antenatal vitamin or mineral supplementation and any prior disorder that could affect blood pressure, proteinuria or calcium metabolism. Each participant completed an administered questionnaire. Blood and scalp hair were taken from each participant. Serum calcium and magnesium concentrations were determined. Women with pre-eclampsia were matched to normotensive controls. Hair calcium and magnesium levels were measured by inductively coupled plasma mass spectrometry. The impact of HIV infection on calcium and magnesium levels was also investigated.

Results: 214 women were recruited to the study. There was no significant difference in hair calcium levels between all women with pre-eclampsia and controls (1 241 ppm, 331 - 4 654 v. 1 146 ppm, 480 - 4 136, p=0.5). This finding was not affected by HIV status. No correlation between serum calcium and hair calcium levels was seen. There was no difference in hair magnesium levels between women with pre-eclampsia and controls in the total group or by HIV status. Diet and socio-economic status were similar in all groups.

Conclusion: Women with pre-eclampsia showed no difference in chronic calcium status compared with controls. The effect of calcium supplementation may be due to a pharmacological effect which modifies the pathological processes underlying pre-eclampsia rather than by correcting a nutritional deficiency as is generally accepted.

THE IMPACT OF A NEW SOUTH AFRICAN OBSTETRIC CRITICAL CARE UNIT AT TYGERBERG HOSPITAL: A COMPARISON OF PATIENT OUTCOMES BEFORE AND AFTER

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Objective: There is a lack of comprehensive emergency management of obstetric complications and of high-care and intensive care facilities in South Africa. This is often listed as an avoidable factor in avoidable maternal deaths. The aim is to demonstrate improved outcomes for obstetric patients with severe morbidity when managed in a dedicated obstetric critical care unit (OCCU) in the labour ward.

Methods: A 3-month prospective audit was carried out during the planning phase of the OCCU in the labour ward of Tygerberg Hospital. The data for patients with an indication for a higher level of care 3 months before the OCCU were compared with data for patients admitted to the OCCU during a 3-month period exactly 1 year later. The necessary infrastructure, equipment and health care provider training were utilised to manage patients according to obstetric critical care principles. The primary outcome was maternal morbidity and mortality. Data were analysed by the University Research Department statistician

Results: In the 3-month period before establishment of the unit, 63 patients (38 antenatal, 25 postnatal) had criteria for a higher level of care. In the 3-month OCCU period, 60 patients (32 antenatal, 28 postnatal) were admitted. There was no significant difference in maternal or neonatal demographic characteristics. There was a significant difference in maternal mortality in the labour ward area; in the before group 7 patients died in the labour ward, whereas no patients died in the OCCU group (chi-square test p=0.01). There was also a significant difference in total maternal mortality including ICU patients during the analysis period, with 9 deaths in the before group and 2 deaths in the OCCU group (Pearson chi-square p=0.03).

Conclusion: This study demonstrated a significant reduction in maternal deaths during the study period at Tygerberg Hospital when patients were managed in an obstetric critical care unit. This model should be implemented in similar tertiary hospitals.

WORLD HEALTH ORGANIZATION (WHO) SUGGESTION FOR UNIVERSAL VOLUNTARY TESTING FOR HIV WITH IMMEDIATE ARV THERAPY IN SOUTH AFRICA

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Introduction: The WHO strategy for South Africa could greatly accelerate the transition from the present endemic phase with most adults living with HIV not receiving ART. This strategy could reduce HIV incidence and mortality to less than one case per 1 000 people per year by 2016, or within 10 years of full implementation of the strategy. In addition, TB control would benefit, as 73% of TB cases appear to be co-infected with HIV, and maternal mortality could be reduced by 50%.

Historical methods: In the South African 1998 demographic and health survey, 69% of South Africans agreed that AIDS should be reported to the health authorities. On 30 April 1999, South Africa's Health Minister Nkosazana Zuma defended the government's decision to make AIDS a notifiable disease. Health workers would then treat AIDS the same as the other 32 notifiable diseases, including TB. Today, Parliament has not yet accepted the proposed bill.

Ethical results: South African (SA) society should, of course, take precedence over the individual. In addition, adding AIDS to the 32 notifiable diseases would destigmatise HIV/AIDS. This now appears feasible, as 'immediate ARV therapy' for all could increase South African life expectancy by 10 years (1 year's GDP).

Conclusion: WHO suggested strategy in SA warrants broad consideration in efforts to reduce HIV transmission in SA. 'Cost' appears to be 10% of 'Return on investment'.

THE PROFILE OF MATERNAL DEATHS IN A DISTRICT HOSPITAL: A 5-YEAR REVIEW OF MATERNAL DEATHS (2006 - 2010)

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Objectives: The primary objective of the study was to determine the clinical and demographic profile of maternal deaths at a district hospital and interrogate the quality of care provided by healthcare workers with the view of making recommendations to the hospital management. The secondary objective was to determine the commonest primary causes of maternal deaths at a district hospital level.

Design & methods: This is a retrospective review of maternal deaths reported from 2006 to 2010 at Northdale (district) hospital. Demographic and clinical characteristics of patients were extracted from patients' charts using a structured pre-designed data sheet. Descriptive statistics were computed using IBM SPSS (version 19) software. Three assessors independently determined the primary cause of each death and evaluated the quality of care provided. Causes of deaths were classified using the headings used in the Saving Mothers reports. Quality of care was categorised into five categories.

Results: There were 61 maternal deaths reported during the study period. The mean age was 28 years. Thirty-three patients (54.1%) attended antenatal clinics; of these, 57.6% booked at ≤20th week. Of the 28 (45.9%) patients who died in the postpartum period, 7 delivered at home and 3 died of anaesthetic complications. Thirty-nine patients (63.9%) tested positive for HIV; of these only 17 (43.6%) had their CD4 cell count results and only 10 were on HAART.

Half of the patients died within 41 hours of admission to the hospital. The five leading causes of deaths at Northdale Hospital were non-pregnancy-related sepsis (54.1%), miscarriage (14.8%), acute collapse (8.2%), pregnancy-related sepsis (6.6%) and anaesthetic complications (4.9%). Antepartum haemorrhage, postpartum haemorrhage, pre-existing maternal conditions, hypertension, embolism and an unknown cause contributed 1.6% each. Almost half the women who died (49.2%) received substandard care.

Conclusions: The profile of maternal deaths at this district hospital differs from the national profile published in the Saving Mothers report. While there is an increase in maternal deaths at the national level, the numbers of maternal deaths are decreasing at the district hospital studied. Non-pregnancy-related sepsis remains the leading cause at both national and facility levels, but the other four major causes differ. It is therefore necessary that health facilities conduct confidential enquiry into maternal deaths at facility level in order to improve quality of care and reduce maternal mortality.

A PRACTICAL APPROACH TO SCREENING FOR CERVICAL NEOPLASIA

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Population-based screening and treatment programmes for pre-malignant lesions of the cervix have significantly reduced the morbidity and mortality associated with cervical cancer, with reductions in deaths of between 45% and 80%. The South African government introduced the national screening program for the prevention of cervical cancer, using the World Health Organization recommendation for middle income countries – that when 80% of women have been screened, the interval should be between 5 and 10 years, as resources permit. In SA an interval of 10 years has been advocated for the present. The South African programme aims at achieving a wide coverage and earlier presentation.

For cervical cancer prevention strategies to be effective, all aspects of a screening programme need to be persued: screening, referral and diagnosis, treatment and follow-up. I will only discuss screening and attempt to make sense of the following:

- Where are we with screening at present in SA?
- Is Pap smear screening the best for SA?
- Age to commence and stop screening? Symptomatic screening.
- Coverage v. intervals of screening – when to repeat the test?
- Liquid Pap v. conventional Pap – when to add HrHPV testing?
- Screening in HIV-infected women.

SCREEN AND LLETZ: IS COLPOSCOPY REALLY NECESSARY?

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Screening with cervical cytology implies further investigation and treatment in the case of an abnormal smear. It has become common practice to offer excision treatment at the first abnormal smear, and the obvious risk of overtreatment exists (Chia 1994).

LSIL regress in up to 50% of patients (Robertson 1988). Even in those with CIN III, only 36% will develop invasive cancer during 20-year follow-up (McIndoe 1984).

LLetz procedures are associated with bleeding (2 - 5% require packing and 0.5% transfusion) (Lopes 1992). The risk of premature delivery is significantly higher after LLETZ (2.07 (CI 1.88 - 2.27), Noehr 2009) (OR 2.61 (CI 2.02 - 3.20), Jakobsson 2009).

Colposcopy has a role to see the location of the abnormalities, to exclude cancer, to diagnose infections and importantly to guide treatment. It plays an important role to identify only the abnormal areas which need excision.

One-step treatment is only recommended if there is HSIL on cytology combined with colposcopic abnormalities on the cervix that support the diagnosis. There should be no evidence of invasive carcinoma (Lindeque 2005).

SHOULD WE USE LIQUID-BASED CYTOLOGY?

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Conventional cytology (CC) has been used for many years as an option in the secondary prevention of cervical cancer, and in countries with formal implemented population-based cervical cancer screening it has reduced the incidence of the disease by up to 70%.

In recent years liquid-based cytology (LBC) has become available as an alternative to conventional cervical smears. In many countries LBC has replaced CC smears as the screening method of choice.

Both methods are acceptable to use. In women with blood or inflammation LBC probably provides better specimen adequacy. Both methods perform equally well for detection of HSIL, while LBC is better in detecting glandular abnormalities, ASCUS and LSIL.

Reflex HPV testing is possible with LBC without the necessity of obtaining a second specimen for this purpose.

Several factors play a role when comparing cost-effectiveness between CC and LBC. In addition, the increased detection of ASCUS and LSIL might add to extra investigations in conditions not that clinically important. Cost-effectiveness should be considered within the context of the health system LBC is used in.

MANAGEMENT OF THE PREMENTRUAL SYNDROME

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The clinical approach to evaluation and management of the premenstrual syndrome or the premenstrual dysphoric syndrome involves taking an accurate history, prospective daily symptom monitoring to establish the diagnosis, patient-specific initial medical or psychological therapy, and adequate follow-up with appropriate alterations in the treatment plan.

Current management strategies include education and self-care, calcium supplementation, and the choice of a number of psychotropic agents that augment serotonin, administered either throughout the cycle or during the luteal phase alone. Complementary and alternative therapies are popular with patients, and given the high level of placebo response, they are still commonly used.

Pharmacological options include selective serotonin reuptake inhibitors, serotonin/norepinephrine reuptake inhibitors, serotonergic tricyclic antidepressants, or hormonal approaches that prevent ovulation, such as some oral contraceptives, gonadotropin-releasing hormone agonists, danazol, and high-dose oestrogen. Psychological approaches, including cognitive/behavioural and relaxation therapy, may also be effective.

The treatment plan should be structured according to the patient's specific symptoms, past pharmacological treatment experiences, and other current and past health and contraceptive needs.

HOW SAFE ARE BIO-IDENTICALS?

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Those involved in the production of medicinal products, i.e. drug companies and manufacturers, state-appointed regulatory authorities, researchers, volunteers in clinical trials, doctors and patients all have deeply vested interests in the integrity and safety of commercial pharmaceutical products.

The safety of a potential medicinal agent is established incrementally through computer models, laboratory tests, studies with small numbers of volunteers, carefully controlled and monitored clinical trials and numerous publications in medical journals. The regulatory authority reviews and evaluates all these studies and papers to determine that the new product will provide health benefits that outweigh potential risks. This review process is ongoing and is crucially dependent on continual input from the biopharmaceutical company, doctors and patients. It is an ethical, and in most countries a legal, obligation to provide the regulating authority with reports of side-effects, adverse reactions or worse.

This paper seeks to assess the safety claims made for bio-identical hormones with respect to the medico-legal requirements for the registration of commercial hormones approved for use by a regulatory authority.

COMPARISON OF CARDIOMETABOLIC PROFILE AND BONE MINERAL DENSITY IN AFRICAN AND INDIAN POSTMENOPAUSAL WOMEN

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Aims: To determine the cardiometabolic risk profile and incidence of low bone mineral density in African and Indian postmenopausal women and to determine whether there is a correlation between cardiometabolic parameters and low bone mineral density.

Methods: A retrospective, descriptive study involving all Indian and African postmenopausal women referred to the menopause clinic at Inkosi Albert Luthuli Central Hospital (IALCH), Durban**.** Data were collected from the medi-com database using a structured questionnaire. Cardiometabolic data were analysed as continuous variables and summarised using means and standard deviations. Bone mineral density was treated as a quantitative variable and correlation analysis was used to assess relationships between the variables. This was done for each race group separately. Student's *t*-test was used to compare cardiometabolic variables between the two ethnic groups.

Results: 106 women were analysed (51 African and 56 Indian). In African and Indian women, the prevalence of hypertension was 54.9% v. 65.5%, the prevalence of diabetes was 31.4% v. 56.4%, the prevalence of dyslipidaemia was 17.6% v. 32.7%, and the prevalence of ischaemic heart disease was 17.6% v. 14.9%. The prevalence of low bone mineral density was higher in Indian women (40%) compared with African women (23.5%). The mean body mass index (BMI) of African women was significantly higher than Indian women, (33 v. 29). There were no significant differences between African and Indian postmenopausal women with regard to lipid profile, fasting glucose, fasting insulin and thyroid profile.

The mean bone mineral density (BMD) in the hip and spine was lower in Indian women compared with African women; however, the prevalence of osteopenia and osteoporosis was not statistically significant. Statistically significant positive correlations were observed between BMI and BMD ($p<0.001$) and weight and BMD ($p<0.001$), and statistically significant negative correlations were observed between serum LDL cholesterol values and BMD ($p=0.03$). There were no significant correlations between BMD and the remaining cardiometabolic variables (i.e. blood pressure, waist-hip ratio, clinical stigma of dyslipidaemia, clinical stigma of insulin resistance, cholesterol, HDL, triglycerides, fasting glucose, fasting insulin and thyroid function).

Conclusions: There is a high prevalence of cardiovascular risks and low BMD among the local menopausal population, irrespective of ethnicity. African and Indian postmenopausal women had a high prevalence of hypertension (60%), diabetes (44%), dyslipidaemia (25%) and obesity (54%). In African women, the incidence of low BMD was 35% in the hip, 53% in the neck of femur and 55% in the lumbar spine. In Indian women, the incidence of low BMD was 55% in the hip, 67% in the neck of the femur and 69% in the lumbar spine.

OSTEOPOROTIC FRACTURES IN AFRICAN AND INDIAN MENOPAUSAL WOMEN

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Aims:

- To determine the prevalence and risk factors for osteoporotic fractures in women attending IALCH Menopause Clinic
- To compare the prevalence of osteoporotic fractures between African and Indian women attending IALCH Menopause Clinic
- To determine the bone mineral density scores at which women sustain fragility fractures.

Methods: Retrospective review of postmenopausal women with and without fractures attending the menopause clinic at IALCH. Bone mineral density measurements for the lumbar spine and hip were performed with DEXA using the Hologic Discovery Bone Densiometry System®. Data were collected on a structured pro-forma including anthropometric data, medical and surgical histories and BMD values.

Results: The prevalence of osteoporotic fractures in the menopause clinic was 30%. Indian women had a higher prevalence than African women (39% and 27%, respectively) ($p=0.04$). The mean age of women attending IALCH Menopause Clinic was 58±7 years. The prevalence of fracture was significantly higher among women 65 years of age or older compared with women under 64. African women with fractures had a younger mean age of 61 years, and a higher mean BMI (34 v. 30) ($p<0.04$). Over half of Indian and African women with fractures suffered from some form of visual impairment (71% and 59%, respectively). The mean menopause age in the fracture subgroup was much lower in African women compared with Indian women (43 years v. 49 years) ($p=0.03$). Indian women with fractures had a higher prevalence of co-morbid diabetes than Indian women without fractures (43% v. 27%) or their African counterparts (43% v. 18%). African women commonly sustained appendicular (ankle) fractures (59%), and Indian women commonly sustained axial (hip) fractures (40%). Two-thirds of fractures occurred in women with T-scores between -1.0 and -2.5.

Conclusion: The prevalence of osteoporotic fractures at the IALCH Menopause Clinic is 30%. Osteoporotic fractures are more prevalent in Indian women. African women tend to have ankle fractures, with risk factors being age, high BMI, low BMD, visual impairment and an early age of onset of menopause. Indian women tend to have hip fractures, with risk factors being age, low BMD, visual impairment and co-morbid diabetes. Most women had fractures in the osteopenic range on DEXA.

AVOIDING ELECTIVE DELIVERY BEFORE 39 WEEKS

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A substantial amount of evidence indicates that the risk of neonatal morbidity is increased if delivery occurs before 39 weeks' gestation in the low-risk pregnancy. Certainly there are indications for delivery before this time, which can be life-saving and morbidity-preventing. For a variety of patient- and provider-driven reasons, however, elective delivery of the low-risk fetus is a frequent obstetric event. By avoiding elective early-term deliveries (36 weeks 0 days to 38 weeks 6 days), it is possible to improve neonatal outcomes, decrease the caesarean section rate, increase throughput in the labour ward, and decrease health care costs. This can best be accomplished by hospital-wide efforts to educate patients about the benefits of delivery at or after 39 weeks for themselves and their baby, 'hard stops' in the scheduling process to require that a mother be at least 39 weeks or have a medical indication for elective delivery, and a robust peer-review process to encourage medical staff adherence to these policies. Lessons learned from the Perinatal Quality Collaborative of North Carolina '39 Week Project', which decreased the rate of elective early-term deliveries in 33 participating hospitals in North Carolina by 45%, will be presented.

PREVENTION OF PRETERM BIRTH

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Preterm birth remains one of the most difficult challenges in perinatal practice. It is a major determinant of neonatal mortality and morbidity, and the long-term consequences are enormous. These consequences embrace a number of areas and can be described in terms of medical, social, sociological and economic costs. The 'medical cost' alone in North America in 2005 was greater than $26 billion.

Approximately 80% of cases relate to so-called idiopathic preterm labour, with 30% of the total being associated with preterm rupture of the membranes. Depending on the health care system, as much as one-fifth of cases may be the result of medical interventions.

The proper categorisation of preterm birth in terms of aetiology remains problematic and the global incidence is therefore challenging to determine. A recent WHO review estimated that about 12.9 million births worldwide were definable as preterm, with 85% being concentrated in Africa and Asia.

The strategies for prevention of preterm labour must be built upon an understanding of the aetiology. This is complex, multifactorial and ill understood. Aetiological factors include infection/inflammation, cervical disease and its treatment, domestic violence, low maternal weight, dental caries and general social factors. Consequently it is unlikely that any single intervention will be uniformly effective in adequately reducing the burden of preterm labour on patients and the community. A number of approaches can be taken, and may be pre-conception, post-conception and perinatal.

Suggested preconception measures for primary prevention include general health improvement and a reduction in CIN and therefore in CIN treatments that may interfere with cervical competence. This may require interventions such as HPV vaccination.

Reductions in fetal malformation rates with, for example, widespread folate supplementation in populations at risk should be a simple, cost-effective measure.

In communities with widespread access to assisted conception programmes, the limitation of numbers of transferred embryos and regulation of ACS generally will limit the multiple pregnancy burden on preterm birth.

Post-conception interventions that have been advocated include bed rest, sexual abstinence, reduced caffeine intake, reduced recreational drug use, reduced smoking, and domestic violence identification and, one presumes, eradication. To say that the evidence base for any of these interventions is substantial is misleading!

Possible strategies include social, interventional, medical and surgical. For the obstetrician, technical interventions such as cervical cerclage, remain attractive and may play a role. The development of agents such as the oxytocin receptor blocker atosiban is promising and may reduce the morbidity of preterm delivery.

However, until a better understanding of a final common pathway is elucidated, possibly including a role for progesterone, the solution will remain elusive.

NON-INVASIVE PRENATAL DIAGNOSIS: THE FUTURE IS HERE

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Objectives: Prenatal diagnosis of chromosomal and single-gene disorders relies on fetal cells obtained by invasive procedures that carry a small but significant risk of fetal miscarriage. It is known that small fragments of cell-free fetal DNA and fetal cells traffic into the maternal circulation, and can be recovered from maternal blood. Both these fetal materials have a specific place in prenatal diagnostic technologies. We hypothesised that fetal cells could be isolated from maternal blood and used for non-invasive prenatal diagnosis.

Design & method: We have developed a method to isolate fetal nucleated red blood cells from maternal blood and identify the cells as fetal using epsilon-globin. Recently we harvested and studied fetal nucleated red blood cells from trophoblast villus samples, and have identified specific fetal cell surface antigens that can be used for isolating these cells from maternal blood. We have then recovered fetal DNA from these cells and used them for studying the fetal genetic status.

Results & conclusion: Our own work has shown that non-invasive prenatal diagnosis using fetal cells from maternal blood is now possible. What remains is to develop the technology into a robust and reliable clinical test. I will also be discussing the place of cell-free fetal DNA in screening for fetal aneuploidies, and how this technology compares with the use of fetal cells derived from maternal blood. Using both these technologies, it is likely that amniocentesis and other invasive fetal testing methods will soon become obsolete.

COMPULSORY NOTIFICATION OF MATERNAL DEATHS IN SOUTH AFRICA: WHAT ARE THE GAINS?

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Compulsory notification of maternal deaths in South Africa began in October 1997. This enabled the establishment of the National Committee for the Confidential Enquiries into Maternal Deaths (NCCEMD) by the Minister of Health. The terms of reference of the NCCEMD are to make recommendations based on the analysis of maternal deaths in South Africa that will reduce the number of maternal deaths in South Africa. The NCCEMD is not an implementation body; implementation is a function of the national and provincial Departments of Health. The recommendations are included in the Saving Mothers reports. Since its establishment there have been five *Saving Mothers* reports, from 1998 to 2010. The question above can be rephrased as 'What impact has the NCCEMD and through it the Saving Mothers reports had on maternal care in South Africa?' Below is a short list.

1. Causes (both pathological and health system failures) of maternal deaths have been established.
2. Guidelines for maternity care for South Africa have been developed.
3. Changes in patterns of disease resulting in changing practice (e.g. obstetric haemorrhage, HIV, anaesthesia) have been detected.
4. Priority areas that need intervention have been determined.
5. Recommendations developed have been included in the health strategy of the national Department of Health, thus impacting on health policy.
6. Development of programmes such as ESMOE and their national scale-up have been stimulated.
7. Essential data for establishing the MMR for SA have been provided.
8. Communication between government structures, universities and other health structures has been facilitated.

Essentially the gains have been in:

- Knowledge
- Communication
- Direction.

The talk will use the 2008 - 2010 *Saving Mothers* report to illustrate the various points.

ROBOTIC SURGERY IN UROGYNAECOLOGY: AN OVERVIEW

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In recent years there has been a growing recognition that adequate support of the vaginal apex is an essential component of a durable surgical repair for pelvic organ prolapse. Sacrocolpopexy (SCP) is considered the gold standard surgical procedure for the repair of level I pelvic support defects with excellent long-term results. A recent randomised controlled trial demonstrated superior efficacy of laparoscopic SCP to the total vaginal mesh procedure in women with vaginal vault prolapse, providing further evidence that SCP is the procedure of choice for these patients. The **advantages** of SCP include:

1. Reduced risk of mesh exposure compared with insertion of vaginal mesh
2. Preservation of vaginal length
3. Reduced risk of re-operation for symptomatic recurrent prolapse
4. Reduced risk of *de novo* dyspareunia secondary to mesh contraction.

While a small number of surgeons are able to accomplish SCP using standard laparoscopic techniques, the majority of these procedures are still performed via laparotomy because of challenges encountered with extensive suturing and knot-tying. The **disadvantages** of the open SCP procedure include increased pain, postoperative time for recovery, and length of hospital stay. With the introduction of the da Vinci® robot, the feasibility of more surgeons performing this operation through a reproducible, minimally invasive technique has greatly expanded. The steep learning curve that is inherent in mastering intracorporeal knot tying and suturing using standard laparoscopy is greatly diminished by the use of articulating instruments, making it an accessible option for all gynaecological surgeons treating women with pelvic organ prolapse. In this lecture, I will detail the steps involved in completing an efficient robotic-assisted SCP utilising a y-shaped polypropylene mesh graft that is exactly modelled after the open technique.

VIRTUAL REALITY 4D INVESTIGATION OF THE PELVIC FLOOR

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Objectives: The levator ani is thought to be of great importance for pelvic organ support. It has been shown in a computer-outlined model from MRI imaging that the levator hiatal area is visualised as a non-Euclidean hyperbolic (convex and concave) structure. Transperineal ultrasound is a cheaper non-invasive investigation method utilised for obtaining imaging of the levator hiatus area. However, measurements are still performed in 2D dimensions and might over- or underestimate the 'real dimensions' of the levator hiatal area. Virtual reality is a novel method of visualising ultrasound data with the perception of depth and offers possibilities for measuring non-planar structures. In the I Space virtual reality system the convex and concave features can be visualised, allowing measurements of the 'real' hiatus. This study compares levator ani hiatus volume (LHV) measurements obtained in 2D (ultrasound) and 3D (virtual reality) and attempts to establish their reproducibility.

Design and methods: 100 symptomatic patients visiting a tertiary pelvic floor clinic with a normal intact levator ani muscle diagnosed on translabial ultrasound were selected. Datasets were analysed using a rendered volume with a slice thickness of 1.5 cm at the level of minimal hiatal dimension during contraction and valsalva. The levator area (cm^2) was measured in conventional 2D ultrasound and multiplied by 1.5 to compare with the levator ani hiatus volumes in 3D (cm^3). Secondly, levator ani hiatus volume measurements were measured semi-automatically in virtual reality (cm^3) using a segmentation algorithm. The reproducibility analysis was performed in 20 randomly chosen patients.

Results: Measurements obtained in 3D were slightly smaller than in 2D; the mean difference in levator ani hiatus volume between 2D and 3D measurements in contraction was 0.10 cm^3 (95% CI -0.15 - 0.35) and in valsalva 1.16 cm^3 (95% CI -0.56 - 1.76) cm^3) (not significant). The intraclass correlation coefficient (ICC) comparing 2D ultrasound with 3D virtual reality measurements was >0.96. Intra-observer and inter-observer ICCs for 2D measurements were >0.94 and for virtual reality measurements >0.97, both

indicating good reliability. Patients with prolapse symptoms had significant larger LHV measurements in valsalva utilising both methods.

Conclusions: Levator ani hiatus volume 3D measurements performed using virtual reality were reliable, and the results were similar to those obtained with conventional 2D ultrasound.

ULTRASONOGRAPHIC ASSESSMENT OF POSTERIOR COMPARTMENT DISORDERS

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Background: Currently, diagnostic evaluation of pelvic floor disorders of the posterior compartment can be performed with clinical examination, anorectal physiology tests, and defecography. Dynamic magnetic resonance imaging (MRI) is performed only occasionally owing to cost and access restrictions. The increasing availability of ultrasound (US) equipment in the clinical setting, and the recent development of three-dimensional (3D) and four-dimensional (4D) US, have renewed interest in using this modality to image pelvic floor anatomy as a key to understanding dysfunction. Ultrasound has several important advantages over other imaging modalities: absence of ionising radiation, relative ease of use, minimal discomfort, cost-effectiveness, limited time requirement, and wide availability.

Methods: Standardisation of ultrasonographic techniques (endovaginal, EVUS; endo-anal, EAUS; translabial, TLUS) for pelvic floor imaging (equipment, patient preparation and patient position, technique of examination, image orientation and imaging planes, manner of performing measurements) is essential for reliability and repeatability. 2D-TLUS by using conventional convex transducers provides a mid-sagittal view of the pelvic floor, including the symphysis pubis anteriorly, the urethra and bladder neck, the vagina, cervix, rectum and anal canal, and allows a functional assessment of the pelvic organs. 3D-EVUS performed with a 360° field of view transducer is used to provide a topographical overview of pelvic floor anatomy and for the assessment of pelvic floor muscles (levator ani, perineal muscles) and fascial structures (pubocervical fascia, paravaginal tissues). 3D-EAUS is useful in assessing the characteristics of the internal and external anal sphincters.

Applications: Combining TLUS, EVUS and EAUS has the potential to complement the advantages and overcome the limitation of each of these modalities and substantially improve the clinical management of posterior compartment disorders. The greatest utility of this ultrasonographic 'integrated approach' is the identification of both anatomical and functional abnormalities of the pelvic floor. Damage to musculofascial systems that support the pelvic organs, such as levator ani (LA) avulsion defects, abnormal LA contractility, pathologically enlarged levator hiatus (ballooning), defects of the rectovaginal septum and anal sphincter and perineal muscle lesions, can be assessed. Ultrasonography also has the advantage of evaluating pelvic floor function with dynamic manoeuvres and helps in differentiating the mechanisms of obstructed defecation syndrome (rectocele, enterocele, intussusception, mucosal prolapse, pelvic floor dyssynergy). Moreover, US is firmly established as the gold standard investigation for the assessment of fecal incontinence.

Conclusions: Ultrasonography should be performed as the initial test or screening method in posterior compartment disorders. Positive findings on US may avoid more invasive tests, whereas negative findings may require confirmation by proctography or MRI in symptomatic patients. Current research is being directed towards the impact of imaging on patient outcomes in both the short and long term.

LAPAROSCOPIC REPAIR OF UROGENITAL FISTULAS

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The management of urogenital fistulas is a challenging condition for the pelvic surgeon. The abdominal approach has been advocated for patients with inadequate vaginal exposure, fistulas in close proximity to ureters, those associated with pelvic pathology, multiple fistulas and high (vault) fistulas. This access route is associated with increased morbidity and prolonged hospitalisation and recovery time.

Laparoscopy, which is minimally invasive, is associated with a shorter hospital stay, quicker recovery time and minimal scars. Furthermore, it allows for magnification, and better access to pelvic pathology. We share our experience with 3 cases of high vesicovaginal fistulas (VVF) following abdominal hysterectomies (2 for fibroids and 1 for ca ovary) and 2 cases of uterovesical fistulas (UVF) following caesarean sections.

VVF: The patients were aged 41, 47 and 45 years. Their BMIs were 31.2, 32.4 and 28 and the time from hysterectomy to diagnosis of the fistula was 2, 10 and 4 months, respectively. Initial management involved cystoscopy, ureteric stenting and identification of the fistulous tract. A left upper quadrant approach using a Veress needle for insufflation and a 5 mm trocar and telescope for visualisation was utilised. Adhesiolysis and enterolysis were performed using a harmonic scalpel until the bladder and the vault became accessible. Bladder cystotomy was done and dissection to the fistulous tract was aided with a vaginal probe. Dissection of the fistulous tract was achieved with sharp scissors and the dissection continued beyond the tract to allow for healthy tissue margins to facilitate closure. The defect in the vagina was closed with 2.0 Vicryl in a transverse fashion so that the pneumoperitoneum could be maintained, and the bladder was then sutured vertically in 2 layers using Vicryl 2.0 on an SH needle. Tissue glue was used over the bladder suture line in 2 cases. A three-way Foley's catheter was then inserted and kept *in situ* for 28 days.

The average surgical time was 147 (range 130 - 170) minutes and the hospital stay was 8 (5 - 12) days. There were no surgical complications. At 3 months, one patient developed a recurrent VVF following a motor vehicle accident. This was successfully repaired 4 months later using an extraperitoneal approach.

UVF: The patients' ages were 30 and 32 years and both had had 2 previous caesarean sections. Incontinence occurred 1 and 2 months after the CS and diagnoses were made 12 and 14 months later. Both patients had cyclical lower abdominal pain, but there was no cyclical haematuria or irritative bladder symptoms. Cystoscopy was performed, the ureters were stented and laparoscopic repair was done. The bladder was densely adherent to the uterus in both cases and a uterine curette for manipulation of the uterus assisted in the dissection. Surgical operative time was 130 and 140 minutes. At 6 months after surgery, both patients were continent.

Laparoscopic VVF repair following hysterectomy and UVF repair following caesarean section is feasible and associated with good outcomes.

PCOS: AN UPDATE

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Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder in women of reproductive age, affecting 5 - 10% of this population. This complex disorder has a widely heterogeneous presentation, which can make the diagnosis challenging. There are several sets of clinical criteria that can be used to make the diagnosis of PCOS, and controversies exist over the pathognomonic features of this condition. Chronic oligo-anovulation and hyperandrogenism are the hallmark features of PCOS, but polycystic ovaries on pelvic ultrasound are also considered when making the diagnosis. Other conditions associated with PCOS include obesity, insulin resistance, hyperglycaemia, dyslipidaemia and abnormal uterine bleeding. PCOS is considered a polygenic disorder, and environmental exposures and lifestyle (i.e. diet and exercise habits) have marked influence on those with PCOS. This presentation will review the diagnostic criteria for PCOS, metabolic issues associated with PCOS, and treatment options including strategies for ovulation induction.

POLYCYSTIC OVARY SYNDROME IN YOUNG WOMEN

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Polycystic ovary syndrome (PCOS) is the commonest endocrinopathy in women of reproductive age. Usually young patients present with reproductive disorders and in later years the metabolic consequences of this syndrome impact on their long-term health.

PCOS clusters in families and to date a clearly defined mode of inheritance has not been identified. It is, however, obvious that if a woman has a sister or a mother affected with this condition, they may well also present with PCOS at some time during their reproductive life.

Adolescent girls with PCOS may have had a low birth weight or precocious pubarche and present with hirsutism, ovarian hyperandrogenism and menstrual dysfunction. In addition they often have metabolic disturbances which are evident at a very young age; these include dyslipidaemia and hyperinsulinaemia. Genetic predisposition and environmental impact both play a role in the development of PCOS in young women. An adverse intra-uterine environment, the endocrine changes associated with puberty and the development of obesity all impact on women with the necessary genetic predisposition and result in the development of PCOS.

Treatment of young women is important because we are offered an opportunity to change their long-term health outcomes and impact on cardiovascular and endocrine disorders.

There is considerable controversy as to how best to manage young women, and undoubtedly the first line of therapy remains lifestyle changes before any necessary pharmacological treatment is instituted. It is important to protect the endometrium, and conditions such as hypertension and dyslipidaemia must receive appropriate attention.

What is often not appreciated is the psychological impact of this condition on affected women. In studies assessing mental health, these patients have been shown to have a worsened quality of life, and are often anxious and depressed. This is partly due to the impact of a chronic disease which will have long-term implications and partly due to patients' perception of the effects of PCOS such as hirsutism and infertility on them personally. Ideally any clinic should include appropriate counselling and supportive facilities.

Therapeutic needs must be carefully assessed and optimally managed with our current available treatment. Patients need to understand that they will require long-term therapy and careful ongoing assessment.

The diagnosis of the young woman with PCOS offers us one of those rare opportunities in our clinical practice to influence ongoing health outcomes. If we counsel appropriately, arrange for long-term therapy and ensure that patients return for follow-up, we may well positively affect their future health and morbidity.

OVARIAN ENDOMETRIOSIS: A SURFACE DISEASE, OR IS IT?

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Ovarian endometriosis and especially endrometrioma is an extremely complex condition. Two major types of endometrioma are found, namely a pseudocyst and a true cyst. In the case of a pseudo cyst, the ovary is found to be adherent to the posterior side of the parametrium or the ovarian bed on the lateral pelvic wall. The inside wall of a pseudocyst is constituted by ovarian cortex which is invaginated into the ovarian stroma. At the site of the adhesion, endometriosis can be found. The invaginated pseudocyst is found to contain superficial endometriosis which can be seen when performing a 'cystoscopy' and also when doing histology thereof. According to Hughesdon, invagination of the ovarian cortex into the stroma involves an active process. Cystic corpora luteum and lutein cysts are frequently found in association with an ovarian endometrioma.

The true ovarian endometriosis cyst probably has its origin from coelomic metaplasia of invaginated epithelial inclusions of ovarian cortex origin. Bleeding (menstruation) from the resulting endometrial tissue then leads to cyst formation surrounded by fibrosis from the ovarian cortex. Stretching of the cyst wall leads to an increase in its diameter, whereas the hilus area is less stretched and contains markedly more primordial follicles.

The origin of ovarian endometriomas favours a surface origin by implantation of endometrium (endometriosis) or by coelomic metaplasia of pelvic mesothelium (surface).

Surgical management should consider these two different conditions with a difference in pathogenesis by either partial cystectomy or drainage and vaporisation of the endometrial tissue on the inside of the cyst wall. The author therefore recommends a mixed approach of partial excision of the cyst wall and ablation of intracystic endometriotic tissue, as proposed by Donnez and Brosens.

REPRODUCTIVE PERFORMANCE OF WOMEN WITH UTERINE ANOMALIES

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Müllerian anomalies, or congenital anomalies of the female reproductive tract, may involve the uterus, cervix, fallopian tubes or vagina. Uterine anomalies are the most common of the müllerian anomalies, and include unicornuate, didelphys, bicornuate, septate, arcuate and diethylstilboestrol-exposed uteri. Although women with uterine anomalies can have normal reproductive outcomes, these anomalies are associated with adverse reproductive outcomes such as recurrent pregnancy loss, second trimester pregnancy loss, cervical incompetence, intra-uterine growth restriction, malpresentation and preterm delivery. It is important to recognise that uterine anomalies do not cause infertility. Approximately 3 - 4% of fertile and infertile women have a uterine anomaly, but the true incidence of these anomalies is unknown since many women are asymptomatic, and only recently have sensitive imaging modalities such as magnetic resonance imaging (MRI) and three-dimensional ultrasound been utilised. A high index of suspicion for a uterine anomaly is warranted in reproductive age women with pelvic pain, dysmenorrhoea, recurrent pregnancy loss, second-trimester pregnancy loss or preterm delivery. Surgical correction of a uterine anomaly can be a major procedure, and is not always feasible. However, the septate uterus can be surgically repaired with hysteroscopic metroplasty, and an improvement in obstetric outcomes has been demonstrated. There are no guidelines for the appropriate management of an infertile woman with a uterine anomaly, but surgical correction of a uterine septum and judicious fertility treatment to minimise the risk of a multiple gestation are commonly recommended.

PROGESTERONE IN PRETERM LABOUR PREVENTION

K P Hanretty
University of Glasgow

Since the pioneering work of Csapo in the 1950s, progesterone has been implicated in one way or another in the physiology and pathophysiology of birth. His theory of seesaw progesterone activity, with progesterone withdrawal or reduction facilitating uterine contractions, has always been attractive. However, absolute levels of progesterone do not appear to directly relate to timing of onset of labour in humans, although they do in almost all other mammalian species.

Undoubtedly, however, the role of mifepristone in pregnancy demonstrates the significant interaction between the progesterone receptor and pregnancy maintenance.

Unfortunately although many studies have investigated progesterone in preventing, for example, preterm labour, of over 700 such studies investigated by McKenzie *et al.* only 3 could be included in a meta-analysis examining treatment in the 2nd trimester. This particular meta-analysis showed that progesterone treatment in women at risk of preterm labour almost halved its occurrence.

Dodds *et al.* in a later meta-analysis demonstrated reduction in preterm birth, low birth weight and intraventricular haemorrhage. Similar findings were achieved in a meta-analysis by Sanchez Ramos *et al.* Unfortunately, the difficulties in assessing studies of progesterone relate to three major issues: the first of these is the gestation of onset of use, the second is the formulation used and the third is route of administration.

It does seem from one meta-analysis that treatment before 20 weeks' gestation in order to reduce preterm labour in a low-risk population confers no benefit.

With regard to formulation, there are no clear data on any advantage or disadvantage of 17-hydroxyprogesterone versus progesterone or of a specific route of administration, whether it be intramuscular, vaginal or oral.

Another confounding variable in reaching conclusions regarding progesterone relates to differing research methodologies, and randomised controlled trials in this context are relatively uncommon, although this is undoubtedly changing.

A further variable is the use of different recruitment criteria such as history of previous preterm labour, cervical length assessed by ultrasound, and/or presence of fetal fibronectin.

Notwithstanding the significant gaps in knowledge regarding the role of progesterone, a number of bodies have made recommendations on the potential for use. ACOG in a 2003 technical bulletin recommends progesterone as a potential treatment, and this may well be the reason why the prevalence of progesterone use virtually doubled from 38% between 2003 and 2005. In a similar population, but in Canada, progesterone use was neither common nor increasing in frequency.

Progesterone does however seem to be safe, but the data on this seemed to be predominantly observational from its use in luteal phase insufficiency and in recurrent pregnancy loss. One study appeared to show an increased incidence of gestational diabetes in women treated with 17-alpha-hydroxyprogesterone preparation compared with controls. What is clear is that there is a need for further research relating to progesterone formulation, route of administration and optimal dose, as well as the gestation at which treatment for prevention should begin.

On this basis a number of authorities have recommended that women should be recruited into the ongoing studies of progesterone in reducing preterm labour incidence but that they should be informed about the lack of available

data with particular regard to neonatal perinatal outcome measures. Data do support the application of progesterone treatment in women with a short cervix between 22 and 26 weeks, but therapy should be started after 20 weeks and stopped when risks related to immaturity in specific neonatal units are low.

If progesterone is to be used, data suggest that in women with a history of previous preterm labour 17-alpha-hydroxyprogesterone should be given weekly intramuscularly.

There is also some justification for the use of progesterone 200 mg daily by the vaginal route for those with a short cervix.

However, the question about the role of progesterone in preventing preterm labour remains 'where now?' There are at least two well-conducted randomised controlled trials in progress.

IUGR: PRENATAL ASSESSMENT

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Fetal growth can be restricted for a variety of maternal and fetal reasons. Fetuses who are small for gestational age (SGA) are by definition less than the 10th percentile for fetal weight. A significant proportion of SGA fetuses are constitutionally small fetuses without pathology In addition, some SGA fetuses are small due to intrinsic fetal disease, such as fetal alcohol syndrome, aneuploidy or infection. IUGR refers to a situation in which a fetus has failed to reach its potential growth due to restriction of delivery of nutrients or normal acid base clearance. Some IUGR fetuses will have an estimated fetal weight in excess of the 10th percentile. IUGR fetuses are at risk of stillbirth, significant neonatal morbidity, prematurity and long-term health consequences. It is the responsibility of the provider of obstetric care to identify the growth-restricted fetus by identifying risk factors for impaired fetal growth and then monitoring fetal wellbeing in order to affect delivery at a time that optimises neonatal outcome. In addition, the provider of care must identify the normal but small fetus and avoid unnecessary intervention. Strategies to assist the obstetrician with this work will be discussed, including risk assessment, antenatal monitoring, and ultrasound including Doppler assessment.

NIFEDIPINE AND FETAL AND UTEROPLACENTAL BLOOD FLOW

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University of Glasgow

Nifedipine has been used in pregnancy for over 25 years. Its initial use was in acute hypertensive complications of pregnancy, but more recently it has also been used as a tocolytic. Nevertheless, knowledge of the effects of nifedipine in pregnancy is relatively modest.

Use in early pregnancy is not advocated but does not appear to be associated with teratogenesis, despite the fact that dihydropyridine-class drugs are associated with cleft palate and digital abnormalities in rats and rabbits exposed in early pregnancy.

It is true that there are still no adequate well-controlled studies in pregnant women, and the manufacturers maintain that nifedipine in particular should be used only when the potential benefit justifies a potential risk to the fetus.

Concern regarding the effect of antihypertensives in pregnancy is related to the theoretical and perhaps actual risk of reduced uteroplacental perfusion. Doppler ultrasound of uteroplacental and fetal vessels, done for the first time in the 1980s, permitted some evaluation of blood flow patterns within the fetal and placental vasculature and nifedipine was investigated at a relatively early stage. It may well be that calcium channel blockers in general may impair uterine blood flow, although there is no consensus about the effect in human pregnancy. Nifedipine loading for tocolysis has been used more recently and, importantly, in the absence of maternal cardiovascular side-effects, Doppler parameters in the placental vessels and in middle cerebral arteries appeared unaffected by nifedipine. More recent studies have reviewed the role of this class of drugs. One of the limitations of studies to date, however, is an absence of consideration of gestation of use, loading dose versus maintenance dose, and the implications of long-term therapy. Co-administration with other agents such as betamethasone has also been inadequately investigated. Only with a clear understanding of the clinical pharmacology of drugs such as nifedipine will a treatment protocol be designed that incorporates this knowledge to optimise outcome for mother and fetus.

PRIMARY OVARIAN INSUFFICIENCY

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Primary ovarian insufficiency (POI) affects 1 in 100 women before the age of 40. Women with POI may present with primary or secondary amenorrhoea, amenorrhoea after discontinuation of oral contraceptive pills, menstrual irregularity or abnormal bleeding, infertility or symptoms of oestrogen deficiency. It is important to recognise that in women with POI, irregular bleeding patterns may predate amenorrhoea, and since menstruation is a unique indicator of a woman's health, persistent changes in menstruation warrant evaluation. The most common aetiologies of POI include sex or autosomal chromosome abnormalities, auto-immune disorders and environmental insults. However, the aetiology of approximately 90% of POI cases is undetermined. Premature deprivation of sex steroids sets into motion a cascade of events that targets the urogenital, skeletal, cardiovascular and neurocognitive systems, and leads to global health deterioration in a subgroup of women years before the typical onset of natural menopause. Women with POI warrant treatment with hormone replacement therapy until the natural age of menopause to control symptoms and mitigate organ system-specific sequelae. However, women with POI often demonstrate intermittent ovarian function and oestrogen production, so it is important not to consider this a permanent condition, as presumed by the phrase 'premature ovarian failure'. In fact, up to 5 - 10% of women with POI may conceive spontaneously. Various treatment regimens exist, and involve oral, transdermal and intra-uterine therapies to provide the appropriate hormone replacement. However, treatment should also include psychological counselling and a discussion of fertility options.

WORK-UP OF THE INFERTILE COUPLE BY THE GENERAL GYNAECOLOGIST

T Matsaseng

Introduction: The prevalence of infertility is estimated to be approximately 15% worldwide and to be as high as 30% in the developing countries. According to the International Conference on Population and Development and the ESHRE special task force, infertility should be recognised as a public health issue. Therefore all of us should be involved with the initial work-up and further management principles of these couples.

Assessment and recommendations: There are multifactorial causes of infertility. Under the current climate of evidence-based practice and good clinical practice, the purpose of the presentation is to critically evaluate the investigations that are associated with improved fecundity and fecundability rates. Different modalities to assess tubal damage, ovulation disorders, uterine abnormalities and male factor will therefore be discussed in detail.

Furthermore, the role of additional investigations such as ovarian reserve testing, endocrine evaluation and routine hysteroscopy as part of the initial work-up will be debated.

Appropriate time to initiate special investigations following thorough clinical evaluation will also be discussed.

Conclusion: The treatment of infertility is likely to be improved by timeous investigations, relevant and accurate testing and appropriate referral.

IS ASSISTED REPRODUCTION AFFORDABLE IN AFRICA?

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Financial strain is generally a problem for patients with a low to middle income seeking reproductive assistance. This universal dilemma was emphasised by the recent global recession, which led to general reassessment of procedures and processes within health care systems. Basic, simplistic, low-cost, minimal stimulation, affordable and accessible assisted reproduction technologies (ART) are terms/concepts used to address aspects of cost-effective, simpler versions of ART.

The opinions of various national/international professionals (fertility and social science specialists, an anthropologist and virologist who are associated with ART) will be shared, regarding the following questions:

- Is ART justifiable in a developing country?
- What are the major cost components per patient/ART cycle in South Africa versus a European country, e.g. Belgium?
- What are the minimum standards, requirements and cost to establish an ART lab in an African setting?

- Is affordable ART only a balance between expenditure and success of procedures, as well as the income of the people who live in an area?
- What are the inclusion and exclusion criteria to provide ART in a patient-friendly, affordable manner?
- Should HIV-discordant or concordant couples participate in such programmes?

Screening and selection of patients using inexpensive first-line diagnostics, minimising preliminary treatments, batching of patients for ART procedures, and using simpler media formulations, equipment and devices are elements that have been or are under investigation. Discussions are also ongoing on alternative ART laboratory training methods and methodologies versus rigorous tuition and protocol.

It should be noted that 'the terminology *"Affordable ART"* has a relative meaning depending on the region of the world or within a health care setting'. Some patients may or may not qualify for less detailed and simpler ART procedures, in which case a custom-made approach would be beneficial. Investigations may not overturn solid existing principles, but could conceive novel solutions to age-old problems, adding new perspectives and innovative approaches.

IS CANCER ON THE INCREASE WORLDWIDE?

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While surgical techniques, chemotherapy and radiation therapy have continued to evolve over the past several decades, cervical cancer is the only gynaecological cancer the incidence of which has significantly declined, as a result of cervical cancer screening, in countries where screening is available. The incidence and mortality of both endometrial and ovarian cancer have slightly increased. During this presentation we will discuss the risk factors for these cancers and potential prevention strategies

HUMAN PAPILLOMAVIRUS: ASSOCIATION WITH CERVICAL CANCER

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Introduction: Accurate current knowledge of the prevalence of genital hrHPV in different developing countries is essential for cost analysis and planning for regionally tailored national prevention and screening programmes.

Epidemiology: Cervical cancer develops as a consequence of infection with oncogenic human papillomavirus (HPV). Various co-factors play a role in the persistence of the infection and in the development of invasive cancer. In South Africa and sub-Saharan Africa co-infection with HIV and the associated immune depletion is without doubt the most dramatic and influential of these. The influence of a high prevalence of untreated HIV infection in the population is expected to influence the epidemiology of HPV and may influence the type distribution, not only in the general population but also among cervical lesions.

HPV epidemiology in Africa and South Africa: Regional differences exist in HPV infection and both local prevalence and type distribution are highly relevant factors to take into account in the development of cervical cancer prevention programmes. In contemporary local data collected among women of reproductive age and from a population with a high prevalence of HIV infection, the prevalence of pre-invasive disease (HSIL) was found to be 11.2% in women 35 and younger, and 7.3% in women >35 years. The incidence of hrHPV infection was 55.3% for the group (65% in women 35 and younger, 50% in women >35).

HPV types in cervical cancer: Worldwide the most common eight HPV types found in association with cervical cancer remain more or less constant and are generally quoted as HPV types 16, 18, 31, 33, 35, 45, 52 and 58. The most striking difference in South African and African data is that type 35 is much more common than in Western and Asian countries and is associated with up to 10% of cases. Types 31 and 58 are less frequently encountered and type 52 is of more importance than in other regions.

In a local study using RNA and DNA analysis of biopsy material, one of these eight most common oncogenic types were responsible for at least 159 of the 183 cases. An additional six tumours contained multiple types from this group. These tumours are almost definitely caused by one or more of the same group of viruses, although the specific type could not be confirmed. In this study 90.2% of cervical cancers were caused by HPV alpha virus numbers 7 and 9, while only 4.4% were probably caused by HPV types from other alpha species including alpha 5, 6 and 11. Eight tumours (4.4%) could not be explained at all using the specific technology and conditions.

Conclusion: The epidemiology of HPV in the general population and in women with pre-invasive disease is of huge importance to calculate the effect of different screening and vaccination options. Of even greater importance are local data reflecting common true carcinogens in our unique population.

SURGERY FOR UTERINE SARCOMA

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Uterine sarcomas are often highly malignant and comprise 3% of all uterine malignancies. The 3 most common types (90% of the total) are carcinosarcoma (MMMT), leiomyosarcoma and endometrial stromal sarcoma.

FIGO changed the staging of sarcomas in 2009 to guide management and diagnosis.

Carcinosarcoma is usually managed by simple hysterectomy with proper washings and adnexectomy. Systematic pelvic (and perhaps para-aortic) lymph node dissection is essential, but it is still unclear whether lymph node dissection improves patient survival (Nam 2011).

Leiomyosarcoma is treated by simple hysterectomy due to low risk for ovarian metastases (salpingo-oophorectomy not essential). Lymph node dissection is not indicated. In the case of isolated lung metastases surgery may play a role.

In the management of endometrial stromal sarcoma, lymph node dissection is not recommended in apparent early disease due to low risk for metastases (only 5.5% in 1708 cases) (Nam 2011).

Complete surgical resection is the only curative treatment modality for uterine sarcomas.

THE MANAGEMENT OF STRESS URINARY INCONTINENCE USING TRANS-OBTURATOR TAPES IN A TERTIARY HOSPITAL IN SOUTH AFRICA

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Introduction: Stress urinary incontinence (SUI) is a distressing condition with social and economic implications, affecting up to 20% of women. Surgical treatment remains the most effective therapeutic option. Many surgical procedures have been described for the treatment of SUI. Since 1995, the tension-free vaginal tape (TVT) has completely modified the field of surgical treatment of SUI. More than a million TVTs have been inserted worldwide with excellent results. The TVT procedure involves a retropubic approach and has been associated with a number of operative complications, mainly bladder and urethral perforations, haemorrhage and bowel perforations. To avoid such complications, a transobturator approach has been developed. This method (termed outside-in), in which the needle passes first through the obturator fossa, was found to be safer.

Methods: The study included 168 patients referred to the pelvic floor clinic with symptoms of SUI during the period April 2005 - March 2011. Included were 5 patients with overflow incontinence who agreed to intermittent self-catheterisation, and 4 patients with mixed urinary incontinence. The ages of the patients ranged from 28 to 84 years (mean 55.3 years). Parity varied between P0 to P6 (mean 2.1). Previous operations included 18 anterior repairs, 28 total abdominal hysterectomies, 16 vaginal hysterectomies and 1 PIVS. All the TOT procedures were performed at Johannesburg Hospital and all the cases were done by the same surgeon, the author. The TOTs were inserted according to the original technique (Delorme, prog.urology 2001;11:1306-1313). Five different transobturator systems were used (IVS-O 141, ARIS 19, Monarc 2, Obtryx 2, Cousin 4). Additional operations during the TOT procedures include: 4 vaginal hysterectomies, 3 laparoscopic-assisted vaginal hysterectomies, 3 posterior IVS, 6 anterior repairs, 7 posterior repairs, 1 removal of IUCD, 2 laparoscopic sterilisations, 2 laparoscopic cystectomies, 1 Fenton's procedure and 1 labial cyst removal.

Results: All cases were successfully completed. During follow-up, the objective cure rate was 96.5%. Operation time varied between 15 and 80 minutes (mean 39.5 minutes). The operation time for the patients who had only TOTs inserted varied between 12 and 30 minutes (mean 19.3 minutes). Postoperative hospital stay varied between 1 and 3 days (mean 2.1 days). Intra-operative complications included 2 bladder perforations and 2 vagina perforations. Both

complications were corrected and the procedure completed successfully. There were no cases of excessive bleeding or need for blood transfusion. Follow-up was performed at 6 weeks, 6 months, 1 year, and thereafter yearly. One tape erosion was detected at the 1-year follow-up and removed, and there were 2 failures at the 6-month and 1-year follow-up. New tapes were inserted and the patients were cured. One case of urge incontinence at the 6-week follow-up was treated with anticholinergic drugs.

Conclusion: The results from our study show that TOT is a simple, effective and safe procedure for treating stress urinary incontinence. The procedure is comparable to other surgical techniques using the obturator fossa and avoiding the major risks of the retropubic approach.

ATIENTS WHO HAD HYSTERECTOMY IN PRIVATE PRACTICE IN PRETORIA

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Objectives: To assess the profile of patients who underwent hysterectomy in private practice, their socio-demographic characteristics and the disease profile that led to hysterectomy.

Design & method: This was a 5-year retrospective record review study conducted at two private hospitals in Pretoria**.** All patients who had hysterectomy between January 2005 and December 2009 were included. Epi-info was used to calculate the sample size. Stat Calc and Excel were used for analysis. The Medunsa Research and Ethics Committee (MREC) gave clearance for the study.

Results: A total of 222 records were drawn and information was extracted from records. The patients' ages ranged from 31 to 67 years (mean 45.05 years). Fibroids were the commonest condition that led to hysterectomy (49.1%). Most women were from Gauteng province (49.1%), and 69.8% of women who had a hysterectomy were married. Abdominal hysterectomy was more common than vaginal hysterectomy. Hysterectomy constituted 27.2% of the total major operations performed in the two practices over a period of 5 years.

There were more abdominal hysterectomies (77.5%) than vaginal hysterectomies (22.5%). Women with a history of three deliveries comprised more than 50% of the study subjects, and 77.5% of women who had hysterectomy also had their ovaries removed at operation.

Conclusion: Regional variations in pathology together with personal habits and teaching received seem to play a role in the choice of surgical modality for uterine removal.

The study, although retrospective and including small numbers from the same region, is in agreement with finding of other studies such as that abdominal hysterectomy is done more frequently than vaginal hysterectomy, Fibroid tumours of the uterus are the common condition that lead to hysterectomy, and most women undergoing hysterectomy are in the reproductive age group.

HPV ALPHA SPECIES 9 AND 7: CHANGED DISTRIBUTION PATTERNS OF GENOTYPES

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Objective: HPV type distribution appears to be regionally different and may be influenced by population-related factors over time. We studied the HPV types in the general population and in cervical cancer specimens of the same peri-urban population in Tshwane, South Africa.

Method: Cervical samples from 1000 women in the population were tested for high-risk HPV DNA. In addition, 150 cervical cancer samples were collected from the same population and tested for the same viral types using DNA and RNA analysis. The viral type distribution was determined in both samples and compared. In addition the type distributions were compared with data reported from meta-analysis of African studies.

Results: The sequence of HPV genotypes of the alpha species 9 in the population was 16, 58, 33, 35, 52, and in cervical cancer it was 16, 35, 33, 52, 31. HPV 35 was present in 8.4% of women, but in 16% of cervical cancer specimens, while type 51 was present in 13% of the population but less than 1% of cancers.

HPV 45 and 18 (alpha species 7) was present in 10% and 9% of the population while it was causative of 10% and 14% of cervical cancer cases.

Discussion: HPV types 35 and 52 are over-represented in cervical cancer in our region and type 45 appears to gain increasing importance as an oncogene. Type 51 was shown to have low oncogenicity and should probably be re-classified.

MODIFIED MULTISLICE (64) COMPUTED TOMOGRAPHY IN THE DIAGNOSIS OF RETROPERITONEAL, RECTOVAGINAL AND BOWEL ENDOMETRIOSIS

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Introduction: Patients with advanced endometriosis are often subjected to a multitude of special investigations to diagnose the extent of the disease. In this respect, barium enema, intravenous pyelograms, ultrasound and MRI have been utilised. This study will explore the capabilities of multislice computed tomography in the diagnosis of advanced endometriosis. The standard multislice technique had to be modified to produce visual images capable of diagnosing deep infiltrating and advanced endometriosis. This modified technique will be described. The following images were obtained using currently available Multislice software:

- 2D multiplaner views
- 2 D maximum intensity projection
- 3D flythrough (virtual colonoscopy)
- 3D cubed volume
- 3D transparent views
- 3D volume rendered.

Using this software we were able to produce a multitude of images positively identifying endometriosis. Selected images and the advantage of this technique will be discussed.

Conclusion: Analyses of the first 125 cases currently under study have shown that multislice computed tomography can be of great benefit in identifying infiltrating and advanced endometriosis. It also obviates the need for a multitude of special investigations, as images generated by a single passage through the multislice CT scanner can positively identify pathology in the urogenital, gastro-intestinal and retroperitoneal spaces.

THE GOOD, THE BAD AND THE UGLY: INDICATIONS FOR 3D SCANNING IN GYNAECOLOGY

D Dumbrill

Whenever a new technology is introduced into clinical practise there is wide-ranging uptake and usage of the tool. Increasingly, 3D imaging is used in the diagnosis and management of gynaecological conditions.

3D ultrasound is extremely useful/'good' in the diagnosis and classification of congenital uterine abnormalities, evaluating the incontinent patient (pre-operatively and after unsuccessful surgery), tracking IUCD positioning and diagnosing non-tubal ectopic pregnancies.

3D ultrasound is useful/'the bad' in mapping sub-mucosal fibroids, viewing endometrial pathology and evaluating tubal patency.

3D ultrasound is unhelpful/'ugly' in the differentiation of ovarian masses, excluding malignancy (with the possible exception of endometrial/myometrial invasion) and eliciting the causes of pelvic pain.

A MODIFIED CERCLAGE AND SCORING SYSTEM FOR CERVICAL INCOMPETENCE

M Kimberg

Introduction: *Delaying delivery in preterm labour is important, and the question is whether it can be delayed by a new technique of cervical cerclage.*

Objective: To describe a new method of cervical cerclage.

Methods: A braided material is avoided by using nylon-1 in the form of a loop suture using spacers and a No. 12 urinary catheter to aid in the correct placing of the suture.

Results: Over 4 years 45 cases have been treated with no serious complications. A scoring system was developed with a score of 6 taken as an indication for cerclage. The results of these cases will be presented.

Conclusion: The modified cerclage delivered acceptable results and it should be considered in patients with incompetent cervix.

A PILOT STUDY COMPARING 3D ULTRASOUND, MRI AND FROZEN SECTION IN MYOMETRIAL INVOLVEMENT IN ENDOMETRIAL CANCER

D Dumbrill, J Whitaker, A Levy, R Soeters

The FIGO classification of endometrial cancer necessitates the accurate assessment of myometrial involvement to determine the extent of primary surgery required. If >50% of the myometrial thickness is infiltrated by the endometrial cancer, pelvic lymphadenectomy is required in addition to the standard surgery of TAH/BSO. This surgery also necessitates the expertise of a gynaecological oncologist.

Studies have shown that three-dimensional ultrasound is as effective and has cost advantages over the other methods of detection (pelvic MRI and frozen section.)

I will present the ongoing data of a small pilot study of those patients with endometrial cancer who undergo transvaginal 3D ultrasound and pelvic MRI (prior to their hysterectomies) and then frozen section at the time of their surgery (operators blinded from each other's findings).

The accuracy and limitations of the techniques as well as cost analysis will be reported.

REMAINING THIRD FETUS SUCCESSFULLY BORN AFTER INCOMPLETE TRIPLET MISCARRIAGE AT 17 WEEKS' GESTATION

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Objectives:

- Multiple gestation is a common reason for preterm delivery (PTD): 34%, 58% and 26.9% respectively for twins, triplets (Malone *et al*., 1998) and quads (Francois *et al*. 2001). Every multiple gestation is at risk of preterm labour (PTL) and must be managed by risk identification: history (PTL, PTD, premature rupture of membranes), incompetent cervix, background uterine activity of excessive uterine stretch (hydramnios, multiple gestation), or bacterial vaginosis.
- The physician should have the philosophy of never giving up and never accept a PTD for multiple gestation, unless the risks of remaining pregnant exceed the risks in the nursery.
- Ideally, triplets should deliver at 35 - 36 weeks, by all means possible, e.g. prophylactic cervical cerclage, prevention and delaying PTD (Elliot, 2007) and risk management.

Design and method:

- PTL management of 17-weeks triplet gestation, with first baby born prematurely 4 years ago (920 g staying in ICU for 3 months), resulted in expulsion of 2 fetuses, failure of 24-hour augmentation of labour for a complete evacuation of the placenta and 3rd fetus retained *in utero* with light *per vaginam* bleeding,
- 36 hours after incomplete abortion, assessment (sonogram, blood testing, vaginal swab for microbiology) disclosed acute maternal anaemia, bacterial vaginosis, alive 3rd fetus, no pending umbilical cords or trace of the aborted fetuses, no further signs of PTL.
- Conservative management included blood transfusion, cervical cerclage, tocolytics, antibiotics, bed-rest, discharge after 10 days of hospitalisation.

Results:

- Conservative management enabled us to suppress the PTL and avoided the PTD of the remaining fetus, delivered by caesarean section at 37 weeks. This result is evidence of the value of aggressive management based on the philosophy of never giving up.
- The young boy is growing very well and attends his pre-school class.

Conclusion: PTL in triplet gestation (76%) is a common cause for PTD (58%); its risk identification plus appropriate skilled management combined with cervical cerclage (although denied by Stok & Norman, 2010) should apply, even after the expulsion of 2 fetuses, without giving up.

IMPORTANT ASPECTS OF MANAGING A PATIENT WITH CARDIAC DISEASE IN PREGNANCY

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University of Pretoria

Pregnancy poses a serious risk of serious morbidity and mortality to women with cardiac disease. Preconceptual counselling should be started in the adolescent period and this should involve advice on safe and effective contraception.

During pregnancy these patients should be managed in a high-risk multi-disciplinary unit consisting of a maternal-fetal specialist, cardiologist and obstetric anaesthesist. Direct self-referral to these high-risk units should be allowed to avoid any bureaucratic delays. The history, physical examination, echocardiogram and electrocardiogram form the foundation of the cardiac evaluation. The most important predictors of pregnancy-related cardiac complications are:

- Poor functional class (NYHA class II - IV)
- Previous cardiac event, e.g. heart failure
- Left heart obstruction
- Left ventricular systolic dysfunction.

Measurement of serial BNP levels may be helpful in following patients at risk for developing heart failure. Women with congenital heart disease have an increased risk of having a baby affected with congenital heart disease and should be offered fetal echocardiography.

A clear plan for management of labour and the puerperium, based on the risk analysis, should be formulated in advance by the multidisciplinary team. Epidural anaesthesia is recommended for vaginal delivery as this reduces the pain response and the sympathetic induced tachycardia. The second stage should be shortened by assisted delivery. During the third stage, low-dose oxytocin infusion is preferred to boluses. Careful haemodynamic monitoring is required for 24 - 72 hours after delivery.

METHODS OF TESTING BLOOD SUGAR IN PREGNANCY

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Several methods of testing blood sugar in pregnancy are available. These methods include a fasting glucose, a random glucose, oral glucose tolerance test (OGTT) after a 75 g glucose load, an OGTT after a non-standardised glucose load, HbA1C, glucose day profile and insulin measurements in early pregnancy. The question is what test to use. This can only be answered after deciding what is the aim of the test. The aim can either be diagnosis of diabetes and gestational diabetes (GDM) or it can be monitoring blood glucose control in pregnancy in a diabetic patient.

The method of choice for the diagnosis of diabetes mellitus is either a fasting blood sugar or a 75 g OGTT. For the diagnosis of GDM it is better to use a 75 g OGTT between 24 and 28 weeks after a fasting test at booking. The Western Cape protocol for diagnosis of GDM uses a non-standardised glucose load for the OGTT. The new proposed criteria also refer to an HbA1C. The problem with HbA1C is that it has not been validated in pregnancy or in patients with an Hb below 12 g%. Insulin measurements in early pregnancy help to identify women at risk of developing GDM but do not assist in making the diagnosis. The sensitivity and specificity to predict women who will develop GDM at 28 weeks are 69.2 and 96.4% respectively for a fasting insulin value of more than 30 mU/l.

For the monitoring of therapy a glucose day profile, which includes a fasting value, 30 minutes before meals and 2 hours after meals, is probably the best way to monitor glucose control in pregnancy. Using an HbA1C can help to assist in the monitoring and is definitely of value early on in pregnancy to establish the level of control at the time of conception but since it is an average it does not provide information on the highs and lows of the blood sugar.

There are also new technologies available that might become the future of glucose monitoring. These include continuous glucose monitors and the so-called closed loop system.

In conclusion, the best diagnostic test for gestational diabetes with the current evidence available is the 75 g OGTT using the new diagnostic criteria of a fasting value of less than 5.1 mmol/l, a 1-hour value of less than 10 mmol/l and a 2-hour value of less than 8.5 mmol/l. The best monitoring is home glucose monitoring doing a glucose day profile.

HOW STRICT MUST BLOOD SUGAR CONTROL BE IN PREGNANCY?

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The level of glucose control in pregnancy should find a balance between the risks of maternal hypoglycaemia and the risks associated with hyperglycaemia to the fetus. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study provides some information. The results of the HAPO study showed that for an odds ratio (OR) 1.75 for adverse outcome was associated with a fasting blood value of 5.1 mmol/l, a 1-hour value of 10 mmol/l and a 2-hour value of 8.5 mmol/l. For an OR of 1.5 for adverse outcome the fasting values were 5 mmol/l, 9.3 mmol/l for 1 hour and 7.8 mmol/l for 2 hours. An OR as high as 2 for adverse outcome had a fasting value of 5.3 mmol/l, a 1-hour value of 10.6 mmol/l and a 2-hour value of 9 mmol/l. The HAPO study was not an intervention trial but provides important information regarding levels of glucose control. Studies have also shown that the normal fasting glucose in pregnant women without diabetes is between 3.83 and 4.16 mmol/l. In women with diabetes the target ranges for glucose control in many guidelines are 5.0 - 5.5 mmol/l and 2 hours post-prandial 7.0 - 7.5 mmol/l. If this is put into the context of what is known, the upper limit of the fasting value for good control is 32% higher than that of healthy pregnant women. A fasting value of 5.5 mmol/l would have an OR above 2 for adverse pregnancy outcome, which includes macrosomia. The adverse outcomes other than birth weight included, a primary caesarean section, clinical neonatal hypoglycaemia, cord C-peptide >90th centile, preterm delivery before 37 weeks, shoulder dystocia and/or birth injury, sum of skinfolds above the 90th centile and pre-eclampsia. The level for glucose control in pregnancy should be as close to normal as possible as long as it is not associated with severe hypoglycaemia. These values should be guidelines, but should be adjusted to the patient. If the patient tolerates the lower values well, the aim should be for fasting values around 5 mmol/l and post-prandial to 7.0 mmol/l. It is further important to realise that tighter control can have an effect for more than just this pregnancy; it can also have an effect on childhood obesity and adult onset disease later in life for the fetus.

A SUMMARYOF THE EFFECTS OF HIV DISEASE IN PREGNANCY

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With the widespread availability of antiretrovirals, HIV infection has largely become a chronic and manageable disease. Management in pregnancy can however be complex as there may be effects on the mother, the fetus and the infant. The effects may be from HIV itself and/or treatment used to manage the disease. This review discusses some of the effects of HIV in pregnancy, and briefly presents preliminary data from a study in Soweto, South Africa.

In the absence of advanced HIV disease and AIDS-defining events, and with the use of antiretrovirals, the literature suggests that pregnancy outcomes in HIV-infected women are comparable to those of HIV-uninfected women. The literature is from both resource-rich and resource-constrained settings. However, in women with advanced HIV disease several adverse pregnancy outcomes have been reported. These include stillbirths; preterm labour and delivery; low-birth-weight deliveries; and increased maternal and infant morbidity and mortality.

In the era of antiretroviral therapy (ART), HIV-related morbidity and mortality have decreased. Efficacious ART regimens have become available, and with updates in HIV treatment guidelines and changes in eligibility criteria for ART, patients are initiating treatment earlier. These changes also apply to HIV-infected pregnant women. There have been concerns raised about adverse pregnancy outcomes related to ART use, specifically preterm birth. Toxicity, especially related to the use of non-nucleoside reverse transcriptase inhibitors (NNRTIs), is also a concern.

The evidence from the literature is conflicting, with some studies showing an increased risk of preterm birth with ART use, while others do not. Various factors have made interpretation of the data difficult as at times different groups are compared, and most of the studies are observational. While different ART regimens have been implicated, protease inhibitor-containing regimens appear to be associated with the most risk. Preliminary analysis of NIMART data from an antenatal clinic in Soweto, Johannesburg, shows no evidence of preterm delivery in women initiated on ART during pregnancy. Between October 2010 and September 2011, 243 pregnant women were initiated on ART. Complete data with delivery details were available for 143 women. The mean CD4 cell count at initiation was 211 cells/µl, and the mean birth weight was 2 996 g. The majority of women were on a NNRTI-containing regimen.

While HIV-related maternal and infant morbidity and mortality have decreased due to the widespread availability of ART, management of HIV in pregnancy can still be complex.

PHASE III RANDOMISED TRIAL OF THE SAFETY AND EFFICACY OF THREE NEONATAL ANTIRETROVIRAL REGIMENS FOR PREVENTION OF INTRAPARTUM HIV-1 TRANSMISSION (NICHD HPTN 040/PACTG 1043)

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Objectives: The optimal neonatal regimen for prevention of mother-to-child transmission (PMTCT) in infants born to HIV+ women not receiving antenatal antiretrovirals (ARV) has not been established. We evaluated in a prospective randomised study the safety and efficacy of adding 1 or 2 ARV drugs to standard zidovudine (ZDV) prophylaxis in HIV-exposed, formula-fed infants born to mothers not receiving ARV prior to labour.

Methods: Formula-feeding infants born to women diagnosed as HIV-infected peripartum (via rapid testing) were randomised within 48 hours of birth to: 6 weeks ZDV; 6 weeks ZDV + 3 doses of nevirapine (NVP) in 1st week of life; 6 weeks ZDV + nelfinavir (NFV) and 3TC for 2 weeks. Maternal intravenous ZDV during labour was allowed. Infants were tested for HIV infection by DNA PCR at birth, 10 - 14 days, 4 - 6 weeks, and 3 and 6 months. Primary outcome was infant HIV infection at 3 months among infants uninfected at birth (excluding *in utero* infection). Kaplan-Meier survival curves were used to estimate HIV transmission rates. The multiple comparisons were made between single-ARV and multiple-ARV arms using the Hochberg modified Bonferroni approach.

Results: 1 684 evaluable infants were enrolled in Brazil, South Africa, Argentina and the USA. The total *in utero* transmission was 5.7% (n=93) and not significantly different between arms. The total intrapartum transmission rate was 3.2% (n=47); by study arm: ZDV 4.9%, n=24 (95% CI 3.3 - 7.2); ZDV + NVP 2.2%, n=11 (95% CI 1.2 - 4.0, p=0.045 compared with ZDV arm); ZDV/NFV/3TC 2.5%, n=12 (95% CI 1.4 - 4.3, p=0.045 compared with ZDV arm). The overall MTCT rate was 8.5% (n=140) and was significantly higher in the ZDV alone than multiple ARV arms, p=0.034. Only treatment arm and maternal viral load were significantly associated with transmission. Factors evaluated but not associated with transmission on multivariate analysis included CD4+ count, age, race, prenatal care, ZDV during labour, maternal syphilis, region of birth, type of delivery, and gestational age. Neutropenia was significantly higher in the 3-drug arm (p<0.001). ARV resistance testing is in progress.

Conclusions: Neonatal post-exposure prophylaxis with a 2 or 3 ARV drug regimen is superior to ZDV alone for prevention of intrapartum HIV transmission among infants born to women not receiving ARVs before labour. Toxicity profile and ease of use suggests that the ZDV/NVP combination regimen may be preferable to ZDV/3TC/NFV.

THE PREVENTION OF PERINATAL HIV INFECTION

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The 2010 National HIV Prevalence Survey among antenatal patients in the public health sector of South Africa indicates a plateau in prevalence at about 30% since 2004. The latest epidemiological data emanating from this report will be presented.

The HIV pandemic has impacted on the maternal mortality ratio resulting in an increase in maternal deaths and more deaths due to indirect obstetric causes compared with direct causes of maternal deaths. The present challenge is to

provide HAART to women of childbearing age with CD4 counts of 350 cells/µl or less or WHO stage 3 of 4 disease.

ARV drugs are most effective in reducing perinatal mother-to-child transmission of HIV (PMTCT). The South African National AIDS Council key priority to scale up coverage with ARV prophylaxis or treatment to reduce PMTCT to less than 5% was reached ahead of the 2011 target date. The National Department of Health implemented a new PMTCT programme in 2010. The programme is based on the WHO guidelines. The WHO programme is based on the best scientific data available at the time of compilation. There are, however, controversies regarding the most appropriate PMTCT methods. These will briefly be discussed using the latest available scientific evidence under the following headings:

- HAART versus dual therapy for women with a CD4 count >350 cells/µl
- Best post-exposure prophylaxis for babies of mothers not on antiretrovirals (ARV)
- NVP resistance and the use of Truvada
- Protease inhibitors and preterm labour
- Breastfeeding and ARV prophylaxis.

Conclusion: The brief overview will allow a conclusion as to how appropriate the present national PMTCT programme is and challenges faced in the immediate future.

CERVICAL CERCLAGE: A LITERATURE REVIEW

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When the French gynaecologist Shirodkar described the Shirodkar cerclage in 1951 and McDonald described his cerclage in 1957, everybody must have thought they had found the magic wand for late miscarriages and early preterm births. Since then a substantial amount of literature has been published on the topic with different approaches, some showing promising results. The early 2000s show the publication of the CIPRACT randomised trial which concluded that therapeutic cerclage with bed rest reduces preterm delivery before 34 weeks' gestation in women with risk factors or symptoms of cervical incompetence. There was, however, no statistical difference in the neonatal survival rates between the two groups. The morbidity was reduced in the cerclage group.

In 2004 Vincenzo Berghella published his first randomised trial on cerclage for women with a short cervix. His conclusions were that cerclage did not prevent preterm birth in women with a short cervix, but that larger trials should confirm these results. The 61 women who were randomised included multiple gestations. A sub-analysis of the singletons also failed to show any benefit. In 2011 he published another article, this time to evaluate cerclage for women with a history of a preterm birth, a singleton pregnancy and a short cervix. This meta-analysis had very promising results with a reduction in the preterm births as well as a reduction in the perinatal morbidity and mortality. This was the first large trial showing a reduction in perinatal mortality, but only in women with a history of preterm birth.

We should be very careful not to misinterpret the available data on cerclage. The main benefit for cerclage seems to be in those women with a previous spontaneous preterm birth, a singleton pregnancy and a cervix shorter than 25 mm in the current pregnancy. It should be noted that women with a history of a prior spontaneous preterm birth may also benefit from progesterone.

DETECTING EARLY-STAGE EPITHELIAL OVARIAN CANCER AT SURGERY, IN THEATRE, IN 5 MINUTES

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Objectives: Early-stage epithelial ovarian cancer is missed in 2 - 14% of cases during ovarian cyst surgery, when no frozen section is performed. Frozen section is not always available at the hospitals where this surgery is performed by gynaecologists, and even at many academic medical centres frozen section is not available at all times of the day/during weekends. It has been shown clearly that the first surgery for ovarian cancer is the most important one, and if done in the correct way will improve patient prognosis. Ovarian cancer surgery should be performed by a gynaecological oncologist, or with one in attendance.

We had hypothesised that there would be a biomarker in ovarian cyst fluid that would be able to distinguish cancer from non-cancer, in both early-stage and late-stage disease.

Design & method: We collected ovarian cyst fluid samples during surgery from 168 patients with epithelial ovarian tumours from the Department of Obstetrics & Gynaecology, National University Hospital, Singapore, and also from six hospitals in the South-East Asia region from 2004 to 2009. We measured haptoglobin concentration in cyst fluid using both in-house sandwich enzyme-linked immunosorbent assay (ELISA) and a rapid colorimetric assay that quantifies haptoglobin in 5 minutes. We compared test accuracy among ELISA, rapid assay and intra-operative frozen section in discriminating between benign ovarian tumours and ovarian cancers.

Results & conclusion: Haptoglobin measured by ELISA was excellent in identifying early-stage cancer. Development of a rapid test using a dye-binding assay allows the test to be performed in the operating room, giving the surgeon a new method of making rapid decisions about further management. This is the first study where an intra-operative tumour maker has been utilised in the differentiation between benign and malignant ovarian lesions.

MINIMALLY INVASIVE SURGERY FOR ENDOMETRIAL CANCER

P T Soliman
M D Anderson Center, Houston, Texas, USA

The role of minimally invasive surgery for the treatment of endometrial cancer has continued to increase over the past decade, and many would consider it part of standard of care treatment for this disease. The objective of this presentation is to review the current published studies on minimally invasive surgery for the staging of endometrial cancer. This will also include information on surgical techniques, different minimally invasive approaches, complication rates, outcomes and quality of life.

THE RELATIONSHIP BETWEEN ENDOMETRIOSIS AND ENDOMETRIAL CANCER

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Endometriosis occurs by definition outside the endometrium, while endometrial cancer occurs by definition in the endometrium and uterine lumen. Endometrial cancer cannot, therefore, develop from endometriotic implants. Various extra-uterine malignancies have been described to develop from endometriotic implants, mostly then with some features of endometrioid histology.

Endometriosis and endometrial cancer do share many characteristics, however, and these will be explored. The two conditions are both overgrowth diseases which can be classified as neoplastic, both originate from the endometrial cells, and both diseases are usually but differentially hormone sensitive. The conditions are both probably monoclonal in most cases and contain important mutations that regulate cellular growth rate and the escape from normal growth control. More mutations will regulate implantation and dissemination or metastatic ability.

The embryological origin of the uterus is the Mullerian tube, consisting of multipotential stem cells that will develop into the tubular structures of the female internal genitalia. It is postulated that just underneath the basal layer of the endometrium a layer of cells remain that could retain some stem cell characteristics. These cells are dubbed the archimetra, or ancient uterus. From these cells the myometrium will develop, consisting of miometrial cells which have both muscle structures and stroma cells. The endometrial basal layer also originates from the archimetra, and endometrial cells develop both stromal and glandular cells.

It is clear that endometriotic cells have a different potential for implantation and growth than normal shed endometrium. It also appears that these implants originate from a single clone, and this implies that the glands and stromal elements in endometriosis originated from a multipotential cell which differentiated into both parts after implantation. This is the origin of the theory that postulates that endometriosis originates from endometrial basal layer cells or even from archimetral cells. Interestingly, all these factors and monoclonal growth and dedifferentiation also apply to endometrial carcinoma.

Hormonal receptors originate from the stem cell that gives rise to the neoplasm and interestingly also responds to environmental factors. Both conditions are very responsive to hormonal manipulation and have been shown to express hormone receptors.

The intact basal membrane in the endometrium prevents invasion of cells into the myometrium, thus preventing adenomiosis, and also should prevent placenta accreta. In the peritoneum, this will prevent invasive growth of endometriosis and in the uterus myometrial invasion of endometrial cancer.

Obviously invasive behaviour is a result of the interaction between an (intact) basal membrane and the characteristics of the malignant cell.

Molecular and genetic factors that are shared between these diseases are unravelled and will be discussed, as will the epidemiological risk factors shared between these diseases.

MINIMALLY INVASIVE SURGERY FOR CERVICAL CANCER

P T Soliman
M D Anderson Centre, Houston, Texas, USA

The role of minimally invasive surgery for the treatment of early cervical cancer has continued to increase over the last decade. The objective of this presentation is to review the data available supporting the feasibility of both laparoscopy and robotic surgery for the treatment of early cervical cancer. In addition, we will discuss current studies on the use of laparoscopy for the surgical staging of more advanced cervical cancers

PATIENT SAFETY AND QUALITY OBSTETRIC CARE

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Obstetric care presents multiple domains for errors to occur and for maternal and fetal safety to be compromised. During the prenatal period, identification of risk factors as well as signs and symptoms of pathophysiological processes allow for early treatment in some cases. Provision of safe, high-quality antenatal care with clear documentation that is available intrapartum prepares the patient and her clinical team for a safer intrapartum experience. The labour and delivery phase of obstetric care is the domain for rapid assessment and intervention. In this arena, patient safety rests upon monitoring for abnormalities in the progress of labour, maternal disorders such as pre-eclampsia, identification and treatment of the potentially hypoxic fetus, and treatment/prevention of haemorrhage, among others.

By organising intrapartum care with standard protocols for care, clear communication and teamwork, and rapid access to necessary supplies and medication, patient safety can be improved.

THE ROLE OF AUDIT IN QUALITY CONTROL AND SAFETY IN OBSTETRICS IN SOUTH AFRICA

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This talk will examine safety from the perspective of the safety for the health care user and quality control from that of the healthcare worker. Safety will be used in the clinical sense of not developing complications, and quality control will be used in the sense of quality of care provided by the healthcare worker (healthcare manager and healthcare provider).

The audit cycle consists of: (*i*) identifying the cases to be audited; (*ii*) collecting the information; (*iii*) analysing the data; (*iv*) recommending solutions; (*v*) implementing recommendations; and (*vi*) evaluating and refining. The first 4 steps are often grouped as audit and feedback. Achieving audit and feedback, although essential steps in improving the quality of care, will not result in any significant change unless the next steps are achieved, namely implementing the required changes and seeing that it is done.

Examples will be given of improving patient safety and quality of care using the *Saving Babies* and *Saving Mothers* reports.

CONTROLLING HAEMORRHAGE AT CAESAREAN SECTION

M S Pretorius
University of the Free State

Obstetric haemorrhage is the third commonest cause of maternal deaths in South Africa, and more so bleeding at caesarean section.

This discussion will focus on preventing, limiting and management options (medical and surgical) of haemorrhage that occurs during caesarean section, as well as recognising intra-abdominal haemorrhage postpartum and management thereof.

We will compare different sutures for an atonic uterus, and look at the value of uterine artery and internal iliac artery obliteration as well as subtotal hysterectomy.

All hospitals that can provide caesarean sections should also be able to manage complications that occur during the operations, as transport of critically ill patients is a risk on its own.

Early recognition and appropriate management in a short decision-making time can hopefully prevent a few unnecessary maternal deaths in our country.

IMPROVEMENT OF LEVEL 1 OBSTETRIC SERVICES IN SOUTH AFRICA

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Objectives: Describe what was published in literature as solutions to improving maternity outcomes in populations at a non-specialist level. The South African context is critically reviewed in line with these recommendations.

Design & method: A literature review of actions required to improve maternal outcomes in a developing setting considering the WHO recommendations. These recommendations are compared to the primary care reengineering process considered for South Africa.

Results: The WHO recommends that there be at least 5 emergency obstetric and neonatal sites for a population of 500 000 people. All these sites must be able to provide the basic emergency obstetric care compliant with 5 internationally defined signal functions. These signal functions include the ability to provide parenteral antibiotics, parenteral anticonvulsants, parenteral uterotonic drugs, emergency miscarriage management, manual removal of placenta, assisted deliveries and basic neonatal resuscitation. One of these sites must be able to provide comprehensive obstetric care including the ability to perform emergency caesarean deliveries and transfuse blood.

Some challenges facing South Africa are the lack of norms and standards with respect to beds and staffing requirements. The workforce is also diluted resulting in suboptimal skilled birth attendance.

Many of the facilities and staff competencies in South Africa have challenges in providing the internationally accepted standards. To address these challenges, we will need changes to the staff providing services and the competency profile of staff working in these settings, and a general change in mindset of South African health workers and providers.

Conclusion: The international recommendation of having 5 basic obstetric and neonatal care units per every 500 000 population, of which at least one provides a comprehensive maternal and neonatal emergency service, is ambitious. The way services are organised and the skills to provide these services have to be critically reviewed. Transformation of the level 1 services is needed to achieve improved outcomes. The NHI will play an enormous role in transforming the health sector to achieve these aims.

PELVIC PAIN IN ADOLESCENTS

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Abdominal and pelvic pain are common presentations for medical care, accounting for 3 - 5% of visits to a primary care provider. There are specific challenges to evaluating adolescents with pelvic pain – variability in pubertal development, psychosocial changes and body image issues, and evolving independence from parents. As with adults, the provider needs to assess specifics about the pain (character, intensity, timing, location, radiation and duration), associated symptoms, and relationship of pain to the menstrual cycle. The gynaecologist should include pubertal milestones and a detailed menstrual history. Confidential information about substance use and sexuality must be obtained in a sensitive manner. An age-appropriate examination is essential, but the pelvic examination may be limited to inspection of the external genitalia and a recto-abdominal exam. Pelvic imaging with a transabdominal ultrasound is recommended to assess pelvic anatomy and identify any potential sources of pain

SEXUAL DYSFUNCTION: MARS AND VENUS

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Female sexual dysfunction (FSD) affects up to 40% of women (Laumann, 1999). The diagnostic classification includes sexual desire disorders (hypo-active sexual desire and sexual aversion disorder), sexual arousal disorder, orgasmic disorder, and sexual pain disorders (dyspareunia, vaginismus, other

sexual pain disorders), all of which have to result in symptoms of personal distress. Roos *et al.* (2009) reported that less than 50% of urogynaecologists screen for FSD despite a strong negative correlation with quality of life.

The neurobiology of sexual function in women is complex. The sex steroids testosterone and oestrogen promote desire and arousal, the hormone prolactin inhibits sexual excitement, and the neurotransmitters dopamine and norepinephrine stimulate desire and arousal whereas serotonin inhibits these functions. The opportunity for a vast number of pharmacological agents such as birth control pills and antidepressants to cause sexual dysfunction is therefore evident.

The evaluation of women with FSD includes an extensive medical and psychosocial history including extensive details about past and current sexual relationships. Soliciting details about subtle relationships stressors is essential. A careful pelvic examination that focuses on any anatomical abnormalities that may be causing pain, and the oestrogen status of the tissues, is indicated. No evidence exists for the role of laboratory testing, especially a testosterone level, for which 'deficient levels' have not been established.

Treatment focuses on clearly identifying the contributing medical and psychosocial factors and altering each individual causative issue. Oestrogen and testosterone supplementation can be utilised with caution. Women with sexual pain disorders, particularly vestibulitis and endometriosis, may benefit from surgical intervention. Careful consideration for the impact on sexual function should be made before proceeding with prophylactic bilateral salpingo-oophorectomy in women under 65.

PREVALANCE AND OUTCOMES OF ANTENATAL HEART DISEASE IN SOUTH AFRICA: A SYSTEMATIC REVIEW

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Background: Physiological increases in blood volume, heart rate and cardiac output occur as a normal part of pregnancy but can exacerbate underlying cardiac conditions, particularly during the latter half of the pregnancy. Globally, complications of heart disease during pregnancy account for a substantial proportion of maternal morbidity and mortality, and heart disease is among the big 5 causes of maternal mortality in South Africa. The prevalence of pre-existing heart disease among pregnant women worldwide varies but has been reported to range from 0.9 to 3.7%. Whereas congenital abnormalities are the commonest abnormalities found in pregnant women from industrialised regions, rheumatic heart disease still predominates in poorer countries.

Methods: Two independent reviewers (DW and MS) reviewed lists of articles obtained from several databases relevant to the South African population. The pre-specified search strategy for each database was as follows. MEDLINE was searched with the term 'Heart Diseases'[Mesh] AND pregnan*[ti/abs] AND 'South Africa'[All Fields]. ISI Web of Science was searched with the term TS=HEART DISEASE (and) TS=PREGNAN* (and) CU=SOUTH AFRICA. The EBSCO Africa-Wide database was searched with the term SU=heart or cardiac or cardiovascular (and) TI=disease* (and) SU=pregnan* (and) TX=South Africa. To search for South African conference proceedings, theses and abstracts, two internal databases at the University of Cape Town Health Sciences Library were searched. Current and Completed Research (SA)[8] was searched using 'heart AND pregnancy' and the SA Cat section on South African Theses[8] was searched using the term ('heart' OR 'cardiac') AND 'pregnancy'. All databases were accessed during the month of March 2011. Articles were selected on the basis of relevant title with relevant abstract and full-text articles were obtained from potentially eligible reports. In the final stage of the search, reference lists of full-text articles were hand-searched. Discrepancies were resolved by consensus discussion between the two reviewers with adjudication by the senior author (BM) as necessary.

Two reviewers (DW and MS) used a standardised data extraction form to obtain information on study design, patient demographics, and total numbers of each cardiac lesion. Secondarily, basic information was obtained on the rates of specific outcomes: maternal death, pulmonary oedema, thrombosis, haemorrhage, and fetal death. Again, discrepancies were adjudicated by consensus discussion between the two reviewers with the assistance of the senior author (BM) as necessary. When study data were incomplete or contradictory with regard to the primary objective, the original author of the manuscript was contacted to clarify his or her findings.

Results: Prevalence values ranged from 123 to 943 per 100 000, with a median prevalence of 616 per 100 000.

Valvular heart disease, principally rheumatic mitral stenosis, mitral regurgitation, and surgically repaired mitral valves, were the commonest type of lesions in all studies, ranging from 71 to 84%. The prevalence of 'other' conditions ranged from 2 to 10% and included conditions such as arrhythmia, pericarditis, and coronary disease, depending on the study.

In the included reports, outcomes varied greatly, were generally centre-dependent, and improved over time. Case-fatality rates ranged from 0 to 9 524 per 100 000. Mitral stenosis, prosthetic valves and cardiomyopathies were most frequently associated with maternal death, while isolated mitral regurgitation typically had a benign course. Throughout the studies, the most frequent causes of death were pulmonary oedema, thrombosis or embolism, and haemorrhage, typically in the setting of anticoagulant use.

Maternal morbidity tended to follow globally established patterns and clear relations to different cardiac lesions. Decompensated heart failure was very common in cardiomyopathies (2 of every 3 patients) and stenotic mitral lesions. One study reported pulmonary oedema in 84% of their 'near-miss' cases and reinforced the need for routine intensive care unit monitoring of cardiac patients in the peripartum period. Not surprisingly, even though thrombosis and haemorrhage were not uniformly fatal, they were common in all the studies and were thought to be related in part to variable adherence to anticoagulation as well as the intrinsic risks of warfarin use.

We also collected data on perinatal mortality, and across the studies antenatal heart disease was associated with a higher rate of fetal loss than in pregnant women without cardiac disease. Furthermore, women with poor cardiac outcomes also had the highest perinatal mortality rates (19.3%) when compared with uneventful pregnancies (no perinatal deaths noted). Secondly, mitral valve pathology tended to carry the highest risk for the fetus. Thirdly, indiscriminate prescription of warfarin was associated with a surprisingly high rate of fetal loss:

LAPAROSCOPIC VECCHIETTI PROCEDURE FOR CREATING A NEOVAGINA

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Congenital vaginal agenesis (CVA) is most commonly seen in women with Mullerian agenesis and complete androgen insensitivity syndrome (CAIS). Although vaginal dilatation is considered first-line treatment, success rates are low and the best treatment remains controversial. A variety of surgical options are available, and recently a laparoscopic Vecchietti procedure (minimally invasive) has been described.

We describe our experience using a traction device kit with pluggable segmented dummies (Karl Stortz Endoscopy) that was used in 4 cases (3 Mullerian agenesis and 1 CAIS) for laparoscopic creation of a neovagina. This is a prospective interventional study. All patients underwent full clinical examination, karyotyping, sonography, CT IVP and psychological counselling prior to surgery. One patient was in a relationship. The mean age was 21 years (17 - 27) and the mean BMI 26.2 (20.7 - 30.1). Three were university students. The surgical procedure will be demonstrated. The technique does not involve a graft, there is no need for dissection of the space between the bladder and rectum, and it is associated with minimal scars.

The average operating time was 93 minutes (70 - 120). No major intra-operative complication was encountered. Hospital stay in all cases was 8 days. Pain in the postoperative period during the traction phase was a problem. Patients were not compliant with regard to use of vaginal dilators after surgery. On discharge, following removal of the device, the vaginal length averaged 8.0 cm (range 7 - 9). At 2 months' follow-up, vaginal length averaged 4.5 cm (range 4 - 7 cm) and no patient was sexually active.

In conclusion, the laparoscopic Vecchietti procedure is a minimally invasive and safe procedure. Pain in the postoperative period and patient compliance with regard to usage of vaginal dilators are challenges.

THE IMPORTANCE OF BALLOONING IN THE EVALUATION OF PELVIC ORGAN PROLAPSE

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Objective: The levator ani plays an important role in pelvic organ support. Enlargement of the levator hiatus is caused by vaginal birth-related injury to the muscle. This kind of injury leads to a detachment ('avulsion') at its

insertion to the pubic bone. It is thought that an abnormal distension of the levator ani dimensions on valsalva, also called 'ballooning', can cause symptoms and signs of pelvic organ prolapse. It has been estimated that 11% of all women will undergo surgery for pelvic organ prolapse and 30% of these women will need second surgery, specifically women who do have recurrence of a cystocele. It therefore seems of importance to be able to identify risk factors. Morphological abnormalities and abnormal distension of the levator ani can be diagnosed using transperineal ultrasound, a non-invasive investigation technique.

Design and method: Women complaining of pelvic organ prolapse symptoms and signs of prolapse were included. Prolapse evaluation was performed according the ICS POP-Q classifications; significant prolapse was defined as ≥ stage 2. All women underwent a standardised transperineal ultrasound examination. Hiatal measurements were performed at the level of minimal hiatal dimension (MHD) in rest, contraction and valsalva. Tomographic ultrasound imaging was utilised for the detection of levator avulsions, with a slice interval of 2.5 mm thickness from 5 mm below and 12.5 mm above the MHD level. An avulsion injury was classified if there was a detachment in the central three slices.

Results: The cut-off for abnormal hiatal dimension was set at 25 cm^2. This cut-off yielded a sensitivity of 0.52 and a specificity of 0.83 for detecting significant prolapse. An increased RR of ballooning was found in women with a unilateral avulsion of 3.5 (95% CI 1.7 - 6.5) and for bilateral avulsion of 3.96 (95% 1.7 - 9.2). In women with an objective recurrence of a cystocele prolapse the RR was 2.3 (95% 1.1 - 4.8)

Conclusions: Ballooning of the levator hiatus is significantly associated with an avulsion injury of the levator ani. Secondly, it predisposes for prolapse symptoms and signs and recurrence of a cystocele.

FAECAL INCONTINENCE

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Fecal incontinence (FI) is defined as the involuntary loss of liquid or solid stool, whereas anal incontinence includes the loss of gas. The best estimate of the prevalence of FI in the non-institutionalised adult population in the USA, provided by the National Health and Nutrition Examination Survey of over 5 000 Americans, was 8.9% of women and 7.7% of men. The biggest identified risk factor was age, with 15% of those older than 70 affected.

The normal storage and evacuation of stool relies on complex neurological and anatomical factors including normal intestinal tract motility (how fast the stream is flowing downhill), stool consistency (what is in the stream), rectal compliance (how good is the dam), anorectal sensation (do you know what is in the dam and when it's full) and anal sphincter function (how good is the dam wall). With this analogy, one recognises the myriad of important factors that affect faecal continence besides the function of the anal sphincter. Therefore, comprehensive assessment of each component is essential.

The anorectum comprises the distal 12 - 15 cm of the gastro-intestinal tract, the termination of which are the anal mucosal folds that provide a tight seal to the outside and facilitate wiping clean after a bowel movement. Women with haemorrhoids often complain of anal seepage and inability to wipe clean because this seal is broken. The anus is separated from the rectum by the dentate line that demarcate the transition from stratified to columnar epithelium and from somatic to autonomic innervation. The sensitive somatic nerves of the anal canal are able to sample the contents of the rectum during the recto-anal inhibitory reflex (RAIR), which occurs after a bolus of fecal material is delivered to the rectum, allowing one to discriminate the contents and determine when evacuation is appropriate.

The anal sphincter complex is made up of the internal (IAS) and external anal sphincters (EAS) that provide both resting and increased voluntary tone of the anal canal. The IAS is a condensation of the circular smooth muscle of the bowel wall (slow twitch, fatigue-resistant) that provides 70 - 75% of the resting tone but only 40% after sudden rectal distension and 65% during constant rectal distension. Therefore, the IAS is responsible for maintaining the primary barrier against stool leakage. This barrier is reinforced during voluntary squeeze of the EAS where an additional 25% of pressure can be generated. The EAS is made up of striated muscle (fast twitch, fatigueable) and has three distinct components: subcutaneous, deep, and a lateral portion. The pudendal nerve, arising from S2 - S4, innervates the EAS. A pudendal nerve block creates a loss of sensation in the genital and perianal skin and weakness of the anal sphincter muscle, but does not affect rectal sensation that is most likely transmitted along the S2 - S4 parasympathetic nerves that traverse along the pelvic splanchnic nerves.

Obstetric anal sphincter injury (OASIS) is a clearly identified risk factor for faecal incontinence, particularly in younger women. The greatest risk factor for anal sphincter trauma is operative vaginal delivery (forceps > vacuum), followed by primiparity, midline episiotomy, occiput posterior head position, macrosomia, and prolonged second stage. Hispanic and Asian females have a significantly higher prevalence of OASIS than Caucasians or African Americans. Faecal incontinence and/or faecal urgency are reported by 20 - 50% of women who sustained anal sphincter trauma, with the highest prevalence in those with combined persistent defects of the IAS and EAS. Fourth-degree tears have been shown to have a higher risk of persistent bowel symptoms than third-degree tears, probably as a result of more persistent IAS defects. Current evidence suggests that if a primiparous woman presents with FI, there is a 76.8% chance of an anal sphincter defect being identifiable on endo-anal ultrasonography.

When evaluating women with FI, it is helpful to divide aetiologies between those that start outside the pelvis (affecting the contents and speed of the stream) such as chronic diarrhoea (infectious, malabsorption, irritable-bowel, tumours), overflow incontinence from rectal impaction, and colorectal neoplasms. New FI, in a previously healthy woman with normal bowel habits, should prompt an investigation for neoplasms. FI secondary to pathology within the pelvis can be divided into two broad categories: (*i*) direct anatomic injury to the anus or anal sphincter complex; and (ii) neuropathic dysfunction of the pelvic floor and anal sphincter that is probably cumulative and presents later in life. In trying to elucidate the potential aetiology of FI, targeted questions to distinguish between these disorders are imperative. A comprehensive medical, surgical, and obstetric history should be obtained. An exact understanding of the onset and duration of symptoms, the precise quality and consistency of the stool that is successfully stored versus that which is leaked, and the patient's bowel habit history should be reviewed. Physical examination should include evaluation of the perianal skin for soiling, presence of a 'dovetail' sign, presence of tissue that may preclude anal coaptation, length of the perineal body, and evaluation for pelvic organ prolapse. A gross neurological exam includes testing the perianal skin for pinprick and light tough discrimination and stroking the perianal skin to elicit the bulbocavernosus reflex. A digital rectal exam includes evaluating for any masses and measuring resting and squeeze anal tone.

Potentially helpful diagnostic tests include colonoscopy, endo-anal ultrasonography and anal manometry. Ultrasound effectively evaluates anal sphincter anatomy, whereas anal manometry provides information about rectal sensation and compliance. Management of FI includes medications to decrease colonic motility (loperamide, Immodium, cholestyramine), stool bulking agents (Citrucel or Metamucil), biofeedback and surgery. In every patient, regardless of the integrity of the anal sphincter complex, maintaining normal stool consistency and frequency is imperative. Sphincteroplasty is reserved for women with large EAS defects, but long-term results are less than promising with cure rates ranging from 0 - 28% after an overlapping repair. Sacral neuromodulation, recently approved by the FDA, carries promise for the treatment of FI.

ENDO-ANAL VERSUS TRANSPERINEAL ULTRASOUND FOR ANAL SPHINCTER INTEGRITY

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Objectives: Faecal incontinence has devastating social and psychological consequences for both patients and their families. This disorder is reported to affect 11 - 15% of the general Western population, but the problem may be underestimated due to social embarrassment. Numerous different factors, which might exist simultaneously, can be identified in the aetiology of faecal incontinence. The most important cause is anal sphincter injury, related to vaginal delivery. Endo-anal ultrasound is considered the diagnostic technique of choice for imaging of the anal sphincters in these patients. However, this technique is invasive and the 360˚ rotating transducers are expensive and not widely available. Recently, 3D-transperineal ultrasound has been introduced as a reliable imaging method for the investigation of the (ab)normal anatomy of anal sphincters. This technique is non-invasive and currently well established as an investigation tool for pelvic floor disorders. To assess the agreement between 3D-transperineal ultrasound and endo-anal ultrasound with regard to the detection of anal sphincter defects in women with faecal incontinence, a prospective observational study was performed.

Design & methods: Between October 2008 and June 2009, all women with complaints of faecal incontinence underwent 2D endo-anal ultrasound, as well as 3D-transperineal ultrasound. The Rockwood faecal incontinence severity index was used to assess the degree of faecal incontinence. Both investigations were performed by different investigators blinded against each other's results. Off-line analysis of the transperineal volumes was performed blinded against

all clinical data using the VCI static technique (slice thickness 2 mm) and tomographic ultrasound imaging. Classification of the external and internal defect was performed using the Norderval scoring system.

Results: Fifty-five patients were included. External and internal anal sphincter defects were observed with endo-anal ultrasound in 27 (49%) and 15 (27%) patients, respectively. 3D-transperineal ultrasound detected an external and internal sphincter defect in 19 (35%) and 16 (29%) patients, respectively. The Cohen's kappa coefficient for the detection of external (κ=0.63) and internal (κ=0.78) anal sphincter defects was good.

Conclusion: This study showed good agreement between 3D-transperineal ultrasound and endo-anal ultrasound with regard to the detection of anal sphincter defects. Most discrepancies between both methods were observed in small and or partial defects. In general surgical repair is only considered to be beneficial in patients with substantial defects (more than 90˚ of the anal circumference). Therefore 3D-transperineal ultrasound may be considered as a valuable alternative non-invasive investigation method.

AMNIOTIC FLUID ABNORMALITIES

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Amniotic fluid volume is regulated primarily by the fetus after 16 weeks' gestation. Fetuses with abnormal fluid volume, both oligohydramnios and polyhydramnios, are at increased risk of fetal anomaly, preterm birth, stillbirth, infant mortality and morbidity. Ultrasound evaluation will be discussed, as well as other types of evaluation and monitoring to help identify the cause of the fluid abnormality as well as to prevent morbidity and mortality. Topics to be included are ultrasound, Doppler, amnio-infusion, amnioreduction, karyotype evaluation and antepartum monitoring.

FLASHFISH: SAME-DAY PRENATAL DIAGNOSIS

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Objectives: Full chromosomal analysis requires 10 - 14 days of culture to obtain sufficient metaphases in prenatal diagnosis. For couples at risk of fetal abnormalities, this long waiting period causes considerable anxiety. Rapid aneuploidy detection methods such as traditional fluorescence *in situ* hybridisation (FISH) and quantitative fluorescence-PCR can detect common fetal aneuploidies within 24 - 48 hours of fetal sampling. We aimed to develop a new FISH methodology that would allow the results to be released within the same day.

Design & method: 1 - 4 ml of amniotic fluid (*n*=40) were collected at 15 - 22 gestational weeks. Indications for amniocentesis were advanced maternal age (≥35 years), a positive screening test or an abnormal fetal ultrasonography. Carnoy's fixed amniocytes were loaded into polydimethylsiloxane microchannels adhered on a titanium dioxide-coated glass slide. Pretreatment and hybridisation were performed within the microchannels using reduced amounts of probes, samples and reagents. The probes were specific to the centromeric regions (chromosomes 18, X, Y) and locus-specific sequences (chromosomes 13, 21). Hybridisation time was decreased from the recommended 6 - 24 hours to 1 hour. Fifty nuclei were enumerated for each target probe by two independent analysts, and all results were validated by their respective karyotypes.

Results & conclusion: Fifty nuclei, each containing unequivocal signals of the target probes, could be scored in 36/40 (90%) cases by both analysts. Of the 40 samples, we found 3 cases of autosomal aneuploidies (trisomies 13, 18, 21), while no aneuploidies were detected in the remaining 37 samples (19 females, 18 males). There were no false positives and no false negatives when compared with the accepted gold standard (karyotype) (kappa coefficient = 1.0; 100% sensitivity, 100% specificity). All FISH results were concordant with their respective karyotypes and ready to be released within 3 hours of sample receipt. Results can be released within the same day of fetal sampling, alleviating parental anxiety and improving clinical management. In conclusion, we have successfully developed a cost-effective prenatal diagnostic assay for common fetal chromosomal aneuploidies using FISH-based microfluidics.

UMBILICAL CORD BLOOD AS A SOURCE OF HEMATOPOIETIC STEM CELLS FOR CURRENT APPLICATIONS AND FUTURE POTENTIAL APPLICATIONS

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Introduction: Umbilical cord blood (UCB) contains haematopoietic stem cells (HSCs) similar to those found in bone marrow, and these cells can be collected, processed, cryopreserved and then retrieved at a later stage if needed for a haematopoietic stem cell transplant (HSCT). The first attempt to transplant UCB stem cells as an alternative to bone marrow stem cells was in 1972, with the first successful recorded and published umbilical cord stem cell transplant performed in France in 1988 for a boy with Fanconi's anaemia. This review focuses on the current use of umbilical cord blood as a source of stem cells for HSCT and use in clinical trials for non-haematological applications.

Method: Literature review and collection of data from NMDP (National Marrow Donor Program), Pubmed and clinicaltrial.gov website on the current use of umbilical cord blood as a source of HSCs in current HSCTs and clinical trials using HSCs for non-haematological disorders.

Results: Today over 25 000 cord blood HSCTs have been performed worldwide for haematological conditions as an alternative source to the more traditional bone marrow source. In the paediatric setting in the USA, cord blood is the most frequently used source of stem cells for HSCTs. In the adult setting, the use of cord blood is limited by the amount of blood obtainable in the umbilical cord and thus the limited amount of these therapeutic stem cells obtained. Use of cord blood in the adult setting is therefore much lower, as the stem cell dose required is determined by the patient's body weight and an average cord blood collection is often not enough to treat an adult for the traditional haematopoietic indications. Areas of research to overcome this cell dose limitation have been extremely active with numerous researchers, biotechnology companies and university institutes actively pursuing preclinical and clinical work to overcome the issue of cell dose by looking at numerous strategies, including amplification of the stem cells, double cord blood transplants, co-transfusion with other stem cells and direct route of administration of stem cells, i.e. intra-osseous. Beyond the accepted and traditional applications for cord blood stem cells in HSC transplants, cord blood is also emerging as a potential source for regenerative medicine and cellular therapy. The cord blood is a rich source of progenitors and stem cells, not only HSCs but also other stem cells that have been implicated in regenerative medicine. Current diseases being researched in clinical trials (listed on www.clinical trials.gov) using *autologous* umbilical cord stem cells for non-haematopoietic applications include cerebral palsy, hypoxic ischaemic encephalopathy, traumatic brain injury and type 1 diabetes mellitus, and current diseases being researched in clinical trials using *allogeneic* umbilical cord stem cells for non-haematopoietic applications include spinal cord injury, epidermolysis bullosa, burns, wounds, heart disease, stroke, peripheral artery disease and others.

Conclusions: Cord blood is increasingly being used as a source of haematopoietic stem cells. The National Marrow Donor Program believes that this will continue to increase exponentially and forecast that there will be over 10 000 cord blood transplants per year by 2015. Carefully regulated and controlled clinical results will further explore the potential use of umbilical cord blood in non-haematopoietic stem cell applications

WHAT HAS BEEN THE IMPACT OF IMPLEMENTATION OF THE TERMINATION OF PREGNANCY ACT ON COMPLICATIONS ASSOCIATED WITH MISCARRIAGES AT A REGIONAL HOSPITAL?

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Objectives: To determine the effect of implementation of the Termination of Pregnancy Act (TOP Act) on the prevalence of septic abortion, abortion, maternal deaths and hysterectomy at Witbank Hospital.

Methodology: This is a retrospective analytical study. The files of all patients seen and admitted in Witbank Hospital during the period 2000 - 2010 after termination of pregnancy had been induced by any person were reviewed by interns and student nurses. The data extracted included age, gestational age, social status, marital status, occupation, contraception, method of induction, complications, treatment received, final outcome and HIV status. All the data was captured and analysed using SAS software.

Results: Four cases of termination of pregnancy were treated at Witbank Hospital per day during this period. There has been a steady increase in the number of cases of TOP compared with pre-TOP Act implementation. The majority of the patients were schoolgirls with a mean age of 18 years. The majority of the abortions were induced by general practitioners and nurses whose practices have not been licensed to carry out TOP. About 25% of the cases had severe sepsis, 5% had perforations, 10% required hysterectomy and 5% required ICU admission.

Conclusion: Implementation of the TOP Act has definitely resulted in an increase in the number of cases of complicated abortions seen at Witbank Hospital. Most of the patients are young schoolgirls. The TOPs were done in centres that have not been licensed to carry out such procedures. This has policy implications.

CHARACTERISTICS OF WOMEN HAVING FIRST-TRIMESTER TERMINATION OF PREGNANCY IN A DISTRICT/REGIONAL HOSPITAL IN KWAZULU-NATAL

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Objectives: The aim of the study was to describe the characteristics of women having first-trimester termination of pregnancy (TOP) in Newcastle Provincial Hospital (NPH) in Amajuba district, South Africa.

Design & method: Of the 758 women who had first-trimester TOP in NPH between January and December 2008, the medical records of 254 were systematically sampled retrospectively and the data were analysed descriptively.

Results: Demography: Most women (75%) were aged between 20 and 34 years. The commonest age was 23 years and the mean age 25.27 years. Two per cent were less than 16 years of age. Ninety-seven per cent were of African race, 75.6% reported having at least one child alive, 1.6% had previously had a TOP, 93.3% were single, and 70.1% resided in Newcastle sub-district while 19.7% resided outside Amajuba district. **Contraceptive use:** Eighty-nine percent were not using any contraception before the pregnancy that was terminated. **Health seeking behaviour:** Fifty-eight per cent requested TOP between 9 and 12 weeks of gestation (the commonest gestational age was 8 weeks). Seventy-four per cent were self-referred to the TOP clinic. **Indications:** Ninety-six per cent had an abortion because of socio-economic reasons. **Disclosure:** Only 69.7% disclosed their intention to procure abortion to a second person. **Support:** Every woman was counselled before TOP.

Conclusion: In our patient population, women that are more likely to have a TOP in the first trimester are in their twenties; Africans; single; parous; sexually active and not using contraceptives; residing in Newcastle sub-district; and of poor socio-economic status.

KNOWLEDGE OF CONTRACEPTION AND BARRIERS TO CONTRACEPTIVE USE IN WOMEN UNDERGOING REPEAT TERMINATION OF PREGNANCY

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Objectives: The aim of this study was to assess the indications for termination of pregnancy (TOP), the knowledge of contraception and barriers to contraceptive use in women undergoing repeat TOP within our clinical services.

Methods: A descriptive cross-sectional study was conducted in Cape Town involving women requesting repeat TOP. A questionnaire was used to interview them and was completed at the initial visit. This included the participant's demographic details, investigation of her current and previous TOPs, knowledge and use of contraception and previous post-TOP care. The perceived barriers to contraceptive use were also explored.

Results: A total of 102 women were recruited. The median age was 28 years (range 18 - 44); 66 women were single and 36 married or cohabiting. The main reasons for requesting TOP were financial constraints (*n*=40), the last child being too young (*n*=15) and family complete (*n*=13). Their knowledge of contraception included the male condom (*n*=100), injectable progestogen (*n*=99) and the combined oral contraceptive pill (COC) (*n*=92). The contraceptive methods they had ever used included the injectable progestogens (*n*=83), male condoms (*n*=69) and the COC (*n*=36). Prior to the current pregnancy 48 participants had used the male condom, 35 no contraception and 14 injectable progestogens.

Only 87 participants had previously accessed family planning services, and the majority of them (*n*=73) indicated that these were helpful and approachable. The hours of the family planning service were acceptable to 63 women, while 22 women found them unsuitable.

Of the 102 participants, 54 indicated that contraceptive services could be improved, 31 were happy with the service and 17 were uncertain about the service. Participants suggested that avoiding long waiting periods (*n*=16), health education for women (*n*=13) and changes in the attitudes of health care practitioners (*n*=11) would improve services.

Conclusion: The participants had a reasonably good knowledge of contraception, but low contraceptive use and adherence. Most unintended pregnancies in this study were related to either non-use of contraception or the use of inefficient methods. The limited use of the highly effective long-acting reversible contraception and emergency contraception was also highlighted. The opportunity for contraceptive counselling after TOP was often missed.

VENOUS THROMBO-EMBOLISM IN GYNAECOLOGICAL PATIENTS: WHAT IS THEIR RISK AS A GROUP, ARE THEY TREATED TO CORRECT PROPHYLAXIS, AND WHAT ARE THE DECISION-MAKING PROCESSES INVOLVED?

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Objectives: This study aimed to describe the venous thrombo-embolism (VTE) risk profile of the population of women undergoing gynaecological surgery at Kalafong Hospital, to audit the VTE prophylaxis practices as compared with international guidelines, and to determine the attitudes of and decision-making processes involved in a group of registrars assigned to their management.

Design & method: 109 women scheduled to undergo elective gynaecological surgery were assessed for their risk of developing peri-operative VTE and classified by means of the Modified Caprini VTE risk assessment model into four risk categories. The prophylaxis they received was documented. A group of registrars was asked to fill out a questionnaire that outlined four case scenarios where they were required to identify the risk group and select the appropriate prophylaxis for each group.

Results: Of the 109 women 45% was classified as at very high risk, 38% at high risk, 14% at moderate risk and 3% at low risk. The audit revealed that only 10% received the correct VTE prophylaxis, 77% received some but inadequate prophylaxis and 13% received no prophylaxis whatsoever. The registrars performed poorly in their assessment, revealing an inability to correctly stratify patients into different risk groups and select the appropriate prophylaxis. 52% prescribed the same regime to all their patients.

Conclusion: VTE is a life-threatening condition. An estimated 33% of patients undergoing a surgical procedure will develop a peri-operative VTE without prophylaxis. It is therefore imperative to be able to correctly identify patients at risk and to employ appropriate prophylactic measures, a practice that was demonstrated to be lacking. Steps need to be taken to overcome this problem.

ALTERNATIVE METHOD OF MYOMECTOMY COMBINED WITH CERVICAL CERCLAGE FOR THREATENED MISCARRIAGE IN SECOND-TRIMESTER PREGNANCY

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Objectives:

- Stout *et al.* (2010) state that fibroids pose a low risk for obstetric complications, in contrast to Klatsky's review (2008) indicating that (*i*) submucosal fibroids have a 95% association with lower ongoing pregnancy rates through decreased implantation; and (*ii*) women with intramural fibroids experience more miscarriages (20.4% v. 12.9%).
- In Africa it is an abomination to do hysterectomy for fibroids in the first place or following life-threatening bleeding during myomectomy.
- Myomectomy in pregnancy may result in excessive bleeding or in miscarriage. To avoid such risks, Suwandinata *et al.* (2008) report a modified surgical method whereby interrupted sutures around the myoma controlled the bleeding for an 18-week GA patient with threatened miscarriage.
- We suggest an alternative, *non-haemorragic myomectomy* combined with cervical cercalge during pregnancy.

Design & method: A 30-year-old primigravida, rejecting TAH offered by colleagues, consulted for threatened miscarriage and multiple giant fibroids. Echography disclosed a 17-week GA fetus and 3 big fibroids (111×102, 132×139 and 101×110 mm). Conservative treatment (bed rest + tocolytics + analgesics) failed. Cervical cerclage and triple intramural fibroid excision leaving a thin external layer of tumour capsule avoided heavy bleeding of the neighbouring myometrium and also opening of the uterine cavity.

Result: A normal baby boy was born by elective CS at 37 weeks' gestation. Despite advice not to conceive again less than 2 years after his birth, the

patient delivered a normal girl by CS, 16 months later. One sub-mucosal and two intra-mural fibroids of 2 560 g were excised with minimal intra-operative bleeding.

Conclusion: Performed in the 2nd trimester, multiple myomectomy without traumatising the neighbouring myometrial layers, combined with prophylactic cervical cerclage, successfully avoided TAH and enabled the reproductive career of a primigravida to be saved.

RETROSPECTIVE REVIEW OF INDICATIONS FOR EMERGENCY OBSTETRIC REFERRALS FROM MOFOLO COMMUNITY HEALTH CENTRE TO CHRIS HANI BARAGWANATH HOSPITAL

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Objectives: South Africa may not be on schedule to meet Millennium Development Goal 5, which is to reduce the maternal mortality rate (MMR) by 75%. The MMR increased by 80% to 410 in 2008 from 230 in 1990. This 80% increase suggests that the MMR for South Africa has worsened by 3.3% each year between 1990 and 2008 (World Health Organization. Trends in Maternal Mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and the World Bank, 2010). This retrospective review aimed to monitor both risk assessment and emergency obstetric care at Mofolo community health centre (CHC).

Design & method: Admission book records of all pregnant women who presented to Mofolo emergency obstetric care unit (EmOC) during the first 3 months of 2010 were reviewed and allocated to two Microsoft-Excel spreadsheets.

Results: HIV test results were recorded for 94%, with HIV prevalence of 28%. Data from 834 presentations was allocated to 2 groups. The *resident group* (*n*=493) included 280 deliveries, 3 transferred due to staff shortage and 210 patients who were discharged home as they were not yet in labour. The *referred group* (*n*=347) included 44 patients who delivered at Mofolo with their respective 44 neonates, which accounted for the referral reason in 51%. Referrals before delivery (*n*=303) were due to PIH (22.7%), delayed cervical dilation as assessed with the partogram (16.5%), MSL (14.7%) and pre-term (8.1%).

Conclusion: Results appear compatible with protocol. As patients may choose to deliver at Mofolo or at Chris Hani Baragwanath Hospital themselves, prior to presentation, the results may not reflect the Mofolo community.

The 94% testing rate for HIV is exemplary and representative of outstanding community and social responsibility, as prevention of mother-to-child transmission can be attempted. This is compatible with both South African policy and the World Health Organization proposal of 'Universal voluntary testing with immediate ARV treatment in South Africa' (Granich et *al.*, *Lancet* 2009;373:48-57).

KNOWLEDGE AND USE OF CONTRACEPTION AMONG WOMEN REQUESTING TOP

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Objectives: To determine the knowledge and use of contraception among women who requested TOP for social reasons.

Design & method: It was a prospective study including a structured questionnaire. Researchers conducted the interview on all (50) women who requested TOP for social reasons over a 2-week period in June 2010 at the Charlotte Maxeke Johannesburg Academic Hospital. Data were both quantitative and qualitative, and descriptive statistics was analysed. This is a preliminary data analysis.

Results: The mean age of the subjects was 26 years and 12% were adolescents. Forty-seven (94%) were single. Only 8% of the women were supported financially by the father of the current pregnancy. The mean GA was 16 weeks and 78% were mulitigravidas. Among the parous women, mean age at first pregnancy was 19 years. Forty-six subjects 46 (92%) had ever used any contraception and 4 (8%) had never used any contraception. Among ever-users, 29 (63%) and 17 (37%) used dual and single agents, respectively. Among them, the oral contraceptive pill, injectable and only condom were used by 21%, 64% and 15%, respectively. All women (46, 100%) used condoms irregularly. Mean interval of last use of any contraception was 3 years. Fifteen (33%) women still claimed to be on contraception currently. Reasons for stopping the contraception were no reason (17, 38%), followed by heavy bleeding (8, 18%), partner separation (4, 9%) and headache (3, 7%). All women (100%) were aware about contraception preventing pregnancy and condoms preventing HIV. Among the choice of future contraceptive method, 11% were unsure while 3% believed in abstinence only and 3% wanted hysterectomy as a form of contraception. Only 10 women (16%) decided to use dual contraception in future.

Conclusion: Although knowledge about individual agents was good among women, their regular and proper use remained limited even in an urban area. Use of condoms as part of dual contraception remained limited. Without the proper use of contraception, unwanted pregnancy and HIV infection cannot be reduced. Large numbers of adolescents (12%) were a particular concern.

DOES HIV INFECTION INFLUENCE OUTCOME OF PREGNANCIES COMPLICATED BY RESPIRATORY DISEASE?

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Objectives: To determine the maternal and perinatal outcomes of women with respiratory disease in pregnancy at King Edward VIII Hospital (KEH), Durban.

Design and methods: Women with respiratory disease delivering at KEH between 1 January 2010 and 31 December 2010 formed the study population. The names and hospital numbers of women with respiratory diseases were obtained from the maternity and radiology departments. A structured data sheet was used to capture information from these records. The chi-square and Fisher's exact tests were used to compare categorical variables and Student's *t*-test was used for comparison of continuous variables.

Results: One hundred and twenty-seven of 6 702 women had their pregnancies complicated by a respiratory disorder, giving a prevalence of 1.9%. Seventy-nine (62.2%) were HIV positive. Pneumonia was the commonest respiratory disease in pregnancy in 77 (60.6%) women, with 67 (52.8%) having community-acquired pneumonia and 10 (7.9%) having *Pneumocystis carinii* pneumonia (PCP). This was followed by asthma in 49 (38.6%) and tuberculosis in 34 (26.8%) women, respectively. In women with pneumonia, preterm delivery (PTD) occurred in 23 (34.8%). Women with PCP had an increased risk of PTD (p=0.018), ICU admission (p=0.000), ARDS (p=0.021), death (0.001), a 5-minute Apgar score <7 (p<0.001), VLBW (p<0.001) and FSB (p=<0.001) when compared with women with other respiratory diseases. The maternal outcomes in women with tuberculosis (*n*=34) were PTD (53.1%), maternal mortality (14.7%), ICU admission (11.8%) and ARDS (11.8%). Tuberculosis affected perinatal outcomes, with low birth weight (LBW) (38.7%), 5-minute Apgar score <7 (25%), very low birth weight (VLBW) (19.4%) and perinatal mortality (20.5%).

In women with TB who were HIV positive (*n*=29), there was a significant difference in the number of maternal deaths (p=0.03), VLBW infants (p=0.01) and perinatal mortality rate (p=0.006) compared with the HIV-negative women.

Asthma (*n*=49) was associated with a risk of PTD in 10.4% and LBW in 12.8% of women. The HIV status in women with asthma did not influence the PTD rate.

Conclusions: The prevalence of respiratory diseases in pregnancy at King Edward VIII Hospital is 1.9%. Respiratory diseases in pregnancy are associated with adverse pregnancy outcomes, worsened by HIV co-infection. The outcomes were lower birth weight, increased perinatal and maternal mortality, and increased PTD.

DOES HIV INFECTION INFLUENCE THE CAESAREAN SECTION RATE AND IS IT ASSOCIATED WITH INCREASED MORBIDITY?

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Aim: To determine whether HIV infection is associated with increased operative and postoperative morbidity in women having caesarean section (CS).

Materials & methods: The study was conducted at KEH from 1 January 2008 to 31 December 2008. Data were collected on a structured data sheet. Statistical analysis was performed using SPSS version 15.

Results: There were 6 276 deliveries during the study period, and 2 900 women (46%) underwent CS. Data analysis was performed using 2 451 charts. There were 2 120 (34%) deliveries in HIV-positive women and 997 (47%) of them underwent CS.

The major indications for CS included fetal distress (27.3%), previous CS × 1 (26%) and cephalopelvic disproportion (16.6%). Of the women with one previous CS having another CS, 20% refused VBAC and 10% had a failed VBAC. Eighteen per cent of women had CS because of previous CS and a co-factor. Co-factors were HIV-positive status (13%), nonspecific APH (0.3%), big baby (0.9%), suspected previous classic scar (0.5%), postdates (1.9%), PPROM (1.3%) and malpresentation (0.3%).

Seven hundred and forty-seven women were booked for elective CS; however, 18.2% ended up having emergency CS. The reasons for CS done before the elective date of surgery were mainly spontaneous onset of labour before the date set for elective CS (66.2%), hypertension (28%) and pre-labour rupture of membranes (5.9%).

Out of the 2 451 charts reviewed, 40.7% women were found to be HIV positive, 56.4% were HIV negative and 2.9% had unknown status. There were no differences in maternal characteristics, indications for CS and complication rates in HIV-positive versus HIV-negative women. The majority of women with one or more previous CS (34%) had a repeat CS.

Conclusions: The CS rate at King Edward VIII hospital was 46%, with fetal distress and previous CS × 1 being the leading indications. There was no difference in the indications, CS rate or postoperative complications between HIV-positive and HIV-negative women.

BREECH DELIVERIES IN TYGERBERG ACADEMIC HOSPITAL: MATERNAL AND NEONATAL OUTCOMES OF VAGINAL AND ABDOMINAL DELIVERIES – A CASE-CONTROLLED STUDY

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Objective: To review the difference in short-term neonatal and maternal outcomes among singleton infants with breech presentation delivered by vaginal or elective caesarean section at term, at Tygerberg Academic Hospital (TBH) in Cape Town.

The study design was a retrospective case control study.

Method:
Part I. A total of 120 patients were selected, 60 vaginal breech deliveries and 60 elective caesarean sections for breech presentation (comprising the control group). 60 cases of vaginal deliveries were collected and 60 control cases of planned elective caesarean sections, where the indication for CS was breech presentation, were collected in the same manner.

Part II. Nineteen registrars completed a questionnaire regarding their subjective experiences of vaginal breech deliveries at Tygerberg Academic Hospital.

Results:
Part I. An analysis of the results found statistically significant differences in maternal ages between the two groups, with younger women delivering by CS; gravidity and parity was lower in the CS group; blood loss was observed to be higher in the CS group with more women requiring a blood transfusion when compared to vaginal delivery; there were more neonatal admissions in the vaginal delivery group as well as more birth trauma, seizures and neonatal death in this group; Apgar scores were higher in the CS group; and finally neonates born by CS were more commonly discharged at the same time as their mothers in the CS group.

Part II. When analysing the registrar questionnaire it can be noted that although clinicians are performing an adequate number of breech vaginal deliveries, with an average of 10 deliveries per year, the skills training for clinicians is invaluable. Not all registrars learned skills from a senior clinician and skills training in skills labs is essential for initial and even continual training of these clinicians. It is suggested that these skills training programmes be made compulsory for all registrars and that a biyearly attendance and completing of such a course be mandatory for those wishing to work in the labour ward.

Conclusions: Although not statistically significant, there was more morbidity and mortality associated with vaginal breech delivery.

HOW HAS THE TERMINATION OF PREGNANCY ACT AFFECTED CONTRACEPTIVE UTILISATION PATTERNS IN MPUMALANGA PROVINCE: A 10-YEAR REVIEW

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Introduction: Since the implementation of the Termination of Pregnacy Act in 1998, fears have been expressed that pregnancy termination may become the preferred method of choice for contraception. To the best of our knowledge no research has addressed whether there are grounds for these fears, which this paper therefore tries to address.

Objective: To determine the effect of the implementation of TOP Act on the rates of utilisation of other methods of contraception in one province in South Africa.

Methods: The reports of the number of all patients who had undergone TOP in the past 10 years and the utilisation data on contraceptives in the three districts in Mpumalanga province were analysed using basic statistical tools. The results are presented in tabular form.

Results: There has been a general decline in the utilisation of contraceptive methods in the province. Despite there being few accredited TOP centres, there has been a gradual rise in the number of women who undergo the TOP procedure in the province.

Discussion: There are grounds for fearing that TOP may become the most popular choice of contraception in RSA if the trends in Mpumalanga can be extrapolated to the other provinces. This has serious policy implications and our ability to fulfil the MDG5. Closer monitoring of these trends needs to be done.

WHAT PROPORTION OF BIRTHS SHOULD BE VAGINAL?

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With the consistent and seemingly unstoppable rise in caesarean section rates worldwide, one is often asked what the ideal proportion of caesarean sections should be. The caesarean section rate in South Africa is now close to 20%. Health service managers sometimes quote the World Health Organization ideal caesarean rate of 15%, and then expect clinicians to reduce their caesarean section rates towards this goal. This is unrealistic and potentially dangerous to pregnant women.

There is no doubt that caesarean sections save lives. It has been shown in studies of countries and regions that as the caesarean section rate for a population rises, maternal and perinatal mortality falls. However, this phenomenon only applies up to a caesarean section rate of 8%, after which mortality rates remain stable. Therefore, caesarean section rates less than 8% can be considered 'too low'.

At what point are caesarean section rates 'too high'? The answer to this question has proved elusive, and can best be characterised as 'it depends'. The determinants for caesarean section rates include population factors such as socio-economic conditions, community attitudes to caesarean section, fertility rates and the state of local health care facilities. Clinical factors among a community's women would include parity distribution, maternal stature and nutrition, frequency of previous caesarean section and the level of coincident pregnancy morbidity such as preterm birth, hypertension, multiple pregnancy, malpresentation and other obstetric factors.

This review will attempt to determine upper limits for caesarean section rates in different contexts, using local experience as well as evidence from epidemiological and clinical studies.

CAN MEDICAL SCHEMES AFFORD A CAESAREAN SECTION RATE OF OVER 60%?

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Discovery Health

Much literature has been published about new global trends that have emerged within the field of maternity. In particular, increasing caesarean section rates have received much attention. Many factors have been linked to this, such as patient choice; doctor preference; fear of malpractice; improved surgical and anaesthetic techniques; and structural issues within health systems. It also facilitates sterilisation by tubal ligation, which women value in certain parts of the world, e.g. Latin America. Subsequently, the impact of these trends on maternal and neonatal outcomes has been under scrutiny.

In this paper, we will present claims and clinical data from the largest medical aid administrator in South Africa, Discovery Health, to describe local maternity trends within the South African private healthcare system. We have used data from 2005 to 2011 to demonstrate longitudinal trends, e.g. caesarean section rates. There were over 200 000 deliveries within this multi-year dataset. We also present a cross-sectional analysis of regional and hospital variation, based on 2011 data which contains 40 103 total maternity admissions.

High-level findings include that caesarean section rates were just over 71% as at the end of 2011, having consistently climbed every year since 2005, when the rate was recorded as 66.8%. These rates are not consistent with international guidelines or with trends in many other countries. For example, while the WHO's optimal rate is 10 - 15%, the highest caesarean section rates that have been documented internationally range from 40% to 50%.

Regional variations within the South African private sector are also found, where some hospitals have caesarean section rates as high 91.4% while others are at 41.1%. There appears to be a relationship with socio-economic factors, as the more affluent areas typically demonstrate higher caesarean section rates, and vice versa. This trend is also evident when one examines by medical scheme benefit option. The low-income plans have a rate of 65%, while the top-end plans have rates that are consistently above 80% in 2010 and 2011.

These high rates of caesarean sections are not accompanied by improvements in or better than expected maternal and neonatal outcomes. In fact, while neonatal outcomes seem to be on par with other country's experiences, maternal outcomes and especially mortality rates are significantly below OECD norms in our data. It is understood that there are certain local factors, e.g. HIV/AIDS, that may contribute to the latter pattern. This will be the subject of future investigation.

One unexpected trend we found in the 2011 period was an increased use of physiotherapists after caesarean section compared with 2010, despite no apparent related complications or co-morbidities. This trend was particularly prevalent in Gauteng province.

Much work is being undertaken in other parts of the world to try to reverse these trends. Countries such as Canada have shown that caesarean section rates can be safely reduced through concerted use of multifaceted strategies, rigorous application of clinical protocols, data analysis and feedback processes to the clinicians. Unfortunately, these efforts are currently limited in the South African private sector, where we appear to have accepted that these trends are irreversible.

Discovery Health is involved in a small scale project aimed at introducing some of these components, in particular, focused on re-building 24/7 multidisciplinary teams within clinical practice which are supported by new reimbursement models that address the fragmented individual practice and the misalignment of incentives. We hope that this will yield favourable results which we can share with the relevant stakeholders.

THE COST-EFFECTIVENESS OF CAESAREAN SECTION VERSUS VAGINAL DELIVERY

P C Koll

The 'great caesar debate' continues unabated, with progressively worsening statistical naughtiness emanating from both camps. One of the arguments of the anti-caesar brigade is the cost of caesarean section. But, does elective caesarean section actually cost more? In this discussion we evaluate the actual costs incurred as a consequence of the patient electing to have a caesarean section compared with the costs incurred as a consequence of the patient electing to have a vaginal birth, regardless of the final outcome.

THE EFFECT OF CAESAREAN SECTIONS ON FUTURE PREGNANCIES

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When we counsel women for consent for a caesarean section we often neglect to inform them of the consequences of this action in the following pregnancy. Probably the most important of these will be the risk of placenta previa with/without accreta. The risk increases substantially with the number of caesarean sections. We know that the risk for caesarean-hysterectomy in the accreta group is above 90%. The second biggest problem is the patients who develop early pregnancy complications in the subsequent pregnancy. A mid-trimester intra-uterine death or diagnosis of a lethal congenital abnormality can be a real management dilemma in patients who have had a previous caesarean section. Other complications reported include uterine rupture, ectopic pregnancy in the scar, unexplained pain during pregnancy, bladder/intestine injury during caesarean section and endometriosis in the abdominal/uterine scar. Research has shown that tubal infertility and unexplained stillbirths are not increased in patients with a prior caesarean section.

DOES A CAESAREAN SECTION PROTECT THE INTEGRITY OF THE PELVIC FLOOR?

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University of the Free State

A woman's pelvic floor has a significant amount of force exerted on it throughout a full-term pregnancy. The mode of delivery might have a long-term effect on the pelvic floor function (sexual, bowel, bladder and risk of pelvic organ prolapse). It is important to distinguish between three specific delivery modalities when one evaluates the impact on pelvic floor function and integrity. These are elective caesarean section, emergency (intrapartum) caesarean section, and of course vaginal delivery. It has been clearly documented in recent times that a vaginal delivery can be associated with levator ani muscular injury, including partial or complete avulsion. Direct muscular trauma is however not the only harmful factor with an effect on long-term pelvic floor function. The integrity of the pelvic floor refers to pelvic organ positioning, normal neural sensation and function as well as muscular function overall, not just function of the levator ani muscle. The ability of a caesarean section to circumvent any detrimental effect on the integrity of the pelvic floor is, however, a controversial and conflicting matter. This talk will focus on the available evidence to judge whether a caesarean section truly protects the integrity of a woman's pelvic floor and thereby long-term pelvic function.

IS CAESAREAN SECTION ON REQUEST THE FUTURE?

P de Jong
Cape Town

Let us disregard for a moment, that the HPCSA has mandated that mothers to be fully informed of all birthing options, including the right to choose elective caesarean section should they so desire.

The World Health Organization suggested a 15% incidence of caesarean section several years ago. This figure is a pure 'thumb suck', with no scientific basis whatsoever to substantiate the assertion. There can never be a blanket caesarean section rate determination – for example, the 5% caesarean section rate in the Netherlands is completely unattainable in a developing country, where a host of high-risk factors mandate a higher rate. It is scandalous that several African states have caesarean section rates of 1 - 2%, but the high maternal and fetal morbidity and mortality prove that many caesarean sections are never done.

Our medical schemes bemoan the high caesarean rate in SA: this is because the private hospitals bill at inflated rates. The cost of an elective caesarean section and the actual hospital bill are completely unrelated. In fact, the cost of an elective caesarean section and a successful vaginal delivery are very similar. Medical aids complain about costs – whatever they say, it's not about patient choice, but about costs.

Litigation is a huge problem: many caesarean sections are done 'prophylactically' to avoid litigation: for example, the vast majority of twin deliveries in private practice are by caesarean section. With the shortage of good, experienced midwives, many obstetricians do caesarean sections as the safer option. With many women opting for smaller families, at a later age, caesarean section is a popular option. Finally, there is scientific doubt whatsoever, that caesarean section protects the pelvic floor, and drastically reduces the incidence of prolapse and urinary incontinence – and perhaps also dyspareunia.

So caesarean section on request is the future, for informed women, should they choose.