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# Obstetrics & Gynaecology

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## The Cover Shot

**The Resilient Bloom**

For centuries, cultures have revered flowers as symbols of fertility and procreation. This exquisite orchid, Nervilia plicata, symbolises the evolving field of Obstetrics and Gynaecology - a domain where innovation meets compassion.

The realm of women's health is blossoming with new advancements, honouring each woman's unique story with tailored support. The commitment to comprehensive care reflects the nurturing spirit of the orchid – delicate yet powerful.

In this print, we celebrate the breakthroughs and holistic care that empower and protect, showcasing a transforming landscape of O&G, much like this flower opening to the world.

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# Editorial

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***Issue Editor***

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The Crude Birth Rate (registered births per 1,000 mid-year population) in Hong Kong decreased by about half from 8.3 in 2015 to 4.4 in 2023.[1] In 2024, the year of the Dragon, the crude birth rate increased to 4.9 mainly due to a preference for the dragon zodiac in Chinese culture[1,2]. Then, the total number of births decreased again by about 14 % from 36,767 in 2024 to 31,714 in 2025 despite government incentives including cash bonuses for each baby, child allowance, tax breaks for assisted reproduction technology (ART) services, and shorter waits for public rental housing or priority in buying subsidised apartments[2]. This decrease was not unexpected, as the long-term success after these incentives has not been definitively proved so far[3].

According to the Youth Sexuality Study conducted by the Family Planning Association of Hong Kong (FPAHK), the proportion of girls and boys who said that they would have child(ren) decreased from 80 % in 2011 to 55 % in 2021, and from 84 % to 70 %, respectively[4]. In addition, most of the youth no longer regarded a two-child family as the ideal, and their ideal age of marriage and first childbirth further rose because they anticipated heavy responsibilities and financial burden of raising children[5]. A more child-rearing-friendly environment for the society was called for in a forum organised by FPAHK in 2024[5]. In my opinion, more effort should be given to achieve this goal in both the public sector and the private sector.

Other reasons for the decline in fertility rates include access to modern contraception and education for women, and government policies around family planning[3]. Thus, low fertility rate is a complex issue. It is unlikely that any policy will restore or increase fertility rates any time soon[6]. Investment approaches, including generous parental leave and subsidies for childcare and housing might slow but did not stop fertility declines according to experiences in overseas countries[6]. Alternate approaches include investment in health and education and supporting adaptation[6].

As the birth rate drops, the demand for obstetric services declines. In the public sector, most antenatal services for the low-risk pregnancies previously provided by the maternal and child health centres (MCHC) have shifted to antenatal clinics in the Hospital Authority (HA) since January 2026. In my opinion, this is a good move, as continuity of care can improve health outcomes and pregnant women's experience[7], compared to shared care services provided by the HA and MCHC. In addition, obstetric services should aim for care that promotes a positive childbearing and childbirth experience, as well as optimising health outcomes for both woman and their newborns. Support should be provided to meet the essential needs of pregnant women from antepartum to postpartum.

In Hong Kong, the perinatal death rate decreased from 6.98 in 1992 to 2.23 in 2012, and thereafter remained low but fluctuated between 2.23 and 4.6[8]. Similarly, the maternal mortality rate remained low. Still, it fluctuated after 2020[9]. These fluctuations could have resulted from delayed childbearing, as a larger proportion of pregnant women were above 35, used ART services, or had complex medical conditions[8,9]. In my opinion, special care, including maternal and foetal medicine (MFM) services, should be provided to these high-risk pregnant women to improve both the perinatal and maternal outcomes.

The decrease in perinatal death rate was probably due to improvements in early prenatal diagnosis and management of congenital malformations

and genetic disorders, the management of pre-eclampsia by obstetricians, as well as the management of moderately preterm neonates by neonataologists[10,11]. In this August issue, the author of this editorial discusses the use of various antenatal screening tests by a narrative review of the current guidelines and evidence. In addition to the traditional antenatal routine investigations, new screening tests for pre-eclampsia, carriers of autosomal recessive disorders/sex-linked disorders and foetal single gene disorders have been introduced recently. With an increasing proportion of high-risk pregnant women with risk factors for foetal anomalies and the expectation of women for a 'healthy child without any abnormalities', the demand for a detailed mid-trimester foetal morphology scan increases. This article will be useful to healthcare professionals caring for pregnant women.

Dr WC Leung shared with us in this August issue the history of development of public funded algorithms of prenatal screening and diagnosis in Hong Kong over the past 30 years, and his vision for the future. The public hospitals have adopted new genomic technologies, including cell-free DNA testing, chromosomal microarray analysis, and whole exome sequencing/whole genome sequencing (expensive test) into the current algorithms of prenatal screening and diagnosis. However, cell-free DNA testing for Down syndrome is not yet routinely offered to all pregnant women.

Pulmonary embolism was one of the leading causes of direct maternal death. In view of the discrepancies between various authoritative guidelines on the prevention of thromboembolism, the lack of local guidelines on this issue, and the controversial balance between benefits and harm in using pharmacological thromboprophylaxis, Dr CW Kong and Dr William To introduced in this August issue a local risk assessment score, adapted from the RCOG guidelines, for all women undergoing caesarean delivery. In my opinion, this score looks promising, but it needs more evidence to validate it.

Hong Kong is facing population ageing due to a low birth rate and a long life expectancy. In 2021, about one in five residents in Hong Kong was aged 65 or older. The number of female persons aged 65 and over increased by 4.3 % from end-2023 to end-2024[12]. With increasing longevity, women spend more years after menopause than before, and thus menopause care, including symptom relief, prevention of long-term sequelae such as osteoporosis, and cardiovascular disease, becomes more important. In this issue, Dr Sue Lo updated us on contemporary approaches to menopausal symptom control and disease prevention, emphasising individualised and evidence-based management strategies that promote healthy ageing. In my view, it is time for healthcare professionals to know current menopause care after the U.S. Food and Drug Administration removed menopause hormone therapy black box warnings in late last year.

Cervical cancer is still among the most common cancers affecting women in Hong Kong despite the introduction of HPV vaccination and comprehensive cervical screening programmes. Traditionally, the standard treatment for early-stage cervical cancer typically involves a radical or simple hysterectomy with lymph node assessment. Still, such treatment is associated with significant complications, including loss of fertility. In this issue, Dr HM Luk and Prof KY Tse explained clearly how to offer less radical surgical approaches for carefully selected low-risk patients with cervical cancer. In my view, such approaches may benefit appropriately selected young patients and are considered state-of-the-art.

Rapid information technology (IT) developments have transformed the health domain improving safety, learning and performance. Artificial Intelligence (AI) can enhance diagnosis and personalised management, whereas Digital Health (DH) can enhance personalised data collection, remote monitoring, and clinical decision support[13]. As such, the integration of DH with AI has made Precision Medicine possible. In this issue, Dr Kenneth Tsang, Dr CH Lau and Miss MW Su reviewed several essential issues surrounding the integration of digital health and precision medicine into clinical practice. The authors rightly pointed out that preparing the healthcare profession is one of the keys to success. In my opinion, responsible integration of AI and DH in clinical care may improve clinical outcomes[14].

In summary, a declining birth rate is a challenge. Support including pre-pregnancy care and infertility care, should be provided to couples who wish to have a child. After getting pregnant, women should be supported by obstetric services that promote a positive childbearing and childbirth experience, as well as optimises maternal and perinatal outcomes. Special care should be provided to high-risk pregnant women. After childbirth, women should be supported by a child-rearing-friendly environment in both the public and private sectors.

I would like to express sincere thanks to my colleagues for their great contributions to this August issue including articles and the cover photo, and the Editorial Board for their tremendous support. I sincerely hope that you enjoy reading this issue.

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# Antenatal Screening Tests: Routine or Selective?

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## INTRODUCTION

To facilitate early detection and hence management of pregnancy complications, some antenatal screening tests, including those for anaemia, thalassaemia, infections, and foetal abnormalities, have been routinely offered to pregnant women for many years[1]. Recently, several new screening tests, including those for pre-eclampsia and foetal genetic disorders, have been introduced. Different guidelines recommend different tests according to patient's clinical needs, the local practice and the availability of resources in different places. Some of these tests are offered routinely, whereas others are offered selectively. Before making an informed decision on whether to accept or decline a screening test, women should be informed properly about the advantages and limitations of the test. The objective of the present article is to discuss the use of various antenatal screening tests by a narrative review of the current guidelines and evidence retrieved by PubMed search.

## SCREENING FOR HAEMATOLOGICAL DISORDERS

According to the Hong Kong College of Obstetricians and Gynaecologists (HKCOG) guidelines[1], determination of ABO blood group and Rhesus (Rh) status, and complete blood count should be performed in early antenatal visit to screen for anaemia, thalassaemia, thrombocytopenia, and red cell antibodies which can cause haemolytic disease of the foetus and newborn. If low mean corpuscular volume or haemoglobin is found, further investigations of the woman and her partner will be required, including haemoglobin pattern and iron status with or without DNA analysis for thalassaemia[2]. Furthermore, a repeat blood test for complete blood count and red cell antibodies can be considered in the third trimester[3].

## SCREENING FOR INFECTIONS

Serological screening for infections including hepatitis B virus (HBV), human immunodeficiency virus (HIV), syphilis, and rubella antibody in early gestation has been a routine practice for a long times[1]. In recent years, routine antenatal group B streptococcus screening at 35 - 37 weeks' gestation has become a common practice in both the public and private sectors in Hong Kong.

Recent HKCOG guidelines recommend high-risk women HIV retesting in late pregnancy because a negative HIV test result in the early antenatal period does not preclude subsequent HIV infection[4]. Among pregnant women with negative results from 2009 to 2015, five cases of paediatric HIV infection were reported in Hong Kong[4]. Similarly, Australia guidelines recommend repeat syphilis serology screening in high-risk populations[3].

Previously, the main purpose of screening for HBV was to provide postnatal intervention to newborns of infected pregnant women. Recently, HKCOG guidelines recommend that the latter should undergo assessments of HBV DNA level, HBe Antigen status, and baseline liver function in early pregnancy to determine the need for antiviral prophylaxis to prevent antenatal mother-to-child transmission (MTCT) of HBV[5].

Australian guidelines recommend routine screening for hepatitis C, and asymptomatic bacteriuria[3], and optional screening for varicella zoster antibody[3]. In high-risk populations, selective screening for chlamydia trachomatis, neisseria gonorrhoeae, and herpes simplex virus infection[6]. Selective screening for cytomegalovirus can be offered to women who come into frequent contact with large numbers of very young children (e.g. primary school teachers)[6]. Selective screening for toxoplasmosis can be considered for those who have close contact with cats[3]. These infections may cause foetal, neonatal and maternal complications, and preterm birth[3,6].

## GENETIC SCREENING

Rapid advances in genetic technology in recent years have substantially enhanced our ability in prenatal genetic screening. Major professional societies, including American College of Obstetrics and Gynecology (ACOG), Society of Maternal and Fetal Medicine (SMFM), American College of Medical Genetics (ACMG), and International Society of Prenatal Diagnosis (ISPD) recommend offering non-invasive prenatal genetic screening (NIPS) to all pregnant women for screening of the common aneuploidies (trisomies 21, 18, and 13)[7-10]. NIPS with cell-free DNA is the most accurate screening test for the common trisomies (21, 13 and 18) in unselected singleton populations, and those at known increased probability[7-10].

ACMG, ACOG and SMFM also recommend offering NIPS to screen for sex chromosome abnormalities (SCA) in singleton pregnancies given its high sensitivity and specificity[7,8,10]. Although NIPS can detect rare autosomal trisomies, sub- chromosomal imbalances, microdeletion/ duplication syndromes and single-gene disorders (mostly dominant disorders with a high de novo rate or for paternally inherited autosomal dominant pathogenic variants), major professional societies do not recommend routine screening for these abnormalities except 22q11.2 deletion syndrome because of insufficient data regarding performance and clinical utility, and unknown prevalence in the general population[7,8,10]. At present, NIPS is commonly used as a primary screening method in the private sector, whereas NIPS for common trisomies is used as a contingent test after combined first-trimester screening for Down syndrome in the public sector.

According to the ISPD, proper counselling should be provided before and after NIPS, and high-risk results should be managed appropriately[9]. After pretest counselling, every woman has the right to opt for or decline prenatal genetic screening and diagnostic testing[10]. Furthermore, first trimester scan at 11 - 14 weeks' gestation should be offered before NIPS was performed[9]. When scan abnormalities, including foetal nuchal translucency (NT) measurement ≥ 3.5 mm, are detected, invasive prenatal diagnostic testing with chromosomal microarray or foetalseq should be offered to detect abnormalities which cannot be detected by NIPS[9].

Carrier screening is used to identify women or couples that are at risk of having a child with a severe autosomal recessive or X-linked genetic disorder[11]. Examples are spinal muscular atrophy and fragile X syndrome. In a local pilot study on Chinese women, the carrier frequency was 47.6 % after excluding thalassaemias, and is higher than previously reported[12]. ACMG recommends all pregnant women should be offered carrier screening to allow discussion of their risks and consideration of available reproductive options[11], whereas RCOG do not, as the chance of an affected child is very low[13]. Clinicians should provide adequate pre-test and post-test counselling, including the advantages and limitations of carrier screening panels, the chance of residual reproductive risk, and the phenotypic variability[11,13].

At present, various ECS panels are available commercially. It may be beneficial to choose a larger panel which cover more genes[13]. ACMG recommends routine Tier 3 carrier screening for conditions with a carrier frequency ≥ 1/200, and select X-linked conditions[11]. ACMG also recommends selective Tier 4 screening (for conditions more than Tier 3, and without lower limit carrier frequency) when a pregnancy stems from a known or possible consanguineous relationship or when a family or personal medical history warrants[11]. Furthermore, it is important to choose a region-specific expanded carrier screening panel as international standards may not align with local genetic and healthcare contexts[14]. In a local pilot study, around two-third of the identified variants were not included in the ACMG or American College of Obstetrics and Gynecology guidelines[12].

Carrier screening panels with the same gene coverage should be offered to couples to enable direct comparison[13]. Concurrent carrier screening of the couple can shorten the turnaround time, and thus allow adequate time for invasive prenatal diagnosis, and subsequent management, but can increase the test cost. Furthermore, in a local pilot study, among women found to be carriers of at least one disease, the uptake rate of partner testing was only 29 % after genetic counselling[12].

## SCREENING FOR FOETAL ANOMALIES AND GROWTH RESTRICTION

Performing a mid-trimester morphology scan (MTMS) at 18 - 22 weeks' gestation allows the detection of abnormalities of foetal morphology and growth, and determination of placental location, among other elements, and hence provides opportunities for further genetic testing, counselling and management[15]. MTMS is a routine practice in the private sector, whereas MTMS is offered selectively to pregnant women with risk factors in the public sector because of limited resources.

A basic MTMS can be offered to low-risk women. In the updated 2022 ISUOG guidelines, extra foetal structures/ elements were added to improve the prenatal detection of foetal abnormalities[15,16]. Furthermore, ultrasound screening for placenta accreta spectrum disorders (PAS) and vasa previa should be performed in at-risk women[15]. A transvaginal scan is more accurate than a transabdominal scan for measurement of cervical length with a cut-off of ≤ 25 mm for the prediction of preterm birth[15].

A detailed MTMS (as recommended in the American Institute of Ultrasound in Medicine guidelines) should be offered to those women with risk factors or scan abnormalities[17]. A detailed MTMS includes foetal neurosonography, echocardiography, and a comprehensive evaluation of other foetal structures as appropriate[17,18]. In my view, such a scan should preferably be performed by or supervised by a maternal foetal medicine (MFM) subspecialist.

According to the recent ISUOG guidelines, the third-trimester ultrasound scan (TTUS) can allow the detection of breech presentation, foetal anomalies (0.5 %), small-for-gestational age (SGA) and large-for-gestational age (LGA), as well as some adverse perinatal outcomes[19]. Nowadays, TTUS is commonly performed in the private sector whereas selectively performed in the public sector. In my opinion, a routine TTUS at 36 weeks' gestation can be offered to all women to improve the detection rate of late-onset foetal growth restriction compared to the traditional screening by serial measurement of the symphysis-fundal height[20].

## SCREENING FOR MEDICAL DISORDERS

In view of global obesity and diabetes, hyperglycaemia in pregnancy (HIP), including gestational diabetes mellitus (GDM), overt diabetes in pregnancy (DIP) and preexisting diabetes, is increasingly common[21]. HIP

is associated with the risk of adverse maternal and perinatal complications.

According to the 2025 consensus recommendations from the Australasian Diabetes in Pregnancy Society (ADIPS)[21], women with risk factors for HIP should be offered the glycated haemoglobin (HbA1c) screening in the first trimester to detect over DIP if HbA1c is ≥ 6.5 %. To women with a HbA1c ≥ 6.0 - 6.4 % or a previous history of GDM, a 75 g two-hour pregnancy oral glucose tolerance test (POGTT) should be offered before 20 weeks' gestation[21]. All women (without HIP detected in the current pregnancy) should be offered a 75 g two-hour POGTT at 24 - 28 weeks' gestation [R21]. The updated diagnostic criteria of GDM include (i) fasting plasma glucose ≥ 5.3 - 6.9 mmol/L; (ii) one-hour plasma glucose ≥ 10.6 mmol/L; and/or (iii) two-hour plasma glucose ≥ 9.0 - 11.0 mmol/L[21]. These cut-offs were higher than that recommended by the W.H.O[22].

HKCOG supports universal screening by POGTT at 24 - 28 weeks of gestation[1]. If universal screening cannot be performed because of limited resources, HKCOG recommends that selective screening should be offered to pregnant women with any risk factor or clinical features of HIP[1].

Pre-eclampsia (PE), affecting 2 % - 5 % of pregnant women, is one of the leading causes of maternal and perinatal complications. As PE is predictable and preventable, universal screening for PE has been recommended by several scientific societies, including FIGO[23]. A recent large prospective study has shown that the best performance of screening for preterm PE was achieved with the first-trimester use of mean arterial pressure, uterine artery pulsatility index and serum placental growth factor (triple test)[24]. A large multicentre stepped wedge cluster randomised trial included maternity/diagnostic units from 10 regions in Asia, which showed that low-dose aspirin effectively reduced the incidence of preterm preeclampsia by 41 % among high-risk women[25]. Recently, routine PE screening with the triple test has been used increasingly in both public and private settings.

Overt or subclinical hypothyroidism is associated with a higher risk of adverse pregnancy outcomes, including pregnancy loss, placental abruption, PE, GDM, SGA, preterm birth and adverse effects on offspring neurodevelopment[26]. Australian guidelines recommend routine screening for thyroid dysfunction whereas HKCOG and RANZCOG recommend selective screening for at risk groups[1,6]. However, there are limitations of selective screening as risk factors alone have poor predictive ability for detecting thyroid dysfunction[26].

## CONCLUSION

Recent advances in medicine and technology have enabled early detection of foetal abnormalities, including common trisomies, anomalies, and genetic disorders, and early prediction of pre-eclampsia and preterm labour. This expanding scope of non-invasive prenatal screening promises to transform obstetric care from reactive to preventive, personalised medicine. Different guidelines recommend different tests according to the patient's clinical needs, local practice and the availability of resources in different places (Table 1). This review summarises updated information for obstetric doctors and other professionals to provide proper counselling on various screening tests to pregnant women.

*Table 1: Different guidelines recommend different tests according to the patient's clinical needs, local practice and the availability of resources in different places (Summarised by the author)*

| | HKCOG/ HA | RCPA | RANZCOG | ACOG | NICE |
|---|---|---|---|---|---|
| **First trimester** | | | | | |
| Blood group and antibody screen | R | R | R | R | R |
| Complete blood count | R | R | R | R | R |
| Ferritin | S | R | S | S | |
| Rubella antibody | R | R | R | | |
| Hepatitis B surface antigen (HBsAg) | R | R | R | R | R |
| Hepatitis C | S | R | S | | |
| Syphilis serology | R | R | R | R | R |
| Human immunodeficiency virus (HIV) | R | R | R | R | R |
| Varicella zoster antibody | | S | | | |
| Cytomegalovirus antibody | | S | S | | |
| Toxoplasmosis antibody | | S | | | |
| Thyroid stimulating hormone | S | R | S | | |
| Mid-stream urine | S | R | R | R | |
| Fasting blood glucose/ HbA1c | S | S | | | |
| Vitamin B12 | | S | | | |
| Calcium | | S | | | |
| Genital swab/ urine for chlamydia | S | S | S | R | |
| Genital swab for gonorrhoea | | S | S | S | |
| Mantoux tuberculin skin test | | | | S | |
| Haemoglobin electrophoresis | S | S | S | | |
| Down syndrome screening | R | R | | | R |
| Genetic carrier screening | | S | | R | |
| Pre-eclampsia screening | R* | | | | |
| Scan | R* | | | S | R |
| **Second trimester** | | | | | |
| Morphology scan | R | R | R | R | R |
| Oral glucose tolerance test | S | R | R | R | S |
| Repeat Complete blood count | | R | | | R |
| Repeat Blood group and antibody screen | | R | | | R |
| **Third trimester** | | | | | |
| Group B streptococcus screening | R* | R | R | R | |
| Repeat Complete blood count | | R | | | |
| Repeat Ferritin | | R | | | |
| Repeat Syphilis | | S | S | | S |
| Repeat HIV | S | S | S | | S |
| Repeat HBsAg and Hepatitis C | | | S | | S |
| Genital swab for chlamydia | | S | | S | |
| Genital swab for gonorrhoea | | S | | S | |
| Scan | S | | S | S | S |

American College of Obstetricians and Gynecologists (ACOG)[27], Hong Kong College of Obstetricians and Gynaecologists (HKCOG)[1,2,4,5], Hospital Authority (HA), National Institute of Health Care Excellence (NICE)[28], Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)[6] , Royal College of Pathologists of Australasia (RPCA)[3], Routine (R), Selective (S).

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## MCHK CME Programme Self-assessment Questions

**Please read the article entitled "Antenatal Screening Tests: Routine or Selective?" by Dr LEUNG Kwok-yin and complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded CME credit under the Programme for returning completed answer sheets via fax (2865 0345) or answer link: https://forms.gle/RTyCe5FY5KqnY26a8 or by mail to the Federation Secretariat on or before 31 August 2026. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary. (Address: Duke of Windsor Social Service Bldg., 4/Fl., 15 Hennessy Rd., Wan Chai. Enquiry: 2527 8898)**

**Questions 1 - 10: Please answer T (true) or F (false)**

1. Despite the introduction of carrier screening, blood test for mean corpuscular volume or mean corpuscular haemoglobin is still used for prenatal screening for thalassaemia.
2. In high-risk women, human immunodeficiency virus (HIV) retesting in late pregnancy is not required because a negative HIV test result at the booking visit can preclude subsequent HIV infection.
3. Recent Hong Kong College of Obstetricians and Gynaecologists guidelines recommend that the pregnant women infected with hepatitis B virus (HBV) should undergo assessments of HBV DNA level, HBe Antigen status, and baseline liver function in early pregnancy to determine the need for antiviral prophylaxis to prevent antenatal mother-to-child transmission of HBV.
4. Selective screening for toxoplasmosis in early pregnancy can be considered for women who have close contact with cats.
5. Non-invasive prenatal screening (NIPS) with cell-free DNA is the most accurate screening test for the common trisomies (21, 13 and 18) in unselected singleton populations, but not those at known increased probability.
6. First trimester scan at 11-14 weeks' gestation will not be required if non-invasive prenatal screening (NIPS) with cell-free DNA is performed and shows a low-risk result.
7. The aim of carrier screening is to identify women or couples who are at risk of having a child with a severe autosomal dominant disorder.
8. A detailed, instead of a basic, mid-trimester morphology scan should be offered to those pregnant women with risk factors or scan abnormalities.
9. According to the 2025 consensus recommendations from the Australasian Diabetes in Pregnancy Society, women with risk factors for hyperglycaemia in pregnancy should be offered the glycated haemoglobin (HbA1c) screening in the first trimester to detect diabetes in pregnancy.
10. The best performance of antenatal screening for preterm pre-eclampsia is achieved with the first-trimester use of mean arterial pressure, uterine artery pulsatility index and serum placental growth factor.

## ANSWER SHEET FOR AUGUST 2026

**Please return the completed answer sheet to the Federation Secretariat on or before 31 August 2026 for documentation. 1 CME point will be awarded for answering the MCHK CME programme (for non-specialists) self-assessment questions.**

# Antenatal Screening Tests: Routine or Selective?

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Answer Link

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Name (block letters):_____ HKMA No.: _____ CDSHK No.: _____

HKID No.: __ __ - __ __ __ __ X X (X) HKDU No.: _____ HKAM No.: _____

Contact Tel No.:_____ MCHK No. / DCHK No.: _____(must fill in)

## Answers to July 2026 Issue

**Exploring the Potential and Challenges of Non-Invasive Brain Stimulation for Local Mental Health**

**1.** T **2.** T **3.** T **4.** T **5.** T **6.** T **7.** F **8.** F **9.** F **10.** T

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易消化[1]
水解蛋白
pHF-W


皇牌雙效水解技術

## 免疫低敏

7 HMO

星級
雙益生菌


免疫加乘組合*

*免疫加乘組合指兩種雙歧益生菌*B. infantis* 及 *B. lactis*及7HMOs^。 2'FL、3FL、LNnT、LNT、6'SL、3'SL及DFL (均屬於母乳低聚糖HMO類別，非源自母乳) 每100毫升雀巢® 能恩全護® INFINIPRO® 4號配方奶粉沖調液含217毫克。1. Billeaud C, et al. European Journal of Clinical Nutrition. 1990.44(8)：577–583. 母乳是最好的。

# History of Development of Public Funded Algorithms of Prenatal Screening and Diagnosis in Hong Kong over the Recent 30 Years and Beyond

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Dr Wing-cheong LEUNG

## ABSTRACT

Similar to the development of the roadmap of MTR in Hong Kong, the public funded algorithms of prenatal screening and diagnosis in Hong Kong also started with a single line offering CVS or amniocentesis for karyotyping to pregnant women with advanced maternal age from the 1980s. Thereafter, different extension lines have been developed with the advancement in technologies and training, including ultrasound for soft markers and structural foetal abnormalities, foetal Down syndrome screening using NT measurement with various maternal serum markers, PCR, chromosomal microarray, NIPS using maternal plasma cell free foetal (placental) DNA, MDT approach with WES or WGS including foetal MRI, foetal autopsy and genetic counselling. More extension lines are developing with the common goal of facilitating the pregnancy journey and decision-making of women and their families. The philosophy of knowing more vs. knowing less is challenging – what would be missed and who should decide? The direction seems to be moving more and more towards Eugenics. Deep thinking about this direction from time to time is required.

- 1980s: Amniocentesis and chorionic villus sampling (CVS) for karyotyping in pregnant women with advanced maternal age.
- 1990s: Routine ultrasound screening for foetal structural abnormalities.
- 1990s: First and second trimester combined screening for foetal Down syndrome.
- 2000s: PCR + karyotyping for amniocentesis and CVS.
- 2010: Universal Down syndrome screening for all pregnant women irrespective of maternal age.
- 2019: PCR & chromosomal microarray +/- karyotyping for amniocentesis and CVS.
- 2019: 2nd tier Non-invasive Prenatal Testing (NIPT) – maternal plasma for foetal (placental) DNA.
- 2021: MDT – FMPRG (Foetal Medicine, Pathology, Radiology, Genetics/Genomics) web-based platform selecting complex foetal structural abnormalities for WES or WGS.

PCR=polymerase chain reaction; MDT=multidisciplinary team; WES= whole exome sequencing; WGS=whole genome sequencing

*Fig. 1: Milestones of development of prenatal screening and diagnosis in Hong Kong (Developed by the author)*

The author graduated from the Medical School of the University of Hong Kong (HKU) in 1989. He has completed his specialist training in O&G in the Dept of O&G, Tsan Yuk Hospital and Queen Mary Hospital, HKU and become a specialist in O&G (HKAM) in 1997. Thereafter he has subspecialised in Maternal Foetal Medicine (MFM) and undergone overseas training in the Perinatal Centre, University of Toronto, Canada in 1999 and the Fetal Medicine Centre, University College London, the U.K. in 2002/3. He became an accredited subspecialist in MFM by RCOG (U.K.) in 2003 (1st one in HK) and by HKCOG in 2005. He earned his MD (HKU) in 2010 with a thesis entitled: *Rapid aneuploidy testing or traditional karyotyping, or both, in prenatal diagnosis*. He has continued serving the public sector (Hospital Authority, HA) for more than 30 years and has experienced the development of public funded algorithms of prenatal screening and diagnosis in Hong Kong.

There are various milestones during the development of public funded algorithms of prenatal screening and diagnosis as listed in Fig. 1. Interestingly, the roadmap of development is very similar to that of the MTR in Hong Kong, with the addition of different routes from time to time. (Fig. 2)

Historically, the concept of prenatal screening and diagnosis focused on foetal Down syndrome (trisomy 21), which is the most common and well-known congenital abnormality since the 1960s. In the 1980s, pregnant women with advanced maternal age (arbitrary defined as 40, 38 or 35 years old) were eligible for CVS or amniocentesis because the likelihood of having a child with Down syndrome increases with maternal age. Although this represented a substantial advancement in prenatal diagnosis, the approach had important limitations. Women with advanced maternal age faced the risk of miscarriage associated with CVS or amniocentesis[2], whereas those younger mothers-to-be were excluded from screening. This exclusion was a considerable oversight, given that most expectant mothers at the time were younger than 35 years old.

With the progressive development of ultrasound technology and ultrasound skills training, the concept of routine ultrasound screening at 18 to 22 weeks gestation was developed in the 1990s. This scan evaluates foetal development and identifies potential foetal structural abnormalities, such as heart defects, spina bifida, and other major organ anomalies[3,4]. The inclusion of the foetal anomaly ultrasound scan is particularly important in regions such as Hong Kong, where termination of pregnancy is legally permissible only within 24 weeks of gestation. By detecting major structural abnormalities within the legal timeframe, pregnant women are enabled to make informed decisions regarding their options and to prepare for any required neonatal interventions. However, despite the gradual improvement in ultrasound machines and standard training offered to O&G specialty trainees, even up to now in HA, routine ultrasound screening at 18 to 22

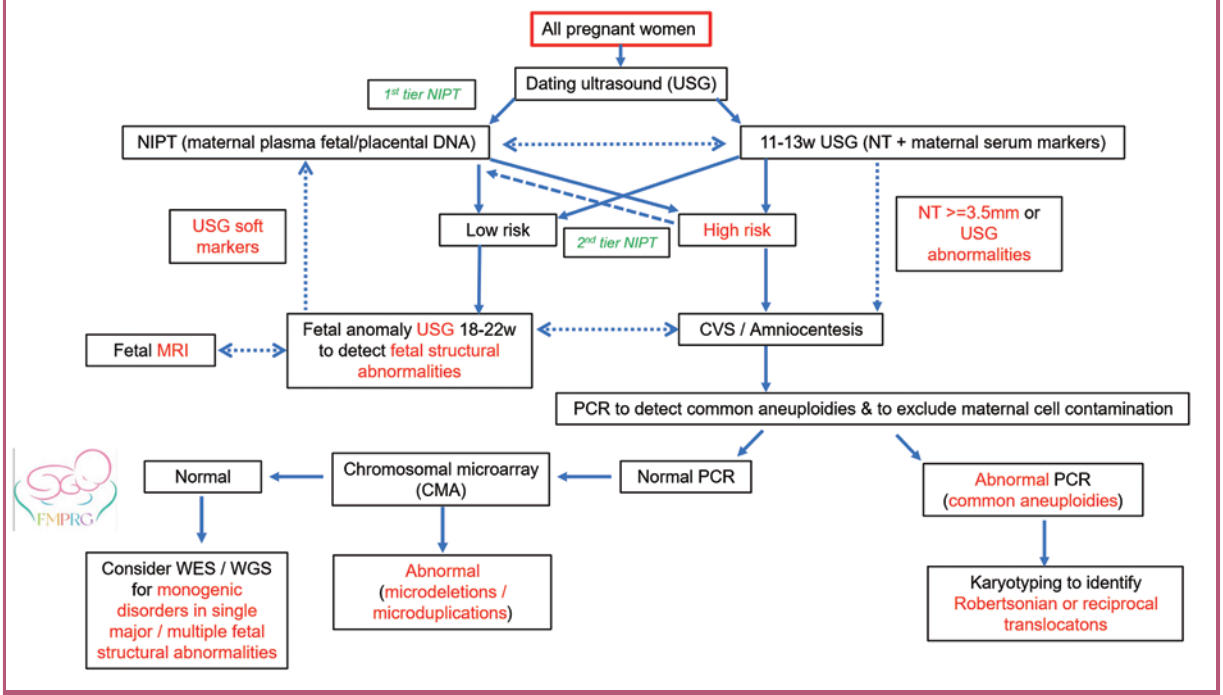


*Fig. 2: Current algorithms in 2026[1] (Excerpted from Lee A, Chung N. Achieving universal and comprehensive publicly funded prenatal screening and diagnostic algorithms in Hong Kong: an interview with Dr Wing-cheong Leung. Hong Kong Med J. 2024 Dec;30(6):517-519. doi: 10.12809/hkmj-hc202412b. PMID: 39734073.)*

weeks gestation with minimal standard can only be offered to pregnant women with advanced maternal age (> = 35 years old) in some of the HA Obstetric units. There is certainly room for improvement.

In the 1990s and 2000s, there were enormous amount of international and local studies focusing on the use of first trimester (preferably), second trimester or combined screening for foetal Down syndrome targeting all pregnant women irrespective of their maternal age, making use of nuchal translucency (NT) measurements in 11 to 13 weeks scan with various maternal serum markers (PAPP-A, beta-hCG, AFP, uE3, inhibin) to select high risk cases for CVS or amniocentesis (achieving a sensitivity of 90 % with a false positive rate of 5 %). This performance is already reasonably good as a screening test. It was not until 2010 when universal Down syndrome screening was offered in HA for all pregnant women irrespective of their maternal age. Nevertheless, this was a big step forward in the public funded algorithms of prenatal screening in Hong Kong[5,6,7,8].

In 2000s, there was the breakthrough development of the clinical application of polymerase chain reaction (PCR) as rapid aneuploidy testing (RAT) with turn-around-time (TAT) of 1 to 2 days (for trisomy 21, 18, 13 and XY aneuploidies) on top of the standard karyotyping with TAT of 2 to 3 weeks (for the entire 23 pairs of chromosomes)[9,10,11,12,13,14]. The accuracy of PCR has been robustly confirmed before its widespread use after CVS or amniocentesis to confirm the common aneuploidies within 1 to 2 days and thus the decision on termination of pregnancy as well as to rapidly reduce the maternal anxiety associated with false positive Down screening tests (up to 5 % of CVS or amniocentesis performed for positive Down screening tests)[15,16]. In 2019, routine PCR was offered in HA for all CVS and amniocentesis.

2019 is an important year in the milestones for the development of public funded algorithms of prenatal screening and diagnosis in Hong Kong. PCR is coupled with chromosomal microarray (CMA) to improve the diagnostic yield from CVS or amniocentesis. CMA, also known as molecular karyotyping, can detect an additional 5 to 10 % (mainly microdeletions or microduplications) on top of PCR and traditional karyotyping (approximately 30 % yield)[17].

In 2010s, another major breakthrough must have been the discovery on using maternal plasma cell free foetal (placental) DNA as a non-invasive prenatal screening (NIPS). The best performance of NIPS is on foetal Down syndrome (trisomy 21) with sensitivity as high as > 99 % with false positive rate as low as much < 1 %)[18], followed by the detection of other common aneuploidies (trisomy 18 & 13)[19]. Starting from 2019, 2nd tier NIPS has been offered in HA for those cases with positive conventional Down screening tests[20]. This approach has significantly reduced the unnecessary CVS or amniocentesis performed due to false-positive Down screening tests. However, the ultimate advantage could only be achieved when NIPS is offered as 1st tier screening test for the common aneuploidies (trisomy 21, 18, 13 & XY aneuploidies). Costing is an important issue if 1st tier NIPS is offered universally in HA to all pregnant women. A co-payment arrangement can be considered for cost-sharing. On the other hand, under this approach, there will be savings from stopping the testing for conventional maternal serum markers (NT to remain as hight NT > = 3.5mm has its own

implications)[21] ; no more 2nd tier NIPS; unnecessary CVS or amniocentesis for false positive conventional Down screening tests; and the associated call back procedures and maternal anxiety. A cost-effectiveness analysis is underway.

In 2020s, whole-exome sequencing (WES) or whole-genome sequencing (WGS) for single gene mutations has been found to be able to increase another 30 % diagnostic yield when PCR and CMA are negative after CVS or amniocentesis for complex foetal structural abnormalities detected by ultrasound[22]. In 2021, the FMPRG platform was established in HA for this purpose[23]. The FMPRG platform uses a multidisciplinary team (MDT) approach to select cases with complex foetal structural abnormalities for public funded WGS or WES. The FMPRG represents the MDT comprising specialists in **F**oetal **M**edicine, **P**athology, **R**adiology (including foetal MRI)[24,25], and Genetics/ Genomics. The voting team currently includes 15 core members, including MFM subspecialists from all eight HA hospitals offering prenatal diagnosis clinical services, clinical geneticists, the heads of the two university prenatal diagnosis laboratories, pathologists, and radiologists. The complex foetal cases are uploaded to the platform for online interactive discussion and voting, enabling the team to select appropriate cases for public funded WES or WGS in a fair and timely manner. Not only does WES or WGS increase the probability of identifying the genetic cause of complex foetal abnormalities, but the anonymised archiving of these cases on the platform also creates a valuable database for future education and research. The current public funding has allowed 60 cases annually; the initiative aims to alleviate the financial burden on eligible mothers while empowering families with critical genetic insights to guide their pregnancies.

Finally, the author envisions the following future development of public funded algorithms of prenatal screening and diagnosis in Hong Kong in the next five years:

(1) 1st tier NIPS for trisomy 21, 18, 13 +/- XY aneuploidies. The pregnant women also have the option of NIPS in the private sector with the addition of NIPS for microdeletions, rare aneuploidies, single gene disorders and others (although the test performance is inferior to the common aneuploidies);

(2) The use of artificial intelligence (AI) in performing NT scan at 11 to 13 weeks (coupled with the latest HA universal Preeclampsia screening); routine foetal anomaly scan at 18 to 22 weeks; the role of MFM trainees or subspecialists is to review the ultrasound images taken by AI;

(3) The use of artificial intelligence (AI) in personalised education and counselling to alleviate the unnecessary stress and anxiety for pregnant women and their family members during the waiting time for face-to-face consultations. By thoughtfully integrating AI within prenatal care, this approach combines the efficiency of AI chatbots with the human touch of in-person interactions, resulting in a more streamlined and responsive care experience.

(4) New alternative to CMA such as low pass genome sequencing which could further improve the test performance;

(5) The quota for the public funded WES or WGS could be increased with increased funding as well as reducing cost with mass processing (high throughput) of samples. The voting mechanism in the FMPRG platform might become unnecessary when the MFM team members have gained more and more experience via the submission of complex foetal cases to the FMPRG platform.

## CONCLUSION

In conclusion, the author is confident that with the joint effort from the MFM team members, together with a MDT approach, the common goal for equitable access to prenatal diagnoses for all expectant mothers can be achieved. The vision is to establish a 'universal safety net' for all pregnant women, regardless of their economic status, equipping them with the resources necessary to make informed decisions about their health and the health of their babies[26].

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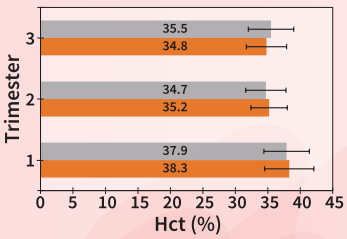


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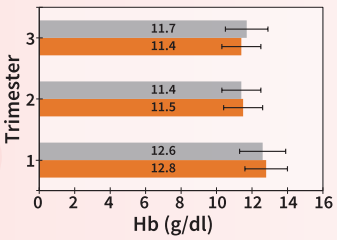


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# Thromboprophylaxis for Caesarean Section

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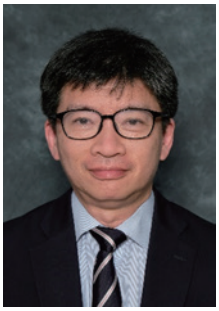

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## INTRODUCTION

Venous thromboembolism (VTE) remains a major cause of maternal mortality and morbidity[1]. The 2025 Mother and Babies; Reducing Risk through Audits and Confidential Enquiries across the United Kingdom (MBRRACE-UK) study showed that thrombosis and thromboembolism were the leading cause of maternal death in the U.K. in 2021 - 23 during or up to six weeks after the end of pregnancy, with a rate of 2.1 per 100,000 maternities[2]. The mortality rate from VTE was more than twice that of any other direct cause during these three years. The rate of maternal deaths due to VTE was 52 % higher in 2021 - 23 than in 2018 - 20, the last complete triennium, though this increase is not statistically significant. Pregnancy is a prothrombotic condition that increases the risk of VTE four to five times as compared to non-pregnant women[3]. In addition, the risks of VTE are 4-fold higher after caesarean section (CS) than those after vaginal delivery[4], and up to 2.0 % of patients suffering from DVT will have life-threatening PE[5]. The risks of VTE are higher in those with advanced maternal age, those with pre-existing thrombophilia, lupus, cardiac disease, sickle cell disease, obesity, fluid and electrolyte imbalance, preeclampsia, postpartum infection and transfusion are the other significant risk factors[1] . Apart from local symptoms of lower limb swelling and pain from DVT, the most common signs of pulmonary embolism (PE) in pregnancy are dyspnoea and tachycardia. Although these symptoms can be completely similar in other illnesses such as heart diseases, given the much higher risks thromboembolic disorders in pregnancy, the possibility of VTE should be addressed early in all pregnant women. It remains controversial whether the incidence of VTE is lower or similar in Asian women compared with western populations[6]. The types of thrombophilia that are more likely to contribute to VTE in Asian populations may also differ from that of western populations, with a higher incidence of congenital thrombophilia such as antithrombin, protein C, and protein S deficiencies in the Chinese population[7].

## INTERNATIONAL THROMBOPROPHYLAXIS PROTOCOLS

Many authoritative protocols have been advocated for the prevention of VTE during pregnancy and in particular after CS[1,8,9,10]. However, there is considerable variation in these approaches to prophylaxis of VTE, and the precise risk threshold at which pharmacologic prophylaxis of VTE is warranted remains controversial. RCOG recommends that all pregnant women should be assessed for pre-existing, obstetric and new onset risk factors for VTE at important stages in their pregnancy. Those at high risk will require antenatal pharmacological thromboprophylaxis with low molecular weight heparin (LMWH) from early antenatal booking, while those at intermediate risk may be started on prophylaxis from 28 weeks gestation onwards. Those who meet the criteria for intermediate risk after having an intrapartum or urgent caesarean delivery should be considered for thromboprophylaxis for 10 days after delivery, while those having an elective CS should be considered for similar thromboprophylaxis if they have any additional risk factors[1]. Such an approach is generally accepted by most authorities, but as CS and the postpartum period pose unique high risks for VTE, specific protocols have been designed to target thromboprophylaxis at or after CS.

The American College of Chest Physicians (ACCP) guidelines recommend prophylaxis with LMWH when one major or two or more minor risk factors are present or when one minor risk factor is present in the setting of an emergency caesarean delivery[8]. The American College of Obstetricians and Gynecologists (ACOG) recommends universal pneumatic compression devices for all women undergoing CS, and if additional risk factors persist during the postpartum period, pharmacologic prophylaxis for up to six weeks should be considered[9]. The National Partnership for Maternal Safety recommends a consensus bundle, using universal pneumatic compression devices for all patients undergoing CS, and the addition of pharmacologic prophylaxis for women at high risk for VTE based on either the RCOG guidelines or the modified Caprini scoring system[11].

## DISCREPANCIES BETWEEN VARIOUS AUTHORITATIVE GUIDELINES

Given the wide discrepancies in the recommended scoring and criteria for thromboprophylaxis between these major guidelines, it is obvious that the resulting proportion of women deemed as requiring prophylaxis would vary greatly. Indeed, in a small cohort, it was found that the RCOG guidelines categorised 40.1 % of all deliveries and 88.8 % of CS as requiring LMWH thromboprophylaxis, while the ACOG and

ACCP guidelines categorised 35.0 % and 40.0 % respectively. In another study including women delivered both vaginally or by CS, by applying RCOG guidelines, 53.6 % of women would have qualified for postpartum LMWH compared with 40.2 % of women using the Society of Obstetric Medicine of Australia and New Zealand (SOMANZ) guidelines, 37.3 % using Society of Obstetricians and Gynaecologists of Canada guidelines, and 8.3 % using ACCP guidelines[14]. Similarly, in a cohort with only caesarean deliveries, 85.0 % of women would need LMWH prophylaxis under RCOG recommendations compared with 1.0 % under ACOG guidelines and 34.8 % under ACCP guidelines[14] . These different guidelines have brought about as much controversy as they have consensus, as the recommendations are based largely on low level evidence from expert opinion, observational studies, and extrapolation from non-obstetric populations. The risk thresholds to recommend the use of LMWH in many of these guidelines appear very low and may imply an unjustifiably high number-needed-to-treat to prevent VTE events. Practical calculations of such numbers needed to treat or to harm were universally lacking[15] , with almost no data from randomised controlled trials or meta-analyses to support recommendations[16]. There is a genuine concern that many current guidelines might lead to overmedicalisation of pregnancy[17] with potential deleterious effects. The 2014 Cochrane analysis concluded that there is insufficient evidence on which to base recommendations for thromboprophylaxis during pregnancy and the early postnatal period, as the number of studies eligible for analysis were small, the trials were not of high methodological quality, and the sample size, being limited to several hundred women in each series, were not large enough to show the true incidence of VTE[18]. Large-scale, high-quality randomised trials are definitely warranted.

## THE CONTROVERSIAL BALANCE BETWEEN BENEFITS AND HARM IN USING PHARMACOLOGICAL THROMBOPROPHYLAXIS

Studies on decision analysis modelling found that there is substantial decision uncertainty regarding the selection of high-risk women for postpartum prophylaxis, mainly around the effectiveness of thromboprophylaxis for preventing VTE[19]. Using a hybrid decision tree model for North American women, it was estimated that adoption of the ACOG guidelines with a low LMWH use of 87 - 115 doses per 1,000 caesarean deliveries would avert around 5 % of VTE cases, the ACCP guidelines would use 570 doses per 1,000 deliveries and reduce up to 21.2 % of VTE cases, while the RCOG guidelines would use over 7,233 does per 1,000 deliveries to avert up to 37.4 % of VTE cases, and a universal regime of LMWH for six weeks postpartum would require an overwhelming 38,648 doses of LMWH per 1,000 patients and avert 57.6 % of all VTE[20] . However, a study adopting the ACOG District II Safe Motherhood Initiative's VTE Bundle to guide heparin-based thromboprophylaxis showed that while more patients received LMWH prophylaxis post-protocol (15.6 % vs 1.2 %), there was no difference in VTE incidence (0.1 % overall) between the pre and post-protocol groups amongst a total of 24,000 deliveries. However, patients post-protocol experienced significantly more wound haematomas, unplanned surgical procedures and blood transfusions[21]. Furthermore, a meta-analysis including six randomised control trials and one prospective cohort showed that LMWH was associated with no obvious decrease in the risk of VTE but was associated with a relative risk of 8.47 for bleeding or haematomas in comparison to negative control[22].

The potential association of LMWH use with increased rates of postpartum complications remains a major clinical concern. Among postpartum women who received early therapeutic anticoagulation, the incidence of a composite of major haemorrhagic complications or major wound complications was reported as 8.4 % for caesarean deliveries and 6.0 % for vaginal deliveries. Complications were associated with earlier resumption of therapeutic anticoagulation, particularly before 9.25 hours for vaginal deliveries and before 15.1 hours for CS[23]. In contrast, a study on cases receiving enoxaparin prophylaxis within 24 hours of CS showed that irrespective of the presence of an epidural catheter, no patient developed a spinal epidural haematoma after early administration of enoxaparin. In addition, the overall incidence of haemorrhagic complications did not increase[24].

## OUR ADAPTED LOCAL PROTOCOL

We implemented a local "risk assessment and preventive care for venous thromboembolism for CS" protocol adapted from the RCOG guidelines in our unit in United Christian Hospital from May 2017 for all women who underwent either elective or emergency caesarean delivery who were not categorised as high risk before their delivery. The model was based on demographic, obstetric and medical risk factors of the patients as in the RCOG protocol, albeit with modified cutoffs, including a higher maternal age cutoff of 40 instead of 35, a lower BMI cutoff between 25 and 30 kg/m$^2$ as overweight to gear to Asian body habitus, and a preterm delivery cutoff of =< 34 instead of 37 weeks. More importantly, instead of initiating pharmacological prophylaxis for patients with two minor risk factors or more, our protocol raised the scoring threshold to three or above before prescribing LMWH (Table 1). Those with major postpartum haemorrhage > 1,000 ml or who required blood transfusion during or immediately after CS would have their scores marked up by one point. The LMWH injection was to commence within the first day post CS unless clinically contraindicated.

We collected data from the implementation of the protocol to December 2024 (94 months, 20,027 deliveries with 24 % CS) and compared the outcome with a pre-protocol control period from 2014 to April 2017 (40 months, 14,212 deliveries with 23.3 % CS). Women who were already on LMWH in the antenatal period due to acquired anti-phospholipid syndrome, previous pregnancy related DVT, hereditary thrombophilia or other specific conditions were excluded.

*Table 1:Department guideline of VTE prophylaxis for caesarean section in United Christian Hospital (Adapted from the RCOG guidelines in our unit in United Christian Hospital )*

| | |
|---|---|
| 1) | Patients who are on antenatal LMWH (such as previous DVT or high risk thrombo-embolism) or those who have already planned for LMWH for six weeks after delivery, should have pneumatic cuff during CS and have LMWH after delivery as planned. Calculation of the VTE score will not be needed for these patients |
| 2) | Patient who will undergo elective or emergency CS should have the following risk factors checked (each risk factor score one in VTE score unless specified):<br>- Age >= 40<br>- BMI (Pre-pregnant or early pregnancy BMI) >= 25 but < 30<br>- BMI >= 30 (Score as two in VTE score)<br>- Parity >= 3<br>- Pre-eclampsia<br>- Multiple pregnancy<br>- Preterm gestation (< 34 week)<br>- Prolonged labour (> 24 hours)<br>- Stillbirth in this pregnancy<br>- Medical comorbidities e.g. cancer, heart failure, active SLE, IBD or inflammatory polyarthropathy, nephrotic syndrome, type I DM with nephropathy, sickle cell disease, current intravenous drug addict<br>- Low-risk thrombophilia<br>- Current smoker<br>- Gross varicose veins<br>- Current systemic infection<br>- Immobility, e.g. paraplegia<br>- Family history of VTE (1st degree relative) |
| | Patient whose VTE score >= 2 should have pneumatic cuff during CS<br>Patient who has PPH >= 1,000 ml or has blood transfusion during CS should add one score in VTE score<br>Patient whose VTE score >=3 should have at least 10 days postnatal prophylactic LMWH<br><br>Regimen:<br>Maternal booking or early pregnancy body weight < 100 kg: enoxaparin subcutaneous 40 mg daily<br>Maternal booking or early pregnancy body weight >=100 kg: enoxaparin subcutaneous 60 mg daily |

VTE=Venous thromboembolism; LMWH=low molecular weight heparin; CS=caesarean section; BMI=Body Mass Index; SLE=systemic lupus erythematous; IBD=inflammatory bowel disease; DM=diabetes mellitus; PPH=postpartum haemorrhage

## OUTCOME DATA BASED ON OUR LOCAL PROTOCOL

Within the protocol group, 3.25 % patients had VTE Score >=3 and required pharmacological prophylaxis with LMWH. When these patients were recoded according to the RCOG protocol or ACCP guidelines, 78.9 % and 27.1 % of them would theoretically be prescribed pharmacological prophylaxis. On the other hand, when they were recoded according to the ACOG protocol, as those with history of VTE or thrombophilia who were already on LMWH before CS were excluded, none of them would be prescribed pharmacological prophylaxis. There were five cases documented in the protocol period, four with PE and one with DVT, compared with 11 postpartum thromboembolic events in the pre-protocol group (3 PE and 8 DVT). The incidence of VTE events after the implementation of the current protocol (0.1 %) was significantly lower than the pre-protocol period (0.33 %) (p = 0.043), with an overall incidence of VTE of 1.9 per 1,000 patients with CS in the entire cohort. No patients who received LMWH prophylaxis after CS had serious haemorrhage or complications that could be directly related to the LMWH used. All patients with VTE recovered fully and there was no maternal mortality related to VTE in either the protocol or pre-protocol period. Our overall incidence of VTE after CS was on par with the incidence reported from other studies based on western obstetric populations of around 0.2 %. As with our previous study[25], our current comparative scoring confirmed that adopting either the RCOG or ACCP criteria would entail a much higher rate of pharmacological prophylaxis. Compared to only early mobilisation after CS in the pre-protocol era, we were able to demonstrate a significant reduction of VTE events to around 1 per 1,000 women after adoption of the protocol despite a low rate of LMWH prophylaxis of only 3.25 %. The estimated risk reduction in VTE from pre-protocol to the protocol period was around 0.2 %, so that the number needed to be screened would be around 500 per VTE event. Assuming the average rate for pharmacological thromboprophylaxis using this risk scoring was in the range of 3 - 5 %, the number-needed-to-treat with LMWH to prevent one VTE would be in the reasonable range of 15 to 25[26]. Nevertheless, due to the low incidence of VTE events, it was not surprising that significant reductions in its incidence could be difficult to demonstrate even in large cohorts[18,23,24] and the possibility of chance findings posed from small number variations in our current study needs to be borne in mind.

## CONCLUSION

VTE remains an important cause of maternal morbidity and mortality during pregnancy and the postpartum period particularly in patients undergoing caesarean delivery. The decision to prescribe pharmacological prophylaxis should be based on a proper scoring system geared to the incidence of postpartum VTE for the specific obstetric population. We have proposed a local risk assessment score that has apparently been effective in reducing VTE events compared to no thromboprophylaxis in a large cohort, while maintaining the need for pharmacological thromboprophylaxis at a relatively low rate to avoid the potential complications of LMWH.

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# Updates on Menopause Management

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## INTRODUCTION

Menopause marks the permanent cessation of ovarian function and the end of a woman's reproductive life. The resulting oestrogen deficiency leads to a wide range of physical and psychological symptoms such as sleep disturbances, fatigue, musculoskeletal aches, hot flashes, mood swings, cognitive problems, urinary complaints and sexual dysfunctions. These symptoms typically begin several years before the final menstrual period (FMP) and persist for a median duration of approximately 12 years[1].

With increasing longevity, women now spend more than one-third of their lives after menopause. Consequently, menopause care must extend beyond symptom relief to encompass the prevention of long-term sequelae such as osteoporosis, cardiovascular disease, and genitourinary symptoms. This review provides an update on contemporary approaches to menopausal symptom control and disease prevention, emphasising individualised and evidence-based management strategies that promote healthy ageing.

## SYMPTOM CONTROL

### Menopausal Hormone Therapy (MHT)

Between 1970s and 1990s, MHT was touted as an elixir that enabled women to stave off the health effects of ageing, such as weight gain, skin ageing, cardiovascular diseases and dementia so that women could remain feminine forever. However, the publication of the Women's Health Initiative (WHI) trials[2,3] fundamentally shifted clinical practice by demonstrating that MHT did not prevent cardiovascular disease and was associated with increased risks of stroke, venous thromboembolism (VTE) and breast cancer (with combined therapy). Subsequent black box warning issued by the U.S. Food and Drug Administration led to a dramatic global decline in MHT use.

Recent reanalyses of WHI data and emerging evidence have shown that, in healthy women who initiate MHT near the FMP, the benefits outweigh the risks[4-7]. Current guidelines support MHT as the most effective treatment for moderate to severe vasomotor symptoms (VMS) and for the prevention of bone loss and fracture in women at increased risk. MHT is not recommended for the primary prevention of cardiovascular disease, dementia or ageing[8-10]. The "timing hypothesis" proposes that MHT initiated during early menopause may reduce cardiovascular risk and all-cause mortality[11-12]. Although suggestive, this hypothesis is largely based on post hoc comparison of observational studies and the subgroup analyses on a small proportion of younger age women in the WHI trials, and definitive randomised evidence remains limited.

When prescribing MHT, selecting the appropriate drug, dose, and route is crucial. Contemporary guidelines[8-10] no longer impose a strict upper age limit for MHT use. Therapy may be continued beyond 60 years old, provided that women are appropriately selected, counselled, and monitored. The guiding principle for dosing has evolved from the "lowest dose" to the "lowest effective dose", recognising that adequate symptom control is integral to quality care.

## SYSTEMIC MHT

### Choice of Oestrogens

Oral oestradiol undergoes hepatic first-pass metabolism, leading to increased production of procoagulant factors, triglycerides, and high-density lipoprotein cholesterol as well as increased bile cholesterol saturation. As a result, oral oestradiol is associated with a higher risk of VTE, gallbladder disease and hypertriglyceridaemia[13,14].

Transdermal oestradiol bypasses hepatic first-pass metabolism and is therefore preferable for women at risk for metabolic, vascular, or gallbladder diseases. However, transdermal absorption can be variable and influenced by factors such as smoking, alcohol and drug use, physical activity, diet, stress and circadian changes in dermal blood flow[15]. Local skin reactions, including irritation and rarely allergic responses, may occur.

Despite its less favourable metabolic profile, oral oestradiol remains a reasonable option for low-risk women because of its convenience, predictable absorption and ease of use.

### Choice of Progestogens

In women with an intact uterus, adequate endometrial protection by progestogen is essential to prevent endometrial hyperplasia and cancer caused by oestrogen. The selection of progestogen significantly influences metabolic, vascular, and breast safety.

Medroxyprogesterone acetate, used in the WHI trials, has been associated with adverse metabolic effects and increased breast cancer risk[2]. Norethisterone acetate, another commonly used progestogen, undergoes partial conversion to oestrogen and has been linked to higher risks of breast cancer[16] and VTE[17].

Dydrogesterone is associated with a more favourable safety profile, with minimal or no effects on lipid and carbohydrate metabolism and lower breast cancer risk[16,18]. However, in Hong Kong, its availability is limited to one brand of cyclical MHT formulation combined with standard-dose (2 mg) oestradiol.

Oral micronised progesterone also has little or no metabolic impact, does not increase breast cancer risk[18], and even improves sleep quality and reduces anxiety[19]. Women should take it before bedtime to maximise sleep benefit and minimise side effects such as dizziness and nausea[19]. Recommended dosages are 200 mg daily for 14 days per cycle in cyclical therapy or 100 mg daily in combined therapy. A combination pill containing oestradiol and micronised progesterone is available in Europe but not currently in Hong Kong.

The 52 mg levonorgestrel releasing intrauterine device provides effective endometrial protection for up to five years when used with systemic oestrogen[20]. It is important to note that there may be a slight increased risk of breast cancer in postmenopausal women, as levonorgestrel can stimulate the proliferation of oestrogen-primed breast tissue[21].

# LOCAL THERAPIES FOR GENITOURINARY SYMPTOMS

## Vaginal Lubricants and Moisturisers

Lubricants are primarily used during intercourse to reduce friction and discomfort. Water-based lubricants are easy to clean but dry quickly. Silicone-based products last longer and provide a smoother feel. Oil-based lubricants offer prolonged lubrication but are most difficult to remove[22, 23].

Moisturisers promote moisture retention and restore elasticity to vaginal tissues and are effective for mild to moderate dryness. They are typically used daily initially and then gradually spaced to twice weekly or weekly maintenance dosing[23].

Lubricants and moisturisers are recommended as the first-line treatment for genitourinary symptoms due to their safety and tolerability[22, 23].

## Vaginal Dehydroepiandrosterone (DHEA)

Vaginal DHEA exerts its effects through intracrinology, whereby DHEA is locally converted into oestradiol and androstenedione within vaginal cells, and then metabolised and excreted, with minimal systemic absorption[24]. It improves epithelial integrity, lubrication, elasticity and sexual function[25, 26]. The most common adverse effect is increased vaginal discharge. Although emerging data support its use in breast cancer survivors[27], caution is advised in women with a history of hormone-sensitive cancers.

## Vaginal Oestradiol

Vaginal oestrogen cream or tablet effectively alleviate vaginal dryness and dyspareunia[8,23]. Some studies showed low-dose vaginal oestrogen tablets do not significantly increase serum oestradiol levels, whereas cream and vaginal DHEA may cause small increases[28]. Current evidence does not demonstrate an increased risk of atypical endometrial hyperplasia or endometrial cancer with low-dose vaginal oestrogen[23,29] and endometrial protection is generally not required[23].

# NON-HORMONAL THERAPIES

## Neurokinin-3 (NK-3) Receptor Antagonists

NK-3 receptor antagonists target thermoregulatory dysfunction within the hypothalamus and are effective in alleviating VMS[30]. Only Fezolinetant is currently available in Hong Kong.

*Table 1: Efficacy and safety of fezolinetant and elinzanetant for vasomotor symptoms in postmenopausal women (Excerpted from a systematic review[30])*

| | Fezolinetant | Elinzanetant |
|---|---|---|
| **FDA approval** | 12.5.2023 | 24.10.2025 |
| **Class** | NK-3 antagonist | Dual NK-1 & NK-3 antagonist |
| **Mechanism of action** | Blocks NKB receptor on KNDy neuron → modulate thermoregulation | Blocks NKB and substance P receptors on KNDy neuron → modulate thermoregulation, sleep, mood |
| **Study subjects** | 1,902 naturally / surgically menopausal women | 1,424 naturally / surgically menopausal women<br>474 HR+ breast cancer women on endocrine therapy |
| **Efficacy** | Reduce VMS, improve sleep & QoL | |
| **Common adverse effects** | Abdominal pain, diarrhoea, insomnia | Headache, fatigue, somnolence |
| **Caution** | Reversible ALT increase<br>LFT 0, 3, 6, 9 mo | No liver derangement<br>LFT monitoring NOT required |

ALT:alanine aminotransferase, KNDy:kisspeptin, neurokinin B, and dynorphin, NKB: neurokinin B

## Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)

Commonly used SSRIs (e.g. escitalopram and paroxetine) and SNRIs (e.g. venlafaxine and desvenlafaxine) have been shown to be modestly effective in treating VMS. They are less effective than MHT and often associated with early adverse effects such as nausea, dizziness, mood fluctuations, and sleep disturbance, which may lead to premature discontinuation. Long term sexual dysfunction is a notable concern[31-33].

# DISEASE PREVENTION

## Genitourinary Syndrome of Menopause (GSM)

Unlike VMS, the prevalence and severity of GSM increase with age. Symptoms such as vulvovaginal dryness, pain, itching, dyspareunia and malodour can significantly impair sexual function and quality of life and lead to social withdrawal and interpersonal difficulties. Although vaginal oestrogen is effective, the response may take several months. Transient irritation is common initially, especially in women with severe atrophy. Systemic MHT may occasionally be initiated first to facilitate early improvement, then switch to vaginal therapy later.

GSM often recur upon cessation of treatment, necessitating ongoing treatment. As long-term endometrial safety data beyond one year of vaginal oestrogen use are limited[23], preventive strategies should be emphasised early in menopause. These include maintaining regular intercourse, at least once a week and routine use of vaginal moisturiser[23].

## Osteoporosis

Comprehensive osteoporosis assessment should integrate clinical fracture risk estimation using the Fracture Risk Assessment Tool (FRAX) and bone mineral density (BMD) measured by dual-energy X-Ray absorptiometry (DXA). Postmenopausal women should consider treatment if they have a fragility fracture or a T-score of -2.5 or less in any sites. The DXA software combines FRAX scores and femoral neck BMD to calculate the 10-year fracture risk of osteopenic women to identify those who would also benefit from treatment. Women discontinuing MHT should undergo baseline DXA assessment with subsequent monitoring.

MHT effectively preserves bone mass and microarchitecture; and significantly reduces hip and vertebral fractures. WHI trials[2,3] showed combined therapy reduced both hip and vertebral fractures by 34 % and oestrogen alone reduced hip fracture risk by 38 % and vertebral fracture risk by 39 %. However, bone protection diminishes rapidly after cessation, with accelerated bone loss in both hip and spine[34] and increased vertebral fracture risk[35] within the first year. MHT is suitable for osteoporosis prevention and treatment during early menopause when prescribed primarily for VMS. In later menopause, alternative therapies such as anti-resorptives (e.g. raloxifene, bisphosphonates, denosumab) or anabolics (e.g. parathyroid hormone, romosozumab) should be considered for long-term treatment.

Lifestyle measures remain a cornerstone of osteoporosis prevention. Women should be advised to ensure adequate intake of calcium (1,000 - 1,200 mg), protein (0.7 g/kg body weight), and vitamin D (800 - 1,000 IU daily), engage in moderate intensity weight-bearing and muscle-strengthening exercises (150 minutes/week), avoid tobacco, excessive alcohol or caffeine intake, maintain ideal body weight and implement fall prevention strategies.

## Cardiovascular Disease

The distinct changes in sex hormones around menopause alter body composition, lipoproteins production and vascular function, accelerates cardiovascular risk. VMS, sleep disturbance and psychological symptoms have been linked to subclinical cardiovascular events, including thickened carotid intima, endothelial dysfunction, carotid plaques and deranged lipid profile[36-40]. The menopause transition represents a critical window for early detection and intervention to prevent adverse cardiometabolic events in later life[41].

The American Heart Association advocates for aggressive lifestyle and risk factor modification during menopause, including smoking cessation, regular physical activity, adoption of a DASH (Dietary Approaches to Stop Hypertension) - like diet, weight optimisation and control of blood pressure, lipids and glucose levels[36].

# CONCLUSION

Menopause care has evolved from a symptom-focused model to a life-course approach that emphasises long-term health and well-being. MHT remains the most effective treatment for VMS and an important option for bone protection when used judiciously in appropriately selected women. Non-hormonal therapies and vaginal treatments expand management options for those unsuitable or prefer not to use systemic hormones. Early intervention during menopause transition, combined with lifestyle modification and shared decision-making, provides a critical opportunity to prevent mid- and late-life morbidity. Through individualised, evidence-based care, clinicians can support women in ageing healthily, confidently, and gracefully.

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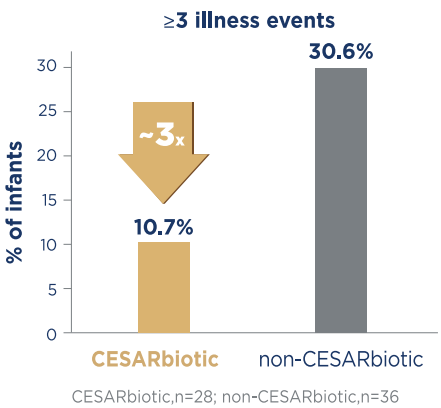


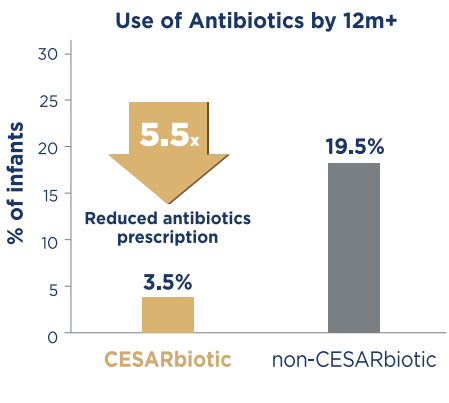


CESARbiotic,n=28; non-CESARbiotic,n=36

**References:** ^指配方中的30億BBM-16V (cfu/100g)及GOS/FOS (8.7g/100g)。根據達能截至2025年4月香港市場資料，以市面上主要銷售的兒童成長配方奶粉標籤作比較。▲根據Kantar香港2021的調查結果，調查對象為醫生(婦產科/兒科專科)，樣本數量為73。兒童需要均衡營養以確保健康成長及發展。兒童成長奶粉可作為均衡飲食的一部分，建議每日飲用兩杯。1. Zhang, K. et al. (2024). Impact of early life nutrition on gut microbiota and its association with parent-reported illness incidence in Chinese infants born by caesarean section: An observational longitudinal study in a real-world setting.

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# De-escalation of Surgical Treatment in Early-Stage Cervical Cancer: Current Evidence and Practice

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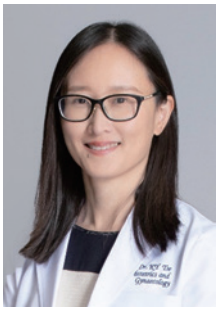

Dr Hiu-mei LUK Prof Ka-yu TSE

## INTRODUCTION

Cervical cancer remains a significant health concern in Hong Kong despite the introduction of HPV vaccination and comprehensive cervical screening programmes. The peak incidence occurs in women aged 50 to 55 years; however, a substantial proportion of cases occur in women aged 30 to 40 years. Cervical cancer ranks as the third most common cancer among women aged 0 to 44 years in Hong Kong[1]. Fertility represents a critical quality-of-life issue for young women diagnosed with cervical cancer. A systematic review identified key risk factors for psychological stress in this population, including younger age at diagnosis, desire for more children, time pressure to make treatment decisions, and inadequate professional counselling[2].

The primary concern for women centres on balancing the urgency of oncological treatment against the desire to preserve fertility. The International Federation of Gynecology and Obstetrics (FIGO) revised the staging system for cervical cancer in 2018 (Table 1), where patients with confirmed lymph node metastasis - either pathologically or radiologically - to stage III disease, regardless of primary tumour characteristics[3]. Several pathological features critically influence oncological outcomes and fertility-sparing treatment eligibility, including histological subtype, tumour size, depth of stromal invasion, lymphovascular space invasion (LVSI) status, resection margin status, and presence of lymph node or distant metastases.

## PREOPERATIVE EVALUATION AND PATIENT SELECTION

Rigorous preoperative assessment forms the cornerstone of safe fertility-sparing surgery. The investigation includes history taking, clinical examination, and blood tests including complete blood picture and liver and renal function tests (Table 2). Chest evaluation is required, which can be either a chest x-ray or computed tomography (CT) of the thorax.

Recent prospective clinical trials have demonstrated that treatment decisions guided by cone biopsy pathology, combined with systematic lymph node assessment, optimise patient selection and oncological safety[4]. Magnetic resonance imaging (MRI) of the abdomen and pelvis is the preferred modality in assessing the disease extent. Pelvic MRI can also evaluate the local extent of disease and the distance between the tumour

*Table 1: FIGO staging system for cervical cancer (2018)[3] (Excerpted from Bhatla, N., et al., Revised FIGO staging for carcinoma of the cervixuteri. International Journal of Gynecology & Obstetrics, 2019. 145(1): p.129-135.)*

| Stage | Characteristics | |
|---|---|---|
| **I** | **Confined to cervix** | |
| | **IA** | Invasive carcinoma that can be diagnosed only by microscopy with maximum depth of invasion < 5 mm[a] |
| | **IA1** | Stromal invasion < 3 mm in depth |
| | **IA2** | Stromal invasion ≥ 3 mm and < 5 mm in depth |
| | **IB** | Invasive carcinoma with measured deepest invasion ≥ 5 mm (greater than stage IA), lesion limited to cervix |
| | **IB1** | Invasive carcinoma ≥ 5 mm depth of stromal invasion, and < 2 cm in greatest dimension |
| | **IB2** | Invasive carcinoma ≥ 2 cm and < 4 cm in greatest dimension |
| | **IB3** | Invasive carcinoma ≥ 4 cm in greatest dimension |
| **II** | **Invades beyond uterus, but has not extended onto lower third of vagina or to pelvic wall** | |
| | **IIA** | Involvement limited to upper two-thirds of vagina without parametrial involvement |
| | **IIA1** | Invasive carcinoma < 4 cm in greatest dimension |
| | **IIA2** | Invasive carcinoma ≥ 4 cm in greatest dimension |
| | **IIB** | With parametrial involvement but not up to pelvic wall |
| **III** | **Involves lower third of vagina and/or extends to pelvic wall and/or causes hydronephrosis or non-functioning kidney and/or involves pelvic and/or para-aortic lymph nodes** | |
| | **IIIA** | Involves lower third of vagina, with no extension to pelvic wall |
| | **IIIB** | Extension to pelvic wall and/or hydronephrosis or non-functioning kidney (unless known to be due to another cause) |
| | **IIIC** | Involvement of pelvic and/or para-aortic lymph nodes, irrespective of tumour size and extent (with r and p notations)[b] |
| | **IIIC1** | Pelvic lymph node metastasis only |
| | **IIIC2** | Para-aortic lymph node metastasis |
| **IV** | **Extends beyond true pelvis or has involved (biopsy proven) mucosa of bladder or rectum** | |
| | **IVA** | Spread to adjacent pelvic organs |
| | **IVB** | Spread to distant organs |

[a] Imaging and pathology can be used, where available, to supplement clinical findings with respect to tumour size and extent, in all stages.
[b] Adding notation of r (imaging) and p (pathology) to indicate the findings that are used to allocate the case to Stage IIIC.

*Table 2: Investigation for newly-diagnosed cervical cancer[4,5]*

| **Initial work-up for cervical cancer** |
|---|
| History and physical examination |
| Complete blood count |
| Liver and renal function tests |
| SCC or CA125 (not standardised) |
| Chest X-ray or CT thorax |
| Renal tract imaging (Ultrasound or IVU or CT/ MRI) |
| MRI (preferred) or CT scan of abdomen and pelvis |
| **Optional investigation or if indicated** |
| EUA |
| Cystoscopy |
| Sigmoidoscopy |
| PET-CT |

(EUA, examination under anaesthesia; IVU, intravenous urogram; SCC, squamous cell carcinoma antigen)

and the internal cervical os. If MRI is contraindicated, computed tomography or positron emission tomography (PET)-CT, or ultrasound can be considered though these cannot delineate the tissue plane as clearly as MRI[5]. To maintain adequate cervical competence for future pregnancy, trachelectomy should generally be avoided if the estimated remaining cervical length is less than 1 cm[6].

For stage IA1 cervical cancer without LVSI, the recommended management comprises conservative surgery with loop electrosurgical excision procedure (LEEP) or cone biopsy, ensuring negative margins. The specimen should not be fragmented, and endocervical curettage above the excision site should be routinely performed[5]. If margins are positive for invasive carcinoma, cone biopsy should be repeated or trachelectomy should be considered. For stage IA1 disease with LVSI present, cone biopsy plus sentinel lymph node mapping or pelvic lymphadenectomy is recommended. Importantly, fertility-sparing surgery should never be offered for rare aggressive histological subtypes, including gastric-type adenocarcinoma, clear cell carcinoma and neuroendocrine carcinoma.

According to the current National Comprehensive Cancer Network (NCCN) guideline, cone biopsy can be considered as an alternative to radical surgery for carefully selected patients with stage IA2 and low-risk stage IB1 cervical cancer who desire fertility preservation[5]. This recommendation is based primarily on the prospective ConCerv trial[4]. Patients could have fertility-sparing treatment if all of the following criteria are met: tumour size ≤ 2 cm, depth of stromal invasion ≤ 10 mm on LEEP or cone biopsy, negative cone margins, squamous cell carcinoma of any grade or grade 1 - 2 usual-type adenocarcinoma, absence or minimal LVSI, negative imaging for locoregional disease, and mandatory sentinel lymph node mapping or pelvic lymphadenectomy. The ConCerv trial demonstrated a recurrence rate of only 3.5 % over a median two-year follow-up period, with a 5 % nodal metastasis rate, suggesting that conservative surgery with mandatory lymph node assessment is oncologically safe for carefully selected patients. Similarly, the GOG-0278 trial confirmed that in appropriately selected patients, conservative surgery with pelvic node assessment can be performed safely while preserving excellent fertility outcomes[7]. A recent systematic review found no significant differences in recurrence or overall survival between simple and radical hysterectomy for stage IA2–IB1 cervical cancer, while radical surgery caused significantly more bladder injury and dysfunction, supporting narrower indications for radical surgery[8].

## THE SHAPE TRIAL AND TREATMENT DE-ESCALATION

Historically, patients with gross tumours less than 2 cm with no suspicious lymph nodes were routinely treated with radical hysterectomy. Consequently, the current NCCN guideline now supports cone biopsy as an acceptable alternative to radical trachelectomy for patients with stage IA2 and low-risk stage IB1 disease who meet the ConCerv criteria[4]. For higher-risk stage IB1 disease not meeting conservative surgery criteria, and select cases of stage IB2 disease (tumour 2 - 4 cm), radical trachelectomy with sentinel lymph node mapping or pelvic lymphadenectomy represents an established option, typically validated only for tumours less than 2 cm[5]. This landscape was changed with the publication of the SHAPE trial[9]. In this randomised controlled trial, patients with stage IA2 and modified stage IB1 disease with low-risk features, including shallow stromal invasion, were enrolled. Women meeting these low-risk criteria were randomised to radical hysterectomy versus simple hysterectomy. The results demonstrated that simple surgery achieved oncological outcomes equivalent to radical surgery in this carefully selected population, with significantly reduced surgical morbidity. In summary, for appropriately selected women with stage IA2 or low risk IB1 cervical cancer who meet ConCerv/SHAPE criteria, simple hysterectomy or cone biopsy can safely replace radical procedures, lowering surgical morbidity without compromising oncologic outcomes. The current treatment paradigm is illustrated in Fig. 1.

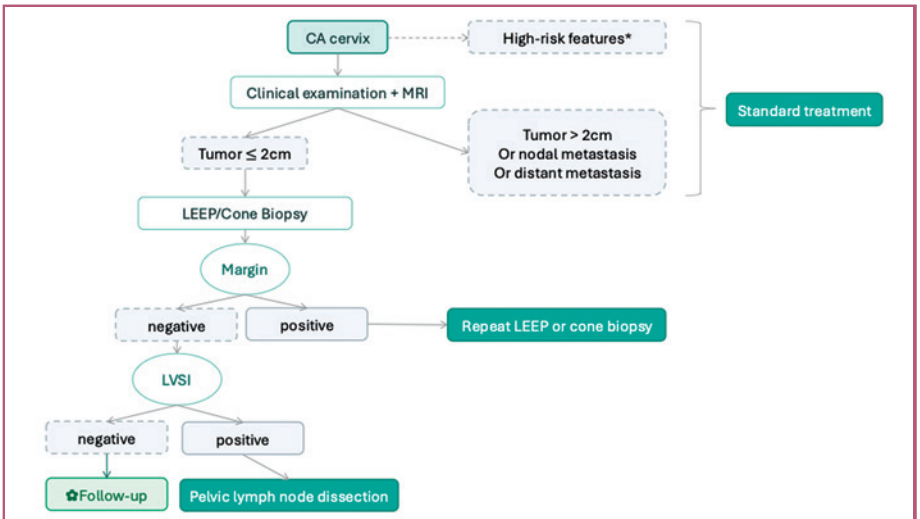


*Fig. 1: Management of newly diagnosed cervical cancer[5,7-9] (Summarised by the authors)*

*High-risk features include poor histology such as HPV-independent adenocarcinoma, gastric-type adenocarcinoma, carcinosarcoma, neuroendocrine carcinoma (LEEP, loop electrosurgical excision procedure; LVSI, lymphovascular invasion)

Stage IB2 and higher stages are generally relative contraindications unless the tumour demonstrates a truly exophytic growth pattern. Systematic review evidence comparing simple trachelectomy or cone biopsy with radical trachelectomy has demonstrated no significant differences in recurrence or death rates, with disease stage remaining the primary adverse prognostic factor[10]. Multiple retrospective cohort studies have demonstrated that radical trachelectomy achieves oncological outcomes comparable to radical hysterectomy, with overall recurrence rates below 10 % and mortality rates below 5 % in appropriately selected patients[10].

## SURGICAL APPROACH AND REPRODUCTIVE OUTCOMES

In 2018, the Laparoscopic Approach to Cervical Cancer (LACC) trial fundamentally altered surgical practice, demonstrating that patients undergoing minimally invasive radical hysterectomy experienced significantly worse outcomes compared with open laparotomy[11].

In 2024, the final LACC analysis confirms that minimally invasive radical hysterectomy yields significantly worse disease free and overall survival than open surgery for early stage cervical cancer, particularly for tumours ≥ 2 cm and in women without prior conisation, and therefore should be avoided outside clinical trials, with open radical hysterectomy remaining the standard of care[12]. For radical trachelectomy, there is MIS with open radical trachelectomy, using 4.5-year disease-free survival as the primary endpoint[13]. The study demonstrated no significant differences in disease-free survival, overall survival, or recurrence rates between groups, suggesting that minimally invasive radical trachelectomy may be oncologically safe. Nevertheless, both open (laparotomy) and minimally invasive (laparoscopic or robotic) approaches are still used; current data do not show the clear survival detriment with MIS that was seen for radical hysterectomy in LACC, but MIS is generally considered more controversial and is often approached with caution or within experienced centres[14].

Beyond standard surgical risks, radical trachelectomy carries specific implications for reproductive outcomes. The most frequent complication is cervical stenosis, occurring in approximately 10.5 % of patients. Additional pregnancy-related complications include subfertility, second-trimester miscarriage, preterm birth, and preterm premature rupture of membranes. To provide mechanical support to the cervical stump, up to 90 % of experts prefer placing a cervical cerclage at the time of trachelectomy using permanent Mersilene tape or Prolene stitches[15]. Alternative strategies include delayed transabdominal or laparoscopic cerclage placement in early pregnancy. Decision-making regarding cerclage should be individualised based on residual cervical length, the patient's obstetric history, and the centre expertise.

For patients with locally advanced cervical cancer (stage IB3 or higher) requiring chemoradiation, ovarian transposition involves surgical repositioning of the ovaries outside the planned radiation field to preserve endocrine function, as high-dose pelvic radiotherapy (≥ 20 Gy) can lead to complete ovarian failure. While ovarian transposition does not preserve fertility for future pregnancy, it may prevent premature menopause and its associated long-term health consequences.

## Neoadjuvant Therapy

A recent systematic review and meta analysis of 19 observational studies involving 1,453 women with early stage cervical cancer and tumours ≥ 2 cm reported that neoadjuvant chemotherapy (NACT) followed by fertility sparing surgery (FSS) was associated with significantly higher pregnancy rates than upfront FSS (31 % vs 8 %), with comparable recurrence rates (13 % vs 10 %)[16]. Hence, it appears that NACT FSS may be considered as a fertility preserving option in carefully selected patients. Nonetheless, given that the evidence is derived from non randomised studies with moderate to high risk of bias, it requires prospective validation and should not be adopted in routine clinical practice, but should be reserved for the research setting. Currently, there are also clinical trials like the phase II NACI trial and PACS trials that investigate the role of neoadjuvant immunotherapy followed by radical hysterectomy in stage IB3-IIA cervical cancer.

## CONCLUSION

Fertility-sparing treatment for early-stage cervical cancer has evolved significantly over the past decade, with high-quality prospective trial data now supporting less radical surgical approaches for carefully selected low-risk patients. The ConCerv and GOG-0278 trials, have demonstrated that cone biopsy with mandatory lymph node assessment achieves excellent oncological outcomes in women meeting strict selection criteria. For higher-risk stage IB1 and select IB2 cases, radical trachelectomy with lymph node assessment remains an established fertility-preserving option. The SHAPE trial further demonstrated the safety of de-escalation of the radicality of the surgical extent in low-risk cervical cancer with tumour less than 2 cm. Rigorous preoperative evaluation using cone biopsy pathology, high-quality pelvic MRI, and systematic lymph node assessment is essential for identifying appropriate candidates and optimising both oncological and reproductive outcomes. Multidisciplinary counselling addressing oncological safety, reproductive expectations, pregnancy-related risks, and the critical importance of close surveillance enables informed patient decision-making and supports the safe delivery of fertility-sparing treatment to appropriately selected young women with early-stage cervical cancer.

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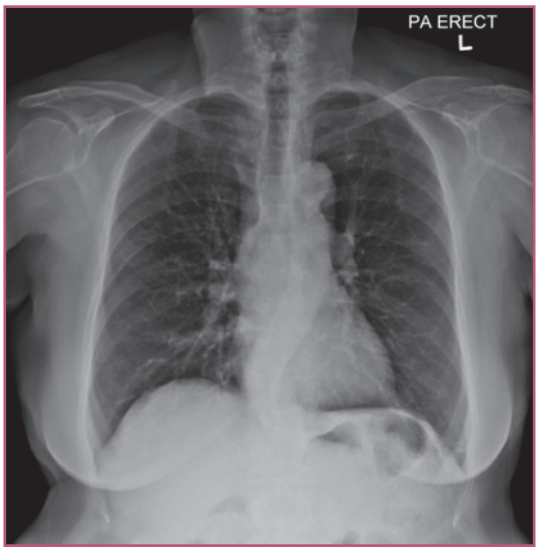
# Radiology Quiz

**Dr Stanley HAU**
MBChB, FRCR

Dr Stanley HAU




A patient presented with cough.

## Questions

1. Is there any abnormality on this radiograph?
2. Is there any other investigation be suggested?

*(See P. 37 for answers)*

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# Digital Health and Precision Medicine: From Promise to Practice in 2026

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*Honorary Clinical Associate Professor of School of Public Health, Li Ka Shing Faculty of Medicine of The University of Hong Kong*
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*Fellow of The Royal Australasian College of Medical Administrators*

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Bachelor of Arts and Sciences in Applied Artificial Intelligence [BASc(AppliedAI)] (HKU)

Dr Kenneth Hing-lim TSANG  Dr Edwin Chi-ho LAU  Ms Sueki Meiwen SU

Precision medicine seeks to tailor prevention, diagnosis, and treatment to the individual rather than relying exclusively on population averages. In 2026, its trajectory cannot be separated from that of digital health: electronic records, genomic assays, remote physiological monitoring, and AI-supported workflows together provide the operational substrate on which any precision approach is now built[1,2]. The two fields are no longer separable in clinical practice. Digital health is what makes precision medicine operational at scale, while precision medicine gives digital health a clinically meaningful purpose. The consequence is a set of immediate practical considerations rather than a distant prospect for Hong Kong clinicians.

## A MATURING REGULATORY LANDSCAPE

The convergence is increasingly being shaped by regulation. The EU AI Act establishes a risk-based framework for artificial intelligence with specific obligations for high-risk systems, including those used in healthcare, and is the most comprehensive horizontal AI legislation in any major market to date[3]. In parallel, the European Medicines Agency and the U.S. Food and Drug Administration jointly announced common principles for AI in medicine development in January 2026, signalling growing transatlantic convergence on what good practice should look like[2]. Together these developments indicate that AI in healthcare is moving from open-ended experimentation toward governed, auditable practice. This shift will increasingly affect what tools clinicians are permitted to deploy and on what evidentiary basis.

## FOUNDATION MODELS AND POLYGENIC SCORES: PROMISE WITH CAVEATS

Within this governed environment, two technical components of precision medicine deserve particular attention.

Foundation models as large pretrained AI systems applicable to multiple downstream tasks are increasingly proposed as a means of integrating heterogeneous biomedical data, such as multiomics inputs, within a single analytic framework[1]. The central promise is not the replacement of clinical reasoning, but an improved ability to organise and interpret data streams that no human clinician can synthesise unaided. The current literature, however, still treats this as an emerging capability rather than a settled standard of care[1]. Clinicians considering such tools should expect performance claims to be domain-specific and actively contestable for some time yet.

Polygenic risk scores (PRS) face a more specific and immediate limitation. A widely cited Nature Genetics analysis demonstrated that current PRS perform measurably less well in non-European-ancestry groups, a discrepancy that risks exacerbating health disparities if scores are deployed without ancestry-appropriate validation[4]. For a population such as Hong Kong's, in which the vast majority of patients are of Chinese descent, this is not a peripheral methodological observation but a fundamental clinical-safety one. PRS may reasonably be considered a useful stratification tool, but only when interpreted with that limitation explicitly in mind.

## LOCAL INFRASTRUCTURE AND THE INTEROPERABILITY TEST

Hong Kong's institutional environment has been steadily preparing the ground for clinical adoption. The 2025 Policy Address highlighted further development of healthcare digitalisation, and a 2025 Legislative Council paper documents cross-boundary health record and personal folder functions on the eHealth App[5]. These do not eliminate the underlying legal and technical barriers to data sharing, but they do signal an institutional direction toward broader interoperability, continuity of care, and data exchange across care settings.

Interoperability is the practical test that any precision-medicine pathway must pass, because precision approaches depend by definition on combining multiple data sources. HL7 Hong Kong has been actively promoting local engagement with international standards, including a Connectathon series under the FHIR (Fast Healthcare Interoperability Resources)

framework in 2025[6,7,8]. Without shared standards, genomic data, electronic clinical records, and remote-monitoring outputs cannot move efficiently between organisational boundaries. Clinicians are forced to transcribe information manually between systems, and the practical value of digital health is correspondingly weakened. The risk in Hong Kong is not the absence of data, but its fragmentation across the public-private divide.

## GENERATIVE AI IN A MIXED-LINGUISTIC SETTING

The rapid maturation of generative AI in clinical settings like documentation support, patient communication, and workflow assistance adds another layer of both opportunity and risk. Like all large language model systems, these tools remain vulnerable to hallucination, training-data bias, and confidently expressed errors that may be difficult for the supervising clinician to detect[1,2]. For Hong Kong, the local language environment makes this risk especially relevant. Clinical consultations are routinely conducted in Cantonese, while formal medical documentation is expected in English. Ambient AI scribes and clinical chatbots developed predominantly in monolingual English-speaking environments cannot be assumed to handle this code-switching reliably. Local evaluation and careful human oversight are therefore not optional refinements but baseline requirements before any such system enters routine use.

## PREPARING THE PROFESSION

A final and indispensable condition for successful adoption is professional preparation. A 2024 Hong Kong Journal of Emergency Medicine article on technology, life-long learning, and heutagogy provides supporting argument that clinicians need self-directed learning approaches suited to a rapidly changing digital environment[9,10]. This is particularly relevant for AI-enabled tools, whose outputs require active critical appraisal rather than passive acceptance. Postgraduate training and continuing professional development in Hong Kong should therefore explicitly include digital literacy, interpretation of algorithmic output, recognition of automation bias, and awareness of the limitations of imported tools. Without this investment, even well-regulated and well-engineered systems will deliver value only intermittently.

## CONCLUSION

Digital health is making precision medicine more operational, and precision medicine is giving digital health a more clinically meaningful purpose. The remaining challenge for health systems is not to adopt more technology, but to validate, regulate and integrate it into workflows that clinicians can trust. For Hong Kong, this means combining regulatory caution, data interoperability, ancestry-aware evaluation, and sustained professional education[1,2,3,4,6,10]. The infrastructure is taking shape. The responsibility for ensuring that it serves, rather than displaces, clinical judgement now rests squarely with the profession itself.

*Fig. 1: Prof Bernard CHEUNG, FMSHK President, presented the certificate to Dr Kenneth TSANG at the FMSHK ASM 2026 on 28 June.*

*Fig. 2: Dr Kenneth TSANG at FMSHK ASM 2026 as speaker of session 1 shared the topic "Use of AI in Medicine"*

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# CAPACITY BUILDING AND EDUCATION PROGRAMMES ON END-OF-LIFE CARE

賽馬會安寧頌 JCEOLC
Jockey Club End-of-Life Community Care Project

## CME ONLINE DOCTOR TRAINING

As the Advance Decision on Life-sustaining Treatment Ordinance will come into effect on 31 July 2026, the CUHK End-of-Life (EOL) Care Project has developed a number of resources and two new CME training videos on this topic.

Learning period:
Now - 30 Apr 2027
Duration: 1 hour
CME: 1 Point
(details refer to each QR code)

**1. How to identify terminally ill patients for ACP / AMD initiations:**

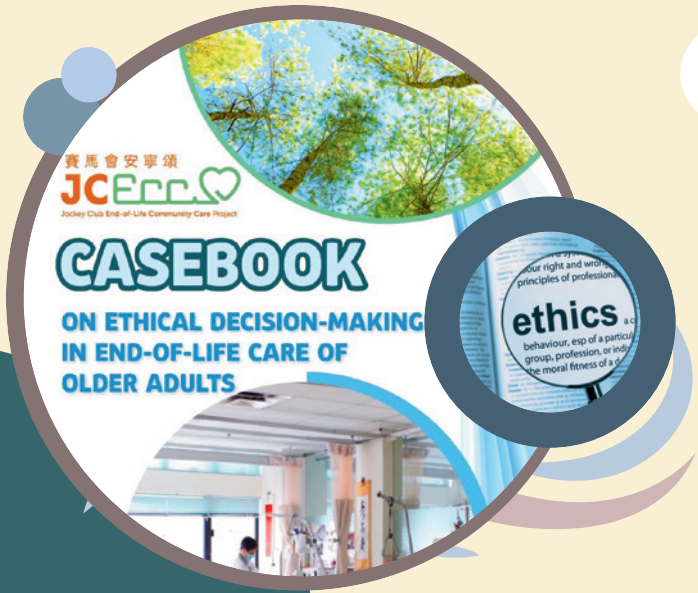
CME Link

**2. Advance Medical Directives: How to Talk to Patients about them:**

CME Link

Video Tool for Initiating ACP/AMD Discussions with Patients

預設醫療指示：
甚麼是維持生命治療？




## EOL Casebook

This casebook is an open-access online resource for doctors and healthcare professionals dealing with ethical issues in end-of-life care for older adults. Each case includes expert commentary that explains the ethical challenges and offers a practical clinical approach.

Read the case and commentary

Initiated and funded by
香港賽馬會慈善信託基金
The Hong Kong Jockey Club Charities Trust

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香港中文大學
The Chinese University of Hong Kong

香港中文大學 賽馬會老年學研究所
CUHK Jockey Club Institute of Ageing

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | ★ HKMA CME Portal (Online)<br>HKMA-KWC CME Online Lecture Series on Common Medical Conditions for GP in 2026<br>Topic: Headache and Silent Radiological Infarct on Neuroimaging<br>3 | ★ In-person / HKMA CME Portal (Online)<br>HKMA-HKSH CME Programme 2026<br>Topic: Common Pediatric Eye Conditions. How to Manage Safely and When to Refer?<br>★ Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)<br>4 | 5 | ★ Certificate Course on Latest Advancement of Nuclear Medicine 2026 (Video Lectures)<br>6 | 7 | 8 |
| 9 | 10 | ★ Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)<br>11 | ★ The Hong Kong Neurosurgical Society Monthly Academic Meeting - To be confirmed<br>★ HKMA CME Portal (Online)<br>The HKMA CME Online Lecture<br>Topic: Topical Finasteride in Male Androgenetic Alopecia<br>12 | ★ Certificate Course on Latest Advancement of Nuclear Medicine 2026 (Video Lectures)<br>13 | 14 | 15 |
| 16 | 17 | ★ Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)<br>18 | 19 | ★ In-person / HKMA CME Portal (Online)<br>The HKMA CME Hybrid Lecture<br>Topic: Topical JAK in The Management of Skin Disease: Vitiligo<br>★ FMSHK Executive Committee Meeting<br>★ FMSHK Council Meeting<br>20 | 21 | 22 |
| 23 | 24 | ★ In-person / HKMA CME Portal (Online)<br>The HKMA CME Hybrid Lecture<br>Topic: PCSK9 Inhibitors: Who are the Right Patients in Primary Care?<br>★ Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)<br>25 | 26 | 27 | 28 | 29 |
| 30 | ★ HKMA CME Portal (Online)<br>HKMA-HKCOG CME Online Lecture Series on "Treatment of Common Conditions in Pregnancy for GPs"<br>Topic: Management of Nausea and Vomiting during Pregnancy<br>31 | | | | | |

| Date / Time | Function | Enquiry / Remarks |
|---|---|---|
| **3 MON**<br>2:00 PM | **HKMA CME Portal (Online)**<br>**HKMA-KWC CME Online Lecture Series on Common Medical Conditions for GP in 2026**<br>**Topic: Headache and Silent Radiological Infarct on Neuroimaging**<br>Organisers: The Hong Kong Medical Association and Kowloon West Cluster of HA<br>Speaker: Dr June Ho-ming WONG | HKMA CME Dept.<br>Tel: 2527 8452<br>1 CME Point |
| **4 TUE**<br>2:00 PM | **In-person / HKMA CME Portal (Online)**<br>**HKMA-HKSH CME Programme 2026**<br>**Topic: Common Pediatric Eye Conditions. How to Manage Safely and When to Refer?**<br>Organisers: The Hong Kong Medical Association and Hong Kong Sanatorium & Hospital<br>Speaker: Dr Jasmine Wing-sang NGAI<br>Venue: The HKMA Wanchai Premises, 5/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong | HKMA CME Dept.<br>2527 8452<br>1 CME Point |
| 7:00 PM | **Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & The Hong Kong Orthopaedic Association<br>Speaker: Dr Koon-man SIEH | Tel: 2527 8898 |
| **6 THU**<br>7:00 PM | **Certificate Course on Latest Advancement of Nuclear Medicine 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & Hong Kong Society of Nuclear and Molecular Imaging<br>Speaker: Dr Pak-lai TSOI | Tel: 2821 3512 |
| **11 TUE**<br>7:00 PM | **Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & The Hong Kong Orthopaedic Association<br>Speaker: Dr Dennis CHAN | Tel: 2821 3512 |
| **12 WED**<br>7:30 AM | **The Hong Kong Neurosurgical Society Monthly Academic Meeting - To be confirmed**<br>Organiser: Hong Kong Neurosurgical Society<br>Speaker(s): Dr Benjamin Hiu-ming LEUNG<br>Chairman: Dr Tak lap POON<br>Venue: Seminar Room, G/F, Block A, Queen Elizabeth Hospital; or via Zoom meeting | CME Accreditation<br>College: 1.5 points College of Surgeons of Hong Kong<br>Enquiry: Dr Jason Chow<br>Tel: 2595 6456 Fax. No.: 2965 4061 |
| 2:00 PM | **HKMA CME Portal (Online)**<br>**The HKMA CME Online Lecture**<br>**Topic: Topical Finasteride in Male Androgenetic Alopecia**<br>Organiser: The Hong Kong Medical Association<br>Speaker: Prof Matilde Iorizzo | HKMA CME Dept.<br>2527 8452<br>1 CME Point |
| **13 THU**<br>7:00 PM | **Certificate Course on Latest Advancement of Nuclear Medicine 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & Hong Kong Society of Nuclear and Molecular Imaging<br>Speaker: Dr Jasmine YIP | Tel: 2821 3512 |
| **18 TUE**<br>7:00 PM | **Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & The Hong Kong Orthopaedic Association<br>Speaker: Dr Eric YEUNG | Tel: 2821 3512 |
| **20 THU**<br>2:00 PM | **In-person / HKMA CME Portal (Online)**<br>**The HKMA CME Hybrid Lecture**<br>**Topic: Topical JAK in The Management of Skin Disease: Vitiligo**<br>Organiser: The Hong Kong Medical Association<br>Speaker: Dr Dennis Siu-pang MA<br>Venue: The Crystal Ballroom A&B, 2/F, The Cityview, 23 Waterloo Road, Kowloon | HKMA CME Dept.<br>2527 8452<br>1 CME Point |
| 7:00 PM | **FMSHK Executive Committee Meeting**<br>Organiser: The Federation of Medical Societies of Hong Kong<br>Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong | Ms Mabel TSANG<br>Tel: 2527 8898 |
| 8:00 PM | **FMSHK Council Meeting**<br>Organiser: The Federation of Medical Societies of Hong Kong<br>Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong | Ms Mabel TSANG<br>Tel: 2527 8898 |
| **25 TUE**<br>2:00 PM | **In-person / HKMA CME Portal (Online)**<br>**The HKMA CME Hybrid Lecture**<br>**Topic: PCSK9 Inhibitors: Who are the Right Patients in Primary Care?**<br>Organiser: The Hong Kong Medical Association<br>Speaker: Dr Jonathan Xinguo FANG<br>Venue: HKMA Central Clubhouse, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Central | HKMA CME Dept.<br>2527 8452<br>1 CME Point |
| 7:00 PM | **Certificate Course on Orthopaedic Degenerative Problems 2026 (Video Lectures)**<br>Organisers: The Federation of Medical Societies of Hong Kong & The Hong Kong Orthopaedic Association<br>Speaker: Dr Patrick Jonathan NG | Tel: 2821 3512 |
| **31 MON**<br>2:00 PM | **HKMA CME Portal (Online)**<br>**HKMA-HKCOG CME Online Lecture Series on "Treatment of Common Conditions in Pregnancy for GPs"**<br>**Topic: Management of Nausea and Vomiting during Pregnancy**<br>Organisers: The Hong Kong Medical Association and the Hong Kong College of Obstetricians & Gynaecologists<br>Speaker: Dr Chun-kit WONG | HKMA CME Dept.<br>2527 8452<br>1 CME Point |

## Announcements

| | | |
|---|---|---|
| **6 September 2026 (Sun)**<br>08:50 - 17:00 | **LI SHU PUI SYMPOSIUM 2026 - Advances in Cancer Management**<br>Organiser: HKSH Medical Group<br>Li Shu Pui Lecture Speaker: Prof Terence T.W. SIO<br>PUMCH Lecture Speaker: Prof XIANG Yang<br>RCSEd Presidential Lecture Speaker: Prof Angus WATSON<br>Speakers: Dr Raymond LIANG, Prof Tony MOK, Dr Daniel CHUA, Dr CHAN Wai-kong, Mr Wyman LI, Dr Benjamin FANG, Dr YAU Chun-chung, Dr Michael KAM, Dr Darren POON, Dr Anselm LEE, Prof Albert CHAN, Dr TAM Kar-fai, Dr Steffi YUEN, Dr LAM Ying-lee, Mr Patrick CHAN, Dr Alex CHOW, Dr HO Chiu-ming | Enquiry:<br>Hong Kong Sanatorium & Hospital<br>Venue: Ballroom, JW Marriott Hotel Hong Kong & via Webinar<br>Website: www.hksh.com/lsp2026 |
| **13 September 2026 (Sun)**<br>08:30 - 17:35 | **26th Regional Osteoporosis Conference (ROC 2026)**<br>Organizer: The Osteoporosis Society Hong Kong (OSHK)<br>Venue: Hong Kong Convention and Exhibition Centre, Wanchai<br>Conference Theme: Bone Health Reimagined: From Prevention to Precision Management<br>Programme: Please visit the Conference Website https://oshk.org.hk/2026/06/20/26th-regional-osteoporosis-conference-roc-2026/ for details. | Enquiry:<br>ROC 2026 Conference Secretariat c/o International Conference Consultants Ltd.<br>Tel: (852) 2559 9973<br>Email: roc@icc.com.hk |

# ISDS, HKCD & HKSDV
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## Abstract Submission Deadline: 5 Sep 2026

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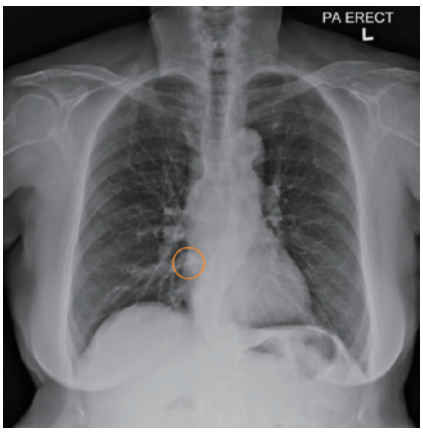
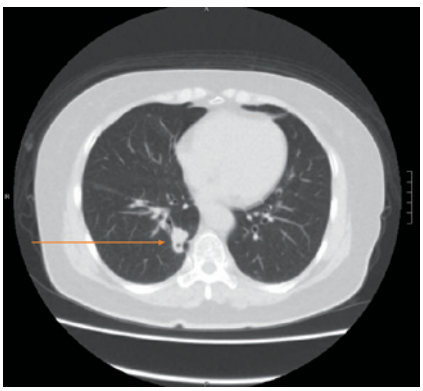
## Answers to Radiology Quiz

**Answers:**

1. A ~1 cm nodular opacity projected at right infrahilar paracardiac region (orange circle).

2. Subsequently CT was also performed which shows a right lower lobe nodule (orange arrow) with a spiculated nodule with small internal cavitation, suspicious of malignancy.



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