臺灣兒科醫學會第六十三屆年會暨第二五〇屆學術演講會時間表

民國111年4月16日（星期六）

201A、B、C會議室(2F)

08:30～09:30 第一單元：心臟血管學（1～6題）

09:30～09:40 休息

09:40～ 第一單元：心臟血管學（7～12題）

10:40～10:50 休息

10:50～11:40 第二單元：腎臟學（13～17題）

12:00～13:30 附加研討會
- 主　題：疫情過後，我們怎麼看待兒童呼吸道疾病
- 主持人：黃玉成教授
- 演講者：呂俊毅醫師、徐任甫醫師、陳家駿醫師

201D、E、F會議室(2F)

08:30～ 第五單元：過敏免疫風濕病學（38～46題）

10:00～10:10 休息

10:10～ 第五單元：過敏免疫風濕病學（47～55題）

11:40～

12:00～13:30 附加研討會
- 主　題：兒科新藍海：疫情下的預防布局
- 主持人：林奏延醫師
- 演講者：邱南昌醫師、何宇苓醫師

102 會議室(1F)

08:30～ 第八單元：腸胃學、營養學（75～83題）

10:00～10:10 休息

10:10～ 第八單元：腸胃學、營養學（84～91題）

11:30～11:50 第九單元：青少年醫學（92～93題）

12:00～13:30 附加研討會
- 主　題：守護嬰兒消化系統的最新營養方針
- 主持人：李宏昌理事長
- 演講者：黃清峯醫師

105會議室(1F)

08:30～ 第十一單元：血液學、腫瘤學（111～120題）

10:10～10:20 休息

10:20～11:10 第十二單元：神經精神醫學（121～125題）

11:10～11:20 休息

11:20～11:50 第十三單元：醫學人文及教育（126～128題）

12:00～13:30 附加研討會
- 主　題：基因治療在脊髓性肌肉萎縮症新角色
- 主持人：李旺祚醫師
- 演講者：鐘育志醫師

民國111年4月17日（星期日）

201A、B、C、D、E、F會議室(2F)

08:30～09:30 陳炯霖教授講座獎
- 主　題：全球暖化與兒童的健康與未來
- 主持人：呂鴻基教授
- 演講者：李遠哲院士

09:30～ 教育演講
- 主　題：兒童成長發育的優質化
- 主持人：王玲常務理事、塗勝雄理事
- 演講者：賴昇層醫師、吳佩昌教授、田英俊教授

12:10～13:25 附加研討會
- 主　題：肺炎鏈球菌研討會
- 主持人：黃立民教授
- 演講者：邱政洵醫師、李建德醫師

102 會議室(1F)

09:30～ 特別演講
- 主　題：兒童友善醫療
- 主持人：吳美環教授
- 演講者：Laura McGrath, CCLS and Natalie Wilson, MA, CCLS、呂立醫師

12:00～13:30 附加研討會
- 主　題：號召守護者!保護嬰幼兒免於感染性疾病威脅
- 主持人：黃立民教授
- 演講者：陳伯彥醫師、黃淞寧醫師

105會議室(1F)

09:30～ 專題演講
- 主　題：兒童食物過敏診斷與治療新進展
- 主持人：黃璟隆醫師、葉國偉醫師
- 演講者：Prof. Wayne G. Shreffler、蘇冠文醫師

12:00～13:30 附加研討會
- 主　題：母乳寡醣臨床應用新進展
- 主持人：李宏昌理事長
- 演講者：Prof. Christine Loscher

（下午）

201A、B、C會議室(2F)

13:30～ 第三單元：新生兒學（18～24題）

14:40～14:50 休息

14:50～ 第三單元：新生兒學（25～31題）

16:00～16:10 休息

16:10～17:10 第四單元：肺臟學（32～37題）

201D、E、F會議室(2F)

13:30～ 第五單元：過敏免疫風濕病學（56～63題）

14:50～15:00 休息

15:00～ 第六單元：重症學（64～67題）

15:40～15:50 休息

15:50～17:00 第七單元：急診學（68～74題）

102 會議室(1F)

13:30～ 第十單元：感染學（94～102題）

15:00～15:10 休息

15:10～16:30 第十單元：感染學（103～110題）

105會議室(1F)

13:30～ 第十四單元：遺傳學、新陳代謝學（129～136題）

14:50～15:00 休息

15:00～16:00 第十五單元：內分泌學（137～142題）

201A、B、C、D、E、F會議室(2F)

13:30～14:30 頒獎／會員代表大會

14:30～14:40 休息

14:40～16:40 醫學的科學、倫理與法律講座－特別演講
- 主　題：COVID-19疫情下醫療倫理的衝擊
- 主持人：李宏昌理事長
- 演講者：陳時中部長、蔡甫昌教授

地址：臺北國際會議中心（台北市信義路五段1號）

一般演講：口頭報告

第一單元：心臟血管學

日期：民國111年4月16日(星期六)
時間：08:30~10:40
地點：201A、B、C會議室(2F)

主持人：林銘泰、鄭敬楓

08:30~08:37　　　1.　類昇糖素胜肽-1：藉由血管舒張與抑制重塑造調控動脈導管之新藥物方向
劉怡慶[1,2]、葉竹來[3]、吳彥賢[1]、戴任恭[1,4]、羅時興[1]、陳怡眞[1,4]、徐仲豪[1,4]
高雄醫學大學附設中和紀念醫院小兒部[1]；高雄醫學大學醫學院臨床醫學研究所[2]、醫學系藥理學科[3]、醫學系小兒學科[4]

08:37~08:44　　　2.　開放性卵圓孔封堵術在缺血性中風的回顧性研究
謝宛諭[1]、張雅婷[1]、徐新貿[1]、李昱昕[1]、鍾宏濤[1]、洪國竣[2]、周宗川[2]、盧政諱[2]、李宗海[3]、張健宏[3]
林口長庚紀念醫院兒童心臟內科[1]、心臟內科系[2]、神經內科系腦血管科[3]

08:44~08:51　　　3.　下腔靜脈塌陷性的再思考----下腔靜脈眞的會塌陷嗎？
謝凱生[1]、戴以信[2]、周正哲[1]
台北醫學大學雙和醫院兒科部[1]；中國醫藥大學兒童醫院兒童心臟科[2]

08:51~08:58　　　4.　法洛氏四合症術後病人的雙心室心肌動能特徵
翁根本、簡光仁、林竹川、謝凱生[2]、彭旭霞[3]、吳銘庭[1]
高雄榮民總醫院兒醫部、放射線部[1]；雙和醫院兒科部[2]；國立清華大學生醫工程與環境科學系[3]

08:58~09:05　　　5.　產前診斷主動脈弓狹窄的新生兒之臨床成效：一家醫學中心的經驗
王怡方、邱舜南、陳俊安、林銘泰、盧俊維、吳美環、王主科
國立台灣大學醫學院附設醫院兒童醫院

09:05~09:12　　　6.　中國醫藥大學兒童醫院「心臟手術團隊」成果報告
戴以信[1]、徐宗正[1]、莊子瑤[1]、彭義欽[1]、張正成[1]、王鍾義[2]、吳佳穎[3]、謝凱生[4]、傅雲慶[5]、李秉純[3]
中國醫藥大學兒童醫院心臟科[1]；中國醫藥大學附設醫院放射線部[2]；中國醫藥大學附設醫院心臟外科[3]；台北醫學大學附設雙和醫院[4]；台中榮民總醫院[5]

09:12~09:30　　　　　討論

09:30~09:40　　　　　休息

主持人：李必昌、鍾宏濤

09:40~09:47　　7.　研究川崎病在兒童的發生率
林聖傑[1,2]、高翊瑋[3]、蕭凱元[3,4]、陳世彥[1,2]、謝邦昌[3,4]、謝凱生[1,2]
臺北醫學大學-部立雙和醫院小兒部[1]；臺北醫學大學醫學系小兒學科[2]；輔仁大學管理學院商學研究所[3]；輔仁大學人工智慧發展中心[4]

09:47~09:54　　8.　整體縱向應變於川崎症不同冠狀動脈後遺症之差異
許瑛倫、吳怡樺、林宜君
高雄長庚醫院兒童心臟內科

09:54~10:01　　9.　青少年Pfizer-BioNTech新冠疫苗施打後心血管相關併發症—單一中心經驗
廖霙鳳、邱舜南、曾偉杰、陳俊安、林銘泰、盧俊維、吳美環、王主科
國立台灣大學醫學院附設醫院兒童醫院

10:01~10:08　　10.　青少年接種BNT162b2 (Pfizer-BioNTech) Messenger RNA COVID-19疫苗後胸痛事件
吳承諭、朱映慈、魏昱仁、謝旻玲、王玠能、吳俊明
國立成功大學醫學院附設醫院小兒科

10:08~10:15　　11.　打完第二劑BNT新冠疫苗之後的心包膜心肌炎—單一中心經驗
劉庭維[1]、鄧沛元[1]、陳怡學[2]、游雅茜[2]、江舒欣[1]、郭雲鼎[1]、方旭彬[1]、周正哲[1]、陳世彥[1,3]、謝凱生[1]
台北醫學大學雙和醫院兒科部[1]；台北醫學大學醫學院醫學系[2]；台北醫學大學醫學院[3]

10:15~10:22　　12.　台灣青少年BNT新冠疫苗施打後大規模心電圖篩檢成效
邱舜南[1]、陳益祥[2]、曾偉杰[1]、盧俊維[1]、花玉娟[3]、許家禎[4,5,6]、王主科[1]
國立台灣大學醫學院附設醫院小兒部[1]、外科部[2]；中華民國心臟病兒童基金會[3]；長庚科技大學高齡暨健康照護管理研究所[4]；臺北市立聯合醫院耳鼻喉科[5]；臺北市立大學運動健康科學系[6]

10:22~10:40　　　　　討論

10:40~10:50　　　　　休息

第二單元：腎臟學

日期：民國111年4月16日(星期六)
時間：10:50~11:40
地點：201A、B、C會議室(2F)

主持人：錢建文、蔡宜蓉

10:50~10:57　13.　丁酸鈉調節母親色胺酸缺乏飲食誘導大鼠後代的高血壓和腸道菌叢
田祐霖[1]、許茜甯[2]、侯智耀[3]、張簡國平[4]
高雄長庚紀念醫院兒童內科部[1]；高雄長庚紀念醫院藥劑部[2]；高雄科技大學水產食品科學系[3]；正修科技大學超微量研究科技中心[4]

10:57~11:04　14.　以TaqMan分子診斷快篩技術研究台灣自體隱性腎顯管發育不良之基因帶因率及奠基者效應
曾敏華[1]、丁肇壯[2]、林石化[3]
林口長庚紀念醫院兒童內科部腎臟科[1]；三軍總醫院小兒科部[2]；三軍總醫院內科部腎臟科[3]

11:04~11:11　15.　補體因子H和其相關蛋白可作為兒童慢性腎臟病心血管危險因子之標誌
廖偉婷、田祐霖
高雄長庚紀念醫院兒童腎臟科

11:11~11:18　16.　利用深度學習技術自腎臟超音波影像預測急性腎盂腎炎
周信旭[1]、邱元佑[2]、蔡志仁[3]、陳崑毅[3]
戴德森醫療財團法人嘉義基督教醫院兒童醫學部[1]；國立成功大學醫學院附設醫院小兒部[2]；亞洲大學資訊工程學系[3]

11:18~11:25　17.　尿道分泌物是24個月以下嬰幼兒泌尿道感染嶄新的臨床表現
方乃文、黃鈺珊、邱益煊
高雄榮民總醫院兒童醫學部兒童腎臟科

11:25~11:40　　　討論

附加研討會
疫情過後，我們怎麼看待兒童呼吸道疾病

日期：民國111年4月16日(星期六)
時間：12:00~13:30
地點：201A、B、C會議室(2F)

主持人：黃玉成教授

12:00-12:10　　1.　開幕致詞
　　　　　　　　　黃玉成教授
　　　　　　　　　林口長庚紀念醫院

12:10-12:30　　2.　不能輕忽的兒童呼吸道傳染性疾病
　　　　　　　　　呂俊毅醫師
　　　　　　　　　台大兒童醫院小兒部

12:30-12:50　　3.　流感消失了？怎麼辦？
　　　　　　　　　徐任甫醫師
　　　　　　　　　林口長庚紀念醫院新生兒科

12:50-13:10　　4.　我們期待怎樣的疫苗？
　　　　　　　　　陳家駿醫師
　　　　　　　　　亞東醫院小兒部

13:10-13:30　　5　問題討論與結語
　　　　　　　　　黃玉成教授
　　　　　　　　　林口長庚紀念醫院

第三單元：新生兒學

日期：民國111年4月16日(星期六)
時間：13:30~16:00
地點：201A、B、C會議室(2F)

主持人：張瑞幸、穆淑琪

13:30~13:37　18. 高氧誘導新生小鼠鐵依賴型細胞死亡並損害肺發育
陳中明[1,2]、周琇珠[3]
台北醫學大學附設醫院小兒部[1]；台北醫學大學小兒學科[2]、解剖暨細胞生理學科[3]

13:37~13:44　19. 缺氧誘發因子1α(HIF-1α)於新生小鼠高氧引發腎臟傷害的角色
黃亮迪[1,2]、周琇珠[3]、陳中明[2,4]
台北市立萬芳醫院兒科部[1]；台北醫學大學醫學系小兒學科[2]、解剖學科[3]；台北醫學大學附設醫院兒科部[4]

13:44~13:51　20. 子宮胎盤功能不全破壞生長受限新生仔鼠的微生物群並損害肺發育
陳中明[1,2]、楊宇辰[3]、周琇珠[4]
台北醫學大學附設醫院小兒部[1]；台北醫學大學小兒學科[2]、聯合人體生物資料庫[3]、解剖暨細胞生理學科[4]

13:51~13:58　21. 早產母親在分娩前腸道微生物組中放線菌屬豐富度較高
于鴻仁[1]、蔡慶章[2]、許德耀[2]、鄭欣欣[2]、黃欣純[1]、陳志誠[1]、華瑜[3]、葉耀宗[4]
高雄長庚紀念醫院兒科[1]；高雄長庚醫院婦產科[2]；高雄長庚醫院生物醫學轉譯研究所[3]；高雄輔英大學衰老與疾病預防研究中心[4]

13:58~14:05　22. 口面部缺陷患兒的唾液微生物菌群和氣喘
陳宜綸[1]、黃新純[1]、黃慧芬[2]、張心瑜[1]、歐陽美珍[1]、陳豐順[1]、鍾美勇[1]、陳志誠[1]
高雄長庚紀念醫院兒科[1]、整型外科[2]

14:05~14:12　23. 預測新生兒休克發生之智慧型微循環監測系統
陳秀玲[1,2]、張潔妙[3]、林伯昰[3]、鐘浩瑋[1]、楊書婷[1]
高雄醫學大學附設醫院小兒科部[1]；高雄醫學大學醫學院呼吸治療學系[2]；國立陽明交通大學影像與生醫光電研究所[3]

14:12~14:19　　24.　應用機器學習方法來幫助臨床使用呼吸器新生兒之呼吸器相關肺炎診斷
徐任甫[1]、朱世明[1]、黃宣蓉[1]、江明洲[1]、傅仁輝[1]、蔡明宏[2]
林口長庚紀念醫院兒童內科部新生兒科[1]；雲林長庚紀念醫院兒童內科部新生兒科[2]

14:19~14:40　　討論

14:40~14:50　　休息

主持人：周弘傑、王藍浣

14:50~14:57　　25.　潛在性疾病的嚴重度決定新生兒肺高壓的預後
黃冠慈、楊曉涵、鄭皓文、陳映廷、蔡明倫、林湘瑜、邱曉郁、林鴻志
中國醫藥大學兒童醫院

14:57~15:04　　26.　壞死性腸炎的發生率與臨床表徵隨早產兒週數之大小有顯著差異
吳維閎、李建忠、吳怡萱、賴美吟、傅仁輝、江明洲、朱世明、林瑞瑩
林口長庚醫院兒童內科部新生兒科暨長庚大學醫學系

15:04~15:11　　27.　新生兒念珠菌菌血症之臨床表徵及治療策略與預後之關係
陳又寧[1]、徐任甫[1]、朱世明[1]、賴美吟[1]、林芝[3]、黃宣蓉[1]、楊鵬弘[1]、江明洲[1]、傅仁輝[1]、蔡明宏[2]
林口長庚紀念醫院兒童內科部新生兒科[1]；雲林長庚紀念醫院兒童內科部新生兒科[2]；基隆長庚紀念醫院兒童內科部新生兒科[3]

15:11~15:18　　28.　Pentoxifylline：早產兒周邊肢端缺血輔助治療的新選擇
王維勳[1]、洪依利[1,2,3]、沈仲敏[1,3]、謝武勳[1,4,5]
國泰醫療財團法人國泰綜合醫院小兒科[1]；國立清華大學後醫學系[2]；天主教輔仁大學醫學院[3]；國立臺灣大學醫學院附設醫院兒童醫院小兒部[4]；國立臺灣大學醫學院小兒部[5]

15:18~15:25　　29.　新生兒缺氧缺血性腦病變與聽力損傷
陳大揚[1]、陳善銘[1,3]、王杏安[1,4]、蘇本華[1,3]、李英齊[1,2,3,4]
中山醫學大學附設醫院兒童部[1]；中山醫學大學附設醫院兒童部神經科[2]；中山醫學大學醫學系[3]；中山醫學大學附設醫院兒童部新生兒科[4]

15:25~15:32　　30.　重新評估執行新生兒神經行為檢查之時間用以預測極低體重早產兒之神經發展預後
洪依利[1,2,3]、陳雅玲[4]、沈仲敏[1,2]、謝武勳[1,5]
國泰綜合醫院小兒科[1]；輔仁大學醫學系[2]；國立清華大學醫學系[3]；國泰綜合醫院復健科[4]；國立台灣大學醫學院小兒科[5]

15:32~15:39　31. 台北市兒童家庭訪視計畫對早產兒及照護者的成果初探—台北市立聯合醫院之經驗分享
王培瑋[1,4]、方麗容[1]、黃怡榛[1]、邱婷芳[2]、楊文理[3]
台北市立聯合醫院和平婦幼小兒科[1]；台北市立聯合醫院忠孝院區[2]；台北市立聯合醫院院本部[3]；國立陽明交通大學環境衛生與職業衛生研究所[4]

15:39~16:00　　　討論

16:00~16:10　　　休息

第四單元：肺臟學

日期：民國111年4月16日(星期六)
時間：16:10~17:10
地點：201A、B、C會議室(2F)

主持人：林毓志、邱志勇

16:10~16:17　32. 蛋白質體抑制劑藉由回復mitofusin-2的表現改善缺氧誘導的肺動脈平滑肌細胞增生
陳怡眞、曾羽辛、羅時興、吳彥賢、劉怡慶、徐仲豪、戴任恭
高雄醫學大學附設醫院兒科部

16:17~16:24　33. 胎便的稀和濃與胎便吸入症候群的新生兒的預後
范洪春[1,2,3,4,5]、潘瀅如[1,2]、游偲翌[1,2]、張光喜[1,2]、陳全木[4,5,6]、黃碧桃[1,3]
童綜合醫院[1]、醫學研究部[2]、兒科[3]；中興大學[4]、生命科學院[5]、榮興轉譯醫學研究中心[6]

16:24~16:31　34. 幼兒施予持續充氣法時上、下氣道腔壓力及管腔變化—以軟式內視鏡監測
陳傑賀、林建亨、宋文舉
中國醫藥大學兒童醫院胸腔科

16:31~16:38　35. 使用脈衝震盪肺功能來幫助診斷小於6歲之兒童有否氣喘
郭威廷[1]、陳傑賀[2]、林建亨[2]、宋文舉[2]
中國醫藥大學兒童醫院[1]；中國醫藥大學兒童醫院兒童胸腔科[2]

16:38~16:45　　36.　嬰兒先天性心臟病合併心室中隔缺損及心衰竭的肺部超音波特徵研究
謝凱生、戴以信、周正哲、唐家婉、林竹川、翁根本
台北醫學大學雙和醫院兒科部[1]；中國醫藥大學兒童醫院兒童心臟科[2]；東港
安泰醫院兒科[3]；高雄榮民總醫院兒童醫學部兒童心臟科[4]

16:45~16:52　　37.　呼吸道異常對台灣某醫學中心先天性心臟病手術術後兒童病人的影響
吳政宏[1]、王景甲[1]、吳恩婷[1]、呂立[1]、黃書健[2]、陳益祥[2]
國立台灣大學醫學院附設醫院兒童醫院小兒部[1]；國立台灣大學醫學院附設
醫院外科部[2]

16:52~17:10　　討論

第五單元：過敏免疫風濕病學

日期：民國111年4月16日(星期六)
時間：08:30~14:50
地點：201D、E、F會議室(2F)

主持人：傅令嫻、姚宗杰

08:30~08:37　　38.　第一孕期孕婦尿液中胞外體組成與早產的相關性分析
簡銘輝[1,2]、林佳學[1,2]、曾芝文[1]、陳治平[4]、黃建霈[4]、楊崑德[1,2,3,4]
馬偕兒童醫院[1]；馬偕醫學院長照所[2]；國立陽明大學臨醫所[3]；馬偕紀念醫院
婦產科，醫研部[4]

08:37~08:44　　39.　臍帶間質幹細胞胞外體促進肌母細胞C2C12生長與分化
沈婕如[1]、曾芝文[1]、林佳學[1]、簡銘輝[1]、陳治平[3]、楊崑德[1,2,4]
馬偕兒童醫院[1]；國防醫學院微免所[2]；馬偕紀念醫院婦產科，醫研部[3]；國立
陽明大學臨醫所[4]

08:44~08:51　　40.　鼠李糖乳桿菌鼻噴霧劑對小鼠氣喘模型呼吸道炎症的免疫調節作用
吳鴻儀[1]、李育慈[3]、柯俊良[3]、蕭昌泓[4]、范怡萱[4]、廖培汾[2,4]、顧明修[2,4]、
孫海倫[2,4]、呂克桓[2,4]
中山醫學大學附設醫院兒童部[1]；中山大學醫學系[2]；中山醫學大學醫學研究
所[3]；中山醫學大學附設醫院兒童部過敏免疫科[4]

08:51~08:58　41.　經由體外和體內的研究探討芳烴受體配體軸和1-磷酸鞘氨醇生成於呼氣道炎症的相互作用
陳力振、王雪君[1]、葉國偉[2]、李文益[2]、郭敏玲[3]、吳艾瑄、游琇玥、黃嘯谷[4]、黃璟隆
新北市立土城醫院兒童內科部；中國醫藥大學生物醫學研究所[1]；長庚醫院兒童過敏氣喘風濕科[2]；長庚大學微生物免疫研究所[3]；國家衛生研究院環境衛生暨職業醫學組[4]

08:58~09:05　42.　Lactobacillus rhamnosus可以減少氣喘小鼠使用prednisolone的劑量
李宜霈[1]、李育慈[2]、柯俊良[2]、蕭昌泓[1]、范怡萱[1]、廖培汾[1]、顧明修[1]、孫海倫[1]、呂克桓[1]
中山醫學大學附設醫院兒童部[1]；中山醫學大學醫學研究所[2]

09:05~09:12　43.　氣喘藥物對砷經由誘發上皮細胞間質轉化及活性氧化物製造之效應
洪志興[1,2,3]、邱馨瑩[4]、林宜靜[5]、郭昶宏[6]、蔡美蘭[7]
高雄醫學大學附設醫院小兒部[1]；高雄醫學大學小兒學科[2]；高雄市立小港醫院小兒科[3]；高雄市立小港醫院教研中心[4]；高雄醫學大學附設醫院檢驗部[5]；大郭診所[6]；高雄醫學大學醫研所[7]

09:12~09:19　44.　代謝質體學分析維他命D和早期兒童呼吸道過敏疾病間的關係
張宇和[1]、葉國偉[2]、黃璟隆[3]、蘇冠文[4]、蔡明翰[4]、花曼津[4]、廖穗綾[4]、賴申豪[1]、陳力振[3]、邱志勇[1]
長庚醫療財團法人林口長庚紀念醫院兒童內科部胸腔科[1]；長庚醫療財團法人林口長庚紀念醫院兒童過敏免疫風濕科[2]；長庚醫療財團法人新北市立土城醫院兒科[3]；長庚醫療財團法人基隆長庚紀念醫院兒科[4]

09:19~09:26　45.　出生前後空氣污染影響異位性皮膚患者發生氣喘的效應
洪志興[1,2,3]、林宜靜[4]、郭昶宏[5]、蔡美蘭[6]、李仲翔[1]、陳宜綸[7]
高雄醫學大學附設醫院小兒部[1]；高雄醫學大學小兒學科[2]；高雄市立小港醫院小兒科[3]；高雄醫學大學附設醫院檢驗部[4]；大郭診所[5]；高雄醫學大學醫研所[6]；高雄長庚醫院小兒部[7]

09:26~09:33　46.　台北市青少年及兒童氣喘盛行率與影響：全球氣喘網絡調查
蘇冠文[1]、顏大欽[2]、歐良修[3]、林莉倫[2]、姚宗杰[3]、葉國偉[3]、黃璟隆[4]
基隆長庚紀念醫院兒童過敏氣喘風濕科[1]；台北長庚紀念醫院兒童過敏氣喘風濕科[2]；林口長庚紀念醫院兒童過敏氣喘風濕科[3]；新北市立土城醫院童過敏氣喘風濕科[4]

09:33~10:00　討論

10:00~10:10　休息

主持人：楊崑德、俞欣慧

10:10~10:17　47.　學齡前氣喘兒童之脈衝振盪儀的參數與兒童呼吸和哮喘控制測試（TRACK）間的關聯性
鄔翔帆[1]、魏長菁[1,2]、王志堯[1,2]、林清淵[1,2]
中國醫藥大學兒童醫院兒童過敏免疫風濕科[1]；中國醫藥大學醫學院醫學系[2]

10:17~10:24　48.　氣候變遷對台灣北部地區花粉過敏的影響
梁友蓉[1]、江伯倫[1,2]、王麗潔[1]
國立臺灣大學醫學院附設醫院小兒部[1]；國立臺灣大學醫學院附設醫院醫學研究部[2]

10:24~10:31　49.　過敏疾病病人的水果過敏原分析
張鈴偲、郭明慧、黃瀛賢、郭和昌
高雄長庚醫院兒童內科部；長庚大學

10:31~10:38　50.　母親患有紅斑性狼瘡之懷孕預後以及新生兒預後分析
廖君樺[1]、林攸眞[1]、陳麒年[1]、王麗潔[2]、謝松洲[3]、江伯倫[2,4]
國立臺灣大學醫學院附設醫院新竹臺大分院小兒部[1]；國立臺灣大學醫學院附設醫院小兒部[2]、內科部[3]、醫學研究部[4]

10:38~10:45　51.　新生兒紅斑性狼瘡：一家醫學中心的20年回溯性研究
許芸禎[1,2]、王麗潔[1]、林于粲[1]、俞欣慧[1]、胡雅喬[1]、楊曜旭[1,3]、李志鴻[1]、江伯倫[1,4]
國立臺灣大學醫學院附設醫院[1]；國泰醫療財團法人國泰綜合醫院[2]；國立臺灣大學醫學院附設醫院新竹臺大分院[3]；國立臺灣大學醫學院附設醫院醫學研究部[4]

10:45~10:52　52.　血清C3之群組化彈道分析與小兒SLE疾病緩解之相關性
陳勇全、黃永杰、陳怡潔、蔡明瑾、傅令嫻
台中榮民總醫院兒童醫學中心

10:52~10:59　53.　抗RNP抗體與兒童紅斑性狼瘡臨床表現之關聯
謝騰緯[1,2]、胡雅喬[2]、楊曜旭[2,3]、林于粲[2]、王麗潔[2]、俞欣慧[2]、李志鴻[2]、江伯倫[2,4]
佛教慈濟醫療財團法人台北慈濟醫院小兒部[1]；國立臺灣大學醫學院附設醫院小兒部[2]；國立臺灣大學醫學院附設醫院新竹臺大分院小兒部[3]；國立臺灣大學醫學院臨床醫學研究所[4]

10:59~11:06 　　54. 探討肺動脈高壓在兒童期發病紅斑性狼瘡之特色
葉育欣[1]、鍾宏濤[2]、吳昭儀[1]、姚宗杰[1]、歐良修[1]、李文益[1]、葉國偉[1]、
林思偕[1]、陳力振[3]、黃璟隆[3]
林口長庚紀念醫院兒童內科部兒童過敏氣喘風濕科[1]；林口長庚紀念醫院兒童內科部兒童心臟科[2]；新北市立土城醫院兒童內科部[3]

11:06~11:13 　　55. 兒童噬血症候群之臨床分析及探討
王敬瑜[1]、王麗潔[1]、胡雅喬[1]、李志鴻[1]、林于粲[1]、楊曜旭[1,2]、江伯倫[1,3]、
俞欣慧[1]
國立臺灣大學醫學院附設醫院小兒部[1]；國立臺灣大學醫學院附設醫院新竹台大分院小兒部[2]；國立臺灣大學醫學院附設醫院醫學研究部[3]

11:13~11:40 　　　　討論

附加研討會
兒科新藍海：疫情下的預防布局

日期：民國111年4月16日(星期六)
時間：12:00~13:30
地點：201D、E、F會議室(2F)

主持人：林奏延醫師

12:00~12:10　　　1.　開幕致詞
　　　　　　　　　　林奏延醫師
　　　　　　　　　　林口長庚紀念醫院兒童感染科

12:10~12:45　　　2.　青少年兩性共同預防HPV重要性
　　　　　　　　　　邱南昌醫師
　　　　　　　　　　馬偕兒童醫院兒童感染科

12:45~13:20　　　3.　後疫情時代：如何與民眾開啓常規與自費疫苗的對話
　　　　　　　　　　何宇苓醫師
　　　　　　　　　　大心診所

13:20~13:30　　　4.　問題討論與結語
　　　　　　　　　　林奏延醫師
　　　　　　　　　　林口長庚紀念醫院兒童感染科

第五單元：過敏免疫風濕病學

日期： 民國111年4月16日(星期六)
時間： 08:30~14:50
地點： 201D、E、F會議室(2F)

主持人：呂克桓、王麗潔

13:30~13:37　　56. 迪喬氏症候群之臨床與免疫學特徵
俞欣慧[1]、王麗潔[1]、簡穎秀[1,2]、李志鴻[1]、胡雅喬[1]、林于粲[1]、楊曜旭[1]、
江伯倫[3]
國立台灣大學醫學院附設醫院小兒部[1]、國立台灣大學醫學院附設醫院基因
醫學部[2]、國立台灣大學醫學院附設醫院醫研部[3]

13:37~13:44　　57. 使用生物製劑對幼年特發性關節炎患者發生惡性腫瘤之統合性分析研究
蔡佳容[1]、陳崇鈺[1]、洪志興[2,3]、林宜靜[1,2,3,4]
高雄醫學大學藥學系臨床藥學碩士班[1]；高雄醫學大學醫學系[2]；高雄醫學大
學附設中和紀念醫院小兒科部[3]；高雄醫學大學附設中和紀念醫院檢驗醫學
部[4]

13:44~13:51　　58. 川崎症住院人數與本土新冠肺炎人數與腸病毒人數有關
蘇于涵[1]、 郭明慧[1,2]、張鈴偲[1,2]、陳俞甄[1,2]、郭和昌[1,2]
高雄長庚醫院兒童內科部[1]；高雄長庚醫院川崎症中心[2]

13:51~13:58　　59. 特異性免疫球蛋白E在川崎症兒童中的特徵
陳俞甄、郭和昌、黃瀛賢、郭明慧、張鈴偲
高雄長庚紀念醫院兒科

13:58~14:05　　60. 對於川崎病在兒童肝臟膽道合併症的研究
林聖傑[1,2]、黃聖文[1]、呂孟哲[1]、謝凱生[1]、陳世彥[1,2]
臺北醫學大學-部立雙和醫院小兒部[1]；臺北醫學大學醫學系小兒學科[2]

14:05~14:12　　61. 不同SARS-CoV-2疫苗體外誘導不同T細胞免疫反應研究
林佳學[1]、曾芝文[1]、闕貴玲[1]、廖婉智[1]、楊崑德[1,2,3]
馬偕兒童醫院[1]；國立陽明大學臨床醫學研究所[2]；國防醫學院微生物免疫研
究所[3]

14:12~14:19　62.　新冠肺炎病毒疫苗阿斯特捷利康誘發疫苗注射前後嗜中性白血球NETosis差異研究
曾芝文[1]、林佳學[1]、闕貴玲[1]、廖婉智[1]、沈婕如[1]、楊崑德[1,2,3]
馬偕兒童醫院[1]；國立陽明大學臨床醫學研究所[2]；馬偕紀念醫院醫學研究部[3]

14:19~14:26　63.　BNT疫苗的罕見副作用病例：基於兒童醫院的研究
張禎祐[1]、陳美玲[2]、張明裕[3]、陳家玉[1]、林昭仁[1]
彰化基督教兒童醫院兒童感染科[1]、病理科[2]、兒童神經科[3]

14:26~14:50　　　討論

14:50~15:00　　　休息

第六單元：重症學

日期：民國111年4月16日(星期六)
時間：15:00~15:40
地點：201D、E、F會議室(2F)

主持人：彭純芝、夏紹軒

15:00~15:07　64.　早期分變嬰兒沙門氏菌敗血症和綠膿桿菌敗血症
林盈瑞[1,2]、吳怡樺[2]、郭玄章[1,2]、徐美欣[1,3]、鄭明洲[1]
高雄長庚紀念醫院兒科部兒童加護科[1]、兒童心臟科[2]、兒童神經科[3]

15:07~15:14　65.　兒童院內心跳停止案例分析—單一醫學中心10年經驗
陳思涵、吳政宏、王景甲、吳恩婷、呂立
國立臺灣大學醫學院附設醫院兒童醫院小兒部

15:14~15:21　66.　遠方指導的心臟超音波的推展經驗
謝凱生[1]、戴以信[2]、周正哲[2]
台北醫學大學雙和醫院兒科部[1]；中國醫藥大學兒童醫院兒童心臟科[2]

15:21~15:28　67.　兒童加護病房設計與死亡風險
張靜兒[1]、黃傑瑞[2]、吳政宏[3]、吳恩婷[3]、王景甲[3]、呂立[3]
Tunku Azizah醫院(馬來西亞吉隆坡婦幼醫院)兒科[1]；彰化基督教兒童醫院兒科[2]；國立臺灣大學醫學院附設醫院兒童醫院兒科[3]

15:28~15:40　　　討論

15:40~15:50　　　休息

第七單元：急診學

日期：民國111年4月16日(星期六)
時間：15:50~17:00
地點：201D、E、F會議室(2F)

主持人：吳昌騰、陳文發

15:50~15:57　68. 愷他命成癮小鼠之腦源性神經營養因子在前額皮質的影響
胡美華[1,2]、吳昌騰[1]、李嶸[1]、陳景宗[3]、張明瑜[1]
林口長庚醫院兒童一般醫學科[1]；長庚大學臨床醫學研究所[2]、生物醫學研究所[3]

15:57~16:04　69. 兒童急診室中單獨血尿兒童罹患泌尿道感染的預測指標
郭倍全[1,2]、黃文彥[1,2]、吳漢屏[1,2,3]
中國醫藥大學兒童醫院兒童急診科[1]；中國醫藥大學醫學系[2]；中國醫藥大學兒童醫院醫學研究部[3]

16:04~16:11　70. 兒童泌尿道感染導致菌血症和入住兒童加護中心的危險因素
黃文彥[1,2]、郭倍全[1,2]、吳漢屏[1,2,3]
中國醫藥大學兒童醫院兒童急診部[1]；中國醫藥大學醫學院醫學系[2]；中國醫藥大學兒童醫院醫學研究部[3]

16:11~16:18　71. 睪丸扭轉導致睪丸切除的危險因子：在兒童急診10年橫斷面的研究及文獻評讀
顏辰瑋、張郢榮、李嶸
林口長庚紀念醫院兒童一般醫學科

16:18~16:25　72. 新冠肺炎疫情對於台灣兒童急診就醫的影響：單一醫學中心經驗分享
黃一安、吳昌騰[1]、江東和[1]、李嶸[1]
基隆長庚紀念醫院兒科；林口長庚紀念醫院一般兒科[1]

16:25~16:32　73. 影響兒童靜脈注射成功率可能因素之新觀點
朱君浩[1,2]、劉瓊眞[1]、田炯璽[1]、謝國祥[1]、林建銘[1]
三軍總醫院兒科部[1]；國軍高雄總醫院左營分院兒科[2]

16:32~16:39　74. 外展多專科團隊進行兒虐評估的有效性
謝棠旭、陳怡眞、趙垂勳、尹莘玲、劉怡慶、吳彥賢、梁文貞、黃瑞妍、徐仲豪
高雄醫學大學附設醫院兒科部

16:39~17:00　討論

第八單元：腸胃學、營養學

日期：民國111年4月16日(星期六)
時間：08:30~11:30
地點：102會議室(1F)

主持人：方旭彬、陳建彰

08:30~08:37　　75.　建立以增強選擇韌性為設計之線上課程的肥胖及過重兒童干預模型及效果評估
蕭宇超[1]、謝婉華[2]、溫淑惠[2]、張雲傑[1]
佛教慈濟醫療財團法人花蓮慈濟醫院[1]；慈濟學校財團法人慈濟大學公共衛生學系[2]

08:37~08:44　　76.　菌血症與非菌血症病人所採集非傷寒沙門氏菌在體外感染人類上皮細胞後之核糖核酸定序及全轉錄體定序比較分析
林珮淳[1]、張珮茹[1,2]、林盈秀[1,2]、鄭弘彥[1]、方旭彬[1,2]
臺北醫學大學部立雙和醫院小兒部小兒消化科[1]；臺北醫學大學醫學院醫學系小兒學科[2]

08:44~08:51　　77.　血片基質金屬蛋白酶7作為膽道閉鎖新生兒篩檢之前驅研究
李致任[1,2,3]、倪衍玄[3]、陳慧玲[3]、吳嘉峯[3]、許宏遠[3]、簡穎秀[4]、李妮仲[4]、胡務亮[4]、陳玉如[5]、張美惠[3]
國立臺灣大學醫學院附設醫院新竹分院兒科部[1]；國立臺灣大學臨床醫學研究所[2]；國立臺灣大學醫學院附設醫院兒童醫院[3]；國立臺灣大學醫學院附設醫院基因醫學部[4]；中央研究院化學研究所[5]

08:51~08:58　　78.　非侵入性臨床指標預測膽道閉鎖病人之食道靜脈曲張
凌郁捷、張美惠、張凱琪、戴季珊、吳嘉峯
國立臺灣大學醫學院附設醫院兒童醫院小兒科

08:58~09:05　　79.　膽道閉鎖病人經葛西氏手術後可預測需要肝移植的臨床特徵
劉素涵[1,2]、賴明瑋[1,2]、陳建彰[1,2]、趙舜卿[1,2]、江文山[1,2]、賴勁堯[1,3]
林口長庚紀念醫院[1]；兒童腸胃科[2]；兒童外科[3]

09:05~09:12　　80.　基因變異性在延遲性非結合型黃疸足月兒身上所扮演之角色
陳緯哲、楊燿榮、羅筱涓、楊喬喻、柳孟娟
國立成功大學醫學院附設醫院小兒科

09:12~09:19　81.　熱休克蛋白60限制粒線體雙鏈RNA核糖核酸的釋放以抑制小鼠肝臟炎症並改善非酒精性脂肪性肝炎
黃瀛賢、楊雅玲[1]、賴宛孜
高雄長庚醫院兒童內科部、麻醉科系[1]

09:19~09:26　82.　產前高脂肪與微塑料暴露在後代脂肪肝中的編程
黃仔妁、刁茂盟
高雄長庚紀念醫院兒科

09:26~09:33　83.　使用超音波逆散射分析評估小兒肝臟脂肪變性和肝臟硬度
張家偉[1]、謝喬善[2]、賴明瑋[1]、崔博翔[3,4]、趙舜卿[1]、陳建彰[1]、葉栢睿[1]、陳米琪[1]
長庚紀念醫院兒童內科部兒童胃腸科[1]；長庚大學醫學工程研究所[2]；長庚大學及長庚紀念醫院放射醫學研究院[3]；長庚大學醫學院醫學影像暨放射科學系[4]

09:33~10:00　　討論

10:00~10:10　　休息

主持人：劉明發、張碧峰

10:10~10:17　84.　幼兒時期便秘後的注意力不足過動症風險：利用世代追蹤研究
鄧沛元[1]、馬聖凱[2,3]、陳世彥[1]
衛生福利部雙和醫院小兒部[1]；國立臺灣大學生醫電資所[2]；中山醫藥大學附設醫院牙科部[3]

10:17~10:24　85.　蟯蟲在資源充足的國家是否仍為兒童的公衛問題？花蓮學齡兒童蟯蟲盛行率及時間序列分析
蕭宇超[1]、王仁宏[2]、朱家祥[1]、張宇勳[1,3,4]、張雲傑[1]、詹榮華[1]、朱紹盈[1]、楊尚憲[1]、陳瑞霞[1]、陳明群[1]
佛教慈濟醫療財團法人花蓮慈濟醫院[1]；佛教慈濟醫療財團法人花蓮慈濟醫院研究部[2]；慈濟學校財團法人慈濟大學醫學系[3]；國立台灣大學醫學院附設醫院小兒部[4]

10:24~10:31　86.　第一型脊髓性肌肉萎縮症病人的多渠道食道腔內阻抗暨酸鹼值分析
李孟儒[1]、梁文貞[2]、鐘育志[2]、黃瑞妍[1]、施相宏[1]
高雄醫學大學附設醫院小兒科部兒童胃腸肝膽科[1]、兒童神經科[2]

10:31~10:38　87.　嬰兒肝臟血管瘤之臨床表現與治療—單一醫學中心14年之處理經驗
戴季珊、張美惠、陳慧玲、張凱琪、吳嘉峯
國立臺灣大學醫學院附設醫院兒童醫院

10:38~10:45　　88.　早產兒糞便內之 β 防禦素-2上升與兒童早期過敏疾病之關連
<u>花曼津</u>[1]、陳建彰[2]、廖穗綾[1]、姚宗杰[2]、蔡明翰[1]、賴申豪[2]、蘇冠文[1]、陳力振[3]、黃璟隆[3]
基隆長庚醫院小兒科[1]；林口長庚醫院小兒科[2]；土城長庚醫院小兒科[3]

10:45~10:52　　89.　梅克爾憩室的流行病學：1996年至2013年以全國人口爲對象之研究
<u>張佑全</u>[1]、吳孟哲[2]、魏正宗[3]
秀傳醫療財團法人彰濱秀傳紀念醫院小兒科[1]；臺中榮民總醫院兒童醫學中心兒童腸胃科[2]；中山醫學大學附設醫院過敏免疫風濕科[3]

10:52~10:59　　90.　遠距醫療在兒童肥胖健康實務照顧的經驗與成果分享
<u>陳如瑩</u>、張芳瑗、黃啓南
臺北市立聯合醫院婦幼院區小兒科

10:59~11:06　　91.　新冠肺炎(COVID-19)台灣2020-2021—二級/三級防疫期間餵養方式對兒童成長之影響
<u>李秀英</u>[1,2]、郭和昌[3]、謝凱生[5]、戴以信[4]、高玉音[2]、侯秋萍[2]、孫慧如[2]、王怡萍[2]、林志鈞[1]
大葉大學休閒事業管理學系[1]；高雄長庚醫院護理部[2]、兒童內科部[3]；中國醫藥大學兒童醫院兒童心臟科[4]；台北醫學大學雙和醫院兒科部[5]

11:06~11:30　　　　討論

第九單元：青少年醫學

日期：民國111年4月16日(星期六)
時間：11:30~11:50
地點：102會議室(1F)

主持人：劉明發、張碧峰

11:30~11:37　　92.　青少年反覆異物吞入的風險因子：單一醫學中心的回顧性研究
　　　　　　　　　　張育晟、蕭宇超、張雲傑
　　　　　　　　　　佛教慈濟醫療財團法人花蓮慈濟醫院

11:37~11:44　　93.　在中學系統中的整合式青少年健康照護：花蓮外展經驗分享
　　　　　　　　　　張雲傑[1]、劉琦文[2]、李玉鳳[2]、張宇勳[1]
　　　　　　　　　　佛教慈濟醫療財團法人花蓮慈濟醫院小兒部[1]；慈濟大學附屬高級中學[2]

11:44~11:50　　　　 討論

附加研討會
守護嬰兒消化系統的最新營養方針

日期：民國111年4月16日(星期六)
時間：12:00~13:30
地點：102會議室(1F)

主持人：李宏昌理事長

12:00~12:10　　1.　開幕致詞
　　　　　　　　　李宏昌理事長
　　　　　　　　　臺灣兒科醫學會

12:10~13:00　　2.　守護嬰兒消化系統的最新營養方針
　　　　　　　　　黃清峯醫師
　　　　　　　　　臺北榮民總醫院兒童胃腸科

13:00~13:30　　3.　問題討論與結語
　　　　　　　　　李宏昌理事長
　　　　　　　　　臺灣兒科醫學會

第十單元：感染學

日期：民國111年4月16日(星期六)
時間：13:30~16:30
地點：102會議室(1F)

主持人：呂俊毅、陳志榮

13:30~13:37　94. 台灣肺炎鏈球菌PMEN3的流行與其逃脫PCV免疫保護的機轉
林維瑄、林奏延、黃玉成、邱政洵、陳志榮、郭貞孋、黃冠穎、謝育嘉
林口長庚醫院兒童感染科

13:37~13:44　95. 13價肺炎鏈球菌疫苗全面公費施打前後，對於孩童所感染肺炎鏈球菌的血清型及抗藥性差異：一個北台灣醫學中心於2010至2020的回顧性調查研究
黃翔[1]、林千裕[2]、邱南昌[1]、黃璁寧[1]、黃競瑩[1]、紀鑫[1]
馬偕兒童醫院小兒科部[1]；新竹馬偕紀念醫院小兒科[2]

13:44~13:51　96. 兒童致病金黃色葡萄球菌抗生素敏感性的近年變化及抗藥基因研究
張佳寧、王志堅
三軍總醫院小兒科部

13:51~13:58　97. 台灣新生兒加護病房院內感染表皮葡萄球菌菌血症的分生特性與臨床表現
黃奕瑄[1]、葉郁柔[1]、黃玉成[1,2]
長庚大學醫學院[1]；林口長庚紀念醫院兒科[2]

13:58~14:05　98. 台灣兒童黴漿菌感染症之分子與臨床特徵演變
熊若晴[1]、馬瑄吟[2]、呂俊毅[3]、顏廷聿[3]、紀鑫[4]、廖怡珍[2]、賴美汝[2]、張鑾英[2]、黃立民[2]
國立台灣大學醫學院[1]；國立台灣大學醫學院附設醫院兒童醫院兒科[2]；財團法人醫藥品查驗中心[3]；馬偕醫院兒科[4]

14:05~14:12　99. 兒童感染巨環黴素產生抗藥性黴漿菌所致肺炎的抗生素治療反應與呼吸道微生物相之間的關聯性
黃崇瑋、林奏延、黃玉成、邱政洵、陳志榮、黃冠穎、郭貞孋、謝育嘉
林口長庚醫院兒童感染科

14:12~14:19　　100.　中台灣單一醫學中心兒童初次與再活化EB病毒感染的臨床表徵差異
衛琇玫、田霓[1]、林曉娟、許玉龍[2]、賴奐丞、陳俊安、劉衍怡、邱玉婷、黃高彬
中國醫藥大學兒童醫院兒童感染科、兒童急診科[2]；中國醫藥大學附設醫院檢驗醫學部[1]

14:19~14:26　　101.　臍帶血中伊科病毒11型，克沙奇病毒B3及腸病毒D68型之血清抗體與嚴重新生兒腸病毒感染之關聯性
胡雅莉[1]、程愛淩[2]、李建南[3]、施景中[3]、林芯伃[3]、陳舜華[4]、張鑾英[2]
國泰綜合醫院小兒科[1]；國立臺灣大學醫學院附設醫院小兒科[2]、婦產科[3]；國立成功大學醫學院微免所[4]

14:26~14:33　　102.　利用全外顯子定序分析建立嚴重腸病毒感染者帶有易罹病的基因點位作為預測型生物標記
宋家橙[1]、G. W. Gant Luxton[2]、洪國勝[3]、吳永富[4]、徐志欣[5]、陳錫洲[1,6]、王志堅[1]、胡智棻[1]
國防醫學中心三軍總醫院小兒部[1]；加州大學戴維斯分校分子與細胞生物學部[2]；國防醫學中心三軍總醫院精準醫學暨基因體中心[3]；國防醫學中心三軍總醫院醫學研究室[4]；國立陽明交通大學腫瘤惡化卓越研究中心[5]；國防醫學中心微生物及免疫學科暨研究所[6]

14:33~15:00　　　　　　討論

15:00~15:10　　　　　　休息

主持人：林千裕、黃玉成

15:10~15:17　　103.　以機器學習模型預測住院呼吸道疾病兒童之病原體
張圖軒[1]、劉允中[2]、邱霈欣[3]、林湘容[3]、何德威[4]、周佳靚[3]、張鑾英[2]、賴飛羆[5,6,7]
奇美醫院兒科部[1]；國立臺灣大學醫學院附設醫院兒童醫院小兒部小兒感染科[2]；國立臺灣大學應用力學研究所[3]；國立臺灣大學醫學院附設醫院外科部[4]；國立臺灣大學生醫電資所[5]；國立臺灣大學資訊工程學系[6]；國立臺灣大學電機工程學系[7]

15:17~15:24　　104.　以機器學習模型預測於加護病房小兒肺炎死亡風險
林湘容[1]、邱霈欣[1]、劉允中[2]、吳恩婷[2]、張鑾英[2]、周佳靚[1]
國立台灣大學應用力學研究所[1]；國立台灣大學醫學院附設醫院小兒部[2]

15:24~15:31　　105.　以臨床列線圖預測3歲以下孩童泌尿道感染
李尚謙[1,2]、黃璁寧[1]、紀鑫[1]、邱南昌[1]、黃競瑩[1]
亞東紀念醫院小兒部[1]；馬偕兒童醫院[2]

15:31~15:38　106.　南台灣社區兒童糞便中帶原mcr-1-大腸桿菌的陽性風險因素和盛行率
　　　　　　　　　　鄭名芳[1,2,3,4]、吳品潔[1,2]、王竣令[5,6]、洪志勳[2]
　　　　　　　　　　高雄榮民總醫院兒童醫學部[1]；義守大學化學工程學系暨生物技術與化學工程研究所[2]；國立陽明交通大學醫學院[3]；輔英科技大學[4]；國立成功大學附設醫院內科部[5]；國立成功大學醫學院[6]

15:38~15:45　107.　南台灣新生兒發燒之臨床及流行病學特徵
　　　　　　　　　　黃品貞、林亭妤、沈靜芬、劉清泉
　　　　　　　　　　國立成功大學醫學院附設醫院小兒部

15:45~15:52　108.　COVID-19流行期間兒童感染症和川崎病的評估：基於兒童醫院的研究和時間序列分析
　　　　　　　　　　傅翊軒[1]、李孟倫[2]、吳焜烺[2]、陳家玉[1]、林昭仁[1]
　　　　　　　　　　彰化基督教兒童醫院兒童感染科[1]、兒童心臟科[2]

15:52~15:59　109.　父母和兒童對於兒童COVID-19疫苗的意願與看法
　　　　　　　　　　戴裕霖[1]、紀鑫[2]、邱南昌[2]、林千裕[1]
　　　　　　　　　　新竹馬偕紀念醫院兒科[1]；馬偕兒童醫院兒科[2]

15:59~16:06　110.　COVID-19大流行期間北臺灣SARS-CoV-2感染兒童之照顧經驗—從檢疫所到後送專責醫院
　　　　　　　　　　吳秉昇[1]、沈君毅、余俊賢、鄭敬楓
　　　　　　　　　　佛教慈濟醫療財團法人台北慈濟醫院兒科部、感染管制中心[1]

16:06~16:30　　　　討論

第十一單元：血液學、腫瘤學

日期：民國111年4月16日(星期六)
時間：08:30~10:10
地點：105會議室(1F)

主持人：陳淑惠、周獻堂

08:30~08:37　　111. 台灣兒童與成人之重度A型血友病患從傳統第八因子rFVIII預防性治療轉換至長效第八因子rFVIII-Fc預防性治療之後，出血頻率，每週劑量，和年度化第八因子藥費的改變
張家堯[1,2,3]、賴學緯[4,5]、劉彥麟[1,2,3]、顧容慈[2]、蔡振華[3,6]、蔡佳叡[3,7]、胡淑霞[4]、何宛玲[1,2]、鄭兆能[8]、陳宇欽[4,5]
台北醫學大學醫學院醫學系小兒學科[1]；台北醫學大學附設醫院小兒部[2]；台北醫學大學附設醫院血友病中心[3]；三軍總醫院血友病中心[4]；國防醫學中心三軍總醫院內科部血液腫瘤科[5]；振興醫院血液腫瘤科[6]；台北醫學大學附設醫院血液腫瘤科[7]；國立成功大學附設醫院小兒部小兒血液腫瘤科[8]

08:37~08:44　　112. 重度A型血友病患者長效凝血因子的真實世界經驗
侯人尹、劉希哲、葉庭吉、黃鼎煥
馬偕兒童醫院兒童血液腫瘤科

08:44~08:51　　113. 以卡鉑為基礎的顱內生殖細胞腫瘤化療的初步研究—聚焦化療反應的初步報告
葉庭吉[1]、梁慕理[2]、劉希哲[1]、侯人尹[1]、黃鼎煥[1]
馬偕兒童醫院小兒血液腫瘤科[1]；馬偕醫院神經外科[2]

08:51~08:58　　114. 以體外擴增循環腫瘤細胞培養系統探討兒童膠質瘤藥物治療反應
劉彥麟[1,5,6,11,*]、呂隆昇[2,4]、陳盈汝[2,4]、陳淑惠[5,6,9,11]、廖優美[7]、何宛玲[1,5,11]、張家堯[1,6,11]、王錦莉[5,6,10,11]、林佩瑾、王士忠[7,8]、J.S. Miser、黃棣棟[5,11,3,5,11]
臺北醫學大學附設醫院小兒部[1]；放射腫瘤科[2]；兒童神經外科[3]；臺北醫學大學生醫材料暨組織工程研究所[4]；臺北癌症中心[5]；醫學院醫學系小兒學科[6]；高雄醫學大學附設醫院小兒血液腫瘤科[7]；彰化基督教兒童醫院兒童血液腫瘤科[8]；衛生福利部雙和醫院(委託臺北醫學大學興建經營)兒科部[9]；臺北市立萬芳醫院-委託財團法人臺北醫學大學辦理兒科部[10]；臺北醫學大學兒童腦瘤照護團隊[11]

08:58～09:05　　115.　台灣兒童惡性睪丸生殖細胞瘤之結果與預後因子，台灣兒童癌症研究群報告

王富民[1,13]、巫康熙[2]、張德高[3]、楊兆平[4]、王士忠[5]、盧孟佑[6]、陳建旭[7]、林明燦[5]、江東和[4]、陳世翔[4]、顏秀如[8]、鄭兆能[7]、邱世欣[9]、林佩瑾[9]、廖優美[9]、劉希哲[10]、黃鼎煥[10]、張修豪[6]、張從彥[4]、錢新南[12]、林凱信[6]、翁德甫[2]、洪君儀[3]、林東燦[6]、陳博文[11]、葉庭吉[10,13]

國防醫學院三軍總醫院[1]；中山大學醫院[2]；台中榮民總醫院[3]；林口長庚醫院[4]；彰化基督教醫院[5]；國立台灣大學醫學院附設醫院兒童醫院[6]；國立成功大學醫學院附設醫院[7]；台北榮民總醫院[8]；高雄醫學大學醫院[9]；馬偕兒童醫院[10]；和信醫院[11]；童綜合醫院[12]；台灣兒童癌症研究群[13]

09:05～09:12　　116.　急性淋巴性白血病兒童罹壞骨骼壞死之可能風險因子與治療方式

陳喬薇、侯人尹、葉庭吉、黃鼎煥、劉希哲

馬偕兒童醫院

09:12～09:19　　117.　首次完全緩解的早期異體造血幹細胞移植對小兒急性骨髓性白血病的預後有積極影響──一項單一的機構研究

羅姿雅[1]、江東和[2]、王奕倫[3]、張從彥[2]、溫玉娟[4]、陳世翔[2]、楊兆平[2]

長庚大學醫學系[1]；林口長庚醫院兒童血液腫瘤科[2]、林口長庚醫院兒童內科部[3]、林口長庚醫院護理部[4]

09:19～09:26　　118.　在小於15公斤的幼兒採集周邊血幹細胞

李致穎[1,5]、余廷彥[3]、林芬蘭[2]、洪君儀[1,5]、侯明欣[1]、何正尹[1]、劉峻宇[2,5]、邱宗傑[4,5]、顏秀如[1,5]

台北榮民總醫院兒童醫學部兒童血液腫瘤科[1]、內科部輸血醫學科[2]；亞東紀念醫院小兒部[3]；台北市立萬芳醫院內科部血液腫瘤科[4]；國立陽明交通大學醫學院醫學系[5]

09:26～09:33　　119.　一個醫學中心二十一年回溯性研究：兒童癌症病人診斷後一個月內死亡原因分析

羅婉珊[1]、謝馨儀[1]、陳昱潔[1,3]、王素貞[1]、王儷螢[2]、蔡嘉慧[2]、沈俊明[1,3]、蕭志誠[1,3]

高雄長庚醫院兒童血液腫瘤科[1]；高雄長庚醫院護理部[2]；長庚大學[3]

09:33～09:40　　120.　Klippel-Trenaunay症候群合併內臟侵犯及消耗性凝血病變：跨領域團隊治療

吳佩芩[1]、張家堯[1,2,3,5]、張承仁[8]、李欣倫[4,5]、何宛玲[1,2,5]、蘇一宇[1,2,7]、梅傑斯[5,6,9]、劉彥麟[1,2,5,6]

臺北醫學大學附設醫院小兒部[1]；臺北醫學大學醫學院醫學系小兒學科[2]；臺北醫學大學附設醫院血友病中心[3]；臺北醫學大學附設醫院放射腫瘤科[4]；臺北醫學大學臺北癌症中心兒童癌症團隊[5]；臺北醫學大學附設醫院癌症中心[6]；臺北醫學大學附設醫院小兒部兒童重症專科[7]；臺北醫學大學附設醫院整形外科[8]；美國希望之城國家醫學中心小兒部[9]

09:40~10:10　　　　　討論

10:10~10:20　　　　　休息

第十二單元：神經精神醫學

日期：民國111年4月16日(星期六)
時間：10:20~11:10
地點：105會議室(1F)

主持人：林光麟、李旺祚

10:20~10:27　　121.　抗N-NMDAR受體腦炎相關的血漿細胞因子：血腦屏障破壞的潛在生物標誌
　　　　　　　　　　<u>鄭怡婷</u>、林光麟、周怡君、洪伯誠、林建志、周明亮、謝孟穎、王蕙珊、
　　　　　　　　　　郭政諺
　　　　　　　　　　林口長庚醫院

10:27~10:34　　122.　新生兒缺氧窒息性腦病變：血糖與神經預後的關係
　　　　　　　　　　<u>楊雅婷</u>[1]、陳善銘[1]、王杏安[1]、蘇本華[1]、李英齊[1,2]
　　　　　　　　　　中山醫學大學附設醫院兒童部[1]；中山醫學大學附設醫院兒童部神經科[2]

10:34~10:41　　123.　胼胝體發育缺失患者的行為發展
　　　　　　　　　　<u>吳柏彥</u>、林建亨、洪宣羽、張鈺孜、林聖興、周宜卿[*]
　　　　　　　　　　中國醫藥大學兒童醫院兒童神經科

10:41~10:48　　124.　南臺灣單一醫學中心面肩胛肱肌失養症之分析
　　　　　　　　　　<u>王晨華</u>[1]、梁文貞[1,3,4]、王建華[1]、邱世欣[1,2,3]、鐘育志[1,2,3,4]
　　　　　　　　　　高雄醫學大學附設醫院小兒科[1]、檢驗醫學科[2]；高雄醫學大學醫學院醫學系
　　　　　　　　　　小兒學科[3]、臨床醫學研究所[4]

10:48~10:55　　125.　先天性肌肉強直症合併癲癇個案之家族研究
　　　　　　　　　　<u>林倍瑜</u>[1]、陳明群[1]、朱紹盈[1]、張宇勳[1,2,3]、王傳育[1]
　　　　　　　　　　佛教慈濟醫療財團法人花蓮慈濟醫院小兒部[1]；慈濟學校財團法人慈濟大學
　　　　　　　　　　醫學系[2]；國立台灣大學醫學院附設醫院小兒部[3]

10:55~11:10　　　　　討論

11:10~11:20　　　　　休息

第十三單元：醫學人文及教育

日期：民國111年4月16日(星期六)
時間：11:20~11:50
地點：105會議室(1F)

主持人：歐良修、楊令瑀

11:20~11:27　　126.　第一型糖尿病服務學習活動－醫學生的5R反思敘事
　　　　　　　　　　　曾鼎鈞[1]、黃子珊[1]、朱紹盈[2,3]
　　　　　　　　　　　慈濟大學醫學系[1]；花蓮慈濟醫院教學部[2]、兒科部[3]

11:27~11:34　　127.　運用「糖尿病看圖對話工具™」來探索第一型糖尿病病友的敘事
　　　　　　　　　　　黃子珊[1]、曾鼎鈞[1]、王懿萱[2]、林惠敏[3]、宋景歡[4]、周威志[4]、朱紹盈[1,4,5]
　　　　　　　　　　　慈濟大學醫學系[1]；花蓮慈濟醫院護理部[2]、營養科[3]、兒科部[4]、教學部[5]

11:34~11:41　　128.　石獅子文化對於兒科醫師的人文啟發
　　　　　　　　　　　謝凱生[1]、戴以信[2]
　　　　　　　　　　　台北醫學大學雙和醫院兒科部[1]；中國醫藥大學兒童醫院兒童心臟科[2]

11:41~11:50　　　　　討論

附加研討會
基因治療在脊髓性肌肉萎縮症新角色

日期：民國111年4月16日(星期六)
時間：12:00~13:30
地點：105會議室(1F)

主持人：李旺祚醫師

12:00~12:10　　1.　開幕致詞
　　　　　　　　　李旺祚教授
　　　　　　　　　臺大兒童醫院

12:10~12:50　　2.　基因治療在脊髓性肌肉萎縮症新角色
　　　　　　　　　鐘育志教授
　　　　　　　　　高雄醫學大學附設醫院

12:50~13:30　　3.　問題討論與結語
　　　　　　　　　李旺祚教授
　　　　　　　　　臺大兒童醫院

第十四單元：遺傳學、新陳代謝學

日期：民國111年4月16日(星期六)
時間：13:30~14:50
地點：105會議室(1F)

主持人：蔡立平、林如立

13:30~13:37　129.　增強自噬作用有效改善GLD腦白質退化症神經病變
林達雄[1,2]、何啓生[3]、黃玉文[4]、李宗翰[4]、黃榮達[4]
馬偕紀念醫院兒科部[1]；馬偕醫學院醫學系[2]；馬偕兒童醫院兒科部兒童神經科[3]；馬偕紀念醫院醫學研究部[4]

13:37~13:44　130.　長效玉米澱粉對肝醣儲積症患者疾病控制效果評估
徐瑞聲[1]、簡穎秀[1]、胡務亮[1]、林如立[2]、翁慧玲[3]、林儀亭[1]、林佑靜[1]、李妮鍾[1]
國立台灣大學醫學院附設醫院基因醫學部[1]；林口長庚醫院兒童內科部[2]；國立台灣大學醫學院附設醫院營養室[3]

13:44~13:51　131.　第一型瓜胺酸血症帶因者表現異常瓜胺酸數值
陳薈安[1,3]、徐瑞聲[1,2]、李妮鍾[1,2]、胡務亮[1,2]、邱寶琴[3]、簡穎秀[1,2]
國立台灣大學醫學院附設醫院小兒部[1]；國立台灣大學醫學院附設醫院基因醫學部[2]；高雄榮民總醫院兒童醫學部[3]

13:51~13:58　132.　成功運用二階段新生兒篩檢診斷第二型瓜胺酸血症
陳薈安[1,3]、徐瑞聲[1,2]、陳鈺涵[2]、徐儷文[2]、蔣書娟[2]、李妮鍾[1,2]、胡務亮[1,2]、邱寶琴[3]、簡穎秀[1,2]
國立台灣大學醫學院附設醫院小兒部[1]、基因醫學部[2]；高雄榮民總醫院兒童醫學部[3]

13:58~14:05　133.　台灣黏多醣症第一型、第二型、第四A型、與第六型之新生兒篩檢計畫
林翔宇[1,2,3,4]、林炫沛[1,2,3,5]、莊志光[2]、李忠霖[1]、塗如意[2]、羅允廷[2]、張雅惠[1]、曾紫蕾[2]、高淑敏[6]、何慧珍[7]
馬偕紀念醫院兒科部[1]；馬偕紀念醫院醫學研究部[2]；馬偕醫學院醫學系[3]；馬偕醫護管理專科學校[4]；國立台北護理健康大學嬰幼兒保育系[5]；中華民國衛生保健基金會新生兒篩檢中心[6]；台北病理中心新生兒篩檢中心[7]

14:05~14:12　134.　台灣成骨不全症患童的功能獨立性研究
許鈺敏[1,2]、林翔宇[2,3]、林炫沛[2,3]
亞東紀念醫院小兒部[1]；馬偕兒童醫院小兒科[2]、兒童遺傳科[3]

14:12~14:19　　135.　軟骨發育不全症患者之追蹤與治療：北台灣單一醫學中心之二十年經驗
　　　　　　　　　　　蔡安黎、林如立、吳明純、游怡眞、陳淑萍
　　　　　　　　　　　林口長庚紀念醫院兒童內科部、內分泌暨遺傳科

14:19~14:26　　136.　威廉氏症候群患者長期心血管疾患追蹤：台灣單一醫學中心的經驗
　　　　　　　　　　　李忠霖[1,2,3,4,5]、林珊妙[1]、陳銘仁[1]、莊志光[6,7]、邱慧菁[1]、塗如意[6]、羅允廷[3]、
　　　　　　　　　　　張雅惠[1,3]、林翔宇[1,3,4,5,6,8]、林炫沛[1,3,4,6,9]
　　　　　　　　　　　台北馬偕醫院小兒科[1]；陽明交通大學臨床醫學研究所[2]；台北馬偕醫院罕見
　　　　　　　　　　　疾病中心[3]；馬偕醫學院[4]；馬偕醫護管理專科學校[5]；馬偕醫院醫學研究部生
　　　　　　　　　　　化遺傳研究組[6]；輔仁大學醫學院[7]；中國醫藥大學附設醫院醫學研究部[8]；臺
　　　　　　　　　　　北護理健康大學嬰幼兒保育系所[9]

14:26~14:50　　　　　討論

14:50~15:00　　　　　休息

第十五單元：內分泌學

日期： 民國111年4月16日(星期六)
時間： 15:00~16:00
地點： 105會議室(1F)

主持人：朱德明、童怡靖

15:00~15:07　　137.　T細胞通過受損的PDHA1/自噬作用介導第1型糖尿病患者之腎小管損傷
　　　　　　　　　　　呂文莉[1]、林佑融[2]、黃宇男[1,4]、蘇本華[5,6]、黃志揚[2,3,7,8,11]、蔡輔仁[1,8,9]、
　　　　　　　　　　　王仲興[1,10,12]
　　　　　　　　　　　中國醫藥大學兒童醫院兒童遺傳內分泌科[1]；佛教慈濟醫療財團法人花蓮慈
　　　　　　　　　　　濟醫院心血管暨粒線體相關疾病研究中心[2]、全人教育中心[3]；中興大學生命
　　　　　　　　　　　科學系[4]；中山醫學大學附設醫院兒童部[5]；中山醫學大學醫學系[6]；中國醫藥
　　　　　　　　　　　大學附設醫院生醫材料創業研究發展中心[7]、醫研部[8]、基因醫學部[9]、遺傳暨
　　　　　　　　　　　罕見疾病中心[10]；亞洲大學醫學檢驗暨生物技術學系[11]；中國醫藥大學醫學
　　　　　　　　　　　系[12]

15:07~15:14　　138.　兒童第2型糖尿病在眞實世界中除了二甲雙胍單一療法的藥物升階選擇：台
　　　　　　　　　　　灣一間醫學中心報告
　　　　　　　　　　　周易宣、羅福松、蘇雅婷、邱巧凡、黃彥鈞
　　　　　　　　　　　林口長庚醫院兒童內分泌暨遺傳科

15:14～15:21　　139.　評估一以Greulich-Pyle骨齡判讀法開發之人工智能判讀骨齡軟體之準確性與效率
喻永生[1,2]、林耀東[3]、周旭騏[4]、周定遠[5,6]
振興醫院兒童醫學部[1]；國防醫學院小兒學系[2]；台灣人工智慧學校[3]；博智電子股份有限公司[4]；耕莘醫院影像醫學部[5]；輔仁大學醫學系[6]

15:21～15:28　　140.　比較Greulich and Pyle及Tanner-Whitehouse 3兩種骨齡判讀方法
喻永生[1,2]、周定遠[3,4]、周經浩[1]
振興醫院兒童醫學部[1]；國防醫學院小兒學系[2]；耕莘醫院放射診斷部[3]；輔仁大學醫學院[4]

15:28～15:35　　141.　罹患22q11.2缺失症候群台灣孩童的內分泌疾病：一醫學中心之經驗
林函怡[1]、蔡文友[1]、童怡靖[1]、劉士嶢[1]、李妮錘[1,2]、簡穎秀[1,2]、胡務亮[1,2]、李正婷[1]
國立台灣大學醫學院附設醫院小兒部[1]；國立台灣大學醫學院附設醫院基因醫學部[2]

15:35～15:42　　142.　HLA-B基因與葛瑞夫茲氏病：以家族為基礎的研究
丁瑋信[1]、林昭旭[2]、吳怡磊[3]、黃琪鈺[1]、李燕晉[1]
馬偕兒童醫院[1]；馬偕紀念醫院新竹分院[2]；彰化基督教兒童醫院[3]

15:42～16:00　　　　　討論

陳炯霖教授講座獎：
全球暖化與兒童的健康與未來

日期：民國111年4月17日(星期日)
時間：08:30~09:30
地點：201A、B、C、D、E、F會議室(2F)

主持人：呂鴻基教授

08:30~09:20　　1.　全球暖化與兒童的健康與未來
　　　　　　　　　　李遠哲院士
　　　　　　　　　　中央研究院

09:20~09:30　　2.　綜合討論

教育演講：
兒童成長發育的優質化

日期：民國111年4月17日(星期日)
時間：09:30~12:00
地點：201A、B、C、D、E、F會議室(2F)

主持人：王玲常務理事、塗勝雄理事

09:30~10:20　　1.　兒童情緒的門診衛教
　　　　　　　　　　賴昇層院長
　　　　　　　　　　長頸鹿小兒科診所

10:20~11:10　　2.　兒醫在幼兒近視的超前部屬
　　　　　　　　　　吳佩昌教授
　　　　　　　　　　高雄長庚紀念醫院眼科部

11:10~12:00　　3.　認識兒童運動發展
　　　　　　　　　　田英俊教授
　　　　　　　　　　高雄醫學大學附設中和紀念醫院骨科部

附加研討會
肺炎鏈球菌研討會

日期：民國111年4月17日(星期日)
時間：12:10~13:25
地點：201A、B、C、D、E、F會議室(2F)

主持人：黃立民教授

12:10~12:15   1.   開幕致詞
                         黃立民院長
                         臺大兒童醫院

12:15~12:45   2.   結合型肺炎鏈球菌疫苗孩童效果研究: 關於疫苗血清型的影響
                         邱政洵醫師
                         林口長庚紀念醫院

12:45~13:15   3.   肺炎鏈球菌疫苗接種對台灣住院之兒童肺炎的效應
                         李建德醫師
                         台大醫院

13:15~13:25   4.   問題討論與結語
                         黃立民院長
                         臺大兒童醫院

頒獎/會員代表大會

日期：民國111年4月17日(星期日)
時間：13:00~14:30
地點：201A、B、C、D、E、F會議室(2F)

14:30~14:40　　　休息

醫學的科學、倫理與法律講座–特別演講：COVID-19疫情下醫療倫理的衝擊

日期：民國111年4月17日(星期日)
時間：14:40~16:40
地點：201A、B、C、D、E、F會議室(2F)

主持人：李宏昌理事長

14:40~15:30　　1.　COVID-19疫情的防疫政策考量與執行方針
　　　　　　　　　　陳時中部長
　　　　　　　　　　衛生福利部

15:30~15:40　　　討論

15:40~16:30　　2.　COVID-19疫情下醫療倫理衝擊
　　　　　　　　　　蔡甫昌教授
　　　　　　　　　　國立臺灣大學醫學院附設醫院

16:30~16:40　　　討論

特別演講：
兒童友善醫療

日期：民國111年4月17日(星期日)
時間：09:30~11:30
地點：102會議室(1F)

主持人：吳美環教授

09:30~09:40　　1.　開幕致詞
　　　　　　　　　李宏昌理事長
　　　　　　　　　臺灣兒科醫學會

09:40~10:30　　2.　兒童醫療中的兒童友善醫療
　　　　　　　　　Laura McGrath, CCLS and Natalie Wilson, MA, CCLS
　　　　　　　　　加拿大多倫多兒童醫院兒童醫療輔導師

10:30~10:40　　3.　視訊Q&A

10:40~11:20　　4.　兒童友善醫療在台灣之發展與推動
　　　　　　　　　呂立醫師
　　　　　　　　　臺大醫院兒童醫院

11:20~11:30　　5.　綜合討論

附加研討會
號召守護者!保護嬰幼兒免於感染性疾病威脅

日期：民國111年4月17日(星期日)
時間：12:00~13:30
地點：102會議室(1F)

主持人：黃立民教授

12:00~12:05	1.	開幕致詞 陳伯彥主任 台中榮總兒童醫學部
12:05~12:40	2.	新冠疫情下，媽媽及寶寶應該接種的疫苗 陳伯彥主任 台中榮總兒童醫學部
12:40~13:15	3.	藏在你我身邊的隱形殺手:腦膜炎雙球菌感染 黃瑽寧醫師 馬偕兒童醫院
13:15~13:30	4.	問題討論與結語 黃立民院長 臺大兒童醫院

專題演講：
兒童食物過敏診斷與治療新進展

日期：民國111年4月17日(星期日)
時間：09:30~11:30
地點：105會議室(1F)

主持人：黃璟隆醫師、葉國偉醫師

09:30~09:35	1.	開場致詞
09:35~10:20	2.	Better Understanding Food Allergy by Studying Its Diversity of Presentations Prof. Wayne G. Shreffler 哈佛大學麻州總醫院兒童過敏免疫科及食物過敏中心
10:20~10:35	3.	視訊Q&A
10:35~11:20	4.	食物過敏與異位性皮膚炎千絲萬縷的關聯 蘇冠文醫師 基隆長庚紀念醫院小兒部
11:20~11:30	5.	綜合討論及結語

附加研討會
母乳寡醣臨床應用新進展

日期：民國111年4月17日(星期日)
時間：12:00~13:30
地點：105會議室(1F)

主持人：李宏昌理事長

12:00~12:20   1.   開幕致詞
　　　　　　　　　　　李宏昌理事長
　　　　　　　　　　　臺灣兒科醫學會

12:20~13:10   2.   母乳寡糖在腸道健康和免疫中的作用
　　　　　　　　　　　Prof. Christine Loscher
　　　　　　　　　　　Dublin City University, Dublin, Ireland

13:10~13:30   3.   問題討論與結語
　　　　　　　　　　　李宏昌理事長
　　　　　　　　　　　臺灣兒科醫學會

一般演講：書面報告

1. 腸系膜腫瘤導致腸內疝氣：一個案例報告
   周琬庭[1]、陳世彥[1]、魏晉弘[2]
   衛生福利部雙和醫院小兒腸胃科[1]、小兒外科[2]

2. 18歲男性突發大量吐血
   黃彥叡、陳安琪[1]、吳淑芬[1]
   中國醫藥大學兒童醫院兒童肝膽腸胃科

3. 心肌病變及先天性心臟病患者在接受COVID-19疫苗後發生之致命性心律不整–病例報告
   陳薏如、邱舜南、曾偉杰、陳俊安、林銘泰、盧俊維、吳美環、王主科
   國立台灣大學醫學院附設醫院兒童醫院

4. 新冠疫苗接種後先天性免疫反應決定中和抗體之產生
   沈靜芬[1,2]、顏嘉良[1]、鄭兆珉[3]、沈孜錡[1]、張沛得[1]、劉清泉[2]、謝奇璋[1,2]
   國立成功大學醫學院臨床醫學研究所[1]；國立成功大學醫學院附設醫院小兒科[2]；國立清華大學生物醫學工程研究所[3]

5. 青少年接受BNT162b2信使RNA疫苗之後心肌炎的案例
   邱煒勝、黃品貞、林亭妤、王玠能、劉清泉、沈靜芬
   國立成功大學醫學院附設醫院小兒部

6. 一名因左側上腔靜脈的右到左分流導致的咽峽炎鏈球菌腦膿瘍的十六歲女孩
   徐健豪[1]、傅俊閔[1]、周安國[1]、劉欣明[2]、林銘泰[3]、陳文發[1]
   國立臺灣大學醫學院附設醫院新竹臺大分院小兒部[1]；國立臺灣大學醫學院附設醫院兒童醫院急診部[2]；國立臺灣大學醫學院附設醫院兒童醫院小兒部[3]

7. ARCN1基因變異之輕症
   周秉誠、蔡俊慧
   美國奧克拉荷馬大學兒科

8. 一名4歲女孩因磷化鋁中毒導致心因性休克
   吳彥璋、曾永澔、陳泰亨
   高雄醫學大學附設中和醫院小兒科部小兒急診科

1

Glucagon-like Peptide 1: A Novel Pharmacologic Target in the Regulation of Ductus Arteriosus Patency through Vasodilation and Anti-remodeling
類昇糖素胜肽-1：藉由血管舒張與抑制重塑造調控動脈導管之新藥物方向

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Background: Glucagon-like peptide 1 receptor (GLP-1R) agonists have been used in clinical management of diabetes and cardiovascular diseases. Our previous study has shown that the GLP-1R agonist can reverse pulmonary arterial hypertension due to vasodilatory and anti-remodeling effects. Postnatal closure of ductus arteriosus (DA) includes two processes: vasoconstriction and remodeling. The present study was to investigate if exendin-4 (Ex-4), a GLP-1R agonist can prevent DA closure in neonatal rats and if so, its underlying mechanisms.

Methods: We use different models to examine effects and mechanisms of Ex-4 on vasoreactivity and remodeling. In vivo, we first examined the GLP-1R expression on DA. In addition, newborn rats were intraperitoneally (i.p.) administered Ex-4 or normal saline immediately after birth. We observed luminal patency and intimal thickening of DA 2h later. Ex vivo, in isolated DA rings, we determined effects of Ex-4 on vasodilation after oxygen-induced DA constriction. In vitro, in cultured DA smooth muscle cells (DASMCs), we investigated cellular and molecular mechanisms underlying DA regulation including proliferation, migration, reactive oxygen species (ROS), and Akt signal transduction.

Results: In vivo, we first demonstrated GLP-1 receptor expression in DA at birth, which declined after birth. In addition, Ex-4 prevented DA closure and intimal thickening at 2h. Ex vivo, Ex-4 attenuated oxygen-induced DA constriction, and this effect was blunted by the cAMP-inhibitor. In vitro, to determine the anti-remodeling mechanisms, our results showed that Ex-4 inhibited PDGF-induced proliferation and migration of DASMCs, with associated downregulation of mitochondrial ROS production and Akt signaling.

Conclusions: These findings suggest that GLP-1R agonist Ex-4 conveys vasodilatory and anti-remodeling effects to prevent DA closure. The mechanisms are mediated, at least partly, by the cAMP pathway, with associated decreased production of mitochondrial ROS and Akt signaling. Therefore, GLP-1R signaling pathway is a novel pharmacological target of DA regulation.

2

Percutaneous Closure of Patent Foramen Ovale in Ischemic Stroke, a Single-Center Retrospective Study
開放性卵圓孔封堵術在缺血性中風的回顧性研究

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Background: Percutaneous closure of patent foramen ovale (PFO) is a treatment option to prevent the recurrence of ischemic stroke from paradoxical embolism. The purpose of this single-center retrospective observational study was to analyze the outcome of percutaneous PFO closure following ischemic stroke.

Methods: Between January 2010 and December 2021, patients who underwent percutaneous PFO closure following ischemic stroke at our institution were recruited, and categorized into two groups, cryptogenic and non-cryptogenic. The patient's demographics, underlying comorbidities, morphology of PFO, procedure-related complications, and recurrence rate of ischemic stroke were retrospectively analyzed.

Results: A total number of eighteen patients underwent percutaneous PFO closure. The mean age was 48.3 years old, and 77% was male. Six patients (33.3%) whose stoke was not due to identifiable etiology, were classified into the cryptogenic group. Twelve patients (66.7%) belonged to the non-cryptogenic group, and large artery stenosis was identified in seven patients (58.3%) among this group. The median of stroke-to-intervention time was 3 months. The overall successful rate of PFO occlusion was 94.4%. The only one who did not complete the procedure was accidentally found chronic type A aortic dissection by perioperative transesophageal echocardiography. Most cases (64.7 %) were performed with a 25-mm PFO occluder without complications like new atrial fibrillation and thromboembolic event. During the follow-up period, two of eleven patients(18%) who completed the procedure in the non-cryptogenic group had a recurrent transient ischemic attack or stroke, and both of them had a history of large artery stenosis. Patients in the

cryptogenic group and those without large artery stenosis are free from recurrent stroke.

Conclusions: Percutaneous PFO closure is a safe procedure without complication at our institution and could be considered for secondary prevention of cryptogenic stroke. Those with large artery atherosclerosis have higher risk of recurrent stroke despite of PFO closure. However, further investigations with larger sample size and longer follow-up periods are needed to confirm this result.

3 **IVC Collapsibility Revisited—Does IVC Really Collapse ?**
下腔靜脈塌陷性的再思考----下腔靜脈真的會塌陷嗎？

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Background: IVC collapsibility index has been widely employed as a prediction for volume responsiveness in patients with emergent-critical situations. While useful, the underlying mechanism for this phenomenon needs to be clarified. aim of this study was aimed to evaluate the possible mechanism of so-called "IVC collapsibility ".

Methods: We enrolled 32 patients (aged 1-18 years) with normal cardiovascular status and normal cardiac ultrasound examination. After the routine cardiac ultrasound examination was completed, we paid particular attention to scan IVC, including subxiphoid-upper abdomen transverse and longitudinal views. Other views may be employed if applicable.

Results: Among all patients, spontaneous respiratory motion caused diminished IVC diameter, and among them, 21/32 showed the total collapse of the IVC during inspiration, while all others had "IVC collapse" > 50%. However, further analysis of the images showed there is medial motion of the hemi-hepatic lobe causing the original slight Rt. lateral poisoned IVC to be pushed medically and resulting in what looks like collapse of IVC.

Conclusions: IVC collapse may be a misconception by the false appreciation of change of the diameter of IVC. While through detailed image analysis, considering the interaction of lung, liver, diaphragm, and abdominal contents, the IVC collapse may be retermed "IVC diameter variability" to avoid misconception.

4 **Differential Characteristics of Biventricular Myocardial Kinetic Energy in Patients with Repaired Tetralogy of Fallot**
法洛氏四合症術後病人的雙心室心肌動能特徵

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Background: Velocity-derived KE is an advanced bio-mechanical parameter in evaluating rTOF patients. Tissue phase mapping is potentially applicable for myocardial KE and has not been reported to investigate the myocardial function of rTOF patients. We aimed to evaluate the adaptation of biventricular myocardial kinetic energy (KE) using tissue phase mapping in patients with repaired tetralogy of Fallot (rTOF).

Methods: This study enrolled 49 rTOF patients and 47 age-matched normal controls without known cardiovascular diseases. All subjects underwent cardiac MRI including tissue phase mapping. The voxel-wise myocardial KE in radial (KE_r), circumferential ($KE_\emptyset$), and longitudinal (KE_z) directions as well as its distribution (%KE_r, %$KE_\emptyset$, %KE_z) were calculated in left and right ventricles (LV and RV).

Results: Compared to normal group, rTOF group had significant increase of LV KE_r, decrease of LV $KE_\emptyset$, increase of RV KE_r, decrease of RV $KE_\emptyset$ and KE_z in either whole cycle, systole, or diastole (all $p < 0.05{\sim}0.001$). The rTOF group also presented significant increase of LV %KE_r, decrease of LV %$KE_\emptyset$ and %KE_z in either the whole cycle, systolic or diastolic phases (all $p < 0.01{\sim}0.001$). In terms of RV %KE in rTOF group, there was significant increase of %KE_r, decrease of %KE_z in whole cycle, systole, and diastole (all $p < 0.001$); while decrease of %$KE_\emptyset$ in systole and increase of %$KE_\emptyset$ in diastole (both $p < 0.01$). The parameters of LV KE_r and %KE_r, RV KE_r and %KE_r, and RV KE_z in whole cycle displayed as independent variables in the prediction of RV end diastolic volume index (adjusted $R2=0.238$, $p < 0.05$).

Conclusions: Our study demonstrated that KE distribution is more sensitive than KE amplitude in the detection of myocardial dysfunction and ventricular interaction in rTOF patients. The decreased %KE_z was compensated by increased %KE_r to maintain cardiac function. Our findings might be an alternative in evaluating myocardial performance of rTOF patients.

5

Clinical Outcome in Neonates with Prenatal Suspicion of Coarctation of the Aorta: a Single Center Experience

產前診斷主動脈弓狹窄的新生兒之臨床成效：一家醫學中心的經驗

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Background: With advance of fetal echocardiography, prenatal diagnosis of congenital heart disease is possible. However, for prenatal diagnosis of coarctation of aorta (COA), false-positive and false-negative rate is high. In neonates after birth, it is still challenging to predict clinical outcome in COA due to mask of a patent ductus arteriosus. In this study, we tried to delineate the clinical outcome in neonates with a prenatal suspicion of COA and predict later outcome by analysis of the early postnatal echocardiography.

Methods: We retrospectively retrieved the data of neonates with a prenatal suspicion of COA, hospitalized in the infant intensive care unit at National Taiwan University Children's Hospital from August, 2020 to September, 2021. We performed echocardiography on the first day of birth and monitored blood gas, blood pressure and urine output closely. Surgical intervention is arranged if critical COA is suspected.

Results: Totally, 24 neonates, who had a prenatal suspicion of COA, were enrolled. Among them, 22 (91%) neonates were identified as COA by the echocardiography on the first day of birth, and 14 (58%) neonates received surgical (13) or transcatheter (1) intervention during the first admission and were considered as critical COA. All neonates survived to discharge after management. The other 8 neonates were regarded as mild COA initially, and 2 of them turned out to be normal during follow-up. We also assessed the prenatal echocardiography parameters and first neonatal echocardiography parameters and correlate with clinical outcome. Small ratio of aortic isthmus to descending aorta (<0.4), smaller ratio of aortic isthmus to left subclavian artery (<0.7), small transverse arch diameter, and the presence of isthmus posterior shelf ($p < 0.05$) on first postnatal echocardiography but not prenatal echocardiography correlates with later intervention.

Conclusions: In neonates with prenatal suspicion of COA, only 54% of them needs intervention during the first admission. The early postnatal echocardiography assessment identify the aortic isthmus and presence of posterior shelf as risk of critical COA.

6

Reports of the China Medical University Children's Hospital Pediatric Cardiology/Cardiovascular Surgeon Working Group

中國醫藥大學兒童醫院「心臟手術團隊」成果報告

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Background: Optimal strategies to improve congenital heart surgery survival outcomes and reduce complication rates across congenital heart program centers in the middle or south Taiwan remain unclear. Many pediatric cardiologists have focused primarily on the referral of higher-risk patients to Taipei for a better prognosis. Improving our understanding of both morbidity and mortality outcomes in our institution compared with US-national variation survey variation across the spectrum of complexity would better inform future referral choice.

Methods: We retrospective review the patient with congenital structural heart disease in CMU children's hospital underwent surgical correction or palliation surgery from 2021.01-2021.12. The demographic data inclusive of age, gender, chromosome anomaly was recorded. The mortality rates of certain index surgery, major complication rates (Renal failure requiring dialysis, Permanent neurologic deficit, Pacemaker, Paralyzed diaphragm, Mechanical circulatory support, Unplanned re-intervention), and mortality rates based on risk stratification (STAT category) were analyzed.

Results: Total 32 surgeries during 2021.01-12, inclusive of 4 TOF, 6 large ASD/VSD contraindicated for percutaneous closure, 3 DORV, 3 systemic to pulmonary shunt, 1 infra-cardiac TAPVR, 1 HLHS and so far. Median age :1 year, 5 neonates, low risk patient (STAT 1-3): 77% (24/32), high risk (STAT 4-5): 23% (8/32). Mean length of ICU stay: 12.35 days, 2 Mechanical circulatory support (6.25%). The overall mortality rates, length of ICU stay, and major complication rates were similar between USA national survey & our institution.

Conclusions: We demonstrated that the outcome for Congenital Heart Disease treated in CMU Children's Hospital compares well with international standards. These findings suggest that, contrary to traditional thinking, referral choice of high-risk congenital heart disease patients to CMU children's hospital is safe & feasible.

7 Study the Incidence of Kawasaki Disease in Children
研究川崎病在兒童的發生率

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Background: Kawasaki disease (KD) is an inflammatory disease encompassing medium vessel vasculitis, potentially including the coronary arteries. It mainly affect children. The prevalence of KD among children in Asia area were still higher than other areas in the world and its incidence is still increasing. The past study of incidence on KD in Taiwan was done over 10 years ago. Our aim of this study was to evaluate the incidence of KD in Taiwan in recent years.
Methods: This is a retrospective cohort study with registration data derived from the National Health Insurance Database. We evaluated children age between 0 to 18 year old with a recorded diagnosis of KD from 2009-2015.
Results: The incidence of KD among children in boys and in girls aged younger than 18 year old in Taiwan between 2009 and 2015 was 33.82–46.57 and 20.71–32.37 per 100,000 person-years, respectively. We found that the boy had higher incidence than the girl. The incidence of KD at the age below 1 year between 2009 and 2015 in children was 110.08 and 122.57 per 100,000 person-years. The incidence of KD at the age below 2 year between 2009 and 2015 in children was 94.13 and 106.31 per 100,000 person-years. The incidence of KD at the age below 5 year between 2009 and 2015 in children was 80.24 and 94.07 per 100,000 person-years. The younger age of children appeared to have higher incidence to have KD. The incidence of KD of children is increasing as of 2009-2015 in Taiwan.
Conclusions: This trend is in accordance with the epidemiological study in other East Asian countries and rank 3rd in East Asia and in the world. Continuous attention should be made to alert the earlier diagnosis and treatment for pediatric patients with possible KD.

8 Global Longitudinal Strain Differs among Kawasaki Disease with Varying Coronary Sequelae
整體縱向應變於川崎症不同冠狀動脈後遺症之差異

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Background: Kawasaki disease (KD) is the most common acquired heart disease in children. Non-invasive imaging study is mandatory to early detect its devastating cardiovascular involvement and to stratify patients at varying risks of myocardial dysfunction. Herein, we attempted to elucidate the clinical utility of global longitudinal strain (GLS) of left ventricle in patients of varying coronary artery sequelae (CAS).
Methods: We prospectively performed echocardiography examination by Phillips EPIQ 7 machine for patients diagnosed and treated as KD by two pediatric cardiologists. Coronary imaging and dynamic cines at standard apical two, three, and four views were acquired and analyzed by Phillips QLab software. The clinical information regarding KD illness were obtained from the chart record. Patients were categorized into 3 groups according to the CAS severity.
Results: There were 160 KD patients enrolled in this study, including 101 males, at median study age of 5.80 (interquartile, IQR 3.70–8.98) years old. Their acute onset median age of 17.37 (IQR, 10.25–26.75) months old, and follow-up median period of 4.08 (IQR, 1.75–7.25) years. All these studied patients had normal ejection fractions regardless of CAS severity. However, 7 patients with severe CAS have significantly lower median average GLS of -22 (IQR: -23--16) when compared to those of normal coronary artery (n= 141, median GLS: -24, IQR: -22--27) and those of moderate CASs (n= 12, median GLS: -23, IQR: -24--21.50) despite negative results from their myocardial perfusion scans and treadmill (p= 0.007, compared among groups by Kruskal-Wallis test). Meanwhile, they also had significantly lower segmental strains, including basal anteroseptal, basal inferolateral, mid inferior, and apical lateral strains when compared to those with no CAS (p= 0.033, p= 0.001, p= 0.033, p= 0.011, respectively).
Conclusions: GLS is a rapid, efficient, and non-radiation tool in assessing the myocardial function of KD patients. For personalized therapy, it is crucial to further explore the relationship of GLS and segmental strains to the individual coronary phenotype.

9 Cardiovascular Complication after Pfizer-BioNTech COVID-19 Vaccine in Teenagers– One Center Experience
青少年Pfizer-BioNTech新冠疫苗施打後心血管相關併發症—單一中心經驗

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Background: In adolescents, mRNA vaccine especially Pfizer-BioNTech COVID-19 (BNT) vaccine is the only vaccine proved by FDA for COVID-19 prevention. Previous studies have reported the safety and efficacy of BNT vaccination in adolescents. However, after nationwide vaccination program in several countries, myocarditis after

BNT vaccine have appeared as an important problem for teenagers. Here we reported cardiovascular complications after BNT vaccination in the teenagers in NTUCH.

Methods: From Sep 2021 to Dec 2021, 11 patients, age between 12 and 17 years, admitted to NTUCH due to cardiovascular complications within 4 weeks after BNT vaccination were analyzed. We summarized the characteristics and clinical course of the patients.

Results: Among the 11 patients, 9 presented as peri-myocarditis, and 2 presented as arrhythmia. The median age was 15 years, and male/female ratio was 8/3. Cardiovascular symptoms were reported in all cases, 10 with chest pain or tightness and 3 with palpitation. The median days from vaccination to the ER visit was 2 days. Initial cardiac enzyme elevated in 7 patients with myocarditis (Troponin T: 41ng/L to 842ng/L, median 255ng/L). Initial ECG showed ST elevation in 5, ST depression in 2, incomplete right bundle branch block in 1 of 9 patients with peri-myocarditis. Another 1 patient presented as sinus bradycardia and the other 1 with frequent VPC as bigeminy pattern. Initial echocardiography showed normal left ventricular ejection fraction in all and 2 had small pericardial effusion. 10 patients admitted to the general ward, and only 1 patient admitted to ICU for vital sign monitoring. For the 8 patients of myocarditis, the median peak time of cardiac enzyme was 5 days after vaccination. And peak value of Troponin T was 1937ng/L, median was 399ng/L. Symptomatic control including usage of NSAID or acetaminophen was given in 3 of 8 patients. No inotropic agent or advance cardiopulmonary support were needed. Total admission days ranged from 3 to 5 days, with median of 4 days.

Conclusions: Cardiovascular complications after BNT vaccination are not rare. In this case series, the clinical course is benign and symptoms resolved spontaneously without further adverse events.

10 **Chest Pain Event after BNT162b2 (Pfizer-BioNTech) Messenger RNA COVID-19 Vaccine in Adolescents**
青少年接種BNT162b2 (Pfizer-BioNTech) Messenger RNA COVID-19疫苗後胸痛事件

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Background: After the initiation of a nationwide vaccination campaing with BNT162b2 mRNA (Pfizer-Biontech, BNT) vaccine against Covid-19, the recognition of initial symptoms/signs indicated an increased incidence of myocarditis in close temporal relationship with vaccinations, especially in adolescents. Chest pain was the most common symptom in the early stage of myocarditis. Therefore, we aimed to investigate the clinical presentation of chest pain event after BNT vaccine in a medical center.

Methods: We retrospectively reviewed the medical records of the adolescents who suffered from chest pain within 30 days of BNT vaccine and were sent to our emergency department from Oct. 2021 to Jan. 2022. Clinical characteristics and parameters were collected for analysis.

Results: A total of twenty-seven patients were enrolled during this period. Seventeen patients were male (60%). The median age was 14 years (range, 12-17 years). Symptom of chest pain occurred at mean 9.4 days after receipt of the vaccine (range, 0-28 days). Fever was noted in one patient (3%). Elevated of blood pressure was noted in 15 patients (55%). One patient had leukocytosis (14500/μL). High sensitive Troponin-T level was elevated in two patients and B-type Natriuretic Peptide was elevated in one patient. The ST-T change was noted in seven patients (25%) on the electrocardiogram (ECG). One patient (3%) was admitted to intensive care unit (ICU) due to myocarditis and was discharged after supportive care.

Conclusions: Although rare, myocarditis could be noted after BNT vaccination. Chest pain was the most common complain, and ECG findings were important for further investigation.

11 **Peri-myocarditis in Adolescents after 2nd Dose of BNT — A Tertiary Center's Experience**
打完第二劑BNT新冠疫苗之後的心包膜心肌炎—單一中心經驗

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Background: It is well known that peri-myocarditis may occur within 1 month after vaccination. In Taiwan, nationwide vaccination program for adolescents in middle school has been implemented since mid-December. This study was aimed to evaluate the occurrence of peri-myocarditis in patients visiting the Emergency Department (ED) after BNT vaccination.

Methods: All the patients aged between 12-18 years old who visited the ED at this center were enrolled for analysis. Particular attention was paid to the BNT vaccination status at triage unit in our ED. All relevant data were reviewed and analyzed.

Results: A total of 364 adolescents aged 12-18 years visited our ED between 15th December, 2021 and 10th January, 2022. Among them, 46 had events temporarily related to BNT vaccination. Nearly all (45/46) of the 46 patients included had chest discomfort related complaints. On the contrary, only 2 patients having visited ED were with chest discomfort without BNT vaccination. Among the 45 with chest discomfort with BNT vaccination, 23 were boys (aged 15.1+/- 1.4 years), 22 were girls (aged 15.1+/- 1.7 years). Three of the 45 patients were admitted due to evidence of peri-myocardial injury. Two of the 3 had maximum troponin-I 33915 pg/mL and 10634

pg/mL respectively. The troponin level soon returned to below 100 pg/mL within several days. We performed cardiac MRI on one patient with maximum troponin-I of 10634 pg/mL, which revealed multifocal patchy myocardial damage. The other 1 had normal cardiac enzyme level but the patient had EKG changes compatible with pericarditis. The echocardiogram showed no abnormalities in all 3 patients.

Conclusions: Our experience revealed that after 2nd dose of BNT vaccination, almost all adolescents with chest discomfort visited ED had events temporarily related to BNT. There was no sex predilection. One of them had cardiac MRI documentation. About 10 % of patients with post-BNT chest discomfort had peri-myocarditis injury. And about 0-10% may develop extensive myocardial injury, though currently all recovered quickly. Particular attention should be paid to the population of adolescents who had chest discomfort after vaccination against COVID-19.

12 **Mass ECG Screening for Cardiovascular Complications after Pfizer-BioNTech COVID-19 Vaccine in Teenagers in Taiwan**
台灣青少年BNT新冠疫苗施打後大規模心電圖篩檢成效

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Background: Peri-myocarditis after the 2nd dose of Pfizer-BioNTech COVID-19 (BNT) vaccine in the teenagers is an important issue. How to prevent or early detect this complication is still not known. Here, we perform a mass ECG screening after the 2nd dose of BNT vaccine in the teenagers.
Methods: In Dec 2021, we perform a mass ECG screening study in 4 senior high schools. All students, who intended to receive 2nd dose of BNT vaccine were invited for the study. Pre-vaccine ECG and questionnaire were performed 1 to 10 days before the 2nd dose of vaccine, and post-vaccine ECG and questionnaire were performed 2 days after BNT vaccine. We performed serial comparisons of ECG parameters to identify new ECG changes after BNT vaccine.
Results: Among 7691 students received the 2nd dose BNT vaccine, 5025 (65.3%) students joined the study and received both pre- and post-vaccine ECG. The male/female was 4482/543. Totally 809 (16.1%) had at least 1 cardiac symptom including chest pain, dyspnea, palpitation, or dizziness after vaccination. Among these students, 52 (1.0%) had abnormal ECG: new ST-T wave change in 37, new arrhythmia in 10,

and other abnormality in 5. Totally, 42 (0.8%) was referred to the hospital for further exam: 1 was diagnosed as myocarditis, 10 was suspected to be pericarditis, and 9 had arrhythmia after exam. None of the patients needed admission to the hospital and all resolved spontaneously.
Conclusions: Cardiac symptoms are common after the 2nd dose of BNT vaccine, but new ECG change presents only in 1% of the patients. The incidence of subclinical myocarditis is low and clinical course is benign.

13 **Sodium Butyrate Modulates Blood Pressure and Gut Microbiota in Maternal Tryptophan-Free Diet-induced Hypertension Rat Offspring**
丁酸鈉調節母親色氨酸缺乏飲食誘導大鼠後代的高血壓和腸道菌叢

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Background: Maternal nutrition, gut microbiome composition, and metabolites derived from gut microbiota are closely related to the development of hypertension in offspring. A plethora of metabolites generated from by diverse tryptophan metabolic pathways shows both beneficial and harmful effects. Butyrate, part of the short chain fatty acids (SCFAs), has shown vasodilation effect. We examined whether sodium butyrate administration in pregnancy and lactation can prevent hypertension induced by maternal tryptophan-free diet in adult progeny and explored the protective mechanisms.
Methods: Pregnant Sprague-Dawley rats received normal chow (CN), tryptophan-free diet (TF), sodium butyrate (SB) 400mg/kg/day in drinking water (CNSB), or TF diet plus sodium butyrate (TFSB) in pregnancy and lactation. Male offspring were sacrificed at the age of 16 weeks (n=8 per group). Plasma levels of acetate, butyrate, and propionate were measured using GC method. Stool samples were analyzed with metagenomics analysis. We also determined tryptophan and its metabolites in the plasma using LC-MS method.
Results: Compared to dams fed a normal chow, adult offspring born to dams fed a tryptophan-free diet for 6 weeks developed hypertension at 16 weeks of age. Maternal sodium butyrate treatment protected offspring against hypertension programmed by tryptophan-free diet. We observed that maternal tryptophan-free diet reduced plasma levels of tryptophan metabolite IAM and IAA, which was prevented by SB intervention. Maternal SB treatment increased mRNA abundance of SCFA receptor GPR41 and GPR109A in the offspring kidneys. Additionally, maternal TF and SB

interventions differentially shaped offspring's gut microbiota profile, resulting four enterotypes. The beneficial effects of SB were relevant to the increase of genera Akkermansia, Ruminococcaceae_NK4A214, Lachnospira and Gordonibacter. Moreover, maternal SB intervention reduced renin-angiotensin system (RAS) components AGT and ACE, but increased MAS mRNA expression in offspring kidneys.

Conclusions: In summary, these results suggest that sodium butyrate protects against maternal TF-induced offspring hypertension, likely by modulating gut microbiota, its derived metabolites, and the RAS.

14 Rapid Detection of Heterozygous Carrier of AGT for Autosomal Recessive Renal Tubular Dysgenesis in Taiwan

以TaqMan分子診斷快篩技術研究台灣自體隱性腎顯管發育不良之基因帶因率及奠基者效應

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Background: Recurrent mutation of homozygous E3_E4 del:2870bp deletion+9bp insertion in the AGT gene responsible for autosomal recessive renal tubular dysgenesis (ARRTD) is frequently reported in Taiwan, but the exact prevalence of heterozygosity is still unknown. The rapid detection of this mutation may help in the prevention of recurrent ARRTD.

Methods: This study was aimed to investigate the prevalence of heterozygosity of E3_E4 del:2870bp deletion+9bp insertion of AGT in Taiwan and develop a simple and rapid method to detect this mutation. Three thousand health, ten heterozygous parents, and five homozygous Taiwanese were enrolled to define this mutation and determine their prevalence by using TaqMan probe-based real-time polymerase chain reaction (RT-PCR). We designed and validated the mutation detection plate, and tested its feasibility in newly diagnosed ARRTD patients.

Results: The recurrent mutation-based TaqMan assays were fully validated with excellent sensitivity and specificity in genetic diagnosed patients and healthy subjects. The prevalence of heterozygosity of E3_E4 del:2870bp deletion+9bp insertion of AGT is 1.27% in Taiwan. The probability that this haplotype occurred independently in all index cases was of 1.52x10-5, suggesting a founder effect.

Conclusions: The prevalence of heterozygosity of E3_E4 del:2870bp deletion+9bp insertion of AGT in Taiwan is high and can be rapidly identified by TagMan probe-based RT-PCR.

15 Complement Factor H and Related Proteins as Markers of Cardiovascular Risk in Pediatric Chronic Kidney Disease

補體因子H和其相關蛋白可作為兒童慢性腎臟病心血管危險因子之標誌

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Background: Cardiovascular disease (CVD) is one of the main cause of mortality among chronic kidney disease (CKD) patients, both in adults and children. Hypertension is one of the most important risk factor of CVD. For early detection of subclinical CVD in children and adolescents with CKD, 24hr ambulatory blood pressure monitoring (ABPM), cardiosonography and arterial stiffness assessment were evaluated. Unlike adults, CAKUT (congenital anomalies of the kidney and urinary tract) is the main etiology of CKD in children. We previously identified complement factor H (CFH) and related proteins differentially expression between CKD children with CAKUT and non-CAKUT using proteomic approach. In this study, we aimed to evaluate whether CFH and related proteins are related to CVD risk in CKD children.

Methods: This study included 102 children and adolescents aged 8 to 18 years old with CKD stages G1-G4. CV assessments consisted of 24hr ABPM, cardiosonography, and arterial stiffness parameters. Plasma levels of CFH, complement factor H-related protein-2 (CFHR2), and -3 (CFHG3) were determined by ELISA kits. Mann-Whityney U test or Chi-square test was performed to investigate the differences between groups.

Results: CAKUT accounted for 56.9% (58/102) of the etiologies. CKD children with non-CAKUT have higher plasma CFHR3 levels than those in CAKUT group (p=0.046). CFHR3 was negatively correlated with LV mass (p=0.009) and pulse wave velocity (p=0.02). We found that CFHR2 was higher but the CFH/CFHR2 ratio was lower in CKD children with 24-hr hypertension in ABPM profile compared to those with normal 24-hr BP (both $p < 0.05$). In addition, CKD children with night-time hypertension had significantly decreased CFH/CFHR2 ratio (p=0.039). Moreover, in children with non-CAKUT CKD, those with day-time hypertension (p=0.036) and increased BP load (p=0.018) displayed lower plasma CFHR3 level.

Conclusions: Our results highlight that CFH and related proteins play a role for an abnormal ABPM profile in children with CKD. Early assessment of CFH, CFHR2, CFHR3 and their ratio may have clinical utility in discriminating CV risk in CKD children with different etiologies.

16 **Deep Learning Algorithm for Prediction of Acute Pyelonephritis from Renal Sonography**
利用深度學習技術自腎臟超音波影像預測急性腎盂腎炎

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Background: Acute pyelonephritis (APN) is associated with renal scarring, hypertension and chronic kidney disease. Longer antibiotics treatment duration is usually required in APN patients. However, a low recognition rate is available regarding APN diagnosis from renal ultrasonography by medical professionals, especially in early disease stages. Hence, this study aims to use a proposed deep learning algorithm to predict APN and compare with some previous models.
Methods: Pediatric patients with first febrile urinary tract infection (UTI) who were admitted to our hospital and received both renal sonography and meso-2,3-dimercaptosuccinic acid (DMSA) renal scan were enrolled in this study during 2004~2019. We proposed a normalized augmented intelligence feature (NAIF) reduced by Principal Component Analysis (PCA) for the input of Support Vector Machines (SVM) to obtain the classifier output of this model from the input image obtained by YoloV5 object detection from patients' renal sonography. Finally, this study compares the proposed method with nine popular convolutional neural network (CNN) models (vgg16, vgg19, resnet50, ResNet101, DenseNet121, mobilenet, Xception, InceptionV3, InceptionResNetV2) and SVM. APN confirmed by DMSA renal scan was regarded as the ground truth of the model development.
Results: Three-hundred-thirteen febrile UTI patients were enrolled in this study with a total of 1,240 renal sonography images. The mean age of the patients was 5.4 months and 48.2% of them were male. Kidneys were successfully detected by YoloV5 object detection algorithm from a standard sonography image set of each patient, including longitudinal and transverse kidney images of both kidneys. VGG 16 model yielded the best performance of predicting APN with sensitivity 85.4%, specificity 84.0%, positive predictive value 94.8% and negative predictive value 62.7%, respectively.
Conclusions: This study shows that deep learning algorithms can achieve satisfactory accuracy in prediction of APN in pediatric febrile UTI patients. Our proposed algorithm outperforms other popular CNN models.

17 **Urethral Discharge as a Novel Manifestation of Urinary Tract Infection in Children ≤24 Months Old**
尿道分泌物是24個月以下嬰幼兒泌尿道感染嶄新的臨床表現

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Background: Children with urinary tract infections (UTIs)are prone to kidney scarring if they are not treated promptly; however, ambiguous symptoms before fever onset makes the early detection of UTIs difficult.
Methods: This study enrolled 678 children younger than 24 months with paired urinalysis and culture performed between 2015 and 2021; 544 children were diagnosed with UTIs. Clinical symptoms, urinalysis, and paired urine culture results were compared.
Results: Urethral discharge was observed in 37 (5.4%) of 678 children in our cohort, and in 28 (5.1%) of children with UTI. The sensitivity and specificity for urethral discharge in diagnosing UTI is 5.1% and 92.5%. Children with urethral discharge had a less severe UTI course (percentage of fever ＞ 39'C in children with and without urethral discharge: 18% and 57%, respectively;P＜ 0.001). They received antibiotics before fever occurred more often; Nine children with urethral discharge received antibiotics before fever onset, seven did not develop a fever during the entire UTI treatment course. Urethral discharge was associated with alkalotic urine and Klebsiella pneumonia infection.
Conclusions: Urethral discharge is an uncommon symptom in children younger than 24 months with UTI, but it is highly specific for UTI diagnosis. Urethral discharge may be observed before a fever develops in children with UTI; therefore, the detection of urethral discharge and prompt antibiotic intervention may prevent or alleviate subsequent systemic involvement in children with UTI and, most importantly, prevent kidney scarring due to acute pyelonephritis in the long term.

18 **Hyperoxia Induces Ferroptosis and Impairs Lung Development in Neonatal Mice**
高氧誘導新生小鼠鐵依賴型細胞死亡並損害肺發育

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Background: Oxygen is often required to treat newborns with respiratory disorders and prolonged exposure to high oxygen concentrations impair lung development. Ferroptosis plays an important role in the development of many diseases and has become the focus of treatment and prognosis improvement of related diseases, such as neurological diseases, infections, cancers and ischemia-reperfusion injury.

Whether ferroptosis participates in the pathogenesis of hyperoxia-induced lung injury remains unknown. The aims of this study are to determine the hyperoxia effects on lung ferroptosis and development in neonatal mice.

Methods: Newborn C57BL/6 mice were reared in either room air (RA) or hyperoxia (85% O2) from postnatal days 1 to 7. On postnatal days 3 and 7, lungs were harvested for histological and biochemical analysis.

Results: The mice reared in hyperoxia exhibited the abnormal mitochondrial morphology typical of ferroptosis, including shrunken mitochondria and mitochondrial membrane rupture, yielded significantly higher Fe2+, malondialdehyde and iron deposition and significantly lower glutathione, glutathione peroxidase 4 and vascular density than did those reared in RA on postnatal days 3 and 7. The mice reared in hyperoxia exhibited comparable mean linear intercept on postnatal day 3 and a significantly higher mean linear intercept than the mice reared in RA on postnatal day 7.

Conclusions: Hyperoxia induced ferroptosis at a time point preceding the impaired lung development adding credence to the hypothesis that ferroptosis is involved in the pathogenesis of hyperoxia-induced lung injury and ferroptosis inhibitors might attenuate hyperoxia-induced lung injury.

19 The Role of Hypoxia Induced Factor-1α on Hyperoxia Induced Kidney Injury in Neonatal Mice

缺氧誘發因子1α(HIF-1α)於新生小鼠高氧引發腎臟傷害的角色

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Background: Prematurity is linked to incomplete nephrogenesis and risk of chronic kidney diseases (CKDs). Oxygen is life-saving in critical circumstances but induces injury in numerous organs. Evidences indicates oxidative stress, an imbalance between reactive oxygen species (ROS) and antioxidant systems, plays a pathogenetic role in the developmental programming of kidney disease. Preterm neonates are particularly vulnerable to oxidative stress as they have low concentrations of antioxidants. The transcription factor hypoxia inducible factor-1α (HIF-1α) is one of the master regulators of oxygen homeostasis which mediates adaptive responses to oxidative stress; however, the mechanisms through which HIF-1α regulates nephrogenesis in response to oxidative stress are poorly understood. Therefore, this study aim to explore the impaction of kidney tissue, expressions of HIF-1α and the following transcription factors under hyperoxia exposure during neonatal period.

Methods: C57BL6 mice pups reared in room air (RA, 21%) or 85% O2 for 7 days. Their daily body weight, final kidney weight, and survival rate are recorded. Their kidneys were excised for histology and analyze the markers for apoptosis, tissue fibrosis and inflammation.

Results: Compared with RA group, hyperoxia exposure group exhibited lower body weight ($p < 0.05$), higher kidney to body weight ratio ($p < 0.001$), higher glomerular injury score ($p < 0.05$), higher tubular injury score ($p < 0.001$), higher interstitial fibrosis ($p < 0.001$), lower expression of HIF-1α ($p < 0.001$), and higher expressions of phosphor-ERK ($p < 0.001$), higher collagen I and α-SMA ($p < 0.001$), higher IL-6 and phosphor-NF-κB ($p < 0.001$).

Conclusions: Our results revealed that hyperoxia exposure increased glomerular and renal tubular injury as well as kidney fibrosis via attenuating HIF-1α expression and upregulating kidney apoptosis, fibrosis and inflammation. Therapeutic activation of HIF-1α can potentially prevent hyperoxia-induced kidney injury in preterm baby.

20 Uteroplacental Insufficiency Disrupts Microbiota and Impairs Lung Development in Growth-Restricted Newborn Rats

子宮胎盤功能不全破壞生長受限新生仔鼠的微生物群並損害肺發育

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Background: Uteroplacental insufficiency (UPI) induces intrauterine growth restriction (IUGR) in newborn rats. Preclinical and human studies have demonstrated that IUGR is associated with reduced lung development during neonate and infancy. The aims are to evaluate the effects of UPI during pregnancy on lung and intestinal microbiota and to assess the correlations between intestinal and lung microbiota and postnatal lung development in growth-restricted newborn rats.

Methods: On gestation day 18, either UPI was induced through bilateral uterine arteries ligation (IUGR group) or sham surgery was performed (control group). All rats were delivered naturally at term (22 days). Litters were weighed and the litter size was reduced to nine to assure uniformity of litter size between IUGR and control litters. On the postnatal days 0 and 7, rats were randomly selected from each group irrespective of sex. Lung and intestinal microbiota were sampled from the left lung and lower gastrointestinal tract, and right lung and terminal ileum were harvested for Western blot and histology analysis. We sampled microbiota using a culture-independent approach (community sequencing of the 16S rRNA gene, Illumina MiSeq). To assess the impact of UPI during pregnancy on the maternal intestinal microbiota, we performed gut microbial profiling of maternal fecal samples collected on postnatal day 0.

Results: Bilateral uterine arteries ligation did not alter α-diversity, -diversity, or bacterial composition at the phylum level of maternal intestinal microbiota. Compared

with control rats, the IUGR rats exhibited significantly lower body weights, radial alveolar count, vascular endothelial growth factor expression, and vascular density on postnatal days 0 and 7. IUGR rats exhibited significantly lower α-diversity of lung and intestinal microbiota than the control rats on postnatal days 0 and 7. The lung and intestinal microbiota composition was different between the control and IUGR rats.

Conclusions: UPI during pregnancy during pregnancy impaired lung development probably through the modulation of intestinal and lung microbiota in growth-restricted newborn rats

21 **Higher Abundance of Actinomyces Spp. in Gut Microbiome of Mothers Delivering Prematurely before Delivery**
早產母親在分娩前腸道微生物組中放線菌屬豐富度較高

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Background: Preterm birth is a major challenge for pregnancy worldwide. Prematurity is the leading cause of death in infants and may result in serve complications. There are near half of preterm births being spontaneous without recognizable causes. Whether maternal gut microbiome and associated functional pathway might play a key role in spontaneous preterm birth (sPTB) were investigated.
Methods: Two hundred eleven-one singleton pregnancies of women were enrolled in a mother-childhood cohort study. Fecal samples were freshly collected at the second gestational stage before delivery, and sequenced using 16S ribosomal RNA gene. Microbial diversity and compositions, and core microbiome were statistically analyzed with records from the Medical Birth Registry.
Results: The gut microbiome of mothers with sPTB had a lower alpha diversity than those delivering term. Higher abundance of Actinomyces spp. was noted determined by the random forest model and inversely correlated with duration of pregnancy in sPTB. Multivariant regression showed the odds ratio of prematurity delivery was 3.274 (95% confident interval (CI): 1.349; p=0.010) in overweight population (BMI≥24) with a cutoff Hit% >0.022 (AUC=0.688; p=0.039) for Actinomyces spp. Furthermore, the enrichment of Actinomyces spp was negatively correlated with glycan biosynthesis and metabolism in sPTB (p=0.049).

Conclusions: Maternal gut microbiota shows that lower alpha diversity, increasing Actinomyces spp., and dysregulated glycan metabolism, may be associated with sPTB risk.

22 **Salivary Microbiome and Asthma in Children with Orofacial Defects**
口面部缺陷患兒的唾液微生物菌群和氣喘

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Background: Congenital orofacial defects, cleft lip (CL), cleft palate (CP), and cleft lip and palate (CLP), provide a direct connection between oral and nasal cavities. The continuous exposure of the respiratory system to microbiome from oral environment in first months of life offers opportunities to develop mucosal immunity in airway. The prevalence of asthma in children who have orofacial defects hasn't been reported before. Thus, this study was conducted to analyze data on asthma occurrence in CL, CP, and CLP infants and the composition of salivary microbiome to explore the potential risk of oral microbiota in developing asthma in childhood.
Methods: Data from the research database of Chang Gung Memorial Hospital between 2004 and 2015 were retrospectively analyzed. CL, CP, and CLP were defined by ICD code. Asthma was defined by ICD code and patients who received selective beta-2 agonistic or/and inhaled corticosteroid treatments twice within one year during 5 to18 years old. Asthma and non-asthma groups were matched on the basis of birth year, gender, antibiotic, and NSAID use. Demographic characteristics were compared between two groups by multivariable regression. Furthermore, saliva collection was performed prospectively from 2016 to 2018 in term healthy infants and CL, CP and, CLP infants on postnatal day 7, 1-month-old 6-month-old. Microbiome in saliva was detected by Next Generation Sequencing (NGS). p < 0.05 was considered statistically significant.
Results: The asthma and non-asthma groups were 988 and 3952 respectively. CP had a higher incidence of asthma development than no orofacial defect (aOR: 5.644, CI: 1.423-22.376). In NGS analysis, case and control groups both had 10 patients. Streptococcus represented more than half of the reads in all samples. In 6-month-old, healthy term babies had the dominance of Lactobacillus, but orofacial defect babies had Bacillaceae. The overall microbiota composition was strongly associated with postnatal age (p < 0.001), especially in infants with orofacial defects.
Conclusions: Children with orofacial defects would be at risk of asthma development. Oral microbiota in the early months of life contributed to the likelihood of asthma.

23 Smart Microcirculation Monitoring System for Predicting Neonatal Shock
預測新生兒休克發生之智慧型微循環監測系統

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Background: The manifestation of shock in the neonates is usually not apparent in the very early stage, leading to missing the golden time for treatment. We intended to use biomedical photoelectric sensing technology to develop a non-invasively monitor system to know neonatal microcirculation status to solve this condition.

Methods: We enrolled the new patients admitted to the neonatal intensive care unit into the study. We developed a wireless neonatal body microcirculation monitoring system, including an optical probe and pressure sensor. We used this system to collect the data while we applied pressures to the skin of the patients' sole (mimicking the capillary refilling time method) and then released. The data of the blood flow, total hemoglobin concentration (HbT), and tissue oxygen saturation (StO2) before, during, and after the pressures were recorded. In addition, the clinical condition of the patients, including the vital signs and disease conditions, were also recorded for analysis. The definition of low blood pressure is the blood pressure less than the gestational age.

Results: This study has included 119 newborns. We found that HbT recorded before, during, and after applying pressure were significantly higher in the term infants than the preterm infants, but not different between the normal blood pressure and low blood pressure over both term and preterm groups. For StO2 recorded before, during, and after applying pressure, there were no significant differences between the term infants and the preterm infants and between the normal blood pressure and low blood pressure. Then, we used the neural network to check the microcirculation status based on the classification of whether the blood pressure is greater than the blood pressure of the corresponding gestational age. The results revealed that the best classification effect could be obtained when the threshold is set to 0.4 (Accuracy = 84.03%, Sensitivity = 81.67%, Positive predictive value = 85.96%).

Conclusions: It is possible to combine the clinical conditions of the newborn and artificial intelligence technology to assist the physician in effectively predicting the risk of neonatal shock.

24 Application of Machine Learning Methods to Help Clinicians Differentiating Ventilator-associated Pneumonia from Non-infectious Events in Neonates on Mechanical Intubation
應用機器學習方法來幫助臨床使用呼吸器新生兒之呼吸器相關肺炎診斷

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Background: Accurate identification of critically ill neonates on mechanical ventilation with possible ventilator-associated pneumonia (VAP) can help avoidance of unnecessary empiric antibiotics. We aimed to examine whether machine learning (ML) methods can improve accurate identification of VAP among neonatal intensive care unit (NICU) patients on intubation.

Methods: A total of 1176 neonates on mechanical ventilation and hospitalized in the NICU of a medical center in Taiwan between January 2015 and December 2020 were randomly divided into training (70%, n = 832) and test (30%, n = 344) sets. The primary outcome was definite diagnosis of VAP. The area under the receiver operating characteristic curves (AUCs) of several ML algorithms were compared and the best ML method was validated in the test set.

Results: For NICU mortality, the random forest (RF) model showed the highest AUC (0.908 [0.892–0.931]) for the accurate identification of neonates with final diagnosis of VAP, and the bagged classification and regression tree model demonstrated the next best results (0.882 [0.851–0.912]). The AUCs of both models were significantly better than the traditional sputum cultures from endotracheal aspirate for diagnosis of neonatal VAP. The superior performances and net benefit were confirmed by higher accuracy, F1 score and better calibration, and the decision curve analysis, respectively. In addition, Shapley additive explanation (SHAP) values were utilized to explain the RF prediction model.

Conclusions: Machine learning algorithms can help the accurate diagnosis of neonatal VAP and decrease the diagnostic error. The RF model is suitable for clinical use in the NICU and clinicians will avoid unnecessary use of empiric antibiotics when unstable respiratory conditions are encountered.

25 Severity of Underline Disease Define the Outcome of Pulmonary Hypertension in Neonate
潛在性疾病的嚴重度決定新生兒肺高壓的預後

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Background: Pulmonary hypertension (PH) is a serious disease in neonates which is frequently associated with very different time onset and underline courses. We try to explore the outcomes of different type of PH in neonates.
Methods: Neonates diagnosed as PH at level III neonatal intensive care unit between January 2009 and 2021 December were enrolled. Diagnosis of PH was according to World Symposium on Pulmonary Hypertension : echocardiography disclosed mean pulmonary arterial pressure(PAP) was > 20mmHg and Tricuspid regurgitant jet velocity 2.5–3 m/s, no matter it was persistent PH of newborn or PH associated with bronchopulmonary dysplasia. We defined PH developed before 24 hours as very early, 2-7 dys as early, >7 days as late and >28 as very late PH. The etiology, time onset, severity of PH, days of ventilation, mortality rate and risk factors associated with mortality were assessed by retrospective chart reviewed.
Results: In total, 110 infants had PH. Twenty-six, 40, 26, and 18 PH neonates were very early, early, late and very late respectively. Of these, 13 (11.6%) were expired before discharge. The most common etiology of very early PH were very preterm infants, asphyxia；MAS, sepsis for early, BPD for late and very late. Very early PH had highest mortality of 27%. The risk factors for PH were: maternal chorioamnionitis, prolonged rupture of membranes > 7 days, birthweight below the 3rd percentile and ventilation >7 days. The risk factors for mortality of PH were very early PH and PAP >25 mmhg.
Conclusions: An echocardiographic in neonates with very float SpO2 help to identify infants with PH and early diagnosis in high risk neonates might help to let the family to prepare the worst prognosis.

26 Impact of Maturation on the Incidence and Clinical Characteristics of Necrotizing Enterocolitis in Very Low Birth Weight Preterm Infants
壞死性腸炎的發生率與臨床表徵隨早產兒週數之大小有顯著差異

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Background: Necrotizing enterocolitis (NEC) is a serious inflammatory disease of the GI tract in newborn infants, especially those born preterm. Gut immaturity is thought to play a key role in the pathogenesis of NEC. The clinical presentation, staging criteria, and subsequently proposed management based on the staging, has been developed in 1978 and adapted until now. For the identification, prevention, and effective management of today's NEC, we conducted this study to test if degree of maturation has an impact on the incidence and clinical presentation of NEC among very low birth weight (VLBW) preterm infants.
Methods: We retrospectively enroll VLBW preterm infants admitted to NICU of Chang Gung Memorial Hospital, Lin-Kou with a diagnosis of severe NEC (stage II and III) from 2017/01 through 2021/10. Patients are divided into categories according to their gestational age (GA) and birth weight (BW). The GA- and BW-specific incidence of NEC, patient demographics, clinical presentations, and outcomes are described and compared.
Results: 60 VLBW patients with NEC II to III were identified and divided in to 3 GA-specific (<26 wks. n=12; 26-27 wks. n=14; and 28-31 wks., n=27) and 2 BW-specific (<1000 gms. n=27;and 1000-1500 gms. n=33) groups. The GA-specific incidence of NEC was 6.5%, 6.7% and 4.0%, and BW-specific incidence was 6.5% and 5.7%, respectively. The average time of NEC onset in each GA group was on 37±22 (Mean±SD), 24±12 , and 26±12 post-natal day, and at about post-menstrual age (PMA) of 31+6 wks., 31+5 wks., and 33+1 wks. The most common symptom was abdominal distention in all GA Grs. (11/12, 11/14, and 21/27), followed by bilious OG aspirate, or increased amount of OG return (9/12, 12/14, and 20/27). Bloody stool occurred less often in the least mature infants (4/12, 9/14, and 12/27). Radiographic findings were specific in that fixed bowel loops and gasless abdomen was the most common presenting feature in the GA <26 wks. Gr. (8/12).
Conclusions: Consistent with recent reports, we found clinical and radiographic presentations of NEC varies according to patients' degree of maturation. Clinicians should recognize such discrepancy and manage patients accordingly.

27 Clinical and Microbiological Characteristics of Neonates with Candidemia and Impacts of Therapeutic Strategies on the Outcomes
新生兒念珠菌菌血症之臨床表徵及治療策略與預後之關係

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Background: Neonatal candidemia is associated with significant morbidities and a high mortality rate. We aimed to investigate the clinical characteristics of Candida bloodstream infections in neonates and the impact of therapeutic strategies on outcomes.

Methods: We identified all neonates with candidemia from a medical center in Taiwan over an 18-year period (2003-2021) and analyzed. Clinical isolates were confirmed by DNA sequencing, and antifungal susceptibility testing was performed. Prognostic factors associated with clinical treatment failure (30-day all-cause mortality and persistent candidemia > 72 hours after antifungal agents) and in-hospital mortality were analyzed using logistic regression modeling.

Results: A total of 123 neonates with 139 episodes of candidemia were included in the study. The median (IQR) gestational age and birth weight of neonates with candidemia were 29.0 (26.0-35.0) weeks and 1104.0 (762.0-2055) g, respectively. The most common Candida spp. was Candida albicans (n=57, 41.0%), followed by C. parapsilosis (n=44, 31.7%), Candida guilliermondii (n=12, 8.6%) and C. glabrata (n = 11, 7.9%). The overall susceptibility to fluconazole was 86.1%. Cumulative mortality rate at 7 and 30 days after the first episode of candidemia was 11.3% and 32.3%, respectively. The overall in-hospital mortality rate was 42.3%. The treatment outcomes did not change over the study period, and were not affected by delayed initiation of antifungal agents. Multivariate analysis showed that delayed catheter removal (odds ratio [OR], 5.54; 95% confidence interval [CI]: 1.93-15.86, P=0.001), septic shock (OR, 7.88; 95% CI: 2.83-21.93, P ＜ 0.001), and multiple chronic comorbidities (OR, 8.71; 95% CI: 1.82-41.81, P=0.007) were independently associated with final in-hospital mortality.

Conclusions: Overall mortality of neonatal candidemia remains consistently high over the past decade. Prompt early catheter removal and aggressive treatment strategy in neonatal candidemia with septic shock would be critical to improve patient outcomes.

28 Pentoxifylline in the Treatment of Peripheral Tissue Ischemia in Preterm Neonates: a New Adjuvant Therapy
Pentoxifylline：早產兒周邊肢端缺血輔助治療的新選擇

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Background: Neonatal vascular thrombotic disease resulting in limb ischemia is not uncommon and usually after intravascular catheter indwelling. Current therapy for neonatal peripheral tissue ischemia consists of removal of intravascular catheters, warm packing to the opposite limb, topical pharmacologic therapy but still has limited effect. Pentoxifylline (PTX) has anti-inflammatory properties by inhibition of erythrocyte phosphodiesterase/lowers blood viscosity and improves microcirculation. It had been reported to use in peripheral circulatory disorders in adults but rare studies applied it in neonatal limb ischemia. We present 3 preterm neonates with peripheral vascular thrombosis, treating with PTX successfully without adverse effect.

Methods: Retrospective chart reviews were conducted for peripheral tissue ischemia treated with oral PTX between 2015 and 2021 in Cathay General Hospital. The perinatal characteristics, clinical presentations, dosage and treatment duration were collected.

Results: Three neonates (F:M=1:2) were enrolled with gestational age of 26, 26, 29 weeks, and birth weight of 770g, 907g and 1,702 g. Presentation of circulatory disturbance over distal upper limbs including pallor, coldness, discoloration and followed by gangrene change developed after arterial catheter placement in 2 cases, each occurred on day of life (DOL) 9 and DOL 13. The other case with gangrene changes over left 2nd, 3rd and 4th fingers and left 1st to 3rd toes were noticed 2 hours after birth, without arterial catheterization. Catheter removal as well as contralateral limb heat packing was done immediately in all cases. One of them received Enoxaparin and the others received topical Sildenafil applied on the gangrene region. Because of the unsatisfied condition, oral PTX 20mg/kg/day divided in 3 doses were given. After PTX treatment, the lesions improved within one week. There were no significant adverse effects including thrombocytopenia, intraventricular hemorrhage or retinal hemorrhage.

Conclusions: PTX may be a safe and effective adjuvant therapy for peripheral tissue ischemia in preterm neonates. Further randomized controlled trials are necessary to assess the efficacy and long-term adverse effects of PTX.

29 Hearing Impairments in Newborns with Hypoxic–Ischemic Encephalopathy
新生兒缺氧缺血性腦病變與聽力損傷

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Background: Hypoxic-ischemic encephalopathy (HIE) can cause unfavorable neurodevelopmental outcomes, including hearing impairment(HI). Therefore, identifying biomarkers to initiate early hearing rehabilitation would be valuable.

Methods: Nighty-six neonatal HIE was enrolled. Seventy-eight were divided into HIE with HI and without HI after excluded 18 congenital anomalies. We compared 11837

newborns with hearing screen.

Results: The hearing screening in 78 HIE exhibited 11 non-passed, and higher than 11837 newborns with hearing screening (14.1% vs. 0.87%; p < 0.001). Among 78 HIE, higher confirmed HI in moderate-to-severe HIE (p = 0.020; odds ratio, 8.61) than mild HIE. The clinical staging and lactate could be predicting factors for HI in HIE. Among 78 HIE, lactate was significantly higher in HIE with HI than those HIE without HI (104.8±51.0 vs. 71.4±48.4; U = 181, p = 0 .032), but not significantly in 46 moderate-to-severe HIE receiving hypothermia therapy with and without HI. More HI in stage III than in stage II [43.8% vs. 10%; $\chi2$ (1, n = 46) = 6.986, p = 0.008].

Conclusions: Clinical staging and blood lactate could be predicting factors for HIE with HI. For clinical moderate-to-severe HIE, the clinical staging was a predicting factor. The degree of HI was correlated with brain MRI anomalies and neurodevelopmental outcome at 1 year.

30 Reappraisal of Neonatal Neurobehavioral Examination Assessment Timing for Predicting Neurodevelopmental Outcomes in Very-Low-Birth-Weight Preterm Infants

重新評估執行新生兒神經行為檢查之時間用以預測極低體重早產兒之神經發展預後

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Background: Neonatal neurobehavioral examination (NNE) is a quantitative assessment of neuromaturation status in neonates. It consists of 3 sections including tone and motor, primitive reflexes as well as behavioral responses. Rare studies had evaluated the NNE assessment timing for predicting the risk of neurodevelopmental disability in preterm infants. The aim of study was to reappraise the NNE scoring at different postmenstrual age to identify VLBW preterm infants who are at risks of neurodevelopmental disability till 1 year of corrected age.

Methods: From 2011 to 2020, 198 VLBW preterm neonates admitted in Cathay General Hospital were enrolled. All of them received the NNE Chinese version examinations after leaving incubators at different postmenstrual age by an experienced physical therapist. All infants underwent the Bayley Scales of Infant Development III (BSID III) evaluation at 6 and 12 months of corrected age. Severe neurodevelopmental disability was defined as presence of one or more of the following: cerebral palsy, visual impairment, hearing impairment or BSID III composites scores＜70.

Results: According to the conceptional age at assessment, 107 preterm neonates received NNE examinations before postmenstrual age of 37 weeks and the remaining 91 neonates were assessed at term age. The NNE scores were significantly higher in neonates who receive NNE assessment at term age than at earlier preterm age. (73.13±3.03 vs. 71.44±4.76; p=0.018) The composites BSID III scores at 6 months or 12 months of corrected age were not significantly correlated with the scores of NNE neither in preterm assessment group nor in term assessment group. However, in neonates with NNE scores ≤ 70 assessed at term age had significant higher risks of severe neurodevelopmental disability at corrected 6 months old. (aOR=15.84, p=0.033, 95% CI: 1.256-199.9)

Conclusions: Low NNE score performed before postmenstrual age of 37 weeks could not well predict neonatal neuromaturation status in VLBW preterm infants. However, preterm neonates with a low NNE scores≤ 70 accessed at term age could predict the risk of poor neurodevelopmental outcomes at 6 months of corrected age.

31 A Preliminary Study on the Outcomes of the Home Visiting Program for Premature Infants and their Caregivers: The Experience of Taipei City Hospital

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Background: Under the guidance of Department of Health, Taipei City Government, Taipei City Hospital has implemented a home visiting project to provide better quality of care for young children since Jan,2020. This study aimed to evaluate the benefits of home visiting program for preterm infants and caregivers at 2-6 months of age.

Methods: All parents of newborns born in the Heping Fuyou Branch of Taipei City hospital were invited to participate in this project. If the parents agreed, the demographic characteristics was collected, and all the children would be visited at the age of 2-6 months. The tasks of home-visiting included health examination, evaluation of home environmental safety, and assessment of parent-children interaction. Parents' mental health status was assessed using the Hospital anxiety depression scale (HADS).

Results: As of December 31, 2021, a total of 227 newborns participated in the program and entered the analysis, including 176 (77.5%) premature babies and 51 (22.5%) newborns. 122 infants completed their first home visiting. The health status of the infants was generally good except that the growth of preterm infants, including height, weight, and head circumference was lower than that of full-term infants. The anxiety and depression scores reported by the parents of preterm infants in the neonatal period were higher than those of the parents of full-term infants, which were 6.2±2.9 vs.

4.9±2.7 and 4.7±3.0 vs. 3.5±2.9, respectively. The anxiety score was significantly increased (p < .05). Parents' depression and anxiety scores reported during the home visiting were 5.5±3.4 vs. 4.4±3.2 and 5.1±3.1 vs. 4.3±3.6 respectively. However, there was no statistical significance(p > .05). The parent-child interaction scores of parents of premature infants are similar to that of full-term infants.

Conclusions: The health of children is very important, as is the mental health of caregivers. We found that parents of preterm infants had higher levels of anxiety and depression stress than term infants but decreased as the children grew older. The effects of home visiting project warrant further study.

32 Proteasome Inhibitors Ameliorate Hypoxia-induced Pulmonary Arterial Smooth Muscle Cells Proliferation by Restoring Mitofusin-2 Expression
蛋白質體抑制劑藉由回復mitofusin-2的表現改善缺氧誘導的肺動脈平滑肌細胞增生

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Background: Pulmonary arterial hypertension (PAH) is a severe progressive disease, and the uncontrolled proliferation of pulmonary artery smooth muscle cells (PASMCs) is one of the main causes. Currently, there is no promising therapy available due to its diversity and complexity. Mitofusin-2 profoundly inhibits cell growth and proliferation in a variety of tumor cell lines and rat vascular smooth muscle cells. Moreover, the down-regulation of mitofusin-2 is known to contributes to PAH. Proteasome inhibitors have shown to inhibit the proliferation of PASMCs, however, there is no study on the regulation of proteasome inhibitors through mitofusion-2 in the proliferation of PASMCs, a major pathophysiology of PAH

Methods: In this study, primary PASMCs were exposed to a hypoxic (1% oxygen) incubator to simulate the hypoxic state as type III pulmonary hypertension. The expression of mitofusin-2 and apoptosis-related protein were detected by Western Blotting. The effects of hypoxia and proteasome inhibitors on the cell viability of PASMC cells was detected by the CCK8 assay kit.

Results: Our results indicated that hypoxia increases the viability and reduces the expression of mitofusin-2 in PASMCs model. Mitofusin-2 overexpression inhibits hypoxia-induced proliferation of HPASMCs. In addition, proteasome inhibitors, bortezomib and marizomib, restored the decreased expression of mitofusin-2 under hypoxic conditions, inhibited hypoxia-induced proliferation and induced cell apoptosis-related protein expression.

Conclusions: Bortezomib and marizomib have the potential to improve hypoxia-induced the proliferation of PASMCs by restoring mitofusin-2 expression. However, in vivo studies and clinical trials are required to validate the results of the present study.

33 The Connection between Meconium Consistency and Outcomes of Neonates with Meconium-Stained Amniotic Fluid
胎便的稀和濃與胎便吸入症候群的新生兒的預後

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Background: Meconium aspiration remains a major contributor to neonatal morbidity and mortality, despite aggressive treatment strategies. However, the meconium consistency serves as an indicator of fetal distress is under debate. The purpose of this study was to investigate the relationship between meconium consistency and the prognosis of meconium-stained amniotic fluid (MSAF).

Methods: 1.Retrospectively analyzing clinical data of neonates born with meconium from a local teaching hospital between 20 13 to 2017. 2.In vitro model using human alveolar epithelial and bronchial cells to determine the effects of meconium exposure on lung cells.

Results: 1.Undesired morbidities, such as intensive birth resuscitation, ICU admission, intubation, ventilation, and death, which were observed for the thick meconium group, did not appear in the thin meconium group. 2.In vitro studies showed that the thick meconium with longer exposure times markedly induced lung cell death and exposure to meconium resulted in the significant release of nitrite from lung cells. 3.RNA-seq and RT-PCR data showed that COX-2 mRNA levels in both A549 and HEL299 cells were highly expressed in response to meconium stimulation. Dexamethasone, and NS-398 [a specific cyclooxygenase 2 (COX-2) inhibitor] significantly reduced the meconium-induced release of nitrite.

Conclusions: The present study suggested that thick meconium in infants might be associated with poor outcomes compared with thin meconium based on chart reviews. The in vitro studies suggested that meconium is a potent inflammatory stimulus that triggers the overproduction of nitrite in lung cells, which may play an important role in the pathogenesis of MAS.

34 Sustained Pharyngeal Inflation on Upper and Lower Airway Effects in Children—Flexible Bronchoscopy Measurement
幼兒施予持續充氣法時上、下氣道腔壓力及管腔變化—以軟式內視鏡監測

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Background: Sustained inflation (SPI) with pharyngeal oxygen and nose-close (PhO2-NC) can create positive inflation pressure (PIP) inside the pharyngeal space. This study measured and compared effects of PIP and images changes with four different SPI duration in the both pharyngeal and tracheal lumens.

Methods: A prospective study, 20 consecutive children aged between 6 months to 3 year-old, scheduled for elective flexible bronchoscopy (FB) were enrolled. In each children, SPI were performed with four different duration (0, 1, 3 and 5 seconds) sequentially for three times. A flexible endoscope of 4.0 mm OD with a 1.2 mm inner channel used for measurement. PIP levels and associated images were taken simultaneously for each SPI in both pharyngeal and tracheal lumens. Patient's demographic details, PIP levels, images changes and lumen expansion scores were collected and analyzed.

Results: A total 60 measurements were collected. The mean (SD) age and body weight were 12.0 (11.5) months and 7.8 (7.5) kg, respectively. The measured mean (SD) PIPs were 3.6 (2.1), 17.8 (3.7), 31.0 (7.9), 48.1 (14.3) cmH2O and 4.4 (2.0), 17.7 (4.4), 29.4 (6.89), 47.0 (16.2) cmH2O at SPI duration of 0, 1, 3 and 5 seconds in pharyngeal and tracheal lumen, respectively. PIP levels all showed significant ($p < 0.001$) positive correlation with SPI duration in both lumen. PIP levels in both pharynx and trachea were near identical ($p > 0.05$) at each SPI duration. At assigned locations, corresponding images displayed significant ($p < 0.05$) increase in lumen expansion scores and number of detected lesions with increase in SPI duration. The mean (SD) procedural time was 6.5 (1.7) minutes. No study related complication was noted.

Conclusions: FB using PhO2-NC as a SPI manner with duration of 0, 1, 3 and 5 seconds is a simple and valuable technique to provide PIP in both pharyngeal and tracheal lumens. These controllable PIP levels were enough to gradually expand both upper and lower airway lumen and improve FB performance in children.

35 Diagnosing Asthma by Impulse Oscillometry in Children less than 6 Years of Age
使用脈衝震盪盪肺功能來幫助診斷小於6歲之兒童有否氣喘

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Background: Impulse oscillometry (IOS), a kind of noninvasive PFT, can be considered an interesting integrative method in the assessment of children's lung function because it is a non-invasive and effort independent technique that only requires the patient's passive collaboration. It can be used as an adjunct method to the diagnosis of respiratory diseases, especially asthma. The aim of this study is to explore the use of impulse oscillometry in diagnosing asthma in young children and evaluating treatment response to montelukast.

Methods: Patients less than 6 years of age with suspecting asthma received IOS from October 1, 2019 to December 31, 2021 were prospectively enrolled into this study. Patients were grouped by asthma group and non-asthma group by history taking and fist time IOS results. Data of R5, R20, R5-R20, resonance frequency were collected, analyzed and compared between these 2 groups. Reduction of airflow resistance by more than 30% after bronchodilator use is defined positive findings in our study.

Results: A total of 59 patients with median age of 5 year (male to female 35:24) were included. All these patients had chronic cough and were suspected having asthma initially. After history taking and IOS examination, 46 patients are diagnosed having asthma and 13 patients are not. In asthma group, 95.6% (44/46) of their bronchodilator test are positive findings; while patients in non-asthma group, all their bronchodilator test are negative findings. The median airway resistance at 5 Hz (R5) was significantly higher in asthma group than non-asthma group (171 vs 120, $p < 0.01$). The median small airway resistance (R5-R20) is not significantly different between asthma group than non-asthma group (1.05 vs 0.88, p=0.672). Resonance frequency is also not significantly different between these 2 group.

Conclusions: Young children with suspicion of asthma should receive IOS, which is a useful tool in diagnosing asthma and monitoring lung function in young children.

36 Chest Sonographic Characteristics of Congenital Heart Diseases with Ventricular Septal Defect and Congestive Heart Failure
嬰兒先天性心臟病合併心室中隔缺損及心衰竭的肺部超音波特徵研究

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Background: Congenital heart disease (CHD) with ventricular septal defect (VSD) is often clinically presented with congestive heart failure(CHF) if with resulting large left to right shunt. The CHF of these infants often clinically is very similar to CHF related to CHF associated with myocardial dysfunction. The aim of this study is to evaluate the chest sonographic pattern among these patients.

Methods: This is a retrospective analysis. We identified Infants carrying the diagnosis of CHD with VSD. All of them had chest sonograms after completed echocardiograms. The infants with evidence of respiratory tract infections were excluded. The echocardiograms showing CHD with VSD were included. And their chest sonograms were reviewed. Their clinical status regarding CHF also was marked.

Results: A total of 31 infants were included. Among them, 19 had VSD and congestive heart failure (CHF), while 12 did not have CHF. Of the 19 infants with VSD and CHF, non had evidence of sonographic interstitial syndrome. All of them had scattered mild small pleural line retractions otherwise no obvious abnormalities were noticed. For the 12 VSD infants without clinical CHF, the chest sonograms also showed similar findings.

Conclusions: This study showed that for infants with VSD and CHF, VSD itself did not result in pulmonary edema, as shown on our chest sonographic findings. Pulmonary congestion (of the pulmonary artery rather than pulmonary edema pet sr) is the underlying pathophysiology. This is in contrast to the CHF induced by left ventricular dysfunction when pulmonary edema is the common association.

37 The Impact of Airway Anomalies on Pediatric Patients After Surgery for Congenital Heart Disease in a Tertiary Referral Center in Taiwan
呼吸道異常對台灣某醫學中心先天性心臟病手術術後兒童病人的影響

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Background: Congenital heart disease (CHD) are sometimes associated with various airway anomalies, which complicate the clinical course especially after surgeries and may lead to significant morbidity and even mortality. However, the incidence and impact of airway anomaly on CHD surgery patients remained unclear in our hospital. This study aimed to define its incidence, associations of airway anomaly and clinical factors as well as outcomes in pediatric patients after CHD surgery.

Methods: A retrospective cohort study was conducted by chart review of CHD surgery in our hospital from 2017 to 2019. Airway anomalies were identified by Flexible Fiberoptic Bronchoscopy (FFB) or computed tomography (CT) with time interval shorter than 180 days and grouped to structure (stenosis or tracheobronchus) or dynamic (malacia or paralysis) anomalies.

Results: A total of 686 pediatric patients receiving CHD surgery were enrolled with median age of 6.2 (interquartile range, IQR: 1.3-17.7) months. Eighty-two patients (12%) with median age of 3.9 months (IQR: 0.4-10.5) were diagnosed with airway anomalies , in whom 47 (57.3%) and 61 (74.4%) children were grouped into structure or dynamic anomalies, respectively. Airway anomalies tended to be identified in patients with genetic syndromes ($p < 0.002$) or receiving pre-operative intubation ($p < 0.001$). Multivariable logistic regression analysis showed airway anomalies were linked to prolonged intubated days > 14 days (odds ratio, OR: 3.6), ICU stay > 28 days (OR: 4.0), and ventilator use after discharge (OR: 4.8) with all p-value < 0.05.

Conclusions: Airway anomalies in pediatric patients after CHD surgeries are not rare and should be considered more in children with genetic syndrome or pre-operative unscheduled intubation. Worse clinical outcomes including prolonged intubation as well as ICU stay and ventilator use after discharge are linked with airway anomalies, highlighting that early recognition of coexistent airway anomalies may help planning the post-operative managements.

38 Characteristics and Correlation of Extracellular Vesicles Biomarkers Derived from 1st Trimester Maternal Urine in Regard to Preterm Birth
第一孕期孕婦尿液中胞外體組成與早產的相關性分析

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Background: Preterm birth is the leading cause of infant death and various pregnancy complications worldwide . Urinary EVs have gained important potential diagnostic biomarkers and contain several bioactive molecules. When reactive oxygen species production is in excess, oxidative damage to proteins, lipids, and DNA occurs, resulting in structural and functional cellular changes and inflammation. We fully studied differences and correlations among 8-hydroxy-2-deoxyguanosine (8-OHdG) as an damage of DNA biomarker, hexanoyl-lysine (HEL) as membrane oxidative biomarker and 29 cytokines in urine extracellular vesicles between 40 preterm and 40 full-term pregnant women in the early first trimester (~12 weeks of GA).

Methods: The 30 ml urine samples were collected from patients of premature birth with 2 groups: (1) spontaneous preterm birth at ≤ 37 weeks gestation (N = 40); and (2) full-term control group (N = 36 to 40). Urine derived extracellular vesicles from preterm relevance were isolated and measured with the concentration of 8-OHdG and HEL normalized to creatinine levels and particle number of EVs.

Results: We analyzed 8-OHdG, HEL and cytokine level of urine EVs derived from 1st trimester pregnant women. From the experiment results, we found that mean urinary 8-OHdG concentrations were 1320 pg/ml in preterm birth higher than those in normal term pregnancy at 860 pg/ml and significant difference ($p < 0.05$). The HEL concentration were 6.4 nmol/ml in preterm birth, which were higher than those in normal term pregnancy as 1.4 nmol/ml ($p < 0.05$). Positive correlations between 8-OHdG and HEL (r=0.23, p=0.21), and between 8-OHdG and IL-1α levels (r=0.486, p=0.032) were found.

Conclusions: The higher levels of 8-OHdG, HEL and proinflammatory cytokines were found in first trimester maternal urinary EVs of premature birth. The oxidative DNA damage levels were correlated to lipid peroxidation and IL-1α in the EVs derived from maternal urine, suggesting early

oxidative stress and inflammation are involved in preterm birth.

39 Extracellular Vesicles (EVs) Derived from Umbilical Cord Mesenchymal Stem Cells Promoted C2C12 Growth and Differentiation
臍帶間質幹細胞胞外體促進肌母細胞C2C12生長與分化

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Background: Extracellular vesicles (EVs) are lipid bilayer membrane vesicles, and represent an endogenous mechanism for intercellular communications. Any cell can release different types of EVs, including exosome (with diameter ranging from 50 to 150 nm), and microvesicle (with diameter ranging from 100 nm to 800 nm). The released EVs can be up-taken by recipient cells, and thereby resulted in delivering the contents of EVs for regeneration and anti- inflammation. We postulated and investigated that EVs derived from umbilical cord mesenshymal stem cells (EVs-ucMSCs) promoted C2C12cell growth and differentiation.
Methods: The ucMSCs harvested from umbilical cord were cultured in Petri dishes for passages. The ucMSC culture between passages 3 and 10 in low glucose DMEM was subject to isolation of EVs from the ucMSCs. The size of EVs is collected between 0.02 and 0.22 um cartridge and those below 0.02 um is defined as drop through. The contents of cytokines and growth factors were measured by a milliplex bead-array, and the growth and differentiation of myoblast cells, C2C12 cells, were assessed.
Results: We confirmed that EVs-ucMSC revealed size of 50-150 nm under electromicroscopy and expressed tetraspanins: CD81 and CD63 markers of EVs in flow cytometric analysis. While compared with the EVs harvested from urine, we found EVs-ucMSC promoted C2C12 cell growth significantly ($P < 0.05$) better than those harvested from urine. Growth factors: FGF2 and VEGF were significantly higher in EVs-ucMSC than those in urinary EVs ($P < 0.01$). We also found that EVs-ucMSC could rescued the impaired C2C12 cell differentiation induced by polycyclic aromatic hydrocarbon (PAH).
Conclusions: EVs-ucMSCs contain higher growth factors (such as FGF2 and VEGF) significantly, associated with promotion of myoblast cell growth, and differentiation, especially rescueing cell differentiation impaired by PAH. This study may be implicated in the treatment for regenerative medicine and pollution-induced tissue damage.

40 Immunomodulatory Effect with Lactobacillus Rhamnosus Nasal Spray on Airway Inflammation in Mouse Asthma Model
鼠李糖乳桿菌鼻噴霧劑對小鼠氣喘模型呼吸道炎症的免疫調節作用

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Background: Asthma, a heterogeneous inflammatory disorder of the airway, is a major public health issue. T helper 2 cells (Th2) responses are usually contributed to high levels of allergen-specific immunoglobulin E (IgE) and eosinophilia airway inflammation. The atopic allergic children in central Taiwan had higher sensitization ratio to HDMs than other indoor allergens, e.g. pet dander, cockroach, and fungi; and the major species of HDMs, including Dermatophagoides pteronyssinus (Der p), D. farina (Der f), D. microceras (Der m), and Blomia tropicalis (Blo t), could yield allergens to induce allergic immune responses and/or asthma. The purpose of this study is to investigate whether treat with Lactobacillus rhamnosus GG (LGG) by nasal spray could controlling airway inflammation in a murine model for allergic asthma in Der p2 sensitization mouse.
Methods: We used Der p 2-sensitized asthma model in female BALB/c mice with intraperitoneal Der p 2 sensitization on day 1, 2 and 3, and intranasal Der p 2 challenge on day 14, 17, 21, 24 and 27. The animals were treated with LGG by nasal spray in pre group during on day 1to 14 or in post group during on day 14 to 27. We also assessed the LGG appears in the nasal and gastrointestinal, airway hyperresponsiveness, serum specific-IgE/ IgG2a, infiltrating inflammatory cells in lung and cytokines in BALF.
Results: Compared to Der p2 sensitization group, per- and post- LGG groups were suppressing asthma symptoms such as AHR, high specific-IgE, high Th2 cytokines and infiltrating inflammatory cells by nasal spray similar with by oral fed.
Conclusions: LGG may improve in Der p2 sensitization mice could beneficial in the treatment of asthma and treat with LGG by nasal spray may be another way of administration.

41 **The Crosstalk of Aryl Hydrocarbon Receptor (AhR) Ligands-axis and Sphingosine-1-phosphate (S1P) Generation in Airway Inflammation: In-vitro and In-vivo Studies**

經由體外和體內的研究探討芳烴受體配體軸和1-磷酸鞘氨醇生成於呼氣道炎症的相互作用

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Background: Increasing oxidative stress response due, perhaps in part, to the exposure of environmental factors, a series of enzymatic processes increased Sphingolipid metabolism, such as S1P. However, the role of S1P in respiratory system is not completely elucidated, particularly that S1P's function seems to be controversial depending on the cell type and the S1PR expression profile.
Methods: We hypothesized that exposure to environmental PAH, generation of S1P in the lung may contribute to the increased airway inflammation in: i) we defined the S1P-S1PL axis in epithelial cells under stress condition as in the context of environmental PAH exposure, and ii) The in vivo functional correlates was tested in a mouse model of asthma. Bronchoalveolar lavage fluids (BALs) will be collected for cytokine as well as cellular content measurements. Lung sections will be assessed for inflammation.
Results: In vitro studies, results showed that reduction of S1PL activity was found in epithelial A549 cells treated with AhR ligands and such effect could be blocked by the AhR antagonist, CH223191. In contrast to wide-type S1PL, the C317A mutant was resistant to modification by oxidation in FICZ-treated cells. Consequently, the cells, A549, with C317A mutant showed decreased levels of intracellular S1P, but increased enzymatic activities. In addition to the inhibition of S1PL activity, we also found that the FICZ-induced S1P generation was significantly inhibited by a SPHK1 inhibitor, PF543 in A549 cells. Furthermore, after OVA sensitization and challenge with or without the exposure to a PAH in a asthma model, we found that the levels of total BALF cells and eosinophils appeared to be lower in mice with S1PL C317A knock-in .
Conclusions: We discovered that the AhR-ligand axis mediated increase in S1P level was due, at least in part, to the reduction in S1PL activity in epithelial cells. SGPL1C317A KI mice showed significantly lower levels of airway inflammation after sensitization and challenge with OVA and exposure to IP (PAH).

42 **Lactobacillus Rhamnosus Could Reduce the Dosage of Prednisolone in Mouse Asthma Model**

Lactobacillus rhamnosus可以減少氣喘小鼠使用prednisolone的劑量

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Background: Asthma is a complex multifactorial chronic airway inflammatory disease with diverse phenotypes and levels of severity. In a certain population of asthma patients, the symptoms cannot be well controlled with steroid. There has been long standing interest in the use of probiotics for treating allergic diseases. The purpose of this study is to investigate whether the combination of Lactobacillus rhamnosus GG (LGG) with prednisolone might reduce the dosage of glucocorticoid in controlling airway inflammation in a murine model for allergic asthma.
Methods: We used Der p 2-sensitized asthma model in female BALB/c mice. The animals were treated with 75μl or 50μl oral prednisolone or combination treatment of these two doses of oral prednisolone with LGG. We also assessed airway hyperresponsiveness, serum specific-IgE/ IgG1/ IgG2a, infiltrating inflammatory cells in lung and cytokines in BALF.
Results: Treated prednisolone with 50μl was less satisfactory in suppressing airway hyperresponsivess, serum IgE and IgG1, Th2 cytokines and inflammatory cytokines such as IL-6, IL-8 and IL-17 as well as infiltrating inflammatory cells than treated with 75μl prednisolone. However, combination of 50μl prednisolone and LGG has a similar effect of treated with 75μl prednisolone only that could decreased airway resistance, specific-IgE/IgG1, inhibited the production of IL-4, IL-5, IL-6, IL-8, IL-13 and IL-17, upregulated serum IgG2a and enhanced Th1 immune response.
Conclusions: LGG could reduce the dosage of prednisolone and thus might be beneficial in the treatment of asthma.

43 **Effects of Anti-asthmatic Medications on Arsenic-induced Epithelial-mesenchymal Transition and Reactive Oxygen Species Production in Human Bronchial Epithelial Cells**
氣喘藥物對砷經由誘發上皮細胞間質轉化及活性氧化物製造之效應

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Background: Corticosteroids, both inhaled and systemic usees, play critical roles in the management of asthma control and acute exacerbations. Montelukast is a cysteinyl leukotriene receptor (CysLT1R) antagonist, which was approved as an effective therapeutic agent for asthma as well as allergic rhinitis. Epithelial-mesenchymal transition (EMT) of airway lung epithelial cells is considered a major driver of fibrosis and airway remodeling. Arsenic exposure was well known to cause malignant transformation of cells, including the lung. Accumulating studies have shown that arsenic exposure is associated with chronic pulmonary diseases. However, the effects of clinical medications, including corticosteroids and CysLT1R antagonist on arsenic-caused pulmonary damage was less investigated.
Methods: By using normal human bronchial epithelial cells, the therapeutic effects of montelukast and fluticasone on sodium arsenite-induced epithelial-mesenchymal transition (EMT) changes were investigated. Arsenic-induced EMT and the involvement of reactive oxygen species production in human bronchial epithelial cells were evaluated by ELISA, western blotting, wound healing assay, transwell migration assay and confocal microscopy with immunoflourescence.
Results: Montelukast was effective on reducing cell migration and the expression of mesenchymal proteins induced by arsenic. On the contrary, fluticasone enhanced the arsenic-induced cell migration, and the extracellular matrix (ECM) protein expressions. Reactive oxygen species (ROS) production was induced by arsenic, which is reduced by pretreatment of montelukast and fluticasone, alone or in combination. Treatment of the ROS inhibitor, N-acetyl cysteine, reduced several mesenchymal protein expressions induced by arsenic, indicating ROS production is involved in arsenic-induced EMT. In addition, combined treatment of montelukast and fluticasone further reduced the ROS production and several mesenchymal protein expressions induced by arsenic.
Conclusions: This study provides therapeutic strategies and mechanisms for arsenic-induced pulmonary epithelial damages.

44 **Metabolomics Analysis of the Association between Vitamin D and Allergic Airway Diseases in Early Childhood**
代謝質體學分析維他命D和早期兒童呼吸道過敏疾病間的關係

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Background: Several studies have reported the relevance between serum vitamin D and allergic immunoglobulin E (IgE) responses and atopic diseases. However, a metabolomics-based approach to the impacts of vitamin D on allergic reactions remains unclear.
Methods: One hundred and eleven children originated from a birth cohort who measured vitamin D at age 3 ($\geq$ 30 ng/ml, n = 54; 20-29.9 ng/ml, n = 41; < 20 ng/ml, n = 16) were enrolled. Urinary metabolomic profiling was performed using 1H-Nuclear magnetic resonance (NMR) spectroscopy and partial least squares discriminant analysis (PLS-DA) was applied using MetaboAnalyst 5.0 platform. Metabolites associated with vitamin D and atopic diseases were correlated and analyzed for their role in functional metabolic pathways.
Results: By selecting variable importance in projection (VIP) > 1, vitamin D-associated 3-hydroxyisobutyric acid and glutamine were positively correlated with atopic disease-associated valine and tyrosine. By contrast, vitamin D-associated hippuric acid and 3-aminoisobutyric were negatively correlated with atopic disease-associated formic acid and threonine (P < 0.01). Absolute eosinophil count (AEC) was positively correlated with serum D. pteronyssinus- and D. farinae-specific IgE levels (P < 0.01) but negatively correlated with vitamin D level. By selecting P value < 0.05, asthma associated formic acid, a gut microbial-derived metabolite, was observed to be strongly correlated with hippuric acid related to vitamin D associated with AEC (P < 0.01).
Conclusions: Urinary metabolomics provides the molecular linkages that vitamin D associated gut microbial-derived metabolites and amino acid metabolism appear to take part in susceptibility to childhood rhinitis and asthma.

45 The Prenatal and Postnatal Effects of Air Pollution on Asthma in Children with Atopic Dermatitis
出生前後空氣污染影響異位性皮膚患者發生氣喘的效應

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Background: Air pollution is strongly associated with asthma, but has not been determined to induces development of new-onset asthma in children with atopic dermatitis (AD). This study aimed to assess whether prenatal/postnatal exposure to airborne particulate matter (PM) triggers development of new-onset asthma in children with AD.
Methods: Data of patients < age 18 years diagnosed with eczema or AD between 2009 and 2019 were extracted from the multicenter Kaohsiung Medical University Hospital Research Database. Each patient's address was used to confirm the location of the nearest Air Pollution Monitoring Station. The Ministry of Environment provided the levels of air pollutants in Kaohsiung from 13 monitoring stations around the city during the study period. Average levels of PM2.5, PM10, SO2, O3, CO, NO, NO2, NOx within one, three and five years before the index date, and three, six and nine months before patient's birth were recorded. Patients diagnosed as new-onset asthma were the case group and patients without asthma history were the control group. The average concentration of particulate matter (PM2.5, PM10), sulfur dioxide (SO2), ozone (O3), carbon monoxide (CO), nitric oxide (NO), nitric dioxide (NO2) and NOx for one, three and five years before the index date, and three, six and nine months prenatally were analyzed and further stratified by age, immunoglobulin (Ig) E and the percentage of eosinophil and eosinophil cationic protein (ECP).
Results: Postnatal exposure to PM2.5, PM10, SO2, O3, CO, NO, NO2 and NOx, and prenatal exposure to PM2.5, PM10, SO2, NO and NOx were significantly higher in the case group than in controls. Patients having IgE above 100 IU/mL and ECP less than 24 ng/mL were significantly influenced by postnatal exposure to PM2.5 and PM10, especially CO, to develop asthma, and those having an eosinophil count > 3% were significantly influenced by prenatal exposure to PM2.5, especially SO2, NO, and NO2.
Conclusions: Prenatal and postnatal exposure to air pollution both influence asthma development in AD patients.

46 Adolescent and Childhood Asthma Prevalence and Impact in Taipei: Global Asthma Network Survey
台北市青少年及兒童氣喘盛行率與影響：全球氣喘網絡調查

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Background: To investigate the current adolescent and childhood asthma prevalence and management in Taipei, Taiwan.
Methods: Global Asthma Network (GAN) survey, an international questionnaire survey of asthma, was completed by 13-14-year-old adolescents and parents of 6-7-year-old children at the end of 2017 in Taipei city. 25 elementary schools and 24 junior high schools were randomly enrolled. We also compared the asthma prevalence by the same questionnaire in 1995 and 2001. The impact of asthma was also analyzed.
Results: 6510 validated questionnaires (3474 from adolescents and 3036 from children) were analyzed. The prevalence of wheezing in the past 12 months in adolescents and children was 9.2% and 13.6% respectively, while the prevalence of physician-diagnosed asthma was 12.4% and 14.4%. Compared with the International Study of Asthma and Allergies in Childhood (ISAAC) data in 1995 and 2001, the prevalence of current wheezing, exercise-induced wheezing, and nocturnal cough were still increasing, whereas the prevalence of cases with severe asthma symptoms didn't increase rapidly. Asthma had a great impact on students' life. 23.5% of adolescents and 38.2% of children with an asthma attack in the past 12 months had school absenteeism, 36.8% of adolescents and 56.9% of children urgently needed to see a doctor, 25.7% of adolescents and 19.6% of children ever went to the emergency department, and 6.6% of adolescents and 5.8% of children ever admitted to hospital in the past 12 months.
Conclusions: Through the GAN survey, the prevalence and impact in Taipei were still high and increased compared with previous ISAAC phase 1 and phase 3 data.

47 **Correlation between Impulse Oscillometry Parameters and Test for Respiratory and Asthma Control in Kids (TRACK) in Asthma Control of Preschoolers with Asthma**

學齡前氣喘兒童之脈衝振盪儀的參數與兒童呼吸和哮喘控制測試（TRACK）間的關聯性

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Background: Assessing asthma control in preschool children is a great challenge for physicians, and hence alternative tools such as impulse oscillometry (IOS) and some tests have been developed for identifying patients with poorly controlled asthma. Some studies shows an association between spirometry and the childhood Asthma-Control Test (C-ACT). However, little research has been conducted to evaluate the correlation between IOS, C-ACT and test for respiratory and asthma control in kids (TRACK) and data of validity of TRACK in Taiwan are limited. Therefore, the purpose of this study is to compare between impulse oscillometry parameters and questionnaires of C-CAT and TRACK for assessing asthma control and to verify the validity and reliability of TRACK.

Methods: This retrospective follow-up study was conducted at China Medical University Hospital between September 1, 2019 and March 31, 2021. Children aged 1-6 had been diagnosed as asthma with acute exacerbation were enrolled and followed until the end of study. Data of IOS, spirometry, TRACK, C-ACT, and asthma-control medications were collected. Correlation among the different parameters of IOS and asthma control tests were assessed using Spearman's rank correlation coefficient.

Results: A total of 115 children presenting as asthma with acute exacerbation were recruited. Their mean age was 4 years(SD,1.2). In current study, the scores of TARCK and C-ACT are significantly correlated ($p < 0.001$). The R5-R20 in IOS of baseline, 12th month of follow-up, and the change of IOS parameters are significantly associated to C-ACT ($p=0.003, 0.015$, and 0.001, respectively). The changes of R5% and R5-R20 in IOS were associated with TRACK ($p= 0.04$ and 0.025, respectively). Sensitivity and specificity of TRACK were 80.8% (95% CI 67.5% to 90.4%) and 91.8 % (95% CI 81.9% to 97.3%), respectively, with cut-off point 80 and AUC 93.2%. After a year of treatment, the change of R5-R20 from baseline 0.64 ± 0.38 KPa/L/s to 12th month 0.48 ± 0.2 KPa/L/s showed statistical significance ($p=0.022$).

Conclusions: TRACK score appears higher association with IOS parameter than C-ACT score. Our findings indicate that TRACK is a validating tool to assess asthma control in preschool children.

48 **The Influence of Climate Changes on Pollen Allergy in Northern Taiwan**

氣候變遷對台灣北部地區花粉過敏的影響

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Background: Pollen allergy in Taiwan is not as common as Western countries, and there is limited data on native aeropalynological study. We aimed to evaluate the role of pollen allergy in Taiwan, and integrated the climate data for further evaluation.

Methods: We enrolled the patients who received multiple allergen simultaneous test (MAST, OPTIGEN®) in National Taiwan University Hospital from January 2014 to December 2020 with positive pollen-specific IgE. The climate data from Central Weather Bureau during this period were analyzed simultaneously. Pearson correlation and Spearman correlation were used for analysis, and data management was performed by SPSS Statistics 22.0 software.

Results: A total of 13873 patients who received MAST tests in the study period were enrolled, and 1095 out of 13873 patients (7.9%) had positive pollen-specific IgE with MAST level $\geq$ class 1 ($\geq$ 27 LUs). There are 8 pollen allergens in the MAST tests. The most common pollen allergen detected was Salix nigra (Black Willow), and most patients (around two thirds) had only one positive pollen-specific IgE. The sensitization of Morus alba (White Mulberry) and Salix nigra increased significantly by years ($r = 0.78$ and 0.824, respectively; $p = 0.038$ and 0.023, respectively). The sensitization of Morus alba and Salix nigra positively correlated with the mean temperature in winter ($rs = 0.964$ and 0.857, respectively; $p < 0.001$ and 0.014, respectively), and negatively correlated with the monthly rainfall in February, which is the month before the flowering months in spring ($rs = -0.893$ and -1.0, respectively; $p = 0.007$ and < 0.001, respectively).

Conclusions: The pollen allergy increased gradually in recent years in Taiwan detected by MAST tests, with the most common sensitization of Salix nigra. Warmer mean temperature in winter and less monthly rainfall in February were significantly correlated with the sensitization of Morus alba and Salix nigra during this period. It is suggested that climate changes might affect the trend of pollen allergy in Taiwan.

49 **Analysis of Fruit Sensitization Allergen Test Results Involving Patients with Allergic Diseases**
過敏疾病病人的水果過敏原分析

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Background: Fruit is a kind of plant food rich in nutrients and immune-regulating ingredients. A meta-analysis has demonstrated that fruits have a protective effect on asthma. On the other hand, clinical syndromes of allergic reactions to fruits manifest as oral allergy syndrome.
Methods: Data were extracted from the Chang Gung Research Database (CGRD) from 2015 to 2019. Fruit sensitization in children from Taiwan was evaluated using the presence of IgE antibodies against specific fruits.
Results: The overall prevalence of positive sIgE responses to fruit allergens in Taiwan, in order from highest, was pineapple (n=628, 10.6%), kiwi (n=696, 10.2%), banana (n=134, 10.1%), and papaya (n=64, 7.2%). Children aged 0–18 had a higher positive rate of pineapple (p=0.004), kiwi, banana, and papaya (p<0.001) than adults over the age of 18. Positive specific IgE for kiwi, banana, or papaya was more frequent in younger kids than in older children (all p<0.001) and in children with higher total IgE of both logarithmic (log) and arithmetic values (p<0.05 for pineapple, kiwi, banana, and papaya). The analysis of log IgE levels for pineapple positive vs. negative children determined an optimal cutoff value, 2.2, with both sensitivity (0.9) and specificity (0.5). Dermatitis/Asthma + dermatitis/dermatitis + rhinitis/asthma + dermatitis + rhinitis were significantly more prevalent in children with positive IgE for pineapple, kiwi, banana, and papaya than negative specific IgE.
Conclusions: This study highlighted a higher sensitivity rate of fruit allergen to pineapple, kiwi, banana, and papaya in children inhabiting the Taiwanese region rich in tropical fruits. Leading complications of hypersensitivity in children were dermatitis and dermatitis concurrent with asthma or rhinitis. Analysis of sIgE tests revealed that the sensitivity rates for fruits were higher in children than in adults. Further prospective or national health and nutrition examination survey studies are warranted to confirm our findings and identify any clinical relationships.

50 **The Pregnant and Neonatal Outcome of Maternal Systemic Lupus Erythematosus**
母親患有紅斑性狼瘡之懷孕預後以及新生兒預後分析

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Background: Systemic lupus erythematosus (SLE) is an autoimmune disease that affects many women of child-bearing age. SLE flare-ups may occur during pregnancy and the post-partum period. Previous studies documenting the incidence and risk factors of SLE flare-up during pregnancy and puerperium had partially discordant results. We aimed to delineate the pregnancy complications of women with SLE, as well as neonatal outcomes, and hoped to clarify the incidence and risk factors of SLE flare-ups during pregnancy and puerperium.
Methods: We retrospectively reviewed the medical records of SLE patients with previous records of pregnancies in our institution. Flare events during pregnancy and puerperium were documented. The pregnancy outcomes recorded include live births, intra-uterine fetal death (IUFD), premature delivery (< 36 weeks of gestational age), NICU admission, and small for gestational age (SGA, <10th percentile). Univariate logistic regression was performed to determine the factors associated with disease relapse and pregnancy outcomes.
Results: From January, 2000 to December, 2019, a total of 86 SLE patients with 128 pregnancies were identified. The overall live birth rate was 92.5% (124/134). Forty (32.3%) of the neonates were delivered prematurely. Forty-two (33.9%) of them were SGA. The admission rate to the neonatal intensive care unit was 25.7% (29/113). The flare rate during pregnancy was 32% while post-partum 16.4%. Low complement C4 and active disease status at conception, low serum albumin level at the first trimester, and infection during pregnancy were associated with antepartum flare. Comorbidity with hypertension, low complement C3 and serum albumin level and active disease status at conception, and presence of disease flare and pre-eclampsia in pregnancy were significantly associated with premature delivery.
Conclusions: Low complement C4 and active disease status at conception, low serum albumin level at the first trimester, and infection during pregnancy were associated with disease flare-up during pregnancy. Patients with relative low complement C3 and serum albumin level at conception, presence of eclampsia or disease flare-up during pregnancy had a higher risk of premature delivery.

51 **Neonatal Lupus Erythematosus: a 20-year Retrospective Study in a Tertiary Medical Center**
新生兒紅斑性狼瘡：一家醫學中心的20年回溯性研究

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Background: Neonatal lupus erythematosus(NLE) is an acquired autoimmune disease caused by transplacental passage of maternal antibodies against Ro and La autoantigens. Mothers of infants with NLE are either asymptomatic or diagnosed with autoimmune disease. The aim of this study is to analyze the epidemiology, symptoms and serology of NLE patients and their mothers in a tertiary medical center in Taiwan.
Methods: We conducted a retrospective study of NLE infants born to women with positive anti-Ro and/or anti-La antibodies and their symptoms of NLE appeared before six months of age in National Taiwan University Hospital between January 2000 and September 2021. Epidemiologic characteristics, clinical manifestations, and laboratory tests of both the patients and their mothers were analyzed.
Results: There were 28 patients (15 male babies) and 28 mothers enrolled. Cutaneous lesions, congenital heart block (CHB), cytopenia, and hepatobiliary manifestations were found in 53%, 60%, 25%, and 21% of cases, respectively. The mothers were diagnosed as SLE, Sjogren syndrome or asymptomatic (35%, 14%, and 50%, respectively). Ten out of 11 patients had complete heart block needing pacemaker implantation. In patients with cytopenia, one patient received steroid treatment while another one patient had human immunoglobulin combined with steroid therapy. Cytopenia in the remaining 5 patients improved spontaneously before 8 months of age. All patients with hepatobiliary manifestations were self-resolved also before 8 months of age. Among patients with CHB, 59% of them were born by asymptomatic mothers. There was no significant association between maternal age and patients with or without CHB. Maternal isolated presence of anti-Ro antibodies was positively correlated with CHB (p = 0.013) and the presence of both anti-Ro and anti-La antibodies was associated with cutaneous lesions (p = 0.01).
Conclusions: CHB associated with NLE was positively correlated with isolated maternal anti-Ro antibodies. However, more than half of these mothers were asymptomatic. Early detection and prevention of CHB in NLE remains the obstacle for prenatal treatment.

52 **The Correlation between Trajectories of Serum C3 Variability and Disease Remission of Pediatric SLE Patient**
血清C3之群組化彈道分析與小兒SLE疾病緩解之相關性

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Background: We have demonstrated there were 9.1% of pediatric SLE (pSLE) patients had clinical remission and seroversion(SV); and 31.3% can ever discontinue systemic corticosteroid (SCS) use. The aim of this study is to investigate the usefulness of 2-year trajectories of C3 variability (TJs) in predicting clinical remission in pSLE.
Methods: We recruited confirmed pSLE patients from electronic database of our hospital. They all had SCS use. 189 patients were available for TJs. We divided them to group A: clinical and serology remission, took no drug or only hydroxychloroquine (HCQ); B: clinical remission, took HCQ and other drugs, but no SCS; and C: other patients. We used the Group-Based Trajectory modeling to divide different groups with similar longitudinal Syb value and to investigate the association between different TJs and clinic outcome.The software was PROC TRAJ in SAS. Based on Bayesian information criteria, we checked different third-order cubic and the reduced model, and got the final parsimonious model to do the analysis. Then we did Chi-square test to check the TJs in group A, B, C. T-test was used to do inter-group comparisons. The p value less than 0.05 is considered to be significant.
Results: The number (%) in group A, B, C were 25(13.2%), 83 (43.9%) and 81(42.9%). The distribution of group A, B, C in these 4 TJs showed significant difference p=0.005. The paired comparisons in these 4 TJs showed difference between A, B (p=0.002) and A, C (p<0.001). Initial C3 and C4 levels in these 4 TJs showed significant differences (all p≦0.001 & p≦0.016). Besides, the % of persistent anti-dsDNA was higher in TJ 1 than TJ 3/4 (p<0.05). We also investigated the association of group ABC with other markers. As to the lowest C4 level, there were differences between these groups (all p ≦ 0.029). In the lowest white cell counts, the comparisons of group A, C showed difference (p=0.018).
Conclusions: From the present study, we find 4 different C3 TJs in pSLE patients. The distribution of clinical outcome groups, as well as initial C3, C4, percent of persistent anti-dsDNA, and lowest WBC are different.

53 **The Association of Anti-RNP Antibodies with Clinical Manifestations in Childhood-Onset Systemic Lupus Erythematosus**

抗RNP抗體與兒童紅斑性狼瘡臨床表現之關聯

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Background: Anti- RNP autoantibodies most commonly occur in the patients with mixed connective tissue disease (MTCD) and systemic lupus erythematosus cases. However, the impact of anti-RNP autoantibodies on clinical characteristics of childhood-onset systemic lupus erythematosus(cSLE) patients is still lacking.

Methods: We conducted a retrospective single-center cohort study. The clinical features and laboratory data of childhood-onset SLE patients diagnosed between 2012 to 2019 were collected. Anti-RNP antibodies were measured by enzyme-linked immunosorbent assay (ELISA).

Results: A total of 66 cSLE patients were enrolled and 35 of them (53.0%) ever had positive anti-RNP antibodies. Among the 35 patients, 25 (75.8%) had positive anti-RNP antibodies at diagnosis, and 5 patients (14.3%) developed transient positive anti-RNP antibodies during follow-up. Compared to cSLE patients without anti-RNP antibodies, those with anti-RNP antibodies had a significantly higher ratio of arthritis (80% vs. 42%,p=0.001) and Raynaud's phenomenon (RP) (33%vs 8%, p=0.03). Anti-RNP antibodies were also associated with the presence of other autoantibodies: anti-Sm (66% vs. 32%, $p < 0.001$) and anti-Ro/SSA (83% vs. 45%,p=0.001), whose ratio were significantly higher in patients with anti-RNP antibodies.

Conclusions: Our results suggested an association of anti-RNP antibodies with musculoskeletal and vascular symptoms in cSLE. Further clarification on the role of this autoantibody in the clinical application needs more studies to be validated.

54 **Characteristics of Patients with Pulmonary Arterial Hypertension in Childhood Onset Systemic Lupus Erythematosus**

探討肺動脈高壓在兒童期發病紅斑性狼瘡之特色

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Background: Systemic lupus erythematosus (SLE) is a systemic autoimmune disease with potential extensive organ involvement. Pulmonary arterial hypertension (PAH) is a severe and life-threatening complication of SLE. Considering the patient characteristics of PAH among childhood onset SLE have not been well described, we aim to investigate the clinical, laboratorial, and therapeutic profiles among childhood onset SLE patients with and without PAH.

Methods: In this cross-sectional study, childhood onset SLE patients diagnosed between 1996 to 2021 were recruited. Patients' demographic data, disease characteristics, laboratory values and therapeutic regimens were carefully reviewed. SLE disease activity was scored according to the SLE Disease Activity Index-2K. Endothelial cell damaging markers including angiopoietin-1, angiopoietin-2, angiopoietin receptor (Tie2), vascular endothelial growth factor, thrombomodulin and a disintegrin and metalloprotease with thrombospondin type 1 motif 13 in patient serum were measured utilizing enzyme-linked immunosorbent assay. PAH was determined based on two-dimensional transthoracic echocardiography.

Results: A total of 97 childhood onset SLE patients were enrolled. Among them, 34 cases (35.1%) were diagnosed with PAH and 63 cases (64.9%) without. The mean age of patients at recruitment was 27.0±7.0 and 26.8±7.3 year-old and the mean age of SLE diagnosis was 12.7±3.2 and 12.8±3.1 year-old for those with and without PAH. Patients' disease activity at time of investigation was 4.9±3.6 and 4.9±3.3 for those with and without PAH, respectively. Dyslipidemia was significantly more commonly found in childhood onset SLE patients with PAH (85.3%) than those without PAH (66.7%) (p=0.048). The maximal velocity of main pulmonary artery was significantly higher in patients with PAH than those without PAH (p=0.016). Levels of Tie2 were more elevated in those with PAH(16.1±6.0pg/mL) than those without (14.4±3.5pg/mL) (p=0.009).

Conclusions: Elevation of serum endothelial cell damaging marker Tie2 and dyslipidemia are associated with PAH in childhood onset SLE. Echocardiography for PAH evaluation is recommended for patients with PAH associated characteristics among childhood onset SLE.

55 **Clinical Characteristics and Outcomes of Hemophagocytic Lymphohistiocytosis and Macrophage Activation Syndrome in Children**
兒童噬血症候群之臨床分析及探討

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Background: Hemophagocytic lymphohistiocytosis (HLH) is a syndrome characterized by immune overstimulation due to cytotoxicity defects of NK and CD8+ T cells with subsequent macrophage hyperactivation, cytokine storms, and hemophagocytosis. Patients develop multi-system involvement with a high mortality rate. The causes of HLH are heterogeneous. Primary HLH has been found to be caused by genetic mutations associated with cytotoxicity, inflammation, or Epstein-Barr virus susceptibility. Secondary HLH could be triggered by infections, malignancy, or autoimmune diseases/systemic autoinflammatory disorders (also known as macrophage activation syndrome, MAS).
Methods: We retrospectively reviewed medical records of patients younger than 20 years old with physician-diagnosed HLH or MAS at National Taiwan University Children's Hospital from 2005 to 2021. At least 4 out of 8 HLH-2004 diagnostic criteria were required for the diagnosis of HLH. The clinical, laboratory features, treatment, and outcomes in patients with HLH or MAS were analyzed.
Results: Forty-eight patients (67% female) with HLH or MAS were included. The median age of diagnosis for all patients with HLH/MAS and for patients with primary HLH was 7.6 (IQR 3.6-13.8) and 5.1 (IQR 4.5-13.7) years old, respectively. The etiologies included infection-associated hemophagocytic syndrome (IAHS) (41.7%), rheumatic diseases-associated MAS (39.6%), primary or genetic HLH (8.3%), malignancy-associated HLH (6.3%), and idiopathic (4.2%). The overall mortality rate of HLH/MAS was 29.2%, and the mortality rate was 75.0% for primary HLH, 66.7% for malignancy-associated HLH, 31.6% for MAS, 15.0% for IAHS, and 0% for idiopathic HLH. One male patient with X-linked lymphoproliferative syndrome type 2, recurrent HLH, and XIAP gene mutation received hematopoietic stem cell transplantation successfully.
Conclusions: Despite aggressive treatment, the mortality rate was still very high in patients with HLH/MAS. Early diagnosis of HLH/MAS and identification for underlying causes were essential for precision treatment and better outcomes.

56 **Clinical Phenotypes and Immunological Defects in Patients with DiGeorge Syndrome**
迪喬氏症候群之臨床與免疫學特徵

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Background: DiGeorge syndrome (DGS) is the most common microdeletion syndrome in humans, and it can present with highly variable clinical manifestations. Immune deficiencies occur as a result of thymic hypoplasia.
Methods: We identified patients who fulfilled the clinical diagnostic criteria for DGS and were admitted to National Taiwan University Children's Hospital from 2000 to 2021 by retrospective chart review. We analyzed the association between immunological abnormalities and age and outcomes.
Results: Eighty-seven patients (male 57.5%) with DGS had median diagnostic age of 1.78 (IQR 0.76-12.25) months. Genetic diagnosis included chromosome 22q11.2 deletion (97.7%) and 10p deletion (1.1%). Patients presented as congenital heart diseases (85.1%), infections (75.9%), developmental delay (60.9%), short stature (58.6%), neuropsychiatric problems (52.9%), language problem (47.1%), gastrointestinal disorders (37.9%), hypoparathyroidism (20.7%), genitourinary tract diseases (19.5%), neonatal seizure (14.9%), autoimmunity (12.6%), and allergic diseases (8.1%). Immunological abnormalities included thymic hypoplasia/aplasia (52.9%), lymphopenia (92.0%), T lymphopenia (62.5%), naïve CD4+ T lymphopenia (65.1%), and decreased T cells proliferation response (34.2%). Severe lymphopenia improved with age: 43/77 (55.8%) for patients with age 0 to 2, 14/50 (28%) for patients with age 3 to 17, and 3/12 (25%) for patients with age of 18 and older. Hypocalcemia due to hypoparathyroidism persisted till adulthood in 14.9% of patients with active vitamin D3 treatment. Intravenous immunoglobulin was given in 9.2% of patients due to hypogammaglobulinemia combined with infections. Two patients (2.3%) with complete DGS were successfully treated with hematopoietic stem cell transplantation at a median age of 3.5 months. The death rate was 13.8% in a median follow-up of 6.9 years. The estimated overall survival probabilities were 77.0% at 35 years of age.
Conclusions: Multisystem involvement in DGS is associated with life-long clinical issues. Comprehensive approach and multidisciplinary care are essential for the survival and quality of life of patients with DGS.

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The Effects of Biological Disease-modifying Anti-rheumatic Drugs on Malignancies Development in Patients with Juvenile Idiopathic Arthritis: a Meta-analysis

使用生物製劑對幼年特發性關節炎患者發生惡性腫瘤之統合性分析研究

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Background: Juvenile idiopathic arthritis (JIA) is the most common arthritis in children. Traditional disease-modifying anti-rheumatic drugs (DMARDs) (e.g., methotrexate) were considered the first-line therapy of JIA. Biological DMARDs (bDMARDs), such as TNF inhibitors, were JIA's subsequent therapies. The bDMARDs with lower using frequency and higher efficacy than DMARDs. It has been reported that bDMARDs might be associated with the increased occurrence of malignancies. Previous studies about the cancer risk in JIA patients treated with bDMARDs are limited due to the small patient population. This study aimed to analyze the evidence regarding the effects of bDMARDs on malignancies development in JIA patients.

Methods: A systematic search of Pubmed, Embase, and the Cochrane Central Register of Controlled Trials was conducted through July 12, 2021. The studies were included if they met the following criteria: (1) JIA patients, (2) comparison between bDMARDs users and non-bDMARDs users, (3) results for incidence of malignancies, (4) a cohort or randomized controlled trial. The quality of observational studies and randomized control trials was assessed by the Newcastle Ottawa scale and Cochrane's Risk of Bias Assessment Tool (ROB 2.0). The outcomes were the incidence of any malignancies, which were performed by incidence ratio (OR) and 95% confidence intervals (CI). RevMan (Cochrane Collaboration), version 5.4, and the random-effects model compared the endpoints, heterogeneity, and bias.

Results: Seven cohort studies and one randomized controlled trial involving 48,561 patients were included. The incidence of malignancies was 35 events in bDMARDs group and 24 events in non-bDMARDs group (OR, 1.55 [95% CI, 0.88 to 2.72], p = 0.13). The risks of solid tumors (OR, 1.97 [95% CI, 0.54 to 7.23], p = 0.31) and hematologic malignancies (OR, 0.79 [95% CI, 0.33 to 1.89], p = 0.59) were not statistical difference.

Conclusions: The risk of malignant development is not significantly different between bDMARDs and non-bDMARDs in JIA patients. Further high-quality studies are still required to investigate the association of using time of bDMARDs and cancer risks.

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Number of Kawasaki Disease Admissions are Associated with Number of Domestic COVID-19 and Severe Enterovirus Case Numbers in Taiwan

川崎症住院人數與本土新冠肺炎人數與腸病毒人數有關

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Background: Non-pharmaceutical interventions (NPIs) introduced in response to the COVID-19 pandemic including mask-wearing and social distancing has changed the prevalence of circulating viruses in the community. Because viral infections are a potential inciting factor for the development of Kawasaki Disease (KD), we examined the relationship between KD admission rates, number of COVID-19, severe influenza, severe enterovirus infections before and after the COVID-19 pandemic.

Methods: A retrospective study was conducted using data obtained from the Chang Gung Research Database (including seven Taiwanese hospitals and more than 10,000 beds) and the Centers of Disease of Control in Taiwan from January 2018 to December 2020. We recorded the number of KD admissions, and COVID-19, severe influenza and severe enterovirus infections.

Results: Number of KD admissions, severe enterovirus infection and severe influenza infections were significantly lower from April to September of 2020. Number of KD hospitalizations was positively correlated with the number of domestic COVID-19 cases (p = 0.040) and severe enterovirus infections (p = 0.008).

Conclusions: Our findings provide further evidence that viral infections may be an important inciting factor in the development of KD. NPIs may not only prevent the transmissible viral infections in children, but also decrease the risk of KD.

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Characteristics of Specific Immunoglobulin E in Children with Kawasaki Disease

特異性免疫球蛋白E在川崎症兒童中的特徵

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Background: Patients with Kawasaki disease (KD) are at a significantly increased risk of allergic diseases. Immunoglobulin E (IgE) is mediating allergic sensitization to various allergens and related to allergic diseases. However, few studies have analyzed specific IgE on allergy biomarkers after KD is diagnosed. Therefore, this study aimed to investigate the pattern of specific IgE levels against food and inhalant allergens.

Methods: This retrospective study was conducted in Taiwan

to identify patients admitted with KD. A subset of 453 admitted KD children younger than or equal to five years of age with IVIG were followed up at our clinic with available specific IgE data.

Results: The three most common allergens were Dermatophagoides farina or pteronyssinus, house-dust, and Cockroach mix. Positive specific IgE for Dermatophagoides farina or pteronyssinus was less common in children diagnosed with KD who were two years old or younger (p=0.028). KD patients with higher basophils before IVIG (p=0.005 and 0.009 for two different mites) or higher C-reactive protein (CRP, p=0.015 and 0.014) after IVIG were at higher risks of mite sensitization. Integraged mite sensitization demonstrated higher basophils before IVIG and higher CRP after IVIG clinically meaningful after logistic regression models adjusted for age and gender.

Conclusions: This study is the first to suggest that specific IgE in KD patients may be correlated with age at KD diagnosis, as well as such inflammatory and allergic parameters as CRP, and basophils. Further longitudinal prospective studies are warranted to clarify the unique profile of specific IgE in KD patients.

60 Study the Kawasaki Disease with Hepatobiliary Involvement in Children
對於川崎病在兒童肝臟膽道合併症的研究

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Background: Kawasaki disease (KD) is a febrile multisystem vasculitis mainly affecting children younger than 5 years. It was also called mucocutaneous lymph node syndrome. KD typically manifests as skin lesions and in the lymph nodes and oral and conjunctival mucosa. It may induce coronary artery abnormalities, such as aneurysms. However, hepatobiliary involvement is not common presentation in KD.

Methods: We review 33 cases of patients with a diagnosis of KD with hepatobiliary involvement between 2000 and 2021. The mean age of the pediatric patients in the reports was 5.26 years. There were 73% and 27% patients presenting with classical and incomplete KD, respectively.

Results: In these 33 patients, in addition to the classical clinical findings of KD, the most common clinical presentations were jaundice and abdominal pain. Moreover, abnormal laboratory results indicating hyperbilirubinemia, cholestasis, and hepatitis, among other conditions were noted. Cardiac involvement was also noted in a high proportion of these children. Furthermore, abdominal ultrasonography revealed abnormal findings for half of the children with KD and hepatobiliary involvement. The 33 patients were all prescribed IVIG and oral acetylsalicylic acid when KD was diagnosed. Fever subsidence was noted for all these patients, and rapid regression of jaundice was noted in 96% of these

patients after treatment. Despite the diverse abdominal ultrasonography results, only one of the patients had autoimmune sclerosing cholangitis after IVIG treatment; the others all had negative abdominal ultrasonography results after follow-up.

Conclusions: KD with hepatobiliary involvement should be taken into consideration when pediatric patients present with prolonged fever combined with abdominal pain and jaundice. Early treatment with IVIG and aspirin is recommended and can effectively relieve symptoms of KD with hepatobiliary involvement.

61 T Helper Cell Differentiation in Response to Different SARS-Cov-2 Vaccines in Vitro Tests
不同SARS-CoV-2疫苗體外誘導不同T細胞免疫反應研究

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Background: Background: T helper cells have essential roles in defense mechanism against viral infections, and in the vaccine efficacy as well. The mRNA, adenoviral vector, and inactivated whole-virus vaccines of SARS-CoV-2 are now in widespread use parallel. According to the fundamental differences of SARS-CoV-2 vaccines, we compared the T helper type 1 (Th1), Th2, Th17 and Treg differentiation toward different vaccines in in vitro using leukocytes of peripheral blood.

Methods: Methods: The heparinized blood samples (16 ml) were collected from healthy donors with and without Covid-19 vaccination. Peripheral blood mononuclear cells (PBMCs) were isolated by Ficoll-Paque centrifugation. Cells (1×10^6/ml) were stimulated with different vaccines (vehicle, aluminum hydroxide, AZ or Moderna) at final concentrations of 2 ug/ml and incubated for 1 and 6 days before immunological analyses of T cell differentiation as measured by flow cytometric analyses of surface markers presenting Th1 with CD183, Th2 with CD194, Th17 with CD194/CD196 and Treg with CD25CD127low. The transcription factors T-bet, Gata-3, RoRrt, and Foxp3 respectively present Th1, Th2, Th17 and Treg.

Results: Results: This study showed that AZ (ChAdOx1) induced prominent Th1 polarization as showing the highest T-bet transcription factor expression (P < 0.05) while compared to those induced by vehicle, aluminum, or Moderna vaccine. As previously known that aluminum induced the highest polarization toward Th2 reaction as showing Gata-3 expression. In contrast, Moderna vaccine induced a higher Th17 polarization than AZ as presented by RORrT expression (P < 0.05). AZ vaccine induced a higher Treg polarization than Moderna as presented by Foxp3 expression (P < 0.05).

Conclusions: Conclusion: Taken together, these results suggest that different SARS-CoV-2 vaccines induced varied T cell polarization, showing a prominent Th1 response for AZ

vaccine and a higher Th17 polarization for Moderna vaccine. This may be compatible to the clinical manifestations of different SARS-CoV-2 vaccines in which AZ induced a higher T cell immunity (Th1) but lower antibody response (Th2), and Moderna induced a higher early local reaction (Th17).

62 ChAdOx1 Vaccine Induced NETosis Varied in Non-Immune and Immune Donors in Vitro Test
新冠肺炎病毒疫苗阿斯特捷利康誘發疫苗注射前後嗜中性白血球NETosis差異研究

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Background: ChAdOx1vaccine (AstraZeneca, AZ) is a well-known COVID-19 vaccine which is applied in the worldwide for immune protection. The side effect was also investigated in the vaccinated populations, like nausea, fever, headache, and thrombosis which might be associated with the neutrophil extracellular traps (NETs) of immune system interaction. NETosis is a defense mechanism of innate immune system, associated with decondensation of chromosome and rupture of the plasma membrane. In this study, we focus on the innate immune reaction of NETosis after exposed to ChAdOx1 vaccine.
Methods: ChAdOx1 vaccine particles are detected by NanoSight Nanoparticle Tracking Analysis (NTA) showing $7.44*10^9$/ mL. The neutrophils from blood are collected by Ficoll separation with purity $>95\%$. Several antioxidants are used to pretreat neutrophils, followed with stimulation for NETs formation by 4 ⌈g AZ for 16 hours. To clarify the mechanism of AZ induced NETosis by reactive oxygen species (ROS), neutrophils were pretreated by 20 ⌈m NADPH oxidase inhibitor diphenylene iodonium (DPI), 1 ⌈m colchicine and 10 ⌈m antibiotic minocycline (Mino) for 30 minutes before stimulation.
Results: Results show that the SYTOX Green DNA labeling NETosis cells were much higher in 2 shots population than naive ones ($p< 0.05$). The DPI, colchicine, or minocycline pretreated neutrophils reduced the ROS mean fluorescence intensity (MFI) compared to untreated samples stained, but the NETosis only reduced by DPI pretreatment. The SYTOX Green DNA labeling showed the minocycline pretreated neutrophils stimulated by AZ induced higher NETosis release (Mino: Mino+ AZ= $22\pm 1\%$: $57\pm 6.3\%$; $p< 0.05$).
Conclusions: AZ vaccine induced NETosis was significantly higher in 2 shots population than naive ones, which might be related to immune dependent enhancement. The DPI significantly reduced the AZ induced NETosis, while the minocycline promoted the AZ induced NETosis, suggesting AZ vaccine may trigger neutrophil NETosis depending on individual conditions or drug interaction. The mechanism shall be conformed in further experiments.

63 Rare Side-effect Cases of BNT 162b2 mRNA COVID-19 Vaccine: A Children's Hospital-based Study
BNT疫苗的罕見副作用病例：基於兒童醫院的研究

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Background: Many kinds of COVID-19 vaccines were developed these 2 years. We focused on the complications after receiving BNT-162b2 vaccine. Injection site reaction, fatigue, headache, and myalgia were common side effects. Myocarditis and pericarditis following receipt of the BNT162b2 COVID-19 vaccine were rare but well-known complications. However, some potential complications might still remain unknown.
Methods: We collected cases who developed very rare complications after receiving BNT-162b2 COVID-19 vaccine, and discuss about the possible relationships between the complications and BNT-162b2 COVID-19 vaccination.
Results: We collected cases who developed very rare complications after receiving BNT162b2 COVID-19 vaccine, and discuss about the possible relationships between the complications and BNT162b2 COVID-19 vaccination. Results The first case was a 17-years-old boy suffered from fever 40C after receiving the BNT-162b2 vaccine for 1 day. Neck computed tomography revealed multiple enlarged lymph nodes on the right level II to III suspect necrotizing lymphadenitis. Excision of right neck lymph nodes and the pathological report revealed diagnosis of Kikuchi disease. The second case was a 16-years-old boy suffered from fever after receiving the BNT-162b2 vaccine for 1 day. Blood survey showed elevated antinuclear antibodies titer and positive result of anti-dsDNA antibody. Ultrasound guided renal biopsy and the pathological report revealed diagnosis of lupus nephritis, class II. The third case was a 18-years-old girl suffered from fever 39 degree Celsius after receiving the BNT-162b2 vaccine for 1 day. Physical examination showed enlarged tonsil with pus coating and injected pharynx. The fourth case was a 16-years-old girl received the BNT162b2 vaccine on 1 October 2021 (Day 1). She suffered from chest tightness on Day 1, 4 and 21. Psychogenic seizure or suspected unspecific seizure post the BNT162b2 vaccine was diagnosed.
Conclusions: Some rare complications after receiving the BNT162b2 COVID-19 vaccine still unknown. Although it is not easy to clarify to relationship between the vaccination and the complications, epidemiology and case collection might be helpful.

64 **Early Differentiation between Salmonella Sepsis and Pseudomonas Sepsis in Infant**

早期分變嬰兒沙門氏菌敗血症和綠膿桿菌敗血症

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Background: Both of Salmonella sepsis (SS) and Pseudomonas sepsis (PS) in infant often present as fever with greenish diarrhea. PS progresses more aggressive and causes higher mortality than SS. SS is usually treated with ceftriaxone but ceftriaxone can't kill pseudomonas. Giving correct antibiotic timely can improve outcome. This study would like to help clinicians early differentiate these two diseases.

Methods: We retrospectively reviewed the medical records of patients who had blood culture proven Salmonella/Pseudomonas sepsis. The patients of prematurity, immunodeficiency, receiving chemotherapy and age older than one year old were excluded. The data of initial admission and ICU admission were analyzed to identify the difference between SS and PS.

Results: Between May, 2004 and June, 2018, a total of 78 infants were enrolled (61 were SS group and 17 were PS group). There were no difference in age(7.93 ± 2.67 vs. 6.7 ± 2.26, p= 0.261) and body weight(7.93 ± 1.59 vs. 7.88 ± 1.32, p= 0.419) between SS and PS. PS group had higher rate of initial ICU admission(n= 9 vs. 1, $p < 0.001$), respiratory distress(n= 14 vs. 6, $p < 0.001$), pleural effusion(n= 6 vs. 0, $p < 0.001$), intubation(n= 7 vs. 1, $p < 0.001$), neutropenia(n= 10 vs. 4, $p < 0.001$) and mortality(n= 4 vs. 1, p=0.001). Regarding the initial laboratory data, PS group had lower WBC(4568.8 ± 5652.1 vs. 11315.3 ± 4096.5, p <0.001), ANC(2339.3 ± 3641.6 vs. 4876.4 ± 2991.0, p = 0.005), Hb(9.7 ± 1.30 vs. 11.4 ± 0.99, p <0.001), Platelet($157.2 \pm 106.5 \times 10^3$ vs. $274.1 \pm 101.6 \times 10^3$, p <0.001) but higher band form percentage(3.38 ± 4.34 % vs. 0.77 ± 1.73%, p =0.001) and CRP(214.3 ± 122.2 vs. 42.3 ± 61.0, p <0.001). Furthermore, using binary logistic regression, platelet count and CRP were independent factors between two groups. The cutoff values estimated by Youden's index was 177.5K sensitivity 91.5%, specificity 81.3%) in platelet count and 71.85(sensitivity 87.5%, specificity 88.1%) in CRP, respectively.

Conclusions: PS had higher ICU admission rate and mortality. It is critical to differentiate PS from SS as early as possible to improve outcomes. Platelet counts less than 177.5K and CRP higher than 71.85 were cutoff value in predicting PS.

65 **Trends in Pediatric In-Hospital Cardiac Arrests in a Medical Center in Taiwan**

兒童院內心跳停止案例分析─單一醫學中心10年經驗

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Background: Pediatric in-hospital cardiac arrest (IHCA) is a catastrophic event for patients and the family, and is associated with a high mortality rate. The aim of this study was to assess the trends in outcomes of pediatric IHCA in a tertiary medical center in Taiwan.

Methods: We evaluated IHCA patients younger than 18 years of age and received at least 1 minute of chest compression. Data were retrieved retrospectively from 2008 to 2018 from our web-based registry system. The primary outcome of the study was survival to hospital discharge, and the secondary outcome was sustained return of spontaneous circulation (ROSC). A multivariable logistic regression was performed to identify factors associated with survival.

Results: We identified 338 patients and the mean age of patients with IHCA is 3.8 years. 269 (79.6%) reached sustained ROSC; survival to hospital discharge rate was 42%. 130 (38.5%) patients were ever supported with extracorporeal membrane oxygenation (ECMO). Comparing the last 3 years (2016-2018) with the previous 8 years (2008-2015), there were less IHCA episodes (23.8 versus 35.1 events per year), less hematology/ oncology patients (5.3% versus 12.8%), and a higher rate of survival to discharge (56.1% versus 39.1%). We further analyzed 151 patients who had IHCA during Jan. 2013 to Apr. 2018. IHCA during off-work hours resulted in a trend of less survival to discharge (23.3% versus 58.3%). Non-survivors have longer CPR duration (22.3 versus 15.6 minutes), more ventilator use before arrest (60.9% versus 32.9%) and more vasoactive drug infusion prior to the arrest (27.3% versus 19%).

Conclusions: For pediatric IHCA, survival rate to discharge has improved from 2008 to 2018. Longer CPR duration, ventilator support or vasoactive drug infusion prior to the arrest, was associated with lower survival rate to discharge. The concept of palliative care is gradually accepted by families of terminally ill patients. As cardiac arrest might be a signal of terminal chronic illness, a timely discussion of do-not-resuscitate status after cardiac arrest might help families prioritize quality of end-of-life care.

66 Remotely/Tele Supervised Echocardiography—Initial Experience
遠方指導的心臟超音波的推展經驗

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Background: Congenital/structural heart disease is getting more and more attention throughout the whole society. However, sometimes pediatric cardiologists are not easily available. Thus echocardiography remotely/Tele supervised would be attractive. At our 1st stage, we will test the applicability of remotely/Tele supervised echocardiography between a senior mentor and a junior pediatric cardiologist.
Methods: Between Jan 1 and Dec 31, 2021, we arranged a remote/Tele supervision echocardiography between a senior mentor and a junior pediatric cardiologist. On-site echocardiography, while supervised remotely /Tele by a senior mentor if the onsite pediatric cardiologist feels uncomfortable for the situation encountered. The experience was analyzed.
Results: During the study period, totally there were 572 echocardiograms performed. We encountered 32 occasions undergoing remotely/Tele supervised echocardiography. The patients' age ranged between fetus and 56 y-o. The primary classification of anatomical-functional abnormalities included: Fetal: arch1,,PR1,LSVC1,Kawasaki Disease/coronary artery status status:10,Pericardial effusion :1,DCRV:1,COA:1,HCM:1, Post-CHD op care:1,Interventions guiding:5, PAH:3, Hemangioma:1, TF/PR:2,AS/AR:2. ALL supervision resulted in better echocardiographic performance.
Conclusions: In our experience, remotely/Tele supervised echocardiography may provide quick/immediate supervision for on-site primary echocardiographic practitioners. Our study provides a sound basis for Its extension to broader clinical application and is especially useful for remote regions where experienced pediatric cardiologists or even pediatric cardiologists are often not readily accessible.

67 Pediatric Intensive Care Unit Design and Mortality
兒童加護病房設計與死亡風險

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Background: Pediatric Intensive Care Unit (PICU) is a highly complex patient care environment where the architectural design may affect patient's safety and care; however, it is unknown that weather mortality might be affected by PICU design. This study compare mortality among patients assigned to PICU room with easily visibility and accessibility from the central nursing station to those patients in less visible room.
Methods: A retrospective cohort study was conducted by chart review for patients admitted to PICU in one medical center from 2019 to 2020.The 20 single-patients room is designed into 4 zone. Zone A is defined as room with less visibility but accessibility from the central nursing station. Zone B is defined as room with easily visibility and accessibility from the central nursing station. Zone C is defined as less visibility but accessibility with room is aligned along corridor which face each other. Zone D is defined as less visible and less accessible room.
Results: Total 1298 pediatric patients were included with the median age of 33.5 months (Interquartile range (IOR): 87.5) and the median length of PICU stay of 3 days (IQR 7). Overall mortality was 3.2%, which was statistically significant different between zones (p=0.03). Higher mortality was found in Zone B and C with 3.5% and 4.9% respectively as compared with Zone A (1.9%) and Zone D (1.2%). The PELOD was higher in Zone B and C (mean 4.0 +standard deviation (SD) 6.9)than Zone A and D (3.1+SD5.8). Multiple logistic regression was performed for analysis of mortality related clinical factors between Zone B and C, which showed that only room visibility and PELOD score were independent factors of mortality with odd ratio (OR) of 3.8, 95% confidence interval (CI): 1.1-13.5, and OR 1.1, 95% CI 1.1-1.2 respectively and that no significant association of bed distance from nursing station with mortality.
Conclusions: Severely ill pediatric patients were generally allocated in area with accessibility (Zone B and C), where less visibility from central station was an independent risk factors for mortality. These results highlight the importance of patient allocation and ICU design in PICU, especially for patients with critical illness.

68 The Role of Brain-Derived Neurotrophic Factor in the Prefrontal Cortex of Ketamine Abuse Mice
愷他命成癮小鼠之腦源性神經營養因子在前額皮質的影響

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Background: Ketamine addiction is the second most illicit drug examined in Taiwan and increasing presenting at emergency departments . Abusive use of ketamine causes long-lasting neuroadaptations, including cognitive impairment,

schizophrenia-like perceptual changes, and synaptic changes. Brain-derived neurotrophic factor (BDNF) plays a crucial role in synaptic plasticity in the brain and regulates the translation of several synaptic proteins. Zinc acts at the post-synapse level and influences synaptic plasticity and nerve impulse transmission. However, little is known about how Zinc affects ketamine abuse. Our aim is to investigate the effect of zinc in the prefrontal cortex of ketamine addiction.

Methods: We used a chronic ketamine addiction model by giving mice a 7-days course of daily intraperitoneal injections of subanesthetic dose of ketamine, then examined BDNF levels in the prefrontal cortex. The western blot data were analyzed using a Student`s t-test or a one-way ANOVA followed by the Dunnett`s or Tukey`s post hoc comparisons, when appropriate. All statistics were performed by GraphPad Prism.

Results: Zinc administration was associated with a reduction in ketamine-induced behavior sensitization. BDNF levels in the prefrontal cortex were significantly higher (p value= 0.0103) in ketamine abuse than saline group and significantly decreased (p= 0.0431) after treatment with zinc in the ketamine abuse group.

Conclusions: Zinc supplementation was associated with variable degrees of prevention of ketamine-induced changes. Additionally, decreased BDNF expression was observed in zinc treatment in the ketamine abuse model. Therefore, zinc might have a potential role in ketamine abuse mice.

69 **Predictor for Urinary Tract Infection in Children with Single Hematuria in Pediatric Emergency Room**
兒童急診室中單獨血尿兒童罹患泌尿道感染的預測指標

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Background: Hematuria is a worrisome symptom in children and is sometimes related to urinary tract infections. Pyuria is present in most urinary infection tract cases. The study was conducted to identify objective and useful clinical factors in hematuria patients without pyuria to predict urinary tract infection in the pediatric emergency department and find the causes of hematuria

Methods: We prospectively recruited patients from the PED. The individual factors of symptoms, urine biochemistry, and microscopic exam data, and blood laboratory tests were analyzed to predict urinary tract infection. Patients were divided into the verbal group (age $\geq$ 2 years)and the non-verbal group(age $<$ 2 years) for research. Causes of hematuria were also investigated.

Results: A total of 161 patients with hematuria and no pyuria were enrolled. Fever was not clinically significant in these patients with urinary tract infections. Among symptoms, only dysuria is correlated with urinary tract infection; the same result is presented at the subgroup of age $\geq$ 2 years. In urine biochemistry data, urine esterase showed a relationship to urinary tract infection; urine esterase and urine nitrite have significant differences in age $<$ 2 years. In urine microscopic exam, urine RBC $>$ 373/ul of age $\geq$ 2 years and urine RBC $>$ 8/ul of age $<$ 2 years are linked to urinary tract infection. No identifiable causes (69.6%), urinary tract infection (13.7%), and urinary tract stone (5.0%) are the top three causes of hematuria in the study.

Conclusions: In hematuria patients without pyuria, the study demonstrated many factors are correlated with urinary tract infection. Clinicians can prescribe antibiotics for treatment in these high-risk patients rather than prophylactic treatment in all patients.

70 **Risk Factors for Bacteremia and PICU Admission in Pediatric UTI**
兒童泌尿道感染導致菌血症和入住兒童加護中心的危險因素

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Background: Urinary tract infection (UTI) is a common febrile disease in children and infants. UTI can cause bacteremia and sepsis in children, while clinicians have difficulties predicting UTI by initial non-specific symptoms and signs in the emergency room (ER). The study found risk factors of bacteremia and PICU admission in children with UTI.

Methods: The initial hospitalized patients' data in ER included age, sex, CRP, serum white blood cell (WBC), hemoglobin, platelet, blood cultures, urine WBC, urine cultures and if PICU admission. We transform continuous variables into categorical variables with specific cutoffs to compare bacteremia and non- bacteremia under Fisher's exact test. Potential risk factors with significant p-values were selected in multivariate logistic regression analysis to calculate odds ratios (ORs) and 95% confidence intervals (CIs). Potential risk factors of PICU admission were also identified.

Results: Of 308 patients, 20 had bacteremia and 5 had PICU admission. The OR(95%CI) of age $<$9 months and CRP $>$5 mg/dL for bacteremia were 4.667(1.310 -16.620) and 4.745(1.843 - 12.218), respectively; that of age $<$5 months and CRP $>$10 mg/dL for PICU admission were 13.318(1.340 - 132.390) and 13.499(1.843 - 98.891), respectively (All p-values $<$0.05).

Conclusions: In pediatric UTI, age $<$ 9 months and CRP $>$ 5 mg/dL were risk factors for bacteremia; age $<$ 5 months and CRP $>$ 10 mg/dL were risk factors for PICU admission.

71 **Factors Influencing Rate of Orchiectomy in Pediatric Patients with Acute Scrotum: 10 Years of Experience at Tertiary Referral Pediatric Emergency Departments and Literature Review**

睪丸扭轉導致睪丸切除的危險因子：在兒童急診10年橫斷面的研究及文獻評讀

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Background: To investigate the risk factors of orchiectomy in testis torsion (TT) in pediatric patient

Methods: Pediatric patients (≤ 18 years) with acute scrotum (AS) visiting pediatric emergency department (PED) of four hospitals of Chang Gung Medical System in Northern Taiwan from January 01, 2011 to Aug 31, 2021. We collected age, time of AS happening, testicle involved, ultrasound (US) characteristics of testis blood flow (TBF), degrees of torsion, numbers of orchiopexy and orchiectomy for further evaluations.

Results: A total of 256 pediatric patients with AS were analyzed in our study and mean age of 11.60 ± 4.61 years. Over two-third (n = 186) were within 10 - 18 years old. The most frequent affected side was left (n = 140, 54.7%). Seventy-two (28.1%) patients confirmed TT via surgery. Orchiectomy was obviously related to time between discomfort and PED arrival ($p < 0.001$), US characteristics of TBF absent ($p < 0.001$), time between discomfort and surgery especially over 24 hours ($p < 0.001$) and degrees of TT ($p < 0.001$). Multivariate logistic regression analysis demonstrated that longer time between discomfort and PED arrival ($p < 0.001$), US characteristics of TBF absent ($p < 0.001$), longer time between discomfort and surgery especially over 24 hours ($p < 0.001$) and degrees of TT ($p < 0.001$) were kept in the model finally.

Conclusions: The detection rate of TT in pediatric patients in the PED was low. Older age, longer time between discomfort and PED, US characteristics of TBF absent, longer time between discomfort and surgery especially over 24 hours and higher degrees of TT were the main risk factors related to orchiectomy in TT children. This study will increase awareness of the necessity for early identification of TT in AS children and also encourage appropriate surgical interventions for those doubt about TT exists in a timely manner to keep testis survival and prevent permanent adverse outcomes of their fertility in pediatric patients in the PEDs.

72 **The Impact of COVID-19 Outbreaks in Taiwan on Pediatric Emergency Visits: Experience of A Tertiary Care Center.**

新冠肺炎疫情對於台灣兒童急診就醫的影響：單一醫學中心經驗分享

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Background: On May 15, 2021 in Taiwan, first major COVID-19 surge mainly clustered at Wanhua District of the capital Taipei. On May 19, the Central Epidemic Command Center (CECC) has responded swiftly to the surge in cases among community and upgraded the COVID-19 alert to level 3 nationwide. It is important to understand the impact of COVID-19 outbreaks in Taiwan on pediatric emergency visits. This study aimed to assess trends of pediatric emergency visits in the past year at a tertiary care center located near the affected area.

Methods: All emergency visits made by children below 18 years old in 2021 were assessed in a tertiary hospital in the North of Taiwan. We retrospective analyzed trends in medical problems and injuries in the emergency department. We also monitored the changes of visits with new confirmed COVID-19 cases among the population of the hospital. The difference of the utilization of emergency care during the period of alert level 3 in patient characteristics, duration of observation, admission, and admission for intensive care were analyzed.

Results: Total 17,160 visits, medical problems accounted for 13,917 (81%) and injuries for 3,243 (19%). The daily visits sharply decreased to half in visits for injuries on the same day of the surge in COVID-19 cases while medical visits gradually decreased to half after the announcement of the alert level 3. The visits for injuries also rebounded rapidly after the confirmed cases dropped while medical visits slowly rose to 60 or 70% compared to visits before the alert level 3. There were 2,179 visits during the period of the alert level 3. They stayed for 4 hours and 25 mins in average, 482 (22.12%) were admitted while 65 were admitted for intensive care. The obvious difference during the period of the alert level 3 was the increased severity of pediatric emergency visits. The rate of admission for intensive care substantial increased from 2.85% to 2.98% (4.56%) among total visits and from 12.41% to 13.49% (8.70%) of admission.

Conclusions: The increased severity of pediatric emergency visits during the COVID-19 outbreaks in Taiwan deserves more careful attention from the front-line emergency staff.

73 **New Perspective on the Potential Factors of Successful Intravenous Access in Children**
影響兒童靜脈注射成功率可能因素之新觀點

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Background: Pediatric intravenous catheterization (PIVC) is pivotal to maintain homeostasis in critically ill children; however, it is still a challenging technique for pediatricians, and the associated parameters affecting successful PIVC establishment have not been fully investigated.
Methods: This prospective observational study collected the data from pediatric patients aged less than 18 years who required PIVC. Study participants were categorized into five groups: newborn, infant, toddler, pre-school, and student (children and adolescent) for subgroup analysis. The detailed demographic and biochemistry data, as well as the executors of PIVC were examined to elucidate the most powerful factors affecting successful PIVC.
Results: A total of 935 venous cannulations from 558 patients over a period of one year were studied. The failure rate (FR) of PIVC was progressively increased from students to newborns, except for the highest FR noted in infants (18.4%). No significant difference in the BMI standard deviation score (BMI-SDS) was noted between the success and failure groups (p-value=0.430). Compared to the success group, more attempts, completion time, and medical staff were needed for IV cannulation in the failure group (all p-values <0.001). A higher serum procalcitonin (PCT) level was correlated to an increased FR (p-value=0.016). In addition, the success rate was positively associated with the seniority of the operators, except for the 3-year experienced R3 group (93.5%) having a higher success rate than the 4-year experienced CR group (84.2%).
Conclusions: Infants were the most difficult group to set up the successful PIVC, being even more difficult than newborns. Even though seniority was a cardinal factor in the success rate of PIVC, a high FR was still noted if there was no continuous and steady practice.

74 **Effectiveness of an Out-reaching Multi-specialty Team for Maltreatment Assessment in a Child Protection Center**
外展多專科團隊進行兒虐評估的有效性

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Background: As growing national awareness with increasing number of child maltreatment reported cases, correctly distinguishing child abuse is more and more important. However, it is sometimes challenging in identifying the reported case due to their various presentations. For timely identification the critical or complex cases outside our child protection center, we established an out-reaching multi-specialty team (OMT) to support Kaohsiung City Government in 2014. In this study, our objective is to examine the role of OMT services in assisting law enforcement.
Methods: We enrolled OMT cases in our data base from Jan 2014 to Dec 2021. OMT reports were reviewed including the clinical characteristics, the types and locations of wounds, image findings, and radiographic findings. Moreover, cases were determined as either a high risk or low risk of child abuse in our OMT report. Finally, the associations among and case outcomes including law enforcement and prosecution were examined.
Results: Thirty-four cases (24 males and 10 females; mean age 1.8 years) engaged in our OMT services. Law enforcement was activated in 20 (64.5%) cases, and was only associated with the high-risk group as determined by the OMT (p $<$ 0.05). The positive predictive rate of law enforcement in the high-risk group was 18/23 (78.2%), and the negative predictive rate was 6/9 (66.7%) for non-law enforcement in the low-risk group. In single variant analysis, the OMT decision is the only significant risk factor for law enforcement.(P = 0.023, Odds ratio: 7.2)
Conclusions: Our study indicates that an OMT can play an effective role in child protection and activating law enforcement for victims of complex or critical physical abuse. We would suggest that OMT services should be included into child protection centers and government child protection policies.

75 **Establish an Intervention Model and Effect Evaluation for Overweight and Obese Children with Online Courses Designed to Enhance Choice Resilience**
建立以增強選擇韌性為設計之線上課程的肥胖及過重兒童干預模型及效果評估

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Background: Childhood obesity increased risks for metabolic disorders, cardiovascular diseases, psychological disorders and marked increased mortality in the adulthood. Multi-level and multi-component intervention for childhood obesity seemed to be effective. This study aimed to evaluate the effectiveness of the designed 8-week online courses with multi-component supportive groups for overweight and obese children.
Methods: In the 8-week, supportive online course, we recruited overweight and obese students from 4 collaborated elementary school in Hualien. The exclusion criteria included

chronic disease, genetic disease, or endocrine disease. Enrolled students will join the online courses with their parents once weekly for successive 8 weeks. The multi-component supportive weight control team consisted of nutritionist, sports coach, psychologist, pediatrician, and school nurse. Data collections included BMI and the questionnaires, and the school exercise tests before and after the online course. The questionnaires consisted of the children's habit of diet and sport, characteristics of family and society.

Results: Total 37 students were enrolled, and finally 34 students completed the online course and evaluation (1-2 graders: 8, 3-4 graders: 12, 5-6 graders: 14). The initial BMI of 1-2 graders, 3-4 graders, and 5-6 graders were 20.95±3.09、23.59±3.54、25.88±4.46 respectively. The declined value of BMI after online course of 1-2 graders, 3-4 graders, and 5-6 graders were 0.31±0.57、0.52±1.20、0.52±1.20, and all of them had significantly decreased BMI (p= 0.004). About the diet habit, there were significantly change of the amount of vegetable, dessert, and beverage consumption after intervention (p < 0.01). In term of the exercise frequency, it significantly increased during weekend (p=0.016) but not during weekday. There was also significantly decreased in time of 3C use and sitting after intervention. There was no change in term of the sleep time, the frequency of home-cook, and parent-child exercise time.

Conclusions: Multi-component online supportive weight control program was an effective intervention model for childhood overweight and obesity to reduce the children's BMI and enhance their choice resilience.

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76 **RNA Sequencing and Comparative Analysis in Global Transcriptomes of Nontyphoidal Salmonella from Bacteremia and Non-bacteremia Patients after Infecting Human Intestinal Epithelium in Vitro**
菌血症與非菌血症病人所採集非傷寒沙門氏菌在體外感染人類上皮細胞後之核糖核酸定序及全轉錄體定序比較分析

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Background: Nontyphoidal Salmonella (NTS) bacteremia is one of the important complications of invasive NTS infection and leads to considerable mortality and morbidity worldwide. Both bacterial virulence and host immunity contribute to NTS bacteremia. We conduct this study to investigate the significantly regulated genes and their representative phenotypes/functions of NTS in stools and blood of bacteremic patients in comparison with NTS in stools of non-bacteremic patients.

Methods: A total of 24 NTS clinical isolates were collected from pediatric patients admitted to Shuang Ho Hospital with

NTS gastroenteritis, including 6 paired bacterial isolates from stool samples (Group A) and blood samples (Group B) of the 6 patients with bacteremia, 6 bacterial isolates from stool samples of the 6 non-bacteremia patients with low CRP levels (Group C), and 6 bacterial isolates from stool samples of the 6 non-bacteremia patients with high CRP levels (Group D). Caco-2 cells were in vitro infected with mid-log cultures of the NTS isolates, and their RNA were isolated for RNA sequencing (RNA-seq). The global transcriptomes were statistically compared pairwise, including significantly upregulated and downregulated genes, gene ontology (GO) analysis, and Kyoto encyclopedia of genes and genomes (KEGG) pathway analysis. A p value < 0.01 and > 2 log2 fold-change was defined as statistical significance.

Results: The principal component analysis of RNA-seq showed that the transcriptome of Group B is obviously different from Group A, C, and D. The transcriptomes of Group B compared with those of Group A and Groups C&D showed significantly that (1) downregulated genes iolR and pglZ (-15.3 to -18.4 log2 fold change) in the top 20 most significantly regulated genes ; (2) involvement of hydrolase and endonuclease activity by GO analysis; (3) involvement of microbial metabolism in diverse environments, and inositol phosphate metabolism by KEGG analysis.

Conclusions: Significantly regulated genes in NTS bacteremic blood strains were identified in comparison with NTS bacteremic gastrointestinal strains and NTS non-bacteremic GI strains after priming with human intestinal cells. These genes are potential biomarkers of NTS bacteremia.

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77 **A Pilot Study of Biliary Atresia Newborn Screening Using Dried Blood Spot Matrix Metalloproteinase-7**
血片基質金屬蛋白酶7作為膽道閉鎖新生兒篩檢之前驅研究

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Background: Timely diagnosis is a critical challenge and crucial to improved survival of biliary atresia (BA) patients. We aim to evaluate accuracy of Matrix Metalloproteinase-7 (MMP-7) protein as a marker for screening BA at 3 days old.

Methods: Using dried blood spot screening for neonatal cholestasis patients (DBS-SCReNC), this study had enrolled pediatric patients with definite diagnosis of BA and compared

with non-BA children. Children were recruited from September 12, 2018, to May 14, 2021 and followed-up until at least 6-month-old. The study was conducted in a tertiary hospital, National Taiwan University Children Hospital hepatology clinic, general pediatric clinic and well-child clinic. Stored newborn screen dried blood spot (DBS) at 3 day old of children enrolled in DBS-SCReNC study were retrieved from newborn screening (NBS) centers in Taiwan. There were 25 BA children and 107 non-BA children. MMP-7 on DBS was quantified in 2021 using a sensitive sandwich enzyme-linked immunosorbent assay.

Results: The age of the 25 children with BA (15 male, 10 female) was 3.3 ± 1.3 years, and age of 107 non-BA children (56 male, 51 female) was 2.2 ± 1.2 years old. Of the non-BA children, 3 children were diagnosed with choledochal cyst, 2 with liver hemangioma, 9 with cholestasis diseases and 93 children visited NTUH due to non-hepatobiliary diseases or for well-child visits. The time of BA patients received Kasai operation was at 43 ± 20 days old. The DBS MMP-7 level of BA children was significantly higher than that of non-BA children (19.2 ± 10.4 vs 5.6 ± 2.7 ng/ml, p < 0.0001). The DBS MMP-7 level showed good diagnostic accuracy with AUC of 93.7% (95% CI, 87.7% - 99.7%). MMP-7 cut-off at 7.8 ng/ml has sensitivity of 92.0% (95% CI, 74.0%-99.0%), specificity of 92.5% (95% CI, 85.8% - 96.7%), positive predictive value of 71.9% (95% CI, 56.3% - 87.5%), negative predictive value of 98.0% (95% CI, 95.3% -100.0%) (p < 0.001).

Conclusions: In this study, DBS MMP-7 is able to distinguish BA from other conditions. This test allows us to screen BA children as early as 3 days old.

78 Non-invasive Clinical Predictor of Esophageal Varices in Biliary Atresia Patients
非侵入性臨床指標預測膽道閉鎖病人之食道靜脈曲張

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Background: Varix bleeding is a major complication of portal hypertension of biliary atresia patients. So far there are no good clinical predictor to predict whether biliary atresia patients need to undergo esophagogastroduodenoscopy (EGD) to evaluate varices or not. We aim to find out non-invasive parameters for the prediction of varices in biliary atresia patients.

Methods: We included biliary atresia patients who underwent EGD from 2015-2021 in National Taiwan University Hospital. We evaluated the diagnostic performance of laboratory tests, BAVENO VI criteria, expanded BAVENO VI criteria, aspartate aminotransferase to platelet ratio index (APRI), fibrosis-4-index (FIB-4) on the prediction of varices in biliary atresia patients.

Results: There were 47 cases included in our study (22 males and 25 female), 40 patients were diagnozed with esophageal varices and and another 7 patients without esophageal varices by EGD. The BAVENO VI criteria is identified as a good

predictor of esophageal varices in our cohort (odd ratio = 16.44, 95% CI = 2.72-102.53, P=0.006). The positive predictive values (PPV) is 90%, and the negative predictive values (NPV) is 57% of BAVENO VI criteria for the prediction of esophageal varices. The BAVENO IV criteria is also predictive of advanced varices (including F3 esophageal varices, F2 esophageal varices with red color sign and gastric varices) (risk difference = 42.5%, 95% CI = 0.27-0.58, P=0.03), PPV of 42.5%, and NPV of 100% of BAVENO IV for the prediction of advanced varices. However, expanded BAVENO VI criteria, APRI, FIB4 are not related to esophageal varices (P=0.06; 0.20; 0.99, respectively).

Conclusions: The BAVENO VI criteria may served as an non-invasive clinical predictor of esophageal varices in biliary atresia patients.

79 Clinical Features Predicting Liver Transplantation in Biliary Atresia Receiving Kasai Portoenterostomy
膽道閉鎖病人經葛西氏手術後可預測需要肝移植的臨床特徵

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Background: Biliary atresia (BA) is a progressive liver disease even after Kasai portoenterostomy (KP). It is the most common cause of end-stage liver disease and the leading indication for liver transplant (LT) in the pediatric group. However, many factors following KP may still adversely affect the long-term outcome. This study aimed to investigate the clinical features before and after KP to predict the need for liver transplantation.

Methods: We conducted a retrospective chart review for patients with BA in Linkou Chang Gung Memorial Hospital from Jan 2000 to Oct 2020. We collected the demographic data, age at KP, time to jaundice clearance, laboratory data, cholangitis episodes, and the outcome of liver transplantation.

Results: A total of 64 BA patients (31 males, 33 females) were included. The median age at KP was 54 days old (IQR=42.5 to 65). Seventeen (26%) patients received LT. The median age at LT was 1.7 years old, and 52 percent were under two years old. The mean total bilirubin level before KP was 7.36 mg/dL and 8.47 mg/dL in non-LT group and LT group, respectively (p=0.043). The patients who received KP at the age < 70 days had significantly reduced LT than those operated ≥70 days (21% vs. 50%, p=0.004). The patients who did not achieve jaundice-free (total bilirubin < 2mg/dL) 3 months after KP had a higher rate for LT (13% vs. 60%, p=0.000). The peak annual cholangitis episodes were 1.21 1.16 and 2.82 1.97 in non-LT and LT groups, respectively (p=0.01). The mean annual cholangitis episodes were 0.32 ± 0.42 and 1.78 ± 1.64 in non-LT and LT groups, respectively (p=0.000).

Conclusions: Higher pre-KP total bilirubin level, not achieving jaundice clearance three months after KP, and more

increased annual cholangitis episodes are significant predictors for liver transplant in BA patients after Kasai portoenterostomy.

80 **The Role of Gene Variations in Term Infants with Prolonged Unconjugated Jaundice**
基因變異性在延遲性非結合型黃疸足月兒身上所扮演之角色

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Background: Uridine diphosphate glucuronosyltransferase 1A1 (UGT1A1) is the key enzyme for bilirubin conjugation, and mutations of UGT1A1 gene cause unconjugated hyperbilirubinemia syndromes known as Crigler-Najjar syndrome and Gilbert's syndrome. Previous reports showed that 5 common variants of UGT1A1 gene are strongly associated to bilirubin levels in healthy Taiwanese adults. Huang et al. also demonstrated that UGT1A1 activity $\leq 40\%$ of normal is a proper risk factor for the development of Gilbert's syndrome in Taiwanese adults. We conducted this study to investigate the role of gene variations in term infants with prolonged unconjugated jaundice.
Methods: This study enrolled infants with prolonged jaundice (n=12) in National Cheng Kung University Hospital in 2021/01-2021/12. Prolonged jaundice was defined as a serum total bilirubin value ≥ 2 mg/dL at 14–60 days of age. Infants with gestational age less than 37 weeks, birth weight less than 2400 grams , direct form jaundice, G6PD deficiency, and other major diseases were excluded. The blood samples were obtained to examine AST/ALT and Bil-T/D. The DNA extraction from PBMC was analyzed for UGT1A1 gene by polymerase chain reaction-restriction fragment length polymorphism method. UGT1A1 enzyme activity was estimated by UGT1A1 gene variations.
Results: Among these 12 infants, the mean age was 38 ± 9.5 days old. The female-to-male ratio was 1.2. The mean total bilirubin level was 8.2 ± 4.7 mg/dL. Of the five SNPs, c.1091 C > T was not seen in all infants, c.211 G > A was observed in 10 infants, c.686 C > A was observed in 5 infants, c.−53 A(TA)6TAA > A(TA)7TAA was observed in 2 infants, and c.1456 T > G was observed in only 1 infant. There were 6 genotypes with estimated UGT1A1 activities ranging from 4.5% to 100% of normal. Unfortunately, there was no correlation between bilirubin level and UGT1A1 activity in the infants with prolonged jaundice (n = 12, r = 0.148, P = 0.645).
Conclusions: C.211 G > A was the most frequent UGT1A1 variant in infants with prolonged jaundice. Unfortunately, there was no correlation between bilirubin level and UGT1A1 activity in the infants with prolonged jaundice.

81 **Heat Shock Protein 60 Restricts Release of Mitochondrial dsRNA to Suppress Hepatic Inflammation and Ameliorate Non-Alcoholic Steatohepatitis in Mice**
熱休克蛋白60限制粒線體雙鏈RNA核糖核酸的釋放以抑制小鼠肝臟炎症並改善非酒精性脂肪性肝炎

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Background: Non-alcoholic fatty liver disease (NAFLD), the most common cause of chronic liver disease, consists of fat deposited (steatosis) in the liver due to causes besides excessive alcohol use. The folding activity of heat shock protein 60 (HSP60) has been shown to protect mitochondria from proteotoxicity under various types of stress.
Methods: In this study, we investigated whether HSP60 could ameliorate experimental high fat diet (HFD)-induced obesity and hepatitis and explored the potential mechanism in mice.
Results: The results uncovered that HSP60 gain not only alleviated HFD-induced body weight gain, fat accumulation, and hepatocellular steatosis, but also glucose tolerance and insulin resistance according to intraperitoneal glucose tolerance testing and insulin tolerance testing in HSP60 transgenic (HSP60-Tg) compared to wild type (WT) mice by HFD. Furthermore, overexpression of HSP60 in the HFD group resulted in inhibited release of mitochondrial dsRNA (mt-dsRNA) compared to WT mice. In addition, overexpression of HSP60 also inhibited the activation of toll-like receptor 3 (TLR3), melanoma differentiation-associated gene 5 (MDA5), and phosphorylated-interferon regulatory factor 3 (p-IRF3), as well as such inflammatory biomarkers as mRNA of il-1β and il-6 expression in the liver in response to HFD. In vitro study also confirmed that the addition of HSP-60 mimics in HepG2 cells led to upregulated expression level of HSP60 and restricted release of mt-dsRNA, as well as downregulated expression levels of TLR3, MDA5, and pIRF3.
Conclusions: This study provides novel insight into a hepatoprotective effect, whereby HSP60 inhibits release of dsRNA to repress the TLR3/MDA5/pIRF3 pathway in the context of NAFLD or NASH. Therefore, HSP60 may serve as a possible therapeutic target for improving NAFLD/NASH.

82 **Programming of Maternal High Fat with Microplastics Exposure in Offspring Fatty Liver**
產前高脂肪與微塑料暴露在後代脂肪肝中的編程

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Background: Prenatal nutrition and toxic exposure will affect the health and disease of offspring. Prenatal high-fat diet or exposure of microplastics can cause the accumulation of liver fat after delivery, which can cause liver fibrosis and cirrhosis.

Aims：To study the offspring fatty liver injury through maternal high-fat diet (1st hit) and microplastics exposure (2nd hit) was with inflammation and apoptosis pathway.

Methods: After confirmation of pregnancy on the 14th day after mating, pregnant females Sprague-Dawley rats are randomly divided for the prenatal high--fat diet exposure paradigm (HFD) or left undisturbed (NC) until delivery. The other NC and HFD were fed with microplastics [NCMP1; NC+microplastics (5um, 100ug/L), NCMP2: NC+microplastics (5um, 1000ug/L), HFDMP1: HFD+microplastics (5um, 100ug/L), HFDMP2: HFD+microplastics (5um, 1000ug/L)]. The offspring was sacrificed 7 days after delivery (PD7).

Results: The PD7 offspring increased more hepatic lipid accumulation in the HFDMP1,2 than HFD and NCMP1,2 studied via liver histology. The pregnant maternal liver weight increased in HFD and HFDMP1. The offspring body weight, increase in HFDMP1,2 than NCMP1,2 and HFD. The offspring liver weight, increased in HFDMP1 than HFD but not HFDMP2. The western blot of cleaved caspase 3 expression increased in NCMP1,2, HFD, HFDMP2 (P＜0.05) but not HFDMP1. The IL-6 expression increased in more in HFDMP2 than NCMP1,2, HFD, HFDMP1 (P＜0.05)

Conclusions: Prenatal microplastics with HFD increased more hepatic lipid accumulation in the offspring. The offspring liver apoptosis and inflammation increased more in prenatal high concentration microplastics with HFD

83 Evaluate Pediatric Hepatic Steatosis and Liver Stiffness through Ultrasound Backscattered Analysis
使用超音波逆散射分析評估小兒肝臟脂肪變性和肝臟硬度

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Background: Nonalcoholic fatty liver disease is the most common liver disease in the pediatric population, and may progress to liver fibrosis. Ultrasound B-mode is a non-invasion examination for diagnosed hepatic steatosis but depends on the physician's experience. Liver stiffness measurement (LSM) by transient elastography is a non-invasive tool for evaluating the grade of liver fibrosis, but the cost is not covered by NHI. Ultrasound backscattered (UBS) analysis may display the microstructure of the tissue, which can be utilized to evaluate the degree of hepatic steatosis and liver stiffness.

Methods: A prospective cross-sectional study of UBS analysis was conducted. Participants aged 3 to 18 years received abdominal ultrasound examinations in the Department of Pediatric Gastroenterology (CGMH at Linkou). Hepatic steatosis index (HSI), LSM and UBS data were collected. The UBS analysis was performed by MATLAB. We analyze the correlation between HSI, LSM, and UBS imaging.

Results: One hundred and seventy-three patients (Aged 11.96 ± 3.95 years, Range: 3~18) were enrolled for ultrasound backscattering analysis and divided into 4 group (Grade 0,1,2,3) by HSI (HSI＜30, 30 ≤ HSI ＜ 36, 36 ≤ HSI ＜ 41.6, 41.6 ≤ HSI). The Nakagami parameter, Entropy_ Shannon, Homodyned-K (HK) distribution revealed significant differences between G 0 and the other 3 groups. And the areas under the receiver operating characteristic (AUROC) curves were 0.96, 0.92, 0.84 for diagnosing hepatic steatosis ≥ G1, ≥ G2, ≥ G3 by Nakagami parameter, 0.97, 0.93, 0.86 by Entropy_ Shannon, and 0.94, 0.91, 0.83 by HK distribution. Forty-four patients received the transient elastography exam and were divided into 2 groups by LSM (LSM＜4, LSM≥4), showing significant differences by the aforementioned 3 ultrasound backscattering analyses. And the AUROC curves were 0.83,0.81,0.83 by Nakagami parameter, Entropy_ Shannon, and HK distribution.

Conclusions: The result of UBS analysis is correlated with HSI and LSM , so it may become a new ultrasound mode for screening hepatic steatosis and early liver fibrosis in children.

84 Risk of Attention Deficit Hyperactivity Disorder Following Early Childhood Constipation: A Population-based Cohort Study
幼兒時期便秘後的注意力不足過動症風險：利用世代追蹤研究

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Background: Attention deficit hyperactivity disorder (ADHD) is a common childhood behavior disorder with main symptoms of hyperactivity, impulsivity, and inattention. Constipation is also a common pediatric multifactorial gastrointestinal problem that mostly resolves as children become older. Occasionally, laxatives are prescribed. However, even a short course of laxatives, although optimal for resolving constipation, may have long-lasting consequences on microbiome. We found that the incidence rates of ADHD were higher among children with laxative usage by analyzing a nationwide population-based cohort and provided a probable pathophysiological mechanism.

Methods: The present study was a retrospective cohort study using data collected from the National Health Insurance Research Database (NHIRD). Propensity score matching was

applied in this study to select non-constipation controls without being biased. The diagnosis of ADHD was retrieved requiring diagnoses made during over two outpatient visits or at least one inpatient discharge note. We excluded (1) pediatric patients with missing demographics, (2) born before 2001, (3) diagnosed with ADHD before constipation onset, (4) those whose diagnoses were made before 2001 or after 2013. Subgroup analyses based on the stratification of age, gender, underlying comorbidities from birth till the index date, and co-medications within one year before the index date were also performed.

Results: A total of 12,897 pediatric patients newly diagnosed with constipation were identified from LHID, among whom 736 cases developed ADHD after constipation onset, which was identified over 985,659 observed person-years. Patients who had constipation were of a significantly higher risk of ADHD when compared to the non-constipation group (relative risk = 1.420, 95% CI = 1.290-1.562) after adjustment. For patients with constipation, those with atopic dermatitis, neonatal infections, congenital malformations, allergic rhinitis, and urticaria were at significantly high risks of ADHD.

Conclusions: Children who are constipated in early postnatal years have a 1.364-fold greater risk for ADHD. Parents and medical professionals should be aware of good bowel hygiene in fragile children.

85 **Is Pinworm Infection Still the Public Health Concern among Children in the Resource-rich Countries? The Prevalence and Time-trend Analysis of Pinworm Infection among School-aged Children in Hualien, Taiwan**
蟯蟲在資源充足的國家是否仍為兒童的公衛問題？花蓮學齡兒童蟯蟲盛行率及時間序列分析

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Background: Enterobius vermicularis, also known as pinworm, is a common type of intestinal parasitic infection which is easily noted in children. Gradually decreased pinworm infection was noted under public policy in the resource-rich region, such as Taiwan. Little information is available regarding the influence of socio-demographic factors among pinworm infection of children who lived in the same area after long-term follow-up under current policy of pinworm prevention in Taiwan. This study aimed to evaluate the trend of pinworm infection prevalence and the associated different socio-demographic risk factors among children in Hualien,Taiwan.

Methods: This retrospective longitudinal study included the school-aged children in Hualien from 2009 to 2018. Pinworm infection was detected by adhesive cellophane perianal swabs at their grade 1,4 and 7. The factors associated with pinworm infection were analyzed. Trend analysis of pinworm rate stratified by gender and urbanization were also performed.

Results: A total of 90730 school-aged children were included among 1,4, and 7 graders from 2009-2018. Young age and male subjects had high pinworm infection rates (p＜0.001). Negative correlation between BMI and enterobiasis was observed throughout the study. Through the followed-up years from 2009 to 2018, decreased pinworm infection was noted. According to different urbanization, suburban and rural areas had higher odds ratio of pinworm infection than urban areas (Suburban: 1.50, Rural: 5.86, respectively. Both p＜0.001), and rural areas had about six times the pinworm infection rate higher than urban areas. Trend analysis of pinworm rate from 2009 to 2018 revealed that overall pinworm rate was significantly decreased (p for trend: ＜0.001). However, there was no obvious change of pinworm infection rate in rural areas within 10 years (p=0.794), and it was higher than urban and suburban areas.

Conclusions: Pinworm infection among school-aged children had decreased trend in urban and suburban areas of Hualien. However, pinworm infection was still an vital issue without decreased trend in rural areas of Hualien.

86 **Combined Esophageal Multichannel Intraluminal Impedance and pH Monitoring in Type I Spinal Muscular Atrophy Patients**
第一型脊髓性肌肉萎縮症病人的多渠道食道腔內阻抗暨酸鹼值分析

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Background: Spinal muscular atrophy (SMA) is a neuromuscular disorder characterized by degeneration of the anterior horn cells. It can be classified from type I to IV according to the age of disease onset. Bulbar dysfunction and associated Gastroesophageal reflux disorder (GERD) lead to feeding difficulty, choking, aspiration pneumonia, and failure to thrive for type I SMA patients. Combined esophageal multichannel intraluminal impedance and pH (MII-pH) monitoring is a sensitive and relatively non-invasive technique to evaluate the extent of both acid and non-acid reflux of esophagus from stomach and becomes one of the gold standards to diagnose GERD.

Methods: We retrospectively reviewed the 10-year database of esophageal MII-pH measurement performed in our hospital between 2012 and 2021. All type I SMA patients and non-SMA infants before one year old were enrolled in the study. Statistical significance was analyzed by Student's t-test, and subgroup comparison was also done.

Results: 12 type I SMA patients and 30 non-SMA disease-control infants were included in the final study. Esophageal pH analysis detected abnormal acid reflux in 50% of the type I SMA patients, and impedance events were less frequent. Oral intake was associated with higher impedance events compared with nasogastric tube (NG) or gastrostomy feeding in both SMA (60.44 vs 22.08) and non-SMA groups (68.97 vs 18.15). In non-SMA groups, infants with neurological impairment were found to have longer bolus clearance time (11.88s vs 1.25s). After excluding infants with neurological impairment from the non-SMA group, longer bolus clearance time was noticed in SMA group than non-SMA group (2.94s vs 1.59s).

Conclusions: Esophageal MII-pH of type 1 SMA patients implies risk of feeding difficulty and reflux-associated airway complications. In addition, neurologically-impaired infants and type I SMA patients have decreased bolus clearance at upper esophagus, suggesting a role of bulbar dysfunction and gut motility disorder. Our findings support useful application of esophageal MII-pH for early diagnosis of GERD in severe SMA patients, especially for the decision of proactive nutritional intervention such as gastrostomy and fundoplication.

87 Clinical Manifestation and Therapeutic Management of Infantile Hepatic Hemangioma-A Single Center 14-year Experience

嬰兒肝臟血管瘤之臨床表現與治療──單一醫學中心14年之處理經驗

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Background: Infantile hepatic hemangioma is rare but the most common benign hepatic tumor in the first year of age. Many cases were detected incidentally by prenatal examination or postnatal ultrasonography check-ups in recent years. Treatment options include expectant management, pharmacological therapy, surgical intervention, and embolization. This study aims to clarify the clinical presentation, treatment preference, and relevant complications in the modern era.

Methods: We utilize National Taiwan University Hospital, integrated Medical Database (NTUH-iMD), and enroll all the cases diagnosed as infantile hepatic hemangioma in National Taiwan University Hospital from 2006 to 2020. The charts are retrospectively reviewed, including gender, age at onset of symptoms, initial presentation, associated complications, lab data, image features, treatment choices, treatment response, and related adverse effects.

Results: There were 21 cases (12 males and 9 females) enrolled in our study. The mean diagnosis age was 0.10 years of age. Most cases were incidentally found (n=9, 42.9%), followed by postnatal self-paid ultrasonography (n=7, 33.3%), prenatal found (n=3, 14.3%) and abdominal distension (n=2, 9.5%). 17 cases had focal hepatic hemangioma, 1 multiple, and 3 diffused lesions. Concurrent cutaneous hemangioma

was also detected in 7 cases (33.3%), which is more associated with multiple and diffused hepatic hemangiomas (100%, and 66.7% respectively). The level of hemoglobulin is prone to be lower in the diffused lesion group than focal one (9.27 v.s. 12.60 mg/dl, p=0.07). Among those 17 cases with focal hemangioma, nine infants were prescribed with propranolol, one treated by surgical resection, and the others had expectant management. All the cases with multiple and diffused hemangiomas were taking propranolol. Only one infant (7.7%) taking propranolol had bradycardia initially and subsided after dose adjustment.

Conclusions: Most infantile hepatic hemangiomas were incidentally found or detected from postnatal ultrasonography screening nowadays. Only one-tenth of them were symptomatic. Propranolol is more preferable and safe for hemangioma, especially for multiple and diffused lesions.

88 Increased Fecal Human Beta-defensin-2 Expression in Preterm Infants is Associated with Allergic Disease Development in Early Childhood

早產兒糞便內之β防禦素-2上升與兒童早期過敏疾病之關連

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Background: This study aimed to investigate whether fecal human beta-defensins (HBD)- 2 expression in preterm infants is associated with allergic disease development by age 2 years.

Methods: Preterm infants' stool samples were collected at the age of 6 and 12 months postnatally. Information regarding medication exposure histories (antibiotics, antipyretics, probiotics) and physician-diagnosed allergic diseases was obtained using age-specific questionnaires and medical records. We compared the 6-month and 12-month fecal HBD-2 concentrations between the medication exposure and non-exposure group, respectively, and between children with and without allergic diseases by 2-years-of-age.

Results: Seventy-four preterm infants (31−36 weeks gestational age) were included. Fecal HBD-2 levels showed a significant increase at age 12 months among children with allergic diseases compared to the controls (37.18 ± 11.80 ng/g vs. 8.56 ± 4.33 ng/g, P= 0.011). This association was more apparent among allergic children given antibiotics (50.23 ± 16.15 ng/g vs. 9.75 ± 7.16 ng/g, P= 0.008) or antipyretics (46.12 ± 14.22 ng/g vs. 10.82 ± 6.81 ng/g, P= 0.018) during the first year, whereas among allergic children who were previously not exposed to antibiotics or antipyretics, the differences were not significant (P> 0.05).

Conclusions: We found that preterm infants who expressed

high fecal HBD-2 at 12 months of age were associated with physician-diagnosed allergic diseases by the age of 2 years.

89 **Epidemiology of Meckel's Diverticulum: A Nationwide Population-based Study in Taiwan from 1996-2013**
梅克爾憩室的流行病學：1996年至2013年以全國人口為對象之研究

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Background: The diverse presentation of Meckel's diverticulum (MD) is a diagnostic challenge for clinicians and most previous studies consist of single institutional case series. The aim of this study was to review the related diagnoses of MD and to investigate the epidemiological characteristics using Taiwan's National Health Insurance Research Database.
Methods: We conducted an observational study using a population-based database. Patients diagnosed with MD who concurrently received intestinal surgery were identified. We analyzed the patients' demographic characteristics and relevant diagnoses using chi-squared test and two-sample t test.
Results: We identified 2453 newly diagnosed MD patients from 1996 to 2013 and 1227 patients (50%) with intestinal obstruction, gastrointestinal bleeding and acute appendicitis (acute abdominal pain) were defined as symptomatic. The male to female ratio was 2.4:1 with half of the patients experiencing symptomatic MD before the age of 20 years old. The age-specific and annual incidence were calculated for all MD and symptomatic MD. Among the symptomatic MD patients, intestinal obstruction was present in 583 (48%), acute appendicitis was present in 464 (38%), and gastrointestinal bleeding was present in 283 (23%) patients. Intestinal obstruction was the most common preoperative diagnosis in the 0-10 years and $>$ 20 years age groups, and acute appendicitis (acute abdominal pain) was the most common diagnosis in the 11-20 years age group.
Conclusions: This population-based 18 years' epidemiologic study described the distributions of MD symptoms among different age groups, which may help clinicians gain a better understanding of this diagnostically challenging gastrointestinal anomaly.

90 **Telemedicine in Children with Obesity ---- A New Model of Weight Manage Care**
遠距醫療在兒童肥胖健康實務照顧的經驗與成果分享

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Background: Incidence of obesity has increased in children and adolescents. One of the reasons accounting for low treatment impact is due to limited in-person contacts. Coronavirus disease (COVID-19) pandemic worsened in the mid-May, 2021 in Taiwan, hindering patients from in-person visits. Telemedicine tools might provide alternative and flexible models to enhance treatment effects. We aimed to analyze the effect of telemedicine exercise program on obesity control in children and adolescents in the era of COVID-19 pandemic.
Methods: This study enrolled 39 obese patients, consisting of 26 patients with standard face-to-face clinic (group 1) before COVID-19 era between September, 2020 to May, 2021 and 13 patients with telemedicine during COVID-19 era (group 2) from December, 2020 to November, 2021. Body-mass index (BMI) Z score and body muscle amount were measured at the first and last visit. Comparisons of the absolute changes of these parameters between two groups were performed.
Results: After a mean follow-up of 3 months, the mean change of BMI Z score in group 1 was -0.149 ($-0.213 \leq 95\%$ CI≤ -0.086, $p < 0.001$) which was comparable to that of group 2, being -0.174 ($-0.318 \leq 95\%$ CI≤ -0.03, p=0.02), the mean change of BMI Z score between group 1 and group 2 showed no significant difference (p=0.699). Compared to group 1, body muscle amount significantly increased in group 2, ($+0.13 \pm 0.52$ kg and $+1.88 \pm 1.00$ kg, $p < 0.0001$).
Conclusions: Telemedicine significantly increased body muscle amount. Might reduce BMI Z score, albeit no statistical significances were observed due to small sample size. These findings also contradicted to the assumption that COVID-19 pandemic might upsurge the incidence of obesity in children and adolescents owing to lack of exercises. Further large-scale investigation is needed to validate these effects.

91 **The Impact of Eating Habits on Children's Growth during the 2020-2021 Level 2 and Level 3 Epidemic Alert Period of COVID-19 in Taiwan**

新冠肺炎(COVID-19)台灣2020-2021—二級/三級防疫期間餵養方式對兒童成長之影響

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Background: The COVID-19 pandemic has brought unprecedented changes to the lives of families around the world. This study aimed to investigate the effects of Level 2/3 alert measures on the growth status of children during the 2020-2021 COVID-19 epidemic period in Taiwan.
Methods: This is a retrospective survey from January 1, 2019, to December 31, 2021. Inclusion criteria: 1. Age 7-18 years old, 2. Respondents and their guardians agree to sign the subject's consent form; Exclusion criteria:1. Unwilling to sign the subject's consent form 2. Suffering from chronic disorders. The questionnaire is divided into three parts. The first part is "Basic Information", the second part is "Children's Eating Behavior Questionnaire" (CEBQ). Measure children's eating behavior: the third part is "Primary Caregiver Eating Behavior" to measure eating behavior.
Results: A total of 80 children and adolescents were enrolled, with an age of 12.39±3.50 years (ranges 6-18). The average BMI value of children before the Level2/3 Alert was 19.08±3.80, significantly lower than that in Sept 2021, which was 19.53±3.74 (t=-3.813, p＜0.0001). The average score of children's eating behavior was 67.01±8.20, and the average score of primary caregiver's parenting behavior was 61.19±8.20. Children's eating behaviors were positively correlated with the primary caregivers' parenting behaviors (r=.254 p=0.023) showing a positive correlation.
Conclusions: There is a significant increase although not yet beyond the normal range in the BMI of children. Although the long-term effect on this aspect still needs to be evaluated. Since obesity is a risk factor for Covid-19 and many other diseases, these changes require close attention.

92 **Risk Factors of Adolescent and Young Adults with Repeat Foreign Body Ingestion: A Single Medical Center Retrospective Study**

青少年反覆異物吞入的風險因子：單一醫學中心的回顧性研究

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Background: Some adolescents and young adults might use foreign body ingestion (FBI) as the option of self-harm behavior, especially in patients with psychiatric diseases who would have repeat foreign body ingestion(RFBI). Thus, we aimed to analyze the characteristics and the ratio of RFBI among these patient population.
Methods: Retrospectively, we reviewed the medical records of the patients, aged 10-24 years old who visited our hospital due to FBI between 2005/1/1 to 2021/8/31.The exclusion criteria including patients who ingested any type of food and only one attempt of foreign body ingestion without records of follow-up within one year duration after initial ingestion attempt. After reviewing records, we divided patients into two groups based on their underlying psychiatric diseases. The difference of the characteristics between these two subgroups were analyzed. The ratio of RFBI was compared among groups.
Results: After reviewing 210 medical records for patients aged 10-24 years old, sixty medical records were included for analysis.There were 28 patients with single RFBI attempt and 12 patients with underlying psychiatric diseases contributed a total 32 attempts in our medical records. More female patients were noted in the psychiatric group (75% vs 25%, p = 0.005). Within the psychiatric group, a higher ratio of RFBI was obtained (50% vs 0%, p ＜ 0.001). The medial interval between the first two attempts of FBI was 12.5 days. The medial interval of every FBI was 14.5 days. In the psychiatric group, a higher ratio of battery ingestion is compared with the subjects in non-psychiatric groups(31.3% vs 3.6%, p = 0.006) and receiving more panendoscopy (PES) foreign body removal (71.9% vs 25%, p ＜ 0.001). The ratio of gastric ulcer or erosion was similar in 2 groups (39.1% vs 14.3%, p = 0.372).
Conclusions: In adolescents and young adults aged 10-24 years old, female and underlying psychiatric disease are the risk factors for repeat foreign body ingestion. Patients with underlying psychiatric disease choosed more harmful objects for ingestion such as battery and higher chance for PES removal.

93 Integrated Adolescent Health Care Model in High Schools: Hualien Outreach Experience

在中學系統中的整合式青少年健康照護：花蓮外展經驗分享

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Background: In 2013, the American Academy of Pediatrics recognized the important role physicians play in promoting the optimal biopsychosocial well-being of children in the school setting. In Taiwan, school nurse played the main roles to provide health promotion in most school campus. Most adolescence spent at least 9-10 hours in school daily and might only seek medical service for acute illnesses. We aimed to demonstrate the roles and contributions as adolescent health specialists can make to support schools and improve health and safety for adolescence.

Methods: We provided weekly school physician hours to the students in Tzu-Chi Senior High School for four years. Main key school health topics encountered on campus included general consultation, evaluation of adolescent common issues: reproductive health, mental health, immunization, and acute illness referral. Involvement of school physician can range from providing health education lecture, serving as an advisor to a school health advisory group to campus-related COVID prevention strategy, or active committee members of student affairs.

Results: In the past four years, the top 3 main key health topics encountered were mental health issue (39%, adaptation problems, peer-relationship, self-harm behavior, and school absenteeism etc.), acute illness survey (25%, headache, chest tightness, respiratory/GI problems, and dermatology etc.), and general issue consult (25%, weight management, pubertal development, vaccination etc.). After evaluating the severity and needs for further medical visits, liaison with community medical clinic for patient referral was arranged. School physician may play the roles of the core advisors to provide integrated care for a comprehensive, coordinated team among the students, family, the school, and community medical providers.

Conclusions: Well-placed school physician can bring the adolescent health expertise into coordinated school health teams, primary care provider, also the students and their family.

94 Mechanisms by which PMEN3 Lineages Evade Pneumococcal Vaccine-induced Immunity and Continuously Spread throughout Taiwan

台灣肺炎鏈球菌PMEN3的流行與其逃脫PCV免疫保護的機轉

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Background: In 2019, serotype 23A emerged as the top cause of invasive pneumococcal disease (IPD) in conjunction with a clonal shift from ST338 to ST166 in Taiwan. ST166 is a single locus variant of ST156 that was grouped into the PMEN3 lineage by the Pneumococcal Molecular Epidemiology Network (PMEN). PMEN3 that predominantly circulates as a PCV7 vaccine serotype 9V (also known as Spain 9V-ST156) was one of the pandemic penicillin-resistant clones identified in Spain in the 1980s, and it subsequently spread globally.

Methods: From July 2019 to May 2021, S. pneumoniae isolates were prospectively collected for antimicrobial susceptibility test at the Lin-Kou Chang Gung Memorial Hospital. Clonal relatedness by multilocus sequence type (MLST), penicillin-binding protein (PBP 1a:2b:2x) analysis, and whole-genome sequencing on the prevalent clone were performed for investigating resistance mechanism and assessing evolutionary relationship with historical strains.

Results: Among 242 non-repetitive isolates, serotype 23A (n=47, 19.4%) was the most common, and this was followed by serotype 3 (n=31, 12.8%), 15A (n=24, 9.9%), and 19A (n=17, 7.0%). MLST analysis showed that 76.6% (36/47) of the 23A isolates belonged to ST166. The MIC90 (MIC for 90% of the strains) values for 36 23A-ST166 isolates for penicillin, amoxicillin, and ceftriaxone were 4 mg/L, 16 mg/L, and 4 mg/L, respectively. The rate of non-susceptibility (non-meningitis criteria) to amoxicillin and ceftriaxone was 100% for the 36 23A-ST166 isolates. Among the 36 23A-ST166 isolates, the profiles of penicillin-binding proteins (PBPs) 1a, 2b, and 2x were 15:11:299 (a new PBP2x type). Whole genome sequencing of isolates of 23A-ST166 clustered these isolates together according to phylogenomic analysis. Compared to ST156, there were 29 recombination sites in ST166, including within the capsular polysaccharide (CPS) region.

Conclusions: 23A-ST166 is a capsular variant of Spain 9V-ST156 (PMEN3). Rapid genomic evolution through high rates of recombination events resulted in the eventual dominance of the ST156 lineage in response to the selective pressure exerted by the vaccine and antibiotic use.

95 **Antibiotic Resistance Rate and Serotype Replacement in Children with Pneumococcal Infection before and after PCV13 Vaccine Introduction: A Retrospective Cohort Study of a Single Center in Northern Taiwan during 2010-2020**

13價肺炎鏈球菌疫苗全面公費施打前後，對於孩童所感染肺炎鏈球菌的血清型及抗藥性差異：一個北台灣醫學中心於2010至2020的回顧性調查研究

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Background: Streptococcus pneumoniae is the main cause of many diseases in children. The literature pointed out that 13-valent conjugate pneumococcal conjugate vaccine (PCV13) has effectively reduced pneumococcal disease in many countries, particularly in invasive pneumococcal disease (IPD). However, the disease caused by the non-vaccine serotype has an increasing trend. The use of vaccine and changes in serotypes have also caused changes in the antimicrobial susceptibility. Here, we analyze the serotype distribution and antimicrobial susceptibility of Streptococcus pneumoniae infection in children before and after PCV13 introduction.
Methods: A total of 340 S. pneumoniae isolates from children younger than 18 years of age were collected from Mackay Memorial Hospital Hospital, MacKay Children's Hospital, and Hsinchu Mackay Hospital during January 1, 2010 to December 31, 2020. Each isolate has been serotyped and tested for antimicrobial susceptibility. We analyzed changes in serotype and antibiotic resistance before and after the administration of pneumococcal conjugate vaccines.
Results: Of the 340 isolates, the proportion of invasive pneumococcal disease gradually declined (34.81% - 8.79%) during the study period (p < 0.001). Serotype 19A has gradually increased since 2010 (32%), and reached a peak (76.1%) in 2012, but it has a rapid downward trend from 2013 to 2020 (4.2%) (p < 0.001). Serotype 19F has increased from 2010 (16%) to 2015 (40%), and then decreased to 2020 (12.5%) year by year (p = 0.022). Some serotypes belonging to non-PCV13 serotypes increased with the year and replaced PCV13 vaccine serotypes. The proportion of serotype 15A has increased the most since 2015 (p = 0.003), becoming the most common serotype. The second most common serotype was serotype 23A, which accounted for 0% of all samples in 2010 to 33% in 2020 (P < 0.001), followed by 15B (p = 0.042). A decrease was observed in nonsusceptible to penicillin, cefotaxime, and ceftriaxone (p < 0.001).
Conclusions: The 13-valent pneumococcal conjugate vaccine (PCV13) is highly effective in reducing IPD. Serotype 19A decreased but non-PCV13 serotypes increased instead. The development of new vaccines is a challenge for the future.

96 **Changing Susceptibility of Staphylococcus Aureus Infection in Children and Study of Methicillin-resistant Gene among Resistant Strains during Recent Years**

兒童致病金黃色葡萄球菌抗生素敏感性的近年變化及抗藥基因研究

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Background: In Taiwan, one study in 2011 showed >50% of pediatric CA S. aureus infections were MRSA. Compare to our study, the incidence of MRSA strains from the highest in 2011(56.8%) and then declined to 34.5% in 2014. The MRSA declined trend similar to previous US report, but the MRSA rate return to 44.1% in 2016. This means the MRSA in pediatric patient had dynamic change, thus epidemiology study should continuous survey.
Methods: (1) Collection and identification of Staphylococcus aureus strains (2)DNA extraction (3)Antibiotic sensitivity test (4) PVL gene detection (5) SCCmec classification
Results: From 2018 to 2020, samples from pediatric patients under the age of 18 were obtained from the Bacteria Room of the Clinical pathology Department, and 80 MRSA strains were isolated. Analyzing these 80 MRSA strains by the SCCmec types, we divided them into 20 strains of type III, 29 strains of type IV, 21 strains of type Vt., and 10 unidentified strains; a total of 50 strains belong to CA-MRSA strains, the detection of SCCmec IV strains with PVL toxin gene accounted for 34.5% (10 strains), Vt strains with PVL toxin gene accounted for 90% (19 strains). MLST genotype analysis was performed on 50 CA-MRSA strains, and the most common type was ST59 (28 strains, 56%), followed by ST45 (8 strains; 16%) and ST8 (7 strains; 14%). 50 CA-MRSA strains were subjected to pulse-field gel electrophoresis (PFGE) genotyping. Through dendrogram analysis, it is found that the ST59 type is SCCmec Vt, 4 groups (13/18 strains; 72.2%) have genetic similarities of more than 80%, forming a cluster phenomenon, and ST8 type is SCCmec IV. The high resistance of these CA-MRSAs to erythromycin and clindamycin has not changed, being 68% and 80%, respectively.
Conclusions: The sensitivity to compound TMP/SMX is high, up to 96%, which means that when treating mild to moderate CA-MRSA infections in pediatric patients, the first choice of empiric antibiotics should not include clindamycin/erythromycin. In conclusion, oral compound TMP/SMX is the main first choice.

97 **Molecular Characteristics and Clinical Features of Staphylococcus Epidermidis Bacteremia among Infants Hospitalized in Neonatal Intensive Care Unit in Northern Taiwan**

台灣新生兒加護病房院內感染表皮葡萄球菌菌血症的分生特性與臨床表現

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Background: Though coagulase-negative Staphylococcus (CoNS) were the most common pathogen of late-onset sepsis (LOS) in neonatal units in Taiwan, most studies did not distinguish the different CoNS species involved, not mentioning molecular epidemiology of CoNS. We reported the first molecular epidemiology of S. epidermidis bloodstream isolates from neonates in Taiwan.
Methods: We collected and molecularly characterized all S. epidermidis bloodstream isolates from infants hospitalized in the neonatal units of a medical center in Northern Taiwan between 2018 and 2020. Medical records of these infants were retrospectively reviewed.
Results: A total of 107 isolates identified from 78 episodes of bacteremia in 75 infants were included for analysis. Of the 78 isolates (episodes), 24 pulsotypes, 11 sequence types (ST), and 5 types of staphylococcal chromosomal cassette (types I-V) were identified; none possessed Panton-Valentine leucocidin genes. ST59 and its single locus variant ST1124 (37.2%)/ SCCmec IV comprised the most common strain, followed by ST35 (14.1%), ST2 (11.5%), and ST89 (10.3%). Comparing the infants infected with these 4 major strains, we found that the patients with underlying immune disease were associated with ST2 infection (P=0.021), and no statistically significant differences were found in terms of clinical and laboratory characteristics. All the isolates were susceptible to teicoplanin and vancomycin. The susceptibility rates to trimethoprim /sulfamethoxazole, clindamycin, erythromycin and oxacillin were 74.4%, 59%, 28.2% and 3.8%, respectively. Vancomycin was used in 64 (82.1%) infants. Persistent bacteremia was noted in 4 (5.1%) patients.
Conclusions: More than 90% of S. epidermidis bloodstream isolates from infants in neonatal units in Northern Taiwan were resistant to oxacillin. Though diverse, four major strains, namely ST59, ST35, ST2 and ST89, were identified and accounted for more than 70% of the isolates. Further surveillance should be performed.

98 **Children with Mycoplasma Pneumoniae Infection in Taiwan: Changes in Molecular Characteristics and Clinical Outcomes**

台灣兒童黴漿菌感染症之分子與臨床特徵演變

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Background: Mycoplasma pneumoniae is an pathogen that causes respiratory diseases in children. Infections caused by M. pneumoniae are usually self-limited but occasionally can be severe. We observed emerging cases of severe mycoplasma infection requiring extracorporeal membrane oxygenation (ECMO). Thus, we investigated chronological changes in the molecular features of the M. pneumoniae and its clinical impacts among the pediatric population.
Methods: From 2011 to 2019, respiratory samples were collected from patients younger than 18 years old with pneumonia in a tertiary children's hospital. Focused multiple-locus variable number of tandem repeats analysis (MLVA) typing was performed on samples positive for M. pneumoniae in 2016 and 2019. Clinical data from the patients' electronic medical records were collected. We described the annual trend of macrolide resistance and MLVA type and analyzed the associations between clinical manifestations and MLVA types.
Results: The percentage of macrolide-resistant (MLR) M. pneumoniae gradually increased from 22% (27/122) in 2015 to 70% (82/117) in 2019. Among the MLR M. pneumoniae, the predominant strain shifted from type P (31% [13/42]) to type A (40% [19/46]). The demographics, initial presentations, and clinical courses of the subjects with MLR M. pneumoniae did not differ significantly between 2011 and 2019. However, in 2019, two fulminant cases requiring venovenous ECMO were observed, which indicates that more attention to the clinical severity of MLR M. pneumoniae infections is warranted.
Conclusions: Obtaining accurate information on macrolide susceptibility is crucial for physicians to initiate appropriate antibiotic treatment in a timely fashion. Although we could not identify significant differences among mycoplasma pneumonias caused by different MLVAs over a span of 9 years, the emergence of severe mycoplasma infections requiring ECMO was a warning sign, and further monitoring was required.

99 **Association between the Respiratory Microbiota and Response to Antibiotic Therapy in Children with Macrolide-resistant Mycoplasma pneumoniae Pneumonia**
兒童感染巨環黴素產生抗藥性黴漿菌所致肺炎的抗生素治療反應與呼吸道微生物相之間的關聯性

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Background: Given the extensive clinical syndrome caused by Mycoplasma pneumoniae infection and the increasing threat of macrolide resistance, it is vital to identify the host determinants of M. pneumoniae susceptibility to develop complementary strategies against M. pneumoniae infection.
Methods: Children hospitalized with radiologically confirmed pneumonia caused by Macrolide-resistant M. pneumoniae infection (MRMP) were prospectively enrolled between 2017 and 2019. MRMP infection was diagnosed on clinical grounds, and tested by RT-PCR from oropharyngeal samplings within 48 hours after admission. We profiled and compared the respiratory microbiota composition between patients without effective treatment and those needing doxycycline through the 16S rRNA gene sequencing analysis.
Results: Among 66 children with MRMP infection, 23 children had not received macrolide treatment or gave response to macrolide (defined as without effective treatment group); 43 children needed doxycycline treatment (defined as doxycycline treatment). Patients in the group of doxycycline treatment had a significantly longer duration of total febrile days ($p < 0.001$) and total hospitalization days ($p = 0.002$) than those in the group without effective treatment. Patients with doxycycline treatment had significantly lower microbial richness, based on the Chao index ($p < 0.05$), and diversity, based on the Shannon index ($p < 0.05$), than those without effective treatment. Furthermore, patients with doxycycline had significantly different overall community composition than patients without effective treatment by principal coordinate analysis ($p < 0.01$) From the list of most relatively abundant Genera in MRMP patients without doxycycline, Catonella, Gemella, Haemophilus, Fusobacterium, Oribacterium, Johnsonella, Leptotrichia TM7x, and Solobacterium negatively correlated with total febrile days and severity score. Oribacterium and Gemella further negatively correlated with C-reactive protein.
Conclusions: These results suggest that respiratory microbiota might modulate the anti- inflammatory effects in response to M. pneumoniae infection and have important implications for treating and preventing M. pneumoniae infection.

100 **Different Clinical Characteristics between Primary and Reactivated Epstein-Barr Virus Infections in Previously Healthy Children in a Tertiary Hospital in Central Taiwan**
中台灣單一醫學中心兒童初次與再活化EB病毒感染的臨床表徵差異

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Background: Epstein-Barr virus (EBV) infection is a common disease worldwide and can range from asymptomatic to fatal illnesses. Few studies have focused on the differences in clinical manifestations of primary versus reactivated EBV infections. Our study aims to investigate the clinical characteristics of primary and reactivated EBV infections in previously healthy children.
Methods: Children with detectable plasma EBV viral loads at China Medical University Children's Hospital from January 2020 to June 2021 were retrospectively enrolled. Patients with an underlying immunocompromised condition and those who received the test without clinical symptoms were excluded from our study. They were divided into primary and reactivated infection groups according to results of EBV specific antibodies. Demographics and clinical data were collected and analyzed.
Results: A total of 63 pediatric patients were enrolled in our study. Of which, 23 patients were primary infections and 31 patients were reactivated infections. Periorbital edema ($p=0.024$), bilateral neck lymphadenopathy ($p=0.014$), exudative tonsillitis ($p < 0.001$) and splenomegaly ($p=0.048$) were found to be significantly predominant in the primary infection group. The median of viral load ($p < 0.001$), WBC ($p < 0.001$), absolute lymphocyte count ($p < 0.001$), atypical lymphocyte ($p < 0.001$), GPT ($p=0.002$)and LDH ($p=0.011$) were also found to be significantly higher in the primary infection group when compared to the reactivation group. Duration of fever ($p=0.083$) was not different between these two groups. No patients in our study suffered from complications of hemophagocytic lymphohistiocytosis during our study period. However, among the reactivated EBV infection group, three patients were diagnosed with Kikuchi-Fujimoto disease (KFD), one nasopharyngeal carcinoma (NPC), one Burkitt lymphoma, and one neuroblastoma.
Conclusions: The clinical manifestations and laboratory findings between primary and reactivated EBV infection are significantly different. Although a higher EBV viral load was detected in the primary EBV infection group, no patient suffered from NPC and Burkitt lymphoma during our study period.

101 Serostatus of Echovirus 11, CoxsackievirusB3 and Enterovirus D68 in the Cord Blood: the Implication of Severe Newborn Enterovirus Infection

臍帶血中伊科病毒11型，克沙奇病毒B3及腸病毒D68型之血清抗體與嚴重新生兒腸病毒感染之關聯性

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Background: Neonates have immature immunity and are very susceptible to infections, so neonates with enteroviruses (NBEVs) infections usually have fulminant clinical course and very high case-fatality rate. Trans-placental maternal antibody would be one of the most important origins of passive immunity against infection for them. Our aim is to investigate the serostatus of NBEVs in the cord blood and factors associated with seropositivity

Methods: We enrolled 231 parturient women currently. We underwent a questionnaire investigation and collected the cord blood sampling to measure the neutralization antibodies against echovirus 11 (E11), coxsackievirus B3 (CVB3) and enterovirus D68 (EV-D68). We also compared the serostatus and geometric mean titre (GMT) of the cord blood with those of age-matched un-pregnant women in 2017

Results: The seropositive rates were 19%, 59% and 95% for E11, CVB3 and EV-D68, respectively (p＜0.001). Analysis of the questionnaire revealed that the factors associated with E11 seropositivity were parturient women with common cold or felt uncomfortable before delivery (p = 0.04) and household children with enterovirus infection (p = 0.03). The parturient women with CVB3 seropositivity were slightly older than those who were negative (p = 0.01). Comparison with the parturient women, the seropositive rate of age-matched un-pregnant women in 2017 were 31%, 63% and 100% for E11, CVB3 and EV-D68. Both the seropositive rate and GMT of E11 in parturient women were significantly lower than that in un-pregnant women (p = 0.006), especially in groups older than 40 years old (p = 0.003)

Conclusions: The seropositive rate and GMT of E11 was low in parturient women, which made it difficult for maternal antibodies to be transferred to the newborn through the placenta and the protective effect was short. Further analysis found that E11 has not circulated in Taiwan for nearly 15 years, so quite a lot of susceptible hosts without E11 antibody accumulated in the community. Lacking specific enterovirus maternal antibody may lead to increased severe case numbers of NBEVs, especially E11, once there were more infected cases of enterovirus serotypes that are risky to the neonates in the community

102 Whole Exome Sequencing Identifies Severe Enterovirus Infection-associated Genome Variants as Potential Predictive Biomarkers

利用全外顯子定序分析建立嚴重腸病毒感染者帶有易罹病的基因點位作為預測型生物標記

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Background: Enterovirus infection is very common among pediatric population, especially in toddlers and preschool age kids. Our study is trying to find ideal biomarkers to differentiate these two groups and establish a useful predictive panel.

Methods: To identify the ideal panel, we performed whole exome sequencing (WES) of blood leukocyte genomic DNA isolated from 14 enterovirus infection cases (including four cases with serious complications) and eight controls who never get enterovirus infection before (at least 5 years old). We utilized bioinformatics analysis workflow to enrich candidate genes and variants that are significantly different between these two groups. We compared four subsets as follows: total enterovirus infection versus health control, severe infection versus health control, mild infection versus health control, severe versus mild infection. The data from Taiwan biobank 1517 cases with whole genome sequencing information was utilized as normal population filter. All the subsets were analyzed by the chi-squared test, set significance when p＜0.05, and odds ratio, set significance when the value ＞2.

Results: We analyzed these raw data from WES results to find the ideal candidate genes and variants that differentiate patients and healthy control well. The results showed no related candidate variants found among PSGL-1, SCARB2, ANXA2, and CD155. There were significant differences among variants associated with cell cycles, apoptosis and MAPK pathway.

Conclusions: This study suggests a panel of biomarkers which helps differentiate serious enterovirus infection from either mild infection or healthy control. We aim to apply this panel in the clinical practice as a part of the preventive and precision medicine.

103 **Developing Machine Learning Models to Predict Pathogens Among Hospitalized Children with Respiratory Illness**
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Background: Acute respiratory infections (ARIs) are the most common cause of pediatric hospitalization. Pathogens among pediatric ARI were mainly viruses or atypical pathogens. However, there is a wide variability in antibiotic prescription and sometimes inappropriate antibiotic use in hospitalized children with respiratory illnesses. Therefore, we aim to develop a machine learning model to predict pediatric ARI pathogens at admission.
Methods: Hospitalized patients with respiratory infections admitted to National Taiwan University Hospital between 2010 to 2018 were included into the study cohort. Clinically relevant features collected during hospitalization were selected to construct models. Models in this research were developed on logistic regression (LR), random forest (RF), gradient boosting (GB), and extreme gradient boosting (XGB) respectively since their prospective performance on clinical classification tasks. The outcome of interest is whether hospitalized patients due to respiratory illness have positive findings on common pathogens for pediatric patients in Taiwan, included influenza virus type A and B, parainfluenza virus, respiratory syncytial virus (RSV), adenovirus, and Mycoplasma pneumoniae (MP).
Results: A total of 14,171 admissions were included in our dataset. All of the models shared the same training dataset and testing dataset, which were at the ratio of 4:1. XGboost models trained with all information reached the best performance in diagnosing most of the pediatric respiratory tract infection pathogens (MP: AUROC 0.91; RSV: AUROC 0.86; adenovirus: AUROC 0.83; flu A: AUROC 0.79; parainfluenza virus: AUROC 0.78; flu B: AUROC 0.74). Feature importance analysis by SHAP values showed age was the most important feature to predict MP, RSV and parainfluenza virus infections. Epidemic patterns were more decisive for influenza virus. And C-reactive protein (CRP) had the highest SHAP value to predict adenovirus infections.
Conclusions: We developed machine learning models to predict common pathogens of pediatric respiratory tract infections. The model showed AUROC between 0.74 to 0.91 among different pathogens. The most important features in prediction included age, epidemic patterns and CRP.

104 **Mortality Prediction for Children with Pneumonia in the Intensive Care Unit Using Machine Learning Model**
以機器學習模型預測於加護病房小兒肺炎死亡風險

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Background: Community-acquired pneumonia (CAP) is one of the most common severe respiratory infections and causes of death among children in Taiwan and worldwide. The Pneumonia Severity Index (PSI) and the CURB-65 score are well-validated prognostic tools for patients with pneumonia. However, these common pneumonia scoring systems are not suitable for pediatric patients. Hence, we aimed to predict mortality for children with pneumonia using machine learning algorithms.
Methods: We obtained the electronic health records (EHRs) of PICU patients with pneumonia from the National Taiwan University Hospital-integrated Medical Database between March 2007 and December 2019. A total of 35 EHR data elements were collected within plus/minus 24 hours of the PICU admission, including sets of static features (i.e. demographics and underlying diseases) and dynamic features (i.e. vital signs and lab data). The outcome of interest was PICU mortality. An eXtreme Gradient Boosting (XGB) was applied to develop a prediction model for the mortality of children with pneumonia in the PICU, and logistic regression model was used as the baseline. A Shapley Additive exPlanations algorithms (SHAP) was applied to obtain the feature importance for explainability.
Results: A total of 1,187 unique patients with 1,504 hospitalizations and 1,615 PICU admissions were included in the final cohort. In the test dataset, the XGB model achieved better performance (AUROC, 0.883 [95% CI 0.813-0.941]) than the logistic regression models (AUROC, 0.827 [95% CI 0.605-0.868]). Cardiovascular (CV) disease, platelet (PLT), lymphocyte, genital urinary (GU) tract disease, and alanine aminotransferase (ALT) were the five most important features for the prediction of PICU mortality. If the patient had CV or GU tract disease, the presence of lower PLT, lymphocyte, or a higher ALT in the laboratory examination results would increase the predicted mortality.
Conclusions: Our XGB model showed excellent performance in predicting pneumonia mortality for pediatric patients. It would identify high-risk pediatric patients in time, promote early clinical intervention, and improve the prognosis.

105 A Practical Nomogram to Predict Urinary Tract Infections in Children less than Three Years Old
以臨床列線圖預測3歲以下孩童泌尿道感染

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Background: Urinary tract infection (UTI) is a frequent disorder of childhood, yet a better diagnostic tool is still needed for pediatricians. Our goal is to provide clinicians with an alternative method to easily diagnose urinary tract infection by finding statistically significant factors and establishing a UTI predictive model.

Methods: From December 2017 till November 2020, a total of 1531 children less than three years old have visited Taipei Mackay Children's hospital and taken both urine culture and urinalysis. We retrospectively reviewed their charts and classified the patients into UTI group and non-UTI group according to the urine culture results. Twenty-one factors including patient demographics, weight percentage, laboratory test and vesicoureteral reflux were analyzed by mixed-effects logistics regression. A stepwise selection was used to build a nomogram plot.

Results: Age, weight percentage, blood WBC count, serum c-reactive protein level, urine leukocyte count, urine nitrite and bacteria present in urine were seven significant factors for predicting UTI in children < 3 years old. ROC curve was drawn and AUC was 0.916. A nomogram plot was also made from the seven significant factors that can draw a probability of diagnosing UTI.

Conclusions: A practical nomogram for frontline doctors to predict urinary tract infections in children less than three years old was built in the study. By simply filling in the clinical data, we can formulate a probability that is more precise than using only one parameter to predict UTI in children less than three years old.

106 Risk Factors and Prevalence of mcr-1-Positive Escherichia Coli in Fecal Carriages among Community Children in Southern Taiwan
南台灣社區兒童糞便中帶原mcr-1-大腸桿菌的陽性風險因素和盛行率

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Background: Colistin is the last resort antimicrobial for treating multidrug-resistant gram-negative bacterial infections. The plasmid-mediated colistin resistance gene, mcr-1, crucially influences colistin's resistance transmission. Human fecal carriages of mcr-1-positive Escherichia coli (E. coli) were detected in many regions worldwide; however, only a few studies have focused on children.

Methods: We identified the prevalence and risk factors of mcr-1-positive E. coli in fecal carriages among community children in Southern Taiwan. In this study, 510 stool samples were collected from April 2016 to August 2019 from the pediatric department at a medical center in Southern Taiwan. These samples were collected within 3 days after admission and were all screened for the presence of the mcr-1 gene.

Results: Diet habits, travel history, pet contact, and medical history were also obtained from participants to analyze the risk factors of their fecal carriages to mcr-1-positive E. coli. Antimicrobial susceptibility testing was determined using the VITEK 2 system and the broth microdilution test. Twelve mcr-1-positive E. coli. were isolated from 2.4% of the fecal samples. Through multivariate analysis, frequent chicken consumption (at least 3 times per week) had a significantly positive association with the presence of mcr-1-positive E. coli in fecal carriages (adjust odds ratio 6.60, 95% confidence interval1.58– 27.62, p = 0.033). Additionally, multidrug resistance was more common in mcr-1-positive E. coli.(75.0% vs. 39.5%, p = 0.031) than in non-mcr-1-positiveEscherichia coli. Furthermore, the percentage of extraintestinal pathogenic E. coli in mcr-1-positive isolates was 83.3%. Some multi-locus sequence types in our mcr-1-positive E. coli were also similar to those isolated from food animals in the literature.

Conclusions: The prevalence of fecal carriages of mcr-1-positive E. coli was low among community children in Southern Taiwan. Our data shows that chicken consumption with a higher frequency increases the risk of mcr-1-positive E. coli.in fecal carriages.

107 Clinical and Epidemiological Characteristics of Young Infant Fever in Children in Southern Taiwan
南台灣新生兒發燒之臨床及流行病學特徵

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Background: Fever in young infants has been a great challenge due to differentiating severe bacterial infections in this age population. Despite dramatic reductions in the rates of bacteremia and meningitis recently, the febrile illness in young infants still raises concerns with potentially serious consequences. This study investigated the clinical characteristics of young infant fever and its associated causative reason.

Methods: We retrospectively searched the electronic medical record in National Cheng Kung University Hospital to enroll infants aged under 90 days hospitalized due to febrile illness

from Jan to Dec 2019. Exclusion criteria included fever at birth, nosocomial infection, or premature infants with corrected age over 90 days. The demographic and clinical information were retrieved for analysis.

Results: A total of 136 infants with febrile illness were enrolled during the study period. The mean age was 54.5±31.2-day-old with a male proportion of 56%. Only 66.2% of the cases had specific clinical diagnoses when discharged. Most common diagnosis is urinary tract infections (UTIs, 29%), followed by respiratory tract infections (RTIs, 27.9%), meningitis (3.6%) and acute gastroenteritis (1.4%). The most common pathogen identified were RSV (34.2%) and influenza A (13.1%) in RTIs, and E.coli (50%) and Enterococcus faecalis (15%) in n UTIs. Five meningitis cases were identified, but only one with pathogen isolated (Streptococcus agalactiae). There are 2 cases of bacteremia, one is S. agalactiae, and the other is Enterococcus faecalis. Still, a majority of cases (33.8%) were discharged without specific focus or causative pathogen. The mean hospitalization days were 5.2 days and 2.9% of patients required intensive care.

Conclusions: UTIs and URIs were two most common causes of young infant fever. Urinalysis and urine culture are still mandatory for infants with fever regardless of other symptoms. Although bacteremia and meningitis are relatively uncommon, early recognition and treatment are still crucial for overall outcome.

108 Assessment of Infectious Disease and Kawasaki Disease in Children during the COVID-19 Pandemic: A Children's Hospital-based Study and Time-series-analysis

COVID-19流行期間兒童感染症和川崎病的評估：基於兒童醫院的研究和時間序列分析

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Background: Under an outbreak of SARS-CoV-2, the state of emergency and admission rate dramatically declined in Taiwan, especially in pediatrics and contact-transmitted infection. However, the relation between Kawasaki disease and contact-transmitted infection were not determined. Nationwide level 2 alert began on May 11 2021, and associated regulation was promulgated. As the isolated regulation for febrile patients who need admission, we were more aggressive on collecting lab data and arranging examinations to rule out COVID-19 and check the cause of fever than before. We noted the incidence of Kawasaki disease was not declining compared with other infectious diseases.

Methods: To assess the incidence of Kawasaki disease under isolated regulation, the retrospective study was conducted from Jun 2018 to Oct 2021 at Changhua Christian Children's Hospital. Pediatric patients who were diagnosed with Kawasaki disease and treated by IVIG were included. Participants were collected by our initial hospital database and

clinical gather which hadn't been updated to the database.

Results: The study participants included 202 patients who were diagnosed with Kawasaki disease under American Heart Association guidelines in 2017. The number of admissions for Kawasaki disease showed no significant decline after isolated regulation from May to October in 2021 vs the same months since 2018. However, thirteen patients were diagnosed after Nationwide level 2 alert, and none of them was typical Kawasaki disease.

Conclusions: In this study, we arranged more aggressive examinations for those febrile patients due to isolated regulation even when they hadn't had a fever up to 5 days. Much atypical Kawasaki disease was diagnosed under the condition, and they could have the defined diagnosis earlier than before. During the state of COVID-19 episode, the initial reason for fever was important, so arranging cardiac sonography earlier for those potential Kawasaki disease patients was suggested.

109 Parents' and Pediatric Intentions and Perceptions About Children COVID-19 Vaccines

父母和兒童對於兒童COVID-19疫苗的意願與看法

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Background: The impact of coronavirus disease 2019 (COVID-19) has been enormous worldwide, and high rates of vaccination is crucial to control the pandemic. In September 2021, Taiwan government has planned to recommend the first dose of COVID-19 vaccine to children aged 12 to 17. Our study aimed to investigate parental acceptability of COVID-19 vaccination for their children, factors affecting their acceptability, and children's perceptions of the vaccines.

Methods: A questionnaire survey was conducted at one regional hospital from September to November 2021. Subjects were parents having children under 18 years and children aged 10–17 years. The questionnaire for parents and children consisted of questions on regarding their intent to have a children COVID-19 vaccine, perceptions of COVID-19 vaccines for children, and trust in sources of information about COVID-19 vaccines. Descriptive and multivariate analyses were used to evaluate parental and pediatric intent to COVID-19 vaccine.

Results: One hundred twenty-three parents and 59 children were included. Altogether, 74% of parents and 69.5% of children responded think children should receive a COVID-19 vaccine. As for the intention, 82.1% of parents and 81.4% of children responded intended to have their children and themselves vaccinated, respectively. The stated likelihood of child vaccination was greater among parents of higher education level (p=0.068), who had positive attitudes towards COVID-19 vaccines (p＜0.001) and who had confidence on vaccine safety (p＜0.01). For children, the likelihood of vaccination was greater among children who have family diagnosed with COVID-19 (p＜0.01) or in quarantine (p＜0.01). However, no predict factor associated with positive

intention to vaccinate their children was identified. The child's doctor is the key trusted source of information about COVID-19 vaccines for 91% of parents and 93% of children. **Conclusions:** This study provides insight into how parents and children aged 10–17 think about the COVID-19 vaccine for children in Taiwan. Both parents and children have high intention to children COVID-19 vaccination. Pediatric healthcare providers play a major role in promoting COVID-19 vaccination for children.

110　Experience of Caring for Children with SARS-CoV-2 Infection during COVID-19 Pandemic in Northern Taiwan : from Quarantine Facility to Referral Hospital

COVID-19大流行期間北臺灣SARS-CoV-2感染兒童之照顧經驗—從檢疫所到後送專責醫院

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Background: During the outbreak of coronavirus disease 2019 (COVID-19) pandemic in northern Taiwan, some quarantine facilities were assigned to isolate and care for patients infected with SARS-CoV-2. There were limited experiences about caring for children with COVID-19 in the quarantine facilities and referral hospitals.
Methods: A retrospective study was conducted to collect demographical data of children with COVID-19 contacts at a quarantine facility and its referral hospital. The clinical manifestations, cycle threshold (Ct) value of rRT-PCR of SARS-CoV-2 and treatment course of children with confirmed COVID-19 were also analyzed.
Results: A total of 117 children with COVID-19 contacts were isolated with their caregivers to Xindian quarantine facility or Taipei Tzu-Chi Hospital from 15th May to 29th July 2021. Of these, 104 children (88.9%) were tested positive for SARS-CoV-2 by rRT-PCR. 12 of 91 children at the quarantine facility were transferred to the referral hospital (referral rate 13.2%). The mean duration of isolation or admission of children with COVID-19 was 11 days (4-21 days). 10 of 17 children (58.8%) with an initial negative rRT-PCR retested positive 7 to 26 days later. The age of children with COVID-19 ranged from 2 to 213 months old (mean 97 months old) and female gender was 55.8%. Only 40 children (39%) presented with COVID-19 associated symptoms, including cough (50%), stuffy nose or rhinorrhea (47.5%) and fever (30%). 15% children with COVID-19 had only gastrointestinal symptoms. All children with COVID-19 had mild disease, and only 5 children (4.8%) received intravenous hydration or antibiotics. However, the Ct values of asymptomatic children were similar to those of symptomatic children (mean Ct value 25.3 and 23.3, respectively; p=0.135).
Conclusions: Quarantine facility for caring of children with COVID-19 was practical because a large majority of children with COVID-19 were asymptomatic or had only mild disease.

However, regardless of symptoms, children with COVID-19 might have high viral load. The policy to isolate children with household contact history at the quarantine facility would play a role in control of community transmissions during COVID-19 pandemic.

111　The Changes after Switching from rFVIII Prophylaxis to rFVIII-Fc Prophylaxis in Bleeding Outcomes, Weekly Factor Doses, and Annualized Factor Costs between Children and Adults with Severe-type Hemophilia A in Taiwan

台灣兒童與成人之重度A型血友病患從傳統第八因子rFVIII預防性治療轉換至長效第八因子rFVIII-Fc預防性治療之後，出血頻率，每週劑量，和年度化第八因子藥費的改變

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Background: Conventional rFVIII had been used in patients with hemophilia A (PwHA) for prophylaxis therapy (PT) for years. Switching to extended half-life rFVIII-Fc had been available in Taiwan since 2018. We aimed to made a pre-switch and post-switch comparison for bleeding outcomes, weekly doses (WD), and annualized factor costs (AFC) between pediatric and adult PwHA on pre-switch and post-switch PT in Taiwan.
Methods: Totally 32 severe-type PwHA on PT with pre-switch rFVIII and with post-switch rFVIII-Fc, were enrolled from two hemophilia centers during Nov, 2018－July, 2019. The charts, including bleeding records, were retrospective reviewed. Annualized bleeding/joint-bleeding rate (ABR/AJBR), WD, and AFC were obtained with pre-switch 12 months and post-switch at least ＞6-month period until July, 2020.
Results: There were 8 boys and 24 adults. Median age when switching was 33 years(8–64). Between boys and adults, there were no significant difference in pre-switch ABR, AJBR, and WD, and in post-switch ABR, AJBR, and WD, but adults had markedly higher pre-switch and post-switch AFC than

children. By within-patient analysis before and after switching, median ABR was reduced from 3 to 1.35 for boys and from 5 to 1.35 for adults (p＜0.01). Median AJBR was reduced from 3 to 1.35 for boys and from 4 to 1.15 for adults (p＜0.01). Median WD was increased from 58.8 to 87.85 IU/kg/wk for boys and from 58.3 to 83.85 IU/kg/wk for adults. Median AFC was increased from 4104225 to 4419800 NTD for boys and from 5879025 to 6024916 NTD for adults. The proportion of zero ABR increased from 12.5% (1/8) to 25% (2/8) for boys and from 8.3% (2/24) to 25% (6/24) for adults. The proportion of zero AJBR increased from 12.5% (1/8) to 25% (2/8) for boys and from 16.7% (4/24) to 37.5% (9/24) for adults.

Conclusions: In both pediatric and adult PwHA, after switching from rFVIII prophylaxis to rFVIII-Fc prophylaxis, reduction in ABR and AJBR, increasing in WD and AFC, and elevated proportions in zero ABR and zero AJBR were evident. Pre-switch bleeding outcomes in adults was more severe than that in children, but improvement after switching in adults was more evident than that in children.

112 Real-world Experience of Entended Half-life Clotting Factors in Patients with Severe Hemophilia A
重度A型血友病患者長效凝血因子的真實世界經驗

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Background: Aggressive prevention and treatment of bleeding episodes can improve the quality of life of patients with severe hemophilia A. Extended half-life (EHL) products have longer half-lives and less frequent injections than standard half-life (SHL) products. Here we report the real-world experience of EHL product in MacKay Children's Hospital.

Methods: Patients with severe hemophilia A were enrolled in the retrospective study. The clotting factor was switched from SHL to EHL product since November 2019. The peak and trough level of factor VIII were obtained for PK study. The PK tools including WAPPS-Hemo and MyPKFiT were performed. Personalized APPs were introduced for treatment diary of patients. The bleeding records including annual bleeding rate (ABR), annual joint bleeding rate (AJBR), annual spontaneous bleeding rate (ASBR), target joints and zero bleeding rate were reviewed.

Results: There were 20 patients with severe hemophilia A enrolled. The median age was 23 years old (4~33). Eighteen received prophylactic and two received on-demand anti-hemophilic treatment, respectively. The PK study was performed in 15 patients. The PK results of the two PK tools had good correlation (R2=0.988). Personalized treatment was tailored according to PK data. Fifteen patients used personalized APPs for treatment management. Significant reductions in ABR (p=0.002), AJBR(p=0.035) and ASBR(p=0.049) were observed after switching to EHL, while zero bleeding rate increased (p=0.002).

Conclusions: Based on the application of EHL, PK tools and personalized APPs, we expect to optimize the individualized

treatment of hemophilia. Patients are willing to switch from on-demand to prophylactic treatment and have better life quality and minimize the bleeding events.

113 A Pilot Study of Carboplatin-Based Chemotherapy for Intracranial Germ Cell Tumor- Preliminary Report Focused on the Response to Chemotherapy
以卡鉑為基礎的顱內生殖細胞腫瘤化療的初步研究—聚焦化療反應的初步報告

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Background: To report treatment response to carboplatin-based chemotherapy for pediatric intracranial germ cell tumors (icGCT), including analysis the changes in tumor size and tumor markers

Methods: From June 1, 2020 to December 31, 2021, 7 children with icGCT were treated at Mackay Children's Hospital. Risk stratifications of icGCT were according to the Japanese classification. Upfront surgical resection was performed for children with intermediate and poor prognosis icGCT and followed by chemotherapy. Two chemotherapeutic regimens, JEB (carboplatin, etoposide, bleomycin) for good prognosis and CARE/IE (carboplatin, etoposide/ifosfamide, etoposide) for intermediate and poor prognosis icGCT, were used. Reduced dose of cranioirradiation were employed to good and intermediate prognosis patients. Serum tumor markers, alpha fetoprotein or beta HCG, were examined at least every two weeks during treatment. MRI imaging was performed within a week after surgery and after 4 courses of chemotherapy to evaluate the change in tumor size.

Results: In this pilot study, there were 4 boys and 3 girls. The median age was 13 years old (range, 8-18 years). A total of 11 involving lesions among 7 patients, and the most involved sites were in the suprasellar region (5/11, 45%), followed by pineal region (4/11, 36%). In histopathological classification, germinoma, mixed germ cell tumor, choriocarcinoma were 4, 2, and 1 patient, respectively. There were 3 patients with good prognosis, while intermediate prognosis and poor prognosis 2 patients respectively. All patients' serum tumor markers returned to normal values after 1-2 courses of chemotherapy, regardless of whether they received upfront surgery. After 4 courses of chemotherapy, all 11 involving tumor lesions were found to have reduction size, with a median reduction ratio of 72% (range, 10-100%).

Conclusions: In combination with upfront surgery, carboplatin-based chemotherapy may provide an effective treatment for children with icGCT.

114 An Ex Vivo Expansion System of Circulating Tumor Cells for Pediatric Gliomas
以體外擴增循環腫瘤細胞培養系統探討兒童膠質瘤藥物治療反應

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Background: Glioma is the most common type of pediatric brain tumors. Although a subset of gliomas can be cured with surgery with/without radiotherapy, the role of pharmacotherapy is debatable and there is no reliable tool to predict treatment response. We hypothesize that the ex vivo expansion of circulating tumor cells (CTCs) recapitulates treatment response in vitro.

Methods: Patients aged 0-21 years with gliomas were enrolled. Peripheral blood mononuclear cells was processed with RBC lyzed to expand CTCs in a microfluidic cell culture system (EVASelect, Cancer Free Biotech Ltd., Taipei, Taiwan) in 6 weeks. Cell clusters were identified, equally aliquoted and treated with selected drugs from a chemical library of compounds.

Results: We successfully cultured and expanded CTCs from 12 out of 16 patients with pediatric gliomas. Comparing the results among low-grade glioma (LGG; n = 4), diffuse midline glioma (DMG; n = 3), and high-grade glioma (HGG, n = 5; including glioblastoma multiforme [GBM; n = 3]), the sensitivity to temozolomide was similarly poor across the three tumor types (mean ± standard deviation, LGG vs. DMG vs. HGG = 65.4±30.1 vs. 62.3±9.8 vs. 58.9±26.4, respectively; P = 0.75 by t test comparing LGG vs. DMG/HGG), probably reflecting a patient population enriched with relapsed/refractory gliomas upon enrollment. Notably, 4 of 4 patients in the LGG group showed good (CTC viability <

20%, n = 3) or moderate (CTC viability = 20–29%; n = 4) sensitivity to at least one chemotherapeutic agents tested, highlighting the usefulness of low-toxicity chemotherapy regimens to control tumor growth and maintain quality of life in LGG. In DMG and HGG/GBM, histone deacetylase inhibitors and a subset of tyrosine kinase inhibitors showed good-to-moderate sensitivity.

Conclusions: An ex vivo CTC expansion system recapitulates drug sensitivity of pediatric gliomas in vitro that might be useful in predicting clinical treatment responses.

115 Outcome and Prognosis Factor of Malignant Testicular Germ Cell Tumors in Children: a Report from the Taiwan Pediatric Oncology Group
台灣兒童惡性睪丸生殖細胞瘤之結果與預後因子，台灣兒童癌症研究群報告

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Background: Primary testicular germ cell tumors (GCTs) are rare pediatric neoplasm and their outcome are better than GCTs of other sites. We aimed to review the patients' outcome and prognosis factors in Taiwan.

Methods: Retrospective collected data of children with malignant extracranial GCT registered to Taiwan Pediatric Oncology Group (TPOG) from January 1, 2005 to December 31, 2019 were investigated to identify the relationship between disease outcome and clinical character and treatment modality.

Results: 72 pediatric patients were included in TPOG with a median of 2.02 years(range 0.36-17.55) and 49 patients(68%) were prepubertal. The medium serum alpha-fetoprotein was 2170 ng/ml(2.74-725600). The 5-year overall survival (OS) and event free survival (EFS) were 94.4±2% and 92±2%. The

survival according to stage: I- 94.6%; II and III- 100%; IV-90%. Characteristics of prepubertal and 11+years patients include: age (49 and 23, p=0.584), stage I (46 and 10, 91.8% and 43.4%, p＜0.001), pure YST (91.8% and 13%, p＜0.001). Most patient (69/72,94.4%) received primary total resection. In 56 Stage I patients, 18 patients (32%) received adjuvant chemotheraphy (≥2 course) with BEP or JEB protocol.

Conclusions: Strong unfavorable clinical characters include stage I diagnosed at older age (＞11 y/o), and histology of yolk sac tumor. Non-significant poor outcome was associated with lesion site and adjuvant chemothepeutic agent use. For choice of initial chemotherapy regimen, low-toxicity chemotherapy with JEB should be considered as an presfer treatment option in children with malignant testicular GCTs rather than cisplatin based regimen.

116 The Risk Factors and Treatment of Osteonecrosis in Children with Acute Lymphoblastic Leukemia
急性淋巴性白血病兒童罹壞骨骼壞死之可能風險因子與治療方式

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Background: Acute lymphoblastic leukemia (ALL) is the most common malignancy in children. Under appropriate treatment with modern therapies, most ALL patients can be cured and have high long-term survival rates. Osteonecrosis(ON) is a major adverse effect of current anti-leukemic treatment, which seriously affects the quality of life. The risk factors and treatments have been investigated in the past studies, but the result remains controversial.

Methods: The patients with ON, who were diagnosed for the first time and received the TPOG-ALL-2013 regimen, from MacKay Children's Hospital were enrolled in the study. The records of chemotherapy, disease response, vitamin D level, bone mineral density (BMD), image, the timing and treatment of ON were reviewed retrospectively. We reviewed the literature on the discussion of risk factors and treatment, and compared them with our data.

Results: Eleven patients (10 ALL and 1 lymphoblastic lymphoma) with symptomatic ON were enrolled. Male to female was 5/6. The median age at diagnosis was 12.7-year-old, of which nine patients were over 10. Ten patients had ON during continuation therapy, and one after completing chemotherapy. Five patients had vitamin D deficiency. Nine patients had decreased BMD, and seven of them had clinically important low BMD (Z-score ＜-2.0). All of the patients received medical treatment, including denosumab, alendronic acid and vitamin D supplements. Only one patient used a back brace due to severe pain. None of the patients underwent surgery.

Conclusions: Known risk factors for ON include female, 10 to 20 years old, hyperlipidemia and use of corticosteroids. There are raising concern over the association between low BMD and ON. There is no data to suggest that vitamin D deficiency is a risk factor. The risk of progression determines further treatment. Corticosteroid adjustment and activity

restriction are still the first-line treatment. Pharmacologic approaches include bisphosphonate, alendronic acid, statins, etc. The role of denosumab is currently unclear. Surgical interventions are more commonly used in patients with larger lesions.

117 Early Allogeneic Transplantation in First Complete Remission Favorably Influences the Outcome of Pediatric Acute Myeloid Leukemia — A Single Institutional Study
首次完全緩解的早期異體造血幹細胞移植對小兒急性骨髓性白血病的預後有積極影響——一項單一的機構研究

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Background: The aggressive biology of acute myeloid leukemia (AML) typically dictates a trimodality approach of chemotherapy, targeted therapy, and allogeneic hematopoietic cell transplantation (alloHSCT). However, though there had been pediatric AML cases successfully treated with HSCT after remission, the indication and timing for alloHSCT remain no consensus due to its potential underlying risk. The goal of this study is mainly to determine the favorable outcome of the pediatric AML patients who received alloHSCT earlier in CR1.

Methods: To examine the impact of HSCT timing in CR1 or CR2 on overall survival (OS) and disease-free survival (DFS), we retrospectively reviewed 44 pediatric AML patients (except AML-M3) who underwent alloHSCT either in CR1 or CR2 between December 1998 and June 2021 with diagnosed age under 18. MSD alloHSCT was scheduled in CR1 for intermediate-risk or adverse-risk AML and HLA-matched unrelated or haploidentical alloHCT for CR2 status or adverse-risk AML without a suitable sibling donor. Studies that assessed OS or DFS by MRD status in patients with AML were included.

Results: There were 33 and 11 patients who received alloHSCT in CR1 and CR2. The median time between diagnosis and transplant was 6.8 months (range, 1.4 - 32.3 months). With a median follow-up after alloHSCT of 63.2 months (range, 0.3 to 272 months), the probability of 5-year OS and 5-year DFS in the CR1 group was 83.7% and 83.5%, respectively. However, the CR2 group presented 54.5% in 5-year OS and 5-year DFS. There was a statistically significant difference between the CR1 and CR2 groups in OS and DFS, with p-value 0.02 and 0.008, respectively.

Conclusions: Though this single-institutional study involved a relatively small number of cases, receiving alloHSCT in CR1 with favorable outcome were still observed. Moreover, we found that risk stratification based on chromosomal and molecular features absolutely cannot be the only criteria to

define clinical conditions and receive alloHSCT or not. We are anticipated to investigate further the issues about alloHSCT with more cases and longer follow-up time for the studies in the future.

118 Peripheral Blood Stem Cell Harvesting in Young Children Less than 15 Kilograms
在小於15公斤的幼兒採集周邊血幹細胞

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Background: Autologous peripheral blood stem(PBSC) cell transplantation plays an important role in pediatric cancer treatment. For some malignancy, tadam transplant has shown some additional benefit. Collecting PBSC in this group of patient is challenging due to younger age and lower body weight.
Methods: From April 2006 to August 2021, 129 collections were performed in total 40 patients under 15kg, who were diagnosed with atypical teratoid/rhabdoid tumor(ATRT), medulloblastoma, primitive neuroectermal tumor(PNET)/ Ewing sarcoma, neuroblastoma, hepatoblastoma, mixed germ cell tumor, etc. The numbers of hematopoietic cells(HPC) in peripheral blood were yielded before collection. Priming with packed RBC was used in all patients. An arterial line or a central venous catheter, or a double lumen catheter was inserted for blood collection. Continuous calcium infusion was performed routinely. Sedation was given if the patients could not cooperate. The collection would perform on 2 or 3 consecutive days aiming to collect sufficient stem cell for tadam or single transplant according to the disease of the patient.
Results: The median age and weight of the patients is 1.93(0.58~5.58) years and 10.95(6.63~14.7) kilograms. The median number of CD34+ cells collected in each apheresis is 4.2 x106(0.006~40.13)/kg. In 60.5% apheresis, the goal of 2x 106 CD34+ cells per kilogram is achieved. No severe complication except 1 extravasation of calcium chloride happened.
Conclusions: PBCS collection in patients under 15 kilograms in 2 or 3 consecutive days is a feasible and safe to collect stem cells for either single or tadam transplant.

119 Death within 1 Month of Diagnosis in Childhood Cancer: an Analysis of the Risk Factors and Scope of the Problem in a Single Institution
一個醫學中心二十一年回溯性研究：兒童癌症病人診斷後一個月內死亡原因分析

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Background: Despite the care in childhood cancer has improved much, some patients die soon after diagnosis. Better understanding of risk factors for early death and scope of the problem is needed to improve the survival rate.
Methods: We retrieved data from Taiwan Pediatric Oncology Group registries on 851 patients aged 0 to 18 years old diagnosed with cancer from January 1, 2001 to December 31, 2021 in the Pediatric Hematology and Oncology Department in Kaohsiung Chang Gung Memorial Hospital. Early cancer death was defined as death within 1 month of cancer diagnosis. We reviewed the causes of death, age at cancer diagnosis, gender and time period of cancer diagnosis (divided into two time periods: January 1, 2001 to December 31, 2010 and January 1, 2011 to December 31, 2021), trying to find the risk factors of early childhood cancer death.
Results: 200 cases fulfilled the inclusion criteria of the study and 16 cases met the criteria of early death. Diagnosis at age younger than 1 year old, hematologic malignancies, and diagnosis before December 31, 2010 were predictors of early death by comparing the early death and non-early death groups. Among the 16 cases of the early death group, hematologic malignancies accounted for the most common cancer diagnosis (7 leukemia, 3 lymphoma), followed by solid tumors (2 hepatocelluar carcinoma, 1 neuroblastoma, 1 sarcoma) and brain tumors (2 brain tumors). 7 of the 16 cases died without treatment. The most common cause of death was rapid tumor progression, followed by infection and operation complication. Of the 16 cases of the early death group, 13 cases died of rapid disease progression. Besides, 10 of the 13 cases died of rapid disease progression died of bleeding events, with 2 of 10 due to tumor rupture and 8 of 10 due to intracranial bleeding. Notably, 7 of the 8 cases died of intracranial bleeding was diagnosed to have hematologic malignancies (6 leukemia, 1 lymphoma).
Conclusions: Risk factors for early death in childhood cancer include diagnostic age younger than 1 year old, hematologic malignancies and diagnosis earlier in the study period. Bleeding events account for the leading cause of death in children died within one month of cancer diagnosis.

120 **Klippel-Trenaunay Syndrome with Visceral Involvement and Consumptive Coagulopathy: A Multidisciplinary Team Approach**

Klippel-Trenaunay症候群合併內臟侵犯及消耗性凝血病變：跨領域團隊治療

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Background: Klippel-Trenaunay syndrome (KTS) is a rare vascular malformation syndrome featured by vascular stain & hypertrophy of the affected limb with varying involvement of vessels. Compared to Kasabach-Merritt syndrome (KMS) with platelet trapping lead to DIC. Distortion of the vascular bed in KTS results in consumptive coagulopathy. We present the clinical challenges and multidisciplinary team care in patients with KTS.
Methods: Records of patients with KTS were reviewed. Treatment response of vascular tumors was evaluated by comparing the product of the maximal perpendicular diameters.
Results: Case 1 is an 8-year-old girl with KTS of left lower limb with pelvic invasion. She suffered from anemia, and gait disturbance and had received LASER therapy for 4 times since the age of 5 years. At 8 years of age, she developed cellulitis of the left lower limb with septic shock, & coagulopathy and had been bed-ridden for 2 months. After multiple wound debridement and infection control, she began therapy with sirolimus, propranolol, aspirin, elastic sock, & rehabilitation program. She could walk at 6 weeks after initiation of medication. Follow-up imaging showed minor response of vascular tumors. Case 2 was a 34-year-old woman with KTS of the left lower limb diagnosed at early childhood. Due to hemostasis with severe anemia, she was amputated above the left knee at the age of 21. Imaging revealed vascular malformations invading the uterus, liver, and spleen. Warfarin, tranexamic acid, leuprorelin acetate, & ergometrine were used for more than 4 years to control uterine bleeding and coagulopathy. Low-molecular-weight heparin had transient effect on bleeding episodes. For tumor progression with severe uterine bleeding, she began sirolimus &

received radiotherapy to the uterus & rectum. Her symptoms had significantly improved since 2 months after therapy. Follow-up imaging showed partial response of vascular tumors within and outside of the radiotherapy field.
Conclusions: Hemorrhagic and infectious complications of KTS with visceral involvement can be managed and prevented by sirolimus, radiotherapy, rehabilitation through a multidisciplinary team approach.

121 **Plasma Cytokines Associated with Anti-N-Methyl-D-Aspartic Acid-Receptor Encephalitis: Potential Biomarkers for Blood Brain Barrier Disruption**

抗N-NMDAR受體腦炎相關的血漿細胞因子：血腦屏障破壞的潛在生物標誌

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Background: Neuroinflammatory condition is thought to play a crucial role in encephalitic syndrome, such as antibody – mediated autoimmune encephalitis and febrile infection–related epilepsy syndrome (FIRES). Previous studies have demonstrated a prominent elevation of Th1 cytokines in FIRES. However, the cytokine changes of anti-NMDAR encephalitis have not yet been elucidated. The aim of the current study is to test the cytokines in the serum of the patients with anti-NMDAR encephalitis before and after treatment.
Methods: We prospectively enrolled patients with active encephalitis and presence of anti-NMDAR autoantibodies in the serum (anti-NMDAR encephalitis) from 2011-2017. At the same time period, we also recruited 2 comparative groups: (1) Patients with FIRES. (2) Patients with intractable epilepsy without evidence of active encephalitis received ketogenic diet. All the serum samples of encephalitic patients were examined at diagnosis of encephalitis and after treatment. We assessed 18 serum cytokines in the paired samples of all subjects. The primary outcome was to analyze the cytokine changes before and after treatment in each group.
Results: 42 patients were studied, including 17 patients with anti-NMDAR encephalitis, 13 with FIRES, and 12 with intractable seizures without active encephalitis. We found different patterns of cytokine evolution in the 3 groups. In anti-NMDAR encephalitis group, intercellular adhesion molecule-1 and vascular cell adhesion molecule-1 were increased after treatment. In FIRES group, t-PA was decreased after treatment. Among intractable epilepsy group undergoing ketogenic diet, Interleukin 10 were elevated after treatment.
Conclusions: This study used paired serum to compare cytokine changes in 3 different conditions and results showed that the pathogenesis of the 3 diseases may be different. In anti-NMDAR encephalitis, endothelial adhesion molecules (ICAM-1 and VCAM-1) changes is the cardinal finding in the paired samples. Both ICAM-1 and VCAM-1 facilitate leukocytes to migrate across the Blood Brain Barrier (BBB).

Hence, ICAM-1 and VCAM-1 with a role of inflammatory cell trafficking across the BBB might play a role in anti-NMDAR encephalitis.

122 First Serum Glucose Level in Neonatal Hypoxic-ischemic Encephalopathy is Correlated with the Neurodevelopmental Outcomes

新生兒缺氧窒息性腦病變：血糖與神經預後的關係

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Background: To analyze the relationship between first serum blood glucose levels and outcomes in neonatal hypoxic-ischemic encephalopathy (HIE).
Methods: The clinical staging of neonatal HIE, brain magnetic resonance imaging (MRI) findings, as well as hearing and neurodevelopmental outcomes at 1 year were correlated with the first glucose level in 74 patients. These patients were divided, based on the first glucose level, into group 1 ($>$ 0 mg/dL and $<$ 60 mg/dL, n =11), group 2 ($\geq$ 60 mg/dL and $<$ 150 mg/dL, n = 49), and group 3 ($\geq$150 mg/dL, n = 14).
Results: Abnormal glucose levels had poor outcomes among three groups in terms of the clinical stage (P= 0.001), brain parenchymal lesion (P = 0.004), and neurodevelopmental outcomes (P = 0.029). The hearing outcome was worse in group 3 than in group 1 (P = 0.062). MRI findings of group 1 showed that one (9.1%) in 11 cases exhibited thalamus and basal ganglion lesions compared to group 3 where 9 (64.3 %) from 14 had thalamus and basal ganglion lesions (P = 0.012).
Conclusions: The first blood glucose level in neonatal HIE is an important biomarker for clinical staging, MRI findings, as well as hearing and neurodevelopment outcomes. Hyperglycemic patients had a higher odds ratio for thalamus, basal ganglia, and brain stem lesions than hypoglycemic patients with white matter and focal ischemic injury. Hyperglycemia may be due to prolonged or intermittent hypoxia and may present with poor outcomes due to involvement of the thalamus and basal ganglia.

123 Prognosis of Neuropsychological Development in Patient with Agenesis of Corpus Callosum

胼胝體發育缺失患者的行為發展

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Background: Neurodevelopmental outcome for individuals with callosal abnormalities is variable. The advances in imaging techniques led detection rate increased and more earlier and makes counseling for the individuals with agenesis of corpus callosum (ACC) challenging especially in prenatal periods.
Methods: This study reviewed the basic data, clinical condition for imaging, and the further study such as electroencephalogram and psychodevelopmental test in eight individuals with agenesis of corpus callosum.
Results: In these eights patients, six patient was diagnosed ACC accidentally while performing prenatal, perinatal brain image. Two of six had clinical significant issue; one with borderline WISC-IV FSIQ and also diagnosed ADHD and preterm labor, another one had seizure episode and Rt limbs clumsy with EEG showed Intermittent L't C-F spikes, and image also revealed left side parasagittal lobulated cystic lesion. In the remaining two patients, one was presented with VSD plused failure to thrive, limbs spasticity, opisthotonus posture at 5month old and diagnosed trisomy 8; one was presented at clinic due to mental retardation and trice seizure episodes in a week.
Conclusions: The clinical outcome of ACC have great variation from asymptomatic to seizure, mental retardation or syndromic disease with other organ malformation. Advanced neuroimage let the diagnosis of ACC more common even in prenatal period. Further studies designed for predicting neurodevelopmental outcome especially in those individuals with isolated ACC as perinatal periods are needed.

124 Facioscapulohumeral Muscular Dystrophy in a Tertiary Hospital in Southern Taiwan

南臺灣單一醫學中心面肩胛肱肌失養症之分析

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Background: Facioscapulohumeral muscular dystrophy (FSHD) is an autosomal dominant disease which causes progressive asymmetric weakness mainly in facial, scapulohumeral muscles and dorsiflexors of the ankle. This study aims to analyze the clinical and genetic features of FSHD patients in a referral center for neuromuscular diseases.
Methods: We reviewed the medical records of FSHD patients whose diagnosis were confirmed by southern blot analysis from 2008 to 2021 in Kaohsiung Medical University Hospital. Sixty-five patients were enrolled.
Results: In our study, there are nine FSHD families (total 29 family members) and 36 sporadic patients. Mean follow-up duration was 4.7 years. The mean age of symptom onset was 14.8 ±10 years old (n=34). Seven patients are early-onset FSHD. Eight patients have hearing impairment and seven have tortuous retinal arteries. 21 patients have developed

restrictive lung disease. The number of patients for 1, 2, 3, 4, 5, and 6 D4Z4 repeats was 5, 10, 10, 7, 16, and 12, respectively; one patient had borderline fragment size (8-10 D4Z4 repeats) and 4 patients from two families had compound heterozygous truncated D4Z4 repeats. There is moderate positive correlation between D4Z4 repeat number and onset age ($r= 0.55$).

Conclusions: Our study investigated characters of Taiwanese FSHD patients. Compared with previous study, our patient had same median onset age but lower D4Z4 repeat number. No significant anticipation phenomenon or dosage effect was found in our cohort. We noticed that there is higher incidence of hearing impairment/ ophthalmologic abnormality/ restrictive lung disease before adulthood in patients who had less than two D4Z4 repeat. Monitoring lung function and regular ophthalmology/hearing examination may be important in FSHD patients since childhood, especially in patients with lower D4Z4 repeat numbers.

125 A Familiar Study of Congenital Myotonic Dystrophy with a Case Diagnosed with Epilepsy since Infantile Stage
先天性肌肉強直症合併癲癇個案之家族研究

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Background: A 9 year-old girl was diagnosed as myotonic dystrophy with the cytosine-thymine-guanine(CTG) trinucleotide repeated number-up to 1262 in myotonic dystrophy protein kinase(DMPK) gene since infantile stage. This time, she was admitted for prolonged generalized tonic-clonic seizure for 20 minutes.

Methods: We checked EEG and brain MRI for epilepsy and systemic survey for myotonic dystrophy, including heart, endocrine and ophthalmology examination. We also invited her families for genetic test post informed consent.

Results: Regarding the seizure survey, she had no trauma history, no infection sign, no electrolyte imbalance, no hypoglycemia, no hyperammonemia. The EEG revealed localized epileptiform activities at bilateral central areas(especially at right side), and rare foci at right parietal area, moreover, there was localized cortical dysfunction at left side, especially at left posterior area. The brain MRI reported bilateral dilated lateral ventricles. The seizure was stable under Keppra treatment after admission. About the familial history, her mother was diagnosed as adult type myotonic dystrophy after this patient was just born. Furthermore, her 29 year-old aunt walked with limping gait recently, and also had cataract post operation, besides, her 15 year-old sister had grip myotonia and warming-up sign. Therefore we invited them for further genetics test and myotonic dystrophy associated survey. Both of her families showed positive genetic myotonic

dystrophy findings.

Conclusions: Myotonic dystrophy is a multi-system disorder, however, seizure in these patients is not common neurological symptoms, especially in congenital type. Known as an autosomal dominant pattern, the family genetic confirm was needed if one of members was diagnosed.

126 Medical Students' 5R Reflection Narrative on Type 1 Diabetes Mellitus Service Learning Program
第一型糖尿病服務學習活動－醫學生的5R反思敘事

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Background:「服務學習」是「需求為導向的服務」與「達成學生學習目標」的相互結合。學生透過整個歷程學習:事前規劃服務活動、結合各方資源,從「做中學,學中覺」積累知識和經驗,並且透過結構化的模式進行反思。第一型糖尿病(T1DM)在國內的發生率約為十萬分之一點五。而在花蓮慈濟醫院約有40位T1DM病童,年齡從3到18歲不等。病友們需要每日早中晚皮下注射胰島素與量測血糖,平均一天要打八針左右,並且無法隨心所欲的吃大餐,需嚴格控制飲食與運動。從小由父母叮嚀,到長大靠自己管控飲食與血糖,過程中可能經歷青少年期同儕的壓力,若沒有足夠的自信、自律、他人支持,很容易就會控制不良,增加中風、心肌梗塞等併發症的風險。為提供T1DM病友更好的照護與生活品質,台灣各地區皆有病友誼會提供團體成員之間溝通與經驗分享、建立醫護團隊與病友家庭的緊密連結。然而,花東地區病友會活動起步較晚,更需要有計畫與持續性的病友聯誼活動以建立完整的照護支持系統。病友會串聯醫院、家庭、病童三方面的力量,藉由短期團體活動讓病童減輕焦慮、增加自信心,家長間可以交流及舒緩壓力,也讓團隊有更多機會了解孩童們的狀況。本報告以敘事的方式呈現醫學生在服務學習後的反思。

Methods: 自2013年起,花蓮慈濟醫院小兒科朱紹盈醫師與醫學生共同合作,透過服務學習的方式聯手為孩子/家長們帶來陪伴、喘息活動與提升健康識能的病友會。近兩年,學生嘗試在病友會中,與孩童/家長們建立關係,也同時了解他們對於自身/孩子疾病的看法與故事。2020年,以服務學習為目標招募了21位慈濟大學中低年級醫學生。行前設計相關培訓課程,邀請校內講師、糖尿病衛教師、護理師、住院醫師等,讓學生在接觸T1DM病友之前,能夠認識疾病機轉、診斷與治療、學習如何建立良好的互動關係、親身體會如何發現需求、同理感受以及學習反思和回饋。服務學習中,有學生設計適合各年齡層的活動,也有大學生病友分享自身與疾病共處的故事,還有小病友們分享繪畫作品和才藝表演,同時也安排了醫師與家長們互動的環境。活動後,學生與老師圍繞成一大圓圈進行反思、分享與回饋。最後總計蒐集並統整19篇「5R結構反思」,以夾敘夾議的方式呈現醫學生服務學習後的所見、所聞、所思、所感。

Results: Reporting對事件或狀況的描述:學生描述在活動期間,觀察到小朋友除了中午打胰島素、量血糖之外,還是與正常的孩子一樣活潑可愛、積極參與活動。但在看似勇敢、樂觀的背後,背負的是壓力和淚水,咬著牙也要與

疾病奮鬥下去的堅定。「『我就只能為她盡力多做一點,希望以後能不要有那麼多併發症。』說到這裡,我注意到潘爸爸都會笑,但是無奈的笑,語氣也漸趨微弱…」Responding記下對該事件的感想:學生無數次地被父母的意志、孩子們的勇敢所感動,也同時為他們迫於現實與經濟壓力的無奈感到心疼與不捨。同時,也很感恩自己有機會能跟他們互動,了解他們的想法,讓自己能提早接觸病人,也學習如何跟他們相處。「我覺得發病時是最痛苦的,無論是生理或心理,要忍受找不到病因的焦慮,確診的徬徨,生活習慣的改變,家庭負擔的增加。他們熬過了這段時間,在自我省思、接受、並且視T1DM為生命的禮物,讓我十分佩服。」 「我無法想像如果我是家長或病人我該要如何面對T1DM。也真的很感謝病友願意把自己當成信任的對象,分享她的心路歷程…」 Relating該事件的認知與過去的經驗的關聯: 有些學生反思:過去會覺得跟生病的人相處,要以比較禮讓和同理的態度對待他們。但其實,他們與一般人沒有區別,他們並不需要被特殊的看待。「剛開始跟某某小朋友接觸時,她會小聲的跟我說:『自己習慣打針了。』其實當下的我心有點疼…但在之後她說自己不希望被同學問東問西(她當時打我的手握的非常緊)。我漸漸了解她其實不喜歡『同情』,她需要的是同理、理解,而且把她當作一位朋友。」 Reasoning解釋事件中是否與重要因素相關聯: 學生省思或許這次的活動能帶給他們短暫的喘息,但沒辦法真正為他們的生活改變甚麼。不過從過程中,學生也意識到疾病雖然帶來痛楚,但是在治療的過程中,若有他人的支持是很重要的,特別是心靈上的陪伴,是不可被忽略的一環。「所謂醫療,是以人為本,很多疾病不只是身體出現變化,其實心靈也伴隨而變。治療是需要理解與陪伴的。我了解到傾聽、耐心、同理心的重要性,這讓我們能聽見他們屬於自己獨一無二的故事…」 Reconstructing重新建構下一步的行動計畫:多數的學生希望能繼續陪伴和給予病友與家屬長期的關懷,期望未來能透過長時間的陪伴與相處,建立長情,更了解他們的需求與難處,也期許自己能精進能力,成為能提供幫助的人。「接下來,我將把握參與病友會的機會,一方面更加了解疾病的歷程,另一方面希望可以從中提供幫助也從中學習,甚至在未來行醫的過程中可以有更成熟的應對各種臨床情境。」

Conclusions: 醫學生從5R反思呈現了自身、病童與家屬之間互為主體的連結,這是學生們培養醫學人文素養的第一步,同時也看見學生是如何解決偏鄉T1DM孩童身心健康相關議題,也體認如何善盡社會與醫學專業的責任,更回應了聯合國永續發展目標其中第三項(促進各年齡層健康生活與福祉),第四項(高品質教育,符合學生自願、自主運作的精神)的共同宗旨。

127 **Applying Diabetes Conversation Map™ to Explore Patients'Illness Narratives in Type 1 Diabetes Mellitus**
運用「糖尿病看圖對話工具™」來探索第一型糖尿病病友的敘事

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Background: 花蓮慈濟醫院約有40位第一型糖尿病(T1DM)病人,年齡層為3-24歲,他們因缺乏胰島素,需要每日多次施打速效和超長效胰島素來控制血糖。為提供T1DM兒童與青少年更好的照護與生活品質,每年定期舉辦病友聯誼會,提供醫護團體、病人和照護成員相互分享自身經驗外,讓病友家庭能加深與醫護團隊的聯繫,共同建構一個互為主體性的雙向支持系統。敘事醫學(Narrative medicine)是醫療藉由專注地傾聽病人的「敘說」,產生緊密的連結、建立良好的關係,也透過述說者的疾病敘事和重要生命經驗建構出以病人為主體的醫療照護。「糖尿病看圖對話工具™」即為一個由傳統單向式衛教翻轉成為互動式討論的工具,不僅提升病友互動意願,也同時讓病人透過敘說的方式來表達與疾病相處的故事情境及真正的想法。本研究目的在呈現醫學生在病友會中運用此工具來聆聽T1DM病友的敘事。

Methods: 2021年花東地區T1DM病友會,慈濟大學醫學生和花蓮慈濟兒科部、護理部、糖尿病東區照護網與營養師共同攜手,透過糖尿病看圖對話工具™「家有第一型糖尿病人」主題地圖,讓病童、家長與醫師以一問一答方式進行互動與分享。從「如何得知自己罹患第一型糖尿病」開始,以開放式的問題,引導病童們分享自己罹患疾病時的情況以及各種身心反應。第二步將對話帶入家裡和學校的情境,讓病童們去敘說他們平時所遇到的問題。第三步則是透過「迷思與事實卡片」,利用小組討論來決定卡片中的糖尿病相關資訊是事實或是迷思,刺激病童思考,也讓他們從中獲得正確的疾病及控糖觀念,增進他們的健康識能。最後,以敘事醫學的理念,在過程中專注聆聽7位病友及家長們所述說的故事,統整並紀錄文本,與病友們產生連結,讓我們不只是用血糖值等臨床數據來評斷他們,而從故事中更加深入的了解他們、完善地照顧到身心靈的健康。

Results: 剛得知得到T1DM時的心情一位自責的母親說到:「那天我小孩突然昏倒,緊急被送進醫院,檢查後得知她罹患第一型糖尿病,是我哪裡沒照護好她嗎?為什麼她突然會得到這個疾病?」。她的孩子在前兩個月才剛被診斷出T1DM,從言語中可以感受到滿滿的擔憂。「為什麼是我?是我的第一個想法。那陣子生氣、悲傷的情緒淹沒我整個人。」她是在22歲健康檢查時得知自己罹患糖尿病,知道自己未來的生活再也離不開胰島素,第一時間的情緒是震驚的,不懂為何疾病會發生在自己身上,她經歷好長一段時間才慢慢調適、接受這個疾病,並與它和平共處。挨針的感受一位剛施打兩個月胰島素的病童,她堅持只要

打在手臂上，醫生擔心會發生局部硬化，未來可能會影響到藥物吸收的效率。我們推測因為以前打針都是打在手臂上，她自己還沒辦法接受在腹部、大腿等其他部位扎針，透過糖尿病看圖說話工具，期望她的觀念可以改變，未來願意更換注射部位。而另一位已經被診斷四年的病童跟大家宣布：「我要自己施打胰島素了，而且一點也不痛唷！」對於一般人來說，每次打針都要做足心理準備，但是T1DM的病童們一天要打八針以上卻可以那麼堅強、樂觀，真的很令人佩服！ 食物選擇遇到的困難「要學會計算碳水化合物的克數是一開始在食物選擇上遇到的問題。連大人在計算的時候都會遇到問題，更不用說小朋友了」，一位母親說到。T1DM病人需要知道每餐吃的碳水化合物克數，以計算他們需要施打的胰島素量，在小朋友時期有家長可以幫忙，但是等他們長大到青少年之後就必須學會自己去計算。 告知朋友與否的選擇和掙扎「一開始認識別人的時候我不會跟他們說我有糖尿病，我不想一開始就被貼上標籤，但是熟了之後我會跟他們說，還好我的朋友們都很支持我。」「我的好朋友都知道我每天要打針。」「我都去老師的辦公室打針，所以有些同學不知道我有生病。」每個T1DM病人對於告知身邊的人與否都有不一樣的考量和面對的方式，可以看到他們對於自身罹患疾病的心境與掙扎，而我們則能從中嘗試給予適當的支持。回診時的感受「每次回診的時候都會遇到醫師、護理師和衛教師姊姊，他們會幫我看看最近血糖值有沒有正常，有時候血糖值很高或是很低的時候都很怕被醫生念。」「最初小孩被診斷為T1DM時心裡很徬徨、慌張，很感謝在醫院有一整個團隊的照護小孩，在每次回診時也有衛教師可以諮詢。」在醫院中，醫生、護理師、衛教師、營養師等都是一個共同照護T1DM病童的團隊，由團隊攜手照顧每一個病童及家屬的身心靈狀況，成為病友們最堅強的後盾。這次的病友會就是一個讓病友們跟團隊更加緊密的活動。

Conclusions: 病友會結束後每一個糖尿病小孩都開心地離開。透過「以病人為中心」的互動方式，運用糖尿病看圖說話工具讓病童們討論、提出問題、透過分享及回饋解決心中的疑問。除了認識到病友們對於自身疾病的看法和認識(illness narrative)之外，我們聆聽病童及家長們對於自身或是小孩罹患疾病所面臨的困境與生命故事(patient narrative)，也看見了他們的日常生活模式、打針的感受、選擇食物的困難、就學與同儕之間的關係等，更重要的是和他們的內心建立連結。

128 **The Cultural Inspiration of Stone Lion to Pediatricians**
石獅子文化對於兒科醫師的人文啟發

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Background: 石獅子坐鎮門前是源自古代的社會傳統民俗文化，其來源至少已達數千年之久！通常石獅子都是成雙成對，一雄一雌分坐門口兩旁！雌獅子通常都會帶著一隻幼獅。有許多民俗學者專家認為說坐鎮門口的石獅子成雙成對是顯為守護宅地，子子孫孫繁衍昌盛！本人身為資深兒科醫師，浸身於兒科醫療當中，深深覺得石獅子文化對於兒科醫療/對於社會其實有人文寓意上更深層的含義！
Methods: 作者分析近兩年來建築物旁有石獅子的造型，

並以醫療人文的立場加以解析其涵義。本次將先報告雌獅的造型研究。
Results: 這兩年來所遇到的35對石獅型中，發現絕大多數都是呈現一雄一雌的陳列（30/35）。並且毫無例外的必定帶著一隻幼獅（30/30）。而幼獅的姿勢體態可以分成兩大類：第一類是幼獅仰臥，雌獅用一足密接壓於仰伸的四足（22/30）。第二大類是幼獅前立於舞獅兩腳之間，通常幼獅的獅首仰望母獅/或幼獅一足趴於雌獅的肢體上/或是幼獅立於雌獅之足旁前視(8/32)。
Conclusions: 本研究顯示先民石獅子文化不僅是人丁繁茂的概念，以筆者長期作為資深兒科醫師的經驗和對人文醫療的體會，石獅子充分也展露了先民社會長久以來對於親情細膩的描述。雌獅子和幼獅並排前視就好像是現在的親子照片一樣！較多的是幼獅趴於雌獅足旁，彷彿就是我們常常看到的幼兒趴在母親的懷之中的寫照。最多呈現的是是幼獅仰臥的雌獅足下但是他們的足面密接。這是在人文還意義上給人感觸最深的！因為獅子是屬於猛獸中的百獸之王，他們的力道非常強大，但是幾千年來，民俗文化藝術家們都能夠將這種母親對兒女疼愛的情懷以「雌獅嘻幼」，恰到好處的模式表達呈現，顯示的是一種威力無比的身軀對弱不禁風的幼獅恰到好處的關懷與珂護。作為兒科醫師，我們會深深地為這種母愛的深度呈現深深地感動！所以石雌獅子的意像絕不僅只是子孫繁衍，而是先民們對「母愛無限，昊天罔極」的另一種無限溫馨感懷意境呈現！

129 **Enhanced Autophagy Ameliorates Pathogenesis of Globoid Cell Leukodystrophy**
增強自噬作用有效改善GLD腦白質退化症神經病變

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Background: Globoid cell leukodystrophy (GLD), the most devastating demyelinating disorders among children, is caused by lysosomal defects, leading to accumulation of toxic metabolites destabilizing myeline and inducing death of oligodendrocytes. Recently, autophagy dysfunction, a common pathological mechanism of proteinopathies, is also unveiled as the underlying pathogenesis of GLD. Herein, the efficacy and therapeutic potential of small molecules targeting the autophagy in the approaches of GLD is determined.
Methods: Rapamycin (RA) was injected peritoneally into GLD mice (twitcher mice) at day 21. The brains of control and experimental animals were collected at day 35. Protein expression of autophagy and neuropathological investigation of myelination and proteinopathies were determined by the western blotting and immunofluorescence staining.
Results: Soluble and insoluble phase of autophagy markers were analyzed by western blotting. The levels of soluble LC3-II, p62 and ubiquitin were indistinguishable between brains of wild-type, twitcher, and RA-twitcher mice. Nonetheless, the level of phospho-S6 was significantly

elevated (3-fold) in RA-twitcher mice. Additionally, the levels of insoluble LC3-II, and p62 in brains of twitcher and RA-twitcher were 3-, and 4-fold of increase, respectively, in comparison to that of wild-type mice. Of note, RA decreased insoluble ubiquitin expression in twitcher mice from 1.75- to 1.5-fold of norm. In neuropathological studies, ubiquitin and p62 aggregates in twitcher mice was ameliorated by RA, which also alleviated the demyelination and maintained the microstructure.

Conclusions: Our studies validate the efficacy of autophagy enhancer in amelioration of neuropathology in GLD. This indicates the therapeutic potential of small molecules targeting the autophagy in the approach of leukodystrophies.

130 Efficacy of Extended Release Cornstarch for Patients with Glycogen Storage Diseases
長效玉米澱粉對肝醣儲積症患者疾病控制效果評估

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Background: Glycogen storage diseases are a group of rare inherited disorders for glycogen storage and glucose metabolism. Patients are prone to hypoglycemia, thus to maintain euglycemia is the main goal. Uncooked cornstarch is characterized by a slow intestinal degradation and absorption which produce a gradual, low rise in blood glucose. The primary treatment is ingestion of uncooked cornstarch between meals which would definitely interrupt the nighttime sleep. With the extended release cornstarch Glycosade®, it seemed to maintain longer period of euglycemia and also to improve sleep quality. The aim of the study is to investigate the benefit of Glycosade® to patients with glycogen storage disease in our country.

Methods: During the period from December 2020 to August 2021, 9 patients diagnosed with glycogen storage disease type Ia were recruited. The age was between 9 and 33 years old. Extended release cornstarch was provided with a period of 6 months. The detailed medical record included continuous glucose monitoring data, biochemical data, and the questionnaires evaluated for sleep and life quality before and after the intervention.

Results: Every participant ingested extended release cornstarch half an hour before going to sleep, with the mean dose of 2.0 ± 0.39 g/kg of body weight. The fasting time at night were increased from 6.8 ± 0.96 hours to 7.9 ± 0.94 hours ($p < 0.05$). The morning fasting blood glucose was 80.0 ± 6.33 mg/dL with traditional cornstarch and elevated to 86.5 ± 8.26 mg/dL with extended release cornstarch ($p < 0.05$). The biochemical data showed decreased levels of liver function tests with ALT from 69.3 ± 77.8 U/L to 46.9 ± 44.8 U/L ($p <$

0.05) and AST from 78.8 ± 99.6 U/L to 42.9 ± 31.12 U/L ($p < 0.05$) after the usage of extended release cornstarch for 24 weeks. The trend of sleep quality score PSQI (Pittsburgh Sleep Quality Index) improved, though no significance (from 4.6 ± 2.01 to 3.1 ± 1.35; $p > 0.05$).

Conclusions: Patients with glycogen storage disease type Ia would benefit from the use of extended release cornstarch with improved morning fasting blood glucose and better liver function control. For long term usage, to import the product should be considered in the future.

131 Asymptomatic ASS1 Carriers Present with Elevated Citrulline Levels
第一型瓜胺酸血症帶因者表現異常瓜胺酸數值

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Background: Citrullinemia Type 1 (CTLN1), also known as ASS1 deficiency, is a rare autosomal recessive disorder caused by variants in the ASS1 gene. CTLN1 can be identified through high citrulline (cit) levels on tandem mass spectroscopy (MS/MS). This study demonstrates the different etiologies causing cit elevations from the newborn screening (NBS) program results.

Methods: Newborns who received confirmatory notification due to abnormal finding for citrullinemia screening from 2011 to 2021 were enrolled, and medical records were reviewed retrospectively. The characteristics between CTLN1 and other etiologies were analyzed. MS/MS was performed on the parents of cases with persistent mild cit elevation. Common variants of ASS1 were used to identify ASS1 carriers using high-resolution melting analysis.

Results: 753,520 newborns were screened by National Taiwan University Hospital newborn screening center, identifying 2 patients with CTLN1. Twenty ASS1 carriers, and 6 double heterozygous carriers of ASS1 and SLC25A13 were also identified. On the initial screening, patients with CTLN1 had a significantly higher cit level (mean 102.8 μM), while ASS1 carriers may also have persistently elevated cit levels (initial/retest mean 24.08/37.65μM). Among all CTLN1 patients and carriers, c.1087C > T (p.Arg363Try) was the most common variant (40.0%), followed by c.773+4A > C (16.7%), c.847G > A (p.Glu283Lys) (10.0%) and c.836G > A (p.Arg279Gln) (6.7%); these variants account for 73.4% of total variants. Hotspot analysis was applied on 39 unknown cases, using the 4 most common variants; 25 (64.1%) were proved to be ASS1 carriers. We also check for other ASS1 variants among cases with an elevation of cit levels. Six in ten carriers with cit elevation had other ASS1 variants, including likely pathogenic variants or variants with unknown significance, while only 2 in 26 carriers without cit elevation

were found to have other ASS1 variants.

Conclusions: Persistent mild cit elevation can be found in some ASS1 carriers, despite being recessively inherited, implying the effect of specific variants or other modifying factors. However, all carriers remained asymptomatic, and no further management or diet restriction is suggested.

132 Improved Diagnosis of Citrin Deficiency by Newborn Screening with a Molecular Second Tier Test
成功運用二階段新生兒篩檢診斷第二型瓜胺酸血症

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Background: Citrin deficiency is an autosomal recessive disorder caused by variants in the SLC25A13 gene. Although newborn screening (NBS) provides a chance for the early diagnosis and treatment of citrin deficiency, the detection rate remains lower than estimated incidence rates.

Methods: Prior to June, 2018, newborn screening for citrin deficiency was performed with tandem mass spectrometry (MS/MS) alone. Since June, 2018, a second-tier molecular test detecting 12 common variants of SLC25A13 gene was implemented to improve the effectiveness of NBS at detecting citrin deficiency. The incidence rate and cost were compared before and after implementation of two-tier screening.

Results: 555,449 newborns screened prior to 2018; among them, 17 patients were ultimately diagnosed with citrin deficiency. Only five of these patients were detected via initial newborn screening. In comparison, of the 198071 newborns screened after 2018, all 11 citrin deficiency patients were found by NBS and there have been no identified false-negatives. The detection rate of citrin deficiency increased from at best 1/32,673 to 1/18,006 after the implementation of the second-tier test with only a minimal increased in total cost. Subjects with citrin deficiency may present with borderline elevated citrulline levels on MS/MS; and may have persistently elevated or rapidly increasing citrulline levels on retest; 4 patients (80%) were identified prior to second-tier testing and 6 patients (55%) were detected after. However, a normal citrulline level at the time of the second blood sampling does not exclude the diagnosis of citrin deficiency as 5 (45%) patients identified with second tier testing had normal citrulline levels on retest tandem mass.

Conclusions: Our study proved that it is vital and cost-effective to employ second-tier molecular testing to improve the detection of citrin deficiency by NBS.

133 Newborn Screening Programs for Mucopolysaccharidoses I, II, IVA and VI in Taiwan
台灣黏多醣症第一型、第二型、第四A型、與第六型之新生兒篩檢計畫

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Background: Mucopolysaccharidoses (MPSs) are a group of lysosomal storage diseases caused by an inherited gene defect. MPS patients can remain undetected unless the initial signs or symptoms have been identified. The onset of disease is commonly between the ages of 18 months and 4 years. Death from respiratory or cardiac failure and respiratory infections usually occurs before the age of 10 years in patients with severe phenotypes.

Methods: Newborn screening (NBS) programs for MPSs have been implemented in Taiwan since 2015, and more than 48.5% of confirmed cases of MPS have since been referred from these NBS programs. The purpose of this study was to report the current status of NBS for MPSs in Taiwan and update the gold standard criteria required to make a confirmative diagnosis of MPS, which requires the presence of the following three laboratory findings: (1) elevation of individual urinary glycosaminoglycan (GAG)-derived disaccharides detected by MS/MS-based assay; (2) deficient activity of a particular leukocyte enzyme by fluorometric assay; and (3) verification of heterogeneous or homogeneous variants by Sanger sequencing or next generation sequencing.

Results: Up to 30 April 2021, 599,962 newborn babies have been screened through the NBS programs for MPS type I, II, VI, and IVA, and a total of 255 infants have been referred to MacKay Memorial Hospital for a confirmatory diagnosis. Of these infants, four cases were confirmed to have MPS I, nine cases MPS II, and three cases MPS IVA, with prevalence rates of 0.67, 2.92, and 4.13 per 100,000 live births, respectively. Four MPS diagnostic groups were classified according to the results obtained from urinary and blood biochemistry examinations and molecular DNA analysis as follows: MPS confirmed group, MPS highly suspected group, MPS carrier or pseudo-MPS group, and non-MPS group.

Conclusions: Intensive long-term regular physical and laboratory examinations for asymptomatic infants with confirmed MPS or with highly suspected MPS can enhance the ability to administer hematopoietic stem cell

transplantation or enzyme replacement therapy in a timely fashion.

134 Functional Independence of Taiwanese Children with Osteogenesis Imperfect
台灣成骨不全症患童的功能獨立性研究

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Background: Osteogenesis imperfecta (OI) is a group of rare genetic disorders that affect bone formation. The patients with OI present mainly with increased bone fragility, bone deformities. This study used The Functional Independence Measure for Children (WeeFIM) questionnaire to assess functional independence in children in Taiwanese children with OI and describe any functional limitations or additional burden of daily care.
Methods: Twenty-eight children between 2 and 21 years of age with OI and their parents were recruited at the Mackay Memorial from January 2013 to December 2019.
Results: Out of a potential score of 126, the mean total WeeFIM score was 111.5. There was a statistically significant difference between the scores of type I, type III and type VI group (121.88[SD 7.01] vs. 76.17[SD 26.08] vs. 119.17[SD 23.01]; $p < 0.001$) There was no statistically significant difference between the scores from different age groups, the male and female participants, and patients with pathogenic variants in COL1A1 and COL1A2. The mean scores for the self-care, mobility, and cognition domains were 47.5 (maximum 56, mean quotient 88.7%), 29.5 (maximum 35, mean quotient 84.5%), and 34.5 (maximum 35, mean quotient 99.1%) respectively. The best performance was in the cognition domain (mean quotient of 99.1%) and the worst was in the mobility domain (mean quotient of 84.5%). There was no statistically significant correlation between WeeFIM scores and age or age of onsets. The total WeeFIM score and 13 subscores for the self-care and mobility domains are all positively correlated with body height ($p < 0.05$). Correlation was lowest for bowel and walking/wheelchair, and highest for bathing and dressing-upper. For tasks in bathing, over 40% of the patients needed help. For tasks in the cognition domain, most patients required no help.
Conclusions: For children with OI, some support and supervision are required for self-care and mobility tasks while the cognition function is nearly the same in this group as that of the general population. The WeeFIM questionnaire may be useful measures appropriate for evaluating functional outcomes in children with OI.

135 Long-term Follow up and Treatment of Patients with Achondroplasia: 20-year-experience in a Tertiary Care Hospital in Northern Taiwan
軟骨發育不全症患者之追蹤與治療：北台灣單一醫學中心之二十年經驗

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Background: Studies describing people with achondroplasia in Taiwan are limited. Our purpose is to characterize the natural history of achondroplasia patients diagnosed by clinical, radiological and molecular assessments.
Methods: Observational and retrospective study of patients who were attended at one tertiary level hospital in north Taiwan between 1998 and 2022.
Results: There are 62 cases who were molecularly and clinically confirmed diagnosis with achondroplasia. Heterozygous mutation 1138G > A in FGFR3 gene was detected in 60 patients and heterozygous mutation 1138G > C in FGFR3 gene was detected in 2 patients. Among 52 patients with available medical records, there are 27 female and 25 males. There are family history with achondroplasia in two cases. 31 cases(59.6%) were diagnosed during neonate or infant period. Near all of them have clinical feature including short stature, high forehead, trident hands and macrocephaly. Genu varum is also common. The prevalent radiographic findings were rhizomelic shortening of the long bones, small foramen magnum, scoliosis, kyphosis of T-L spine, and osteoporosis. Some patients has hypotonia, motor developmental delay, speech delay, and mental retardation. CNS manifestation is common among our achondroplasia cases and some of them received neurosurgery. Two patients received C-spine surgery. Other skeletal problem, such as kyphosis or scoliosis, became prominent at toddler or adolescent stage and some of them received surgery. Osteopenia or osteoporosis is recorded in 7 cases. Body weight, height, and head circumference were recorded and applied to growth curve which is special for people with achondroplasia. It seems that special growth chart for achondroplasia published before could be applied to our patients in Northern Taiwan. However, body weight is not suit for our female cases. The most oldest patient with outpatient department follow-up is now 38-year-old.
Conclusions: Despite presenting a benign course, it is necessary to establish a systematic protocol for the surveillance of these patients due to the common clinical intercurrences.

136 **Long – Term Cardiovascular Findings in Williams Syndrome: A Single Medical Center Experience in Taiwan**

威廉氏症候群患者長期心血管疾患追蹤：台灣單一醫學中心的經驗

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Background: Cardiovascular lesions are the leading cause of morbidity and mortality in patients with Williams syndrome. Recent studies have rebutted conventional reports about the natural course of cardiovascular anomalies in Williams syndrome.

Methods: We followed up long – term outcome of cardiovascular lesions, peak velocity change in obstructive cardiovascular lesions over time, post– interventional courses of disease – specific intervention, and intervention – free survival of obstructive cardiovascular lesions from eighty patients with Williams syndrome followed up for more than 5 years in Taipei MacKay Memorial Hospital.

Results: The median follow– up duration was 11.0 (5.1–28.3) years. Among 27 patients, supravalvular aortic stenosis (87.5%) was the most common cardiovascular lesion, followed by branch pulmonary stenosis (PS) (53.8%), mitral valve prolapse (22.5%), and aortic arch hypoplasia/coarctation (5.0%). During the follow– up period, the peak flow velocity of supravalvular aortic stenosis did not change on peak Doppler echocardiography. Initially, severe supravalvular aortic stenosis was aggravated (P < .027). Conversely, the peak velocity of branch pulmonary stenosis decreased (from 3.08 to 1.65 m/s; P < .001) within age 3.2 (0.4– 6.9) years. Even the group with severe branch PS improved over time. Three patients (11.1%) with Williams syndrome underwent disease– specific interventions without mortality, mostly for supravalvular aortic stenosis or mitral valve prolapse. No patient in the late– onset and initially mild supravalvular aortic stenosis group needed intervention.

Unlike the conventional therapeutic concept, the intervention for branch pulmonary stenosis was almost unnecessary.

Conclusions: In Williams syndrome, initially severe supravalvular aortic stenosis worsened over time and most branch pulmonary stenosis, including those in the severe group, improved spontaneously. Most patients with branch pulmonary stenosis did not require disease – specific intervention. Surgical repairs for cardiovascular abnormalities in Williams syndrome showed favorable results.

137 **T Cell Mediates Kidney Tubular Injury via Impaired PDHA1/Autophagy in Type 1 Diabetes**

T細胞通過受損的PDHA1/自噬作用介導第1型糖尿病患者之腎小管損傷

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Background: Nephropathy is the severe complication of type 1 diabetes (T1DM). CD4+ T cell and Pyruvate dehydrogenase alpha 1 (PDHA1) dysfunction show a critical role in the nephropathy of T1DM. However, the interaction between the PDHA1-regulated mechanism and CD4+ T cells on early stage of kidney tubular injury remains unknown. This study aims to evaluate the role of PDHA1 in the regulation of tubular cell/CD4+ T cell and interaction in tubular cell injury of T1DM.

Methods: Plasma and total RNA collected from T cells of 35 T1DM patients and 33 healthy controls were determined for the protein expression level of neutrophil gelatinase-associated lipocalin (NGAL)/Kidney Injury Molecule-1 (KIM-1) and mRNA expression level of PDHA1 and biomarkers of T helper 1 cells (Th1) and Regulatory T cells (Treg) in CD4+ T cells. Human kidney 2 cell line (HK-2) co-cultured with CD4+ T cells from T1DM patients or healthy

donors (HD) were to evaluate the interaction of CD4+ T cell regulation and establishment of stable knockdown of PDHA1 expression in HK-2 was used to investigate the effect of metabolic reprogramming/autophagy in renal tubular cell injury.

Results: Increased PDHA1 gene expression level in CD4+ T cells was positively associated with the plasma level of Neutrophil gelatinase-associated lipocalin (NGAL) in poorly regulated T1DM and HD. Our data demonstrated that the Th1/Treg paradigm skewed Th1 in T1DM. Under high-glucose stimulation, knockdown of PDHA1 in kidney tubular cells decreased ATP/ROS production, reduced NAD/NADH ratio, increased cell apoptosis, and represses mitochondrial respiration. Furthermore, PDHA1 depletion induced impaired autophagic flux. Co-culture between tubular cells and T1DM T cells showed impaired CPT1A, up-regulated FASN, and induction of kidney injury.

Conclusions: Our findings indicate that Th1 cells induce tubular cell injury through dysregulated metabolic reprogramming/autophagy. It suggests a balance of metabolic reprogramming/autophagy pharmacological strategy that may allow for therapeutic manipulation of kidney tubular injury on T1DM.

138 **Real-World Treatment Escalation from Metformin Monotherapy in Youth-Onset Type 2 Diabetes Mellitus: One Medical Center Report in Taiwan**
兒童第2型糖尿病在真實世界中除了二甲雙胍單一療法的藥物升階選擇：台灣一間醫學中心報告

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Background: Youth with type 2 diabetes (T2D) experience high rates of comorbidities and complications early in the disease course and have more rapid decline in beta cell function than adults with type 2 diabetes. In clinical trials, youth with type 2 diabetes also have a higher rate of metformin monotherapy failure than adults. The purpose of this study is to evaluate the patterns of treatment escalation beyond metformin monotherapy among individuals with youth-onset T2D.

Methods: This study is a retrograde cohort study and collect eighty-three patients with youth-onset T2D (HbA1c $\geq$ 6.5% and negative pancreatic autoantibodies (GAD, IA2, ZnT8) in our medical center from Nov 2011 to Jan 2021. The methods of statistical analysis include Fisher's exact test, one-way ANOVA, Kaplan-Meier plot, and cox proportional hazards model.

Results: There are a total of 83 cases (39% female, 61% male) with the average tracking time of 3.47 years (median 4 years) and age of onset of 13.8 year (9-17.9, median 13.67). 93% have a family history of diabetes in first-class relatives. The SDS of average BMI and average A1c are 2.11 and 10.19 at diagnosis, respectively. Common complications include 40% HTN, 30% hyperlipidemia, 10% proteinuria, and 47% higher liver function. In the tracked years, 11 (13%) no drugs, 19

(23%) insulin therapy, 37 (45%) upgrading drugs, and 16 (19%) metformin monotherapy. The factors inclined to upgrade drugs include high serum triglyceride and microalbuminuria/proteinuria.

Conclusions: Hypertriglyceridemia and microalbuminuria at diagnosis of diabetes are related to treatment escalation with insulin.

139 **Accuracy and Efficiency of a Novel Artificial Intelligence System for Bone Age Assessment Compared to the Greulich-Pyle Method**
評估一以Greulich-Pyle骨齡判讀法開發之人工智能判讀骨齡軟體之準確性與效率

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Background: Bone age (BA) assessment performed by artificial intelligence (AI) is of growing interest due to improved accuracy, precision and time efficiency in daily routine. The aim of this study was to investigate the accuracy and efficiency of a novel AI software version for automated BA assessment in comparison to the Greulich-Pyle (GP) method.

Methods: Radiographs of 200 patients were analyzed in this retrospective study. Total BA was assessed independently by two blinded experienced pediatric radiologists/pediatric endocrinologist applying the GP method and by the AI software. Overall and gender-specific BA assessment results, as well as reading times of both approaches, were compared.

Results: The total intraclass correlation coefficient (ICC)between AI-derived BA and reference BA was 0.989. ICC for 100 females was 0.986; for 100 males was 0.991. Mean absolute deviation was 0.45 years and root mean square deviation was 0.57 years. Reproducibility of AI-derived BA was 100%. Rejection rate was zero. Mean reading times were reduced by more than 95% using the AI system.

Conclusions: A novel AI software enables highly accurate automated BA assessment. It may improve efficiency in clinical routine by reducing reading times without compromising the accuracy compared with the GP method.

140 **A Comparison of the Greulich and Pyle and the Tanner and Whitehouse 3 Method for Bone Age Assessment**
比較Greulich and Pyle及Tanner-Whitehouse 3兩種骨齡判讀方法

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Background: Greulich and Pyle (GP) method and Tanner-Whitehouse (TW3) method are two of the most common techniques for bone age (BA) assessment. The applicability of these methods for ethnic populations outside of the USA and Europe has been questioned in several recent studies around the world. The purpose of this study is to assess the applicability of these methods to Taipei children.
Methods: Clinical data from10/1, 2010 to 3/31, 2020 were retrospectively collected from a general hospital in city Taipei. After excluding those with diseases and unqualified data, 654 for males and 809 for females were analyzed Comparison of the BA and the chronological age (CA) was done in children group with body weight and height in the 15th-85th percentile of normal children. A subset of 200 radiographs was evaluated for validity and reproducibility. All data were analyzed statistically.
Results: The correlation coefficients for the intra-observer comparison were 0.933, 0.985 and 0.981 for GP, TW3 RUS and TW3 carpal respectively; for inter-observer comparison were 0.992, 0.984 and 0.973 respectively. The time needed for BA evaluation for GP method was 0.81±0.14 min, for TW3 RUS method was 3.14±0.95 min, for TW3 carpal method was 1.89±0.62 min. The range of TW3 RUS standard was limited at 14.5 years for boys and 16.5 years for girls. The BA determined by both of GP and TW3 RUS methods were basically very close to each other in the range of 9- 15 years old in male and 7-14 years of in female. Yet, a different pattern of BA at individual CA interval was noted for two methods.
Conclusions: BAs assessed at mid-childhood and mid-adolescent stage by both methods are surprisingly close to each other. The validity and reliability of GP method are better than TW3 method, and the time needed for BA evaluation is shorter for GP than TW3. There is discrepancy between BA and CA for both methods.

141 **Endocrine Disorders in Taiwanese Children with 22q11.2 Deletion Syndrome: The Experience of a Single Medical Center**
罹患22q11.2缺失症候群台灣孩童的內分泌疾病：一醫學中心之經驗

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Background: Endocrine disorders are common in patients with 22q11.2 deletion syndrome (22q11.2DS). However, relevant data are lacking in Taiwan. This study was conducted to elucidate the clinical manifestations of parathyroid and thyroid disorders in Taiwanese children with 22q11.2DS.
Methods: From 1994 to 2020, the medical records of 138 patients with 22q11.2DS diagnosed at our hospital were reviewed. Their clinical courses and laboratory data including serum total calcium, phosphorus, magnesium, intact parathyroid hormone (iPTH), alkaline phosphatase, creatinine, free T4 and thyroid-stimulating hormone were thoroughly reviewed.
Results: Hypocalcemia was detected in 57 of 135 patients (42%). Among the 104 patients who had simultaneous serum calcium and iPTH level checked, 33 patients (32%) had hypoparathyroidism, and 87% of them had hypocalcemia detected before the age of one. Most patients had precipitating stressors during episodes of symptomatic hypocalcemia. Twenty-nine patients with hypoparathyroidism who had been followed up for more than one year were enrolled for the analysis of the natural course of their parathyroid status. During 10.7±8.9 years' follow-up, 18 of them (62%) had overt hypoparathyroidism at their last visits. Eleven of them had persistent hypoparathyroidism while the other seven had recurrent hypoparathyroidism. In terms of thyroid status, four of 84 patients had thyroid disorders including thyroid developmental anomalies in two, dyshormonogenesis in one and Graves' disease in one.
Conclusions: Hypoparathyroidism is a common endocrine disorder in patients with 22q11.2DS. Because the risk of overt hypoparathyroidism can occur at any age, it is prudent to assess parathyroid function at diagnosis and during follow-up, especially during infancy, adolescence or in the presence of stress such as surgery or acute illness to prevent symptomatic hypocalcemia. Although thyroid disorders are not so common as parathyroid disorders in patients with 22q11.2DS, monitoring of their thyroid status during follow-up is recommended.

142 The HLA-B Gene and Graves Disease in Children: Family-based Studies

HLA-B基因與葛瑞夫茲氏病：以家族為基礎的研究

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Background: Graves disease (GD) is a multifactorial autoimmune disease. It affects up to 0.5% of the general population and is among the most prevalent autoimmune endocrinologic diseases in children and adolescents. The λs for GD is 5.4-12.6 [p9709918a] and even up to 15. The concordance rate of GD is 20-35% in monozygotic twins but only 3-7% in dizygotic ones and 79% of the liability to develop GD is attributable to genetic factors. Therefore GD results from the interaction of existential factors as sex and parity, genetic background, and environmental influences. We have reported that HLA-DRB1*09:01 confers susceptibility to GD. In the study, we recruited trios to test whether linkage between HLA-B and GD was present.

Methods: Subjects There were 126 children with GD and their parents forming 126 trios. Their age of children at the diagnosis was 10.7 ± 3.3 (range, 2.7 – 17.8) years. The diagnosis of GD was based on the clinical and laboratory criteria, including manifestations of thyrotoxicosis with/without ophthalmopathy, diffuse goiter, elevated free T4/total T4 level, suppressed TSH level, and a positive TSH receptor autoantibody. HLA-B allele typing We genotyped HLA-B on the 126 trios using HLAssure (TBG Biotechnology Corp. Taiwan). Statistical analysis Transmission of alleles was analyzed using the TDT. All statistical analyses were performed using SAS 9.4. (SAS Institute Inc., Cary, NC, USA)

Results: The B*46:01 allele was significantly more frequently transmitted to the patients than other alleles with OR (95% CI) = 5.21 (3.20 - 10.95), P=2.52E-10.

Conclusions: HLA-B*46:01 was associated with and in linkage with GD.

書面報告摘要

1 **Internal Herniation of Intestine Caused by a Mesenteric Tumor: Report of a Case**
腸系膜腫瘤導致腸內疝氣：一個案例報告

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Background: An internal hernia is defined as the protrusion of abdominal viscera. The small bowel loops go through a peritoneal or mesenteric aperture into a compartment in the abdominal or pelvic cavity. We here reported an emergent presentation of bowel obstruction caused by mass related internal hernia rarely found in young children.
Methods: An 1-year-and-6-month-old boy presented with severe vomiting since morning of Jan. 14, 2021 with bilious contents later on. The boy was previously healthy under scheduled vaccination without previous admission history. He manifested numerous vomiting and irritable crying only after feeding and was brought to our emergency room. Physical examination showed distended abdomen, hypoactive bowel sound, and tenderness on the whole abdomen. Abdominal sonography showed a target-like mass in mid-upper abdomen. Since the emergent fluoroscopic reduction showed no typical intussusception, further abdominal computerized tomography scan was arranged and demonstrated a mesenteric tumor in the left upper abdomen with collapsed regional bowel loops. Subsequent surgical intervention revealed intestinal adhesion with internal herniation with bowel strangulation related to two mesenteric tumors and adhesiolysis with excision of tumors was performed.
Results: After operation, the boy was cared for in the intensive care unit with adequate oral nutrition supplement in general ward and then discharged. Microscopic finding of two masses showed fibroadipose tissue with fat necrosis, calcification and chronic inflammation. Subsequent outpatient department follow up showed no recurrence.
Conclusions: Internal hernia of intestine, one of the causes of bowel obstruction, which is uncommonly found in young children and infancy. The bowel configuration usually presents a saclike mass or cluster of dilated small bowel loops within an abnormal anatomic location in the setting of small bowel obstruction. If bowel strangulation is present, engorgement, crowding, twisting, stretching of mesenteric vessels will happen. We should be aware of the emergency condition and manage in time.

2 **18-Year-Old Male with Sudden Massive Hematemesis.**
18歲男性突發大量吐血

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Background: 18-year-old male patient with past medical history of normocytic anemia sufferred from intermittent epigastric pain for 5 days but just took unknown analgesic drug bought from pharmacy. On Apr. 17, 2021, sudden massive hematemesis occurred and he was sent to our ER immediately. Initial PE showed signs of hypovolemic shock and he was admitted to PICU. After stabilizing his vital signs, esophagogastroduodenoscopy showed : 1.Esophagitis. 2.Esophageal ulcer. 3.Suspect Mallory-Weiss syndrome. 4.Chronic gastritis. 5.Gastric ulcers. 6.Chronic duodenitis. Proton pump inhibitor was given and he was discharged under stable clinical condition. However, during OPD follow-up, epigastric pain relieved but headache with frequent nausea sensation and sometime vomiting occurred. Brain MRI revealed multiple enhancing tumors along corpus callosum, bilateral periventricular areas. Central nervous system lymphoma with metastasis was suspected. Now this patient is under palliative chemotherapy and radiotherapy.
Methods: Esophagogastroduodenoscopy and brain MRI
Results: Esophagogastroduodenoscopy showed : 1.Esophagitis. 2.Esophageal ulcer. 3.Suspect Mallory-Weiss syndrome. 4.Chronic gastritis. 5.Gastric ulcers. 6.Chronic duodenitis. Brain MRI showed multiple enhancing tumors along corpus callosum, bilateral periventricular areas. Central nervous system lymphoma with metastasis was suspected.
Conclusions: The elevated intracranial pressure caused by brain tumor, head injury or other space-occupying lesion, etc, could result in gastroduodenal ulcer called Cushing ulcer. The IICP may affect areas of the hypothalamic nuclei or brainstem leading to overstimulation of the vagus nerve or paralysis of the sympathetic system and thus increase secretion of gastric acid and the likelihood of ulceration of gastroduodenal mucosa. (Reference:Walker's Pediatric Gastr ediatric Gastrointestinal Disease, 6th edition). Reviewed current literature on PubMed, Cushing ulcer was reported rarely. Not to mention the majority of reported cases of Cushing ulcer were mainly elder adults. (Reference:Asian J Neur sian J Neurosurg. Apr-Jun 2015;10(2):8794). Therefore, the case we reported here is a very rare one.

3

Life-threatening Arrhythmia after COVID-19 Vaccination in Patients with Cardiomyopathy and Congenital Heart Disease - Case Series

心肌病變及先天性心臟病患者在接受COVID-19疫苗後發生之致命性心律不整 - 病例報告

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Background: The COVID-19 pandemic has led to an unprecedented surge of patients worldwide. Several COVID-19 vaccines were introduced for the prevention of COVID-19 spread. Several cardiovascular adverse effects were reported including myocarditis and arrhythmias.
Methods: We enrolled three cases of ventricular arrhythmia after COVID-19 vaccination. Two patients had history of cardiomyopathy, one was arrhythmogenic right ventricular cardiomyopathy(ARVC) and one was hypertrophic cardiomyopathy(HCM) with myocardial bridging. The third patient had history of repaired extreme Tetralogy of Fallot(TOF) and previous documented VT history. During these three patients, two received Pfizer BioNTech COVID-19 Vaccine and one received MVC COVID-19 vaccine. All of them presented with VT or ventricular fibrillation(VF) after COVID-19 vaccination within one month.
Results: The first case was a 22-year-old woman with familial ARVC. She had non-sustained VT in previous 24-hour Holter monitor and controlled well under Flecanide and Inderal use. This time, she received Treadmill exam 26 days after Pfizer/BioNTech COVID-19 Vaccination, which showed sustained VT non-response to beta-blocker and amiodarone. DC cardioversion was performed, and implantable cardioverter-defibrillator(ICD) was then implanted. The second case was a 14-year-old boy with HCM with myocardial bridging, receiving myomectomy 1 year ago. He presented with out-of-hospital cardiac arrest due to VF 19 days after Pfizer/BioNTech COVID-19 Vaccination. Cardio-pulmonary resuscitation and AED shock were performed, and ICD was then implanted. The third case was a 48-year-old man with repaired extreme TOF. ICD was implanted due to VT attack when he was 32 years old, and he received transcatheter ablation 2 years ago without further VT attack thereafter. This time, 25 days after first dose of MVC COVID-19 vaccine and 2 days after 2nd dose vaccine, frequent ICD shock were recorded. He then received transcatheter ablation for VT substrate.
Conclusions: Life-threatening ventricular arrhythmia may occur within one month after COVID-19 vaccination in patients with underlying cardiovascular diseases especially cardiomyopathy.

4

Innate Immune Responses of Vaccinees Determine Early Neutralizing Antibody Production after ChAdOx1nCoV-19 Vaccination

新冠疫苗接種後先天性免疫反應決定中和抗體之產生

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Background: Innate immunity, armed with pattern recognition receptors including Toll-like receptors (TLR), is critical for immune cell activation and the connection to anti-microbial adaptive immunity. However, information regarding the impact of age on the innate immunity in response to SARS-CoV2 adenovirus vector vaccines and its association with specific immune responses remains scarce.
Methods: Fifteen subjects between 25-35 years and five subjects between 60-70 years were enrolled before ChAdOx1 nCoV-19 vaccination. We determined activation markers and cytokine production of monocyte, NK cells and B cells ex vivo stimulated with TLR agonist before vaccination and 3-5 days after each jab with flow cytometry. Anti-SARS-CoV-2 neutralization antibody titers a were measured using serum collected 2 months after the first jab and one month after full vaccination.
Results: The older adult vaccinees had weaker vaccine-induced sVNTs than young vaccinees after 1st jab (47.2±19.3% vs. 21.2±22.2%, p value < 0.05), but this difference became insignificant after the 2nd jab. Imiquimod, LPS and CpG strongly induced CD86 expression in IgD^{+}CD27^{-} naïve and IgD^{-}CD27^{+} memory B cells in the young group. In contrast, only the IgD^{+} CD27^{-} naïve B cells responded to these TLR agonists in the older adult group. Imiquimode strongly induced the CD86 expression in CD14^{+} monocytes in the young group but not in the older adult group. After vaccination, the young group had significantly higher IFN-γ expression in CD3^{-} CD56^{dim} NK cells after the 1st jab, whilst the older adult group had significantly higher IFN-γ and granzyme B expression in CD56^{bright} NK cells after the 2nd jab (all p value < 0.05). The IFN-γ expression in CD56^{dim} and CD56^{bright} NK cells after the first vaccination and CD86 expression in CD14^{+} monocyte and IgD^{-}CD27[-]double-negative B cells after LPS and imiquimod stimulation correlated with vaccine-induced antibody responses.
Conclusions: The innate immune responses after the first vaccination correlated with the neutralizing antibody production. Older people may have defective innate immune responses by TLR stimulation and weak or delayed innate immune activation profile after vaccination compared with young people.

5

Myocarditis after BNT162b2 Messenger RNA COVID-19 Vaccine in Adolescents
青少年接受BNT162b2信使RNA疫苗之後心肌炎的案例

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Background: Myocarditis and pericarditis had been identified and reported after the massive immunization with messenger RNA (mRNA) COVID-19 vaccines, particularly in adolescents and young adults. Here, we describe the symptoms, clinical course and short-term outcome of myocarditis after the BNT162b2 mRNA COVID-19 (Pfizer-BioNTech) vaccination in two previous healthy male adolescents.

Methods: The first case was a 14-year-old male presented to our hospital with left chest tightness and dyspnea 3 days after the 1st dose of BNT162b2 vaccine. The initial vital sign was, body temperature 35.8°C, pulse rate 67 beats per minute, respiratory rate 19 breaths per minute, and the blood pressure 110/77 mmHg. The ECG showed the ST-elevation in leads V3-V5. Laboratory data revealed the highest peak of high-sensitive cardiac troponin T (hs-cTnT) to 1010 ng/L, creatine kinase (CK) 992 U/L, CK-MB 79.6 ng/mL, and mild elevated C-reactive protein (CRP)18.8 mg/L. Infectious pathogens survey only identified adenovirus from throat swab by Filmarray respiratory panel. The second case, a 16-year-old male experienced palpitations and left chest tightness radiating to the neck after the 2 days of his second dose of BNT162b2 vaccine. At the initial presentation, the body temperature was 36.5°C, the pulse rate 84 beats per minute, the respiratory rate 18 breaths per minute, and the blood pressure 153/82 mmHg. The ECG revealed ST-elevation in leads II, III and AVF. Peak level of hs-cTnT was 659 ng/L, CK was 313U/L, CK-MB 38.3 ng/mL. The CRP mildly increased to 14 mg/L. Other infectious etiologies survey including viral serology, blood culture, and Filmarray respiratory panel were all negative.

Results: The first case had normal LV function (LVEF 72.1%) by echocardiogram. Cardiac MRI showed late gadolinium enhancement and myocardial edema. He presented the improvement of symptoms without medical intervention after the second day of admission. Anti-SARS-CoV-2 spike antibody was 63.63 U/mL 72 days post 1st BNT vaccine. The second case was treated with oral colchicine 0.5 mg and naproxen 250 mg twice per day. His left ventricular systolic function was normal (LVEF 86%). The cardiac MRI revealed myocardial edema in left ventricle, no delayed myocardial enhancement demonstrated. The chest tightness ameliorated on the 4th day of admission. Anti-SARS-CoV-2 nucleocapsid antibody was non-reactive and anti-SARS-CoV-2 spike antibody was 91.01 U/mL 4 days post 2nd BNT vaccine.

Conclusions: These two patients all developed myocarditis within one week post BNT vaccination with typical symptoms, laboratory finding and EKG changes. Although the cardiac function remains well and both of them recovered without sequalae, long-term follow up is still warranted.

6

A 16-year-old Girl with Streptococcus anginosus Brain Abscess due to Right to Left Shunt of Left Superior Vena Cava which Drained to Left Atrium with Unroofed Coronary Sinus.
一名因左側上腔靜脈的右到左分流導致的咽峽炎鏈球菌腦膿瘍的十六歲女孩

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Background: A 16-year-9-month old girl, without underlying disease, presented to emergency department due to fever for two weeks, accompanied with headache, neck soreness, blurred vision and intermittent vomiting. Physical examination revealed diplopia and equivocal Brudzinski's sign. Lab data showed white blood cell 14470/uL and C-reactive protein 3.489 mg/dL. A brain computed tomography(CT) scan showed two 3.5 x 1.5cm hypodense lesions with rim enhancement and perifocal edema in right parieto-occipital lobes, compressing right ventricle and resulting midline shift. Empirical vancomycin, cefotaxime and metronidazole were administered.

Methods: Emergent operation for brain abscess excision was performed. Intraoperation pus culture of brain abscess yielded Streptococcus anginosus. We further arranged echocardiogram for survey of brain abscess, which showed patent fossa ovalis(PFO) with enlarged unroofed coronary sinus, and a persistent left superior vena cava (PLSVC). Bubble test during echocardiogram revealed bubbles appeared mainly in left atrium and left ventricle chambers, which suggested present of right to left shunting.

Results: The patient continued to improve neurologically and discharged smoothly after total forty-four days of antibiotic treatment. Four months later, she received Dacron patch repair of PFO and coronary sinus, and reimplantation of PLSVC to right atrium appendage, which originally drained to left atrium. She was uneventfully after four years follow up.

Conclusions: Streptococcus anginosus present as normal flora of human oral cavity and gastrointestinal tract, but known for their pathogenicity and tendency for abscess formation especially in brain and liver. Our case remind clinicians of patient who presents with prolonged fever with headache should raise concern of central nervous system infection. Besides, unexplained brain abscess in an otherwise healthy child mandated thorough examination. As in this case, a paradoxical right to left shunt from PLSVC to left heart via PFO and coronary sinus was identified by cardiac echo and CT.

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A de novo ARCN1 pathogenic variant (c.120delG) presents in a child with mild developmental delay, micrognathia, and microcephaly.

ARCN1基因變異之輕症

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Background: COPI, COPII, and clathrin are three coatomer proteins essential for intracellular transport between the endoplasmic reticulum (ER), Golgi apparatus, and cell membrane due to the proteins' enveloping of vesicles during transport. COPI facilitates retrograde transport from the Golgi apparatus to the ER. One of the subunits that forms COPI, delta-COP, is encoded by the ARCN1 gene. Pathogenic variants in the gene can disrupt proper functioning of COPI. The clinical phenotypes of ARCN1-related syndromes include severe micrognathia, microcephalic dwarfism, joint laxity, and mild developmental delay. There are some phenotypic overlaps between ARCN1-related syndromes and Stickler syndrome, such as micrognathia, short stature, and joint laxity, although neurological, ocular, and audiology features differ.
Methods: We present a 15-month-old female with mild developmental delay, mild microcephaly, and micrognathia, thick gums, prominent alveolar ridges, a small sternum without obvious skeletal findings. This child had a normal SNP microarray, normal mitochondrial dual genome sequencing and del/dup assay and a whole exome sequencing. Review of literatures were performed to characterize the spectrum of this gene changes
Results: (WES) revealed a nucleotide deleted in position 120 (c.120delG): : p.Met40IlefsX15 in exon 2 in the ARCN1 gene (NM_001655.4). The normal sequence with the base that is deleted in brackets is: TCAT[delG]AACA.
Conclusions: We report a clinically recognizable craniofacial disorder characterized by facial dysmorphisms, variable skeletal anomalies and mild developmental delay due to loss-of-function heterozygous mutations in ARCN1. Given that ARCN1 deficiency causes defective type I collagen transport, reduction of collagen secretion represents the likely mechanism underlying the skeletal phenotype. Without any other significant skeletal anomalies our patient represents a mild spectrum of this condition.

8

A 4-year-old girl with cardiogenic shock caused by aluminum phosphide intoxication

一名4歲女孩因磷化鋁中毒導致心因性休克

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Background: Aluminum phosphide (AlP) is a pesticide and fumigant that is commonly used for agriculture purpose. AlP toxicity causes lung, heart, liver and renal injuries, and Fatality rates in the range of 20% have been reported. The symptoms of AlP toxicity include epigastric pain, nausea, vomiting, diarrhea, and dyspnea, which may make misdiagnosis as acute gastroenteritis. Patients may promptly progress to cardiogenic shock, multiorgan failure, and even death.
Methods: A 4-year-old girl had an underlying disease with right eye retinoblastoma post enucleation and chemotherapy. She presented with acute gastrointestinal symptoms developing in a day, including abdominal pain associated with multiple episodes of nonbilious/non-hemorrhagic vomiting. However, progressions to dyspnea, pale face, and generalized weakness were noted. Then she was transferred to our Emergency Room (ER) for help.
Results: On arrival, she was found to be bradycardic (34beats/min), hypotensive (26/16mmHg), and desaturation (SpO2=80-90%) and appeared weak and conscious loss. A venous blood gas analysis was performed, and the results demonstrated an anion gap acidosis. Laboratory investigations showed a high serum glucose level and metabolic acidosis with an elevated anion gap. Her 12-lead electrocardiogram (ECG) showed diffuse ST segment depression, especially more prominent in the inferior and lateral leads. However, sudden asystole developed but no reposed despite of continuous cardiopulmonary resuscitation and inotropic agents administration. The deploy of extracorporeal mechanical oxygenation (ECMO) was recommended but refused by family. The case died in the ER.
Conclusions: AlP intoxication in children may cause rapid progression of multisystem organ failure, cardiovascular collapse, and death Factors that have been associated with decreased survival include ECG changes (ST segment depression and sinus tachycardia) and metabolic acidosis on arterial blood gas analysis at presentation. Given the high rate of morbidity and mortality, we would recommend prompt referral to a tertiary care center that can provide ECMO and continuous renal replacement therapy or hemodialysis in cases of suspected or documented AlP poisoning.