

出國報告（出國類別：開會）

2025 FMF 胎兒醫學基金會年會開會報告

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摘要

本屆大會雲集全球超過 3000 位與會者參與此次盛會，聚焦胎兒結構異常的產前診斷與介入、母胎併發症（特別是先兆子癇與妊娠糖尿病）、AI 於超音波與胎兒心臟病檢查的應用、先天遺傳疾病與基因異常關連，以及多胞胎妊娠併發症（如: TTTS 與 TAPS）的精準醫學發展。

本報告依據大會官方議程與講者內容，系統性的陳述十項關鍵主題，涵蓋從胎兒神經系統異常、脊髓裂與腹壁畸形，到複雜心臟病介入與 AI 決策輔助技術等重要主題。報告將針對每主題說明最新研究成果、具體臨床應用與潛在發展挑戰。亦將於文末提出未來趨勢展望，包括精準醫療與 AI 結合、胎內治療，以及跨領域的合作。

關鍵字：母胎影像醫學、超音波、胎兒醫學基金會、FMF

目 次

一、	目的.....	1
二、	過程.....	1
三、	心得.....	9
四、	建議與改進作法.....	10
五、	附錄.....	11

一、 目的

胎兒醫學基金會（Fetal Medicine Foundation, FMF）起源於英國倫敦，致力於母胎醫學領域的繼續教育和推廣，每年的年會由歐洲各國輪流舉辦，近年多次參加國際年會後，深深感到學無止境，腳步要加快。

有鑑於母胎醫學領域的日新月異，自去年九月份參加於布達佩斯舉辦的第33屆ISUOG年會，再次滿新期待把平日自己在專業領域的所聽所聞與實際臨床工作上經歷到的一些疑惑，能夠再度藉此五天的盛會，獲得實質的回饋與更上一層樓。

出發前的兩到三個月的期間，個人花了許多時間，根據大會先提供的議程及節目表，計畫性的針對比較困難與不熟悉的主題，仔細加以閱讀文獻多方了解。行前，即設定了數個熱門和冷門的參與主題，且聚焦於多元化的[母胎醫學影像]與[遺傳醫學]相關的主題，其中包括早孕期結構檢查（特別是腦部及心臟）、胎兒異常、多胞胎妊娠懷孕、產前遺傳診斷、與人工智慧 AI 發展與運用等主題。目的是希望充分利用此次盛會，獲得滿載的充電而歸，嘉惠我們的孕產婦，也和未成行的同好進行分享。

二、 過程

6月29日：清晨 7:30 抵達布拉格機場（時差慢六小時），即刻前往旅館先寄放行李，搭地鐵前往 Prague Congress Center，並如期趕上九點的開幕式。先快速的了解 Day1 的整個課程（如圖一）。

Sunday 29th June 2025: Joint session with Eurofoetus

08:00 - 09:00	Registration	
09:00 - 09:10	Welcome	Kypros Nicolaides (UK)
09:10 - 10:05	Vein of Galen aneurysm Discussants: Yves Ville (France), Michael Belfort (USA)	
09:10 - 09:18	Pathophysiology	Darren Orbach (USA)
09:18 - 09:26	Prenatal prediction of outcome	Karen Chen (USA)
09:26 - 09:34	Outcomes of postnatal treatment	Fergus Robertson (UK)
09:34 - 09:42	Prenatal embolization	Darren Orbach (USA)
09:42 - 09:50	Feasibility of antegrade embolization	Emma Vanden Eede (Belgium)
09:50 - 10:05	Discussion	
10:05 - 10:45	Ventriculomegaly Discussants: Jan Deprest (Belgium), Greg Ryan (Canada)	
10:00 - 10:08	Differential diagnosis by ultrasound	Anastasija Arechivo (UK)
10:08 - 10:16	Additive values of MRI	Gregor Kasprian (Austria)
10:16 - 10:25	Early genomic sequencing for tailored in-utero therapy	Akos Herzeg (USA)
10:25 - 10:35	Is fetal surgery likely to be useful?	William Whitehead (USA)
10:35 - 10:45	Discussion	
10:45 - 11:00	Prenatal therapy for spinal muscular atrophy	Richard Finkel (USA)
11:00 - 11:30	Coffee break	
11:30 - 12:45	Spina bifida Discussants: Jan Deprest (Belgium), William Whitehead (USA)	
11:30 - 11:37	Exome sequencing in spinal dysraphism	Ivonne Bedei (Germany)
11:37 - 11:44	The phenome of Chiari II malformation in spina bifida	Gregor Kasprian (Austria)
11:44 - 11:51	Ventriculomegaly and hindbrain herniation after fetal surgery	Michael Aertsen (Belgium)
11:51 - 11:58	12-French fetoscopic skin graft repair	Jan Deprest (Belgium)
11:58 - 12:05	Biocellulose patch techniques for fetoscopic spina bifida repair	Denise Lapa (Brazil)
12:05 - 12:15	Neurosurgical reinterventions after pre- and postnatal repair	Dominic Thompson (UK)
12:15 - 12:22	Neurulation during fetal repair	Nicole Ochsenbein (Switzerland)
12:22 - 12:32	Single-port endoscope-assisted fetal surgery	Sergio Cavalheiro (Brazil)
12:32 - 12:45	Discussion	
12:45 - 13:00	In utero enzyme replacement therapy for lysosomal diseases	Akos Herzeg (USA)
13:00 - 14:00	Lunch break	
14:00 - 14:40	Encephalocele Discussants: Marta Santorum (UK), Dominic Thompson (UK)	
14:00 - 14:10	Prenatal assessment and natural history	Magdalena Sanz (USA)
14:10 - 14:20	Patient stratification and postnatal treatment	William Whitehead (USA)
14:20 - 14:30	Fetoscopic repair	Renato Ximenes (Brazil)
14:30 - 14:40	Discussion	
14:40 - 15:27	Abdominal wall defects Discussants: Greg Ryan (Canada), Paolo De Coppi (UK)	
14:40 - 14:45	Abdominal wall defects: Pediatric surgical challenges	Paolo De Coppi (UK)
14:45 - 14:53	Experimental evidence for fetal gastroschisis repair	Tomohiro Arai (Belgium/Japan)
14:53 - 15:01	Abdominal wall defects: Two step repair	Miguel Parra (Colombia)
15:01 - 15:09	Gastroschisis: Fetoscopic repair	Sundeep Keswani (USA)
15:09 - 15:17	Giant exomphalos: long term neurocognitive outcome	Enrico Danzer (USA)
15:17 - 15:27	Discussion	
15:27 - 16:00	Special lectures	
15:27 - 15:35	Interactive mid-air imaging technology in fetal surgery	Mingming Zheng (China)
15:35 - 15:43	Fetal resuscitation during fetal surgery	Caitlin Sutton (USA)
15:43 - 15:51	Evacuation of massive fetal intracranial hemorrhage	Andri Welly (Indonesia)
15:51 - 16:00	Discussion	
16:00 - 16:30	Coffee break	
16:30 - 18:50	Multiple pregnancies Discussants: Yves Ville (France), Anthony Johnson (USA), Liesbeth Lewi (Belgium)	
16:30 - 17:00	Presentation of cases and panel discussion	Yves Ville, Anthony Johnson, Liesbeth Lewi
17:00 - 17:15	Intertwin EFW and UA PI discordance and adverse outcome	Veronica Giorgione (UK)
17:15 - 17:25	Uterine artery PI at 20w for prediction of SGA in twins	Yi-Yun Tai (Taiwan)
17:25 - 17:35	sFGR and outcome in DC vs MC twin pregnancies	Vesna Sokol Kanadjole (Canada)
17:35 - 17:50	Discussion	
17:50 - 18:05	Fetal growth and MCA PSV in TAPS	Margot van de Sande (Netherlands)
18:05 - 18:15	MCA PSV discordance in MC twins beyond TAPS	Raphael Bartin (France)
18:15 - 18:25	Laser for TTTS: Laparotomy assisted membrane closure	Gerardo Sepulveda (Mexico)
18:25 - 18:35	Neonatal and long-term outcomes in multifetal pregnancies	Steffen Kristensen (Denmark)
18:35 - 18:50	Discussion	
20:30 - 23:00	Welcome reception	

圖一：第一天課程

第一天的課程滿滿，充滿期待與挑戰。對我已有 33 年經驗的婦產科醫師而言，這些主題雖經歷許多，課程不僅提供了自己複習的機會，也從熟悉的主題中，吸收更多臨床診斷與處置上，目前新的探索與嘗試。所有課程中，包括胎兒腦部的 Vein of Galen Aneurysm、腦室擴大 (Ventriculomegaly)、脊柱裂 (Spina bifida)、大腦膨出 (Encephalocele)、腹壁裂 (Abdominal

wall defects) 與多胎懷孕 (Multiple pregnancies)，都讓自己聚精會神。

其中，印象最深刻的是，胎兒腦室擴大 (Ventriculomegaly) 的原因一直都很複雜，可能合併腦內發育異常，先天性感染或基因方面的症候群，因此，在產前檢查部份，應該同時進行詳細超音波檢查、巨細胞病毒檢查、染色體基因檢查、甚或全外顯子定序檢查。此外，針對多胞胎妊娠 (同卵或異卵，單羊膜或雙羊膜) 與併發症最新處理建議，也特別認真聽講，更加認知多胞胎懷孕病生理機制，比如雙胞胎輸血症候群 (Twin-to-Twin transfusion syndrome) 診斷與治療方法及時機。

Day 1 結束，晚上七點下課。

6 月 30 日：第二天的課程依然滿滿。所有課程中 (如圖二)，包括先天橫膈膜疝氣 (Congenital Diaphragmatic Hernia)、胎兒心臟學 (Fetal Cardiology)、母體心臟學 (Maternal Cardiology) 及其他子題。

其中，值得一提的是，人工胎盤 (Artificial Placenta) 系統的發展，創造一個體外類似健康子宮內的優良條件，提供極度早產的新生兒，一個更佳存活機會，進而減少早產併發症。這套研發中的系統，未來將具有可以期待的臨床使用價值，嘉惠重度早產的病嬰。此外，今年有針對母體心臟學 (Maternal Cardiology) 提出一些案例探討與臨床處置建議，懷孕婦女於孕期會面臨體內血量增加 40-50% 的生理改變，對於懷孕前本身即有合併心臟病者，將會帶來心臟更大的負擔與不定數。講者特別舉幾個危險個案要特別注意，包括：馬凡氏症 (Marfan syndrome)、肺動脈高壓 (如：Eisenmenger complex) 與主動脈狹窄 (Aortic stenosis) 等。一些零星主題的分享，也得到不同面向的正面收穫，比如：胎兒巨大膀胱 (Megacystitis)、胎盤血管瘤 (Chorioangioma) 和新生溶血貧血的病因與後續治療，這些很少見到的個案，提供未來遇見類似案例很好的參考。

Day 2 結束，晚上八點下課。

Monday 30th June 2025: Joint session with Eurofoetus

08:00 - 08:45	GE Healthcare live scan session: Meet the experts for a live scan on the Voluson™ Expert 22	Katia Bilardo (Netherlands) Rabih Chaoui (Germany)
09:00 - 10:05	Congenital diaphragmatic hernia Discussants: Jan Deprest (Belgium), Alexandra Benachi (France)	
09:00 - 09:08	Outcomes in moderate hypoplasia	Francesca Russo (Belgium)
09:08 - 09:16	Long term outcome French TOTAL trial cohort	Alexandra Benachi (France)
09:16 - 09:24	Smart tracheal occlusion trial	Francesca Russo (Belgium)
09:24 - 09:32	Safety of MRI with smart tracheal occlusion balloon	David Basurto (Mexico)
09:32 - 09:40	Discussion	
09:40 - 09:48	CDH prediction of outcome by prenatal defect-to-hemithorax ratio	Isabella Fabietti (Italy)
09:48 - 09:56	European MDR is a threat for fetal diagnosis and therapy	Jan Deprest (Belgium)
09:56 - 10:05	Discussion	
10:05 - 11:00	Special lectures	
10:05 - 10:20	Artificial placenta	Eduard Gratacos (Spain)
10:20 - 10:35	The n=1 trial: treating ultra-rare disease	Robert Bopp (Germany)
10:35 - 10:50	Introduction of new technologies into clinical practice	Mark Evans (USA)
10:50 - 11:00	FMF PE risk at 36w: association with labor onset and fetal compromise	Antonio Farina (Italy)
11:00 - 11:30	Coffee break	
11:30 - 13:00	Special lectures Discussants: Eduard Gratacos (Spain), Yves Ville (France)	
11:30 - 11:40	Vesicoamniotic shunt for first-trimester fetal megacystis	Eva Christin Weber (Germany)
11:40 - 11:50	Ultrasound guided laser coagulation of liver hemangioma	Enrique Gil Guevara (Peru)
11:50 - 12:00	Vascular closure device for sealing the uterine entry site	Eyal Krispin (USA)
12:00 - 12:10	Discussion	
12:10 - 12:20	Chorioangioma: fetoscopic treatment	Michael Belfort (USA)
12:20 - 12:30	Chorioangioma: medical treatment	Monique Haak (Netherlands)
12:30 - 12:40	Discussion	
12:40 - 12:50	Natural history of fetal and neonatal alloimmune thrombocytopenia	Joanne Verweij (Netherlands)
12:50 - 13:00	Prediction for recurrent fetal transfusions in B19 Parvovirus and Rh disease	Marta Dalmau Artal (Spain)
13:00 - 14:00	Lunch break	
14:00 - 17:30	Fetal cardiology Discussants: Anita Moon-Grady (USA), Marietta Charakida (UK)	
14:00 - 14:10	Effect of prenatal sirolimus on cardiac rhabdomyomas and brain tubers	Simen Vergote (Canada)
14:10 - 14:20	Cardiac septoplasty	Shane Morris (USA)
14:20 - 14:30	Fetoscopic transesophageal pacing	Chen Gongli (China)
14:30 - 14:45	Outcome of fetal cardiac interventions	Anita Moon-Grady (USA)
14:45 - 15:00	Discussion	
15:00 - 15:15	Tips on how not to miss fetal cardiac defects	Rabih Chaoui (Germany)
15:15 - 15:30	Presentation of fetal cardiac defects	Michael Brusilov (Israel)
15:30 - 15:45	Indications for fetal echocardiography: consensus and controversies	Valentina De Robertis (Italy)
15:45 - 15:55	Pulmonary atresia and intact ventricular septum	Roland Axt-Fliedner (Germany)
15:55 - 16:00	Discussion	
16:00 - 16:30	Coffee break	
16:30 - 16:40	The heart-placental axis: Placental disease in Tetralogy of Fallot	Fatima Crispi (Spain) Reza Razavi (UK)
16:40 - 17:30	AI in routine screening and diagnosis of severe heart defects	Julien Stirrermann (France) Marilyne Levy (France) Rabih Chaoui (Germany)
17:30 - 18:30	Maternal cardiology Discussants: Catherine Williamson (UK), Elisa Llurba (Spain)	
17:30 - 18:00	Maternal cardiac disease: presentation of cases	Katherine Economy (USA) Anne-Marie Valente (USA)
18:00 - 18:10	Cardiovascular adaptation in pregnancies at high-risk of preeclampsia	Elisa Llurba (Spain)
18:10 - 18:25	Maternal cardiovascular assessment and pregnancy complications	Marietta Charakida (UK)
18:25 - 18:30	Discussion	

圖二：第二天課程

7月1日：第三天的課程依然滿滿（如圖三）。經由前兩天課程緊湊的洗禮，昨晚早睡些，讓今天更專注且減少打瞌睡的時間。近年，每年皆會出國開國際會議，雖每年總是類似的幾個大主題不變，內容與觀念卻是年年有所變化，讓平日被諸多臨床與行政事務圍繞的我，可以很幸福的好好重新複習基本功夫。

今天最認真也收穫最多的課程，包括：先天巨細胞病毒感染專題討論、早產與早期破

水議題與感染防治、與胎兒超音波與基因議題結合，後者是我長期專注與進行的主要面向。近年，由於高階超音波機器的進步與解析度的增加，即使透過孕母的肚皮，我們很有機會可以提早發現較小的胎兒異常，例如：腎臟、尿道下裂與眼睛異常等。近年，更透過併基因晶片（array CGH）與全外顯子定序（exome sequencing），診斷更罕見的遺傳疾病。

Day 3 結束，又是晚上八點下課。晚上去布拉格舊城區走走逛逛，覺得悠閒。

Tuesday 1st July 2025

08:00 - 08:45	Samsung live scan session: Timing of birth in multiple pregnancies	Basky Thilaganathan (UK)
09:00 - 11:00	Topics in maternal - fetal medicine Discussants: Catherine Williamson (UK), Mina Savvidou (UK)	
09:00 - 09:30	Presentation of cases	Catherine Williamson (UK) Kate Wiles (UK) Ali Chakera (UK) Yariv Yogeve (Israel)
09:30 - 09:45	Monogenic diabetes	Fabricio Costa (Australia)
09:45 - 10:00	Gestational diabetes mellitus - new developments	Cristina Gomez (UK)
10:00 - 10:10	Placental and circulatory molecular profiling: indicators of GDM severity	Christos Iacovou (UK)
10:10 - 10:20	Gestational diabetes mellitus - postnatal findings	Noa Gilad (Canada)
10:20 - 10:30	Maternal glycemic profiles after bariatric surgery and pregnancy outcomes	Melanie Nana (UK)
10:30 - 10:40	Obstructive sleep apnea in pregnancies affected by obesity	
10:40 - 10:50	Hyperemesis Gravidarum: ethnicity and nutrients	
10:50 - 11:00	Discussion	
11:00 - 11:30	Coffee break	
11:30 - 12:20	Cytomegalovirus infection Discussant: Yves Ville (France), Oliver Kagan (Germany)	
11:30 - 11:40	AI assisted detection of fetal periventricular and subependymal cysts	Yves Ville (France)
11:40 - 11:50	In vivo assessment of CMV vertical transmission	Nicolas Bourgon (France)
11:50 - 12:00	Prevention of transmission of primary CMV infection with Valaciclovir	Lennart Van der Veeke (Belgium)
12:00 - 12:10	CMV infection in early pregnancy: postnatal outcome and prenatal prediction	Nicolas Bourgon (France)
12:10 - 12:20	Long-term follow-up of children with congenital CMV infection	Christos Chatzakis (France)
12:20 - 13:00	Special lectures	
12:20 - 12:30	Lancet journal on Women's health	Sonia Mulyil (UK)
12:30 - 12:40	AI assisted detection of fetal head position in labor by transperineal ultrasound	Ruben Ramirez Zegarra (Italy)
12:40 - 12:50	Timing of birth based on antenatal maternal risk stratification	Jesrine Hong (Australia)
12:50 - 13:00	Uterine arteries Doppler in women with placenta accrete spectrum	Edgar Hernandez Andrade (USA)
13:00 - 14:00	Lunch break	
14:00 - 15:20	Preterm birth Discussants: Roberto Romero (USA), Steve Thornton (UK)	
14:00 - 14:10	Management and outcome of PPROM Before 22 weeks' gestation	Katerina Mackova (Czechia)
14:10 - 14:20	Early PPROM and fetal pulmonary development	Charline Bradshaw (UK)
14:20 - 14:30	AI assisted prediction of preterm birth: multicentre study	Emilie Sejer (Denmark)
14:30 - 14:45	Outcomes of extreme prematurity: influence of prenatal conditions	Eduard Gratacos (Spain)
14:45 - 15:05	Preterm labor and intraamniotic inflammation: diagnosis and treatment	Roberto Romero (USA)
15:05 - 15:20	Discussion	
15:20 - 16:00	Special lectures	
15:20 - 15:35	Genetics meets Art	Katia Bilardo (Netherlands)
15:35 - 15:50	Simulation training for ultrasound and fetoscopic procedures	Rogelio Cruz-Martinez (Mexico)
15:50 - 16:00	Patient-operated home ultrasound and remote diagnosis	Ronit Shtrichman (Israel)
16:00 - 16:30	Coffee break	
16:30 - 19:00	Fetal ultrasound meets genetics Discussants: Tessa Homfray (UK), Rabih Chaoui (Germany)	
16:30 - 16:40	Introduction	Tessa Homfray (UK)
16:40 - 17:00	Fetal kidney dysplasia	Dario Paladini (Italy)
17:00 - 17:20	Fetal eye anomalies	Oliver Kagan (Germany)
17:20 - 17:40	Fetus abnormal and exome normal; what next?	Rabih Chaoui (Germany)
17:40 - 18:00	Fetal hypospadias	Marisa Borenstein (Spain)
18:00 - 18:10	Comments	Tessa Homfray (UK)
18:10 - 18:20	AI assisted assessment of the first trimester scan	Prathima Radhakrishnan (India)
18:20 - 18:30	Digital PCR for non-invasive prenatal detection of aneuploidies	Pavel Calda (Czechia)
18:30 - 18:40	Cell-free DNA discordant results and confined placental mosaicism	Yvette Raymond (Australia)
18:40 - 18:50	Residual risk for pathogenic CNVs with cell-based and cell-free NIPT	Francesca Grati (Italy)
18:50 - 19:00	Discussion	

圖三：第三天課程

7月2日: 第四天的課程仍然豐富，無法鬆懈 (如圖四)。

今天的主題，最重要的是胎兒神經學超音波 (Fetal Neurosonography) 診斷，雖然這個高難度領域自己平日都有在進行臨床檢查，能夠在一天內聆聽大師演講與複習，仍給我帶來莫名的激動與開心。

胎兒後顱窩 (Posterior Fossa) 與大腦中線 (Midline) 發育十分複雜，從早孕期 (妊娠 11 - 14 週)、中孕期、甚至晚孕期，都可能被診斷異常，除診斷的困難外，臨床諮詢與決定也面臨挑戰。第一堂課先 Live Demo 示範基礎胎兒正常 Posterior Fossa 的檢查與進一步深入性檢查注意事項，胎兒腦部檢查，特別在早孕期，常須藉由陰道超音波 (Transvaginal Ultrasound; TVU) 進一步仔細掃描，胎兒腦部核磁共振檢查 (Fetal MRI) 是另一項重要利器。傳統主要的 Posterior Fossa 先天性異常包括有: Dandy-Walker malformation、Vermian hypoplasia、Blake pouch cyst 與 Megacisterna Magna，鑑別診斷並不容易，需注意小腦 (Cerebellum) 發育大小、第四腦室 (4th ventricle) 與小腦天幕 (Cerebellar Tentorium) 角度變化，前兩者較嚴重，對神經發展 (Neurodevelopment) 預後影響較大，後兩者則預後較佳。大腦中線 (Midline) 的異常更加困難產前診斷，Dr. Pooh 長久鑽研胚胎超音波 (Embryosonography)，對於早期胚胎神經發育，見解獨到，過去也在不同場合，多次接受演講洗禮，Dr. Pooh 也常提出許多胎兒腦部異常個案及其基因異常的關聯性。這次，Dr. Pooh 演講的重點聚焦在 Midline 異常，除了先 Live Demo 外，內容極富深度，包括胼胝體 (Corpus Callosum) 異常的診斷技巧，特別提到胼胝體旁邊的 Marginal artery 和 Pericallosal artery 和診斷的關聯性，Corpus Callosum 分為四部分: Rostrum、Genu、Body 和 Splenium，其異常分為完全性和部分性發育不全 (Complete and Partial agenesis of corpus callosum; cACC and pACC)；Fetal MRI 檢查，除了解剖結構外，也可以顯示神經纖維束造影 (Tractography)，對產前諮詢十分有幫助。講完胼胝體後，導入早孕期中線異常診斷技巧與常見 (Early Diagnosis of Midline Anomalies: Tips and Tricks)，大腦空洞症 (Holoprosencephaly)、腦中隔 (Septal) 和 胼胝體發育不良，分享數個合併有基因異常的案例，例如: L1 syndrome、Tubulinopathy 和 Joubert syndrome (“Molar tooth sign”) 等，更強調使用 Fetal MRI 輔助診斷的必要性。

Day 4 結束，又是晚上八點下課。晚上去布拉格著名的查理大橋欣賞夜景，覺得舒暢。

Wednesday 2nd July 2025

09:00 - 12:20 Fetal neurosonography

Discussants: Guillermo Azumendi (Spain), Magdalena Sanz (USA)

09:00 - 09:15	Neurodevelopmental disorders: subplate development	Ritsuko Pooh (Japan)
09:15 - 09:30	Neuronal proliferation and apoptosis: disorders of brain growth	Gustavo Malinger (Israel)
09:30 - 09:45	The complex process of neuronal migration and its anomalies	Elisenda Eixarch (Spain)
09:45 - 10:00	Axonal development and guidance: connecting the brain	Karina Haratz (Israel)
10:00 - 10:35	Presentation of cases	Gustavo Malinger (Israel)
		Dario Paladini (Italy)
		Ritsuko Pooh (Japan)
10:35 - 10:50	Cerebral blood vessels and their disorders	Dario Paladini (Italy)
10:50 - 11:00	Natural history of fetal malformations of cortical development	Alessandra Familiari (Italy)

11:00 - 11:30 Coffee break

11:30 - 11:40	AI assisted detection of abnormal fetal brain findings at 2nd trimester scan	Ruben Ramirez Zegarra (Italy)
11:40 - 11:50	AI assisted first-trimester diagnosis of fetal neural tube defects	Kirill Kostyukov (Russia)
11:50 - 12:00	Cellular atlas of 2nd trimester fetal brain with multimodal imaging	Suresh Seshadri (India)
12:00 - 12:10	First-trimester assessment of the fetal brain anterior complex	Nicola Volpe (Italy)
12:10 - 12:20	Fetal intracranial hemorrhage: unraveling the cause by neuroimaging	Shiri Shinar (Canada)

12:20 - 13:00 Special lectures

12:20 - 12:35	The challenge of reducing global maternal mortality	Gerry Visser (Netherlands)
12:35 - 12:45	Sonographic assessment of maternal-fetal interaction	Andrea Dall'Asta (Italy)
12:45 - 12:55	Fetal recognition of maternal vocal patterns	Juan Luis Delgado (Spain)
12:55 - 13:00	Discussion	

13:00 - 14:00 Lunch break

14:00 - 18:35 Preeclampsia

Discussants: Laura Magee (UK), Liona Poon (Hong Kong), Jon Hyett (Australia)

14:00 - 14:08	Exploring placental molecular signatures across subtypes of PE	Fabrizio Costa (Australia)
14:08 - 14:16	Genetically-estimated ancestry and the risk of PE	Frances Conti-Ramsden (UK)
14:16 - 14:24	Discussion	
14:24 - 14:34	Common algorithm for prediction of PE, SGA and PTB	David Wright (UK)
14:34 - 14:40	Discussion	
14:40 - 14:48	First-Trimester sequential screening for PE	Daniel Oros (Spain)
14:48 - 14:56	"Inverting the pyramid" of antenatal care and reduction of preterm PE	Ailsa Borbolla Foster (Australia)
14:56 - 15:02	Discussion	
15:02 - 15:10	Cost-benefit analysis of adding PIGF in screening for PE	Erika Bonacina (Spain)
15:10 - 15:18	RREVENT: health economic analysis	James Goadsby (UK)
15:18 - 15:24	Discussion	
15:24 - 15:32	Ophthalmic artery Doppler and sFlt-1/PIGF in near-term pregnancies	Maria Fernanda Tinajero (Spain)
15:32 - 15:40	GlyFn vs sFLT-1/PIGF as point of care test for PE	Nouran Elbarbary (UK)
15:40 - 15:48	sFlt-1/PIGF at 26 weeks to assess risk of PE, FGR, abruption	Sergio Gómez-Limón (Spain)
15:48 - 16:00	Discussion	

16:00 - 16:30 Coffee break

16:30 - 16:40	New Fetal Medicine Foundation software	Argyro Syngelaki (UK)
16:40 - 16:48	Preeclampsia prediction by machine learning in twin pregnancies	Hamutal Meiri (Israel)
16:48 - 16:56	Screening for PE in triplet pregnancies	Gülen Yerlikaya-Schatten (Austria)
16:56 - 17:05	Discussion	
17:05 - 17:13	Ultra-processed foods consumption and risk of PE	Francesca Crovetto (Spain)
17:13 - 17:21	Extra virgin olive oil and PE	Fatima Crispi (Spain)
17:21 - 17:30	Discussion	
17:30 - 17:38	Gestational metabolic shift with aspirin for women at risk of PE	Long Nguyen-Hoang (Hong Kong)
17:38 - 17:46	Aspirin delays PE in women with chronic hypertension	Emmanuel Bujold (Canada)
17:46 - 18:03	Discussion	
18:03 - 18:11	FMF 1st trimester PE risk and long-term maternal cardiovascular health	Maria Andersen (Denmark)
18:11 - 18:20	Discussion	
18:20 - 18:28	Ophthalmic artery Doppler 3-6 years after placental insufficiency	Pablo Garcia-Manau (Spain)
18:28 - 18:35	Discussion	

圖四：第四天課程

7月3日: 第五天閉幕日的課程仍然豐富，上午八時就大講堂定位，看工作人員進進出出，仔細查看任何環節，以利會場進行順利。首日議程如圖五。

今日參與的課程主題有: (1) 生殖醫學與母胎醫學 (Fetal medicine meets reproductive

medicine) 和 (2) 胎兒生長遲緩 (Fetal growth restriction)。近年，因生殖醫學是顯學，累積經驗顯示的確會增加妊娠期婦女合併症 (如: 子癲前症與妊娠糖尿病) 和胎兒異常機率 (如: 先天性心臟病)，提醒我在平日接觸此類個案，更要注意的重點。胎兒生長遲緩這項主題，我本來就熟捻，再仔細複習一次，對自己更有幫助。

Day 5 結束，下午 3:30 下課。接著參加大會舉辦的 Closing Reception and Boat Trip，也認識一些新朋友，為此行劃下句點。大會也傳來上課證明 圖六。

Thursday 3rd July 2025

09:00 - 10:20 Fetal Medicine meets Reproductive Medicine		
Discussants: Nikolaos Polyzos (Spain), Petya Chaveeva (Bulgaria)		
09:00 - 09:15	12 million IVF babies: Exploring Birth defects and time trends	Anja Pinborg (Denmark)
09:15 - 09:30	Contributors to perinatal outcomes of ART babies	Christina Bergh (Sweden)
09:30 - 09:45	Preeclampsia risk assessment. Are IVF pregnancies different?	Nikolaos Polyzos (Spain)
09:45 - 10:00	Fertility issues in maternal medicine	Charlotte Frise (UK)
10:00 - 10:20	Discussion	
10:20 - 11:00 Special lectures		
10:20 - 10:35	How to read and write a meta-analysis in a time of fake data	Ben Mol (Australia)
10:35 - 10:45	AI assisted assessment of Doppler of umbilical & middle cerebral arteries	Zahra Bashir (Denmark)
10:45 - 11:00	Screening <20 weeks for both early sPTB and PE	Carl Weiner (USA)
11:00 - 11:30 Coffee break		
11:30 - 13:50 Fetal growth restriction		
Discussants: Francesc Figueras (Spain), Gerry Visser (Netherlands)		
11:30 - 11:40	Genetic issues	Antoni Borrell (Spain)
11:40 - 11:48	Angiogenic factors and Doppler to predict genetic anomalies in early-FGR	Manel Mendoza (Spain)
11:48 - 11:55	Discussion	
11:55 - 12:03	Induction of labor in term FGR: dinoprostone vs cervical balloon	Ignacio Herraiz (Spain)
12:03 - 12:10	Discussion	
12:10 - 12:18	Growth velocity and umbilical vein blood flow as predictors of FGR	Tamara Stampalija (Italy)
12:18 - 12:26	Angiogenic factors and Doppler in early and term FGR	Manel Mendoza (Spain)
12:26 - 12:34	Optimal timing of delivery in FGR at term	Raffaele Napolitano (UK)
12:34 - 12:42	RCT: value of additional ultrasound scan at 35-37 w to one at 28-32 w	Alessandra Familiari (Italy)
12:42 - 13:00	Discussion	
13:00 - 13:08	Universal second trimester uterine artery Doppler in screening for FGR	Valentina LeThanh (UK)
13:08 - 13:16	AI assisted second trimester prediction of SGA neonates	Yoram Louzoun (Israel)
13:16 - 13:30	Discussion	
13:30 - 13:38	Association of CPR and fetal heart function in the 3rd trimester	Romy Helena Novoa (Spain)
13:38 - 13:46	Fetal brain development on ultrasound and MRI in early FGR	Lotte Meijerink (Netherlands)
13:46 - 13:50	Discussion	
13:50 - 15:00 Lunch break		
16:00 - 22:00 Reception at Obcanska Plovarna and boat trip		

圖五：第五天課程

Certificate of Attendance

This is to certify that

Dr Jenn-Jhy Tseng

has attended the

22nd World Congress in Fetal Medicine

29 June - 3 July 2025

Prague, Czechia



Director: Kypros Nicolaides

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圖六：上課證明

三、 心得

這是我第一次參加 **FMF 胎兒醫學基金會年會**，發現這次在布拉格舉辦的年會準備得細膩無比，不論是課堂安排、動線安排、對講者的尊重（即便是一般 oral presenter，也和主持

大師們一起圓桌 Panel Discussion) 以及餐點，都非常出色。參加者約三千位，主要來自歐洲國家。以色列講者因戰亂，無法前來，以線上方式進行，殊為可惜（以色列講者往往都有很少見也很深入的獨到見解）。藉著 Lunch Break 的空檔，就教 Dr. Sanz Cortes (USA) 平日內心糾結的疑問，請教早孕期胎兒腦部檢查的 Learning Curve，他的回答就是 [Make great efforts and Share with each other]，原來，[努力] 佔了成功的主要因素，[分享] 則是讓我們的視野更廣闊，大師亦復如此。和 Dr. Abuhamad (USA) 的接觸，起於他於 [胎兒先天性心臟病] 的講題，正好和自己投稿中的文章有關，除了上課認真作筆記外，也就投稿中仍有疑問的部份，再度向他進行釐清盲點，準備 Revision 時可以派上用場，感到不虛此行。大會期間，課程很緊湊很累，雖有 Tension，但成功達到此行期待，卻也值得。

此外，利用早上提早到達和午餐空檔，就目前最新超音波機型與功能進行更多的認知和了解，可以確定的是，目前我們 [母胎醫學影像中心] 的高階儀（分別是 2019 年和 2022 年購入），內建功能仍然完整足夠研究與服務所需，符合 2026 年至 2027 年的願景發展與使用。值得要注意的是 AI 部份的發展，於胎兒檢查部份，目前發展已較過去兩年更優，唯仍以型態 (Morphology) 辨識和量測 (Measurement) 為主，對於疾病辨識和分類 (Disease Classification) 仍有盲點；雖然，在適合的胎兒姿勢下，AI 的使用可以減少檢查的時間（比如說，可由人工約六分多鐘的時間減為約 56 秒完成一個正常胎兒心臟檢查），疑問是，胎兒在媽媽子宮內的姿勢，大多數時間是動來動去，無法維持限定姿勢，只有部份個案適用。然而，AI 浪潮無法檔，高階儀的進展，值得持續關注。

此次 FMF 年會，總共有超過 3000 位同好參加，因為動線清楚，會場寬敞，覺得舒適。除了主辦單位，位於英國倫敦的 FMF 總部派了大批人員進駐，他們累積多年各地舉辦年會的經驗，無論人力、物力和財力，都在水準之上。參與者如我，很羨慕人家，更清楚了解帶領團隊作好每一件事，是自己下一階段要勇於承擔的志業。

四、 建議與改進作法

從此次 2025 FMF 布拉格年會的心得，為了更加強化本院 [母胎醫學] 領域的未來發展，並提供更優質的產前照護，一併提出精進作為如下：

- 一、 目前部內有五名產科主治醫師與兩名研修醫師，月出生量約 80 名上下，其中約一半是高危險妊娠。謝謝院方大力支持，目前在智慧產房建置部份，順利進展，原本最擔心的經費，也因最近提出 [健康臺灣深耕計畫] 的部份計畫書，可望得到部分挹注。可以為未來的 [母胎安全] 照顧品質，達到新境界。
- 二、 這次有特別仔細訪查最新高階超音波儀器的發展與其臨床使用，比較目前部內 [母胎醫學影像中心] 兩部高階超音波儀器，確認目前儀器使用足以符合同仁服務與研究需求。唯為因應未來幾年 AI 的發展，或許 2027-2028 年是添購具備更佳 AI 使用軟體新機種的好時機。針對這點，我明年前去維也納年會時，會再特別注意。
- 三、 母胎醫學目前已往早孕期檢查推進，這次年會提出不少值得參考與檢討的地方，團隊成員各有專長，團隊分工合作，彼此在定期團隊會議中分享，不僅可以對母胎有幫助，也提升論文產出。
- 四、 最後，若院方支持，婦女醫學部將選派一名年輕主治醫師明年前往 FMF 倫敦總部進修一個月 (Observer)。

五、 附錄

以上相關圖片，均摘錄自:大會官方與會手冊