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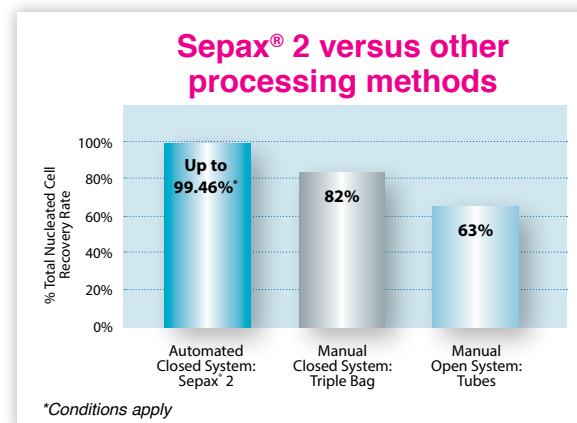
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Sepax®2
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Cordlife Max360°

Automated Stem Cell Processing System
The Standard in Cord Blood Banking

High recovery of nucleated cells is one of the important end-points in cord blood processing. It affects the number of stem cells that can be harvested or recovered from the cord blood. Higher cell recovery rates often positively correlate with higher number of stem cells, translating to the success of HSC transplants. That's why Cordlife has invested in the Sepax® 2 automated stem cell processing technology, a safe, sterile and fully automated cord blood processing technology – so you get more stem cells for maximum transplant success*.



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baby talk

**THE NEWSLETTER
FOR MOTHERS**

2013 ISSUE 02
MCI (P) 199/06/2013

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THE POTENTIAL OF CORD TISSUE & CORD BLOOD

Stem cells which have the potential to treat conditions such as heart diseases and many more

SKIN DEEP

A Deeper Look into Beauty

PAIN RELIEF IN LABOUR

Clearing Misconceptions



EDITOR'S *NOTE*



Long Celebration

The Wealth of a nation is not so much in its of economical and natural resources but it lies more decidedly in the kind and quality of the wealth of its children. It is they who will be the creators and shapers of a nation's tomorrow.

Therefore, it is always said that children are the future of tomorrow.

In Singapore, Children's Day is celebrated to honour childhood and is celebrated on the first Friday of October, that way, kindergarten and primary school children do not have to attend school and be able to have fun over a long weekend.

So every October, I will make it a point to celebrate Children's Day with my children and make sure that their childhood is filled with love and lots of happy holidays.

Hence this will be that golden opportunity for you to go for that overdue holiday, catch up with friends or family and for your case, getting ready to become a parent.

Whilst we make plans to relax, it is also important we keep abreast of healthcare-related issues you will find in this magazine, topics ranging from labour pain management, prenatal testing options and how you may protect your baby by banking his/her "medical waste".

So I hope this educational magazine can help enhance your journey towards parenthood.

Happy reading. 

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13TH OGSS ANNUAL GOLF TOURNAMENT



THE 9TH SICOOG 2013

SINGAPORE INTERNATIONAL CONGRESS OF OBSTETRICS & GYNAECOLOGY 2013



▲ The Minister of Health, Mr. Gan Kim Yong at Cordlife's booth

Remarkably, Singapore is emerging as a regional referral hub for tertiary care involving high-risk obstetrics cases, complex gynaecological cancer treatment, urogynaecological problems and neonatal care. Leading the way with Asia's first test-tube baby in the 1980's, Singapore pioneered the world's first micro injection baby in the 1990's, and in 2010, the world's first emergency operation for cornual ectopic pregnancy via a single navel incision.

With the aim of sharing Obstetrics & Gynaecology (O&G) treatment outcomes from the regions that they serve, the Obstetrical & Gynaecological Society of Singapore has designed bi-annual meetings to address new learning and to facilitate members of Asia Pacific's O&G community to keep abreast with a fast-changing panorama of women's health in the societies that they served since 1994.

As highlighted during the opening speech by Dr. Tony Tan, the President

of the Obstetrical & Gynaecological Society of Singapore, Singapore's connected environment offers high-value exposure to healthcare professionals, this level of care is completed by the industry partners' supply of services, medicine, instruments, materials and systems hence attaining as the regional referral hub for tertiary care.

In line with this statement, Cordlife participated as a Platinum sponsor during the 9th Singapore International

Congress of Obstetrics & Gynaecology (9 SICOOG) which was held at Fairmont Hotel between 22 and 24 August 2013.

Cordlife finds that it will be most appropriate to promote its healthcare services through this SICOOG platform. This outreach was accomplished through a visual representative of its market leadership position in cord blood banking, its advanced processing technology, a published transplant track record, corporate social responsibility programmes and strong financial capabilities.

Informative panels were also displayed to provide information about the potential of storing umbilical cord

tissue which comprises mesenchymal and epithelial stem cells in cord lining membrane.

It was a privilege for Cordlife to greet the Guest-of-Honour, Mr. Gan Kim Yong, and the Minister for Health of Singapore when he was visiting the exhibition areas during the event. Cordlife took the opportunity to show Mr. Gan how umbilical cord is collected through an improvised candy simulator.

The attendance at 9 SICOOG has achieved a record high attendance of 858 Doctors from 34 countries, with Singapore, China, Philippines, Malaysia and Vietnam, being the largest groups among the participants. Cordlife is

delighted to support SICOOG's objective of medical education outreach to over 12,000 O&G community members in Asia Pacific region.

The congress came to an official close during a closing ceremony on 24 August 2013 which was held at Raffles City Stamford Ballroom in the event of a Gala Dinner. **bt**



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INDONESIA



Jason Wong
Cordlife Group Limited

UPDATES ON CELLULAR THERAPY

DOCTOR CLAIMS BREAKTHROUGH IN RACE FOR SPINAL 'CURE'

- Trials for severe spinal cord injuries using stem-cell therapy showed groundbreaking results in giving immobile patients the ability to walk again.
- After second round of tests using stem cells to regrow nerve fibres, the China Spinal Cord Injury Network (ChinaSCINet) has applied for regulatory approval in China for a third and final phase.
- 15 out of 20 patients who received umbilical cord blood cell transplants and intensive walking therapy, were on average able to walk with minimal assistance.
- The treatment involves injecting umbilical cord blood mononuclear cells into patients' damaged spines to help regenerate nerves.
- "It's the first time in human history that we can see the regeneration of the spinal cord," US-based doctor Wise Young, chief executive officer of ChinaSCINet, told AFP. [b1](#)



AFP, Jun 26, 2013. Doctor claims breakthrough in race for spinal 'cure', The Economic Times, http://articles.economictimes.indiatimes.com/2013-06-26/news/40207098_1_cord-blood-cell-stem-cell-therapy-patients, [3 Jul, 2013]

FIRST AUTOLOGOUS CELL THERAPY OF CEREBRAL PALSY CAUSED BY HYPOXIC-ISCHEMIC BRAIN DAMAGE IN A CHILD AFTER CARDIAC ARREST – INDIVIDUAL TREATMENT WITH CORD BLOOD

- Each year, thousands of children incur brain damage that results in lifelong sequelae.
- The boy, was 2.5 years old and normally developed when global ischemic brain damage occurred resulting in a persistent vegetative state.
- In this desperate situation, the parents contacted the Department of Obstetrics and Gynecology (Ruhr-University Bochum) to inquire about a potential individual treatment with their son's cord blood that had been collected at birth.
- Nine weeks later, the boy received autologous cord blood (91.7 mL, cryopreserved, 5.75×10^8 mononuclear cells) intravenously.
- At 2-months follow-up the boy's motor control improved, spastic paresis was largely reduced, and eyesight was recovered.
- First directed words (ma-ma, pa-pa) were spoken at seven months after the insult.
- Two-word sentences and expressive vocabulary of eight words were noted at two years, though pronunciation was somewhat slurred.
- At three-year follow-up, this further improved to four-word sentences using approximately 200 words expressive vocabulary accompanied by a remarkably broad understanding.
- There was significantly improved receptive and expressive speech competence.
- This remarkable functional neuroregeneration suggest that autologous cord blood transplantation may be an additional and causative treatment of pediatric cerebral palsy after brain damage, a condition for which there is no cure at present. [b1](#)



Fig 1. (a)



Fig 1. (b)



Fig 1. (c)

Jensen and E. Hamelmann (2013). First Autologous Cell Therapy of Cerebral Palsy Caused by Hypoxic-Ischemic Brain Damage in a Child after Cardiac Arrest–Individual Treatment with Cord Blood. Volume 2013, Article ID 951827.

Fig 1. (a), (b), and (c) Two-months follow-up. (a) First social smiling of the patient (L.B.) towards his mother and (b, c) laughing, when played with, 2 months after autologous transplantation of cord blood cells (i.e., 4 months and one week after severe brain damage caused by cardiac arrest).

THE POTENTIAL OF CORD TISSUE AND CORD BLOOD

The umbilical cord tissue comprise an outer cord lining membrane (the amniotic lining membrane) that contains Wharton's jelly in which is embedded two umbilical arteries and one umbilical vein. Cord blood is contained within the umbilical arteries and veins.

The umbilical cord tissue comprise an outer cord lining membrane (the amniotic lining membrane) that contains Wharton's jelly in which is embedded two umbilical arteries and one umbilical vein. Cord blood is contained within the umbilical arteries and veins.

The umbilical cord tissues as well as the cord blood are great sources of stem cells. Stem cells may either be haematopoietic stem cells (which form blood cells), mesenchymal stem cells (which form solid organ cells) or epithelial stem cells (which form surface cells outside and inside the body). Cord blood contains only haematopoietic stem cells and a few mesenchymal stem cells. The cord lining membrane contains BOTH epithelial and mesenchymal stem cells. The rest of the cord tissue only contains mesenchymal stem cells.

What is important to realise are that these stem cells are infant stem cells that are more robust and potent than adult stem cells (for example bone marrow stem cells). Truly it can be said that the umbilical cord and its contents is a stem cell store for the baby in the womb.



When cord blood is stored with cord tissues, you are storing ALL the precursor cells that are available for regenerative purposes. If a child develops leukaemia (a blood cell cancer), after the cancerous blood cells are destroyed by irradiation, the stored cord blood can be used to replenish the blood cell population. Similarly, if an individual suffers a severe burn injury and loses skin, stored epithelial cells could potentially be used to restore the skin surface. In another scenario, bone loss from trauma or surgical removal could potentially regenerate using mesenchymal stem cells.

Latest research has shown that sometimes these cells can help each other! Combined administration of mesenchymal stem cells with

haematopoietic stem cells has been shown to increase the survival and engraftment of the haematopoietic stem cells as the mesenchymal stem cells dampen the body's immune response, which tends to reject the transplanted haematopoietic stem cells. Resurfacing of skin (in a chronic ulcer, for example) is also expedited by combined administration of epithelial and mesenchymal stem cells.

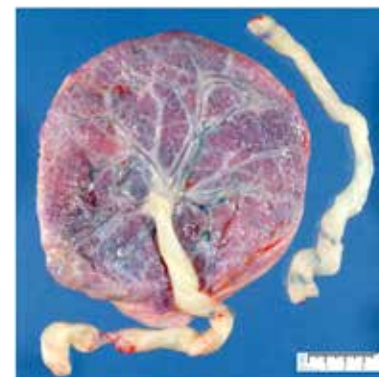
New developments in stem cell research occur daily, and scientists the world over continue to be amazed by the potential of stem cells and their role in the treatment of an ever-increasing spectrum of diseases. Stem cells have been converted into the basic cellular building blocks of all the major tissue types of the body (skin, bone, cartilage,

fat, nerve, insulin producing cells, liver cells, etc) Transfusion of a certain type of cord blood (which lack a receptor called CCR) has even been shown to cure HIV infection! Saving cord blood and cord tissue allows the individual all opportunities for regeneration. Certainly this may not be available tomorrow, or even the day after- but it will be available very soon, and faster than you think.

EPITHELIAL STEM CELLS ARE SAVING INJURED EYES!

The cornea is the transparent part of the eye through which light is transmitted to reach the retina at the back of the eye. Injury to the cornea results in loss of the surface cells of the cornea and an ulcer is formed. Corneal ulcers are exceedingly painful, and restrict the amount of light passing through it, resulting in diminished vision. Sometimes, these ulcers become chronic if the cornea does not heal properly (persistent corneal deficiency), and worse still, scar formation might make the cornea opaque, light does not pass through, and the eye is effectively blinded.

Epithelial Stem Cells which come from the cord lining membrane and have been used effectively to treat such defects. These Cord Lining Epithelial Stem Cells are placed on a supporting structure called a scaffold that is only a fraction of a millimetre in thickness. The scaffold layered with Cord Lining Stem Cells is placed on the chronic ulcer to allow it to heal. To date, more than 60 eyes have had vision restored using this technique- another reason to bank your Cord Lining Stem Cells.



▲ Placenta & Umbilical Cord

LIVER REGENERATION WITH CORD LINING EPITHELIAL CELLS

The function of the liver in the body is multifaceted- from the metabolism (breaking down and conversion) of ingested nutrients, to the production of bile necessary for digestion.

One of the important functions of the liver is also to break down ingested medicines so that the final product absorbed by the intestines is different from what was originally consumed (what doctors call first pass metabolism).

Cord Lining Stem Cells have been successfully differentiated (converted) into liver cells, and the potential of this for liver regenerative purposes is considerable. Animal studies are ongoing to explore liver regeneration in pigs where a large part of the liver has been surgically removed (large enough to compromise the survival of the animal in normal circumstances) to assess if Cord Lining Stem Cells can physically reconstitute the liver. Suffice to say, but the pigs treated with Cord Lining Stem Cells remain alive to this day!

Cord Lining Stem Cells converted to liver cells are also being used as a laboratory based drug discovery platform to assess liver cell conversion of medicinal drugs (the first pass metabolism mentioned earlier).

STEM CELLS AND BLOOD VESSELS

When blood vessels to the limbs get clogged from cholesterol deposits or other causes, blood flow is decreased, and the limb becomes ischaemic (starved of blood). Blood flow is important as it carries oxygen to the muscles (muscles use a lot of oxygen to work), and waste products away from the muscles for removal from the body (e.g. in the urine). Ischaemic limbs are painful and activity is restricted. Untreated, affected patients are unable to walk, and any

“ Your baby's cord tissue and cord blood contains stem cells which have the potential to treat conditions such as heart diseases, stroke and cartilages injuries. ”

limb injuries fail to heal as reparative blood is not flowing to the injured site. Interestingly, diabetics suffer chronic ulcers for a similar reason. Small vessels (called microvessels) get blocked, and therefore the ulcers do not heal. In extreme circumstances, the ulcers get badly infected, involve the bone, and the limb may need to be amputated.

The latest studies in mice have shown that the infusion of stem cells into ischaemic limbs can restore blood flow by the rapid opening of new blood vessels (called a collateral circulation). This takes away the pain, and restores muscle and therefore limb activity. At the current time, the limbs have been studied as limb blood flow is easy to assess. In the future they may also be applied to clogged vessels to the brain which causes stroke! **bt**



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SKIN DEEP

A DEEPER LOOK INTO BEAUTY



Our skin, the largest organ of the human body. The way by which we enjoy the feel of fluffy towels against our cheeks, light summers breezes, a loved one's touch. Also, the way by which our body protects us against natural elements such as extensive water loss, and warns us of immediate physical dangers such as a boiling kettle of water. It is even involved in giving us our unique identity with the tiny ridges on our fingers, also known as our fingerprint!

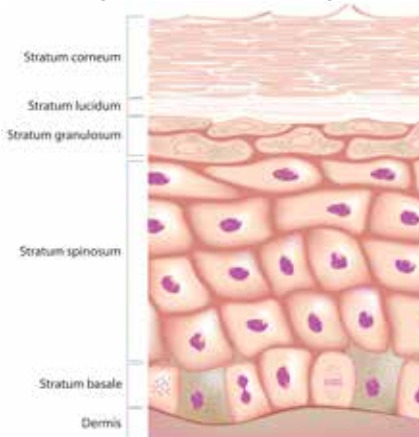
Beginning as a baby, our skin is largely perfect. It is smooth, has a certain glow to it, with much elasticity and bounce. However, over years of exposure to damaging factors such as abrasion, sun damage, acne, it inevitably begins to dull. The skin becomes a historical record with entries of various scars and pigmentation spots, eventually losing its glow.

To understand how all this happens, we need to be privy to the complex structure of our skin. Two major layers of what we call skin contribute heavily to the skin's appearance - the epidermis, and the dermis.

Our epidermis is the outer layer, which consists of many layers of keratinocytes. They begin their journey as epidermal stem cells located at the

stratum basale, which is considered the base layer of the epidermis. The epidermal stem cells specialize into keratinocytes that then leave the stratum basale to travel outwards, becoming more and more keratinized. They eventually reach the outermost layer of the epidermis, the stratum corneum (consisting of dead cells) where they prepare to be sloughed off or shed. This entire process for youthful skin takes approximately 28-30 days¹.

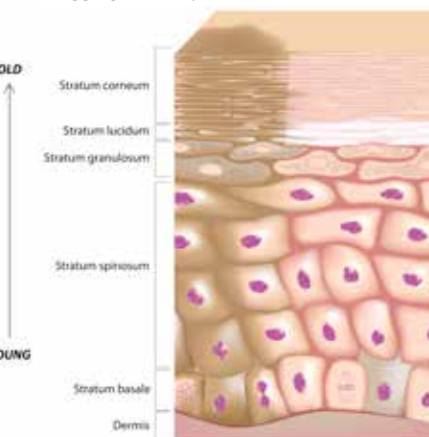
However, for aged, or damaged skin, this can take around 40 days¹. The fact that it takes longer for the cells to turn over, means that the layer of dead cells accumulate and thicken, contributing to a dull, rougher and darker looking surface.



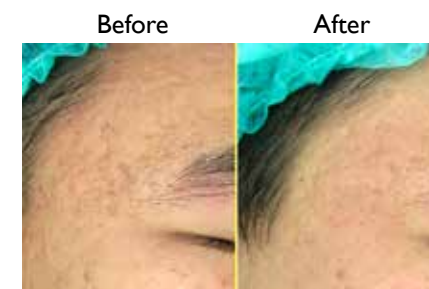
Structure of the Epidermis

Longer cell turnover contributes to uneven colouring of the skin as well. Age/sun spots or other skin lesions with scary names such as seborrhoeic keratoses begin to make appearances.

Below the epidermis, is the dermis. Within it, resides a very important cell, the fibroblast. Fibroblasts manufacture proteins such as collagens and elastins which give our skin strength, stretch as well as helping wounds to heal². It also secretes a particular molecule called hyaluronic acid, which hydrates the dermis, keeping it plump and full. As the skin ages, less of this support material are produced. The result is that the dermal layer dries, thins and becomes less elastic, contributing to sagging and dry skin, and wrinkles³.



Skin Pigmentation



Acne scar skin



Pigmentation skin



Frown Lines

With the current advancements in stem cell research, the good people at CellResearch Corporation have discovered a valuable mix of proteins secreted by proliferating cord lining stem cells, called CALECIM®. This mix contains "skin food" that affects the epidermis by normalizing cell turnover rate back to 28-30 days. This encourages the skin to behave younger, thus also appearing younger. In vitro, CALECIM® is seen to increase keratinocyte number in the epidermis, and fibroblasts number in the dermis⁴. This helps with making epidermal cell turnover more regular, and also aids in replacing material such as collagen and hyaluronic acid in the thinning dermis.

Clinically observed, the overall effects of CALECIM® are that the rough, dull surface of the skin is eventually replaced by fresh cells so that skin surface is smoother and more even than before. Pigmentation trapped in the dull stratum corneum also gets shed, so colouration is lighter and more even. The increasingly hydrated dermis layer appears to fill up with collagen, elastin and other supportive fibres, which help decrease the appearance of acne scars and other deep crevices of the skin such as crow's feet and frown lines. As a side note, this protein mix contains interleukin-10, an anti-inflammatory protein, CALECIM® has also been clinically tested on eczema. Results were rapid recovery of infected skin surfaces, lessening itch and inflammation.

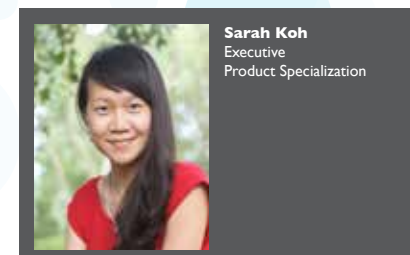
The two product lines currently available in Singapore are CALECIM® Treatment Cream and CALECIM® Serum Programme. CALECIM® Treatment Cream is a daily use cream, with 50% CALECIM® concentration that should be applied twice a day after cleansing. Results are usually seen within 28-30 days. The CALECIM® Serum Programme is a more concentrated formula, for more intense application which should be applied once a week, for four to five weeks using a skin roller. Effects of skin tightening and plumping are typically seen almost immediately after application. So far, applications have been largely on the face, however, with the mechanisms described above, potential uses may range from preventing/ reducing stretch marks, and clearing pregnancy pigmentation quicker post partum. <http://www.calecimpro.com>

To make your way to younger skin, kindly email to calecimpro@cordlife.com for more information.



Reference

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FIBROIDS AND PREGNANCY



Fibroids are non-cancerous tumours that grow in or around the womb (uterus) and is very common. The growths are made up of muscle and fibrous tissue and vary in size from under 1cm to over 20cm. Fibroids are sometimes known as uterine myomas or fibromyomas.

Many women are unaware that they have fibroids as they do not have any symptoms. This often means that **fibroids are diagnosed** by chance during a routine gynaecological examination, test or scan.

However, larger fibroids may cause swelling in the lower tummy, pain, difficulty passing urine, feeling of bulge

while bending or constipation. If the fibroid impinges in the uterine cavity (area where baby grows) it may cause difficulty conceiving, miscarriage or heavy and painful periods.

Fibroids that cause difficulties in conceiving require treatment. Surgery is the mainstay of treatment. Surgery can be performed using key hole or traditional open (bikini line cut). For fibroids confined to the uterine cavity, they may be removed from the vaginal route using a hysteroscope; without any scars.

Key hole surgery is offered to patients whose fibroids are not too large. Rarely in Singapore patients present with fibroids that are very large; over 15cm;

occasionally a midline scar is needed for access to the tumour.

Key hole surgery has advantage of less pain, shorter stay in hospital and smaller scars.

After surgery, the surgeon will advise the duration of rest before the patient may conceive. This may be any time from three months post-surgery. Some patients will require caesarean section for all future delivery after fibroids are removed. This is to prevent rupture of the uterine scar during labour.

In the longer term, fibroids may recur requiring future surgery.



“Fibroids are non-cancerous tumours that grow in or around the womb (uterus) and is very common. The growths are made up of muscle and fibrous tissue and vary in size from under 1cm to over 20cm. Fibroids are sometimes known as uterine myomas or fibromyomas.”

FIBROIDS DURING PREGNANCY

One of the more common complications of large fibroids in pregnancy is “red degeneration”. This causes moderate to severe pain and may be difficult to differentiate from uterine contractions. Red degeneration occurs because of diverted blood away from the fibroid to the growing baby. The reduction in blood and oxygen to the fibroid causes pain and the fibroids may shrink.

Rarely, fibroids within the uterine cavity may cause miscarriage. Very large fibroids may be associated with preterm birth. Majority of fibroids remain about the same size throughout pregnancy and does not cause major complications.

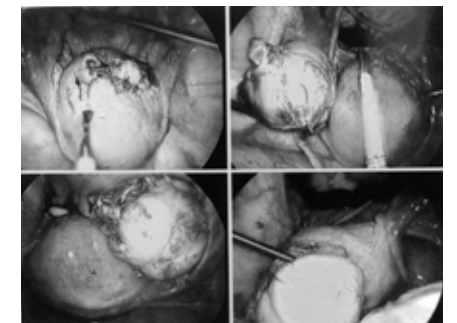
As long the fibroid is not physically obstructing the passage of the baby, women with fibroids may undergo natural birth.

FIBROIDS NOTED AT CAESAREAN SECTION

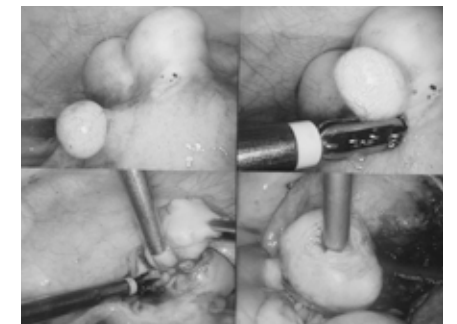
It is not routine to remove fibroids at caesarean delivery. This is because of the increased risk of bleeding in doing so. The exception is when the fibroids are “sticking out” or at the surface. In these cases, the base of the fibroid is much smaller and it may be safely removed. **bt**



▲ Fibroids sticking out during C-section can be safely removed.



▲ Large fibroids at key-hole surgery (fibroids same size as uterus).



▲ Multiple fibroids at key-hole surgery.



▲ Fibroids macerated into smaller pieces.

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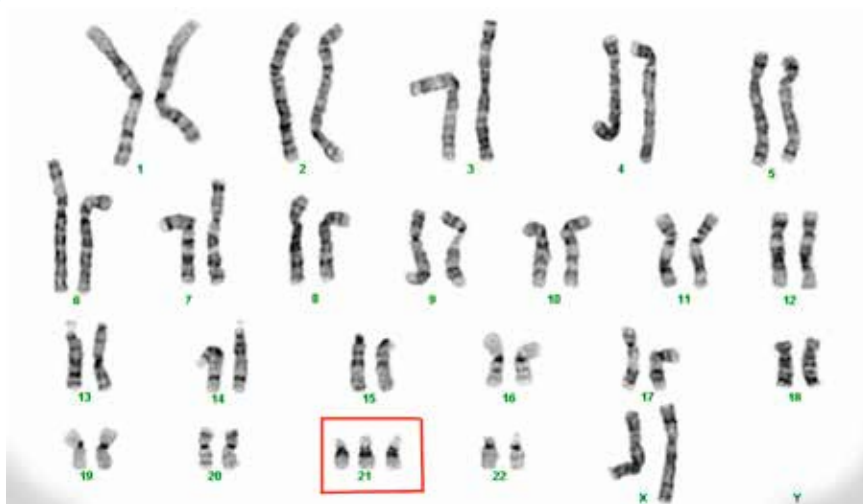
NON-INVASIVE PRENATAL TESTING (NIPT)

DAWN OF A NEW ERA



The normal human genome consists of 23 pairs of chromosomes and forms the basis for all human cell functions. The presence of incorrect number of chromosomes within the cell (known as aneuploidy) can lead to miscarriages, which are very common, occurring in 15% of pregnancies. 1 in every 300 live-births is aneuploidy. An example is Down syndrome which is caused by an extra chromosome 21 (trisomy 21).

Traditionally, **DIAGNOSIS** of aneuploidy can be made prenatally by amniocentesis or chorionic villous sampling (CVS). These procedures involve aspiration of liquor from the amniotic sac or aspiration of cells from the placenta respectively. However, both of these procedures pose risks to the mother and foetus. Most significantly, there is a risk of miscarriage of about 1 in 300 of such procedures.



▲ Extra chromosome 21 in Down syndrome

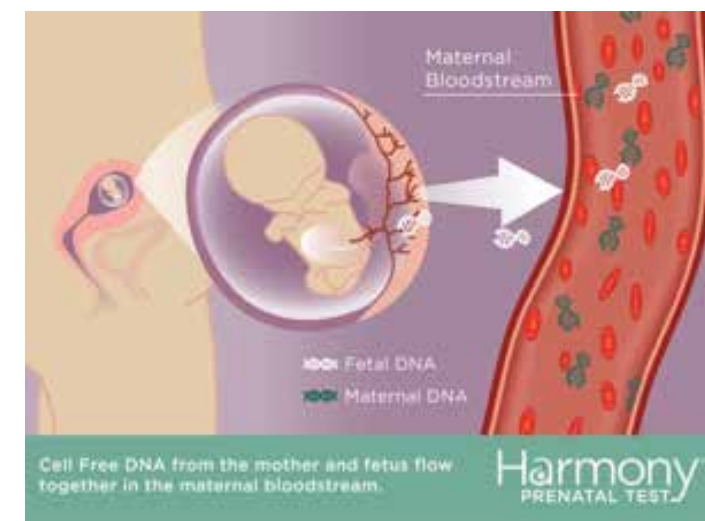
Risk-free prenatal **SCREENING** for Down syndrome can be done by a blood test from the expectant woman and ultrasound measurement of the skin fold behind the foetal neck (nuchal translucency). An example is the OSCAR test. There is no increased risk of miscarriage from the test itself.

However, one must note that **SCREENING** tests are only risk estimations and not diagnostic. They can only detect risk of Down syndrome up to 90%. Furthermore, about 5% of foetuses deemed high risk by these screening tests are actually normal.

The **NON-INVASIVE PRENATAL TEST (NIPT)** is a totally new and highly predictive test to screen for Down syndrome. It involves only a blood test from an expectant woman, hence there is no procedural risk to the mother or foetus at all. The test analyses short segments of foetal genetic material that are naturally floating around in the maternal blood and can be done from the 10th week of pregnancy onwards.

The Harmony Prenatal Test is one such test. The best part of this test is its high accuracy of 99% in detecting Down syndrome. Furthermore, the false positive rate is < 1% (i.e. less than 1% of foetuses deemed high risk by this test are actually normal). This compares favourably with that of older prenatal screening tests whose accuracy is 90% and a false positive rate of 5%.

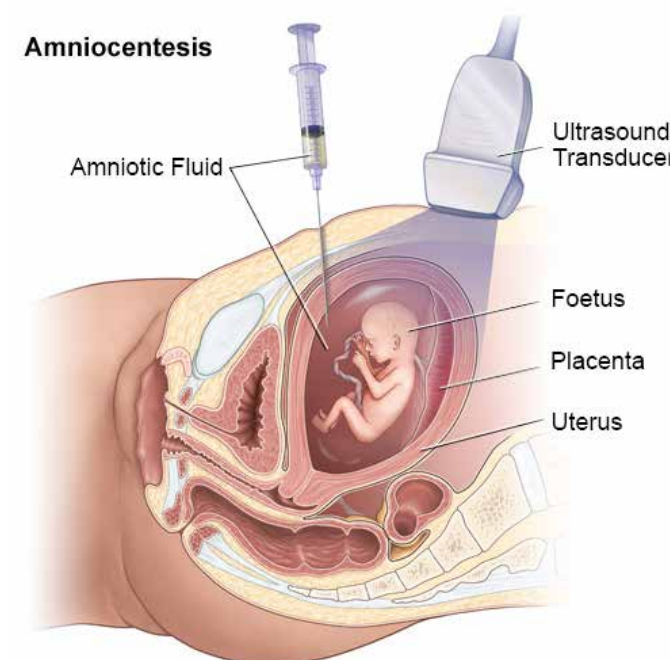
The American College of Obstetricians & Gynaecologists supports the use of NIPT in clinical practice stating that this appears to be the most effective screening test for aneuploidy in high risk women*.



Despite the Harmony Prenatal Test being a highly accurate screening test for Down syndrome, there are certain limitations of the test that one must be aware.

- Firstly, the Harmony Prenatal Test is a screening test for trisomy 21, 18 & 13 (i.e. extra chromosome numbers 21, 18, 13 in the foetus). Even though the Harmony Prenatal Test is highly predictive, confirmation of screen positive patients through CVS or amniocentesis is necessary.
- Secondly, it does not test for all chromosomal anomalies and single-gene disorders.
- Thirdly, discordant results between the Harmony Prenatal Test & amniocentesis or CVS result can occur.
- Cost of NIPT differs in different Centres varies, ranging from about S\$2000-3000.

In **CONCLUSION**, the Harmony Prenatal Test is a new and accurate non-invasive prenatal test to screen for trisomy 21 (Down syndrome), trisomy 18 (Edwards syndrome) and trisomy 13 (Patau syndrome). It is recommended for high risk women who do not wish to go for an invasive diagnostic test due to the inherent risk involved in these tests. Other similar tests, e.g: MaterniT21 PLUS, are available as well. However, there are still limitations to it as stated above. **bt**



*High risk women include maternal age 35 years or older at delivery, foetal ultrasound findings indicating increased risk of aneuploidy, history of a prior pregnancy with trisomy, positive test result for aneuploidy from other prenatal screening, parental balanced Robertsonian translocation with increased risk of foetal trisomy 21 or 13.

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PAIN RELIEF IN LABOUR

CLEARING MISCONCEPTIONS



For countless women, the joy of pregnancy is also intermixed with a fear of labour, and the pain that is necessary for delivery. This fear is compounded by all the horror stories of labour pain-relief methods that do not work; or worse still, cause unpleasant or dangerous side effects and complications. This article will attempt to dispel certain myths and allay fears, that there are good and effective methods of pain-relief for labouring women.

As the pregnancy approaches term, which is described as 37 completed weeks of gestation, the womb (uterus) starts to contract. What were previously painless Braxton-Hick contractions ends with transition to painful labour contractions. Initially, these contractions

are irregular, but progressively become regular and more intense. In primiparous (first pregnancy) women, regular contractions have a frequency of one contraction every 10 minutes; and in multiparous women (second pregnancy onwards), contractions are considered regular if they come every 15 minutes or in shorter cycles. Typically, the cervix will be dilated three to four centimetres in diameter. The water bag may also rupture, causing leakage of amniotic fluid; and there may be a 'show', where the mucus plug is dislodged from the dilating cervix, accompanied by blood.

In the first stage of labour, the cervix progressively dilates from 3 to 10 centimetres; and this may take 8 to 10 hours for a primiparous woman,

and 4 to 6 hours (on average) for a multiparous woman. In the second stage of labour, where synchronised pushing with contractions deliver the baby, a primiparous woman may actually take up to 2 hours to deliver her baby, and a multiparous woman may take up to an hour of pushing to achieve delivery. After delivery, cord blood banking may be performed if so desired, and active management of the third stage of labour reduces the risk of severe bleeding (post-partum haemorrhage). This entails delivering the placenta by controlled cord traction, manually rubbing the uterus to cause a sustained contraction, and various medications to stop bleeding. For most women, total breast feeding is very appealing, and the delivery suite team would actively encourage breastfeeding from the start, accompanied by skin-to-skin contact to aid in bonding between the mother and her baby.

After reading the previous paragraph, it would appear that labour does take a certain length of time, during which there will be regular contraction pains to contend with. Pain is debilitating when it occurs repetitively, it saps our concentration and strength. It also causes various bodily changes in the labouring mother, increasing the workload of the mother's heart, increasing blood pressure, reducing placental blood flow, and causing uncoordinated uterine contractions; thus leading to prolonged labour and a greater chance of foetal distress. As such, any method of blocking labour pains would intuitively improve maternal and foetal outcomes, and likely shorten the duration of labour.

There are non-pharmacological and pharmacological methods of reducing or blocking labour pains. In terms of non-pharmacological pain-reducing methods, one of the most useful is that of continuous labour support. Be it the partner or spouse, a relative, a

staff nurse or a midwife; the presence of someone to support the labouring mother has been shown to shorten labour duration, reduce request for analgesia, improve the entire labour experience, and reduce assisted instrumental delivery and Caesarean section¹. Other methods that appear to work are acupuncture, hypno-birthing and water baths. Acupuncture does relieve pain, thus reducing the need for pharmacological analgesics, and is safe if performed by an expert. Hypno-birthing does reduce the need for further analgesics, and improves the overall birthing experience. Water baths temporarily relieve pain and muscle spasm, and do not increase the risk of foetal distress. Hence, it is considered safe for a labouring mother to have a warm bath². What have proven **INEFFICACIOUS** for relieving pain in labour are massage therapy, touch therapy, certain maternal birthing positions, aromatherapy, audial analgesia, and Transcutaneous Electrical Nerve Stimulation (TENS) – where nerve stimulation by an electronic device purportedly reduces pain³.

All maternity wards and delivery suites in hospitals have the necessary equipment and services available for effective pharmacological methods of relieving pain. There are currently three available: Entonox gas analgesia, Pethidine injections and Epidural analgesia. They have varying effectiveness and are suitable for different occasions, and the effectiveness can be quantified by using a Wong-Baker Visual Analogue Scale (VAS) system – where a pain-score '0' is completely pain-free, and '10' would be the worst possible pain experienced by an individual.

Entonox is considered the mildest of the three pharmacological pain-relief methods. Entonox is a mixture of nitrous oxide (laughing gas) and oxygen. The combination of gases does provide mild analgesia from labour pains. Labouring women do have to

time the inhalation of Entonox to precede the start of the contraction, to obtain maximal benefit from Entonox. As Entonox stays in the body system for only as long as the gas is inhaled, analgesia wears off rapidly once room air is inhaled. As such, Entonox is very safe for mother and the unborn baby, as well as the healthcare workers in the delivery suite⁴. Entonox effectively reduces the pain score by 1 to 2 points when used to control labour pain.

Another commonly used analgesic is Intramuscular (IM) Pethidine injection, which is an opium-derived painkiller used since the 1970's. Both nursing and medical personnel can administer Pethidine every 4 to 6 hours. Opium-derived analgesia causes nausea and vomiting; as such, an anti-nausea agent is usually given at the same time (IM Maxalon or Stemetil) as a preventative agent. Pethidine injections can be given in multiple doses, but this causes drug accumulation in the body; and it is not advisable if delivery is imminent, as maximal foetal concentrations are found 2 hours after injection. This can lead to risk of sedation in the new born, which may require neonatal resuscitation⁵. Pethidine effectively reduces the pain score by 4 to 5 points when used during labour, at appropriate timings.

Epidural analgesia is currently used extensively for labour pain management, and involves the introduction of local anaesthetic solution into the space surrounding the spinal cord nerves (the epidural space), to produce markedly diminished or absent pain perception, via a fine and flexible plastic tube, that is inserted by an anaesthetist. It is effective in reducing pain scores by 8 to 9 points. Frequently, labouring women are completely pain-free after an epidural, compared to other simpler forms of analgesia; and they can still opt for an epidural if the side effects of other medications are intolerable, or their labours are advanced and Pethidine cannot be administered safely.

“Entonox gas analgesia, Pethidine injections and Epidural analgesia. They have varying effectiveness and are suitable for different occasions, and the effectiveness can be quantified by using a Wong-Baker Visual Analogue Scale (VAS) system.”

Women with medical conditions also benefit from an epidural. Women with hypertension or pre-eclampsia have better pressure control during labour, and there is better placental blood flow to reduce the risk of foetal distress during labour and delivery, especially in cases of growth restriction. Diabetic mothers and gestational diabetics have better sugar control during labour; and with adequate pain relief, instrumental deliveries or Caesarean section can be facilitated smoothly when required. In cases of twin pregnancy, breech babies, and vaginal birth after caesarean (VBAC); there is a higher risk of conversion to caesarean section, and an epidural facilitates a smooth transition from labour to caesarean when required⁶. Patients with clotting problems due to medical conditions, back skin infections, spinal problems, a history of spinal surgery and severe cardiac disease are not suitable candidates for an epidural.



When one uses an epidural, one of the commonest side effects experienced is numbness and weakness of the lower body and legs, due to a variable degree of motor nerve block. Other side effects commonly felt are nausea and vomiting, shivering, transient blood pressure changes and difficulty with passing urine. Hence, many patients have an indwelling catheter inserted once they are on an epidural. Other uncommon side effects are that of inadequate pain relief, a one-sided block (where the patient experiences pain on one side of the body and not the other); and rapid progression of labour, such that the labour process is shortened dramatically, and delivery becomes imminent. Rarely,

are there very serious side effects like seizures and respiratory arrest.

Apart from the side effects of epidurals, there are certain myths surrounding the use of an epidural. One such myth is that epidurals can result in long-term backache. Another such myth is that epidurals may potentially harm the baby, or increase the risk of Caesarean section, and that epidurals cannot be used too early in labour.

It was discovered that antenatal backache was common, with an incidence of 53 to 89% in pregnant women. Epidural use was not found to contribute to causation or worsening of backache, instead the pain was due to the physiological changes associated with pregnancy; such as poor posture, spinal anatomical changes associated with pregnancy, hormonal changes resulting in relaxation of ligaments and water retention which contributes to further ligamentous laxity⁷. It is excellent advice from obstetricians to return to previous exercise regimes, especially core body strengthening exercises after delivery, to reduce the risk of chronic backache in the long run.

In one study, there was a comparison between epidural given early before established labour had started, and epidurals given later in established labour. It was discovered that patients

who had an early epidural (where the cervix was dilated less than 4 centimetres in diameter) were found to have a shorter duration of labour; and did not have an increased risk of progression to Caesarean section. It was also found that the babies delivered had better health assessment scores (Apgar scores), apart from superior pain relief⁸. It is postulated that shorter labours may be due to relaxation of the pelvic floor muscles when the patient is pain-free, allowing easier passage of the baby through the birth canal. It was discovered that epidural was associated with better neonatal acid-base balance status, which is a means of assessing peri-partum health, and again alludes to preservation of good placental oxygenation and nutrient transfer to the baby, with use of an epidural during labour⁹.

Labour is an unpleasant experience for many women, and it cannot be acceptable for women to experience pain that can be ameliorated with safe and expeditious methods of analgesia. It is quoted that in "the absence of a medical contraindication, maternal request is a sufficient indication for pain relief during labour"¹⁰. Hence, knowing what pain-relief methods are available, the pros and cons of each method, allow patients to experience a new level of comfort, and equally important, safety for both mother and the unborn baby during labour. **bt**

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13TH OGSS ANNUAL GOLF TOURNAMENT



The Obstetrical & Gynaecological Society of Singapore hosted the 13th OGSS Annual Golf Tournament at the Marina Bay Golf Course on 3 July 2013. The Golf Course, armed with 91 pot bunkers and its traditional links of Scotland put 40 golfers to a gruelling test which format of play was tabulated on a 36 count back handicap system.

Fortunately, every participant enjoyed golf friendly weather during this event which was a diverse transformation from the worsening haze condition triggered by transboundary smoke from Indonesia's forest fires one week earlier. This played an important role to participating golfers as they were targeting wholesome results on their scorecards.

This traditional event returned after a one-year absence and was only made possible by Dr Abdul Aziz who headed the organising committee with the support of Cordlife, QST Technologies & Friso.

For the first nine holes, the 13th OGSS Annual Golf Tournament was a battle between Dr William Verhoeven, Dr See Tho Kai Yin and Dr Stephen Koh. Dr Verhoeven had dropped a shot on the tenth to slip to one over for the tournament. After a pair of pars, he started to make his move with a birdie on the thirteenth and that moved him within one of the lead as Dr See Tho bogeyed the tenth and twelve to fall into a share of second with Dr Koh.

The long hitting Dr Koh missed a par putt on the sixteenth hole, only to see Dr See Tho saved par subsequently, this moved him down one notch from the tied-second position which concluded all the way through the eighteenth hole. Ultimately, Dr Verhoeven extended his lead to two after he birdied the seventeenth hole to secure men category tittle.

Dr Chua Yang, a regular participant was in excellent form as she looked stunning in her subtle golf apparel and shot a two over par score line at the Marina Bay Golf Course. She played consistently throughout the eighteen holes and secured the ladies category title.

Everyone was in high spirit after the tournament as we proceeded to the prize presentation ceremony at Ocean Restaurant @ Resort World Aquarium organised by Cordlife. The backdrop

of Manta rays, sharks and thousands of fish gliding silently past the enormous floor-to-ceiling glass windows created a delightful dinner ambience as we bring together OGSS alliances to join in for this celebration.

Dr Aziz took the opportunity to congratulate and acknowledge achievements of past OGSS committee members during the opening speech. He had the privilege of presenting appreciation trophies to Dr Kee Wei Heong and Dr See Tho Kai Yin for their past contributions to the society before inviting Mr Jeremy Yee, the C.E.O of Cordlife Group Limited to give away the golf tournament's awards.

At the End of the Evening, Dr Aziz added that, "It's only with the support and encouragement of the sponsors that this event can take place every year", he hope that this legacy will continue to be an underlying thread to build harmony and foster relationships among the OGSS fraternity. **bt**

RESULTS* 13TH OGSS ANNUAL GOLF TOURNAMENT

Men Category

| Position | Name | Score |
|----------|----------------------|-------|
| 1st | Dr William Verhoeven | 70 |
| 2nd | Dr See Tho Kai Yin | 72 |
| 3rd | Dr Stephen Koh | 73 |

Ladies Category

| Position | Name | Score |
|----------|--------------|-------|
| 1st | Dr Chua Yang | 72 |

*Scores tabulations based on 36 count back Hcp system



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