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AOGD BULLETIN

"Women's wellness-From tiny heartbeats to timeless strength"

THEME: BREAKING NEW GROUND IN OB-GYN PRACTICE

AOGD SECRETARIAT
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AOGD 2025

47TH ANNUAL CONFERENCE OF AOGD

ASSOCIATION OF OBSTETRICIANS AND GYNAECOLOGISTS OF DELHI

ORGANISED BY: LADY HARDINGE MEDICAL COLLEGE, CONNAUGHT PLACE, NEW DELHI

FIRST ANNOUNCEMENT

Be a Part of **47th AOGD Annual Conference 2025**!
We're pleased to announce our upcoming 47th AOGD Annual Conference 2025 at **Indian Habitat Centre**, Delhi from **13th to 14th September 2025**! The theme for this year conference is "**Tiny hear beats to timeless strength- Honouring the journey of women through birth & beyond**"
Dates for Pre & Post Conference workshops **12th Sep & 15th Sep 2025** Respectively. This event will bring together Obstetricians & Gynaecologists for a dynamic experience. There will be skill enhancement, up-scaling of knowledge, learning from experts and networking all under one roof.

We are look forward to welcoming you!
Team AOGD

Highlights:

- **Dedicated Video based sessions on surgical techniques**
- **Stimulating Orations by stalwarts in the field**
- **Case based panel discussions on current topics**
- **Dedicated session on controversies in Obstetrics & Gynaecology**
- **Keynote lectures on surgical innovations**
- **Excellent opportunity to showcase your research through paper & poster presentations**

Theme for abstract submission:

- **High risk Obstetrics**
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- **Reproductive Endocrinology**
- **Miscellaneous**

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Category	Early Bird (Till 30th June 2025)			Regular (1st July to 15th Aug 2025)			From 16th Aug 2025 Onwards/On-spot		
	Amount	GST 18%	Total	Amount	GST 18%	Total	Amount	GST 18%	Total
AOGD Member	6000	1080	7080	6500	1170	7670	7000	1260	8260
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AOGD Bulletin

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Lady Hardinge Medical College, New Delhi-110001

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From the President's desk

Dear AOGD members,

Greetings

As Lady Hardinge medical college and Smt Sucheta Kriplani hospital has been bestowed upon the responsibility to serve AOGD for the year 2025-2026. I express my Gratitude and feel honoured for this responsibility.We look forward to a year of learning ,collaboration and progress guided by the wisdom and support of our Patron ,advisors and every member of our fraternity.

The Theme for this year " Women's wellness: From tiny heart beats to timeless strength" reflects our commitment to comprehensive women's health care across all stages of her life. Throughout the year we will be organizing a series of CMEs, workshops and outreach community programmes.We strive to uphold the long held legacy of AOGD while bringing our own vision in this tenure .It is with great pleasure that we announce 47th annual conference of AOGD scheduled on 13th and 14th September 2025 at India Habitat centre. .Preconference and post conference workshop on 12th Sep and 15th Sep 2025 respectively. We hope for participation of AOGD members in large numbers.

I congratulate Editorial team under the able guidance of Dr Pikee Saxena bringing out first issue AOGD bulletien theme of which is " Breaking new grounds in OB-GYN practice"includes current hot topics in the field.

We look forward for a fruitful and enjoyable learning year ahead.

Dr Reena Yadav

President AOGD

From the Secretarial Desk

Dr Ratna Biswas
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Dr Swati Agrawal
Joint Secretary

Dr Anuradha Singh
Joint Secretary

Dear Members,

Greetings from AOGD secretariat at Lady Hardinge Medical College!

I am deeply honoured and grateful to represent our magnificent association as the honorary secretary for the year 2025-26 with the support of the President AOGD and our team here at Lady Hardinge Medical College and the well wishes of all the AOGDians.

Spring has arrived symbolizing new hope , new beginnings and so has AOGD proudly embarked on its new tenure at Lady Hardinge Medical College under the theme:

"Women's Wellness: From Tiny Heartbeats to Timeless Strength"

This theme reflects a holistic vision of women's health across all ages — honouring every stage from birth to maturity and is the brainchild of our versatile AOGD President.

We are delighted to share that we commenced this journey with an array of dynamic activities in April: Public forum on Safe motherhood , CME on Healthy Beginnings, Hopeful Futures: Advancing Maternal and New Born Health, Workshop on "vNOTES (Vaginal Natural Orifice Transluminal Endoscopic Surgery) & Workshop on Research Methodology . We were ably supported by our subcommittees in our outreach and educational endeavours.

We envision to enhance educational activities this year focussed on skill and knowledge building with emphasis on recent advances and evidence based management, augment our knowledge on research methodology through liaison with Research Institutes and also increase our social commitments through outreach activities .

For this we seek the blessings and support of our esteemed Patrons, Advisors, Executive Committee Members , Sub Committee Chairpersons and all Members who are the pillars of this great Association of Obstetricians & Gynaecologist of Delhi and who would be instrumental in achieving our goals.

We request your attention and patronage for our fourth coming annual conference .

IMPORTANT ANNOUNCEMENT : PLEASE BLOCK YOUR DATES for the 47TH ANNUAL CONFERENCE OF AOGD scheduled on 13th & 14th September 2025 , Pre Conference Workshops on 12th September & Post Conference Workshop on 15th September.

My best wishes to the editorial team as they bring forth the first AOGD Bulletin of our tenure.

AOGD Secretariat

From the Editor's Desk

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Dr Pikee Saxena

Dr Manisha Kumar

Co-editors

Dr Vidhi Chaudhary

Dr Shilpi Nain

Dr Apoorva Kulshreshtha

Dr Divya Gaur
Co-editor

Dear AOGD Members,

Warm greetings from Lady Hardinge Medical College! We are excited to present the inaugural edition of the AOGD Bulletin for 2025, brought to you by Team LHMC. This academic platform aims to foster understanding, analytical thinking, and collective education in the dynamic field of Obstetrics and Gynaecology.

This month's theme is *"**Breaking New Ground in OB-GYN Practice**."* We open with an insightful article on **AI in Clinical Practice: A Game Changer**, exploring how artificial intelligence can revolutionize maternal and neonatal care, particularly in low- and middle-income countries like India. With AI-powered tools such as machine learning and chatbots, we can improve early diagnosis, personalize treatment, and optimize delivery outcomes.

In **Menopause**, we shift from a static view to one of innovation, highlighting advancements in hormone therapy, non-hormonal options, and personalized care, all of which are enhancing targeted symptom management.

The **Legal Aspects of OB-GYN** are also discussed, focusing on the significant risks in this field and offering guidance on navigating potential legal pitfalls.

The **Placenta** remains a crucial element in pregnancy, influencing maternal and fetal outcomes. This edition delves into the *placental puzzle* and its role in conditions such as fetal growth restriction (FGR), preeclampsia, and stillbirth.

We also present the latest **ESHRE Guidelines on Endometriosis**, shedding light on new clinical evidence, technological innovations, and the disease's impact on quality of life and reproductive health.

While **pre-viable and peri-viable preterm prelabour rupture of membranes** has always been a challenging presentation, we explore strategies for effective monitoring, management, and support during this critical phase based on latest recommendations.

An update on the **HPV Vaccine** follows, highlighting its potential to prevent cervical cancer, along with a fun, interactive **Puzzle Section** to stimulate your intellectual curiosity.

By *breaking new ground*, we are shaping a future where every woman receives the highest standard of care.

A heartfelt thank you to all the authors for their dedication in making this issue both informative and engaging. As always, we welcome your feedback to help us improve with each edition.

Thank you for your continued support.

Warm regards,
The Editorial Team

AI in Clinical Practice: A Game Changer

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Introduction

Millions of women in low- and middle-income countries (LMICs), including India, lack access to adequate maternal healthcare. This gap underscores the urgent need for innovative and integrative healthcare models that improve maternal and neonatal outcomes. A holistic restructuring of healthcare services is crucial to addressing key factors influencing maternal, neonatal, and infant mortality, particularly in rural and underserved regions.

Artificial intelligence (AI) is rapidly transforming the field of obstetrics and gynaecology (OB/GYN), enhancing how conditions are diagnosed, managed, anticipate and prevent complications. By leveraging patient-specific data, AI also facilitates personalized treatment plans, increasing the effectiveness of care.

It is important to understand what is AI and it's subtypes including Machine learning, Deep learning and Neural Networks. A comprehensive table with clinical examples is given below to explain these concepts.

Table 1. Defining AI and its subtypes

Application Area	Definition	Example
Artificial Intelligence (AI)	The broad field of creating machines or software that can mimic human intelligence	An AI-powered clinical decision support system can assist gynaecologists in diagnosing conditions like polycystic ovary syndrome (PCOS) by analysing patient symptoms, lab results, and medical history
Machine Learning (ML)	A subset of AI where systems learn from data and improve over time without explicit programming	ML algorithms can be trained to predict the likelihood of preeclampsia in pregnant women by analysing patterns in electronic health records (EHR), such as blood pressure trends, protein levels, and patient demographics
Deep Learning	A more advanced type of ML that uses multi-layered neural networks to analyse large and complex data	Deep learning can be used to analyse ultrasound images and detect fetal abnormalities more accurately than traditional imaging methods. For instance, it can automatically identify structural defects like congenital heart disease in the fetus.
Neural Networks	Computing systems inspired by the human brain, consisting of layers of "neurons" that process and transmit data	A convolutional neural network (CNN) - a type of neural network — can be trained to interpret Pap smear images for cervical cancer screening, improving detection rates and reducing the workload on cytopathologists

Together, these technologies are revolutionizing obstetrics and gynaecology by enabling earlier diagnoses, improving patient outcomes, and making care more personalized and efficient. Examples of use of AI, ML, deep learning, and neural network applications in obstetrics and gynaecology are shown below in table2

Table 2: Utility of AI, ML, deep learning, and neural network applications in obstetrics and gynaecology

Application Area	Technology Used	Example/Use Case	Impact/Benefit
Early Cancer Detection	Machine Learning / Deep Learning	Predicting ovarian or endometrial cancer risk from genetic and biopsy data	Enables early diagnosis and tailored treatment plans
Fetal Monitoring Interpretation	Deep Learning / Neural Networks	Analysing CTG data to detect fetal distress	Supports timely interventions during labour
IVF Outcome Prediction	Machine Learning	Predicting IVF success based on patient and cycle data	Enhances personalization and increases treatment success rates
Cervical Cancer Screening	Neural Networks (CNNs)	Automated analysis of Pap smear or VIA images	Improves detection rates, especially in low-resource settings
Preterm Birth Risk Stratification	Machine Learning	Analysing EHR and ultrasound data to identify high-risk pregnancies	Enables early preventive care and reduces complications

Clinical Documentation & Risk Extraction	AI / Natural Language Processing (NLP)	Extracting risk factors from free-text clinical notes	Improves efficiency and accuracy in identifying patient risks
Robotic-Assisted Surgeries	AI & Robotics	Precision surgeries like hysterectomy using robotic systems	Reduces complications and shortens recovery time
Maternal Health Chatbots	AI	Chatbots offering prenatal care education and guidance	Expands access to reliable health information, especially in underserved areas
Ultrasound Image Analysis	Deep Learning / CNNs	Detecting fetal abnormalities from ultrasound scans	Enhances accuracy and supports early diagnosis
Personalized Medicine in Gynaecology	Machine Learning	Tailoring hormone therapy or treatment plans based on individual profiles	Increases treatment effectiveness and reduces side effects

The Role of Digital Health

a) The Rise of Fem Tech

FemTech (Female Technology) —a term that encompasses software, diagnostics, products, and services that leverage technology to improve women's health—is emerging as a powerful force in OB/GYN. This includes innovations in fertility tracking, menstrual health, pregnancy monitoring, and menopause management. In India, FemTech startups are playing a pivotal role in democratizing access to women-centric healthcare.

The market is projected to reach $103 billion by 2030 (CB Insights, 2022), with significant advancements in:

- Wearable devices (e.g., fitness trackers for ovulation and pregnancy monitoring).
- Remote fetal monitoring tools (e.g., AI-driven diagnostics for early risk detection).
- Mobile health applications (e.g., period and fertility trackers used by 50M+ women globally).
- At-home diagnostic tools (e.g., cervical cancer screening kits, reducing mortality from the disease, which claims 300,000 lives annually [WHO, 2023]).

b) Revolutionizing Universal Access Through Mobile Health (mHealth)

Chatbot is a software application designed to simulate human conversation through text or voice interactions. By leveraging technologies like natural language processing (NLP) and machine learning, chatbots can interpret user inputs and provide appropriate responses, facilitating seamless communication between humans and digital systems.

Types of Chatbots:

i. **Rule-Based Chatbots:** Operate on predefined scripts and respond to specific commands or keywords.

ii. **AI-Powered Chatbots:** AI chatbots use natural language processing to offer personalized, 24/7 interactions, improving over time to boost engagement and efficiency.

Chatbots are increasingly being integrated into obstetrics and gynaecology (OB/GYN) to enhance patient care, education, and support. Their applications include 1. Patient Education and Support,2. Prenatal and Postnatal Care 3. Screening and Early Detection 4. Appointment Scheduling and Reminders 5. Pre-Screening and Triage 6. Genetic Counselling 7. Mental Health Support

Challenges: While chatbots offer numerous benefits in OB/GYN, it's essential to ensure the information they provide is accurate and up-to-date. Regular oversight by medical professionals is necessary to maintain the quality and reliability of chatbot interactions.

c. Introducing the E-Hybrid Prenatal Care Model for improving maternal and child health

To bridge healthcare accessibility gaps, E-Hybrid Prenatal Care Model, leveraging virtual consultations, enhanced point-of-care services, and self-care tools has been proposed. This model will facilitate seamless interactions between patients and healthcare providers, including doctors, nurses, and community-based caregivers.

Key Components:

- Virtual prenatal consultations to reduce unnecessary clinic visits.
- Remote monitoring of vital maternal health indicators (e.g., blood pressure, fetal movement, glucose levels).

- Self-care interventions, empowering women with educational resources and digital support.
- Customized prenatal care plans, ensuring both medical and emotional support.

Telehealth and Hybrid Models in Maternal Care

The American College of Obstetricians and Gynaecologists (ACOG) and CDC (2021) recommend integrating telehealth into maternal care to reduce infection risks and improve accessibility. This approach gained attraction during the COVID-19 pandemic, when telemedicine consultations increased by 150% globally.

Benefits of Telehealth in Maternal Care:

- Lower healthcare costs (estimated reduction of 30% in patient expenses).
- Time savings (cutting travel time by an average of 2–4 hours per visit).
- Higher patient satisfaction (over 80% prefer hybrid prenatal care).

The PregCare Model: A Multidisciplinary Digital Health Initiative

PregCare is an innovative, technology-driven call centre staffed by perinatal specialists, including doctors, nurses, and midwives. By combining telehealth, AI-driven diagnostics, and remote monitoring, PregCare aims to:

- Improve maternal health outcomes in both urban and rural settings.
- Ensure high-risk pregnancies receive specialized care.
- Enhance patient engagement and satisfaction.
- Hybrid Health Perinatal Model: A Data-Driven Approach
- Traditional prenatal care models often follow a one-size-fits-all approach, leading to:
- Overuse of resources for low-risk pregnancies.
- Insufficient attention to high-risk cases.
- Inefficiencies in healthcare resource allocation.

The Hybrid Perinatal Model integrates biochemical and biophysical markers, sonography, medical history, demographics, and advanced diagnostic tests to create personalized pregnancy care plans.

Revised Prenatal Care Schedule is shown in figure 1:

- 6 visits during pregnancy (from early first trimester to delivery).
- 1 preconception visit (for early risk assessment and counselling).
- 1 postpartum visit (for maternal and neonatal well-being).

Impact & Outcomes:

- Time & cost savings: Reducing in-person visits by 50% could save expectant mothers 40–60 hours of travel and waiting time, cutting healthcare costs by 30–40% (CDC, 2021).
- Higher patient satisfaction: Over 80% of women prefer a hybrid model when combined with telehealth (NIH, 2023).
- Improved health outcomes: Hybrid models have reduced pregnancy complications by 25%, while increasing adherence to prenatal care guidelines (WHO, 2023).

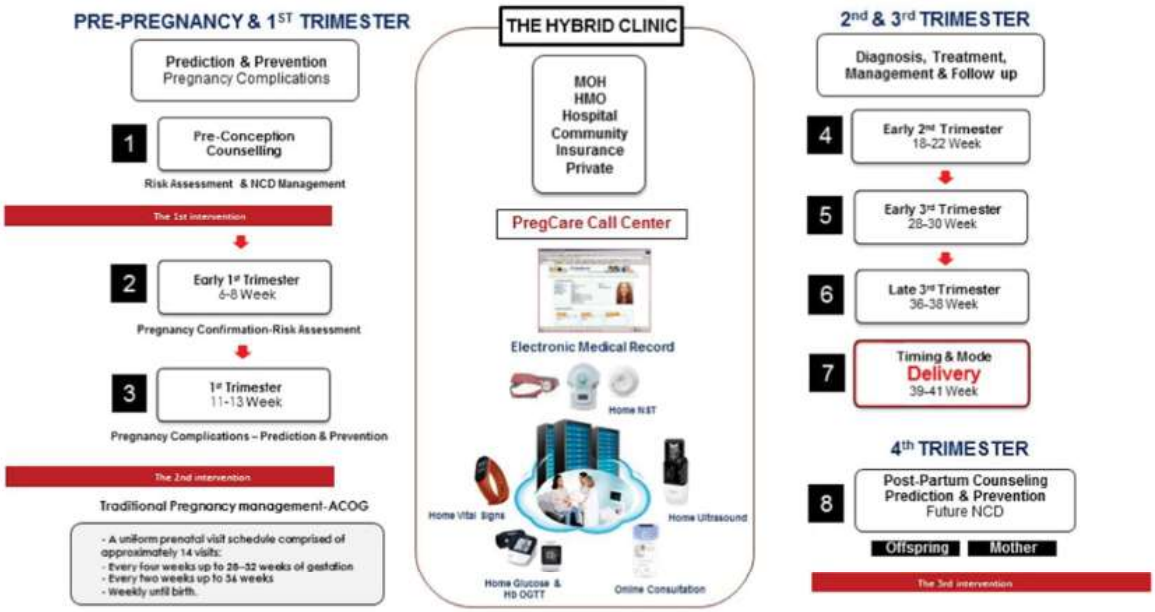


Figure 1: Revised Prenatal Care Schedule is shown in figure 1

The hybrid perinatal clinic; a new approach to pregnancy management. From office to point- of-care/home—in eight steps. ACOG

Government & Institutional Support in India for improving fetomaternal outcome

A. Impact of Telemedicine in Rural India

In India, 65% of the population resides in rural areas, where telemedicine has significantly enhanced healthcare accessibility. The E-Sanjeevani telemedicine platform, launched by the Government of India, has facilitated 140 million virtual consultations as of 2023 (Ministry of Health & Family Welfare).

B. The Role Department of Biotechnology (DBT)

DBT has been instrumental in advancing obstetrics and gynaecology through initiatives such as:

- Development of 'Garbhini-GA2' AI Model: Researchers in India have developed an AI model, Garbhini-GA2, to more accurately estimate the gestational age of a fetus in the second and third trimesters. Designed using Indian population data, this model significantly reduces age estimation errors—by almost three times compared to existing models based on Western populations. Developed by IIT Madras and THSTI under the GARBH-Ini program, the model supports better pregnancy care by predicting due dates more accurately, helping to reduce maternal and infant mortality. The research emphasizes the importance of using population-specific data and stresses collaboration between clinicians and data scientists to ensure real-world clinical impact.
- GARBH-Ini Program: A national research initiative integrating clinical, epidemiological, and biological data to develop predictive tools for adverse birth outcomes.
- Advancements in Reproductive Immunology: DBT-supported research has contributed to novel contraceptive methods and immune contraceptive protocols.

D. Promotion of Assisted Reproductive Technologies (ART):

Figure 2 summarizes the key steps of the IVF process (ART) and highlights the points where AI is integrated to enhance efficiency and accuracy.

IVF Process		AI intervention
Ovarian stimulation	→	AI –driven stimulation monitoring
Egg retrieval		
Sperm collection & analysis	→	AI based sperm analysis
Fertilization (ICSI/IVF)	→	AI assisted fertilization monitoring
Embryo culture	→	AI monitoring of embryo development
Embryo selection	→	AI based embryo viability assessment
Embryo transfer	→	AI based endometrial analysis
Pregnancy testing	→	AI prediction of pregnancy success & OHSS risk

Figure 2: Key steps of IVF process and the AI-powered enhancements at specific stages of the IVF process, where AI helps optimizes decision-making, improve accuracy, and increase the chances of a successful pregnancy

World's first baby born using AI-assisted IVF system born on 10th April 2025

The world's first baby has been born through a fully automated, AI-assisted IVF system that performs all 23 steps of the ICSI process without human hands. Developed by Conceivable Life Sciences, the system uses AI for sperm selection and laser immobilisation, achieving faster and more precise fertilisation. A 40-year-old woman in Mexico gave birth to a healthy baby boy after one embryo, created using this method, was successfully implanted. This marks a major step toward fully automated and standardised IVF treatments.

Role of AI in Genital tract malignancies

AI is playing a pivotal role in advancing the field of gynaecological oncology by enhancing diagnostic accuracy, enabling early detection, and facilitating personalized treatment approaches. Ongoing research and technological advancements continue to expand AI's potential to improve outcomes for patients with cancers of the genital tract.

1. Cervical Cancer

- **Screening and Diagnosis**: AI algorithms enhance the accuracy of cervical cancer screenings. For instance, the Cervical AI assists in objectively identifying precancerous lesions and cervical cancer cells from patient samples, streamlining the review process and increasing detection sensitivity.
- **Colposcopy Analysis**: AI models have demonstrated superior accuracy compared to experienced colposcopists in colposcopic examinations, aiding in the precise identification of cervical abnormalities.

2. Ovarian Cancer

- **Early Detection**: AI-enhanced blood tests, known as "liquid biopsies," analyse genetic changes and protein biomarkers to detect early signs of ovarian cancer.
- **Ultrasound Diagnostics**: AI models have been integrated into ultrasound diagnostics to improve the accuracy and efficiency of ovarian cancer detection. Studies have shown that these models outperform both expert and non-expert examiners, suggesting their potential as valuable diagnostic support tools.

3. Endometrial Cancer

- **Histopathological Analysis**: An AI model named ECgMPL has been developed to detect endometrial cancer with 99.26% accuracy by analysing histopathological images. This advancement could significantly enhance early detection and treatment planning.

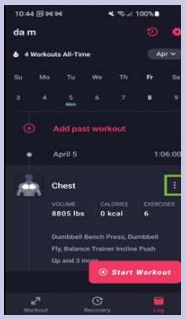
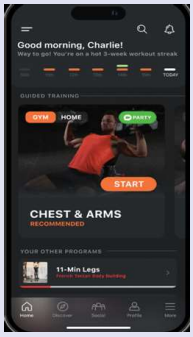
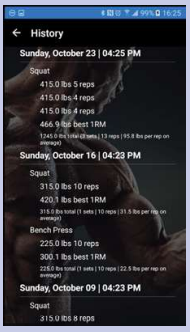
4. Digital Pathology

- **Histopathology Slide Analysis**: AI applications in digital pathology have shown promise in accurately diagnosing and classifying histopathological subtypes of gynaecological cancers, as well as predicting treatment responses and prognoses

5. Risk Prediction and Personalized Medicine

- **Predictive Modelling**: Machine learning models are being utilized to predict individuals' risk of developing gynaecological cancers, enabling personalized screening and prevention strategies.

E. Smart Fitness Apps for improving health

APPs	Image
Fitness AI Tailors workouts by analysing over 5.9 million sessions, optimizing sets, reps, and weights to help users achieve their fitness goals efficiently.	
Fitbod Creates customized workout plans based on individual goals, available equipment, and fitness levels, adjusting routines as users progress	
SHRED Acts as a virtual personal trainer, offering AI-powered workout customization suitable for both home and gym settings.	
Dr. Muscle Specializes in strength training with personalized plans, exercise videos, and real-time feedback to support muscle-building goals.	
Planfit Utilizes an AI trainer named 'Max' to guide users through personalized workouts, aiming to accelerate fitness progress.	

Challenges of Using AI in the Medical Field

Implementing AI in healthcare presents several challenges:

1. Data Privacy and Security: Ensuring the confidentiality of sensitive patient data is paramount.
2. Data Quality and Availability: AI systems require large, high-quality datasets, and incomplete or biased data can lead to inaccurate outcomes.
3. Bias and Inequity: AI models can inherit biases from training data, potentially leading to unequal care.
4. Lack of Explain ability: Many AI models operate as "black boxes," making it difficult to interpret their decisions.
5. Integration into Clinical Workflows: Aligning AI systems with existing healthcare workflows is challenging and requires careful planning.
6. Legal and Ethical Concerns

Conclusion

AI and FemTech are reshaping clinical practice by making care more accessible, personalized, and data-driven. In countries like India, these innovations can bridge critical gaps in maternal and reproductive healthcare, especially in underserved areas. To realize this potential, a collaborative and ethical approach is essential—combining technology with inclusive design, strong policy support, and community engagement. With the right direction, these tools can significantly improve outcomes and empower women to take charge of their health.

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Innovations in Menopause Care: Personalized hormone replacement therapy (HRT)

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Perimenopause is a transitional phase in a woman's life characterized by hormonal fluctuations and a diverse range of symptoms. While hormone replacement therapy (HRT) can mitigate these effects, a standardized approach may not be optimal. A personalized treatment strategy, tailored to an individual's unique hormonal profile, lifestyle factors, and symptomatology, is essential for effectively managing this physiological transition.[1]

Understanding estrogen levels in perimenopause

Primarily, the natural decline in ovarian function plays a key role; as menopause approaches, the number and activity of ovarian follicles decrease, leading to reduced estrogen production. Genetic predisposition can also influence estrogen levels, as some women may experience an earlier or more abrupt decline due to inherited factors. Additionally, lifestyle choices such as diet, stress levels, and physical activity significantly affect estrogen production. Poor nutrition or excessive physical exertion, for example, can suppress estrogen synthesis.[2] Another critical factor is elevated cortisol levels, as chronic stress increases cortisol production, which may interfere with the body's ability to maintain adequate estrogen levels.[3]

The role of cortisol in perimenopausal health

Cortisol, commonly known as the "stress hormone," is produced by the adrenal glands and plays a crucial role in stress regulation and metabolism. In perimenopausal women, elevated cortisol levels can have significant effects. Increased cortisol is associated with heightened fatigue, irritability, and mood swings, contributing to overall emotional instability.

Additionally, high cortisol disrupts hormonal balance by inhibiting estrogen production, which can worsen symptoms such as hot flashes, insomnia, and night sweats. It also affects progesterone levels through a mechanism called "pregnenolone steal," where the body prioritizes cortisol synthesis over progesterone due to their shared precursor, pregnenolone. This imbalance may further exacerbate perimenopausal symptoms.[4]

Implementing stress management strategies, engaging in regular physical activity, and making lifestyle adjustments can help regulate cortisol levels, promoting hormonal balance and alleviating perimenopausal discomfort..

Progesterone: The balancing hormone

Progesterone is integral to modulating estrogen activity, stabilizing mood, promoting restful sleep and reducing anxiety. During perimenopause, declining progesterone levels, due to irregular ovulation, can lead to several challenges. One such issue is the relative predominance of estrogen, often termed "estrogen dominance," which may result in symptoms like weight gain, breast tenderness, and mood swings. Additionally, progesterone's calming effect on the brain means its reduction can cause sleep disturbances and increased anxiety, exacerbating the difficulties of this transitional phase.[5] Moreover, progesterone supports bone health; thus, its decline can negatively impact bone density over time.[6] To mitigate these symptoms and maintain hormonal balance, replenishing progesterone through bioidentical hormones or other supplements, as guided by a healthcare provider, may be beneficial.

Case Vignettes

Case Vignette I

A 50-year-old CEO experienced her last period four months ago and struggles with frequent nighttime hot flashes, sleep disruption, and anxiety about public speaking. Frequent travel worsens her exhaustion. She has a BMI of 22 kg/m^2 and takes 12.5 mg of hydrochlorothiazide for borderline high BP. In-office, her BP is 150/90, which she attributes to traffic stress. What are the commonly prescribed HTs for VMS?

This patient would likely benefit from a low dose of hormone therapy (HT). Her blood pressure (BP) should be stabilized either by adding a second medication or increasing the dose of her thiazide diuretic.

A weekly or biweekly transdermal estradiol patch (25 to 50 meg/day) combined with 100 mg of oral micronized progesterone at night may help alleviate or eliminate her symptoms and improve sleep quality. BP should be reassessed after starting hormone therapy, as estrogen can activate the renin-angiotensin-aldosterone system, potentially raising BP. However, transdermal estradiol at standard HT doses does not appear to activate this system and may even help lower BP.

Alternative hormonal options include conjugated equine estrogen or other oral estradiol or estrogen formulations, along with nightly progesterone. Conjugated equine estrogen can also be combined with bazedoxifene to eliminate the need for progestin.

Case Vignette II

A 54-year-old woman GOPO, presents with worsening night sweats, waking 6-8 times per night due to intense heat in her upper body, sweating, and occasional heart palpitations, followed by chills. This disrupts her sleep and affects her daytime performance at her high-pressure job. She experiences occasional daytime hot flashes but finds nighttime awakenings most distressing. Her menstrual cycles became irregular 18 months ago, shortening to 26 days before she began skipping periods. Her last cycle was 4 months ago, with lighter and shorter bleeding. She has no intermenstrual spotting and does not use contraception due to her husband's vasectomy. What are the commonly prescribed HTs for VMS?

Commonly Prescribed FDA-approved Hormone Therapiesfor Treatment of vasomotor Symptoms		
Preparation	**Dose**	**Available Dose**
Estrogen therapies		
Oral		
Conjugated equine estrogens	0.3mg/d	0.3,0.45,0.625,0.9,1.25 mg
Micronized 17-β estradiol	0.5mg/d	0.5,1.0,2.0mg
Transdermal		
17-β estradiolpatch	25mcg	14,25,37.5,50,75,100mcg
17-β cutaneous gel	0.25-1.25g	0.25,0.5,0.75,1.0mg/d
17-β cutaneous spray	1.5mg/d	1.5,3.0,4.5mg/d
Vaginalring (systemic)		
Estradiol acetate	0.05mg/d	0.05,0.10mg/d 90d duration
Progestogen therapies		
Oral		
MPA	2.5mg/d	2.5,5.0,10mg/d
Norethindrone	0.35mg/d	0.35mg/d
Micronized progesterone	100mg/d	100,200mg/d
Levonorgestrel		
Levonorgestrel	6mcg/d	13.5mgfor3years 52mg for 5 years
Vaginal gel progesterone	4%	4%,8%;as45or90mg,app
Combination HT		
CEE+MPA	0,3/1.5mg/d	0.3/1.5;0.45/1.5;0.625/2.5
17β-E2+ norethindrone acetate	0.5/0.1mg/d	0.625/5
17 B-E2+ drospirenone	0.5/ 0.25mg/d	0.5/0.1;1/0.5 mg/d
EE+norethindrone acetate	2.5mcg/ 0.5mg/d	0.5/0.25;1.0/0.5;1.0 /1.0mg/d
	0.45mg/ 20mg/d	2.5/0.5;5.0/1.0mg/d
CEE+BZA		1dose available
Transdermal		
17β-E2+ norethindrone acetate	50mcg/ 0.14mg	50/0.14;50/0.25/patch 1 dose available
17-βE2+Norg	45mcg/ 0.015mr	
17-β E2 indicates 17-β estradiol; ace, acetate; BZA, bazedoxifene; CEE, conjugated equine estrogens; EE, ethinyl estradiol; L Norg, levonorgestrel; MPA, medroxyprogesterone acetate		

Non-Hormonal Treatment Options For Vasomotor Symptoms		
Treatment Option	**Dose Range**	**Comments**
Recommend*		
Cognitive behavioral therapy		
Clinical hypnosis		
Prescription medication therapies		
Selective serotonin reuptake inhibitors		
Paroxitene salt	7.5mg/dl	No titration needed
Paroxitene	10-25mg/d	Startwith10mg/d
Citalopram	10-20mg/d	Startwith10mg/d
Escitalopram	10-20mg/d	Startwith10mg/d
		(Consider 5mg if older)
Serotonin norepinephrine reuptake inhibitors		
	100-150mg/d	Start 25-50 mg/d; titrate dose daily
Desvenlafaxine		
Venlafaxine	37.5-75mg/d	Start with 37.5 mg/d :75 mg
Gabapentin	300-900mg/d	Start with 300 mg QHS; then BID or TID Titrate q 3-4 d
Pregabalin	75-150mg/BID	Start 50 mg/d; titrate to 75 mg
Clonidine	0.1 mg/d patch	TD preparation better tolerated

Case VignetteIII

A 52-year-old menopausal woman seeks relief from hot flashes and night sweats, which disrupt her sleep. Her mother is recovering from a hip fracture, and her aunt had breast cancer at 72. Though interested in hormone therapy (HT), she is hesitant due to media coverage of its "D" rating by the USPSTF.

What do the observational studies suggest regarding the use of Hormone therapy in women with family history of

breast cancer?

HT and Breast Cancer Risk: Observational studies suggest HT does not further increase breast cancer risk in women with a family history, but individual assessment is necessary.

BRCA-Positive Women Without Breast Cancer: Limited data indicate systemic HT after risk-reducing oophorectomy until natural menopause may be safe, but decisions should be individualized and reassessed.

History of Endometrial or Breast Cancer: HT is generally not recommended. Non-Hormonal treatments (e.g., antidepressants, clonidine, gabapentin, CBT, hypnosis) should be tried first.

Case Vignette IV

A 53-year-old postmenopausal woman sought a second opinion after experiencing bothersome hot flashes and night sweats during the placebo week of her oral contraceptives, which she had continued for cycle control. She had a history of heavy bleeding and breast tenderness during perimenopause, which improved with low-dose contraceptives. Concerned about fracture risk due to her mother's hip fracture at 85, she was interested in hormone therapy but hesitant due to her past symptoms.

What would be the ideal Combination for such a patient? (Comparing the Target Tissue effects of TSEC and Traditional ET and EPT)

The TSEC combination of CEE 0.45mg/BZA 20mg effectively reduces VMS, including hot flashes, night sweats, and sleep disturbances, while improving quality of life and vulvovaginal atrophy. It has a neutral effect on the breast, with no significant increase in breast cancer incidence over two years and no rise in mammographic density seen with EPT. CEE/BZA protects against estrogen-induced endometrial neoplasia and has spotting and amenorrhea rates comparable to placebo. For women with a uterus, it offers symptom relief and bone loss prevention with minimal breast tenderness or vaginal bleeding, improving tolerability.

Target Tissue Effects Of TSEC and Traditional ET and EPT

Target Tissue	TSEC	Oral ET/EPT
Bone	Improved bone density	Improved bone density
Endometrial neoplasia	Neutral at 2 y	Neutral with EPT, increased with estrogen alone
Breastcancer	Neutral at 2 y	Increased in WHI trial
VMS	Improved frequency and severity	Improved frequency and severity
CVrisk	No increased risk seen	With both ET. EPT
VTErisk	2-fold increased risk BZA, no additive risk with CEE/ZA	2-fold increase with oral ET. EPT; potentially less with transdermal therapies.

Case Vignette V

A54-year-oldwomanwithdyslipidemiaandhypothyroidism, reports bothersome menopausal symptoms. Her last period was two years ago, and she experiences 5-8 daily hot flashes and 2-3 nightly sweating episodes. She has no surgical history or family history of breast cancer A paternal grandfather died of heart disease in his 70s. Currently She takes levothyroxine and a multivitamin, with normal, up-to-date screenings. She seeks treatment options but is hesitant about hormone therapy due to concerns and association leading to breast cancer and heart disease. How will you counsel this woman regarding the risk of breast cancer associated with Hormone therapy?

This woman can be advised that while her mother's breast cancer slightly increases her personal risk, the impact of HT is minimal. She should follow routine breast screening. All women should be assessed for a family history of breast cancer to evaluate hereditary risk. A single first-degree relative with breast cancer slightly raises personal risk, but HT does not significantly alter this. However, breast cancer in a first-degree relative before age 40 or multiple affected relatives may indicate a high-penetrance mutation, warranting genetic counseling and possible BRCA testing.

Women with a strong family history or known genetic mutations may opt for risk-reducing salpingo-oophorectomy (RRSO). Evidence suggests HT after oophorectomy improves quality of life without increasing breast cancer risk. For premenopausal women treated for breast cancer, VMS, low libido, and dyspareunia can reduce quality of life. The impact of HT on recurrence is unclear, and it is not recommended during tamoxifen or aromatase inhibitor therapy. After completing treatment, some women at low recurrence risk may consider HT for quality-of-life benefits.

Off-label low-dose vaginal estrogen may be an option if other treatments fail, though caution is needed for women on aromatase inhibitors.

Case Vignette VI

A 48-year-old woman (G2P2) with a history of stage I, Type I endometrial cancer underwent hysterectomy and bilateral salpingo-oophorectomy six months ago. Previously menstruating regularly, she now experiences frequent, severe hot flashes, night sweats, and vaginal dryness causing sexual discomfort, unrelieved by moisturizers and lubricants. The Patient wants to know whether MHT is an option for her?

Gynecologic cancer survivors often experience treatment-induced menopause, leading to more severe and persistent symptoms.

Hormone Therapy (HT) Considerations:

- HT effectively manages symptoms and may reduce

long-term risks like cognitive decline, cardiovascular issues, and bone loss.

- Survivors of early-stage, low-risk endometrial cancer may consider HT.
- Women with high-grade, advanced, or unfavorable endometrial cancer should opt for non-hormonal treatments.
- HT use in ovarian cancer depends on tumor type those with estrogen-sensitive tumors (e.g., sex cord stromal, serous, and endometrioid) may need caution, while others can use HT as indicated.
- Cervical, vulvar, and vaginal cancers are not hormone-dependent, so HT is generally safe.
- Low-dose vaginal estrogen can be used for vaginal dryness and dyspareunia if non-hormonal treatments fail, even in women avoiding systemic HT.

Case Vignette VII

A 35-year-old G1P1 with a long history of endometriosis and chronic pain previously underwent left salpingo-oophorectomy for an ovarian endometrioma with extensive adhesions. She returned with persistent pain and was counseled on medical and surgical options. Having completed her family and seeking relief, she opted for definitive surgical management and underwent a hysterectomy with removal of her remaining ovary. At her postoperative visit, the patient inquires about the risks and benefits of hormone therapy and whether menopausal hormone therapy is an option. She also asks if progesterone is necessary.

- Previous recommendations discouraged hormone therapy (HT) after BSO for endometriosis due to concerns about recurrence, based on limited studies using estrogen alone.
- Current Evidence: One study found a low recurrence rate with combined estrogen-progestin HT after hysterectomy with BSO.
- HT Considerations: Estrogen-progestogen therapy is more effective for vasomotor symptoms than estrogen alone. While unopposed estrogen is standard for hysterectomized women, an exception exists for those with endometriosis, as residual disease may persist.
- Practice Approach: Expert opinions vary, with some recommending combined HT initially, then transitioning to estrogen alone until the natural menopause age. In severe menopausal cases, a trial of combined HT is advised.

Case Vignette VIII

A 56-year-old woman (G2P2) with worsening vaginal dryness and painful intercourse since menopause at 51. Initially managed with OTC lubricants, but they are now ineffective. She also has decreased sexual desire and frequency, leading to less intercourse, which both she and her partner miss. Additionally, she experiences recurrent UTIs, which were not an issue before menopause. Her primary care physician treated the UTIs but never addressed vaginal or sexual concerns. Assuming her symptoms were a normal part of aging, she never sought help until a friend's advice and online research led her to consult a gynecologist. What are the Non-Hormonal Therapeutic options for GSM? What are the Hormonal Options?

Vaginal Lubricants
For use with sexual activity (reduce friction)
Applied before sexual activity
Formulations:
Water-based
Oil-based
Silicone -based
Vaginal moisturizers (long acting) For use on a regular basis Applied at bedtime 2-3 times weekly Vaginal activity Sexual/ vaginal activity on a regular basis With a partner
Without a partner
Pelvic floor PT
Vaginal dilator therapy
Performed independently
Performed under the guidance of a professional (Physical Therapist, sex therapist)

Prescription Therapies for Symptomatic Vaginal Atrophy		
Composition	**Product Name**	**FDA approved Dosage**
Vaginal creams 17 B-estradiol	Estrace Vaginalcream	Initial: 2-4 g/d for 1-2 wk. Maintenance:1g/1-3times/wk (0.1 mg active ingredient per gram)
Conjugated estrogens	Premarin Vaginalcream	For VVA: 0.5-2g/d for 21 d then off 7 d For dyspareunia: 0.5 g/d for 21 d then off 7 d or twice per week. (0.625 mg active ingredient per gram.
Estrone	Estragyn Vaginalcream	2-4 g/d (1 mg active ingredient per gram) intended for short-term use; progestogen recommended)
Vaginal rings17 B-estradiol	Estring	Device containing 2 mg releases approximately 7.5 kg/d for 90 d (for VVA)
Estradiolacetate	Femring	Device containing 12.4 or 24.8 mg estradiol acetate releases 0.05 or 0.10 mg/d estradiol for 90 d both doses release systemic levels for treatment of

Case Vignette IX

A P2L2, 28 yr old female with h/o regular cycles comes to you with complaints of secondary amenorrhea since 8 months with anxiety, low VMS, low libido, vaginal dryness, poor sleep Dry eye, glaucoma. On Investigations, she is diagnosed with Hypergonadotropic hypogonadism and autoimmune thyroiditis. USG reveals small ovary with few residual follicles. How to manage the case and what is the role of Androgen Therapy in Management of Early Menopause?

Primary and secondary POI differ from natural menopause, making hormone therapy (HT) crucial for symptom relief and long-term health (CVD, bone, cognitive). HT should continue until at least the natural menopause age, with younger women often requiring higher estrogen doses. Those undergoing fertility-impacting treatments should explore options like egg or ovarian tissue freezing.

Testosterone therapy may improve sexual interest and psychological well-being in menopausal women but remains controversial. It can be considered for vasomotor symptoms unresponsive to HT but is contraindicated in those with breast/uterine cancer, CVD, or liver disease. Baseline lipid/liver function tests and regular monitoring are advised, with reassessment after six months.

The only FDA-approved testosterone formulation for women in the U.S. is a combination of esterified estrogen with methyltestosterone, available in 2.5 mg and 1.5 mg doses.

Case Vignette X

48 Yr old lady underwent laparotomy with TAH and BSO with lymphadenectomy and omentectomy for Ca Ovary. HPE is Serous cystadenocarcinoma stage lla NOMO. Received chemotherapy. Referred to the menopausal clinic for HRT discussion as she is suffering from severe hot flashes and mood swings. What Options are available to this lady for the management of menopausal symptoms?

MHT may be considered for women with prior epithelial ovarian cancer, except for advanced serous and endometrioid types. Limited evidence raises concerns about its use in ER-positive tumors like serous carcinoma and sex cord-stromal tumors. In GCT cases, MHT can be considered, though definitive data are lacking.

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Avoiding Lawsuits: Legal Pitfalls in Obstetrics and Gynaecology Care

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Introduction

Obstetrics and gynaecology deals with the most complicated part of medicine, that is human life. It is unpredictable and uncertain, varies from person to person and in the same person from time to time. It also varies from drug to drug, in the same drug from dose to dose, from investigations to investigations, from procedure to procedure.

Medical science is not exact science. Due to continuous research and experiments, newer modalities of management of the patients are coming up. A drug or a procedure well accepted today can be outdated tomorrow. A sincere doctor will try to be updated with newer drugs, technique and procedure but at the same time it is not possible to be aware of each and every research and newer modalities of treatment.

Doctor is also under obligation to manage the patient with due care and skill. In spite of all these limitations, doctor works in emergency, twenty four hours a day and seven days a week. But expectations of patients and relatives are so high that, in spite of all efforts on part of doctor, if anything goes wrong or expected result is not achieved, it is likely that doctor may have to face litigations.

Ignorance of law is no excuse

As soon as any act, any law, any ordinance passes in Government Gazette, it is presumed that each citizen of India knows it and that is why ignorance of law is never an excuse. Doctor may have to face litigations either under CPA 1986 (Amendment 2003) or under Civil suit or Criminal case and sometimes simultaneously under both CPA and CRIMINAL or CIVIL and CRIMINAL. One may have face litigation before medical board, medical council/medical commission, human right commission, Government, departmental inquiry also.

Prevention is always better than cure

The field of obstetrics and gynaecology carries a high risk of medicolegal challenges due to the sensitive nature of the care provided, the potential for complications, and the emotional investment of patients. No clinician is immune to litigation. Being involved in a medical claim is demoralising and adds to the emotional burden already experienced by the healthcare provider working under constant stress. There is need for interdisciplinary collaboration among health care providers, policymakers and legal professionals to navigate complex issues like consent, negligence, patient's autonomy and ethical dilemmas.

Let us have a look at the various medicolegal pitfalls in our practice.

a) Informed consent:

Failure to obtain proper informed consent is a frequent source of litigation. This includes:

- Not adequately explaining the risks, benefits, and alternatives of procedures.
- Lack of documentation of the consent process.
- Consent obtained under duress.
- Taking blanket consent

b) Negligence:

This involves a breach of the duty of care, leading to patient harm. Common examples include:

- Errors in diagnosis or treatment.
- Failure to monitor patients appropriately.
- Surgical errors.
- Failure to act in a timely manner
- Failure to identify complications and subsequent remedial act

c) Medical Records and Documentation:

Inadequate or inaccurate medical records can severely weaken a defence in a lawsuit. This includes:

- Missing or incomplete documentation.
- Illegible handwriting.
- Failure to record pertinent information.

d) Communication:

Poor communication between healthcare providers and patients can lead to misunderstandings and dissatisfaction, increasing the risk of litigation.

- Failure to communicate test results.
- Not adequately addressing patient concerns.
- Lack of empathy.

e) Medical Termination of Pregnancy (MTP):

This is a highly sensitive area, with legal regulations that must be strictly adhered to. Errors in procedure, or not following protocol can lead to legal issues. Key areas of concern are:

- Gestation Limits and Interpretation: Determining the precise gestational age can be challenging, and errors can lead to legal violations. The interpretation of "substantial fetal abnormalities" for terminations beyond 20 weeks can be subjective, leading to potential disputes.
- Consent and Confidentiality: Ensuring truly informed consent, especially in vulnerable populations (minors, mentally ill women), is crucial. Maintaining strict confidentiality is paramount, and breaches can have severe legal consequences.
- Documentation
- Compliance with Legal Requirements: Strict adherence to the MTP Act's provisions regarding qualified medical practitioners and approved facilities is mandatory.
- Overlapping Laws: The interplay between the MTP Act and Protection of Children from Sexual Offences (POCSO) Act, can create complex legal situations, particularly in cases involving minors. Navigating these overlapping laws requires careful attention to detail and legal expertise.
- Medical Boards: The process of getting approval from the medical board, for termination of pregnancies past 24 weeks, can produce legal and ethical dilemmas.
- Ethical Concerns: Medical professionals may face ethical dilemmas when applying the MTP Act, particularly in cases involving fetal abnormalities or late-term terminations.

f) POCSO ACT

The POCSO Act, while a vital safeguard for children, presents several potential medicolegal pitfalls for healthcare professionals. Areas where one can face challenges are:

- Reporting and Interpretation: The mandatory reporting requirement can create dilemmas when healthcare providers suspect abuse but lack definitive evidence. Misinterpretation of signs and symptoms can lead to unnecessary reporting, causing distress to families. Conversely, failure to report suspected abuse can result in legal consequences.
- Age Determination: Accurate age determination is crucial under the POCSO Act. Discrepancies in age can have significant legal implications. Healthcare providers must be aware of the methods used for age determination and their limitations
- Documentation: Meticulous documentation of findings, including physical examinations, statements, and observations, is essential. Incomplete or inaccurate records can weaken a defence in legal proceedings. Documentation of the exact words of the child is very important.
- Confidentiality vs. Reporting: Balancing patient confidentiality with the legal obligation to report suspected abuse can be challenging. Healthcare providers must be aware of the legal exceptions to confidentiality in POCSO cases.
- Examination and Evidence Collection: Proper examination and evidence collection are crucial. Healthcare providers must be trained in forensic examination techniques and evidence preservation. Improper handling of evidence can compromise its admissibility in court.
- Dealing with Minors and Their Families: Interacting with child victims and their families requires sensitivity and specialized skills. Healthcare providers must be aware of the child's rights and the legal procedures involved.

g) ART act

The Assisted Reproductive Technology (Regulation) Act, 2021 (ART Act), in India, is a significant piece of legislation aimed at regulating ART clinics and banks. However, it also introduces several potential medicolegal pitfalls.

- Eligibility and Access: The Act's limitations on who can access ART services (e.g., excluding certain individuals or couples) can lead to legal challenges based on discrimination. Defining "infertility" and the required duration of attempts to conceive can be subjective, leading to disputes.
- Consent and Documentation: Obtaining and documenting informed consent from all parties involved (couples, donors) is crucial. Any ambiguity or lack of proper documentation can result in legal issues. Maintaining accurate and detailed records of all procedures, gamete handling, and embryo storage is essential. Appropriate forms for each procedure as mentioned in the ART Act 2021 need to be filled and preserved.
- Gamete and Embryo Handling: Strict adherence to the Act's provisions regarding gamete sourcing,

storage, and handling is mandatory. Errors in labelling, storage, or transfer can lead to serious legal consequences. The rules regarding the number of times a women can donate eggs or the number of eggs that can be retrieved, have to be considered.

- Rights of the Child: Clarifying the legal parentage of children born through ART is essential. Disputes over parental rights can arise, especially in cases involving donors. The Act's provisions regarding the child's rights must be strictly adhered to.
- Clinic and Bank Compliance: ART clinics and banks must comply with all registration and operational requirements outlined in the Act. Failure to do so can result in significant penalties, including fines and imprisonment.
- Ethical Considerations: ART procedures raise complex ethical questions, and healthcare providers must be aware of their ethical obligations. Balancing the rights of all parties involved can be challenging.

h) Patient referral

Referral pitfalls include poor communication, incomplete information, lack of pre-referral communication, inadequate transportation and delays in receiving care, potentially leading to worsened patient outcomes.

- Poor Communication: Incomplete or unclear referral information, lack of pre-referral communication between facilities, and inadequate feedback systems can lead to delays in diagnosis and treatment.
- Lack of Pre-Referral Communication**:** Health facilities failing to communicate before a referral can lead to a lack of preparedness at the receiving facility, potentially delaying care.
- Poor Feedback System: Inadequate feedback from the receiving facility to the referring facility hinders learning and improvement in the referral process.
- Lack of Referral Skills: Health workers may lack the necessary skills to identify cases requiring referral and to complete referral documentation properly.
- Incomplete Referral Documentation: Referral letters lack essential information, such as the reason for referral, pre-referral treatment, and investigations performed. Illegible or poorly organized referral letters can lead to misinterpretation and delays.
- Late Referrals: Delays in referring patients can lead to worsening conditions and poorer outcomes.

Ways to avoid litigation

- Take care with **compassion** of your patient during treatment/surgery. Approach child victims and their families with sensitivity and empathy, providing appropriate support and resources.
- Proper **history taking** and thorough **examination** of Patient
- Proper **counselling**
- All necessary **investigations** well in time
- **Expert opinion** whenever required
- Take valid informed **consent**
- Meticulous record keeping/proper **documentation**
- Please do not issue any **certificate** in absence of patient or in back date
- If you are not sure of cause of death, please do not issue death certificate with cause of death. Advise Post mortem examination
- **Adherence to Guidelines**: Follow established clinical guidelines and protocols. Printed protocols help not to miss any important part of management. Implementing standardized protocols for assessing and reporting can help ensure consistency and minimize errors.
- **Risk Management**: Implement robust risk management strategies.
- **Continuing Education**: Stay up-to-date on the latest medical advancements and legal requirements.
- **Professional Liability Insurance**: Maintain adequate professional liability insurance.
- It's important to remember that laws and regulations can vary by jurisdiction. Therefore, healthcare providers should consult with **legal counsel** to ensure they are complying with all applicable requirements. Healthcare providers must have a comprehensive understanding of the MTP Act and its amendments, ART act, POCSO act and other laws pertaining to clinical practice.
- **Transfer of patient**: Transfer only after ensuring availability of the required facility (dialysis/ ventilator or blood bank). It should be timely, escorted by a healthcare worker/ team-mate in same vehicle with emergency kit, with summary of treatment provided . Vitals at the time of transfer, on the way and handover should be documented.
- **Emergency box** should be available round the clock with all emergency drugs. Please check expiry date and update it accordingly time to time.
- If you are providing Medical Termination of Pregnancy

services ,ultrasound services and ART services, please get your **centre registered** under MTP act, PCPNDT act and ART act accordingly and strict compliance with the provisions of the act.

- **Security** should be available round the clock. **CCTV coverage** at every strategic point
- Formation of local level **rush team** in society to have surgical assistance in emergency and assistance at the time to declare bad news, in event of sudden death on table, mob violence and other odd situations and medico legal consequences.
- **Collective responsibility** in unusual circumstances when treating persons are more than one. Do not blame each other
- **Proper communication** with relative about any mishap. In case of dealing with high risk patients, inform relatives time to time about seriousness of the condition of patient with probable outcome.
- **Collaborating** with forensic experts, child protection specialists, and legal counsel can provide valuable guidance.
- Inform **Police,** if required.
- **Identify** yourself well in the court.

Conclusion

It's vital for healthcare providers to adhere to the legal requirements to minimize medicolegal risks while safeguarding the rights of patients and maintaining the highest standards of care.

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Calendar for AOGD Monthly Clinical Meeting 2025-2026

25th April 2025	ESI, Basaidarapur Hospital
30th May 2025	Sitaram Bhartiya Hospital
27th June 2025	Apollo Hospital
25th July 2025	Army Hospital- Research & Referral
29th August 2025	AIIMS
26th September 2025	VMMC &Safdarjung Hospital
31st October 2025	DDU Hospital
28th November 2025	MAMC & LNJP Hospital
26th December 2025	Sir Ganga Ram Hospital
30th January 2026	Dr RML Hospital
27th February 2026	UCMS & GTB Hospital
27th March 2026	LHMC & SSK Hospital
24th April 2026	To be decided

Placental Puzzle: Influencing Fetomaternal Outcome

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Introduction: The Role of Placenta in Pregnancy

The placenta is a transient yet vital organ that establishes and maintains pregnancy by facilitating an intricate array of biological processes. Its fundamental functions include nutrient transfer, gas exchange, waste elimination, hormonal regulation, immune modulation, and protection against infections. Formed from both maternal and fetal tissues, the placenta is structurally designed to support the growing fetus throughout gestation while ensuring the health and physiological adaptations of the mother.

One of the most critical roles of the placenta is to mediate the transport of oxygen and nutrients, such as glucose, amino acids, and fatty acids, from maternal to fetal circulation. Concurrently, it facilitates the removal of carbon dioxide and metabolic wastes produced by the fetus. Specialized transport systems and barrier functions enable selective transfer, ensuring that harmful substances are filtered while essential nutrients are prioritized.

In addition to its metabolic functions, the placenta acts as an endocrine organ, producing hormones necessary for maintaining pregnancy and preparing the maternal body for childbirth and lactation. Hormones such as human chorionic gonadotropin (hCG), progesterone, estrogens, human placental lactogen (hPL), and corticotropin-releasing hormone (CRH) contribute to modulating maternal metabolism, vascular tone, immune tolerance, and parturition.

Immunologically, the placenta creates a privileged environment where the semi-allogeneic fetus can survive without being attacked by the maternal immune system. Trophoblast cells, particularly syncytiotrophoblasts, express non-classical major histocompatibility complex (MHC) molecules and secrete factors that suppress maternal immune activation.

The placenta is highly adaptable; it must constantly respond to changing physiological demands as gestation progresses. This dynamic remodeling requires precise regulation at molecular, cellular, and vascular levels. Any disruption to these regulatory processes can impair placental function and jeopardize fetal development and maternal well-being.

Failure of normal placental development or function has been implicated in a wide range of obstetric complications, including fetal growth restriction (FGR), preeclampsia, preterm birth, and stillbirth. The impact of placental insufficiency is not limited to pregnancy alone but extends to long-term consequences such as cardiovascular disease, metabolic disorders, and neurodevelopmental impairment in the offspring.

Thus, the placenta serves as both a lifeline and a sentinel of pregnancy, and understanding its biology is fundamental to advancing maternal-fetal medicine.

Phases of Placentation

Placentation involves a carefully coordinated sequence of events commencing at implantation and culminating in the establishment of the mature placental circulation.

Implantation:

Following blastocyst formation, implantation occurs approximately 6–10 days post-fertilization. The outer trophoblast layer differentiates into cytotrophoblasts and syncytiotrophoblasts. Syncytiotrophoblasts invade the maternal endometrium, initiating decidualization and vascular changes.

Trophoblast Invasion:

Extravillous trophoblasts (EVTs) emerge from the cytotrophoblastic shell and migrate into the maternal decidua and the walls of spiral arteries. This invasion is finely regulated by maternal immune cells, cytokines, and growth factors to ensure appropriate depth and extent.

Spiral Artery Remodeling:

Under the influence of EVTs, maternal spiral arteries are transformed from high-resistance, low-capacitance vessels into dilated, low-resistance channels. This remodeling removes the smooth muscle and elastic lamina, allowing for increased blood flow without vasomotor control.

Failure of Remodeling:

If trophoblast invasion is inadequate or if the immune environment is hostile, spiral artery remodeling remains incomplete. The resulting narrow arteries predispose to ischemia-reperfusion injury, oxidative stress, and systemic consequences manifesting as pregnancy complications.

Effective placentation thus demands coordinated cellular, vascular, and immune adaptations. Disruptions at any phase compromise fetal perfusion and threaten fetomaternal health.

Pathophysiology of Deep Placentation Disorders

Deep placentation disorders refer to a spectrum of abnormalities characterized by impaired invasion of

the maternal decidua and myometrium by EVTs and incomplete spiral artery remodeling.

Mechanisms of Impairment:

- Inadequate trophoblastic differentiation or invasion limits penetration into the decidua and myometrium.
- Defective immune tolerance leads to an unfavorable maternal environment, inhibiting EVT migration.
- Aberrant oxidative stress responses damage the trophoblast or the maternal endothelium.

Consequences:

The unremodeled spiral arteries retain vasoconstrictive capabilities, causing fluctuating perfusion and exposing the placenta to intermittent hypoxia and oxidative bursts. This injury upregulates the release of antiangiogenic factors such as soluble fms-like tyrosine kinase-1 (sFlt-1) and soluble endoglin (sEng).

Maternal Endothelial Dysfunction:

Circulating sFlt-1 and sEng antagonize VEGF and PlGF, impairing angiogenesis and vascular integrity. The resulting systemic endothelial dysfunction manifests clinically as hypertension, proteinuria, and multi-organ involvement — hallmark features of preeclampsia.

Thus, deep placentation disorders bridge early trophoblast defects to late maternal and fetal morbidity.(Figure 1)

Consequences of Deep Placentation Disorders

Deep placentation disorders exert a profound influence on both maternal and fetal outcomes, underpinning a broad spectrum of obstetric complications. The clinical consequences arise primarily due to impaired uteroplacental perfusion, oxidative stress, inflammatory activation, and systemic endothelial dysfunction.

Maternal Consequences:

Among mothers, the most notable consequence is the development of hypertensive disorders of pregnancy, especially preeclampsia. Preeclampsia is characterized by new-onset hypertension and proteinuria or evidence of organ dysfunction after 20 weeks of gestation. The pathophysiology reflects systemic endothelial activation leading to widespread vasoconstriction, increased vascular permeability, and a hypercoagulable state. Complications include eclampsia, HELLP syndrome (hemolysis, elevated liver enzymes, low platelets), cerebrovascular accidents, renal impairment, hepatic failure, and pulmonary edema. In severe cases, maternal mortality may occur if preeclampsia progresses unchecked.

Fetal Consequences:

On the fetal side, compromised placental function reduces oxygen and nutrient supply, resulting in fetal growth restriction (FGR). FGR fetuses are at elevated risk of hypoxic injury, acidosis, and stillbirth. Intrauterine hypoxia can precipitate abnormal fetal heart rate patterns necessitating emergent preterm delivery. Long-term, FGR survivors face increased risks of neurodevelopmental disabilities, metabolic syndrome, hypertension, and ischemic heart disease later in life.

Preterm Birth:

Deep placentation disorders are a major contributor to both spontaneous and medically indicated preterm births. Spontaneous preterm labor may occur secondary to placental ischemia and inflammatory cytokine activation, while indicated preterm deliveries are often undertaken to prevent maternal or fetal demise in severe preeclampsia or FGR.

Placental Abruption:

Incomplete spiral artery remodeling predisposes the placenta to mechanical failure. Placental abruption, the premature detachment of the placenta from the uterine wall, results in maternal hemorrhage, uteroplacental insufficiency, fetal hypoxia, and often stillbirth. Severe abruption may necessitate emergency cesarean delivery and can be catastrophic for both mother and fetus.

Stillbirth:

Placental insufficiency resulting from deep placentation disorders is a leading cause of late fetal demise. Chronic hypoxia, thrombotic occlusion of fetal vessels, and abruptio placentae culminate in stillbirth if not detected and managed timely.

Thus, the spectrum of consequences arising from deep placentation disorders highlights the critical necessity for early detection, careful monitoring, and strategic intervention to mitigate risks to both mother and child.

Deep Placentation and the Great Obstetric Syndrome (GOS)

The concept of the Great Obstetric Syndrome (GOS) has emerged from the recognition that a variety of pregnancy complications share a common pathophysiological origin — defective deep placentation. Traditionally, each obstetric complication was studied in isolation; however, increasing evidence suggests that preeclampsia, fetal growth restriction (FGR), preterm birth, placental abruption, and stillbirth represent different clinical manifestations of a singular underlying placental pathology.

Unifying Pathophysiological Mechanism:

The central event in GOS is defective remodeling of

maternal spiral arteries due to shallow or incomplete trophoblast invasion. Failure of vascular transformation leads to high-resistance blood flow, intermittent hypoxia, oxidative stress, and the release of antiangiogenic factors such as sFlt-1 and soluble endoglin. This cascade ultimately results in systemic endothelial dysfunction, inflammation, and coagulopathy — processes fundamental to the development of maternal and fetal complications.

Spectrum of Clinical Manifestations:

- **Preeclampsia:** Initiated by maternal systemic endothelial dysfunction secondary to placental hypoxia and oxidative stress.
- **Fetal Growth Restriction:** Resulting from impaired delivery of oxygen and nutrients to the fetus due to insufficient uteroplacental blood flow.
- **Preterm Birth:** Either spontaneous, driven by placental inflammation and cytokine release, or iatrogenic due to worsening maternal or fetal compromise.
- **Placental Abruption:** Linked to mechanical instability of the placental attachment site in the presence of ischemia-induced degeneration.
- **Stillbirth:** The end-stage manifestation when placental failure leads to prolonged fetal hypoxia and demise.

Implications for Clinical Practice:

Recognizing these complications as interrelated components of GOS shifts the clinical approach from reactive management of individual disorders to a more proactive, preventive strategy targeting placental health early in pregnancy. Risk stratification models, biomarker-based screening (e.g., PlGF, sFlt-1), and preventive interventions like low-dose aspirin are now being developed and applied with the goal of improving overall pregnancy outcomes.

Research and Future Directions:

Understanding GOS also encourages research into shared molecular pathways, such as impaired angiogenesis, oxidative damage, immune dysregulation, and coagulation abnormalities. This integrated perspective paves the way for future development of unified therapeutic strategies aimed at enhancing placental function and preventing the cascade of adverse events.

Thus, the Great Obstetric Syndrome represents a paradigm shift in maternal-fetal medicine, emphasizing the placenta's central role in a wide array of pregnancy complications.

Placental Pathology in Deep Placentation Disorders: MVMs and FVMs

Histopathological examination of the placenta provides invaluable insights into the underlying mechanisms of deep placentation disorders. Two major patterns dominate the pathology: Maternal Vascular Malperfusion (MVM) and Fetal Vascular Malperfusion (FVM). Recognition of these patterns is crucial, as they correlate strongly with adverse pregnancy outcomes and help guide clinical counseling and future pregnancy management.

Maternal Vascular Malperfusion (MVM)

Definition:

MVM refers to a constellation of histological findings indicating impaired maternal blood flow to the placenta due to defective spiral artery remodeling.

Key Histopathological Features:

- **Distal Villous Hypoplasia:** Reduced branching and maturation of terminal villi, resulting in diminished surface area for maternal-fetal exchange.
- **Accelerated Villous Maturation:** Villous structures appear more mature than appropriate for gestational age, reflecting a compensatory response to chronic hypoxia.
- **Atherosis of Spiral Arteries:** Deposition of lipid-laden macrophages (foam cells) in spiral arteries, analogous to atherosclerosis, impairing blood flow.
- **Placental Infarctions:** Focal areas of ischemic necrosis secondary to vascular occlusion.
- **Increased Syncytial Knots:** Excessive syncytiotrophoblast nuclear aggregates, indicating oxidative stress and hypoxia.

Clinical Correlates:

MVM is commonly associated with early-onset preeclampsia, fetal growth restriction (FGR), preterm birth, placental abruption, and stillbirth. The severity and extent of MVM lesions often correlate with the degree of clinical compromise.

Fetal Vascular Malperfusion (FVM)

Definition:

FVM represents a group of placental lesions reflecting obstruction or compromise of fetal blood flow within the placenta.

Key Histopathological Features:

- **Thrombosis of Fetal Vessels:** Clots obstructing fetal circulation in large chorionic plate vessels or stem villous vessels.
- **Avascular Villi:** Villous structures devoid of fetal capillaries, suggesting chronic vascular occlusion.
- **Stem Vessel Obliteration:** Fibrosis and narrowing of major fetal vessels supplying the villous tree.
- **Villus Stromal Karyorrhexis:** Fragmentation of nuclei within the villous stroma, secondary to ischemic injury.

Clinical Correlates:

FVM is associated with adverse fetal outcomes, including intrauterine growth restriction, neurologic injury, cerebral palsy, and stillbirth. It may result from umbilical cord abnormalities (e.g., hypercoiling, true knots) or hypercoagulable states.

Diagnostic Importance

Placental histopathology serves as a critical diagnostic tool post-delivery, particularly in cases of unexplained stillbirth, severe FGR, preterm birth, or recurrent pregnancy loss. Identifying patterns of MVM or FVM provides evidence of underlying pathophysiology, informs recurrence risk assessment, and directs preventive strategies in subsequent pregnancies. (Table 1)

Standardized protocols such as the Amsterdam Placental Workshop Group Consensus have been developed to ensure uniform definitions and sampling methods, enhancing the clinical utility of placental pathology.

Table 1: Key Placental Pathologies and Outcomes

Pathology	Histopathological Features	Associated Clinical Outcomes
Maternal Vascular Malperfusion (MVM)	Distal villous hypoplasia, accelerated villous maturation, atherosis, infarctions	Preeclampsia, FGR, preterm birth
Fetal Vascular Malperfusion (FVM)	Thrombosis of fetal vessels, avascular villi, stem vessel obliteration	Stillbirth, neonatal neurologic impairment
Placental Abruption	Retroplacental hematoma, decidual hemorrhage	Preterm labor, fetal demise, maternal hemorrhage
Placental Infarctions	Areas of ischemic necrosis	Severe FGR, preterm birth, stillbirth

Prevention and Newer Treatment Options

Prevention and treatment of complications arising from deep placentation disorders aim to enhance placental perfusion, mitigate endothelial dysfunction, and optimize maternal and fetal outcomes. Although no definitive cure for defective placentation exists once established, several strategies have been developed to prevent or manage associated clinical manifestations.

Prevention Strategies

Low-Dose Aspirin:

Prophylactic administration of low-dose aspirin (usually 75–150 mg daily) initiated before 16 weeks of gestation in women at high risk for preeclampsia significantly reduces the incidence of preterm preeclampsia and related complications. Aspirin's antiplatelet effect improves uteroplacental blood flow by reducing thromboxane-mediated vasoconstriction and promoting prostacyclin-mediated vasodilation.

Calcium Supplementation:

In populations with low dietary calcium intake, supplementation with 1.5–2 g/day has been shown to lower the risk of preeclampsia. Calcium likely reduces vascular smooth muscle excitability and promotes vascular stability, mitigating hypertensive responses.

Lifestyle Modification:

Optimization of maternal weight, control of chronic hypertension or diabetes, smoking cessation, and promotion of physical activity before and during pregnancy are important in reducing the risk of placental dysfunction.

Early Risk Stratification:

First-trimester screening using a combination of maternal history, uterine artery Doppler, mean arterial pressure, and biomarkers like PlGF and PAPP-A enables identification of women at elevated risk for preeclampsia and FGR, allowing targeted preventive measures.

Treatment Approaches

Emerging therapies such as statins (targeting angiogenic balance), metformin (improving vascular function), and nanoparticle-based targeted drug delivery systems are under investigation, but further trials are needed before widespread clinical adoption.

Thus, while preventive measures have substantially improved outcomes, continued research is essential to develop interventions that can directly reverse or ameliorate defective placentation.

The placenta stands at the center of pregnancy success, functioning as the critical interface that supports fetal development while regulating maternal physiological adaptations. Disruptions in the complex processes of trophoblast invasion and vascular remodeling lead to deep placentation disorders, underlying a wide spectrum of adverse outcomes grouped under the Great Obstetric Syndrome. Complications such as fetal growth restriction, preeclampsia, preterm birth, placental abruption, and stillbirth share a common placental origin, highlighting the fundamental importance of early placental health. Advances in screening, preventive strategies such as low-dose aspirin and calcium supplementation, and improved clinical management have significantly enhanced fetomaternal outcomes. Nevertheless, challenges remain in predicting, preventing, and treating these disorders, particularly in resource-limited settings. Continued research into the molecular pathways of placental development, angiogenic balance, and immune regulation holds promise for novel targeted therapies. A deeper

understanding of the placental puzzle is essential not only for optimizing pregnancy outcomes but also for shaping future preventive and therapeutic approaches in maternal-fetal medicine.

Conclusion

The placenta serves as the foundation of a successful pregnancy, ensuring appropriate fetal development and maternal adaptation. Disruptions in placental development, particularly involving defective deep placentation, give rise to a series of complications unified under the Great Obstetric Syndrome. Conditions such as preeclampsia, fetal growth restriction, preterm birth, placental abruption, and stillbirth stem from shared pathophysiological mechanisms involving impaired uteroplacental perfusion, oxidative stress, and systemic endothelial dysfunction.

Histopathological examination of the placenta, revealing patterns such as maternal and fetal vascular malperfusion, offers crucial insights into underlying disease processes and guides clinical management and counseling. Advances in screening, preventive strategies like low-dose aspirin, and management protocols have significantly improved outcomes, though challenges persist.

Ongoing research into the molecular underpinnings of placental dysfunction and the development of targeted therapies holds the promise of more effective interventions in the future. A deeper understanding of the placental puzzle remains essential for optimizing fetomaternal health and reducing the burden of adverse pregnancy outcomes worldwide.

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Forthcoming Events

- **11/05/2025** - SWASTHA NARI ABHIYAAN YATRA & "CME on Breast & Cervical Cancer Awareness: A FOGSI presidential awareness program " will be held in collaboration with Dept. of Obst & Gynae , LHMC & SSKH and AOGD in India Habitat Centre , Magnolia Hall
- The Endometriosis Committee, AOGD, is organizing a session on the "Use of Nutraceuticals in Endometriosis and Male Infertility" on **20th May 2025** from 3 PM to 5 PM at Southgate Hotel, Green Park.
- On occasion of World Menstrual Hygiene day **28th May 2025**, Community Health and public awareness SubCommitte AOGD will be conducting Awareness talks at Schools, Hospitals, Health care Centers .
- **31/05/2025** – Masterclass on Ovulation Induction and IUI: From Basics to Breakthroughs-Organized by Department of Obstetrics and Gynaecology, LHMC and Infertility & Reproductive Endocrinology Subcommittee of AOGD with SIG Early Pregnancy, Indian Fertility Society on 31st May 2025 (Saturday), 9:30 AM – 4:00 PM; Mini auditorium, LHMC, New Delhi.
- **05/07/2025 -** From Suspicion to Survival: Red flags and real-world management, will be conducted by Max Saket, New Delhi in collaboration with AOGD Oncology committee at Lalit hotel.

The Latest Evidence Based Guidelines

European Society of Human Reproduction And Embryology (ESHRE) Guideline on Endometriosis, 2022

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Introduction

Endometriosis is a common, chronic, and non-life-threatening gynecological condition, often referred to as the "chameleon of gynecology" due to its varied and often misleading symptoms. Endometriosis is defined as a disease characterised by the presence of endometrium-like epithelium and/or stroma outside the endometrium and myometrium, usually with an associated inflammatory process.[1]

The World Health Organization recognizes the condition's profound impact on quality of life, citing pain, fatigue, depression, and infertility as key contributing factors. It affects an estimated 5–10% of women of reproductive age worldwide, with more than 176 million women impacted globally.[2] Clinically, it presents with symptoms such as infertility, dysmenorrhea, and non-menstrual pelvic pain, the latter of which occurs in 50–80% of cases. Despite its high prevalence, diagnosing endometriosis remains a significant challenge—around 65% of affected women are initially misdiagnosed.

In February 2022, the European Society of Human Reproduction and Embryology (ESHRE) released a comprehensive update to its endometriosis guidelines with focus on the diagnosis and management across various life stages marking the first major revision since 2014. Based on peer-reviewed evidence, the updated guideline incorporates the latest advancements in diagnostic and therapeutic approaches, utilizing the GRADE system for evaluating evidence. The revisions focus on five key areas: **Diagnosis**, **Pain Management**, **Infertility**, **Adolescent Endometriosis**, and **Endometriosis in Menopause and Cancer**. These updates aim to refine clinical decision-making and enhance the overall quality of care for individuals with endometriosis with evidence summaries, clinical recommendations and rationale for each recommendation[4].

Key Areas of Recommendations

The guideline strongly recommends the following clinical aspects:

1. **Diagnosis of Endometriosis**
   a) Laparoscopy is no longer the diagnostic gold standard and it is now only recommended in patients with negative imaging results and/or where empirical treatment was unsuccessful or inappropriate.
   b) In patients with suspected endometriosis, clinical examination—including vaginal examination when appropriate—may be useful for detecting deep infiltrating nodules or endometriomas, although its diagnostic accuracy remains limited.
   c) Even with a normal clinical examination further diagnostic steps such as imaging (USG or MRI) in patients with suspected endometriosis, including imaging, should be considered. It is emphasised that a negative finding on imaging does not exclude endometriosis, particularly superficial peritoneal disease.
   d) The use of measurement of biomarkers in endometrial tissue, blood, menstrual or uterine fluids to diagnose endometriosis is not recommended

2. **Treatment of endometriosis-associated pain**
   a) **Hormonal therapy should be offered as a treatment option to alleviate endometriosis-associated pain** such as dyspareunia, dysmenorrhea, and non-menstrual pelvic pain,. This may include combined hormonal contraceptives (oral, transdermal, or vaginal ring formulations), progestogens, GnRH agonists, or GnRH antagonists, depending on individual needs and preferences.
   b) The levonorgestrel-releasing intrauterine system and the etonogestrel-releasing subdermal implant are recommended as effective options for managing endometriosis-associated pain.
   c) To reduce the risk of bone loss and hypoestrogenic side effects, clinicians are advised to consider prescribing combined hormonal add-back therapy in conjunction with GnRH agonist treatment.

3. **Endometriosis-associated pain refractory to other medical or surgical treatment**
   a) Aromatase inhibitors are recommended for the management of endometriosis-associated pain and may be used in combination with oral contraceptives, progestogens, GnRH agonists, or GnRH antagonists to enhance efficacy.
   b) The 2022 ESHRE guideline also introduces gonadotropin-releasing hormone (GnRH) antagonists as an additional second-line treatment option for pain management.

c) Conversely, the use of danazol, antiprogestogens, anti-adhesion agents, laparoscopic uterosacral nerve ablation, and presacral neurectomy is no longer recommended due to limited efficacy or unfavorable risk-benefit profiles.

d) Furthermore, preoperative hormonal therapy is not recommended for improving immediate surgical outcomes in endometriosis management.

4. Surgical Treatment

a) Surgical intervention should be offered as one of the treatment options for managing endometriosis-associated pain.

b) In patients with negative imaging findings or when empirical medical therapy is ineffective or inappropriate, diagnostic laparoscopy is recommended to confirm the diagnosis and guide further management.

c) For women undergoing surgery for ovarian endometriomas, cystectomy is preferred over drainage or coagulation, as it is associated with lower recurrence rates and greater reduction in endometriosis-related pain.

d) When performing cystectomy, clinicians should exercise particular care to minimize ovarian damage and preserve ovarian reserve.

5. Endometriosis-associated infertility

a. Ovarian suppression therapy should not be prescribed to improve fertility outcomes.

b. Postoperative hormonal therapy aimed solely at enhancing future pregnancy rates is not recommended.

c. Pentoxifylline, anti-inflammatory agents, and letrozole (outside of ovulation induction) should not be used to improve natural conception rates.

d. Extended GnRH agonist therapy prior to Assisted Reproductive Technology (ART) is not advised, as its benefit on live birth rates remains uncertain.

e. Routine surgery prior to ART is not recommended for women with Revised American Society for Reproductive Medicine (rASRM) stage I/II endometriosis or for those with ovarian endometriomas, due to lack of proven benefit and potential harm to ovarian reserve.

f. Surgical removal of deep endometriosis lesions prior to ART should be considered based on pain symptoms and patient preferences, as evidence for improved reproductive outcomes is insufficient.

g. In cases of extensive ovarian endometriosis, clinicians should discuss the potential pros and cons of fertility preservation, though its benefit remains unclear.

h. In the context of managing endometriosis-related infertility, the updated guideline introduces the Endometriosis Fertility Index (EFI) as a valuable tool to guide treatment decisions and identify the most appropriate strategy for achieving pregnancy following surgery.

i. The guideline also emphasizes that postoperative hormonal suppression should not be used solely to improve future pregnancy outcomes in women planning to conceive.

j. Additionally, the ultralong protocol—involving extended use of GnRH agonists prior to assisted reproductive technology (ART)—is no longer recommended, as current evidence does not support a clear benefit in improving live birth rates in infertile women with endometriosis.

6. Pregnancy and Endometriosis

Clinicians should be aware that endometriosis-related pregnancy complications are rare and based on low to moderate quality evidence. These findings should be interpreted with caution and do not justify increased antenatal monitoring or discourage pregnancy.

a. Patients should not be encouraged to conceive solely as a treatment for endometriosis, as pregnancy does not consistently improve symptoms or halt disease progression.

b. Atypical findings of endometriomas may occur during pregnancy which should prompt referral to a specialist centre.

c. Clinicians should be aware of a potentially increased risk of first-trimester miscarriage , ectopic pregnancy or atypical findings of endometriomas in women with endometriosis.

7. Endometriosis and adolescence

a) In adolescents, a detailed history to identify risk factors for endometriosis, including family history, obstructive genital anomalies, early menarche, or short menstrual cycles and evaluation of symptoms such as chronic or acyclical pelvic pain—especially when accompanied by nausea, dysmenorrhea, dyschezia, dysuria, dyspareunia, or cyclical pain—should raise suspicion.

b) Transvaginal ultrasound is recommended when appropriate to detect ovarian endometriosis.

c) If not suitable, alternatives such as MRI, transabdominal, transperineal, or transrectal imaging may be used.

d) Serum biomarkers (e.g., CA-125) are not recommended for diagnosis.

e) If laparoscopy is performed, histological confirmation through biopsy should be considered, although negative histology does not exclude endometriosis.

f) For adolescents with severe dysmenorrhea or endometriosis-related pain, first-line hormonal treatment with combined hormonal contraceptives or progestogens (oral, injectable, or LNG-IUS) is recommended. Caution is advised with some progestogens, as they may reduce bone mineral density.

g) Postoperative hormonal therapy should also be considered to help prevent symptom recurrence.

8. Endometriosis and menopause

Clinicians should avoid prescribing estrogen-only therapy for vasomotor symptoms in postmenopausal women with a history of endometriosis, due to the potential increased risk of malignant transformation.

9. Endometriosis and cancer

a) Clinicians should inform women that endometriosis does not significantly increase overall cancer risk. While there is a slightly higher risk of ovarian, breast, and thyroid cancers, the absolute risk compared with women in the general population remains low.

b) Women can be reassured that hormonal contraceptives do not significantly increase malignancy risk in the context of endometriosis.

c) Routine cancer screening beyond standard population guidelines is not recommended.

d) Although some evidence—mainly for ovarian endometriosis—suggests that complete excision may lower ovarian cancer risk, this must be balanced against surgical risks, including potential harm to ovarian reserve.

Apart from the above mentioned areas , the guideline also suggested strong recommendations for other areas as described below

Asymptomatic endometriosis

a) Clinicians should avoid routinely performing surgical excision or ablation for incidentally discovered, asymptomatic endometriosis during surgery.

b) Similarly, medical treatment is not recommended for women with incidental, asymptomatic endometriosis.

Endometriosis recurrence

a) For women undergoing surgery for endometrioma, ovarian cystectomy is preferred over drainage and coagulation to reduce recurrence of dysmenorrhea, dyspareunia, and non-menstrual pelvic pain. However, the potential impact on ovarian reserve should be considered.

b) For secondary prevention of endometriosis-associated dysmenorrhea, postoperative use of a 52 mg levonorgestrel-releasing intrauterine system (LNG-IUS) or combined hormonal contraceptives for 18–24 months is recommended.

c) In women not planning immediate pregnancy, long-term hormonal therapy (e.g., combined hormonal contraceptives) is advised after surgical treatment to prevent recurrence of endometrioma and related symptoms.

Conclusion

The guideline outlines the diagnostic process for endometriosis, which challenges laparoscopy and histology as gold standard diagnostic tests. The options for treatment of endometriosis-associated pain symptoms include analgesics, medical treatments and surgery. Non-pharmacological treatments are also discussed. For management of endometriosis-associated infertility, surgical treatment and/or medically assisted reproduction are feasible.

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Transforming OB-GYN Care: latest insights for clinical practice

Pre-Viable and Peri-Viable Preterm Prelabour Rupture of Membranes

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Battarbee AN, Osmundson SS, McCarthy AM, Louis JM; Society for Maternal-Fetal Medicine Consult Series #71: Management of previable and periviable preterm prelabor rupture of membranes. Am J Obstet Gynecol. 2024 Oct;231(4):B2-B15. doi: 10.1016/j.ajog.2024.07.016. Epub 2024 Jul 16. PMID: 39025459.

Introduction

Preterm prelabor rupture of membranes (membrane rupture before labor that occurs before 37 0/7 weeks of gestation) is associated with substantial maternal and neonatal infectious morbidity and mortality. The term "Pre viable" denotes the period when a fetus would not survive outside the uterus and thus is not a candidate for life-sustaining interventions. "Peri viable" denotes the period when the fetus may survive outside the uterus with life-sustaining interventions but still with a high risk of death or severe morbidities. Most international societies define the peri-viable period as 20 0/7 to 25 6/7 weeks of gestation. [1] Rates of neonatal survival to discharge in this period range from 23% to 76% and the rate of serious morbidity is 98% to 100% among the survivors.

Management

Management options include expectant management and abortion care. Assess for signs and symptoms of infection. Notably, clinical symptoms of infection may be less overt at earlier gestational ages. Thus, the diagnosis of intraamniotic infection and appropriate intervention should not be delayed because of the absence of maternal fever. [2]

Infection, haemorrhage, onset of labour or fetal demise preclude expectant management and abortion care should be initiated. Decision regarding the type of abortion care (procedural or medication abortion) should be according to maternal stability, gestational age, and availability of clinicians able to provide procedural abortion care. Referral to a tertiary care center may be needed depending on the availability of these services.

Ethical Concerns

The Society for Maternal-Fetal Medicine maternal risk assessment algorithm (**Figure 1**) summarizes the complex medical and contextual factors that affect maternal risk in pregnancy. Integration of these factors can guide decision-making. Clinicians should respect pregnant individuals' autonomy to make decisions that best align with their core values after counseling that provides all medically appropriate options.

Maternal medical benefit takes priority when maternal and fetal benefit conflict. When the woman prioritizes perceived fetal benefit over their own medical benefit, it does not imply that clinicians are ethically obligated to offer any requested course of action. In such circumstances, clinicians' counseling should exclude interventions where there is an absence of reasonable evidence for fetal benefit.[3]

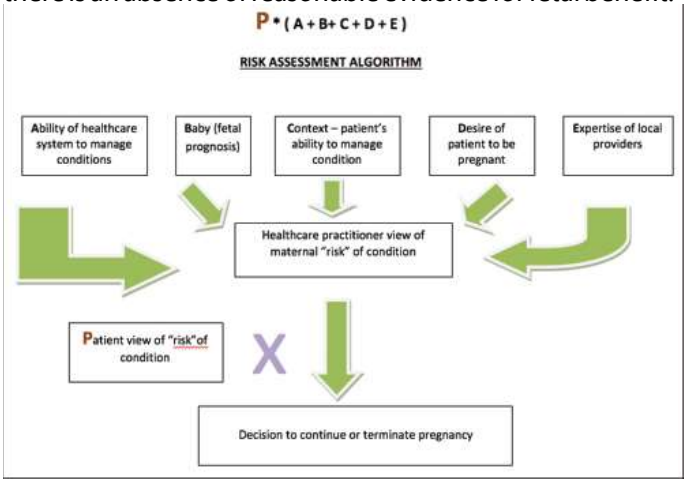

Figure 1: Society for Maternal-Fetal Medicine maternal risk assessment algorithm

Maternal risks associated with expectant management compared with abortion care

Compared with abortion care, expectant management increases the risk of multiple maternal complications. [4]

- intraamniotic infection
- endometritis, sepsis
- operative procedure after abortion/ injury requiring repair
- unplanned hysterectomy/ hysterotomy
- uterine rupture
- hemorrhage of >1000 mL, transfusion
- acute renal insufficiency
- venous thromboembolism, pulmonary embolism

Average latency and perinatal outcomes associated with expectant management

The primary goal of expectant management after previable

PPROM in patients is to reach a gestational age when the neonate can survive. For many parents, the goal is neonatal survival without major disability.

The average latency (leaking to delivery) varies substantially across studies of previable and periviable PPROM, with reported duration ranging from 7 days to 51 days. [5,6] Latency has been inversely associated with gestational age at PPROM (ie, the earlier PPROM occurs, the longer the latency period can be expected). A better measure of latency after previable and periviable PPROM may be the proportion of individuals whose pregnancies reach viability after expectant management. [7]

Even after achieving a live birth at a viable gestational age, there remains a high risk of neonatal morbidity and mortality. One of the major concerns is lack of sufficient amniotic fluid during the period of fetal lung development, resulting in pulmonary hypoplasia and/or death. Respiratory distress and bronchopulmonary dysplasia are common among surviving neonates. Other complications such as skeletal deformities, intraventricular hemorrhage, necrotizing enterocolitis, sepsis, and retinopathy of prematurity have also been observed. Long-term health problems like worse lung function, pulmonary hypertension, and lower peak oxygen consumption, motor difficulties and learning and attention problems may also occur.[8]

Antepartum interventions that improve perinatal outcomes

A) Antibiotics

Broad-spectrum antibiotics can be considered at 20 0/7 to 23 6/7 weeks to prolong latency and reduce neonatal morbidity. The recommended antibiotic regimen includes a 7-day course of antibiotic therapy with intravenous ampicillin and erythromycin for 48 hours followed by oral amoxicillin and erythromycin for an additional 5 days.

Azithromycin can be used as an alternative to erythromycin in settings where it is not available. [9]

Amoxicillin-clavulanic acid should be avoided because it has been associated with increased risk of necrotizing enterocolitis. Considerable variations exist in current clinical practice regarding optimal antibiotic type, dose, and timing of administration. Nevertheless, caution is advised against prolonged or repeated antibiotic courses.

SUMMARY OF GUIDELINES FOR INTERVENTION WITH THREATENED PERIVIABLE BIRTH

ACOG and SMFM, 2024

INTERVENTION	20 0/7 to 21 6/7 wk	22 07 to 22 6/7 wk	23 0/7 to 23 6/7 wk	24 0/7 to 24 6/7 wk	25 0/7 to 25 6/7 wk
Neonatal assessment for resuscitation	Not recommended 1A	Consider 2B	Consider 2B	Recommended 1B	Recommended 1B
Antenatal corticosteroids	Not recommended 1A	Consider 2C	Consider 2B	Recommended 1B	Recommended 1B
Magnesium sulfate for neuroprotection	Not recommended 1A	Not recommended 1A	Consider 2B	Recommended 1B	Recommended 1B
Antibiotics to prolong latency during expectant management of PPROM	Consider 2C	Consider 2C	Consider 2B	Recommended 1B	Recommended 1B
Intrapartum antibiotics for GBS Prophylaxis	Not recommended 1A	Not recommended 1A	Consider 2B	Recommended 1B	Recommended 1B
Cesarean delivery for fetal indication	Not recommended 1A	Not recommended 1A	Consider 2B	Consider 1B	Recommended 1B

PPROM: preterm prelabor rupture of membranes.

B) Antenatal Corticosteroids and Magnesium Sulfate

Administration of antenatal corticosteroids and magnesium sulfate is not recommended until the time when a trial of neonatal resuscitation and intensive care would be considered appropriate by the healthcare team and desired by the patient. [3]

C) Inpatient vs outpatient management

High-quality evidence to decide regarding inpatient vs outpatient management during expectant management is lacking. It is reasonable for individuals to be observed for a period of time in the hospital to ensure stability without evidence of preterm labor, abruption, or infection before discharging. Outpatient management with close monitoring for hemorrhage or infection is often preferred when the pregnant person desires expectant management during the period when neonatal resuscitation and intensive care would not be pursued for fetal benefit.

Before hospital discharge, it is important to provide instructions about the signs and symptoms of complications. These include daily temperature monitoring to screen for maternal fever and infection, contractions, vaginal bleeding, discolored or malodorous vaginal discharge, and abdominal pain. In addition, weekly follow-up including assessment of maternal vital signs, fetal heart rate, physical examination, and possible laboratory evaluation for signs of infection such as leukocytosis.

Hospital readmission should occur if there are contraindications to continued expectant management, such as hemorrhage, infection, or fetal demise, or after reaching a point when a trial of neonatal resuscitation and intensive care would be considered appropriate so that antenatal corticosteroids, magnesium sulfate, and antepartum fetal surveillance may be initiated.[3]

D) Serial amnioinfusions and amniopatch

Investigators have attempted to use serial amnioinfusions and techniques that reseal the amniotic membrane to improve outcomes after periviable PPROM. Trials that evaluated impact of serial amnioinfusions in cases of previable PROM until 28 to 34 weeks of gestation found no reduction in maternal and perinatal morbidity.[10]

Similarly, an amniopatch, or injection of autologous platelet concentrate and cryoprecipitate has not significantly improved perinatal morbidity after previable PPROM. Although there seemed to be evidence of longer latency (median 30 days), later gestational age at delivery (median 25.3 weeks) and less histologic chorioamnionitis (57.1% vs 76.2%) with amniopatch, these differences were not statistically significant and were limited by a small sample size. [11]

On the basis of these findings, serial amnioinfusions and amniopatch are considered investigational and should be used only in a clinical trial setting; they are not recommended for routine care of previable and periviable preterm prelabor rupture of membranes (Grade 1B).

MANAGING CERVICAL CERCLAGE AFTER PPROM

There is a lack of consensus regarding cerclage management after PPROM at any gestational age. One randomized clinical trial evaluated the efficacy of cervical cerclage removal after PPROM at 22 0/7 to 32 6/7 weeks of gestation vs expectant management with cerclage retention in situ. Cerclage retention did not significantly increase the rates of chorioamnionitis (41.6% vs 25.0%), postpartum endometritis (12.5% vs 3.1%), composite neonatal morbidity (56% vs 50%), or perinatal mortality (16% vs 12%) compared with cerclage removal. [12]

Hence, it is reasonable to either remove the cerclage or leave it in situ after discussing the risks and benefits and incorporating shared decision-making (Grade 2C).

SUBSEQUENT PREGNANCIES

There is limited evidence regarding best practices for management of subsequent pregnancies after a history of previable or periviable PPROM. On the basis of limited existing data, in subsequent pregnancies (after a history of previable or periviable PPROM), guidelines for management of pregnant persons with a previous spontaneous preterm birth (GRADE 1C) should be followed. History-indicated cerclage should be reserved for individuals with classic historical features of cervical insufficiency or an unexplained second trimester loss in the absence of placental abruption.[3]

Conclusion

Previable and periviable PPROM is a serious obstetrical complication with high rate of maternal and neonatal morbidity and mortality. Pregnant individuals require counseling about all management options, and individuals who elect expectant management should be provided with the most realistic estimate of perinatal survival and morbidities based on the best available evidence. Informed consent, respect for patient autonomy, and shared decision-making aligned with the pregnant individual's values and incorporating the best available data should ultimately guide management decisions after previable and periviable PPROM.

S. No.	SUMMARY	Grade
1.	We recommend that pregnant patients with previable and periviable PPROM receive individualized counselling about the maternal and fetal risks and benefits of both abortion care and expectant management to guide an informed decision. All patients with previable and periviable PPROM should be offered abortion care. Expectant management can also be offered in the absence of contraindications.	1C
2.	We recommend antibiotics for pregnant individuals who choose expectant management after PPROM at ≥24 weeks of gestation.	1B
3.	Antibiotics can be considered after PPROM at 20 0/7 to 23 6/7 weeks of gestation.	2C
4.	Administration of antenatal corticosteroids and magnesium sulfate is not recommended until the time when a trial of neonatal resuscitation and intensive care would be considered appropriate by the healthcare team and desired by the patient.	18
5.	Serial amnioinfusions and amniopatch are considered investigational and should be used only in a clinical trial setting; they are not recommended for routine care of previable and periviable PPROM.	1B

6.	Cerclage management after previable and periviable PPROM is similar to cerclage management after PPROM at later gestational ages; it is reasonable to either remove the cerclage or leave it in situ after discussing the risks and benefits and incorporating shared decision-making.	2C
7.	In subsequent pregnancies after a history of previable or periviable PPROM, we recommend following guidelines for management of pregnant persons with a previous spontaneous preterm birth.	1C

PPROM: preterm prelabor rupture of membranes.
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Next Generation innovations in women's healthcare

HPV Vaccine Update - Single dose, Gender neutral

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Background

Human Papilloma Virus (HPV) is a common sexually transmitted infection, with acquisition occurring soon after first sexual activity.[1] Most HPV infections are transient and asymptomatic. However, recurrent and persistent infections with high-risk (oncogenic) HPV types can lead to development of cervical, anal, penile, vaginal, vulvar, and oropharyngeal cancers, after several decades. Burden of disease is high in low- and middle-income countries due to inequity of robust screening and immunisation.[2]

Cervical cancer is the fourth most common type of cancer in women, and more than 95% of cervical cancer is caused by sexually transmitted HPV.

Increasing access to effective **HPV vaccines** is a highly significant step in preventing the development of cervical cancer thereby alleviating morbidity and mortality. Most new HPV infections occur in adolescents and young adults. Although most sexually active adults have been exposed to HPV, new infections can occur with a new sex partner.[3]

HPV infection and its immune response

HPV infections are restricted to the epithelial layer of the mucosa and known to induce a mild immune response.[40] The median time from HPV infection to seroconversion is approximately 8–12 months, although immunological response varies by individual, HPV type and duration of infection. After natural infection, 70–80% of women seroconvert; their antibody is of low titre and avidity. In men there is less response to natural HPV infection; few men seroconvert, and any antibodies produced may not be protective.4 1Hence vaccination is required to generate vigorous immune response to produce antibodies against HPV.[4,5]

HPV Vaccines[2]

HPV vaccines are highly immunogenic. The existing vaccines are delivered via the intramuscular route, resulting in rapid access to draining lymph nodes, and induce a proinflammatory milieu conducive to initiating a strong humoral response with robust memory. The serological response to vaccination is much stronger (1–4 logs higher) than the response after natural infection.[6]

The first vaccine for the prevention of HPV-related disease was licensed in 2006. Currently 6 prophylactic HPV vaccines are licensed**. (Table 1)**

All vaccines use recombinant DNA and cell-culture technology, They are prepared from the purified L1 structural protein, which self-assembles to form HPV type-specific empty shells, known as virus-like particles (VLPs). HPV vaccines do not contain live biological products or viral DNA and are therefore non-infectious. All HPV vaccines contain VLPs against high-risk HPV types 16 and 18.

The nonvalent vaccine contains VLPs against high-risk HPV types 31, 33, 45, 52 and 58; and the quadrivalent and contain VLPs to protect against anogenital warts causally related to HPV types 6 and 11.

	Vaccine	Type	Licensed	Dose Schedule	Aproximate Cost of Available Vaccine in India/Dose
1.	CERVARIX*+	Bivalent	GIRLS AND BOYS 9–14 years	2 DOSES (5-13 months apart) ≥15 YRS- 3 doses(0, 1-2.5 months, 5-12months)	Rs 2400
2.	CECOLIN*	Bivalent	GIRLS 9–14 years	2 DOSES (6 months apart) ≥15 YRS- 3 doses(0, 1-2 months, 5-8 months)	
3.	WALRINVAX	Bivalent	GIRLS 9–14 years	2 DOSES (6 months apart with min. 5 month interval) ≥15 YRS- 3 doses (0, 2-3 months, 6-7 months)	
4.	GARDASIL*+	Quadrivalent	GIRLS AND BOYS 9–13 years	2 DOSES (6 months apart) ≥13 YRS- 3 doses (0, 1-2 months, 4-6 months)	Rs 3500-4500

5	CERVAVAC+ (Indigenous)	Quadrivalent	GIRLS AND BOYS 9–14 years	2 DOSES (6 months apart) ≥15 YRS- 3 doses(0,2, 6 months)	Rs 2000
6.	GARDASIL-9*+	Nonavalent	GIRLS AND BOYS 9–14 years	2 DOSES (5-13 months apart) ≥15 YRS- 3 doses(0, 1-2 months, 4-6 months)	Rs 10840

* WHO's 2022 recommends alternative, off-label use in single-dose schedules (9-20 yrs); + Available in India

Objectives of HPV Immunisation

Adolescents are the key focus of the HPV vaccination program worldwide. Uniform recommendations across genders will simplify the immunization schedule and will effectively implement HPV vaccination when given before exposure to any HPV, as in early adolescence .[2,3]

HPV acquisition occurs soon after first sexual activity, hence ,vaccine effectiveness will be lower in older age groups due to prior infections with HPV .Evidence suggests that although HPV vaccination is safe for adults aged 27 through 45 years, population benefit would be minimal. However, some adults who are not adequately vaccinated might be at risk for new HPV infection and might benefit from vaccination in this age range.

The primary objective of HPV programmes is to prioritize HPV vaccination as a part of immunisation ,among Primary target group i.e. Girls aged 9–14 years before they become sexually active . Achieving over 80% coverage in girls also reduces the risk of HPV infection for boys.

Vaccination of secondary target populations, e.g. females aged ≥15 years, boys, older males or MSM, is recommended only if this is feasible and affordable, and does not divert resources from vaccination of the primary target population or effective cervical cancer screening programmes.(6)

HPV Vaccination Schedule[2]

WHO recommends:

- A one or two-dose schedule for girls aged 9-14 years
- A one or two-dose schedule for girls and women aged 15-20 years
- Two doses with a 6-month interval for women older than 21 years
- Individuals known to be immunocompromised or HIV-infected (regardless of age or antiretroviral therapy status) should receive at least two HPV vaccine doses (minimum 6 months interval) and, where possible, three doses.

***Alternative single-dose schedule. As an off-label option, a single-dose schedule can be used in girls and boys aged 9–20 years.**

Centres for Disease Control and Prevention (CDC) recommendations[7]

- Two doses of HPV vaccine are recommended for most persons starting the series from 9 to < 15 yrs of age. The second dose of HPV vaccine should be given 6 to 12 months after the first dose.
- Adolescents who receive two doses less than 5 months apart will require a third dose of HPV vaccine.
- Three doses of HPV vaccine(0, 1–2 and 6 months) are recommended for teens and young adults who start the series at ages 15 through 26 years.
- Three doses are recommended for immunocompromised persons (including those with HIV infection) aged 9 through 26 years.
- For adults ages 27 through 45 years, clinicians can consider discussing HPV vaccination with people who are most likely to benefit. HPV vaccination does not need to be discussed with most adults over age 26 years.

Choice of HPV Vaccine[7]

Current evidence suggests that, from a public health perspective, all currently licensed bivalent, quadrivalent and nonavalent vaccines offer comparable immunogenicity, efficacy and effectiveness for the prevention of cervical precancer and cancer, which is mainly caused by HPV types 16 and 18.The choice of HPV vaccine should be based on an assessment of locally relevant data on the magnitude of HPV-associated burden of disease and available infrastructure and type of vaccine availability.

Vaccine Efficacy and Safety.[8,9]

- HPV vaccines are very safe. Scientific research shows the benefits of HPV vaccination far outweigh the potential risks. Like all medical interventions, vaccines can have some side effects.
- Data were considered from 11 clinical trials of 9vHPV(9 valent), 4vHPV(4valent), and/or 2vHPV(2 valent) in adults aged 27 through 45 years, along with supplemental bridging immunogenicity data. In per-protocol analyses from three trials, 4vHPV and 2vHPV demonstrated significant efficacy against a combined endpoint of persistent vaccine-type HPV infections, anogenital warts, and cervical intraepithelial neoplasia (CIN) grade 1 (low-grade lesions) or worse.
- In nine trials, seroconversion rates to vaccine-type HPV

after 3 doses of any HPV vaccine were 93.6%–100% at 7 months after the first dose. Overall evidence on benefits was GRADE evidence level 2, for moderate-quality evidence. In nine trials, few serious adverse events and no vaccine-related deaths were reported(GRADE evidence level 2.

Storage OF HPV Vaccines[2]

- All HPV vaccines should be stored at 2–8 °C, not frozen and protected from light. They should be administered as soon as possible after being removed from the refrigerator. The shelf-life of HPV vaccines is as per manufacturers guidelines. Cervarix is stable and can be stored outside the refrigerator for up to 3 days at temperatures between 8 °C and 25 °C, or for up to 1 day at temperatures between 25 °C and 37 °C.
- Gardasil and Gardasil-9 are licensed to be stored for 3 days at temperatures from 8 °C to 42 °C (controlled temperature chain (CTC)) or for 4 days at temperatures from 8 °C to 40 °C.

Current Position of HPV Vaccines[10]

- SAGE's review in April 2022 concluded that a single-dose Human Papillomavirus (HPV) vaccine delivers solid protection against HPV, the virus that causes cervical cancer, that is comparable to 2-dose schedules. refOften referred to as the 'silent killer' and usually preventable, cervical cancer is a disease of inequity of access.
- The new SAGE recommendation is due to concerns over the slow introduction of the HPV vaccine into immunization programs and overall low population coverage, especially in poorer countries. The option for a single dose of the vaccine is less costly, less resource intensive and easier to administer. It facilitates implementing catch-up campaigns for multiple age groups, reduces the challenges linked to tracing girls for their second dose.
- WHO endorsed SAGE recommendations and opined in their position paper of single-dose schedule, referred to as an alternative, off-label single–dose schedule that can provide a comparable efficacy of protection similar to a two-dose regimen. improving sustainable supply of HPV vaccines—allowing more coverage of girls to prevent cervical cancer.

Single Dose Rationale[11,12]

The avidity of the polyclonal antibody response is much higher after vaccination than after infection but does not increase appreciably after boosting. The high efficacy of HPV vaccine seen in the clinical trials to date has precluded identification of a minimum protective antibody titre, and there is no known serological correlate of immunity. Most studies found very high rates of seropositivity for vaccine-type HPV genotypes, regardless of the number of doses received.

Particulate antigens, such as VLPs, can persist for years in lymph nodes49 and may be the mechanism for the observed avidities after single-dose HPV vaccination. These data include results from a high quality RCT in which 2250 sexually active 15–20-year-old females were randomized to receive either bivalent (Cervarix) or nonavalent (Gardasil-9) vaccine or to a control group. At 18 months postvaccination, the efficacy of a single dose of HPV vaccine against incident persistent high-risk (HPV16/18) infection was 97.5% (95%CI 82–100) for the nonavalent vaccine and 97.5% (95%CI 82–100) for the bivalent vaccine.

In a similar randomized open-label trial (DoRIS), 930 females aged 9–14 years were randomized to receive 1, 2 or 3 doses of bivalent (Cervarix) or nonavalent (Gardasil-9) vaccine. At 24 months postvaccination, over 97.5% of participants in all dose groups for both vaccines were seropositive. Immunobridging showed that a single dose of HPV16/18 produced antibody responses that were non-inferior to those in studies where single-dose efficacy was observed.

Systematic reviews have shown seropositivity among single dose subjects ,to be non-inferior to those after 2 or more doses.48, 82 the adjusted reductions in HPV infection prevalence were similar for three doses (92%; 95% CI 85–96), two doses (93%; 95%CI 53–99), and one dose (92%; 95%CI 46–99).(11)

Vaccine Efficacy estimates against HPV16/18 infections were similar for single dose and multidose regimens. HPV16/18 antibodies were shown to persist at levels several times above natural infection for up to 11 years in all subjects, including those who received a single dose.

Worthwhile to note is that data on outcomes of single-dose HPV vaccination among males are limited.

Precautions[2,8]

1. Syncope (fainting) can occur after any medical procedure, including vaccination. Adolescents should be seated or lying down during and after 15 minutes of vaccination in-order to prevent any injuries that can result as a fall during a syncopal event.
2. Acute illness (moderate to severe) – Defer vaccination until symptoms of the acute illness improve
3. Minor acute illness (Diarrhoea or mild upper respiratory tract infection)- No need to defer vaccination.

Adverse Reactions[10]

- The most common adverse reactions reported are local reactions at the site of injection i.e. redness, swelling and pain.
- A temperature of 100°F during the first fortnight after HPV vaccination has been reported in 10% to 13% of recipients. A similar proportion of placebo recipients

too, reported an elevated temperature.

- Systemic adverse reactions include nausea, dizziness, myalgia, and malaise. However, these symptoms occurred with equal frequency among both HPV vaccine and placebo recipients.
- No serious adverse events have been associated with any HPV vaccine. Ongoing monitoring is conducted by CDC and the Food and Drug Administration.

Contraindication[2,10]

1. History of immediate hypersensitivity to yeast as 9-valent HPV vaccine is produced in Saccharomyces cerevisiae (baker's yeast)
2. A known severe allergic reaction (e.g., anaphylaxis) to a vaccine component or following a prior dose of HPV vaccine.
3. Pregnancy - HPV vaccines have not been studied in pregnant women in clinical trials. Women known to be pregnant should delay initiation of the vaccination. However, pregnancy testing before vaccination is not needed. If a woman is found to be pregnant after starting the HPV vaccine series, further doses should be delayed until she is no longer pregnant.

Note: Any suspected adverse events following HPV vaccination during pregnancy or otherwise should be reported to Vaccine **adverse event reporting System (VAERS).**

Conclusion

HPV is a very common sexually transmitted infection. Most HPV infections are transient and asymptomatic and cause no clinical problems.

HPV vaccination prevents new HPV infections but does not treat existing HPV infections or diseases. HPV vaccine works best when given before any exposure to HPV.

A new sex partner is a risk factor for getting a new HPV infection. Those in a long-term, mutually monogamous relationship are not likely to get a new HPV infection

WHO underscores the importance of vaccinating as a priority of immunocompromised people, or those living with HIV. Immunocompromised individuals should receive at a minimum two doses and where possible three doses.

WHO recommends Alternative single-dose schedule as an off-label option, in girls and boys aged 9–20 years.

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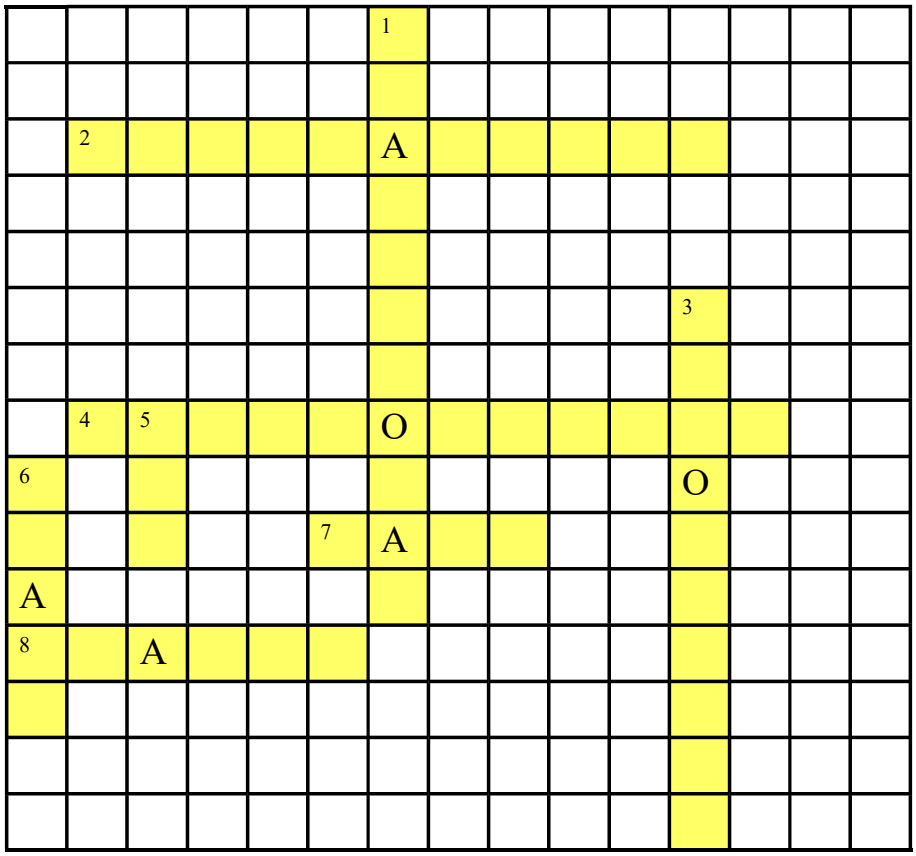
Quiz: "Crack the Code!"

Shivangni Sinha
Assistant Professor, Department of Obstetrics and Gynaecology,
LHMC & SSK Hospital, New Delhi



Down

1. Identify the third-party reproduction which involves a surrogate carrying a child which is genetically related to her?
3. Gold standard for diagnosis of pelvic congestion syndrome?
5. Single best predictor of IVF success in terms of clinical pregnancy and live birth rates in a self-cycle?
6. The trial that demonstrated the non-inferiority of simple hysterectomy to radical hysterectomy with respect to local recurrence in patients with stage IA2 and IB1 cancers less than 2 cm in size and with less than 10 mm of stromal invasion on excisional biopsy or less than 50% of the stromal depth on magnetic resonance imaging?

Across:

2. The nerve plexus that holds clinical-surgical significance, and needs to be preserved during nerve-sparing fertility preserving procedures in cases of endometriosis/radical hysterectomy?
4. The first FDA- approved SERM that combines with conjugated estrogen to treat vasomotor symptoms and help reduce the risk of osteoporosis in a menopausal woman with intact uterus.
7. The trial that investigated the clinical consequences of using a guideline based on Zhang's normal labor curve compared with the Friedman's Curve of labor?
8. Sterilization technique using hydrogen peroxide gas, and radiofrequency energy at a low temperature primarily for heat sensitive medical instruments/ Laparoscopic instruments?

Answer:
Down: Traditional, Venography, Age, SHAPE
Across: Hypogastric, Bazedoxifene, LaPS, Plasma

AOGD Monthly Clinical Meeting Held on 25th April 2025

Organized by ESI PGIMSR Basaidarapur, New Delhi

1. DOUBLE TROUBLE: ENDOMETRIOMA'S DECEPTIVE MIMICRY

Sanghmitra Rawat[1], Shabnam[2], Taru Gupta[3], Shalini Mahana Valecha[4]

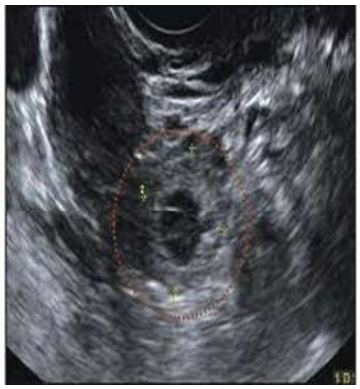
Post Graduate Student[1], Assistant Professor[2], Professor[3], Director Professor and Head of Department[4]

Department of Obstetrics and Gynaecology, ESIC Medical College and Hospital, Basaidarapur, Delhi

Pregnancy with adnexal mass is not uncommon and are detected incidentally in first trimester. Most of them are generally benign and resolve spontaneously. Some, however need urgent attention as they may complicate and cause morbidity and mortality. Complications like rupture, bleeding & torsion need immediate intervention in cases like heterotopic pregnancy, corpus-luteal-cyst, endometrioma. Rising needs of Assisted-Reproductive-Techniques has increased the incidence of Heterotopic pregnancies. Furthermore, ovarian ectopic being its rare subpart is life threatening & is diagnostically challenging preoperatively due to radiological similarities with other adnexal masses.

A 29-year-old, Primigravida with 1.5 months of amenorrhea presented with complaint of lower-abdominal-pain since 1 week with sudden exacerbation since 1 day. On-examination, patient had tachycardia, tenderness present in right lower-abdomen and 4x4cm tender-mass with restricted mobility felt in right-fornix with cervical-motion-tenderness. Ultrasonography revealed a single-live-intrauterine-fetus of 6^{+2} weeks with a 5x4 cm thick-walled cystic-mass in right-ovary with 'ring-of-fire' sign positive and mild free-fluid in Pouch-of-Douglas prompting urgent intervention. Exploratory laprotomy followed by cystectomy i/v/o heterotopic pregnancy was done. Per-operative findings showed: 6-8 weeks gravid uterus, Discolored Ovarian mass of around ~ 5 x 4 cm with mild free fluid in POD. Cyst wall excision was done and sample sent for HPE. Histopathological report revealed a Decidualized Endometriotic Cyst. Post-operative period was uneventful. Patient is continuing her intrauterine-pregnancy successfully.

This report describes a case of suspected ovarian heterotopic pregnancy ended up being an intrauterine-pregnancy with decidualized endometrioma. Pregnancy with adnexal mass are difficult to differentiate from heterotopic pregnancy due to their clinico-radiological similarities with ectopic pregnancy, Corpus luteal/Hemorrhagic-cyst, Hydrosalpinx, Endometriotic-cyst, Ovarian-Torsion or Degenerating-Fibroid. Although rare, possibility of heterotopic pregnancies should not be neglected in patients with intrauterine-gestation with symptomatic adnexal mass due to its potentially life-threatening nature and difficult preoperative diagnosis. First line of investigation for evaluation is Ultrasound with Color Doppler. MRI can be used in complex masses in hemodynamic stable patient. Diagnostic Laproscopy is the gold standard investigation for diagnosis. Tumor markers may be used to rule out benign and malignant tumors. Often these masses are diagnosed intraoperatively or postoperatively after histopathological report. Pregnancy with adnexal mass remains uncomplicated and resolve spontaneously and are usually managed conservatively, however, may require surgical interventions in complications like torsion, rupture or inflammation. Heterotopic-pregnancy is usually treated-surgically (if intrauterine pregnancy is desired) and the intrauterine component is preserved which may continue normally. High index of suspicion can minimize both morbidity and mortality of the patient.



2. A DILEMMA: BIOCHEMICAL PREGNANCY WITH LARGE FIBROID LEADING TO HEMOPERITONEUM AND SHOCK

Mahendra Kumar Bairwa[1], Priyanka Talware[2], Taru Gupta[3]

Assistant Professor[1], Post Graduate Resident[2], Professor [3]

ESIPGIMSR Medical college Basaidarapur New Delhi

Fibroids are most common pelvic tumors of reproductive age in females seen in 25 % approximately .They are usually asymptomatic and may present as dysmenorrhea , abnormal uterine bleeding , infertility or pressure symptoms .This case report emphasis the necessity of considering rupture of superficial feeding vessel of fibroid and highlights the need for thorough evaluations when patient presents with hemoperitoneum and shock with early pregnancy . A 42-year-old female gravida 3 para 2 live 2 presents with sudden abdominal pain and urine pregnancy test positive and presented with shock. Imaging suggested of

hemoperitoneum and large right adnexal mass? subserosal fibroid? TO mass. However, surgical exploration revealed a superficial feeding vessel rupture of fibroid leading to massive hemoperitoneum . Patient underwent emergency laparotomy followed by hysterectomy with bilateral salpingectomy as all conservative measures failed to ensure haemostasis. Her histopathological report show large fibroid with no decidua or chorionic villi in endometrial cavity . A high index of suspicion and detailed imaging are essential for accurate diagnosis as early detection can be managed with minimally invasive methods.

3. WANDERING FIBROID: THE LOST TRAVELLER

Anjali Malik[1], Deepshikha Jaiswal[2], Disha Andhiwal Rajput[3]

Post graduate student[1], Assistant Professor[2], Professor and Unit head[3]

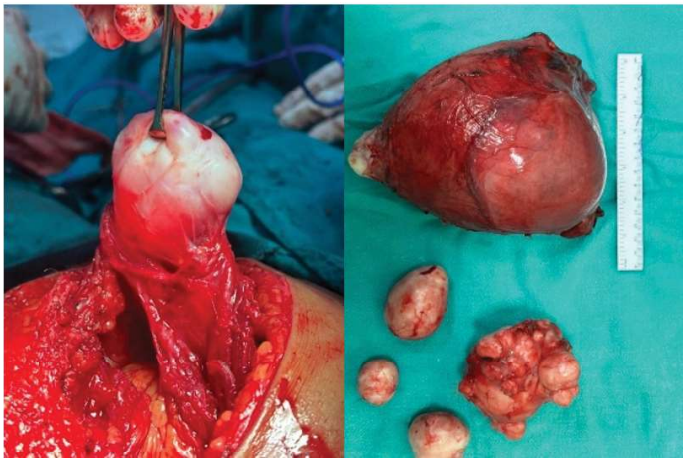
Department of Obstetrics & Gynaecology, ESIC Medical College & Hospital, Basaidarapur, Delhi

Parasitic or wandering fibroids, classified as Type 8 under the FIGO leiomyoma classification system, are a rare form of uterine fibroids that detach from the uterus and reimplant onto extrauterine structures, deriving blood supply from adjacent tissues. These fibroids may occur spontaneously but are increasingly linked to surgical interventions, especially laparoscopic myomectomy involving power morcellation, with reported iatrogenic incidence ranging from 0.07% to 1.25%.

This case report details a 44-year-old multiparous woman who presented with irregular, heavy menstrual bleeding and an abdominopelvic mass. Her surgical history included laparoscopic myomectomy, later converted to open surgery, and a subsequent mesh repair for hernia. Imaging and clinical evaluation suggested uterine fibroids, prompting a total abdominal hysterectomy. Intraoperatively, multiple fibroids were found embedded within the rectus muscle, entirely separated from the uterus. Histopathological confirmation established the diagnosis of parasitic leiomyomas.

Parasitic fibroids often present with vague symptoms such as abdominal pain or fullness, making diagnosis challenging. While imaging modalities like ultrasound and MRI aid in evaluation, definitive diagnosis typically requires surgical exploration and histopathology. Treatment involves complete surgical excision, with careful inspection to detect any additional fibroid implants.

This case underscores the importance of clinical suspicion for parasitic fibroids in women with a history of fibroid surgery and highlights the risks associated with uncontained morcellation. It reinforces the need for cautious surgical approaches and thorough postoperative follow-up to minimize the potential for tissue dissemination and recurrence.



Events Held 2025

Glimpses of the AOGD office handing over to LHMC on 28th March, 2025

Public forum on "Safe Motherhood" on the occasion of Word Health Day" Conducted by Dept. of Obst. & Gynae LHMC & SSK Hospital & AOGD on 7th April 2025

Training cum awareness program on occasion of National Safe Motherhood Day conducted by Community health and Public Awareness Subcommittee on 7th April 2025

Public awareness camp on Prevention of CaCx & opportunistic screening conducted by Breast and cervical cancer awareness and prevention committee on 11th April 2025 at GTB Hospital

Public awareness activity on "Health and mental well being of pregnant mothers" conducted by Safe motherhood committee AOGD on 11th April at Shree Sanatan Dharm Mandir

Talk on "Robust Antoenatal Care & Safe Motherhood Healthy baby" by Safe motherhood committee AOGD on 14th April at SMS Hospital, Gagan Vihar

CME on "Healthy Beginnings, Hopeful Futures: Advancing Maternal and New born Health" "Occasion of World Health Day" conducted by Dept. of Obst. & Gynae LHMC & SSK Hospital & AOGD on 19th April 2025

Department of Obstetrics & Gynaecology
Lady Hardinge Medical College &
Smt. Suchita Kriplani Hospital, New Delhi
under the aegis of AOGD
Organizes
CME on Healthy Beginnings, Hopeful Futures: Advancing Maternal and New born Health
On the Occasion of World Health day
On
Date: **19th April 2025,** *Time:* **10.00 am-12.00**
Venue: **ME Hall SJ Auditorium, LHMC, New Delhi**

Program Schedule

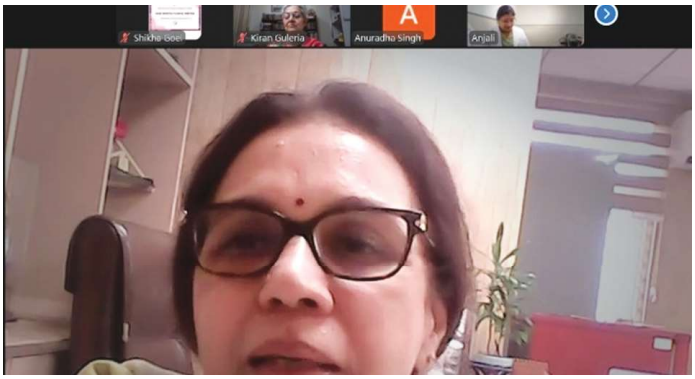
Dr Reena Yadav	Dr Sharda Patra	Dr Apoorva Kulshreshtha
Organizing Chairperson	Organizing Secretary	Joint Organizing Secretary

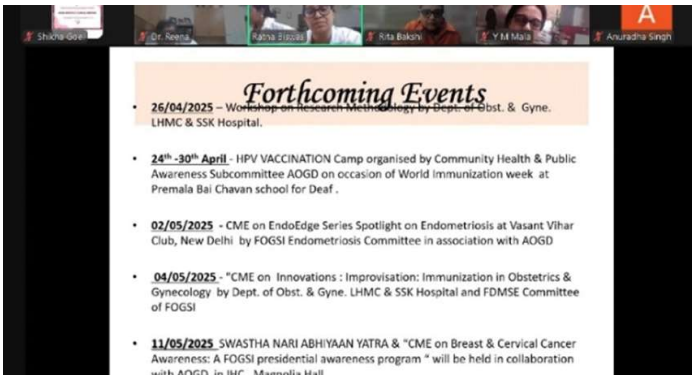
10.00AM-10.15am	Welcome Address- **Dr Reena Yadav** *Speech by* **Dr Anju Seth**, Principal LHMC & SSKH, *Chief Guest* *Guest of Honour* **Dr LH Ghotekar** IMS, SSKH, **Dr Harish Pemde**, MS KSCH		
Session 1: Maternal Health - Optimizing Antenatal and Intra partum Care for Better Outcomes			
Time	**Topic**	**Speaker**	**Chairperson**
10.15am-10.30am	Anemia Mukt Bharat: Ensuring Healthy Beginnings for Every Mother and Baby"	Dr Swati Agrawal	Dr S S Trivedi Dr Ashok Kumar
10.30am-10.45am	Tackling Pregnancy Hypertension: Innovations and Best Practices"	Dr Vidhi Chaudhary	Dr Reena Yadav Dr Tanu Gupta
10.45am-11.00am	WHO Labor Care Guide: A Roadmap to Positive Birth Experiences"	Dr Meenakshi Singh	Dr S N Basu Dr Y Mala
11.00am-11.15am	Managing Postpartum Haemorrhage in a Resource-Limited Setting	Dr Anuradha Singh	Dr Kiran Aggarwal Dr Jyoti Bhaskar
11.15am-11.25am	**Q & A (5 min)**		
Session 2: New born Health 40 min: Neonatal Resuscitation and Immediate New born Care			
11.25am-11.35am	Neonatal resuscitation protocols (NRP)	Dr Sushma Nangia	Dr Harish Pemde Dr Ratna Biswas
11.35am-11.45am	Kangaroo Mother Care for preterm babies	Dr Pratima Anand	Dr Manisha Kumar
11.45am-11.55am	Preventing birth asphyxia and neonatal hypothermia	Dr Ajay Dudeja	
	Q&A (5mins)		
AOGD Executive committee meeting 12-1pm followed by Lunch			

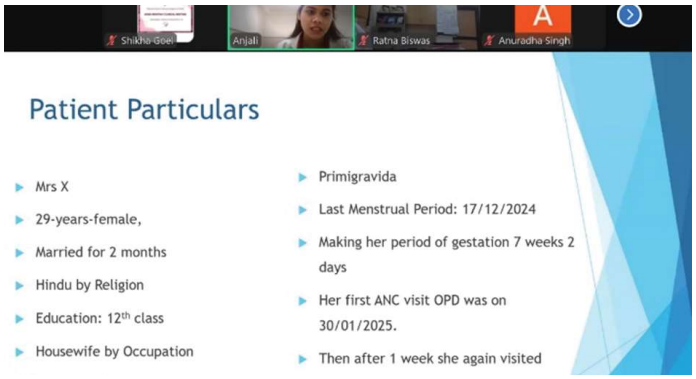
A CME on Cervical cancer prevention & awareness conducted by Breast and cervical cancer awareness and prevention committee on 24th April at Sir Ganga Ram Hospital

CME cum Hands on Workshop on "vNOTES (Vaginal Natural Orifice Transluminal Endoscopic Surgery)" conducted by Dept. of Obst. & Gynae LHMC & SSK Hospital & AOGD on 24th April 2025

The AOGD Monthly Clinical Meeting (virtual) conducted by the Department of Obst & Gynae, ESI, Basaidarapur Hospital, New Delhi on 25.04.2025







Workshop on Research Methodology conducted by Dept. of Obst. & Gyne. LHMC & SSK Hospital and AOGD on 26th April 2025

Surgical Camp at Civil Hospital Jogindernagar, Himachal Pradesh under Urogynae sub committee and Okti Foundation and HPV Vaccination to 150 adolescent girls undertaken in collaboration with Innerwheel club on 28th April 2025.

Community Health and Public Awareness subcommittee organized free HPV Camp for specially abled children and Awareness Talk on HPV vacination and Cervical cancer screening in association with Golden Lioness Club, Anaya and IAP East Delhi on 28/4/2025.





CME on EndoEdge Series Spotlight on Endometriosis conducted by FOGSI Endometriosis Committee in association with AOGD at Vasant Vihar Club, New Delhi on 02/05/2025


"CME on Innovations: Improvisation: Immunization in Obstetrics & Gynecology conducted by AOGD & Dept. of Obst. & Gyne. LHMC & SSK Hospital in association with FDMSE Committee of FOGSI on 04/05/2025.

AOGD President & Vice President Election (2026-27)

Call for nominations

Nominations are invited from eligible AOGD members for the following posts

- President (2026-27)
- Vice President (2026-27)

Last date for submission of nominations is 31th Mav, 2025

- Applications by desirous candidates should be submitted on the prescribed form available on AOGD website (www.aogd.org)/bulletin/office, with due entry in the office register in a sealed envelope & through email aogdlhmc2025@gmail.com.
- The nomination shall be proposed by one regular member and seconded by two regular AOGD members.
- The candidate, his/her proposer and seconder should have cleared all their dues towards the membership subscription in full. Noncompliance with this condition shall render the nomination invalid.
- Nominations as per the eligibility criteria should reach AOGD secretariat: Department of Obst. & Gynae LHMC & SSK Hospital, New Delhi-110001 (Phone no. 9717392924) by 31st May 2025.

Accepted nomination(s) will be displayed at AOGD website by 15 June, 2025.

NOTE:

- The new members joining AOGD after the date of call for nominations will not be eligible for voting.
- Associate members are not eligible to vote.

Dr. Ratna Biswas (Secretary AOGD, 9971372695)

Eligibility Criteria for PRESIDENT AOGD

1. He/she shall be a senior and active member of faculty in a multidisciplinary hospital of Delhi in the public or the private sector, with such hospital having clinical and para-clinical departments and having post graduate courses, duly recognized by the National Medical Commission and/or the National Board of Examination.
2. He/she must have held the post of professor/ senior consultant/ an equivalent thereof with such hospital for more than 10 years.
3. He/she must have the experience of having completed at least one tenure as the chairperson of a sub-committee of the AOGD or the experience of having completed at least one tenure as Vice President or Secretary or member of the Executive Committee of the AOGD.
4. He/she must be a life member of the AOGD with more than twenty years of experience after post graduation in the specialty of obstetrics and Gynaecology.
5. He/she should have experience of conducting academic conferences, seminars or workshops.
6. A person who has held the post of President of the AOGD in the past shall be ineligible to hold the post of President of the AOGD again.

7. Faculty from the institution that fields the President shall be ineligible to apply for election to the post of President for a period of five years from the date of start of the tenure of that President.

Eligibility Criteria for VICE PRESIDENT AOGD

1. He/she shall be a senior member of faculty in a multidisciplinary hospital of Delhi in the public or the private sector, with such hospital having clinical and para-clinical departments and having post graduate courses, duly recognized by the National Medical Council/National Board of Examination.
2. He/she must have held the post of professor/senior consultant/or an equivalent thereof with such hospital for more than seven years.
3. He/she must have the experience of having completed at least one tenure as the chairperson of a sub-committee of the AOGD or the experience of having completed at least one tenure as Secretary or Treasurer or Editor or member of the Executive Committee of the AOGD having attended at least 75% of the meetings of the Executive Committee during his/her tenure as member of the Executive Committee
4. He/she must be a life member of the AOGD with more than fifteen years of experience after post graduation in the specialty of obstetrics and gynaecology.
5. He/she should preferably, have experience of conducting academic conferences, seminars or workshops.
6. A person who has held the post of Vice-President of the AOGD in the past shall be ineligible to hold the post of Vice-President of the AOGD again.

The Association of Obstetricians & Gynaecologists of Delhi

Nomination Form

Name:_____

Designation/Affilation_____

AOGD Membership no:_____

Official Address:_____

Residential Address:_____

Phone:_____Email:_____

Bio Sketch (Relevant to the Eligibility Criteria in 250words)

Post Applied for

President 2025-26 ☐ Vice President 2025-26 ☐

Proposed by – Name AOGD Membership no. Signature

1.

Seconded by

1.

2.

Nominations should reach at AOGD Office
For any Query please call Mrs. Sarita : 9211656757, 9717392924

Association of Obstetricians & Gynaecologists of Delhi

MEMBERSHIP FORM

Name:.....

Surname: .....

Qualification (year): .....

Postal Address: .....

City:..... **State:** ..... **Pin code:** .....

PHOTO

Place of Working: .....

Residence Ph. No. ..... **Clinical / Hospital Ph. No.** .....

Mobile No:..... **Email:** .....

Gender: Male:..... **Female:**.....

Date of Birth: Date.....**Month** ..... **Year**.....

Member of Any Society:.....

Proposed by .....

Cheque/DD / No: .....

Cheque/Demand Draft should be drawn in favour of: **Association of Obstetricians and Gynaecologists of Delhi**

FOR ONLINE TRANSFER THROUGH NEFT/RTGS

Name of Account: Association of Obstetricians and Gynaecologists of Delhi
Account no: 5786412323
Name of Bank: Central Bank of India
Branch: LHMC & SSK Hospital
IFSC code: CBIN0283462
MICR code: 110016067

ASSOCIATION OF OBSTETR
12418708@cbin
BHIM UPI

For Life Membership	: Rs. 11,000 + Rs. 1,980 (18% GST applicable) = Rs. 12,980
For New Annual Membership*	: Rs. 2,000 + Rs. 360 (18% GST applicable) = Rs. 2,360
For Old Renewal Membership+	: Rs. 1,200 + Rs. 216 (18% GST applicable) = Rs. 1,416

Encl.: Attach Two Photocopies of All Degrees, DMC Certificate and Two Photographs (Self attested)

*** Annual Membership is for the calendar year January to December.**

*** In case of renewal, mention old membership number.**

Note: 18% GST will be applicable as FOGSI requires it.

Send Complete Membership Form Along With Cheque / DD and Photocopy of required documents to the secretariat.
For online transaction send scan copy of all documents with payment slip on given mail id

Secretariat
Department of Obstetrics and Gynaecology
Lady Hardinge Medical College & SSK Hospital, New Delhi-110001
Tel.: 011-23408297, (M): 9717392924 | Email Id: aogdlhmc2025@gmail.com

AOGD SECRETARIAT
Department of Obstetrics and Gynaecology
Lady Hardinge Medical College & Associated Hospitals, New Delhi-110001
Tel.: 011-23408297, (M) : 9717392924 | Email Id: aogdlhmc2025@gmail.com