中華民國醫用超音波學會 2022 年第一次學術研討會暨第十九屆中區會員代表選舉

111 年 6 月 26 日(星期日) 童綜合醫院醫療大樓 20 樓會議中心

會長：童敏哲總院長
顧問：陳穎從教授、李三剛教授
節目籌備人員：李博仁副院長、黃振義部主任、劉錦成部主任、藍顥章主任、陳宗勉主任、葉宏仁主任、林維文主任、吳保宗主任
內容：一般科、消化內科系、婦產科、心臟內科
報到處：童綜合醫院 醫療大樓 20 樓 會議中心 (臺中市梧棲區臺灣大道八段 699 號)
投票處及時間：醫療大樓 20 樓貴賓室 12:30-15:40
報 到 費：會員/會友免費　　非會員伍佰元
主辦單位：中華民國醫用超音波學會、童綜合醫療社團法人童綜合醫院

一般科　　**地點：交誼廳**

時間	頁	題目	演講者	主持人
13:30-13:40		Opening Remarks	童敏哲總院長 童綜合醫院	
13:40-14:10	1	Carotid Sonography and Transcranial Color Doppler in Acute Stroke	陳淑儀醫師 童綜合醫院神經內科	李政君主任 童綜合醫院 放射診斷科
14:10-14:40	1	Ultrasonography of Extraperitoneal Fluid	曹登富醫師 中山醫學大學附設醫院 影像醫學部	
14:40-15:10	2	Sonography Diagnosis of Acute Appendicitis	黃振義部主任 童綜合醫院放射診斷科	
15:10-15:30	Coffee Break			
15:30-16:00	2	Ultrasound of Thyroid Gland: Form Diagnosis to Treatment	鄭凱倫醫師 中山醫學大學附設醫院 影像醫學部	藍顥章主任 童綜合醫院 放射診斷科
16:00-16:30	3	Advances in Musculoskeletal Ultrasound in Rheumatology	賴國隆醫師 臺中榮民總醫院 風濕免疫科	
16:30-17:00	5	Ultrasound Assessment of Skeletal Muscle Injury and Myopathies.	藍顥章主任 童綜合醫院放射診斷科	
17:00-17:10		Closing Remarks	李三剛顧問 童綜合醫院	

消化內科系　　**地點：大講堂**

時間	頁	題目	演講者	主持人
1330 - 1340		Opening Remarks	陳宗勉醫師 童綜合醫院胃腸肝膽科	
1340 – 1410	6	肝臟彈性度檢測儀（elastography：ARFI and Fibroscan）在肝臟疾病的臨床應用與實務	顏聖烈醫師 彰濱秀傳醫院胃腸肝膽科	葉宏仁主任 童綜合醫院 胃腸肝膽科
1410 - 1440	6	超音波導引肝癌射頻消融燒灼術在多科團隊治療的角色	陳宗勉醫師 童綜合醫院胃腸肝膽科	
1440 - 1510	Q&A			
15:10~15:30	Coffee Break			
1530 - 1600	7	腹部超音波檢查在急性腹痛的臨床經驗	陳俊欽醫師 光田綜合醫院胃腸肝膽科	陳宗勉醫師 童綜合醫院 胃腸肝膽科
1600 - 1630	8	臨床常見的腹部超音波影像徵象在疾病診斷的角色	鄭煜明醫師 童綜合醫院胃腸肝膽科	
1630 - 1700	8	腹部超音波在肝癌 BCLC 各期的運用	莊伯恒醫師 中國醫藥大學附設醫院 胃腸肝膽科	
1700 - 1710	Q&A			

婦產科 **地點：視聽教室**

時間	頁	題目	演講者	主持人
13:25-13:30		Opening Remarks	劉錦成部主任 童綜合醫院	
13:30-14:00	9	Update of Fetal Therapy in Taiwan	蕭勝文主任 臺北長庚醫院婦產科	魏添勇主任 童綜合醫院產科
14:10-14:40	9	超音波在不孕症病人的應用	劉勇良醫師 中山醫學大學附設醫院 婦產科	李宗賢主任 中山醫學大學 附設醫院 生殖醫學中心
14:50-15:20	10	Review of First Trimester Contingent Screening	陳彥妮醫師 台兒診所婦產科	何銘主任 中國醫藥大學 附設醫院婦產科
15:30-15:40		Coffee Break		
15:40-16:10	20	Histology-specific Diagnosis of Ovarian Cancers	孫珞主任 臺中榮民總醫院 婦科病房	呂建興主任 臺中榮民總醫院 婦癌科
16:20-16:50	20	CSP and Corpus Callosum Evaluation	莊聖偉醫師 童綜合醫院婦產部	劉錦成部主任 童綜合醫院
17:00-17:10		Closing Remarks	劉錦成部主任 童綜合醫院	

心臟內科 **地點：國際會議廳**

時間	頁	題目	演講者	主持人
13:30-13:35		Opening Remarks	陳穎從教授 童綜合醫院	
13:35-14:05	21	Cardiovascular Disease Prediction by Big Data Analysis and Machine Learning	林維文主任 臺中榮民總醫院心臟衰竭科	李博仁副院長 童綜合醫院 心臟內科
14:05-14:35	22	Cardiovascular POCUS in Intensive Care Unit	林子翔醫師 臺中榮民總醫院心臟內科	
14:35-15:00		Q/A		
15:00-15:30	Coffee Break			
15:30-16:15	23	達文西微創手術治療左心室出口狹窄心肌病 (台中童醫院長期經驗)	鄭伯智副院長 童綜合醫院心臟血管外科	林維文主任 臺中榮民總醫院心臟衰竭科
16:15-16:30	24	A 67-Year-Old Woman with Shortness of Breath for 2 Days	董承昌醫師 中國醫藥大學附設醫院 心臟血管系	
16:30-16:45	24	Trouble Never Comes Alone – Challenges in Echocardiography Imaging	謝祐銓醫師 彰化基督教醫院 心臟血管內科	
16:45-17:00	25	A Case Presenting as Acute Coronary Syndrome with Cardiogenic Shock and aVR ST-elevation	蕭文智醫師 中山醫學大學附設醫院 心臟內科	
17:00-17:10		Q/A		
17:10-17:20		Closing Remarks	吳保宗主任 童綜合醫院心臟內科	

Carotid Sonography and Transcranial Color Doppler in Acute Stroke

陳淑儀醫師
童綜合醫院神經內科

頭頸顱內外血管超音波已是神經科檢查常規項目，尤其是腦中風及頭暈的患者，中華民國醫用超音波學會 2013 年 9 月會訊: 神經科超音波，有詳細的詳述及介紹。近幾年，臨床上急性腦中風的處置，結合更多影像評估及手術選擇已成為趨勢，頸部及穿顱的超音波可以輔助術前、術後的治療策略，以實際的案例分享頭頸超音波在急性腦中風患者的應用經驗。

Ultrasonography of Extraperitoneal Fluid

曹登富醫師
中山醫學大學附設醫院影像醫學部

The extraperitoneal space is the portion of the abdomen and pelvis which does not lie within the peritoneum. Fluid in this space is a critical finding on ultrasonography during daily clinical practice and it can stem from a broad spectrum of diseases. This review presents a series of patients with extraperitoneal fluid collections, including urine, blood, pus, lymph, transudative, and exudative fluids. Although detailed locations of the fluid within the perirenal, anterior or posterior pararenal, or the subcapsular space of the retroperitoneum or other extraperitoneal spaces may not be discernable based on sonographic images alone, a combination of ultrasound findings in conjunction with clinical features usually helps to determine the nature of the fluid and provides useful clues to its accurate diagnosis.

Sonography Diagnosis of Acute Appendicitis

黃振義部主任
童綜合醫院影像醫學部

Acute appendicitis is the most common disease entity of acute abdomen need surgical intervention. Imaging studies including computed tomography (CT) andreal-time ultrasonography (RTUS), both of them can offer the accurate diagnosis with specificity near 100% and sensitivity approximately 90%.

With the improvement of resolution & introduction of graded-compression US by Puylaert in 1986, the RTUS has played more important role in the diagnosis of acute appendicitis. The US criteria are showing a noncompressiblesausage-shaped tubular structure, greater than 6mm in outer diameter with blind-end and connection to the base of the cecum. The diagnostic accuracy can reach 90-95% in an experienced hand, even though the appendix located in the unusual locations such as retrocecal / retroperitoneal or in the deep pelvic cavity.

However, many disease entities may present the symptom of RLQ abdominal pain mimic acute appendicitis in the daily practice. The spectra varied from the pelvic inflammatory disease (PID), gastro-intestinal disorders to hepato-pancreatico-biliary diseases. This presentation will display many interesting cases. The young ER doctors, sonographers or radiologists should be familiar with normal anatomy and its different pathological conditions over RLQ of abdomen to avoid serious missing diagnosis.

Ultrasound of Thyroid Gland: Form Diagnosis to Treatment

鄭凱倫醫師
中山醫學大學附設醫院影像醫學部

本次演講介紹三大主題：

1. 容易被誤判的甲狀腺問題
2. 超音波導引甲狀腺微創治療技術
3. 微創治療的挑戰

Advances in Musculoskeletal Ultrasound in Rheumatology

賴國隆醫師
Division of Allergy, Immunology and Rheumatology, Department of Internal Medicine, Taichung Veterans General Hospital, Taiwan

Musculoskeletal ultrasound (MSUS) has been widely used for diagnosis, monitoring and intervention of rheumatic diseases. In Taiwan MSUS has been a part of regular training course of rheumatologists in past 15 years. More and more rheumatologists have applied MSUS in their daily practice in order to obtain accurate diagnoses rapidly and to conduct adequate pharmacologic therapies. The structures of joint including synovium, bone, cartilage, capsule, ligament and tendon in addition to the overlying subcutaneous and cutaneous tissues could be visualized using MSUS. This lecture reviews the clinical applications ofMSUS in rheumatology.

Synovium : synovitis and joint effusion

Synovitis is the hallmark of inflammatory arthritis such as rheumatoid arthritis (RA), psoriatic arthritis, Reiter's disease, systemic lupus erythematosus,…etc. Synovitisis diagnosed by the presence of an abnormallythickened hypoechoic synovium usually accompanied with various degree of Doppler signals. The severity of synovial hypertrophy and synovial vascularity can be semi-quantitatively scored (0-3) using OMERACT (Outcome Measurement of Rheumatoid Arthritis Clinical Trial) criteria. Power Doppler (PD) US correlates with MRI in RA patients. Time-integrated PD and gray scale synovitis scores are predictive for joint erosive progression in RA.The detection of a fluid collection in joints,bursae, tendon sheaths and soft tissues is a useful sign ofinflammation. MSUS has been confirmed to be superior to clinical examinationin the detection of effusion, even in a large and relatively easilypalpable joint such as the knee joint.The amount of joint effusion can be semi-quantitatively scored (0-3) using OMERACT criteria.We had reported the experience of 40-joint ultrasonography in early diagnosis of RA and precise assessment of RA disease activity.

Bone

MSUS has been used for evaluation of bone erosion in RA.MSUS is capableof detecting up to seven times more erosions than plainradiography in early RA. MSUS has also been used in the evaluation of fractures, osteomyelitis, and bone neoplasia where bone cortex abnormalities andperiosteal reaction are prominent features of the disease process.

Cartilage

On ultrasonography normal hyaline cartilage appears anechoicor hypoechoic with well-marked margins.MSUS features of osteoarthritis (OA) include focal or diffusethinning of the cartilage layer, presence of osteophytes, less welldemarcated

synovial space–cartilage interspace and increased intensity of the posteriorbone–cartilage interface. MSUS detects double contour sign in gout and chondrocalcinosis in pseudogout. MSUS has also been used for detection of costochondritis.

Tendon and ligament

MSUS has become the gold standard forexamination of tendons. Tenosynovitis, tendinitis and tendon tear are routinely detected by MSUS.One should prevent misinterpretation due to anisotropy. Similar pathological changesin ligaments can also be detected by MSUS.

Interventional MSUS

MSUS has been applied to guidance of aspiration, local injection and soft tissue biopsy. Inpatients with inflamed metacarpophalangealand proximal interphalangealjoints, MSUSimproved accurate needle placement from 59% by palpationguidance to 96% by MSUS guidance. We had reportedthe experiences in US-guided synovial biopsy using SuperCore biopsy instrument with a high success rate.

New technology in MSUS

3D imaging has advantages in volume measurement and avoidance of operator bias. Contrast-enhanced US, superb microvascular imaging and ultrafast Doppler are sensitive to detect small and slow blood flows. Machine learning for image classification or lesion segmentation is under investigation.

Conclusion

MSUS is an ongoing trend in the field of rheumatology worldwide. Rheumatologists can apply MSUS tonearly all rheumatic diseases in order to improve diagnosis, monitoringand intervention. MSUS leads to a significant improvement in patient care.

Ultrasound Assessment of Skeletal Muscle Injury and Myopathies

藍顥章主任
梧棲童綜合醫院 影像醫學部

For superficial location of skeletal muscles, ultrasound (US) is well suitableforassessment of variety skeletal muscle abnormalities, i.e. traumatic and athletic muscle injuries, inflammatory or infectious myositis, muscle fibrosis and atrophy, muscle tumors, as well as abnormalities of muscle fasciae. On short-axis US scanning, a normal skeletal muscle consists of hypoechoic muscle fiber bundles confined in hyperechoic muscle fasciae, i.e. perimysium and epimysium, and forms a unique reticular pattern. On long-axis scanning, the perimysia should be parallel each other and, be connected to the central tendon or the epimysia of a muscle. US can easily and accurately depict lesionsand, is helpful for differential diagnosis. US can also provide useful information for characterizing a lesion, i.e. solid versus cystic, localized versus infiltrative etc. US can also be used to assess the dynamic lesions of muscles, i.e. muscle hernia. Doppler US is an useful tool for evaluation and diagnosis of a lesion. It can not only illustrate the vasculature and vascularity of a lesion but also provide informations of flow hemodynamics. US is also a convenient imaging tool for image-guided biopsy and for post-treatment follow-up.

We will demonstrate clinical applications of ultrasound in muscle disorders and discuss the recent advances as well.

肝臟彈性度檢測儀（elastography：ARFI and Fibroscan）在肝臟疾病的臨床應用與實務

顏聖烈主任
彰濱秀傳紀念醫院內科部

Ultrasound-based elastography is primarily used as an alternative to liver biopsy for the assessment of hepatic fibrosis. Transient elastography (TE) and acoustic radiation force impulse imaging (ARFI) are the most frequent elastography techniques. TE (FibroScan®) is currently the most extensively used elastography technique in clinical practice. However, ARFI imaging has many advantages over TE. The technology used for ARFI has been incorporated into a conventional ultrasound system, allowing ultrasound analysis of liver morphology at the same time. The clinical application of TE and ARFI on diffuse liver disease will be discussed in this lecture.

超音波導引肝癌射頻消融燒灼術在多科團隊治療的角色

陳宗勉醫師
童綜合醫院內科

肝癌的治療，同時須考慮腫瘤顆數、大小、有無血管侵犯、遠處轉癌、肝臟殘餘功能、與病人的體能狀態。過往 BCLC (Barcelona Clinic Liver Cancer) 分期指引中限制與僵化的治療選擇，因為這幾年系統性治療(Systemic therapy)，如小分子標靶與免疫治療等藥物的突破，不僅改變了中晚期肝癌治療預後，更讓局部治療(Locoregional therapy)，如射頻消融燒灼術(Radiofrequency ablation, RFA)與經動脈血管化學栓塞術(Transarterial chemoembolization, TACE)等傳統上限用於早中期病人的治療選項有了不一樣的角色。從腫瘤「分期分層」(Stage hierarchy: 即，各個期別該用什麼治療?)轉變到「治療分層」(Therapeutic hierarchy: 即，哪一種治療能讓病人存活率最高?)的思維更新，不僅活用了各種治療的組合與先後順序(left-to-right and right-to-left treatment stage migration)，也讓個人化與精準醫療變為可行。當中，多科介入的團隊治療，絕對是重要的一環。報告中也將以個人幾個案例分享，介紹超音波導引肝癌射頻消融燒灼術在多科團隊治療的角色。

腹部超音波檢查在急性腹痛的臨床經驗

陳俊欽主任
光田綜合院胃腸肝膽科

- 急性或慢性腹痛是消化系內科外科急診科及基層診所醫師平常在看診時常遇到的問題
- 腹部除了很大部分的消化道器官—胃，小腸，大腸，肝，膽，胰，脾外，也包括泌尿道系統，女性生殖系統及腹膜，血管系統。因此腹痛是因為什麼原因或疾病引起考驗看診醫師的診斷能力。
- 若能快速正確診斷也才真正幫助病人正確找出治療方式。尤其是一些外科急症如急性盲腸炎，膽囊炎，胃腸穿孔，腸套疊，腸壞死，腫瘤破裂出血，輸卵管卵巢扭轉，子宮外孕, 主動脈剝離…等。若能及早診斷大多可以挽救病人的生命。
- 腹部超音波是醫師的最佳助手若能熟悉超音波檢查的技巧及累積經驗必能協助醫師在面對腹痛的病人能有快速診斷的能力以安排後續安全有效的治療
- 藉由個人近 30 年的超音波檢查經驗分享希望能提供各位會員對提升超音波診斷急性腹痛能力的重視！

臨床常見的腹部超音波影像徵象在疾病診斷的角色

鄭煜明醫師
童綜合醫院胃腸肝膽科

臨床上很少使用超音波顯影劑，所以超音波診斷肝膽疾病的敏感度不如 contrast CT & MRI。超音波也容易受限於病人配合度，體態以及檢查者的經驗。但並非 contrast CT & MRI 可以完全取代超音波，許多特殊的超音波表徵對於肝膽疾病有很大的診斷意義，希望能透過這次演講，與大家分享臨床上超音波學診斷肝膽疾病。

腹部超音波在肝癌 BCLC 各期的運用

莊伯恒醫師
中國醫藥大學消化醫學中心

The abdominal ultrasound (US) with or without AFP is used as a surveillance tool for hepatocellular carcinoma (HCC) in high-risk patients. Liver Imaging Reporting and Data System (LI-RADS) and later US LI-RADS and Contrast-enhanced ultrasound (CEUS) LI-RADS were proposed to make an image diagnosis of HCC for further treatment. Traditionally Response Evaluation Criteria in Solid Tumors (RECIST) or Response Evaluation Criteria in Cancer of the Liver (RECICL) were proposed to assess the direct effects of treatment on HCC by locoregional therapies, such as radiofrequency ablation and transarterial chemoembolization. The non-invasive non-contrast US plays an important role in each post-treatment of Barcelona Clinic Liver Cancer (BCLC) staging in between the two dynamic images studies or even changes the staging. However, we still have to prepare for the possible reimbursement of CEUS using sonazoid in Taiwan.

Update of Fetal Therapy in Taiwan

蕭勝文主任
臺北長庚醫院產科

胎兒也有接受治療的權利，這個觀念已經發展超過二十年。隨著產前診斷的進步，越來越多缺陷可以在很早期就被發現，也有了治療這些胎兒的機會。本次演講將整體的介紹台灣胎兒治療的歷史，從各大醫學中心的發展，到最新的胎兒治療近況。內容包含了非侵入性的胎兒治療：胎兒心律不整，侵入性的胎兒治療：從雙胞胎輸血症候群，單一絨毛膜多胞胎的選擇性減胎，胎兒胸水導管放置，胎兒貧血胎內輸血，玻璃娃娃胎內幹細胞移植，到胎兒內視鏡手術等。最後也會分享未來胎兒治療的走向，以及多元化的疾病治療型態。

超音波在不孕症病人的應用

劉勇良, M.D., Ph.D.
中山醫學大學附設醫院婦產部生殖不孕科

- 導論
- 不孕症的原因
- 婦科超音波在不孕症的應用
  - 子宮的評估
  - 卵巢的評估
  - 輸卵管的評估
- 案例分享

Review of 1st Trimester Contingent Screening

陳彥妮醫師
2022/06/26

Contents

1st trimester Combined Test

VS

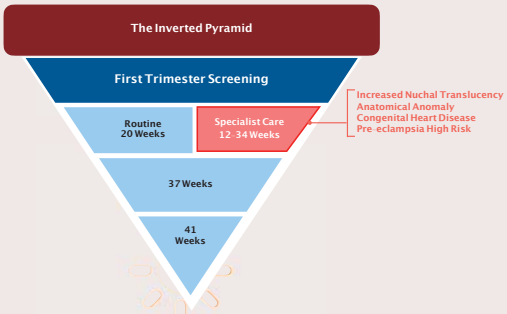
1st trimester Contingent screening

1st trimester Combined Test

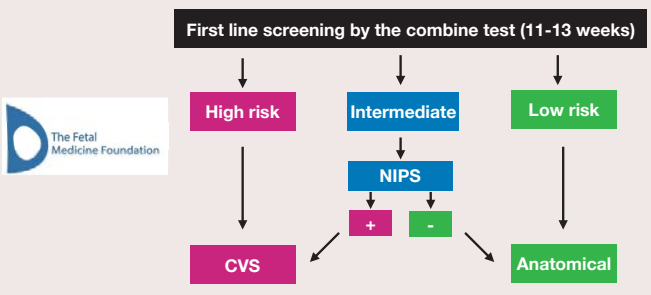
Maternal factor	Age, racial origin, parity, BP…
Ultrasound	NT, NB, TR, FHR, Ut a. PI
Biomarker	PAPP-A, free β-HCG, PlGF

Risk of T21, T18, T13, and preeclampsia

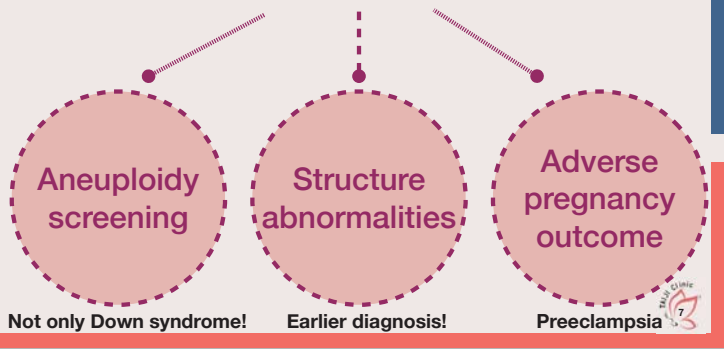
1st trimester Contingent screening



1st trimester Contingent screening



Ultrasound Screening at 1st Trimester



Not only Down syndrome! Earlier diagnosis! Preeclampsia

cfDNA Screening Should Be Postponed After 1st Trimester Anatomical Screening

- Younger women have a higher chance of structural abnormalities
- Save unnecessary costs in case of fetal demise
- Reduce test failure
- The coincidental finding of a large NT would call for a more advanced genetic examination

Ultrasound Obstet Gynecol 2018; 51: 463–469.

01

Detection of atypical chromosome abnormalities

Atypical Chromosome Abnormality

- Other autosomal Trisomy (T16 or T9)
- Triploidy
- Pathogenic CNV
- Mosaicism

Ultrasound Obstet Gynecol 2014; 43: 265–271
Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.13270

Potential diagnostic consequences of applying non-invasive prenatal testing: population-based study from a country with existing first-trimester screening

O. B. PETERSEN*#, I. VOGEL†#, C. EKELUND‡, J. HYETT§, A. TABOR ‡, the Danish Fetal Medicine Study Group and the Danish Clinical Genetics Study Group

Table 2 Chromosomal abnormalities stratified by maternal age in a population of 219 324 singleton pregnancies

Risk group	*Total pregnancies**	*Pre- or postnatal karyotyping performed†*	*Abnormal karyotype‡*	*Atypical abnormal karyotype§*	*Prevalence of atypical abnormal karyotype (% (95% CI))†*
Maternal age					
< 20 years	3894 (1.8)	118 (3.0)	13 (11.0)	5 (38.5)	0.13 (0.06–0.30)
20–24 years	26 891 (12.3)	820 (3.0)	88 (10.7)	37 (42.1)	0.14 (0.10–0.19)
25–29 years	71 439 (32.6)	2416 (3.4)	241 (10.0)	82 (34.0)	0.11 (0.09–0.14)
30–34 years	77 667 (35.4)	4036 (5.2)	392 (9.7)	113 (28.8)	0.15 (0.13–0.18)
35–39 years	34 171 (15.6)	3597 (10.5)	406 (11.3)	64 (15.8)	0.19 (0.15–0.24)
40–44 years	5078 (2.3)	1224 (24.1)	185 (15.1)	11 (6.0)	0.22 (0.12–0.39)
≥ 45 years	184 (0.1)	67 (36.4)	12 (17.9)	2 (16.7)	1.09 (0.30–3.88)
Total	219 324 (100.0)	12 278 (5.6)	1337 (10.9)	314 (23.5)	0.14 (0.13–0.16)

Table 3 Chromosomal abnormalities stratified by nuchal translucency (NT) percentile in a population of 215 223 singleton pregnancies

Risk group	*Total pregnancies**	*Pre- or postnatal karyotyping performed†*	*Abnormal karyotype‡*	*Atypical abnormal karyotype§*	*Prevalence of atypical abnormal karyotype (% (95% CI))†*
NT percentile					
< 95th	209 257 (97.2)	8977 (4.3)	682 (7.6)	253 (37.1)	0.12 (0.11–0.14)
≥ 95th to < 99th	4604 (2.1)	1673 (36.3)	174 (10.4)	14 (8.0)	0.30 (0.18–0.50)
≥ 99th	1362 (0.6)	1214 (89.1)	422 (34.8)	31 (7.3)	2.28 (1.61–3.22)
Total	215 223 (100.0)	11 864 (5.5)	1278 (10.8)	298 (23.3)	0.14 (0.13–0.16)

Table 4 Chromosomal abnormalities stratified by pregnancy-associated plasma protein-A (PAPP-A) multiples of the medan (MoM) and by free β-human chorionic gonadotropin (β-hCG) MoM in a population of 194 443 singleton pregnancies

Risk group	Total pregnancies*	Pre- or posnatal karyotyping performed†	Abnormal karyotype‡	Atypical abnormal karyotype§	Prevalence of atypical abnormal karyotype (% (95% CI))†
PAPP-A MoM					
< 0.2	936 (0.5)	775 (82.8)	166 (21.4)	39 (23.5)	4.17 (3.07–5.65)
0.2–0.399	9067 (4.7)	2916 (32.2)	304 (10.4)	39 (12.8)	0.43 (0.31–0.59)
0.4–0.999	84 923 (43.7)	4397 (5.1)	499 (11.3)	103 (20.6)	0.12 (0.10–0.15)
1.0–1.999	79 429 (40.8)	1740 (2.1)	133 (7.6)	73 (54.9)	0.09 (0.07–0.11)
≥ 2.0	20 088 (10.3)	435 (2.1)	31 (7.1)	11 (35.5)	0.05 (0.03–0.09)
Free β-hCG MoM					
< 0.2	227 (0.1)	76 (33.5)	43 (56.6)	16 (37.2)	7.05 (4.39–11.14)
0.2–0.999	92 123 (47.4)	4396 (4.8)	504 (12.0)	146 (29.0)	0.16 (0.14–0.19)
1.0–1.999	76 887 (39.5)	3795 (4.9)	352 (9.3)	67 (19.0)	0.09 (0.07–0.11)
2.0–3.999	22 834 (11.7)	1805 (7.9)	85 (4.7)	30 (35.3)	0.13 (0.09–0.19)
4.0–4.999	1515 (0.8)	216 (14.3)	30 (13.9)	2 (6.7)	0.13 (0.04–0.48)
> 5.0	857 (0.4)	175 (20.4)	19 (10.9)	4 (21.1)	0.47 (0.18–1.2)
Total	194 443 (100.0)	10 263 (5.3)	1133 (11.0)	265 (23.4)	0.14 (0.12–0.16)

Data given as *n* (%) except where indicated. *% of total population. †% of pregnancies in individual risk group. ‡% of those with karyotyping performed in risk group. §% of those with abnormal karyotype in risk group.

Ultrasound Obstet Gynecol 2014; 43: 265–271

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Table 5 Chromosomal abnormalities stratified by risk of Down syndrome on combined first-trimester screening (cFTS) in a population of 193 638 singleton pregnancies

Risk group	Total pregnancies*	Pre- or postnatal karyotyping performed†	Abnormal karyotype‡	Atypical abnormal karyotype§	Prevalence of atypical abnormal karyotype (% (95% CI))†
cFTS trisomy 21 risk					
> 1:300	8018 (4.1)	6759 (84.3)	770 (11.4)	84 (32.4)	1.06 (0.86–1.31)
> 1:10	734 (0.4)	675 (92.0)	378 (56.0)	13 (3.4)	1.77 (1.04–3.01)
1:10 to 1:19	448 (0.2)	404 (90.2)	79 (19.6)	7 (8.9)	1.56 (0.76–3.19)
1:20 to 1:49	1240 (0.6)	1132 (91.3)	114 (10.1)	22 (19.3)	1.77 (1.17–2.67)
1:50 to 1:99	1580 (0.8)	1390 (88.0)	96 (6.9)	22 (22.9)	1.39 (0.92–2.10)
1:100 to 1:199	2169 (1.1)	1783 (82.2)	65 (3.6)	13 (20.0)	0.60 (0.35–1.02)
1:200 to 1:299	1847 (1.0)	1375 (74.4)	38 (2.8)	7 (18.4)	0.38 (0.18–0.78)
1:300 to 1:999	11 135 (5.8)	1062 (9.5)	75 (7.1)	26 (34.7)	0.23 (0.16–0.34)
≤ 1:1000	174 485 (90.1)	2384 (1.4)	277 (11.6)	152 (54.9)	0.08 (0.07–0.10)
Total	193 638 (100.0)	10 205 (5.3)	1122 (11.0)	262 (23.4)	0.14 (0.12–0.16)

Data given as *n* (%) except where indicated. *% of total population. †% of pregnancies in individual risk group. ‡% of those with karyotyping performed in risk group. §% of those with abnormal karyotype in risk group.

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Risk Factors for Atypical Chromosome Abnormalities

- T21 risk > 1:100
- NT ≥ 3.5 mm
- PAPP-A < 0.2 MoM
- Free β-hCG <0.2 MoM or > 5.0 MoM
- Maternal age ≥ 45 y/o

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Ultrasound Obstet Gynecol 2018; 51: 487–492
Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.18979

Prenatal diagnostic testing and atypical chromosome abnormalities following combined first-trimester screening: implications for contingent models of non-invasive prenatal testing

A. LINDQUIST[1,2,3], A. POULTON[1], J. HALLIDAY[1,4] and L. HUI[1,3]

- High risk of CFTS (>1 in 10, 4.6%)
- Free β-hCG < 0.2 MoM (5.2%)
- PAPP-A < 0.2 MoM (6.9%)
- Ultrasound abnormalities

Detection rate 90.2%

Ultrasound Obstet Gynecol 2018; 51: 487–492.

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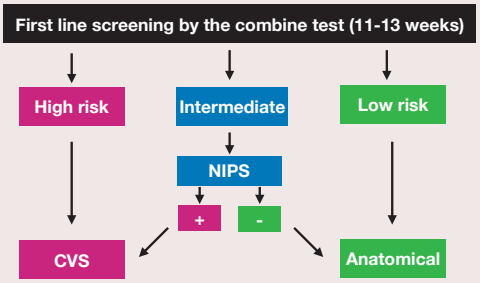
1st trimester Contingent screening

The Fetal Medicine Foundation



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02

Prediction of Preeclampsia

National Institute for Health and Clinical Excellence

NICE Guidance

High Risk

- Hypertensive disease during a previous pregnancy
- Chronic kidney disease
- Autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome
- Type 1 or type 2 diabetes
- Chronic hypertension.

Moderate Risk

- First pregnancy
- Age 40 years or older
- Pregnancy interval of more than 10 years
- Body mass index (BMI) of 35 kg/m2 or more at first visit
- Family history of pre-eclampsia
- Multi-fetal pregnancy.

ACOG Practice Guideline

Table 1. Clinical Risk Factors and Aspirin Use*

Level of Risk	Risk Factors	Recommendation
High†	• History of preeclampsia, especially when accompanied by an adverse outcome • Multifetal gestation • Chronic hypertension • Type 1 or 2 diabetes • Renal disease • Autoimmune disease (ie, systemic lupus erythematosus, the antiphospholipid syndrome)	Recommend low-dose aspirin if the patient has one or more of these high-risk factors
Moderate‡	• Nulliparity • Obesity (body mass index greater than 30) • Family history of preeclampsia (mother or sister) • Sociodemographic characteristics (African American race, low socioeconomic status) • Age 35 years or older • Personal history factors (eg, low birth weight or small for gestational age, previous adverse pregnancy outcome, more than 10-year pregnancy interval)	Consider low-dose aspirin if the patient has more than one of these moderate-risk factors§
Low	• Previous uncomplicated full-term delivery	Do not recommend low-dose aspirin

Screening program for pre-eclampsia (SPREE)

Comparison of diagnostic accuracy of early screening for pre-eclampsia by NICE guidelines and a method combining maternal factors and biomarkers: results of SPREE

M. Y. TAN[1,2], D. WRIGHT[3], A. SYNGELAKI[1], R. AKOLEKAR[1,4], S. CICERO[5], D. JANGA[6], M. SINGH[7], E. GRECO[8], A. WRIGHT[3], K. MACLAGAN[9], L. C. POON[1,10#] and K. H. NICOLAIDES[1,2*]

Method of screening	Detection rate (n (%, 95% CI))	Difference in detection rates between methods (% (95% CI))	
		No adjustment for effect of aspirin	Adjustment for effect of aspirin*
All-pre-eclampsia ($n = 473$)			
NICE guidelines	144 (30.4, 26.3–34.6)	—	—
Maternal factors + MAP + PAPP-A	201 (42.5, 38.0–46.9)	12.1 (7.9–16.2)	11.3 (7.1–15.5)
Preterm pre-eclampsia ($n = 142$)			
NICE guidelines	58 (40.8, 32.8–48.9)	—	—
Maternal factors + MAP + PAPP-A	76 (53.5, 45.3–61.7)	12.7 (4.7–20.7)	10.5 (2.3–18.8)
Maternal factors + MAP + PlGF	98 (69.0, 61.4–76.6)	28.2 (19.4–37.0)	24.0 (14.3–33.7)
Maternal factors + MAP + PlGF + UtA-PI	117 (82.4, 76.1–88.7)	41.6 (33.2–49.9)	35.1 (25.1–45.0)

Ultrasound Obstet Gynecol 2018; 51: 743–750

Screening program for pre-eclampsia (SPREE)

Comparison of diagnostic accuracy of early screening for pre-eclampsia by NICE guidelines and a method combining

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		No adjustment for effect of aspirin	Adjustment for effect of aspirin*
All-pre-eclampsia ($n = 473$)			
NICE guidelines	144 (30.4, 26.3–34.6)	—	—
Maternal factors + MAP + PAPP-A	201 (42.5, 38.0–46.9)	12.1 (7.9–16.2)	11.3 (7.1–15.5)
Preterm pre-eclampsia ($n = 142$)			
NICE guidelines	58 (40.8, 32.8–48.9)	—	—
Maternal factors + MAP + PAPP-A	76 (53.5, 45.3–61.7)	12.7 (4.7–20.7)	10.5 (2.3–18.8)
Maternal factors + MAP + PlGF	98 (69.0, 61.4–76.6)	28.2 (19.4–37.0)	24.0 (14.3–33.7)
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Ultrasound Obstet Gynecol 2018; 51: 743–750

Routine first-trimester combined screening for pre-eclampsia: pregnancy-associated plasma protein-A or placental growth factor?

L. NOËL[1], G. P. GUY[2], S. JONES[3], K. FORENC[1], E. BUCK[1], A. T. PAPAGEORGHIOU[1,4] and B. THILAGANATHAN[1,4,5]

	PE < 37 weeks		PE ≥ 37 weeks	
	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
PAPP-A	46.7 (14/30) (28.3–65.7)	91.2 (885/970) (89.3–92.9)	26.7 (28/105) (18.5–36.2)	92.1 (824/895) (90.1–93.8)
PlGF	51.7 (15/29) (32.5–70.6)	91.3 (861/943) (89.3–93.0)	27.0 (27/100) (18.6–36.8)	92.0 (802/872) (90.0–93.7)
Difference	5.0 (−20.5 to 30.6)	—	0.3 (−11.8 to 12.5)	—
	SGA < 37 weeks		SGA ≥ 37 weeks	
	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
PAPP-A	34.1 (14/41) (20.1–50.6)	91.1 (874/959) (89.2–92.9)	16.3 (20/123) (10.2–24.0)	91.0 (798/877) (88.9–92.8)
PlGF	37.5 (15/40) (22.7–54.2)	91.2 (850/932) (89.2–92.9)	17.8 (21/118) (11.4–25.9)	91.1 (778/854) (89.0–92.9)
Difference	3.4 (−17.5 to 24.2)	—	1.5 (−8.0 to 11.0)	—

Ultrasound Obstet Gynecol 2021; 58: 540–545

Why 150mg Aspirin & before 16 weeks?

Systematic Reviews ajog.org

The role of aspirin dose on the prevention of preeclampsia and fetal growth restriction: systematic review and meta-analysis

Stéphanie Roberge, PhD; Kypros Nicolaides, MD; Suzanne Demers, MD, MSc; Jon Hyett, MD; Nils Chaillet, PhD; Emmanuel Bujold, MD, MSc

Am J Obstet Gynecol. 2017 Feb;216(2):110-120.e6

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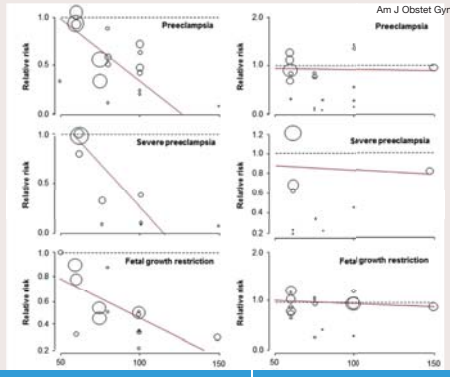
Am J Obstet Gynecol. 2017 Feb;216(2):110-120.e6



Before 16 weeks of gestation | After 16 weeks of gestation

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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Aspirin versus Placebo in Pregnancies at High Risk for Preterm Preeclampsia

Multicenter
Double-blind
Placebo-controlled trial

N Engl J Med. 2017 Dec 14;377(24) 2399-400

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Table 2. Outcomes According to Trial Group.

Outcome	Aspirin Group (N=798)	Placebo Group (N=822)	Odds Ratio (95% or 99% CI)*
Primary outcome: preterm preeclampsia at <37 wk of gestation — no. (%)	13 (1.6)	35 (4.3)	0.38 (0.20–0.74)
Secondary outcomes according to gestational age			
Adverse outcomes at <34 wk of gestation			
Any — no. (%)	32 (4.0)	53 (6.4)	0.62 (0.34–1.14)
Preeclampsia — no. (%)	3 (0.4)	15 (1.8)	0.18 (0.03–1.03)
Gestational hypertension — no. (%)	2 (0.3)	2 (0.2)	1.02 (0.08–13.49)
Small-for-gestational-age status without preeclampsia — no./total no. (%)†	7/785 (0.9)	14/807 (1.7)	0.53 (0.16–1.77)
Miscarriage or stillbirth without preeclampsia — no. (%)	14 (1.8)	19 (2.3)	0.78 (0.31–1.95)
Abruption without preeclampsia — no. (%)	1 (0.1)	3 (0.4)	0.36 (0.02–7.14)
Spontaneous delivery without preeclampsia — no. (%)	12 (1.5)	12 (1.5)	1.07 (0.37–3.10)
Adverse outcomes at <37 wk of gestation			
Any — no. (%)	79 (9.9)	116 (14.1)	0.69 (0.46–1.03)
Gestational hypertension — no. (%)	8 (1.0)	7 (0.9)	1.19 (0.31–4.56)
Small-for-gestational-age status without preeclampsia — no./total no. (%)†	17/785 (2.2)	18/807 (2.2)	1.01 (0.42–2.46)
Miscarriage or stillbirth without preeclampsia — no. (%)	14 (1.8)	19 (2.3)	0.78 (0.31–1.95)
Abruption without preeclampsia — no. (%)	2 (0.3)	4 (0.5)	0.52 (0.06–4.91)
Spontaneous delivery without preeclampsia — no. (%)	40 (5.0)	49 (6.0)	0.83 (0.47–1.47)
Adverse outcomes at ≥37 wk of gestation			
Any — no. (%)	178 (22.3)	171 (20.8)	1.12 (0.82–1.54)
Preeclampsia — no. (%)	53 (6.6)	59 (7.2)	0.95 (0.57–1.57)
Gestational hypertension — no. (%)	72 (9.0)	62 (7.5)	1.24 (0.78–1.98)
Small-for-gestational-age status without preeclampsia — no./total no. (%)†	54/785 (6.9)	56/807 (6.9)	1.00 (0.60–1.66)
Stillbirth without preeclampsia — no. (%)	2 (0.3)	2 (0.2)	1.01 (0.08–13.40)
Abruption without preeclampsia — no. (%)	2 (0.3)	2 (0.2)	1.05 (0.08–13.92)

N Engl J Med. 2017 Dec 14;377(24) 2399-400

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Table 2. Outcomes According to Trial Group.

Outcome	Aspirin Group (N=798)	Placebo Group (N=822)	Odds Ratio (95% or 99% CI)*
Primary outcome: preterm preeclampsia at <37 wk of gestation — no. (%)	13 (1.6)	35 (4.3)	0.38 (0.20–0.74)

N Engl J Med. 2017 Dec 14;377(24) 2399-400

29

Table 2. Outcomes According to Trial Group.

Outcome	Aspirin Group (N=798)	Placebo Group (N=822)	Odds Ratio (95% or 99% CI)*
Secondary outcomes according to gestational age			
Adverse outcomes at <34 wk of gestation			
Any — no. (%)	32 (4.0)	53 (6.4)	0.62 (0.34–1.14)
Preeclampsia — no. (%)	3 (0.4)	15 (1.8)	0.18 (0.03–1.03)
Gestational hypertension — no. (%)	2 (0.3)	2 (0.2)	1.02 (0.08–13.49)
Small-for-gestational-age status without preeclampsia — no./total no. (%)†	7/785 (0.9)	14/807 (1.7)	0.53 (0.16–1.77)
Miscarriage or stillbirth without preeclampsia — no. (%)	14 (1.8)	19 (2.3)	0.78 (0.31–1.95)
Abruption without preeclampsia — no. (%)	1 (0.1)	3 (0.4)	0.36 (0.02–7.14)
Spontaneous delivery without preeclampsia — no. (%)	12 (1.5)	12 (1.5)	1.07 (0.37–3.10)

N Engl J Med. 2017 Dec 14;377(24) 2399-400

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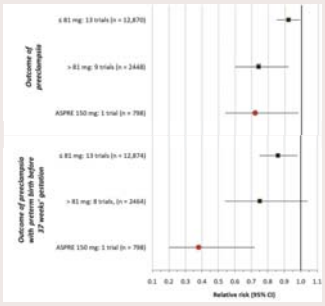
Research Letter

ajog.org

Optimal aspirin dosing for preeclampsia prevention



Am J Obstet Gynecol. 2018; 219: 117-118

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SUPPLEMENT ARTICLE

WILEY

The International Federation of Gynecology and Obstetrics (FIGO) initiative on pre-eclampsia: A pragmatic guide for first-trimester screening and prevention

TABLE 5 Proposed aspirin regime for preterm pre-eclampsia prevention.

Maternal weight, kg	Daily required dosage, mg	Administration, mg
<40	100	1 × 100
≥40	~150	2 × 60 2 × 75 2 × 81 1 × 100 + ½ × 100 (discard the other half) ½ × 300 (discard the other half)

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Universal Prophylaxis?

- Only 23.5% need aspirin (ACOG guideline)
  -> cost savings of approximately US $370 million
- No high quality evidence
- Many pregnant women prefer to avoid medication
- Aspirin may be associated with small risk of cerebral palsy

33

03

Twin Pregnancy in 1st Trimester

Dating

Chorioamniocity

Labeling

Detect abnormalities

35

Common complication of Twin pregnancy

- Twin-to-twin transfusion syndrome (TTTS)
- Antenatal growth restriction
- Twin reversed arterial perfusion (TRAP)
- Structure anomalies (cardiac defects and CNS defects)
- GDM
- Preeclampsia

36

Screening for trisomies by cfDNA testing of maternal blood in twin pregnancy: update of The Fetal Medicine Foundation results and meta-analysis

Trisomy 21	DR	FPR
Singleton pregnancy	99.7% (95% CI: 99.1-99.9%)	0.04% (95% CI:0.02-0.07%)
Twin pregnancies	98.2% (95% CI:83.2-99.8)	0.05% (95% CI:0.01-0.26%)

Trisomy 18	DR	FPR
Singleton pregnancy	97.9% (95% CI:94.9-99.1%)	0.04% (95% CI:0.03-0.07%)
Twin pregnancies	88.9% (95% CI: 64.8-97.2)	0.03% (95% CI:0.00-0.03%)

First published: 04 June 2019
https://doi.org/10.1002/uog.20284

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RESEARCH Open Access

First-trimester ultrasound measurements and maternal serum biomarkers as prognostic factors in monochorionic twins: a cohort study

Fiona L. Mackie[1,2*], Rebecca Whittle[3], R. Katie Morris[1,2], Jon Hyett[4], Richard D. Riley[3] and Mark D. Kilby[1,2]

- 177 MCDA twin pregnacies
- NT, CRL measurement
- Three serum biomarkers (AFP, sFlt-1, PlGF)

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Table 1 Maternal characteristics used as adjustment factors

	Fetal composite (TTTS, TAPS, TOPS, IUGR, IUFD)	
	At least one fetal complication present (n = 94)	No fetal complication (n = 83)
Maternal age, mean (SD) years	30.73 (5.30)	29.99 (5.53)
Maternal BMI, mean (SD) kg/m²	24.71 (5.08)	25.05 (5.77)
Maternal smoking status, n (%)		
Never	64 (75.29)	63 (79.75)
Current smoker	8 (9.41)	4 (5.06)
Ex-smoker	13 (15.29)	12 (15.19)
Maternal ethnicity, n (%)		
White	60 (64.52)	52 (65.00)
Mixed	3 (3.23)	7 (8.75)
Oriental	11 (11.83)	11 (13.75)
South Asian	12 (12.90)	7 (8.75)
African-Caribbean	7 (7.53)	3 (3.75)
Parity, n (%)		
0	61 (64.89)	46 (55.42)
1	23 (24.47)	25 (30.12)
2	8 (8.51)	10 (12.05)
3	1 (1.06)	1 (1.20)
4	1 (1.06)	1 (1.20)
Assisted conception, n (%)	14 (15.22)	10 (12.50)
Gestational age at delivery, median (IQR)	34.36 (30.00, 36.43)	36.00 (35.00, 36.57)
Steroids administration	67 (71.28)	58 (70.73)
Magnesium sulphate administration	10 (10.64)	2 (2.44)

Table 2 Number of events (per pregnancy (*n* = 177) unless otherwise stated)

	N (%)
Uncomplicated monochorionic diamniotic twin pregnancy, delivered > 34 weeks gestation	55/177 (31.07)
Fetal composite*	94/177 (53.11)
Twin-twin transfusion syndrome	23/177 (12.99)
Antenatal growth restriction	41/177 (23.16)
Antenatal growth restriction (per fetus)	73/354 (20.6)
Postnatal growth restriction	43/177 (24.29)
Postnatal growth restriction (per baby)	54/354 (15.25)
Intrauterine fetal death (single)	11/177 (6.21)
Intrauterine fetal death (double)	12/177 (6.78)
Maternal antenatal and postnatal composite **	46/177 (25.99)
Spontaneous preterm birth at 24–34 weeks	12/177 (6.78)
Neonatal composite **	91/340 (26.76)

*Fetal composite included at least one of the following: twin-twin transfusion syndrome, antenatally detected growth restriction, postnatally detected growth restriction, twin anaemia polycythaemia sequence, or intrauterine fetal death
**see Additional file 1 for full definitions of these composites

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Table 1 Maternal characteristics used as adjustment factors
Table 2 Number of events (per pregnancy (*n* = 177) unless otherwise stated)

Fetal composite* 94/177 (53.11)

Maternal antenatal and postnatal composite ** 46/177 (25.99)

*Fetal composite included at least one of the following: twin-twin transfusion syndrome, antenatally detected growth restriction, postnatally detected growth restriction, twin anaemia polycythaemia sequence, or intrauterine fetal death
**see Additional file 1 for full definitions of these composites

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Potential prognostic factor	Unadjusted OR (95%CI)	Adjusted* OR (95%CI)	*p* value	Change in c-statistic†
Fetal adverse outcome composite				
NT (% discordance)	*1.03 (1.01, 1.05)*	*1.03 (1.01, 1.06)*	*0.011*	*0.045*
CRL (% discordance)	*1.16 (1.06, 1.27)*	*1.17 (1.07, 1.29)*	*0.001*	*0.103*
AFP	1.91 (0.93, 3.94)	2.08 (0.94, 4.59)	0.071	0026
sFlt-1	1.12 (0.52, 2.40)	1.03 (0.42, 2.50)	0.950	<0.001
PlGF	0.73 (0.44, 1.22)	0.65 (0.37, 1.13)	0.125	0014
Twin-twin transfusion syndrome (TTTS)				
NT (% discordance)	*1.05 (1.02, 1.08)*	*1.06 (1.03, 1.10)*	*< 0.001*	*0.137*
CRL (% discordance)	1.07 (0.96, 1.20)	1.09 (0.97, 1.23)	0.161	0032
AFP	*3.04 (1.05, 8.78)*	*3.24 (1.00, 10.48)*	*0.050*	*0.067*
sFlt-1	1.91 (0.62, 5.88)	1.64 (0.44, 6.03)	0.459	0006
PlGF	*0.43 (0.20, 0.91)*	*0.42 (0.19, 0.93)*	*0.032*	*0.074*
Antenatal growth restriction				
NT (% discordance)	1.01 (0.99, 1.03)	1.01 (0.99, 1.04)	0.261	0014
CRL (% discordance)	*1.17 (1.06, 1.30)*	*1.20 (1.08, 1.34)*	*0.001*	*0.119*
AFP	1.55 (0.67, 3.55)	2.10 (0.82, 5.40)	0.123	0032
sFlt-1	1.25 (0.50, 3.13)	1.47 (0.49, 4.35)	0.491	0011
PlGF	0.91 (0.50, 1.66)	0.88 (0.44, 1.76)	0.720	−0.001

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Twin-twin transfusion syndrome (TTTS)

Potential prognostic factor	Unadjusted OR (95%CI)	Adjusted* OR (95%CI)	*p* value
NT (% discordance)	*1.05 (1.02, 1.08)*	*1.06 (1.03, 1.10)*	*< 0.001*
PlGF	*0.43 (0.20, 0.91)*	*0.42 (0.19, 0.93)*	*0.032*

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Antenatal growth restriction

Potential prognostic factor	Unadjusted OR (95%CI)	Adjusted* OR (95%CI)	p value
CRL (% discordance)	*1.17 (1.06, 1.30)*	*1.20 (1.08, 1.34)*	*0.001*

Diagn Progn Res. 2019 May 9;3:9

Potential prognostic factor	Unadjusted OR (95%CI)	Adjusted* OR (95%CI)	p value	Change in c-statistic
Single intrauterine fetal death (sIUFD)				
NT (% discordance)	1.01 (0.98, 1.05)	1.02 (0.98, 1.06)	0.425	<–0.001
CRL (% discordance)	*1.17 (1.00, 1.36)*	*1.19 (1.01, 1.40)*	*0.035*	*0.085*
AFP	0.68 (0.16, 2.87)	0.80 (0.17, 3.90)	0.787	–0.004
sFlt-1	1.27 (0.27, 6.04)	1.79 (0.30, 10.64)	0.523	<–0.001
PIGF	*0.35 (0.13, 0.97)*	*0.34 (0.12, 0.98)*	*0.045*	*0.057*
Double intrauterine fetal death (dIUFD)				
NT (% discordance)	1.02 (0.98, 1.06)	1.02 (0.98, 1.06)	0.420	–0.005
CRL (% discordance)	1.06 (0.91, 1.24)	1.12 (0.94, 1.33)	0.221	0.019
AFP	1.33 (0.34, 5.21)	0.97 (0.18, 5.33)	0.970	<–0.001
sFlt-1	4.13 (0.92, 18.58)	8.21 (1.02, 66.24)	0.048	0.035
PIGF	*0.23 (0.08, 0.63)*	*0.18 (0.05, 0.58)*	*0.005*	*0.080*

Diagn Progn Res. 2019 May 9;3:9

Single intrauterine fetal death (sIUFD)

PIGF	*0.35 (0.13, 0.97)*	*0.34 (0.12, 0.98)*	*0.045*

Double intrauterine fetal death (dIUFD)

PIGF	*0.23 (0.08, 0.63)*	*0.18 (0.05, 0.58)*	*0.005*

Diagn Progn Res. 2019 May 9;3:9

TTTS — Increased NT discordance, Decreased PIGF

Antenatal growth restriction — Increased CRL discordance

IUFD — Decreased PIGF

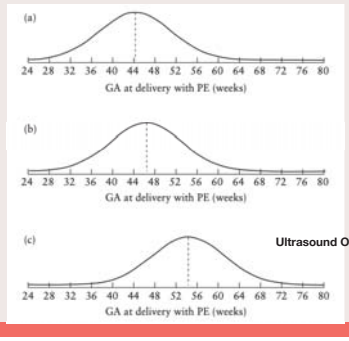
Diagn Progn Res. 2019 May 9;3:9

Preeclampsia risk in Twin pregnancy

Ultrasound Obstet Gynecol 2017; 50: 501–506
Published online 23 August 2017 in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.17529

Competing-risks model in screening for pre-eclampsia in twin pregnancy by maternal characteristics and medical history

Preeclampsia risk in Twin pregnancy



Ultrasound Obstet Gynecol 2017; 50: 501–506

Preeclampsia risk in Twin pregnancy

Table 2 Screen-positive rate and detection rate at different risk cut-offs in screening by maternal factors and medical history for pre-eclampsia (PE) in singleton and twin pregnancy

	Risk cut-off 1 in 10		*Risk cut-off 1 in 50*		*Risk cut-off 1 in 75*	
	Singletons (n = 93 297)	*Twins (n = 2219)*	*Singletons (n = 93 297)*	*Twins (n = 2219)*	*Singletons (n = 93 297)*	*Twins (n = 2219)*
Screen-positive rate	722 (0.8; 0.7–0.8)	1113 (50.2; 48.1–52.3)	6517 (7.0; 6.8–7.2)	2152 (97.0; 96.2–97.7)	12 512 (13.4; 13.2–13.6)	2211 (99.6; 99.3–99.8)
Detection rate						
PE < 32 weeks	26/161 (16.1; 10.8–22.8)	15/21 (71.4; 47.8–88.7)	74/161 (46.0; 38.1–54.0)	21/21 (100; 83.9–100)	90/161 (55.9; 47.9–63.7)	21/21 (100; 83.9–100)
PE < 37 weeks	76/597 (12.7; 10.2–15.7)	88/124 (71.0; 62.1–78.8)	222/597 (37.2; 33.3–41.2)	123/124 (99.2; 95.6–100)	299/597 (50.1; 46.0–54.2)	124/124 (100; 97.1–100)
PE < 42 weeks	175/2140 (8.2; 7.1–9.4)	116/171 (67.8; 60.3–74.8)	675/2140 (31.5; 29.6–33.6)	169/171 (98.8; 95.8–99.9)	935/2140 (43.7; 41.6–45.8)	171/171 (100; 97.9–100)

Data are given as *n/N* (%; 95% CI).

Ultrasound Obstet Gynecol 2017; 50: 501–506

Preeclampsia risk in Twin pregnancy

Ultrasound Obstet Gynecol 2021; 57: 257–265
Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.23531

Prediction of pre-eclampsia in twin pregnancy by maternal factors and biomarkers at 11–13 weeks' gestation: data from EVENTS trial

Preeclampsia risk in Twin pregnancy

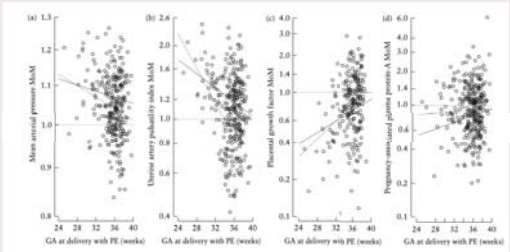


Figure 2 Scatter diagrams and regression lines (· · · ·) for relationship between mean arterial pressure (a), uterine artery pulsatility index (b), serum placental growth factor (c) and serum pregnancy-associated plasma protein-A (d) multiples of the median (MoM) and gestational age (GA) at delivery with pre-eclampsia (PE) in twin pregnancies. Solid lines are regression lines for singleton pregnancies from previous publication[3].

Ultrasound Obstet Gynecol 2021; 57: 257–265

Preeclampsia risk in Twin pregnancy

Table 3 Performance of screening for delivery with pre-eclampsia at < 37 and < 32 weeks' gestation, at 10% false-positive rate, by maternal factors (MF) combined with mean arterial pressure (MAP), uterine artery pulsatility index (UtA-PI), serum placental growth factor (PlGF) and pregnancy-associated plasma protein-A (PAPP-A) in twin pregnancy

Method of screening	*Study population (n)*	*AUC (95% CI)*	*Cases detected (n/N)*	*Detection rate (95% CI) (%)*
Pre-eclampsia < 37 weeks				
MF	3938	0.742 (0.710–0.773)	63/253	24.9 (19.7–30.7)
MF + MAP	3025	0.742 (0.710–0.773)	70/209	33.5 (27.1–40.3)
MF + UtA-PI	3502	0.689 (0.655–0.723)	71/238	29.8 (24.1–36.1)
MF + PlGF	2635	0.744 (0.708–0.780)	58/175	33.1 (26.2–40.6)
MF + PAPP-A	3724	0.694 (0.661–0.727)	65/241	27.0 (21.5–33.0)
MF + MAP + UtA-PI	3001	0.747 (0.715–0.779)	75/208	36.1 (29.5–43.0)
MF + MAP + PlGF	2398	0.773 (0.739–0.808)	66/164	40.2 (32.7–48.2)
MF + UtA-PI + PlGF	2584	0.748 (0.712–0.784)	59/173	34.1 (27.1–41.7)
MF + MAP + UtA-PI + PlGF	2383	0.776 (0.741–0.811)	67/163	41.1 (33.5–49.1)
MF + MAP + UtA-PI + PlGF + PAPP-A	2383	0.776 (0.741–0.811)	67/163	41.1 (33.5–49.1)
Pre-eclampsia < 32 weeks				
MF	3938	0.702 (0.622–0.782)	11/36	30.6 (16.4–48.1)
MF + MAP	3025	0.838 (0.778–0.897)	17/28	60.7 (40.6–78.5)
MF + UtA-PI	3502	0.847 (0.791–0.904)	18/33	54.5 (36.4–71.9)
MF + PlGF	2635	0.888 (0.830–0.946)	15/23	65.2 (42.7–83.6)
MF + PAPP-A	3724	0.728 (0.652–0.805)	8/33	24.2 (11.1–42.3)
MF + MAP + UtA-PI	3001	0.915 (0.879–0.950)	21/28	75.0 (55.1–89.3)
MF + MAP + PlGF	2398	0.932 (0.902–0.962)	18/22	81.8 (59.7–94.8)
MF + UtA-PI + PlGF	2584	0.915 (0.865–0.966)	18/23	78.3 (56.3–92.5)
MF + MAP + UtA-PI + PlGF	2383	0.950 (0.924–0.976)	19/22	86.4 (65.1–97.1)
MF + MAP + UtA-PI + PlGF + PAPP-A	2383	0.953 (0.930–0.976)	19/22	86.4 (65.1–97.1)

AUC, area under the receiver-operating-characteristics curve.

Ultrasound Obstet Gynecol 2021; 57: 257–265

Preeclampsia risk in Twin pregnancy

- High screening positive rate
- Most national guidelines recommend aspirin for twin pregnancies with one additional risk indicator.
- Use the new distributions of log10 MoM values of UtA-PI, MAP and PlGF according to gestational age at delivery with PE
- However, efficacy studies for aspirin in multiple pregnancies are lacking.

Take Home Message

First Trimester Contingent Screening

- Risk Assessment

- Chromosome Abnormalities
- Preeclampsia
- Structure Abnormalities

Take Home Message

Atypical Chromosome Abnormalities

- T21 risk > 1:100
- NT ≥ 3.5 mm
- PAPP-A < 0.2 MoM
- Free β-hCG <0.2 MoM or > 5.0 MoM
- Maternal age ≥ 45 y/o
- Ultrasound abnormalities

First trimester Level II !!

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Take Home Message

Prevention of Preeclampsia

- Before 16 weeks
- 150mg Aspirin

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Take Home Message

For Twin Pregnancy

- NIPT is not good as singleton !
- High screening positive rate in prediction of preeclampsia risk.
- NT, CRL and PlGF could be factors for predicting adverse outcome.

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Thanks for your Attention

Histology-Specific Diagnosis of Ovarian Cancer

孫珞主任
台中榮民總醫院婦科病房

- Ovarian cancer in Taiwan and US
- Sonographic Dx of ovarian cancer
  - Gross features differs in different histology, thus lead to pre-op prediction frequent possible.
  - Gross and sono libraries set-up help beginners in sonography.
- Histological D/D by sonography
  - high-grade serous carcinoma
  - clear cell carcinoma
  - endometrioid carcinoma
  - Mucinous carcinom
  - Borderline malignancy

CSP and Corpus Callosum Evaluation

莊聖偉醫師
童綜合醫院婦產部

Partial and complete agenesis of cavum septum pellucidum are accounted for 1/5000 of fetal anomaly. Clinical symptoms can be ranged from normal to severe psychomotor delay. CSP screen is recommended since 18 weeks of gestation. Compelete agenesis of corpus callosum is easily detected. However, partial agenesis is a retative hard diagnosis to make. Here we demonstrated our clinical experience of corpus callosum evaluation and recent research review.

Cardiovascular Disease Prediction by Big Data Analysis and Machine Learning

Wei-Wen Lin, MD, PhD
Taichung Veterans General Hospital, Cardiovascular Center

Cardiovascular disease is one of the major health killers of modern people in the world, and it ranks among the top 10 causes of death in Taiwanese. This study uses the cardiac ultrasound data provided by the Taichung Chief Cardiologist, and uses machine learning to find out the characteristics of patients with different ultrasound data, and use this data to assist doctors in judging which course of treatment should be performed. We use cardiac ultrasound data to study patients and divide them into three treatment modalities for improvement, namely cardiac catheterization, ventricular defibrillator, and drug control. Assisting doctors through the results of machine learning judgments, allowing doctors to make more accurate judgments in a shorter time, reducing the possibility of mistakes, thereby improving the efficiency of the entire circulation operation and course of treatment, so that patients can receive correct treatment as soon as possible to avoid Many regrets.

Ultrasound patient data will have different categories due to age and posture. This study uses machine learning to find relevant features and models, which can be divided into unsupervised learning and supervised learning in machine learning. Learning (Supervised Learning), we use unsupervised learning and supervised learning methods to estimate the accuracy of model judgment, whether we can find the most effective model to assist the accuracy of doctors, which uses unsupervised learning to test Our classification effect.

Unsupervised learning is a learning algorithm that finds appropriate labels for classification on unlabeled data. Unlabeled means that we have a lot of data, but the data is not classified into a specific category or answer, so all the data can be redefined into a category, or belong to a certain category. Therefore, unsupervised learning hopes to find out the rigorous internal representation in the data through imitation, and then generate the classification that it imagines and judges.

Supervised learning (Supervised Learning), in order to let the model learn the changes of data through the defined labels, find the model with the highest accuracy, and use it as the prediction of new data, so the difference between the two learning is whether the label has been Given.

In the analysis of clinical data, this study uses the Scikit-learn module as a main tool. Scikit-learn is a Python module that aggregates various state-of-the-art machine learning algorithms for medium-scale supervised and unsupervised problems.

Cardiovascular POCUS in Intensive Care Unit

林子翔醫師
臺中榮民總醫院心臟內科

Echocardiography is important in cardiovascular critical care unit. It helps us identify the etiology promptly and guide the therapies. Although it takes lots of efforts to become an experienced cardiac sonographer. However, it is much easier for the physicians of other specialist to perform point of care ultrasound (POCUS) in the aspect of heart to evaluate left ventricle function, right ventricle function, cardiac tamponade, inferior vena cava and valvular abnormality with some practice. My topic is POCUS (Echocardiography) in critical care unit.

達文西微創手術治療左心室出口狹窄心肌病 (台中童醫院長期經驗)

鄭伯智副院長
台中童醫院外科部心臟外科

Robotically Assisted Intra-Cardiac Repair of Hypertrophic Cardiomyopathy
– Long-Term Experience in Tungs' Taichung MetroHarbor Hospital –

Bor-Chih Cheng, MD,
Division of Cardiovascular Surgery, Department of Surgery, Tungs' Taichung MetroHarbor Hospital

Objective: Hypertrophic cardiomyopathy (HCM) is a disease with high incidence of adverse events, and surgical treatment (septal myectomy) is the treatment of choice. Various types of surgical methods were proposed, including the trans-aortic, trans-mitral and trans-apical approach, and robot-assisted approach was applied under this minimally invasive era.

Method: From June, 1996 to October. 2021, total 3650 patients underwent various types of cardiac surgery in Chi-Mei Medical Center and Tungs'TaichungMetroHarbor Hospital by a single surgeon. Of these 36consecutive patients underwent hypertrophic muscle resection ether through sternotomy procedure (26 patients) or by robotic endoscopical procedure (10 patients). Gender distribu-tion is 12 female and 24 male. Average age is 68+/- 2.4 years old. Concomitant procedure includes mitral valve repair: 23 (63.8%), mitral valve replacement: 9 (25%), Double valve replacement: 4 (11%), Maze procedure: 4 (11%), Aortic valve replacement: 3 (8.2%), CABG:1(2.7%), ASD repair:1(2.7%). The follow up duration is from 3 months to 22 years. There is no surgical mortality or major complication. Two patients in da Vinci robotic group received permanent DDD pace-maker implantation. Post-operative trans-aortic pressure gradient are less than 25mmHg in most patients. There are two patients revealed increasing pressure gradient at LVOT. (57mmHg, 5 years after OP & 34mmHg, 1 year after OP) Both patients were followed in OPD regularly. Four patients died of cancer disease. No post-operative SAM or significant residual mitral regurgitation.

No significant diffidence of post-operative ICU stay and hospital stay between sternotomy or da Vinci robotic group. But significant satisfaction of post-operative pain scale and cosmetic effect in da Vinci robotic group.

Results:Excellent outcome was proven after surgical treatment in both sternotomy group and da Vinci robotic group. The understanding of HCM pathology kept progressing and minimally invasive procedure for radical disease management. Long segment hypertrophy is the future challenge needed to be addressed for.

A 67-Year-Old Woman with Shortness of Breath for 2 days

董承昌醫師
中國醫藥大學附設醫院心臟血管系

Shortness of breath is a common chief complaint in the emergent department. However, it was not specific and had several causes. Besides history taking and physical examination, the bedside echo could also help to differentiate whether it had cardiac problems, tumors, increased lung fluid, etc. Some diseases had specific patterns under ultrasound images, and further confirmation examination will be arranged. It will affect the prognosis if an early diagnosis is made.

Trouble Never Comes Alone – Challenges in Echocardiography Imaging

謝祐銓醫師
彰化基督教醫院心臟內科總醫師

The patient presented here is a 46-year-old IV drug user with a history ofcoronary artery disease (CAD) status post percutaneous coronary intervention (PCI) with stent placement in 2021, HCV, HIV and smoking.

The patient underwent PCI at 802 Hospital in May this year and had been placed on DAPT with Aspirin and Ticagrelor. He complained of chest tightness for 1 day before the current admission, but denied dyspnea, back pain, radiation pain, or cold sweating. Due to progressive and persistent chest tightness, he came to YUN-LIN Chang Gung Medical Hospital, where elevated cardiac enzyme was noted.He was referred to Changhua Christian Hospital emergency department and admitted to CCU for further care.

After admission the patient developed a fever, butthere was no cough, abdominal pain, or diarrhea. Blood culture later yielded Streptococcus agalactiae and he underwent further survey. However, unexpected challenges arose and we would like to share our experiences here.

A Case Presenting as Acute Coronary Syndrome with Cardiogenic Shock and aVR ST-elevation

蕭文智
中山醫學大學附設醫院心臟內科主治醫師

A ruptured sinus of Valsalva aneurysm can presentas a clinical emergency and can lead to progressivelydeteriorating dyspnea. We describe an unusual case ofsinus of Valsalva aneurysm (SOVA) presenting withacute chest pain and dyspnea with electrocardiographicST-segment elevation in the V1 and aVR leads. Diagnosticangiography and cardiac computed tomographyangiography showed contrast enhancement fromthe aorta to the right ventricle and pulmonary artery.The patient was referred to a cardiovascular surgeonfor immediate surgical excision and repair. This casehighlights the importance of echocardiography, especially in the emergency setting,since the disease can manifest in various presentations.