


**JOURNAL ARTICLE  
SUMMARY SERVICE**
**March 2022**
**Opportunistic salpingectomy**

Opportunistic salpingectomy is the removal of both fallopian tubes during surgery at the time of hysterectomy or instead of an “occlusive” tubal ligation. The addition of this procedure, or the replacement of tubal occlusion, carries an advantage in that it may be a primary preventative measure against ovarian cancer.

The majority (two thirds) of spontaneously occurring ovarian malignancies are high-grade serous carcinomas with a five-year survival rate at diagnosis of less than 50%. Almost all cancers in BRCA I and II carriers are similar histological types. There are no reliable screening tests for early detection of ovarian malignancies, so any prophylactic measure is of considerable interest.

For more than a decade the tubal origins (especially of the fimbrial end and endosalpinx) of serous carcinomas have been identified, with speculation that surgical removal of this tissue could reduce the risk of ovarian cancer ([Kindelberger et al Am J Surg Path 2007;31:161-9](#)). Now there is evidence that including salpingectomy at hysterectomy, or replacing tubal ligation with salpingectomies, does decrease the number of ovarian cancers – both serous and epithelial ([Hanley et al JAMA Netw Open 2022;5:e2147343](#)). These researchers followed up women in each category and compared numbers of subsequent ovarian malignancies:

<u>Procedure</u>	<u>Numbers</u>	<u>Mean Age</u>	<u>Serous Ca</u>	<u>Epithelial Ca</u>
Opportunistic salpingectomy	25,000	40	0	<5
Hysterectomy or tubal ligation	32,000	38	5	8

Ovarian removal in these age groups is not recommended because of links with increased mortality rates, cardiovascular disease, and osteoporosis. The situation in germline BRCA I and II variant carriers is different and needs individual, shared decision making.

*Editorial opinion – Any potential reduction in ovarian cancer risk is a welcome prospect, and salpingectomy, when permanent contraception is required, should be discussed with eligible patients. Hesitancy by doctors include the woman’s age, lack of operative technique instruction, theatre time, and bleeding, if carried out at caesarean section ([Obermair et al ANZJOG 2021;61:973-7](#)). My view is every opportunity should be taken to offer this form of risk reduction.*

**Ovarian cancer – fact file**

- About 10% of ovarian cysts or pelvic masses that are surgically investigated, turn out to be malignant
- Epithelial ovarian cancers comprise ovarian, fallopian tube and peritoneal lesions. Most (70%) are high-grade serous carcinomas
- They are the second most common gynaecological malignancies after endometrial cancer, but they are the most lethal, mainly because of their late presentation

- 5-year survival rates are 85% for local and regional disease but 30% for distant spread. The overall 5-year survival rate is 50%
- There is no satisfactory screening test at present ([Menon et al Lancet 2021;397:2182-93](#))
- Research is being directed at following recurrent disease with a view to chemotherapy and “second look” surgery with cytoreduction ([Harter et al NEJM 2021; 385:2123-31](#))
- Assessing and monitoring ovarian disease utilises Cancer Antigen 125 (CA 125) and a novel serum biomarker which is being added to the evaluation and prognostication list. This is called “human epididymis 4” (HE4) and with CA 125 will improve predictive accuracy. For more information see [Turner et al Medscape 2022](#).

## Comparative Family Planning

Long-acting reversible contraceptive methods are becoming increasingly popular and intra-uterine devices are high on the list of choices. However, there are differences of opinion as to the selection of the device and the effectiveness of each, in terms of their pregnancy prevention “in the real world”. A large survey was conducted in the United States where 2 IUCDs were compared with each other and with tubal ligation ([Schwarz et al 2022 J Gen Int Med doi 10.1007/s11606-022-07433-4](#)). There were more than 20 000 women in each of the three arms of the study population – tubal ligation, levonorgestrol IUCD and copper IUCD. None were used postpartum and pregnancy rates were collected at one year.

<u>Method</u>	<u>Pregnancy rate at 1 year</u>
Tubal ligation	2.6%
Levonorgestrol IUCD	2.4%
Copper IUCD	3%

These failure rates are considerably higher than those quoted in conventional brochures and texts and the authors of the article offer no explanation for these consistently elevated figures other than “real-world” results.

Where IUCDs are used, it is accepted that a certain number will be expelled, and this risk is greatest when they are inserted soon after birth. The actual figures from a series of more than 300 000 were that if placed within 3 days of delivery, the expulsion rate was 10% which drops to 3% at 6 weeks postpartum ([Armstrong et al JAMA Netw Open 2022;5:e2148474](#)).

## Assisted Reproductive Technology

Assisted reproductive technology (ART) involves the in vitro manipulation of gametes and embryos in a synthetic culture environment. The **developmental origins of health** theory posits that any factors before birth can have long-term epigenetic influences on the offspring later in life, so research is required to observe any effects of ART into adulthood. To date more than eight million infants have been born following ART and 4 to 6% of all deliveries are ART initiated in high-income countries.

### **Are children conceived using ART at increased risk of altered cardiovascular function?**

Intrauterine influences such as restricted growth, hypertensive disorders, and early delivery can manifest in cardiovascular pathology many decades later. Cardiac remodelling occurs in the fetus and some studies have found increased rates of cardiac disorders in ART-conceived children. However, detailed measurements of heart structure and function in 6 to 10 year-olds presents challenges so definitive data are scanty.

A group of nearly 400 ART-conceived children, and an equivalent number of naturally conceived controls, had their blood pressure accurately measured plus left ventricular structural and functional parameters assessed by echocardiography ([Cui et al JAMA Netw Open 2021;4:e2132602](#)). The ART group had statistically significantly higher blood pressure readings (systolic 106 v 104 and diastolic 67 v 62) plus more abnormal left ventricular dysfunction measurements and questionable structural elements than the control group.

The researchers describe these changes as unfavourable and call for investigations into incidence, possible remedial pathways, and follow-up recommendations into adulthood.

### **Are children conceived using ART at increased risk of psychiatric disorders in adolescence?**

Infertility can cause tension in relationships and long-awaited pregnancies can carry anxiety and maternal stress is known to be associated with adverse developmental outcomes. A study from Sweden reviewed a cohort of more than a million births and noted any psychiatric histories over 18 years to explore any raised risk of such disorders in relation to ART conceptions ([Wang et al JAMA Psychiatry 2021 doi 10.1001/jamapsychiatry.2021.3647](#)).

The results showed no greater incidence of psychiatric disorders in ART-conceived offspring and an elevated risk of obsessive-compulsive disorders in adolescence was “explained by differences in parental characteristics”.

### **Is ICSI of value when the sperm count is normal?**

Intracytoplasmic sperm injection (ICSI) is of benefit when male factor infertility is an issue, but it has become more often used when no such impediment is identified. ICSI is an additional and more expensive manoeuvre than conventional IVF, so why is it more frequently offered as part of the process, and does it add value as measured by higher live births rates?

A study from Vietnam compared the outcomes of more than 1 000 couples (with normal sperm counts) half of whom had ICSI and half had “usual” insemination ([Dang et al Lancet 2021 doi 10.1016/S0140-6736\(21\)00535-3](#)). There was no statistical difference in birth rates, which begs the question as to why the increase in ICSI use.

*Editor’s question – Will these results cause clinics to reconsider their policies?*

The downward trend of sperm counts and quality around the world is a vexed question for reproductive analysts. Work from China explores the question of air pollution as a factor, and it seems that living in an environment where the atmosphere contains large quantities of particulate matter between 2.5 $\mu$  and 10 $\mu$  causes a decrease in sperm motility (asthenospermia). A study of more than 30 000 men strongly suggested an association between greater particulate matter counts and sperm quality ([Zhao et al JAMA Netw Open 2022;5:e2148684](#)).

### **Polygenic risk scores for embryos – is it ethical?**

It is unethical to offer expensive (or any) tests that have no proven worth to patients? This is what is happening in some ART clinics in the US and Europe with polygenic risk scores (PRS) being promoted as an “add-on” test on embryos pre-implantation.

Ostensibly PRS will genetically “predict the likelihood of an unborn child being liable to a specific disease in the future” but there is no evidence that this is true. PRS is used experimentally in adults to estimate an individual’s genetic liability to a trait occurring because of their genotype in association with “relative genome-wide association study (GWAS) data”. These scores depend on many genetic variants and give a number that can only be rationally interpreted in the light of

clinical and environmental factors. No work has been published demonstrating any value in the prediction of an embryo's future health.

Various genetic experts have slated PRS testing of embryos as “unusable, unethical, and impractical” ([Mahase BMJ 2022;376:o218](#)). Others say it is “unproven and unethical” and that prospective parents should be warned against such practices and be given “adequate and unbiased information” ([Forzano Eu J Hum Gen 2021 doi 10.1038/s41431-021-01000-x](#)).

*Editorial comment – The exploitation of couples seeking infertility treatment should be guarded against. Offering an unevaluated test such as PRS, “is like selling snake oil”.*

## Preterm deliveries

All data presented about preterm deliveries have to be couched in the context of gestational age and WHO definitions are: preterm – less than 37 completed weeks; moderate to late preterm – 32 to 36 weeks; very preterm – before 32 weeks, and extremely preterm – before 28 weeks.

The global figures are around 10% of all births being preterm, with 0.5% in the extremely preterm category, with these having an infant mortality rate around 200 times greater than term babies. Even these broad statistics vary between high-income countries, with the preterm rate in the US being three times higher than that of Denmark with factors such as seasonality, obesity, and Covid lockdowns all affecting rates of extreme prematurity ([Hviid et al JAMA Netw Open 2022;5:e2145800](#) and [Nelson et al JAMA Netw Open 2022;5:e2145808](#)).

As obstetric management advances and neonatal services expand, more extremely young infants survive but, because of ethical guidelines and long-term follow-up results, decisions about management have become more nuanced ([Morgan et al BMJ 2022;376:e055924](#)). Within the extreme bracket, mortality rates are closely linked to gestational age as follows: 24 weeks 40%, 25 weeks 30%, 26 weeks 20% and 27 weeks 15%. These figures are from tertiary institution research data ([Juul et al JAMA Netw Open 2022;5:e2146404](#)) with half of all deaths occurring within the first 10 days after birth.

Infants born between 22 and 26 weeks gestation in hospitals with high-care facilities were evaluated at two years and the following outcomes were recorded ([Bell et al JAMA 2022;327:248-63](#)).

<u>Neurological Development</u>	<u>Percent of cohort (22-26 weeks GA)</u>
None or mild impairment	50%
Moderate impairment	30%
Severe impairment	20%

As survival rates have increased, so has interest in the short- and long-term effects in extreme preterm birth, such as:

- Survival free of major neurodevelopmental disability has increased from 40% two decades ago to 60% ([Cheong et al JAMA Pediatr 2021 doi 10.1001/jamapediatrics.2021.2052](#)).
- Both low gestational age and birth weight survivors are being followed to adulthood and compared with term-born adults, with a mean difference of 12 IQ points noted. IQ was also influenced by maternal educational levels ([Eves et al JAMA Pediatr 2021 doi 10.1001/jamapediatrics.2021.1058](#)).
- There are also challenges of cognition, executive function and behaviour once these children reach school-going age. These characteristics lead to, and are amplified by, high screen-time

(more than two hours per day) as measured in six year olds ([Vohr et al JAMA Pediatr 2021 doi 10.1001/jamapediatrics.2021.2041](#)).

- Heart failure in infants is also being revealed by cardio-metabolic studies and appears partly attributable to pulmonary dysfunction and may play out into adulthood ([Crump et al JAMA Pediatr 2021;175:689-97](#)). Interestingly, infants who were fed maternal breast milk had superior cardiac function compared with those not breast-fed ([El-Khuffash et al JAMA Netw Open 2021;4:e2121206](#)).
- Long-term visual deficits are one of the possible sequelae of extreme preterm birth. Following such a group into young adulthood, it was found that visual acuity, strabismus, ocular motility and nystagmus were all commoner than in term-born controls. Only half had a history of retinopathy of prematurity and the group, as a whole, perceived their visual health as good ([Jain et al JAMA Netw Open 2022;5:e2145702](#)). The authors suggest that, at least ophthalmologically, these children remain “preterm for life”.

### **Preterm prevention**

The reasons for a woman delivering early are mostly unknown, with the vast majority of cases occurring in “low-risk” pregnancies. These two factors make prevention on a large scale unrealistic, but even where “high-risk” situations do arise, there is no reliable or effective management.

What is tried in those with a history of a preterm delivery or found to have a short cervix (ultrasonically less than 30mm at 20 weeks) is progesterone in various forms. Vaginal and intramuscular routes of administration do have some association with fewer births prior to 34 weeks, but outcomes are inconsistent and the impact on the absolute number of preterm deliveries is negligible – less than 0.05%. ([EPPIC Group Lancet 2021 doi 10.1016/S0140-6736\(21\)00217-8](#)). For comparative intervention outcomes (including cerclages) see [Care et al BMJ 2022;376:e064547](#).

## Neuraxial analgesia in labour

Neuraxial analgesia is correctly defined as the use of epidural anaesthesia alone or combined with spinal anaesthesia for pain relief in labour. Challenges to any adverse maternal or fetal effects, such as increased rates of caesarean delivery or long-term back pain and poorer “offspring outcomes” have been refuted in recent trials ([Butwick & Wall-Wieler JAMA Netw Open 2021;4:e2131722](#), [Kearns et al JAMA Netw Open 2021;4:e2131683](#) & [Straub et al JAMA Netw Open 2021;4:e2140458](#)).

Now a large trial has demonstrated neuraxial analgesia’s association with lowered maternal morbidity, mainly mediated through lower rates of postpartum haemorrhage (by 20%) ([Guglielminotti et al JAMA Netw Open 2022;5:e220137](#)). The proposed mechanism is that having anaesthesia “on board” allows the immediate treatment of the causes of bleeding after delivery, such as a retained placenta removal or trauma. Being the most effective form of pain relief and offering reduced morbidity is reassuring, and rightly calls for the technique’s wider availability in public health policies in all countries ([Pankiv et al JAMA Netw Open 2022;5:e220142](#)).

*Editorial comment – This trial emanates from New York and is an example of American physicians addressing wider healthcare problems which are a source of deep concern in that country. The United States allocates a larger portion of its GDP to medical care than any country in the world. European and other high-income nations spend 7 to 12%, but the US doles out 17% each year for medically related matters. Despite this expenditure, the efficiency of its healthcare system languishes below 30<sup>th</sup> in the world rankings and this is reflected in two aspects of obstetric care, namely preterm delivery and maternal mortality rates.*

*Both are higher than comparable countries by some margin which are variously attributed to unequal healthcare facilities being accessible to different socio-economic groups, and racial disparity. For example, the latest maternal mortality rate – for 2020 – was 24 deaths per 100 000 births ([Hoyert 2022 Nat Cen Health Stats](#)). Most European and high-income countries have rates of below 10. The figure is higher than for 2019 and revealed that deaths for Black women were three times greater than for White women ([CDC Mat Mort 2022](#)) probably reflecting “structural racism” ([Dreyer JAMA Netw Open 2021;4:e2138828](#)).*

*There were also marked discrepancies in relation to age, with those over the age of 40 being at seven times the risk of dying in pregnancy compared with those below the age of 25 years.*

*The efforts being put in by the medical establishment to rectify the situation are monumental, but the issues are endemic and socio-political in origin. They do not reflect our profession’s willingness to embrace diversity, equality and inclusiveness (DEI).*

### Caesarean section skin incisions in obese women

Obesity is associated with higher rates of caesarean section than in non-obese women and this is especially true in those who are morbidly obese – with a BMI greater than 40. Faced with the practicalities of operating on these patients of anaesthesia, tilting, access and physical assistance, there is also the question of what skin incision to make.

In a retrospective study of 4 000 patients, skin incisions were divided into vertical and transverse (Pfannenstiel) in a 1:4 ratio and outcomes compared in terms of wound morbidity ([Martin et al Obstet Gyn 2022;139:14-20](#)). Although statistically there was no difference in the frequency of wound separation, infection and dehiscence, more women were likely to undergo vertical hysterotomy and transfusion compared with those having transverse approaches. Infraumbilical vertical incisions had higher rates of wound disruption than did transverse incisions.

The overall frequency of 13% wound morbidity speaks to the high-risk nature of this group and the need for skilled surgeons and support staff.

### Anti-seizure medication

Epilepsy is a common disorder, occurring in 7 per 1 000 women in their child-bearing years. It requires daily medication with potentially teratogenic anticonvulsants, so awareness and diligence are required for appropriate management. Advice in pregnancy is important and should ideally be discussed as pre-pregnancy counselling.

It is known that decreased protein binding, altered hepatic metabolism and increased renal clearance all change the pharmacokinetics of anticonvulsants but the actual level variations are unknown in pregnancy. A study where the researchers studied serum levels throughout gestation now gives insight into actual therapeutic values during pregnancy ([Pennell et al JAMA Neurol 2022 doi 10.1001/jamaneurol.2021.5487](#)). Sodium valproate was not included in this series because of its acknowledged raised congenital abnormalities risk, but all other commonly used drugs were evaluated. Generally, the concentrations dropped significantly starting in the first trimester to between one to two thirds their pre- and post-delivery levels, thus decreasing below their therapeutic range.

To avoid adverse clinical consequences, monitoring of the woman's serum levels should be initiated from early on and measured at appropriate intervals thereafter – every few months and the doses of anti-convulsant adjusted accordingly. It was noted in the trial reported here that carbamazepine had the least variation of the medications under investigation.

## Follow-up of topics addressed in previous issues of JASS

### Diversity, Equity and Inclusion

The quantity of articles on Diversity, Equity and Inclusion (DEI) continues to grow ([Hanchuk et al Acad Med 2022 doi 10.1097/ACM.0000000000004629](#)). There has been a plethora of publications on the topic by the following specialties: Academic Medicine<sup>1,2,3</sup>, Health Care Workers<sup>4</sup>, Radiation Oncology<sup>5</sup>, ENT<sup>6</sup>, Dermatology<sup>7,8</sup>, and Surgery<sup>9,10</sup> with the latter directly addressing parental leave during surgical training and in the UK calling for all media literature and graphics “that are diverse, inclusive and accurately reflect themselves and the patients they serve.”

*Editor's comment – DEI includes women in every context and we in O&G represent and uphold the rights of women on fronts beyond their health. Our challenge is to be the leading force for the initiation and development of all matters involving women's rights and other women-specific issues. The references are given to emphasise the trending nature of the topic and are supplied in the index.*

### LGBTQ+

The piece on LGBTQ+ in January drew an energetic response from readers. Further articles on legal protection for non-cisgender people ([Das et al JAMA Surg 2022 doi 10.1001/jamasurg.2021.7571](#)) and evidence-based approaches to improving their mental health, indicate the wide range of publications at present ([Dolotina et al JAMA Netw Open 2022;5:e220926](#)).

If this is a topic of particular interest to you please see the [BMJ Sexual and Reproductive Health Blog](#) or make email contact with Professor [Susan Bewley](#) (at her request).

### Vitamin D supplementation

The lament about vitamin D supplementation in last month's issue has been followed by three further articles explaining some of the difficulties in proving that additional vitamin D to the general population has benefit. The two major stumbling blocks are confounding by other risk factors such as comorbidities, age, BMI and socio-economic status and secondly reverse causation – diseases causing the factor being measured to decrease ([Butler-Laporte et al Lancet 2021;9:803-4](#)). Other results show that vitamin D does not reduce all-cause mortality, cancer rates or cardiovascular disease ([EPIC-CVD Collab Lancet Diab & Endocrin 2021;9:837-46](#) & [Virtanen et al Am J Clin Nutr 2022 doi 10.1093/ajcn/nqab419](#)).

### Abortion

Last month, Colombia's constitutional court decriminalised abortion up to 24 weeks, changing the country's status from conservative to liberal as far as pro-choice is concerned ([Booth Lancet 2022;399:899](#)). It has joined Mexico and Argentina which have also recently reformed their laws.

In the US, the highly restrictive and bizarre (SB 8) abortion bill in Texas has come into force with the nett result that Texan women are accessing self-managed abortion to circumvent the law ([Aiken et al JAMA Netw Open 2022;5:e221122](#)).

## Snippets

### The G-Spot & the C-Spot

Gräfenberg's eponymous G-Spot in the vagina has eluded definition both anatomically and histologically. Supposedly located in the anterior wall, the existence of an area which has copious nerve fibres has not been proven which leads to the view that "The evidence is far too weak to support the reality of the G-spot." ([Hines AJOG 2001;185:359-62](#)).

The clitoris on the other hand is richly innervated and is responsive to tactile stimulation often leading to arousal and orgasm but the area of the brain where these stimuli are received has not been defined. Researchers, using fMRI, have now mapped the region where clitoral stimuli are registered. This varies individually in its anatomical localisation, which may be the reason why it has not previously been identified ([Knop et al J Neuroscience 2021 doi 10.1523/JNEUROSCI.1081-21.20210](#)). The spots are in the dorsolateral area of the somatosensory cortex where the human genital field is located. When the clitoris is stimulated, in research instances by a vibrating instrument strapped over the area, the C-Spot can be demonstrated with precision for "structural analysis" ([Haelle WebMD Health News 2022](#)).

It turns out that each woman participating in the research had a thickness of her "left genital field" that correlated with the frequency of her declared sexual intercourse activity over the last year. This is compatible with the hypertrophy of any tissue with use and is the opposite of disuse atrophy. Theoretically these findings can be used to better understand a woman's response to genital stimulation and explore problems she may experience.

### An inconvenient truth – antibiotic resistance

Antibiotic resistance or, more correctly, antimicrobial resistance (AMR) is becoming the elephant in the room in terms of worldwide mortality rates. Its effects are difficult to quantify, as they are "largely invisible" being reflected in prolonged bacterial infections, leading to extended hospital admissions, and contributing to needless deaths ([Laxminarayan Lancet 2022;399:406-7](#)). Death from resistant pathogens or with resistant pathogens are hard to distinguish, but in an attempt to offer statistics, the following figures have been published ([Murray et al Lancet 2022;399:629-55](#)).

<u>Burden</u>	<u>Deaths worldwide per year</u>
Attributable to AMR	1.2 million
Associated with AMR	5 million
HIV/AIDS	850 000
Malaria	650 000

Efforts, and spending, need to be directed at preventing infections, using antibiotics judiciously, bringing new products to market and providing effective and affordable antibiotics to low- and middle-income countries.

*Editorial comment – These data demand political or policy initiatives, but we can all contribute by prudent prescribing of antibiotics in our own practices and clinics. The Americans call it practicing antibiotic stewardship which is an eloquent way of expressing increased discretion* ([Taylor et al JAMA Netw Open 2022;5:e220211](#)).

 **JOURNAL ARTICLE  
SUMMARY SERVICE**

March 2022

Dear Colleague

JASS has recently welcomed to its readership members of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists.

RANZCOG has negotiated the distribution rights of JASS to those belonging to their College. If JASS subscribers in other countries think their national organisations would be interested in similar arrangements – then please contact me [atholkent@mweb.co.za](mailto:atholkent@mweb.co.za)

Looking back on 2021, some of the topics covered were:

Are you empowered or enslaved? (by your phone) A virtual meander; Maternal mood & fetal brain growth; OCs and malignancies; The most exciting advances (in medicine) – A Genomic meander; Screening for breast cancer; A tale of two epidemics – an obesity/Covid meander; Hypoactive sexual desire disorder; Neurodevelopmental disorders – a causal meander; Women & men doctors' income & statistics in North America; Menopause changes; Sleep – perchance to dream – a sleepy meander; The War on Drugs – Is it a fight worth fighting? Optimal time for delivery – an editorial meander; Cannabis – an informational meander Access to abortion; Maternal metabolism and fetal brain development; HPV and vaccination; What happens to your brain when you fall in love (extra)!

If you were not a JASS subscriber last year and would like the 2021 summaries, please email me with a request "Please email me the 2021 JASS summaries" and a full set will be sent to you. The cost is US\$50 for which you will be invoiced.

Enjoy this month's varied offerings.

Kind regards

Athol Kent

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**Monthly Questions – March 2022****True/False**

- |   |       |
|---|-------|
| 1. Bilateral salpingectomies reduce the risk of developing ovarian cancer   | _____ |
| 2. Regular screening reduces a woman's chances of developing an ovarian malignancy  | _____ |
| 3. Children conceived using assisted reproductive technology are more likely to have cardiac abnormalities diagnosed on echocardiography than normally conceived children | _____ |
| 4. Children conceived using assisted reproductive technology are more likely to have psychiatric diagnoses in adolescence than normally conceived children                | _____ |
| 5. The use of polygenic risk scores on embryos can predict future pathology   | _____ |
| 6. About half of infants delivered between 22 and 26 weeks gestation have subsequent neurological impairment  | _____ |
| 7. Anticonvulsant levels in pregnancy are reduced due to physiological changes  | _____ |
| 8. Neuraxial analgesia in labour is associated with reduced maternal morbidity  | _____ |
| 9. Vitamin D supplementation reduces mortality rates even in vitamin D replete persons  | _____ |
| 10. Intracytoplasmic sperm injection increases live-birth rates in couples irrespective of the male factor  | _____ |

*Please ask for the Annual Answer Sheet from JASS administration if you intend trying for CPD points using JASS. Requests to [atholkent@mweb.co.za](mailto:atholkent@mweb.co.za)*

*The Annual Answer Sheet will be emailed to you so you can fill in your answers each month.*

*Do not send copies of this Monthly Questions page or subsequent question documents.*

*The completed Annual Answer Sheet should then be scanned and emailed to JASS*

*at the beginning of next year and your CPD certificate will be sent to you.*

*For South African subscribers, the HPCSA will also be notified electronically of your CPD points achievement.*

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