臺灣兒科醫學會第二五八屆學術演講會時間表

民國 113 年 4 月 20 日(星期六)

201A、B、C 會議室(2F)

09:00 | **第一單元：血液學、腫瘤學** (1~7 題)
10:10
10:10 | 休息
10:20
10:20 | **第二單元：心臟血管學** (8~15 題)
11:40
12:00 **附加研討會**
主　題：嬰幼兒免疫與大腦發展的前瞻科學
主持人：李宏昌教授、林光麟醫師
演講者：楊耀榮醫師、楊生滴醫師
13:30

13:30 | **第三單元：新生兒學** (16~24 題)
15:00
15:00 | 休息
15:10
15:10 | **第三單元：新生兒學** (25~33 題)
16:40

201D、E、F 會議室(2F)

09:00 | **第四單元：神經精神醫學** (34~40 題)
10:10
10:10 | 休息
10:20
10:20 | **第四單元：神經精神醫學** (41~47 題)
11:30
12:00 **附加研討會**
主　題：台灣兒童營養面面觀-協助孩童營養攝取與提升營養吸收
主持人：陳安琪醫師、楊俊仁院長
演講者：劉明發醫師、Dr. Robert David Murray
13:30

13:30 | **第五單元：過敏免疫風濕病學** (48~58 題)
15:20
15:20 | 休息
15:30
15:30 | **第五單元：過敏免疫風濕病學** (59~68 題)
17:10

102 會議室(1F)

09:00 | **第六單元：腸胃學、營養學** (69~73 題)
09:50
09:50 | 休息
10:00
10:00 | **第六單元：腸胃學、營養學** (74~77 題)
10:40
12:00 **附加研討會**
主　題：幼童免疫防護破口-毀滅性疾病：腦膜炎雙球菌
主持人：黃立民院長、黃玉成教授
演講者：陳伯彥住任
13:30

13:30 | **第七單元：感染學** (78~86 題)
15:00
15:00 | 休息
15:10
15:10 | **第八單元：小兒預防醫學及流行病學** (87~91 題)
16:00
16:00 | 休息
16:10
16:10 | **第九單元：腎臟學**(92~98 題)
17:20

103 會議室(1F)

09:00 | **第十單元：急診學及重症學** (99~105 題)
10:10
10:10 | 休息
10:20
10:20 | **第十一單元：肺臟學** (106~108 題)
10:50
10:50 | 休息
11:00
11:00 | **第十二單元：醫學人文及教育** (109~112 題)
11:40
12:00 **附加研討會**
主　題：兒科抗疫新紀元：COVID-19 疫情對兒童醫療的挑戰與機遇
主持人：林奏延教授、黃立民教授
演講者：張鑾英教授、林千裕主任
13:30

13:30 | **第十三單元：遺傳學、新陳代謝學** (113~117 題)
14:20
14:20 | 休息
14:30
14:30 | **第十三單元：遺傳學、新陳代謝學** (118~122 題)
15:20
15:20 | 休息
15:30
15:30 | **第十四單元：內分泌學** (123~126 題)
16:10

105 會議室(1F)

12:00 **附加研討會**
主　題：強化流感防治策略：細胞培養流感疫苗的臨床與經濟效益
主持人：邱政洵醫師、陳志榮醫師
演講者：呂俊毅醫師、齊嘉裕醫師
13:30

民國 113 年 4 月 21 日(星期日)

201A、B、C、D、E、F會議室(2F)

09:00 **教育演講**
主　題：兒童常見身心成長問題
主持人：洪佑承醫師、詹前俊醫師
演講者：吳佑佑醫師、黃世綱醫師、莊海華副教授
12:00
12:00 **附加研討會**
主　題：與時俱進: 疫苗的突破與創新
主持人：邱南昌醫師
演講者：紀鑫醫師、陳伯彥醫師
13:30

13:30 **頒獎/會員代表大會**
14:30
14:30 | 休息
14:40
14:40 **醫學的科學、倫理與法律講座**
主　題：少子化對於兒科醫療衝擊
主持人：陳銘仁副理事長
演講者：劉越萍司長、鄭雁馨博士
16:40

102 會議室(1F)

09:00 **陳炯霖教授講座獎**
主　題：生命早期經驗與後期健康福祉：台灣出生世代研究的發現
主持人：倪衍玄理事長
演講者：江東亮教授
10:00
10:00 **專題演講**
主　題：基因檢查常見迷思
主持人：簡穎秀醫師、王仲興醫師
演講者：蘇本華主任、周言穎醫師、李妮鍾教授
12:00
12:00 **附加研討會**
主　題：兒童常見感染：現況與未來
主持人：張鑾英醫師
演講者：謝育嘉醫師、李俊毅醫師
13:30

103 會議室(1F)

12:00 **附加研討會**
主　題：新生兒疾病預防新里程
主持人：黃立民醫師、邱政洵醫師
演講者：蔡明倫醫師、呂俊毅醫師、紀鑫醫師
13:30

105 會議室(1F)

12:00 **附加研討會**
主　題：兒科抗生素治療中抗生素相關腹瀉與益生菌之角色
主持人：倪衍玄理事長
演講者：Prof. Guven, Sirin
13:30

地點：臺北國際會議中心(台北市信義區信義路 5 段 1 號)

一般演講：口頭報告

第一單元：血液學、腫瘤學

日期：民國113年4月20日(星期六)
時間：09:00～10:20
地點：(2F)201A、B、C會議室

主持人：張修豪、陳世翔

09:00～09:07　1. 以萬科合併化學治療非典型畸胎橫紋肌樣瘤之可行性研究
何宛玲[1,5]、謝明芸[2]、廖優美[3]、邱世欣[3]、夏和雄[4]、江昌旭[5]、周獻堂[6]、顏秀如[7]、李宜燕[7]、梁慕理[8]、葉庭吉[8]、周育誠[9]、黃芳亮[9]、陳淑惠[5,10]、李欣倫[1,5]、郭嘉駿[1,5]、陳淑美[1,5]、蔡明蘭[1,5]、張　璽[1,5]、謝立群[1,5]、方嘉郎[1,5]、張家堯[1,5]、王錦莉[5,11]、陳珠瑾[2]、羅永欽[3]、林佩瑾[3]、林子欽[12]、王士忠[13]、杜伊芳[14]、鄭兆能[14]、莊銘榮[15]、Huy Minh Tran[16]、宋賢穎[5]、賴柏融[5]、吳國盛[5]、James S. Miser[1,17]、劉彥麟[1,5,*]、黃棣棟[1,5]
臺北醫學大學附設醫院[1]；高雄榮民總醫院[2]；高雄醫學大學附設醫院[3]；慈濟醫院台北分院[4]；臺北醫學大學[5]；臺大醫院兒童醫院[6]；臺北榮民總醫院[7]；馬偕兒童醫院[8]；臺中榮民總醫院[9]；衛生福利部雙和醫院(委託臺北醫學大學興建經營)[10]；臺北市立萬芳醫院-委託臺北醫學大學辦理[11]；林口長庚紀念醫院[12]；彰化基督教兒童醫院[13]；國立成功大學附設醫院[14]；高雄長庚紀念醫院[15]；越南胡志明市醫藥大學[16]；美國希望之城醫學中心[17]

09:07～09:14　2. 兒童腦瘤基因變化的重要性
蘇旻昱、張德高
中國醫藥大學兒童醫院小兒血液腫瘤科

09:14～09:21　3. 一中部醫學中心兒童炎性肌纖維母細胞瘤 20 年治療經驗
張可歆[1]、陳其延[1]、曾瑞如[1]、梁瓊文[1,2]、陳麗敏[2]、張德高[3]、黃芳亮*[1]
臺中榮民總醫院; 兒童醫學中心血液腫瘤科[1], 護理部[2]; 中國醫藥大學兒童醫院小兒血液科[3]

09:21～09:28　4. 運用簡便具高敏感度的分析方法以監測急性淋巴性白血病病童體內 6-MP 代謝物
劉希哲[1]、鍾孟哲[1]、葉庭吉[1]、侯人尹[1]、黃鼎煥[2]、劉充智[1]、鄭佳祐[1]、林純卉[1]
馬偕兒童醫院[1];新竹馬偕兒童醫院[2];

09:28～09:35　5. Tocilizumab 對於兒童因嗜中性球低下合併發燒而導致敗血症/敗血性休克的治療效果：單一機構之經驗
陳世翔[1]、王奕倫[1]、張從彥[1]、江東和[1]、李恩沛[2]、林建志[2]、蕭翌雯[3]、楊兆平[1]、洪悠紀[1]
林口長庚紀念醫院兒童血液腫瘤科[1]、兒童加護科[2]、護理部[3]

09:35～09:42　6. 兒童急性淋巴性白血病併發巨細胞病毒性視網膜炎：病例系列報告及文獻探討
劉兆能[1]、劉希哲[2]、侯人尹[2]、黃鼎煥[3]、葉庭吉[2]
台北馬偕兒童醫院兒科部[1]; 台北馬偕兒童醫院兒童血液腫瘤科[2]; 新竹馬偕兒童醫院兒童血液腫瘤科[3]

09:42～09:49　7. 造血細胞移植醫療旅遊 — 單中心經驗
王奕倫[1]、溫玉娟[2]、白藍妮[3]、楊淑賀[2]、張從彥[1]、陳世翔[1]、江東和[1]
林口長庚紀念醫院兒童血液腫瘤科[1]、護理部[2]、國際醫療中心[3]

09:49～10:10　討論

10:10～10:20　休息

第二單元：心臟血管學

日期：民國113年4月20日(星期六)
時間：10:20～11:40
地點：(2F)201A、B、C會議室

主持人：鄭敬楓、簡邵如

10:20～10:27　8. 用核磁共振取得幾何圖形來評估法洛氏四合症術後雙側肺動脈逆流
翁根本[1]、鄧惠中[2]、簡光仁[1]、林竹川[1]、吳銘庭[2]
高雄榮民總醫院兒醫部[1]、放射線部[2]

10:27～10:34　9. 對於兒童肥厚型心肌病心因性猝死以現行治療指引預測能力有限
邱舜南、莊志明[1]、曾偉杰、李妮鍾[2]、陳俊安、林銘泰、盧俊維、王主科、吳美環
台大醫學院，台大醫院小兒部、內科部[1]、基因醫學部[2]

10:34～10:41　10. 川崎氏症之發生率在新冠肺炎大流行期間顯著下降: 使用時間序列分析之研究
林怡瑄[1,3]、林明志[1,3]、林敬恒[2]
台中榮民總醫院兒童醫學中心[1]、研究部[2]、國立中興大學學士後醫學系[3]

10:41～10:48　11. 早產兒(＜2kg) 之開放性動脈導管關閉器尺寸選擇與如何避免併發症之探討
林俊嘉[1,2]、戴以信[2]、傅雲慶[3]、謝凱生[2]、彭義欽[2]、莊子瑤[2]、莊傑貿[3]、徐宗正[2]
彰濱秀傳醫院兒科部[1]、中國醫藥大學兒童醫院心臟科[2]、台中榮總兒童醫學中心[3]

10:48～11:55　12. 後新冠症候群對於未成年族群是否有心臟血管的影響
彭義欽[1]、劉邦衍[2]、戴以信[1]、莊子瑤[1]、徐宗正[1]、謝凱生[1,2]、王志堯[3]
中國醫藥大學兒童醫院兒童心臟科[1];中國醫藥大學附設醫院醫研部[2];中國醫藥大學附設醫院 過敏免疫與微菌叢研究中心[3]

11:55～11:02　13. 心導管消融治療成人期先天性心臟病與非先天性心臟病之心房顫動之個案對照研究

莊傑貿[1]、范文博[2]、傅雲慶[1]、林明志[1]、詹聖霖[1]、戴以信[3]、李昱昕[4]、彭瀠萱[5]、李必昌[1]

台中榮民總醫院兒童心臟科[1];台北榮民總醫院兒童心臟科[2];中國醫藥大學附設兒童醫院兒童心臟科[3];林口長庚醫院兒童心臟科[4];中山醫學大學附設醫院兒童心臟科[5]

11:02～11:09　14. 先天性心臟病術後上心室頻脈之危險因子分析及長期追蹤結果

張乃勻[1]、吳佩圜[2]、邱舜南[1]、陳益祥[1]、黃書健[1]、王主科[1]、吳美環[1]、林銘泰[1]、盧俊維[1]、陳俊安[1]

國立臺灣大學醫學院附設醫院兒童醫院[1]; 中華民國衛生福利部[2]

11:09～11:16　15. 單一中心經心導管與外科手術置換肺動脈瓣膜之比較

鄭又寧[1]、陳俊安[1]、曾偉杰[1]、邱舜南[1]、林銘泰[1]、盧俊維[1]、黃書健[2]、陳益祥[2]、王主科[1]、吳美環[1]

國立台灣大學醫學院附設醫院小兒部[1]、外科部[2]

11:16～11:40　討論

附加研討會
嬰幼兒免疫與大腦發展的前瞻科學

日期：民國113年4月20日(星期六)
時間：12:00～13:30
地點：(2F)201A、B、C會議室

主持人：李宏昌教授、林光麟醫師

12:00～12:05　1. 開幕致詞
李宏昌教授
台北馬偕兒童醫院

12:05～12:45　2. 強化嬰兒免疫營養新突破
楊燿榮醫師
成大醫院

12:45～13:25　3. 早期核心營養對嬰幼兒腦發展的關鍵影響
楊生湳醫師
義大醫院

13:25～13:30　4. 討論與結語
林光麟醫師
林口長庚紀念醫院

第三單元：新生兒學

日期：民國113年4月20日(星期六)
時間：13:30～15:00
地點：(2F)201A、B、C會議室

主持人：林毓志、廖穗綾

13:30～13:37　16. 母鼠柴油顆粒暴露改變新生大鼠的腸道微生物群並誘發肺損傷
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]

13:37～13:44　17. 台灣新生兒死亡率的地區差異分析：2008 至 2022 年
周佳穗[1,2,3]、呂宗學[4]、李昱聲[1,2,3]、曹珮真[1,2,3]、鄭玫枝[1,2,3]、台灣新生兒死因研究小組
臺北榮民總醫院兒童醫學部新生兒醫療中心暨新生兒科[1]; 國立陽明交通大學急重症醫學研究所[2]; 國立陽明交通大學醫學院兒科[3]; 國立成功大學醫學院公共衛生系[4]

13:44～13:51　18. 剖腹產和產婦/新生兒抗生素的使用會增加足月嬰兒敗血症的風險：全國人口研究
李浩遠[1]、蔡明倫[2,3]、沈上博[3]、陳映廷[3]、邱曉郁[4]、林湘瑜[2,3]、李文源[1]、鄭皓文[3]、林鴻志[3,4]
為恭紀念醫院小兒科[1]; 中國醫藥大學臨床醫學研究所[2]; 中國醫藥大學兒童醫院新生兒科[3]; 亞洲大學附屬醫院兒科[4]

13:51～13:58　19. 新生兒腎盂擴大: 發生率，周產期特徵與追蹤預後
曾涵泰[1]、洪依利[1;2;3]、沈仲敏[1;3]、林隆煌[1;3]、謝武勳[1;4]
國泰醫療財團法人國泰綜合醫院[1]; 國立清華大學醫學院[2]; 天主教輔仁大學醫學院[3]; 國立臺灣大學醫學院[4]

13:58～14:05　20. 台灣新生兒死亡證明書上常見的填寫錯誤
吳怡萱[1,3]、林瑞瑩[1,3]、江明洲[1,3]、呂宗學[2,3]
林口長庚紀念醫院兒童內科部新生兒科[1]; 成功大學醫學院公共衛生研究所[2]; 台灣新生兒死因研究小組[3]

14:05～14:12　21. 子宮內生長遲滯大鼠肺和缺氧肺泡上皮細胞降低了 Notch-Hes1 訊號路徑
黃亮迪[1,2]、曹伯年[5,6]、周秀珠[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]; 台灣大學附設醫院兒科部[5]、臺灣大學發育生物學與再生醫學研究中心[6]

14:12～14:19　22. 新生兒黃疸與先天性腎臟異常及併發的尿路感染風險增加有關
林怡璇[1]、周信旭[2,3]、黃琳淇[2]、張育嘉[4,5]、沈上博[1]、蔡明倫[1]、林鴻志[1]
中國醫藥大學兒童醫院[1]; 戴德森醫療財團法人嘉義基督教醫院兒童醫學部[2]; 亞洲大學生物資訊與醫學工程學系[3]; 亞洲大學醫學暨健康學院健康產業管理學系[4]; 國立金門大學健康護理學院長期照護學系[5];

14:19～14:26 23. 子宮胎盤功能不全引起子宮內生長受限的新生大鼠腸道代謝變化
何昇遠 [1,2]、Merryl Esther Yulian[3,4]、周琇珠 [5]、陳中明 [2,3,6,7]
國防醫學院三軍總醫院兒科部 [1]；臺北醫學大學醫學院臨床醫學研究所 [2]、國際博士學程 [3]；印尼基督教大學醫學院 [4]；臺北醫學大學醫學院解剖學與細胞生物學系 [5]、小兒學科 [6]；臺北醫大學附設醫院兒科 [7]

14:26～14:33 24. 子宮內胎兒生長遲滯對學齡期之極低體重早產兒的體組成及飲食影響
陳倩儀 [1]、翁慧玲 [2]、曹伯年 [1]、周弘傑 [1]
國立台灣大學醫學院附設兒童醫院小兒部 [1]; 國立臺灣大學醫學院附設醫院癌醫中心分院 [2]

14:33～15:00 討論

15:00～15:10 休息

主持人：陳中明、鄭玫枝

15:10～15:17 25. 維生素 D 濃度與維生素 D 代謝基因遺傳多態性在高風險懷孕中之關聯
謝妙禧 [1]、楊智怡 [2]、蔡明倫 [3]、陳佩琪 [1]、吳世欣 [1]、王志堯 [1]
中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [1]; 中國醫藥大學附設醫院婦產部 [2]; 中國醫藥大學兒童醫院新生兒科 [3]

15:17～15:24 26. 比較胎兒小於妊娠年齡的孕期危險因子、產後併發症及周歲前的生長發育狀況
崔舒評 [1]、陳威宇 [1,2,3]、周佳穗 [1,2,3]、羅宇成 [1,2,3]、曹珮真 [1,2,3]、李昱聲 [1,2,3]、鄭玫枝 [1,2,3]
台北榮民總醫院兒童醫學部 [1]; 國立陽明交通大學醫學院醫學系小兒學科 [2]; 國立陽明交通大學急重症醫學研究所 [3]

15:24～15:31 27. 隱藏變數：新生兒產後處置的選擇對單一醫療中心新生兒死亡率的影響
陳佳慧 [1,3,4]、逄芯品 [1]、張弘洋 [1,4]、李松澤 [2,4]、呂宗學 [5]、彭純芝 [1,4]、張瑞幸 [1,4]、許瓊心 [1,4]、詹偉添 [1,4]、林佳瑩 [1,4]
馬偕兒童醫院新生兒科 [1]; 新竹兒童醫院小兒神經科 [2]; 國立陽明交通大學急重症醫學研究所 [3]; 馬偕醫學院醫學系 [4]; 國立成功大學公共衛生研究所 [5]

15:31～15:38 28. 維生素 D 濃度對後代過敏性疾病的影響
蔡明倫 [1,2]、藍智嵩 [2]、楊曉涵 [2]、鄭皓文 [2]、陳映廷 [2]、沈上博 [2]、林湘瑜 [1,2]、邱曉郁 [2]、林鴻志 [2,3]、王志堯 [4,5]
中國醫藥大學生物醫學研究所 [1]; 中國醫藥大學兒童醫院新生兒科 [2];亞洲大學附屬醫院兒科部 [3]; 中國醫藥大學兒童醫院過敏免疫與微菌叢研究中心 [4]; 中國醫藥大學兒童醫院兒童過敏免疫風濕科 [5]

15:38～15:45 29. 以噴霧方式給予表面張力素治療早產兒之新生兒呼吸窘迫症之初步研究報告
陳秀玲 [1,2]、楊書婷 [1,2]、蘇品淳 [1]、黃子融 [3]
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]、高雄醫學大學附設中和紀念醫院呼吸治療組 [3]

15:45～15:52 30. 子癲前症母親和新生兒的轉錄組學分析
林宜君 [1]、賴韻如 [2]、蔡慶章 [2]、鄭妤君 [1]、于鴻仁 [1]、刁茂盟 [1]、沈俊明 [1]
台灣高雄長庚醫院 兒童內科部 [1]; 高雄長庚醫院婦產部 [2]

15:52～15:59　31. 咖啡因是否能減少極低出生體重早產兒腸衰竭相關肝病的發生?
陳美淇、李建忠、賴美吟、許凱翔、傅仁煇、朱世明、林瑞瑩、吳怡萱、楊長佑、江明洲
林口長庚紀念醫院兒童內科部新生兒科

15:59～16:06　32. 新生兒腹腔顯影劑滲漏的臨床表徵與急性處置
胡晉傑[1]、許凱翔[1]、江明洲[1]、王超然[2]、張志丞[2]、賴勁堯[3]、明永青[3]、徐任甫[1]、朱世明[1]、林瑞瑩[1]
林口長庚紀念醫院兒童內科部新生兒科[1]；林口長庚紀念醫院影像診療科[2]；林口長庚紀念醫院小兒外科[3]

16:06～16:13　33. 早產在主要死因中的排序：比較兩種不同的分類法
張毓珊[1]、呂宗學[2]
奇美醫院急診醫學部[1];國立成功大學醫學院公共衛生學科暨研究所[2]

16:13～16:40　討論

第四單元：神經精神醫學

日期：民國113年4月20日(星期六)
時間：09:00～11:30
地點：(2F)201D、E、F會議室

主持人：林光麟、郭雲鼎

09:00～09:07　34. Pank2 敲除小鼠的 AAV9 基因治療：初步研究
洪宣羽[1,2,3]、胡務亮[4]
中國醫藥大學醫學院醫學系[1];中國醫藥大學生物醫學研究所[2];中國醫藥大學兒童醫院小兒神經科[3];中國醫藥大學附設醫院精準醫學中心[4]

09:07～09:14　35. 醫療院所舉辦親子共讀工作坊的可行性和成效
王中豪[1]、王培瑋[1]、方麗容[1]、童寶娟[2]、艾秀芸[2]、張維珊[2]、王心宜[2]
臺北市立聯合醫院和平婦幼院區小兒科[1];國立臺北護理健康大學語言治療與聽力學系[2]

09:14～09:21　36. 兒童新冠肺炎(Omicron)感染後引發之神經症狀回顧(2022-2023)
游翔皓、陳錫洲、丁肇壯、方泓翔、白立凡、曾梓翔
國防醫學中心附設三軍總醫院內湖總院區小兒科部

09:21～09:28　37. 管狀聚集性肌肉病變之分析: 系列病例報告
王晨華[1]、梁文貞[2,4,5]、鐘育志[2,3,5]
高雄市立小港醫院小兒科[1]；高雄醫學大學附設醫院小兒科[2]、檢驗醫學科[3] ；高雄醫學大學醫學院 醫學系小兒學科[4]、臨床醫學研究所[5]

09:28～09:35　38. 針對卓飛症候群 stiripentol 在東台灣之實際應用
張旻軒[1]、張宇勳[1,2]、王傳育[1,2]
佛教慈濟醫療財團法人花蓮慈濟醫學中心小兒部[1]; 慈濟大學醫學院醫學系小兒學科[2]

09:35～09:42　39. 癲癇青少年的運動習慣和健康相關的生活品質
范琦[1]、宋承智[3]、王煇雄[1,2]、郭政諺[1]、劉文瑜[4]、林光麟[1,2]
林口長庚醫院兒童神經內科[1];長庚大學醫學院[2];亞東紀念醫院復健部[3];長庚大學物理治療系[4]

09:42～09:49　40. 臺灣兒童後新冠患者的心理評估研究
魏吉宏[1]、陳佩琪[2]、林宗瑩[3]、吳世欣[2]、謝妙禧[2]、王志堯[2]
中國醫藥大學兒童醫院醫研部[1]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[2]; 國立成功大學醫學院健康照護研究所[3]

09:49～10:10　討論

10:10～10:20　休息

主持人：林光麟、郭雲鼎

10:20～10:27　41. 兒童腦瘤的診斷落差
楊曜綸[1]、遲景上[1]、李秀芬[1,2]、吳珮瑜[1]、劉書寧[1]
台中榮民總醫院兒童醫學中心兒童神經科[1];國立中興大學學士後醫學系[2]

10:27～10:34　42. 新生兒無臨床觀察到的腦波抽搐: 病例系列研究
陳思宇[1,2]、趙英棋[1,2]、黃瑞喜[1,2]、李英齊[1,2]
中山醫學大學附設醫院 兒童部 兒童神經科[1]; 中山醫學大學醫學系[2]

10:34～10:41　43. 透過改變基底塗層增強骨骼肌纖維類型轉變
張璽[1,2]、蔡明蘭[1,2]、李逢卿[1]、李芷娟[2]、Yhusi Karina Riskawa[2]
臺北醫學大學附設醫院 小兒科[1]；臺北醫學大學醫學院醫學系小兒學科[2]

10:41～10:48　44. 以新生兒篩檢促甲狀腺激素之四分位濃度分層極度早產兒神經發展障礙風險-人口世代研究
陳俐文[1]、朱基祥[2]、林永傑[1]、黃朝慶[1,3]
國立成功大學醫學院附設醫院小兒部[1];東海大學統計系[2];臺北醫學大學醫學院小兒部[3]

10:48～10:55　45. 體外震波治療對於腦性麻痺兒童的運動功能影響之系統性回顧與統合分析
彭彙惠[1]、宋明杰[1]、林廉傑[2]
臺北醫學大學醫學系[1]; 雙和醫院復健醫學部[2]

10:55～11:02　46. 什麼是兒童心智最早的功能性預測因子？
郭煌宗[1]、陳妍廷[2]、翁岳塘[3]、林秀縵[1]、蔡明倫[4]、吳亞倫[3]、葉宸妤[3]、王韋竣[3]、劉書岑[1]
中國醫藥大學兒童醫院兒少發展暨心智行為科 親職及兒童發展研究小組[1];馬偕醫院[2];中國醫藥大學附設醫院 AI 中心[3];中國醫藥大學兒童醫院 新生兒科[4]

11:02～11:09　47. 視知覺與聽知覺於事件相關電位之 P300 潛時不匹配可成為華語文學習環境中學習障礙者診斷之指標
王心宜[1]、趙文崇[2]、童寶娟[3]、翁仕明[3,4]
臺大醫院北護分院復健科[1]; 埔基醫療財團法人埔里基督教醫院小兒神經科[2]; 國立臺北護理健康大學語言治療與聽力學系所[3]; 臺北市立萬芳醫學中心小兒神經科[4]

11:09~11:30　討論

附加研討會
台灣兒童營養面面觀
-協助孩童營養攝取與提升營養吸收

日期：民國113年4月20日(星期六)
時間：12:00~13:30
地點：(2F)201D、E、F會議室

主持人： 楊俊仁院長、陳安琪主任

12:00～12:05　1. 開幕致詞
楊俊仁院長
新竹市立馬偕兒童醫院

12:05～12:35　2. 兒科小患者大挑戰-餵食困難的科學解方?
劉明發醫師
新光醫院

12:35～13:15　3. CPPs(酪蛋白磷酸胜肽)提升兒童骨骼成長潛力-從消化吸收談起
Prof. Robert David Murray
俄亥俄州立大學

13:15～13:30　4. 討論與結語
楊俊仁院長
新竹市立馬偕兒童醫院

第五單元：過敏免疫風濕病學

日期：民國113年4月20日(星期六)
時間：13:30～17:10
地點：(2F)201D、E、F會議室

主持人：孫海倫、蔡易晉

13:30～13:37　48. 以新冠病毒抗核衣殼蛋白抗體作為評估兒童後新冠嚴重程度的生物指標
李宗儒[1]、陳佩琪[2]、吳世欣[2]、謝妙禧[2]、郭文碩[2]、王志堯[2]
中國醫藥大學兒童醫院過敏免疫科[1]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[2]

13:37～13:44　49. Adalimumab 使用於兒童特發性關節炎的良好治療反應預測因子
黃柏翰[1]、吳昭儀[1]、陳力振[2]、葉國偉[1]、林思偕[1]、李文益[1]、歐良修[1]、姚宗杰[1]、蘇冠文[1]、黃璟隆[2]
林口長庚紀念醫院兒童過敏氣喘風濕科[1], 新北市立土城醫院兒童內科[2]

13:44～13:51　50. 兒童與成人全身型過敏性反應之分析
鍾佩蓉[1]、王麗潔[1]、江伯倫[1,2]
國立台灣大學醫學院附設醫院小兒部[1];國立台灣大學生命科學院基因體與系統生物學學位學程[2]

13:51～13:58　51. 早產與足月產孕婦尿液胞外體具有不同調節訓練免疫力的機轉研究
楊崑德[1,2,3]、林佳學[1,2]、曾芝文[1]、黃建霈[3]
馬偕兒童醫院[1], 陽明交通大學臨醫所[2], 馬偕紀念醫院婦產科、醫研部[3]

13:58～14:05　52. 九價人類乳突病毒疫苗降低幼年型關節炎的發生--COVID-19 大流行前後的研究
蔡明瑾[1]、傅令嫻[1,2]
臺中榮民總醫院兒童醫學中心[1]; 國立中興大學學士後醫學系[2]

14:05～14:12　53. 漿膜炎作為兒童全身性紅斑性狼瘡不良長期預後之預測因子之探討
高瑋辰[1,4]、胡雅喬[1]、李志鴻[1]、王麗潔[1]、林于粲[1]、楊曜旭[1]、江伯倫[1,2,3]、俞欣慧[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臨床醫學研究所[2]、國立台灣大學生命科學院[3]、佛教慈濟醫療財團法人台北慈濟醫院兒科部[4]

14:12～14:19　54. 環境曝露與綠化對氣喘病童鼻腔及腸道菌相的影響
王志堯[1]、Aji Kusumaning Asri[2]、劉宗霖[3]、蔡慧如[4]、吳治達[2]
中國醫藥大學兒童醫院過敏免疫科，過敏免疫及微菌叢研究中心[1]; 國立成功大學測量及空間學系[2]; 國家衛生研究院群體健康研究所[3]; 國立成功大學生物科技及產業科學系[4]

14:19～14:26　55. 維生素 D 結合蛋白基因型對維生素 D 濃度及氣喘發生率的影響: 跨種族研究
林芊慧[1]、謝妙禧[2]、吳世欣[2]、Natalia Paramonova[3]、Brigita Sitkauskiene[4]、Sonomjamts Munkhbaya[5]、王志堯[2]
中國醫藥大學兒童醫院[1]; 中國醫藥大過敏免疫及微菌叢研究中心叢 (AIM)研究中心[2]; 拉脫維亞大學醫學院基因體及生物資訊研究室[3]; 立陶宛健康科學大學醫學院過敏及胸腔學科[4]; 蒙古人民共和國國立大學醫學院[5]

14:26～14:33　56. 新冠肺炎後是否會增加過敏性疾病發生的機率?以美國電子病歷資料庫探勘結果
楊樹文[1]、魏正宗[2]、王志堯[3]
中國醫藥大學兒童醫院過敏免疫科[1]; 中山醫學大學醫學研究所[2]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[3]

14:33～14:40　57. CBM 訊息複合體功能低下引發 Hyper-IgE 與異位性症狀
林達雄[1,2,3]、林國瑞[4]、吳竺燕[3]、黃榮達[3]、李宗翰[3]、黃玉文[3]、嚴仲陽[4]
馬偕紀念醫院 兒科部[1];馬偕醫學院 醫學系[2];馬偕紀念醫院醫學研究部[3];中央研究院生醫所[4]

14:40～14:47　58. 兒童多樣化後新冠症狀與腸道微菌叢的相關性研究
陳佩琪[1]、劉宗霖[2]、吳世欣[1]、謝妙禧[1]、許玉龍[3]、宋文舉[4]、謝凱生[5]、周宜卿[6]、陳安琪[7]、王志堯[1]
中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[1]; 國立成功大學生物科技及產業科學系[2]; 中國醫藥大學兒童醫院 感染科[3]，胸腔科[4]，心臟科[5]，神經科[6]，胃腸科[7]

14:47～15:20　討論

15:20～15:30　休息

主持人：王怡人、洪志興

15:30～15:37　59. 使用吸入型類固醇氣喘病患與 COVID-19 醫療使用之相關研究
李宗儒、楊樹文、魏長菁、王志堯
中醫大兒童醫院小兒過敏免疫風濕科

15:37～15:44　60. 在低氧培養條件下培養的臍帶間質幹細胞(MSCs)所分泌的外泌體通過調控糖代謝和 AKT 活化途徑拯救一般氧培養的 MSCs 衰老現象
林佳學[1]、陳治平[2]、楊崑德[1,2]
馬偕兒童醫院[1];馬偕紀念醫院婦產科、醫研部[2]

15:44～15:51　61. 不同細懸浮微粒對動物模型的影響
陳育萱[1]、柯俊良[2]、李育慈[2]、廖培汾[1]、顧明修[1,2]、孫海倫[1,2]、呂克桓[1,2]
中山醫學大學附設醫院 兒童部 過敏免疫風濕科[1]; 中山醫學大學 醫學院 醫學系 醫研所[2]

15:51～15:58　62. 間質幹細胞外泌體調節訓練免疫力不同於類固醇的作用機轉研究
鄭以琳[1]、林佳學[1,2]、曾芝文[1]、陳治平[3]、楊崑德[1,2,3]
馬偕兒童醫院[1], 陽明交通大學臨醫所[2], 馬偕紀念醫院婦產科、醫研部[3]

15:58～16:05　63. 多種生物體液代謝體學分析深入了解兒童過敏性鼻炎和氣喘
邱志勇[1,2]、江孟翰[2]、郭捷妮[1]、蘇冠文[3]、葉國偉[3]、黃璟隆[4]
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];長庚醫療財團法人臨床代謝體學核心實驗室[2];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[3];長庚醫療財團法人新北市立土城醫院兒科[4]

16:05～16:12　64. 塵蟎經氧化壓力訊息傳遞調節增強警報素誘導上皮-間質轉換
洪志興[1,2,3]、蔡美蘭[4]
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]高雄醫學大學醫研所[4]

16:12～16:19　65. 台灣桃園地區國中學童體適能與氣喘調查分析
蕭永軒[1,2]、姚宗杰[1,3]、葉國偉[1,3]、李文益[1,3]、陳力振[1,4]、黃璟隆[1,4]、歐良修[1,3]
長庚大學醫學院[1]、林口長庚紀念醫院教學部[2]、林口長庚紀念醫院兒童過敏氣喘風濕科[3]、新北市立土城醫院兒童內科[4]

16:19～16:26　66. 主要組織相容性複合體相容性可能影響嚴重複合型免疫缺乏症病人接受骨髓移植後 B 細胞功能回復
陳志安[1]、林靜微[1]、楊媛甯[1]、陳建旭[1]、謝奇璋[1,2]
國立成功大學醫學院附設醫院小兒部[1];國立成功大學醫學院附設醫院臨床醫學研究所[2]

16:26～16:33　67. 金針菇免疫調解蛋白(FIP-fve)可以改善 PM2.5 和過敏原誘發的氣道發炎
陳若晴[1]、柯俊良[2]、李育慈[2]、廖培汾[1]、顧明修[1,2]、孫海倫[1,2]、呂克桓[1,2]
中山醫學大學附設醫院 兒童部 過敏免疫風濕科[1]; 中山醫學大學 醫學院 醫學系 醫研所[2]

16:33～16:40　68. 巨環類抗生素於小兒氣喘治療的效果及安全性：系統性文獻回顧與統合分析
張博雄[1,3]、林于粲[3]、張博勝[2]、江伯倫[3]
亞東紀念醫院小兒部過敏免疫風濕科[1]; 亞東紀念醫院小兒部肝膽胃腸科[2]; 國立台灣大學醫學院附設醫院小兒部過敏免疫風濕科[3]

16:40～17:10　討論

第六單元：腸胃學、營養學

日期：民國113年4月20日(星期六)
時間：09:00～10:40
地點：(1F)102會議室

主持人：林裕誠、趙舜卿

09:00～09:07　69. 兒童嗜伊紅性食道炎：台灣北部一間醫學中心的經驗
曾文禹[1,2]、趙舜卿[2,3]、蘇冠文[4,5]、賴明瑋[2,3,6]、陳建彰[2,3]
仁愛長庚合作聯盟大里仁愛醫院[1]; 林口長庚紀念醫院兒童內科部兒童腸胃科[2]、兒童風濕免疫科[4]; 長庚大學醫學院[3]; 基隆長庚紀念醫院兒童內科[5]; 林口長庚紀念醫院肝臟研究中心[6]

09:07～09:14　70. 嬰兒腸絞痛的危險因子與預後
廖舫敏[1]、沈上博[2]、蔡明倫[2]、陳安琪[1]、吳淑芬[1]、張育嘉[3]、林鴻志[2]
中國醫藥大學兒童醫院兒童腸胃肝膽及營養科[1]、新生兒科[2]; 金門大學長期照護學系[3]

09:14～09:21　71. 母親產前感染與兒童膽道閉鎖的關係
王唯豪[1,2]、邱方榆[3,4]、郭芷彤[5]、邵于宣[2,6]
彰化基督教兒童醫院兒科部[1]; 臺北醫學大學醫學資訊研究所[2]; 臺中榮民總醫院婦女醫學部[3]; 連江縣立醫院婦產科[4]; 臺北醫學大學數據處健康資料加值暨統計中心[5]; 臺北醫學大學附設醫院臨床大數據研究中心[6]

09:21～09:28　72. 探討益生菌對人體腸道抗萬古黴素腸球菌之去定植作用：隨機臨床試驗之系統性回顧與統合分析
范翡夏[1,2.]、林以娟[1,2]、陳錦華[3,4,5]、方旭彬[1,2,6,7]
臺北醫學大學醫學院醫學系小兒學科[1]、部立雙和醫院小兒部小兒消化科[2]、大數據科技及管理研究所[3]、應用流行病學碩士學位學程[4]、國際生技醫療管理博士學位學程[5]、藥學院臨床基因體學暨蛋白質體學碩士學位學程[6]、消化醫學研究中心[7]

09:28～09:35　73. 台灣發炎性腸道疾病中 NUDT15 基因變異與中性球低下之關聯
陳韋廷[1]、游智翔[4]、楊永立[2,3]、吳嘉峯[2]
國立台灣大學醫學院附設醫院新竹分院小兒部[1];國立台灣大學醫學院附設醫院小兒部[2];國立台灣大學醫學院附設醫院檢驗醫學部[3];中央研究院統計科學研究所[4]

09:35～09:50　討論

09:50～10:00　休息

主持人：方旭彬、施相宏

10:00～10:07　74. 妊娠糖尿病母親之新生兒腸道代謝物質的改變
蘇莞心[1]、陳建彰[1]、江明洲[2]、傅仁煇[2]、賴明瑋[1]、趙舜卿[1]、葉栢睿[1]、陳米琪[1]、王宜薇[1]

林口長庚兒童肝膽腸胃科[1]; 林口長庚新生兒科[2]

10:07~10:14 75. 體外探討可抑制多重抗藥性非傷寒沙門氏桿菌之多重益生菌株及其對抗生素之加乘作用
林以娟[1,2]、范翡夏[1,2]、吳凱[1,2]、方旭彬[1,2,3,4]
臺北醫學大學醫學院醫學系小兒學科[1]、部立雙和醫院小兒部小兒消化科[2]、藥學院臨床基因體學暨蛋白質體學碩士學位學程[3]、消化醫學研究中心[4]

10:14~10:21 76. 新冠肺炎大流行期間的急性胃腸炎分子流行病學-北台灣一家醫學中心之經驗
楊詠家[1]、陳世彥[1,2]、林文川[1,3]、林聖傑[1,4]
衛生福利部雙和醫院(委託臺北醫學大學興建經營)[1]、兒童腸胃科[2]、兒童感染科[3]、兒童過敏氣喘免疫科[4]

10:21~10:28 77. 空迴腸閉鎖的特色及預後：一家醫學中心的 10 年臨床經驗
林芝羽[1,2]、賴明瑋[1]、趙舜卿[1]、陳建彰[1]、葉栢睿[1]、陳米琪[1]
林口長庚紀念醫院 兒童胃腸科[1]、 基隆長庚紀念醫院 小兒科[2]

10:28~10:40 討論

附加研討會
幼童免疫防護破口
-毀滅性疾病：腦膜炎雙球菌

日期：民國113年4月20日(星期六)
時間：12:00～13:30
地點：(1F)102會議室

主持人： 黃立民院長、黃玉成理事長

12:00～12:05　1. 開幕致詞
黃立民院長
台大兒童醫院

12:05～12:45　2. 幼童免疫防護破口-毀滅性疾病：腦膜炎雙球菌
陳伯彥住任
台中榮民總醫院感染管制中心

12:45～13:25　3. 自費疫苗施打的必要性-醫師觀點座談會
陳伯彥主任
台中榮民總醫院感染管制中心

13:25～13:30　4. 討論與結語
黃玉成理事長
台灣兒童感染症醫學會

第七單元：感染學

日期：民國113年4月20日(星期六)
時間：13:30～15:00
地點：(1F)102會議室

主持人：林曉娟、謝育嘉

13:30～13:37　78. 兒童新冠病毒感染重症中抗第一型干擾素自體抗體之探討
郭貞孍[1,2]、夏紹軒[1]、林建志[1]、雷偉德[3]、李倩瑜[4]、謝凱生[5]、鄭名芳[6]、顧正崙[1,2]、黃玉成[1]、林奏延[1]
林口長庚醫院兒童感染科、兒童加護科[1]；長庚大學臨床醫學研究所人類免疫與感染醫學實驗室[2]；新竹馬偕紀念醫院兒童過敏免疫科[3]；部立桃園醫院小兒科[4]；中國醫藥大學兒童醫院小兒科[5]；高雄榮民總醫院小兒感染科[6]

13:37～13:44　79. 2018 年至 2021 年間在台灣北部單一醫學中心經陰道分娩的足月新生兒使用無痛分娩麻醉的使用情況和感染率的調查
張佳寧、王志堅
國防醫學院三軍總醫院小兒科部

13:44～13:51　80. 新型冠狀病毒感染率、新冠後症候群之發生率和臨床特徵在兒童族群之探討
周昱廷[1,4]、張圖軒[5]、商志雍[2]、高淑芬[2]、林家瑋[3]、陳淑惠[6]、施佾玓[7]、陳芬苓[7]、朱彥儒[1]、張鑾英[1]
國立台灣大學醫學院附設醫院小兒部[1]、精神醫學部[2]、復健部[3];衛生福利部桃園醫院小兒部[4];奇美醫院兒科部[5];國立台灣大學心理系[6]; 國立台北大學社會工作學系[7]

13:51～13:58　81. 中台灣單一醫學中心兒童住院患者中感染呼吸道融合病毒和人類間質肺炎病毒的臨床特徵分析比較
邱玉婷、衛琇玫、陳俊安、賴奐丞、劉衍怡、張煜昌[1]、蕭瓊子[1]、許玉龍、林曉娟、黃高彬
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院檢驗醫學部[1]

13:58～14:05　82. 兒童 Omicron 變異株感染所致急性腦炎/腦病變和哮吼的血液轉錄體分層分析
黃崇瑋[1]、廖威超[2]、張益峯[2]、林建志[3]、郭貞孍[4]、陳志榮[4]、黃玉成[4]、邱政洵[4]、陳志和[5]、謝育嘉[4]
基隆長庚兒童內科[1]; 長庚大學分子醫學研究中心[2];林口長庚兒童重症加護科[3];林口長庚兒童感染科[4]; 高雄長庚兒童感染科[5]

14:05～14:12　83. 長庚紀念醫院 2011-2023 年間肺炎鏈球菌腦膜炎研究
唐青敏[1,4]、林建志[1,2,3,4]、林光麟[1,2]、邱政洵[5,6]
林口長庚紀念醫院兒童神經科[1]; 長庚大學醫學系[2]; 林口長庚紀念醫院一般醫學科[3]; 林口長庚紀念醫院兒童重症加護科[4]; 林口長庚紀念醫院兒童感染科[5]; 林口長庚紀念醫院傳染疾病分子研究中心[6]

14:12～14:19　84. 維生素 D 與兒童新冠感染後遺症的相關性研究

王鉉玄[1]、陳佩琪[2]、吳世欣[2]、謝妙禧[2]、王志堯[2]
中國醫藥大學兒童醫院兒童內科部[1];中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[2]

14:19～14:26　85. 副流感病毒感染住院兒童臨床表徵與發展為重症之風險因子分析
白孟丘、劉允中、顏廷聿、黃冠穎、呂俊毅、陳中明、李秉穎、張鑾英、黃立民
台大兒童醫院小兒感染科

14:26～14:33　86. 仙人掌桿菌菌血症的臨床特徵及相關因素
黃筱倫[1,2]、顏廷聿[1]、黃崧銘[3]、陳宜君[4]、丁菱[5]、張圖軒[2]、張鑾英[1]、呂俊毅[1]、黃冠穎[1]、黃立民[1]
國立台灣大學醫學院附設醫院小兒部、小兒感染科[1]; 奇美醫療財團法人奇美醫院兒科部[2];天主教輔仁大學附設醫院兒童醫學部[3]; 國立台灣大學醫學院附設醫院內科部、感染科[4];國立台灣大學醫學院附設醫院感染管制中心

14:33～15:00　討論

15:00～15:10　休息

第八單元：小兒預防醫學及流行病學

日期：民國113年4月20日(星期六)
時間：15:10～16:00
地點：(1F)102會議室

主持人：邱婷芳、紀鑫

15:10～15:17　87. 中台灣兒童新冠感染後遺症的臨床特徵和疫苗效果分析
許玉龍、陳佩琪[1]、吳世欣[2]、蔡宜芬[3]、賴奐丞、林曉娟、魏吉宏; 謝凱生[4]、黃高彬、蔡慧如[3]、王志堯[1,5]
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院過敏免疫及微菌叢研究中心[1]; 中國醫藥大學生物醫學研究所[2]; 國家衛生研究院群體健康科學研究所[3]; 中國醫藥大學兒童醫院醫學研究部[4]; 中國醫藥大學兒童醫院兒童過敏免疫風濕科[5]

15:17～15:24　88. 兒童 SARS-CoV-2 感染住院患者的後新冠症候群：臨床特點及風險評估
賴奐丞[1]、許玉龍[1,2]、陳佩琪[3]、蔡宜芬[4]、魏吉宏[5]、謝凱生[5]、林建亨[6]、黃高彬[1]、蔡慧如[4]、王志堯[3]
中國醫藥大學兒童醫院兒童感染科[1], 中國醫藥大學生物醫學研究所[2], 中國醫藥大學過敏免疫及微菌叢研究中心[3], 國家衛生研究院[4], 中國醫藥大學兒童醫院醫學研究部[5], 中國醫藥大學兒童醫院兒童胸腔科[6]

15:24～15:31　89. Epstein-Barr 病毒對兒童新冠感染後遺症的影響
許玉龍、陳佩琪[1]、吳世欣[2]、謝凱生[3]、賴奐丞、林曉娟、黃高彬、王志堯[1,4]
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院過敏免疫及微菌叢研究中心[1]; 中國醫藥大學生物醫學研究所[2]; 中國醫藥大學兒童醫院兒童心臟科[3]; 中國醫藥大學兒童醫院兒童過敏科[4]

15:31～15:38　90. 兒童後新冠症候群使用傳統中醫的臨床特色：回顧性觀察研究
蔡妙君[1]、許有志[1]、潘思佑[1]、黃芬緯[3]、顏宏融[2,4]、王志堯[5,6]、賴琬郁[1,2]
中國醫藥大學附設醫院中醫部、中醫兒童科[1];中國醫藥大學中醫學院[2];中國醫藥大學附設醫院醫學研究部[3];中國醫藥大學附設醫院中醫部、中西醫結合科[4];中國醫藥大學兒童醫院兒童過敏免疫風濕科[5];中國醫藥大學附設醫院過敏免疫與微菌叢研究中心[6]

15:38～15:45　91. 從新竹縣的群體調查探討家長對兒童體重的認知與兒童肥胖問題
周安國[1,2]、廖君樺[1]、徐千婷[1]、洪瑋勵[1]、李孟如[1]、楊曜旭[1,3]、陳端容[4,5]
國立臺灣大學醫學院附設醫院新竹臺大分院小兒部[1]；國立臺灣大學公共衛生學院健康政策與管理研究所[2]；國立臺灣大學醫學院醫學系小兒部[3]；國立臺灣大學公共衛生學院群體健康研究中心[4]；國立臺灣大學公共衛生學院健康行為與社區科學研究所[5]

15:45～16:00　討論

16:00～16:10　休息

第九單元：腎臟學

日期：民國113年4月20日(星期六)
時間：16:10～17:20
地點：(1F)102會議室

主持人：曾敏華、蔡宜蓉

16:10～16:17　92. 小兒腎移植後 BK 病毒感染的臨床特徵
吳重緯、林清淵
中國醫藥大學兒童醫院

16:17～16:24　93. 人類白血球抗原基因與 IgA 腎炎之關聯: 一台灣族群之研究
黃永杰[1,5,7]、陳怡潔[2]、蕭自宏[2,6]、陳一銘[2,3,4,5]、傅令嫻[1,4,5]
台中榮總兒童醫學中心[1]、醫學研究部[2]、內科部過敏免疫風濕科[3]；國立陽明交通大學醫學院[4]；國立中興大學醫學院學士後醫學系[5]、基因體暨生物資訊學研究所[6]、榮興轉譯醫學研究中心[7]

16:24～16:31　94. 應用全基因定序分析進行兒童頻繁復發性腎病症候群的個人化治療策略
唐翊軒[1,2]、王馨慧[1,2]、林建宏[1,2]、陳惠蘭[1,2]
臺北榮總兒童醫學部兒童免疫腎臟科[1], 國立陽明交通大學[2]

16:31～16:38　95. 年輕末期腎病合併囊性腎病變的遺傳因素
楊芯霈、唐翊軒、陳蕙蘭、林建宏、王馨慧
臺北榮民總醫院兒童醫學部兒童免疫腎臟科

16:38～16:45　96. 兒童與成人 IgA 腎病變患者脾臟酪胺酸激酶表現的比較分析
余美靜[1,2]、吳莉佳[1]、陳泰迪[3]
林口長庚紀念醫院 兒童腎臟科[1];長庚大學 醫學系[2];林口長庚紀念醫院 解剖病理科[3]

16:45～16:52　97. 尿液嗜中性白血球明膠酶相關運載蛋白/肌酸酐比值和白蛋白/肌酸酐比值在早期區分小兒尿路感染、玫瑰疹及川崎病的應用
方乃文[1,2]、黃鈺珊[2]、吳松霖[2]、姚采忻[3]、翁根本[4]、邱益煊[2]
屏東榮民總醫院小兒科[1];高雄榮總兒童醫學部兒童腎臟科[2];高雄榮總教學研究部[3];高雄榮總兒童醫學部先天性結構性心臟病中心[4]

16:52～16:59　98. 針對尿毒症雌鼠產前瓜胺酸的補充能避免成年雄性後代罹患高血壓
李欣蓉[1]、田祐霖[2,3,4]、侯智耀[5]、張簡國平[6,7,8]、林淑芬[6,7,8]、許茜甯[9,10*]
高雄長庚兒童內科部[1]; 高雄長庚兒童腎臟科[2]; 長庚大學醫學院[3]; 高雄長庚醫院生物醫學轉譯研究所[4]; 國立高雄科技大學海洋生物學系[5]; 正修科技大學環境毒物與新興污染研究機構[6]; 正修科技大學超微量研究科技中心[7]; 正修科技大學環境毒物與新興污染研究中心[8]; 高雄長庚藥劑部[9]; 高雄醫學大學藥學系[10]

16:59～17:20　討論

第十單元：急診學及重症學

日期：民國113年4月20日(星期日)
時間：09:00～10:10
地點：(1F)103會議室

主持人：夏紹軒 、陳文發

09:00～09:07　99. 台灣兒童加護病房內急性腎損傷影響和風險因子分析
吳政宏 [1,2]、張登紘 [3]、林湘容 [3]、王景甲 [1]、吳恩婷 [1]、呂立 [1]、周佳靚 [3]、張鑾英 [1]、蔡宜蓉 [1]
國立臺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金山分院醫療部 [2];國立臺灣大學應用力學研究所 [3]

09:07～09:14　100. 新生兒呼吸衰竭使用體外維生循環之臨床表現及預後 – 台灣醫學中心之經驗
余英豪 [1]、吳政宏 [1,2]、王景甲 [1]、吳恩婷 [1]、呂立 [1]、周恒文 [3]、黃書健 [3]、陳益祥 [3]
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金山分院醫療部 [2]; 國立台灣大學醫學院附設醫院外科部 [3]

09:14～09:21　101. 接受 Naxitamab 治療的神經母細胞瘤病患之血液動力學分析
彭偉峰 [1,2]、吳政宏 [1,3]、盧孟佑 [1]、張修豪 [1]、楊永立 [1]、周書緯 [1]、王景甲 [1]、吳恩婷 [1]、呂立 [1]
國立臺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雲林分院小兒部 [2];國立台灣大學醫學院附設醫院金山分院醫療部 [3]

09:21～09:28　102. 自動連續尿液線上紀錄系統之評估
郭威廷 [1]、謝凱生 [1,2]、徐宗正 [1]、莊子瑤 [1]、戴以信 [1]、彭義欽 [1]、謝仁仰 [3]、施松村 [3]
中國醫藥大學兒童醫院小兒心臟科 [1]、結構/先天性心臟病及超音波中心 [2];正修科技大學電子工程研究所 [3]

09:28～09:35　103. 微血管再充血時間的再思
林怡璇 [1]、謝凱生 [1,2]、徐宗正 [1]、莊子瑤 [1]、戴以信 [1]、彭義欽 [1]、謝仁仰 [3]、施松村 [3]
中國醫藥大學兒童醫院小兒心臟科 [1]、結構/先天性心臟病及超音波中心 [2];正修科技大學電子工程研究所 [3]

09:35～09:42　104. 嗜酸性白血球增多症在發燒兒童評估川崎症的應用
蔡智閔、郭和昌、張鈴偲、黃瀛賢
高雄長庚醫院 兒童內科部

09:42～09:49　105. 急診兒科精神病患就診之趨勢與臨床特徵: 台灣某區域醫院七年之回溯性分析
卓靜怡 [1,2]、張弘潔 [1]、陳文發 [3]、羅光武 [3]、陳雲昶 [4]、張善涵 [4]
台灣大學公衛學院健康管理研究所 [1],禾馨桃園婦幼診所 [2],國立台灣大學附設醫院新竹台大分院 [3],國立台灣大學附設醫院雲林分院 [4]

09:49～10:10　　討論

10:10～10:20　　休息

第十一單元：肺臟學

日期：民國113年4月20日(星期六)
時間：10:20～10:50
地點：(1F)103會議室

主持人：吳恩婷、蘇有村

10:20～10:27　106. 比較呼出一氧化氮、脈衝振盪測量系統和肺活量測定法評估兒童氣喘
黃東毅[1]、林建亨[2]、陳傑賀[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 胸腔暨重症科[2]

10:27～10:34　107. 感染新冠肺炎孩童的後新冠症狀及功能性肺功能的量化分析
吳政宏[1,2]、王景甲[2]、呂立[2]、吳恩婷[2]
國立台灣大學醫學院附設醫院金山分院醫療部[1]; 國立台灣大學醫學院附設醫院兒童醫院小兒部[2]

10:34～10:41　108. 脈衝式震盪儀測定後新冠症候群兒童之肺功能
陳傑賀[1]、郭恆志[2]、王志堯[3]
中國醫藥大學兒童醫院胸腔暨重症科[1]; 中國醫藥大學兒童醫院一般兒科[2]; 中國醫藥大學兒童醫院免疫風濕科[3]

10:41～10:50　　討論

10:50～11:00　　休息

第十二單元：醫學人文及教育

日期：民國113年4月21日(星期六)
時間：11:00～11:40
地點：(1F)103會議室

主持人：楊令瑀、陳慧玲

11:00～11:07　109. 虛擬實境用於兒科困難氣道疾病教學應用之研究
許文菁[1,3]、鄭玫枝[1,2]
國立陽明交通大學急重症醫學研究所[1];臺北榮民總醫院兒童醫學部新生兒科[2];
臺北榮民總醫院胸腔部呼吸治療科[3]

11:07～11:14　110. 兒科門診裡的溝通
許伯瑜[1]、蔡楚翊[1]、朱紹盈[2,1]
慈濟大學醫學系[1]; 花蓮慈濟醫院兒科部/教學部[2]

11:14～11:21　111. 以翻轉教室及自製桌上遊戲教導醫學生及 PGY 醫師兒童生長發育
田智瑋[1]、柯信如[2]、彭純芝[1]
馬偕兒童醫院[1];新竹馬偕兒童醫院[2]

11:21～11:28　112. 貝蒂好想吃香蕉~兒科醫師的閱讀處方
吳淑娟
羅東博愛醫院兒科

11:28～11:40　討論

附加研討會
兒科抗疫新紀元：
COVID-19 疫情對兒童醫療的挑戰與機遇

日期：民國113年4月20日(星期六)
時間：12:00～13:30
地點：(1F)103會議室

主持人： 林奏延名譽院長、黃立民特聘教授

12:00～12:05　1. 開幕致詞
林奏延名譽院長
長庚兒童醫學中心

12:05～12:50　2. 兒童 COVID-19 監測：解析臨床特徵與流行病學數據
張鑾英教授
台大兒童醫院

12:50～13:25　3. mRNA 疫苗：疫苗學的新篇章
林千裕主任
新竹市立馬偕兒童醫院

13:25～13:30　4. 討論與結語
黃立民特聘教授
台大兒童醫院

第十三單元：遺傳學、新陳代謝學

日期：民國113年4月20日(星期六)
時間：13:30～15:20
地點：(1F)103會議室

主持人：朱紹盈、侯家瑋

13:30～13:37　113. 根據定量 DNA 甲基化分析以及 Netchine-Harbison 臨床評分系統分析台灣西弗-羅素氏症候群患者的表觀基因型-表現型的相關性

林翔宇[1,2,3,4,5]、林炫沛[1,2,3,4,6]、李忠霖[1,3,4,5]、牛道明[7]、周言穎[8]、蕭惠彬[9]、蔡孟哲[8]、邱寶琴[10]、蘇本華[11]、潘妤玟[8]

馬偕兒童醫院兒童遺傳暨新陳代謝學科[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]; 馬偕紀念醫院罕見疾病中心[5]; 國立台北護理健康大學嬰幼兒保育系[6]; 台北榮民總醫院兒童醫學部[7]; 國立成功大學醫學院附設醫院小兒科部[8]; 高雄醫學大學附設中和紀念醫院兒科部[9]; 高雄榮民總醫院兒童醫學部[10]; 中山醫學大學附設醫院兒科部[11]

13:37～13:44　114. Ehlers-Danlos Syndromes 的基因型複雜性

徐瑞聲[1,2,3]、李妮鍾[1,2,3]、胡務亮[1,2,3,4]、陳薈安[1,2,3]、簡穎秀[1,2,3]

國立台灣大學醫學院附設醫院基因醫學部[1]、小兒部[2]; 國立台灣大學醫學院小兒科[3]; 中國醫藥大學附設醫院精準醫學中心[4]

13:44～13:51　115. 台灣黏多醣症第四 A 型新生兒篩檢計畫與篩檢陽性個案之長期追蹤

林翔宇[1,2,3,4,5]、林炫沛[1,2,3,4,6]、李忠霖[1,3,4,5]、莊志光[2]、張雅惠[1,3]、塗元榕[2]、羅允廷[3]、牛道明[7]、高淑敏[8]、何慧珍[9]

馬偕兒童醫院兒童遺傳暨新陳代謝學科[1]; 馬偕紀念醫院醫學研究部[2]; 馬偕紀念醫院罕見疾病中心[3]; 馬偕醫學院醫學系[4]; 馬偕醫護管理專科學校[5]; 國立台北護理健康大學嬰幼兒保育系[6]; 台北榮民總醫院兒童醫學部[7]; 中華民國衛生保健基金會新生兒篩檢中心[8]; 台北病理中心新生兒篩檢中心[9]

13:51～13:58　116. 以「歌舞伎綜合徵」為題,探索臺灣患者的遺傳與表現型差異

李忠霖[1,2,3,4,5]、莊志光[6,7]、邱慧菁[1]、塗元榕[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]

13:58～14:05　117. 探究歌舞伎症候群患者先天性心臟疾病的遺傳基礎

李忠霖[1,2,3,4,5]、莊志光[6,7]、邱慧菁[1]、塗元榕[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]

14:05～14:20　討論

14:20～14:30　　休息

主持人：李妮鍾、林翔宇

14:30～14:37　　118. 利用基因體測繪技術結合全基因組序列解析白血病中染色體的複雜結構變異
蔡孟儒[1,2]、高曉容[3]、陳曉慧[3]、游智翔[4]、簡穎秀[5]、胡務亮[1,5,6]、郭沛恩[3]、李妮鍾[5]、楊永立[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雲林分院小兒部[2]; 中央研究院生物醫學科學研究所[3]; 中央研究院統計科學研究所[4]; 國立台灣大學醫學院附設醫院基因醫學部[5]; 中國醫藥大學附設醫院總院精準醫學中心[6]

14:37～14:44　　119. 長片段定序技術提升粒線體基因組結構變異之檢測敏感度
陳薈安[1,2]、胡務亮[1,3]、吳兆斯[1]、薛學文[4]、翁姣謹[2]、范碧娟[2]、楊智超[4]、簡穎秀[1,2]、許家郎[5]、李妮鍾[1,2]
國立臺灣大學醫學院附設醫院基因醫學部[1];國立臺灣大學醫學院附設醫院兒童醫院小兒部[2];中國醫藥大學附設醫院精準醫療中心[3];國立臺灣大學醫學院附設醫院神經部[4]、醫學研究部[5]

14:44～14:51　　120. 兒童肥胖之瘦素-黑素皮質素途徑的遺傳負荷
張聿民、潘妤玟、周言穎、蔡孟哲
國立成功大學醫學院附設醫院小兒部

14:51～14:58　　121. 台灣 CHD7 疾患之臨床表現光譜-回溯性研究
賴建亦[1]、李妮鍾[2,3]、簡穎秀[2,3]、胡務亮[2,3]
國立臺灣大學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小兒部[2]; 國立臺灣大學醫學院附設醫院基因醫學部[3]

14:58～15:05　　122. 台灣兒童肥胖的全基因關聯性研究
吳信儒[1]、劉鼎元[2]、王仲興[1]、蔡輔仁[1]
中國醫藥大學兒童醫院醫學遺傳暨兒童新陳代謝內分泌科[1];中國醫藥大學附設醫院醫學研究部精準醫學中心[2]

15:05～15:20　　討論

15:20～15:30　　休息

第十四單元：內分泌學

日期：民國113年4月20日(星期六)
時間：15:30～16:10
地點：(1F)103會議室

主持人：林昭旭、童怡靖

15:30～15:37　123. 台灣 26 名肥胖青少年瘦體素、脂聯素及維生素 D 濃度調查
李心茹、羅福松
林口長庚醫院兒童內分泌暨遺傳科

15:37～15:44　124. 生長激素治療對台灣特納氏症患者的有效性及其對最終成年身高的影響：在三個醫療中心進行的 25 年分析
張毓庭[1,2]、黃映樺[2]、羅福松[1]
林口長庚醫院兒童內分泌暨遺傳科[1];高雄長庚醫院兒童內分泌暨遺傳科[2]

15:44～15:51　125. 人工智能輔助骨齡判讀軟體可以改善醫師骨齡判讀之正確性
喻永生[1,2]、張天祐[3]、周定遠[4,5]
振興醫院兒童醫學部[1]、國防醫學院小兒學系[2]、振興醫院放射診斷部[3]、新店耕莘醫院放射診斷部[4]、輔仁大學醫學系[5]

15:51～15:58　126. 探討磷酸化修飾的 KLHL3 在 WNK 介導 NCC 路徑中之體內作用
丁宜瑄[1]、朱君浩[2]、林石化[3]、林建銘[1]
國防醫學院三軍總醫院小兒部[1];國軍左營總醫院小兒科[2];國防醫學院三軍總醫院腎臟科[3]

15:58～16:10　討論

附加研討會
強化流感防治策略：
細胞培養流感疫苗的臨床與經濟效益

日期：民國113年4月20日(星期六)
時間：12:00～13:30
地點：(1F)105會議室

主持人：邱政洵醫師、陳志榮醫師

12:00～12:05　1. 開幕致詞
邱政洵醫師
林口長庚紀念醫院

12:05～12:45　2. 優化流感預防的密碼：細胞培養流感疫苗的潛在好處
呂俊毅醫師
臺大兒童醫院

12:45～13:25　3. 使用細胞與雞蛋培養之季節性流感疫苗於台灣兒童族群之成本效益分析
齊嘉裕醫師
成大醫院

13:25～13:30　4. 討論與結語
陳志榮醫師
林口長庚紀念醫院

教育演講：
兒童常見身心成長問題

日期：民國113年4月21日(星期日)
時間：09:00～12:00
地點：(2F)201A、B、C、D、E、F會議室

主持人：洪佑承醫師、詹前俊醫師

09:00～09:50　1. 六歲前兒童社會情緒行為之發展困難
吳佑佑醫師
宇寧身心診所

09:50～10:00　2. 討論

10:00～10:50　3. 小孩長不高?發育太快?兒童生長評估之理論與實務
黃世綱醫師
愛群兒童成長診所 兒童內分泌科

10:50～11:00　4. 討論

11:00～11:50　5. 迎接肥胖海嘯世紀：兒科的挑戰與契機
莊海華副教授
台北長庚紀念醫院家庭醫學部

11:50～12:00　6. 討論

附加研討會
與時俱進：疫苗的突破與創新

日期：民國113年4月21日(星期日)
時間：12:00～13:30
地點：(2F)201A、B、C、D、E、F會議室

主持人：邱南昌醫師

12:00～12:05　1. 開幕致詞
邱南昌醫師
馬偕兒童醫院兒童感染科

12:05～12:45　2. 如何加速消弭 HPV 相關癌症以及疾病
紀鑫醫師
馬偕兒童醫院兒童感染科

12:45～13:25　3. 肺炎鏈球菌疫苗現況暨本土與國際新知匯報
陳伯彥醫師
台中榮民總醫院兒童感染科

13:25～13:30　4. 討論與結語
邱南昌醫師
馬偕兒童醫院兒童感染科

頒獎/會員代表大會

日期：民國113年4月21日(星期日)
時間：13:30～14:30
地點：(2F)201A、B、C、D、E、F會議室

13:30～14:30　會員代表大會

頒獎

1. 臺灣兒科醫學會獎
   得獎者：李宏昌醫師(馬偕紀念醫院)

2. 臺灣兒科醫學會兒科醫學教育貢獻獎
   得獎者：彭純芝醫師(馬偕紀念醫院)

3. 臺灣兒科醫學會基層醫師服務貢獻獎
   得獎者：王志祿醫師(高雄柏仁醫院)
   林釗尚醫師(林釗尚小兒科診所)
   詹前俊醫師(詹前俊小兒科診所)
   (依姓氏筆畫排序)

4. 陳炯霖小兒科研究獎助金基金會
   112 年度優秀論文獎
   主治醫師組得獎者：王唯豪醫師(彰化基督教兒童醫院兒童血液腫瘤科)
   年輕醫師組得獎者：朱君浩醫師(國軍高雄總醫院左營分院小兒科)

5. 年輕研究者獎

14:30～14:40　休息

醫學的科學、倫理與法律講座：
少子化對於兒科醫療衝擊

日期：民國113年4月21日(星期日)
時間：14:40～16:40
地點：(2F)201A、B、C、D、E、F會議室

主持人：陳銘仁副理事長

14:40～15:30　1. 少子化趨勢下兒童醫療人才傳承與創新
劉越萍司長
衛生福利部醫事司

15:30～15:40　2. 討論

15:40～16:30　3. 台灣的低生育率現象：成因、趨勢與相關政策
鄭雁馨博士
中央研究院社會學研究所

16:30～16:40　4. 討論

陳烱霖教授講座獎

日期：民國113年4月21日(星期日)
時間：09:00～10:00
地點：(1F)102會議室

主持人：倪衍玄理事長

09:00～09:50　1. 生命早期經驗與後期健康福祉：台灣出生世代研究的發現
江東亮教授
國立臺灣大學公共衛生學院健康政策與管理研究所

09:50～10:00　2. 綜合討論

專題演講：
基因檢查常見迷思

日期：民國113年4月21日(星期日)
時間：10:00～12:00
地點：(1F)102會議室

主持人：簡穎秀醫師、王仲興醫師

10:00～10:05　1. 開場致詞

10:05～10:40　2. 遺傳疾病之常用檢查
蘇本華主任
中山醫學大學附設醫院兒童部

10:40～11:15　3. 這樣是有病嗎－基因變異判讀
李妮鍾教授
臺灣大學醫學院附設醫院基因醫學部

11:15～11:50　4. 接下來呢－精準醫療
周言穎醫師
成功大學醫學院附設醫院小兒部

11:50～12:00　5. 綜合討論及結語

附加研討會
兒童常見感染：現況與未來

日期：民國113年4月21日(星期日)
時間：12:00～13:30
地點：(1F)102會議室

主持人：張鑾英醫師

12:00～12:10　1. 開幕致詞
張鑾英醫師
臺大醫院

12:10～12:45　2. 肺炎鏈球菌疾病捲土重來？臨床案例暨挑戰與未來疫苗展望
謝育嘉醫師
林口長庚紀念醫院

12:45～13:20　3. 臺灣 RSV 感染暨流行病學趨勢
李俊毅醫師
彰濱秀傳醫院

13:20～13:30　4. 討論與結語
張鑾英醫師
臺大醫院

附加研討會
新生兒疾病預防新里程

日期：民國113年4月21日(星期日)
時間：12:00～13:30
地點：(1F)103會議室

主持人：黃立民醫師、邱政洵醫師

12:00～12:05　1. 開幕致詞
邱政洵醫師
林口長庚紀念醫院

12:05～12:25　2. 兒科疫苗全球趨勢：六合一疫苗
蔡明倫醫師
中國醫藥大學兒童醫院

12:25～12:45　3. 兒童 RSV 的預防研究新進展
呂俊毅醫師
臺大醫院兒童醫院

12:45～13:05　4. RSV 的流行病學、疾病負擔
紀鑫醫師
馬偕兒童醫院

13:05～13:25　5. 綜合討論

13:25～13:30　6. 結語
黃立民醫師
臺大醫院兒童醫院

附加研討會
兒科抗生素治療中
抗生素相關腹瀉與益生菌之角色

日期：民國113年4月21日(星期日)
時間：12:00～13:30
地點：(1F)105會議室

主持人：倪衍玄院長

12:00～12:10　1. 開幕致詞
倪衍玄院長
台大醫學院

12:10～13:00　2. 兒科抗生素治療中抗生素相關腹瀉與益生菌之角色
Prof. Sirin Guven
Professor at University of Health Sciences, Head of Department of Pediatrics at Sancaktepe Training and Research Hospital, Istanbul, TURKİYE

13:00～13:20　3. 問題討論

13:20～13:30　4. 結語
倪衍玄院長
台大醫學院

一般演講：書面報告

1. 以模擬直腸腫瘤表現的繁茂性肉芽組織增生
刁茂盟[1]、黃昭誠[2]、于鴻仁[1]、胡萬祥[3]
高雄長庚紀念醫院小兒科[1]、病理科[2],、直肛科[3]

2. 一名十天大新生兒之退伍軍人菌院內感染：個案報告
劉宇翔、黃婉愉、周宇光、黃崇濱
光田醫療社團法人光田綜合醫院兒科

3. Eculizumab 和 Belimumab 治療青少年發病的系統性紅斑狼瘡性腎炎及繼發性血栓性微血管病變的療效
曾彥文、林子晴、郭力熒、張富邦、張瑞文
臺北榮民總醫院兒童醫學部、病理檢驗部

一般演講：口頭報告

1

The Feasibility of Using Bortezomib with Chemotherapy in Atypical Teratoid/Rhabdoid Tumors
以萬科合併化學治療非典型畸胎橫紋肌樣瘤之可行性研究

Wan-Ling Ho[1,5], Ming-Yun Hsieh[2], Yu-Mei Liao[3], Shyh-shin Chiou[3], Her-Shyong Shiah[4], Chang-Hsu Chiang[5], Shiann-Tarng Jou[6], Hsu-Ju Yen[7], Yi-Yen Lee[7], Muh-Lii Liang[8], Ting-Chi Yeh[8], Yu-Cheng Chou[9], Fang-Liang Huang[9], Shu-Huey Chen[5,10], Hsin-Lun Lee[1,5], Chia-Chun Kuo[1,5], Shu-Mei Chen[1,5], Min-Lan Tsai[1,5], Hsi Chang[1,5], Kevin Li-Chun Hsieh[1,5], Chia-Lang Fang[1,5], Chia-Yau Chang[1,5], Jinn-Li Wang[5,11], Chu-Chin Chen[2], Joon-Khim Loh[3], Pei-Chin Lin[3], Tzu-Chin Lin[12], Shih-Chung Wang[13], Yi-Fang Tu[14], Chao-Neng Cheng[14], Ming-Jung Chuang[15], Huy Minh Tran[16], Shian-Ying Sung[5], Irving Lai[5], Kuo-Sheng Wu[5], James S. Miser[1,17], Yen-Lin Liu[1,5,*], Tai-Tong Wong[1,5]
Taipei Medical University Hospital, Taipei, Taiwan [1]; Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan [2]; Kaohsiung Medical University Hospital, Kaohsiung, Taiwan [3]; Buddhist Tzu Chi General Hospital, Xindian, New Taipei, Taiwan [4]; Taipei Medical University, Taipei, Taiwan [5]; National Taiwan University Children's Hospital, Taipei, Taiwan [6]; Taipei Veterans General Hospital, Taipei, Taiwan [7]; Mackay Children's Hospital, Taipei, Taiwan [8]; Taichung Veterans General Hospital, Taichung, Taiwan [9]; Shuang Ho Hospital, Ministry of Health & Welfare–Taipei Medical University, Zhonghe, New Taipei, Tawan [10]; Wang Fang Municipal Hospital (Managed by Taipei Medical University), Taipei, Taiwan [11]; Chang Gung Memorial Hospital, Linkou, Taoyuan, Taiwan [12]; Changhua Christian Children's Hospital, Changhua, Taiwan [13]; National Cheng Kung University Hospital, Tainan, Taiwan [14];
Chang Gung Memorial Hospital, Kaohsiung, Taiwan [15]; University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam [16]; City of Hope National Medical Center, Duarte, CA, USA [17]
何宛玲 [1,5]、謝明芸 [2]、廖優美 [3]、邱世欣 [3]、夏和雄 [4]、江昌旭 [5]、周獻堂 [6]、顏秀如 [7]、李宜燕 [7]、梁慕理 [8]、葉庭吉 [8]、周育誠 [9]、黃芳亮 [9]、陳淑惠 [5,10]、李欣倫 [1,5]、郭嘉駿 [1,5]、陳淑美 [1,5]、蔡明蘭 [1,5]、張 璽 [1,5]、謝立群 [1,5]、方嘉郎 [1,5]、張家堯 [1,5]、王錦莉 [5,11]、陳珠瑾 [2]、羅永欽 [3]、林佩瑾 [3]、林子欽 [12]、王士忠 [13]、杜伊芳 [14]、鄭兆能 [14]、莊銘榮 [15]、Huy Minh Tran[16]、宋賢穎 [5]、賴柏融 [5]、吳國盛 [5]、James S. Miser[1,17]、劉彥麟 [1,5,*]、黃棣棟 [1,5]
臺北醫學大學附設醫院 [1]；高雄榮民總醫院 [2]；高雄醫學大學附設醫院 [3]；慈濟醫院台北分院 [4]；臺北醫學大學 [5]；臺大醫院兒童醫院 [6]；臺北榮民總醫院 [7]；馬偕兒童醫院 [8]；臺中榮民總醫院 [9]；衛生福利部雙和醫院(委託臺北醫學大學興建經營) [10]；臺北市立萬芳醫院-委託臺北醫學大學辦理 [11]；林口長庚紀念醫院 [12]；彰化基督教兒童醫院 [13]；國立成功大學附設醫院 [14]；高雄長庚紀念醫院 [15]；越南胡志明市醫藥大學 [16]；美國希望之城醫學中心 [17]

Background: Atypical teratoid/rhabdoid tumors (ATRTs) are highly aggressive pediatric cancers of the central nervous system (CNS) with upregulation of protein synthesis and proteasome degradation. Sensitivity to proteasome inhibitors have been shown in patient-derived ATRT cells and animal models. We designed a multicenter phase Ib/II trial to test the feasibility of combining the proteasome inhibitor bortezomib with standard and high-dose chemotherapy.
Methods: Patients aged 0-20 years with CNS ATRT were enrolled since January 2022. Patients with newly diagnosed ATRT (Cohort 1) were treated with a modified Medical University of Vienna (MUV-ATRT) protocol (VDC/PEI/VM/VM * 3) followed by high-dose chemotherapy with autologous stem cell rescue, with concurrent bortezomib of 1.3 mg/m2/dose given intravenously or subcutaneously twice a week for 2 weeks followed by 1 week of resting. Patients with relapsed/refractory ATRT (Cohort 2) were treated with bortezomib alone. Radiation therapy was at the discretion of the treating team.
Results: Until December 2023, 6 patients have been enrolled into Cohort 1 and have completed 36 chemotherapy cycles with bortezomib. The primary endpoint of grade 3 or higher non-hematologic toxicities (G3+NHT) (n) include: AST/ALT elevation (1), hypokalemia (1), peripheral neuropathy (1), subdural hemorrhage (2), vomiting (2), oral mucositis (3), lung infection (1), urinary tract infection (2), sepsis (2), febrile neutropenia (6), and septic shock (1; developed during high-dose chemotherapy and resulted in death). None of the G3+NHT were considered bortezomib-related. Three patients completed all 32 doses of bortezomib treatment; 2 patients discontinued the study after 2 or 4 cycles due to progressive disease (PD). Best response among 4 evaluable patients were: 1 partial response, 2 stable disease, and 1 PD. In addition to the case with grade 5 septic shock, there were 3 other deaths due to PD (2) and septic shock after PD (1).Two patients had progression-free survival for 16+ and 22+ months after diagnosis, respectively.
Conclusions: Adding bortezomib to standard and high-dose chemotherapy of ATRT was feasible with the occurrence of grade 3/4 toxicities no more than what was expected with chemotherapy alone.

2

Role of Genomic Alternations in Pediatric Brain Tumors
兒童腦瘤基因變化的重要性

Min-Yu Su, Te-Kau Chang
China Medical University Children's Hospital, Division of pediatric hematology and oncology
蘇旻昱、張德高
中國醫藥大學兒童醫院小兒血液腫瘤科

Background: Pediatric brain tumors account for the second most commonly pediatric malignancy. Among the era of molecular diagnosis, whether the molecular diagnosis will influence treatment regimen and outcome is of interest.
Methods: For brain tumor those cannot be totally resected, we exam the tumor tissues via RNA-based sequencing. If

targetable gene was identified, we may use medication accordingly instead of traditional regimen. The data was collected during July 2020 to Dec 2023 for patients initially diagnosed at our hospital.
Results: Among 5 patients, tissue of 3 patients (60%) was detected with targetable fusion gene. One is high grade infantile hemispheric glioma with SOX5-ALK fusion treated with loratinib; and other two are pilomyxoid astrocytoma with KIAA1549-BRAF fusion. One of them were treated with trametinib, whild another patient was treated with traditional therapy. Two of them who received target therapy have stable disease status with no progress for a follow-up around 2 years.
Conclusions: There is high yield rate of abnormality in molecular level within pediatric brain tumors. Respectively treatment seems promising the treatment in this kind of malignancy.

3

Clinical Experience in Pediatric Inflammatory Myofibroblastic Tumor from a Single Tertiary Institution in Central Taiwan for 20 Years
一中部醫學中心兒童炎性肌纖維母細胞瘤 20 年治療經驗

Ke-Xin Chang[1], Chi-Yen Chen[1], Jui-Ju Tseng[1], Chiung-Wen Liang[1,2], Li-Min Chen[2], Te-Kau Chang[3], Fang-Liang Huang *[1]
Children's Medical Center[1], Department of Nursing[2], Taichung Veterans General Hospital, Taichung, Taiwan; Section of Pediatric Hematology, China Medical University Children's Hospital, Taichung, Taiwan [3]
張可歆 [1]、陳其延 [1]、曾瑞如 [1]、梁瓊文 [1,2]、陳麗敏 [2]、張德高 [3]、黃芳亮*[1]
臺中榮民總醫院; 兒童醫學中心血液腫瘤科 [1], 護理部 [2]; 中國醫藥大學兒童醫院小兒血液科 [3]

Background: Inflammatory myofibroblastic tumor (IMT), also referred to as inflammatory pseudotumor or plasma cell granuloma, is a rare fibro-inflammatory lesion. This soft tissue neoplasm is commonly observed in children and adolescents and is predominantly located in the pulmonary and abdomen region. The precise etiology and pathogenesis of IMT remain incompletely understood. Notably, approximately 30% of pediatric IMT cases exhibit gene alterations, including the fusion of the anaplastic lymphoma kinase (ALK) gene.
Methods: A retrospective observational study on IMT was carried out at Taichung Veterans General Hospital spanning from 2004 to 2023. The study focused on delineating the demographic, histological, and clinical characteristics of patients. Information regarding treatment modalities and clinical outcomes was extracted from the patients' medical records for analysis.
Results: A total of 9 children is enrolled, all of whom were confirmed by pathology. The median age within this cohort was 9.5 years (ranging from 0.5 to 18 years), and there was a noticeable male predominance, with a male-to-female ratio of 8:1. The primary tumor sites varied, with 4 cases (44.4%) located in the abdomen, 2 cases (22.2%) on the scalp, and one case each (11.1%) in the shoulder, finger bone, and lung. Various clinical presentations were observed, including local mass, abdominal pain, vomiting, low-grade fever, painful nodules, and chronic cough. All patients underwent surgical interventions. Among them, 5 patients underwent surgery exclusively, while 2 patients underwent a combination of surgery and chemotherapy (CT). Another patient underwent surgery, CT, and targeted therapy (TT). Additionally, one patient received surgery and TT. All 7 patients tested positive for ALK through immunohistochemical staining, while Epstein-Barr virus-encoded small RNA was negative in all three cases tested. Three patients experienced refractory or recurrent disease, and two patients died. The overall survival rate in this study was 78%.
Conclusions: In spite of the good prognosis of IMT in children, we should be aware of refractory and recurrent disease in the management of IMT.

4

A Simple, high-sensitivity Approach for Monitoring 6-mercaptopurine Metabolites in Acute Lymphoblast Leukemia during Maintenance Therapy
運用簡便具高敏感度的分析方法以監測急性淋巴性白血病病童體內 6-MP 代謝物

Hsi-Che Liu[1], Meng-Jeh Chung[1], Ting-Chi Yeh[1], Jen-Yi Hou[1], Ting-Huan Huang[2], Chong-Zhi Lew[1], Chia-Yu Cheng[1], Chun-Hui Lin[1]
MacKay Children's Hospital, Taipei, Taiwan[1]; Hsinchu MacKay Children's Hospital, Hsinchu, Taiwan[2]
劉希哲 [1]、鍾孟哲 [1]、葉庭吉 [1]、侯人尹 [1]、黃鼎煥 [2]、劉充智 [1]、鄭佳祐 [1]、林純卉 [1]
馬偕兒童醫院 [1];新竹馬偕兒童醫院 [2];

Background: 6-meracptopurine (6-MP) is one of the essential chemotherapeutic drugs for treatment of pediatric ALL. The cytotoxicity of 6-MP depends on the conversion into 6-thioguanine nucleotides, which are incorporated into DNA (DNA-TGN), causing cell death by post-replicative DNA mismatch. Here, we aim to establish a high-throughput and simplified platform for serial monitoring of DNA-TGN.
Methods: The previously described methods by Quinlivan (Anal Biochem. 2008) were modified and adopted in this study. The peripheral blood samples, collected at desired time point, were mixed with RBC lysis buffer to obtain leukocytes. The genomic DNA was extracted using the QIAamp DNA Mini Kit (Qiagen) according to the manufacturer's instructions. Also, the genomic DNA was incubated at 37°C with enzyme cocktails and reaction buffer containing internal standard (Deoxyguanosine-13C,15N2) and DL-Dithiothreitol. After termination with ethylenediaminetetraacetic acid, the mixture was centrifuged and the supernatant was subjected into liquid chromatograph/mass spectrometer (LC/MS).
Results: The lower limit of quantitation in LC/MS was 0.1 ng/mL. The retention time for internal standard and standard were 1.96 and 2.49, respectively. The R2 was ＞0.995 by linear regression. The coefficient of variation determined by QC was ＜10%. These results suggested the high sensitivity and accuracy of the LC/MS in this experiment. The DNA-TGN levels were 1635.46 fmol/μg in positive control (NALM6 cell line treated with 10 μM 6-MP) and only noise background in negative control (NALM6 without treatment). Additionally, 6 samples of ALL patients, who had wild types of TPMT/NUDT15 alleles and underwent maintenance therapy, were evaluated. Their results ranged from 42.39-281.87 fmol/μg DNA and the duplicated samples had comparable results.
Conclusions: We have successfully established a platform, which only requires 0.5 μg genomic DNA, to monitor the DNA-TGN during maintenance therapy of ALL. The optimal adjustment of 6-MP dosage of Taiwanese pediatric ALL patients could be attempted by integrating with genotypes of

TPMT and NUDT15.

5 **Effect of Tocilizumab on Treatment Outcome of Sepsis/Septic Shock in Children with Febrile Neutropenia: A Single-Institution Experience**

Tocilizumab 對於兒童因嗜中性球低下合併發燒而導致敗血症/敗血性休克的治療效果：單一機構之經驗

Shih-Hsiang Chen[1], Yi-Lun Wang[1], Tsung-Yen Chang[1], Tang-Her Jaing[1], En-Pei Lee[2], Jainn-Jim Lin[2], Yi-Wen Hsiao[3], Chao-Ping Yang[1], Iou-Jih Hung[1]
Division of Pediatric Hematology/Oncology[1], Division of Pediatric Critical Care and Emergency Medicine[2], Department of Nursing[3], Linkou Chang Gung Memorial Hospital, Chang Gung University College of Medicine, Taoyuan, Taiwan
陳世翔 [1]、王奕倫 [1]、張從彥 [1]、江東和 [1]、李恩沛 [2]、林建志 [2]、蕭翌雯 [3]、楊兆平 [1]、洪悠紀 [1]
林口長庚紀念醫院兒童血液腫瘤科 [1]、兒童加護科 [2]、護理部 [3]

Background: Febrile neutropenia is a frequent complication of chemotherapy or immunotherapy among children with hemato-oncological diseases. It is considered an oncological emergency because the risk of developing severe sepsis/septic shock is increased. Elevated IL-6 has been found in patients with severe sepsis/septic shock. It is not clear about the effect of blockade of IL-6 by tocilizumab on treatment outcome of sepsis/septic shock in children with febrile neutropenia.
Methods: Patients younger than 18 years old treated at Linkou Chang Gung Memorial Hospital between November 2022 and October 2023 were screened. The episodes of severe sepsis/septic shock in patients with febrile neutropenia were identified. The medical records were retrospectively reviewed.
Results: Seven patients with febrile neutropenia complicated with severe sepsis/septic shock were identified. There were 3 boys and 4 girls. The median age of developing severe sepsis/septic shock was 13.4 years (range 6.4 – 17.3 years). The diagnoses of underlying diseases included severe aplastic anemia in 3, acute myeloid leukemia in 2, acute lymphoblastic leukemia in 1, and malignant germ cell tumor in 1. Four of 7 patients received tocilizumab in addition to standard of care. The median of IL-6 level before administration of tocilizumab was 14,147 pg/ml (range 672 – 30,509 pg/ml). Fever resolved within 24 hours after administration of tocilizumab. All 4 patients (100%) successfully recovered from severe sepsis/septic shock. Three of 7 patients received standard of care without tocilizumab. IL-6 levels were checked in 2 patients (2,191 and 838 pg/ml, respectively). Both patients died soon after PICU admission. The remaining one patient (33%) successfully recovered.
Conclusions: Administration of tocilizumab reduced mortality of severe sepsis/septic shock in children with febrile neutropenia. However, it warrants confirmation with a larger number of patients and longer follow-up.

6 **Cytomegalovirus Retinitis in Children with Acute Lymphoblastic Leukemia: Case Series and Review of the Literature**

兒童急性淋巴性白血病併發巨細胞病毒性視網膜炎：病例系列報告及文獻探討

Chao-Neng Liu[1], His-Che Liu[2], Jen-Yin Hou[2], Ting-Huan Huang[3], Ting-Chi Yeh[2]
Department of Pediatrics, Mackay Children's Hospital, Taipei, Taiwan[1], Division of Pediatric Hematology-Oncology, Department of Pediatrics, Mackay Children's Hospital, Taipei, Taiwan[2], Division of Pediatric Hematology-Oncology, Department of Pediatrics, Hsinchu Mackay Memorial Hospital, Hsinchu, Taiwan[3]
劉兆能 [1]、劉希哲 [2]、侯人尹 [2]、黃鼎煥 [3]、葉庭吉 [2]
台北馬偕兒童醫院兒科部 [1]; 台北馬偕兒童醫院兒童血液腫瘤科 [2]; 新竹馬偕兒童醫院兒童血液腫瘤科 [3]

Background: Cytomegalovirus retinitis is one of the severe ophthalmic complications in children with acute lymphoblastic leukemia undergoing chemotherapy. Nine children with CMV retinitis from our institution were reported, and we reviewed the reports in the literature.
Methods: This retrospective review focuses on pediatric patients with ALL who developed CMV retinitis at Mackay Memorial Hospital during the period from January 2007 to October 2019. The study illustrates the clinical presentations, ophthalmological manifestations, and laboratory data in pediatric ALL patients with CMV retinitis. We conducted a comparative analysis and compared these findings with the results of a systematic review of medical literature on PubMed/Cochrane.
Results: A total of 9 patients in our institution and additional 10 cases provided from literatures review, resulting in a combined dataset of 19 ALL patients with CMV retinitis for analysis. The median age at the time of CMV disease diagnosis was 11.6 years, with 53% of them being male. CMV disease occurred in 15 patients during the maintenance therapy phase. The median absolute lymphocyte count was 321/μL, and the median CD4 count was 222 cells/μL. Interestingly, 10 out of the 19 patients with retinitis did not exhibit any visual symptoms at the time of CMV retinitis diagnosis. CMV viremia was detected in 17 patients. Treatment with ganciclovir/valganciclovir (median: 37.6 weeks) was administered, and compared with other cases included, cytotec was given to all of our 9 patients. Remarkably, 5 of the patients experienced at least one recurrence of CMV retinitis, which resulted in poor visual outcomes.
Conclusions: While childhood ALL with CMV retinitis is relatively rare, its occurrence can result in severe ocular complications. Hence, it is recommended that ALL patients undergo regular monitoring for CMV virus during chemotherapy and gain a comprehensive understanding of their immune system status, particularly during the maintenance phase of treatment. In cases where CMV retinitis is diagnosed in childhood ALL patients, it is crucial to undergo regular ophthalmic examinations and adhere to antiviral treatment to prevent visual degeneration or loss.

7 **Medical Tourism for Hematopoietic Cell Transplantation – A Single-Center Experience**

造血細胞移植醫療旅遊 — 單中心經驗

Yi-Lun Wang[1], Yu-Chuan Wen[2], Lan-Ni Pai[3], Shu-Ho Yang[2], Tsung-Yen Chang[1], Shih-Hsiang Chen[1], Tang-Her Jaing[1]
Division of Hematology/Oncology, Department of Pediatrics[1], Department of Nursing[2], International Medical Center[3], Chang Gung Memorial Hospital, Linkou, Taoyuan, Taiwan
王奕倫 [1]、溫玉娟 [2]、白藍妮 [3]、楊淑賀 [2]、張從彥 [1]、陳

世翔[1]、江東和[1]
林口長庚紀念醫院兒童血液腫瘤科[1]、護理部[2]、國際醫療中心[3]

Background: The rise in popularity of medical tourism has caught the interest of policymakers, researchers, and the media. The quality and availability of the service affect the behavior of medical tourism, as well as economic and cultural factors. The communication skills of the professional health team in addressing a patient's perspective and cultural differences may pose a barrier. The study focused on analyzing key factors that influence the choice of a destination for potential medical tourists.
Methods: We conducted a thorough examination of hematopoietic cell transplantation (HCT) data from the pediatric population at our institution between 2006 and 2023, focusing on the aspect of medical tourism.
Results: A total of 219 pediatric patients sought treatment in the field of hematology and oncology. Forty-seven patients underwent 66 HCT. The median age at transplant was 2 years (range, 0.6-17.1 years). The majority of these patients come from Malaysia, China, and India. Our institution conducted a total of 46 umbilical cord blood transplants and 20 peripheral blood progenitor cell transplants. All patients, except 5 cases, received an unrelated donor transplant for the treatment of underlying diseases. The most common indication for HCT was thalassemia (82%). The cumulative incidence of transplant-related mortality was 19% at 1 year post-transplant. Unfortunately, 4 out of 13 patients passed away after returning to their home country during the follow-up period. The results of our study indicate that the outcomes of these patients were comparable to those of patients for unrelated donor HCT who were not from international backgrounds.
Conclusions: Chinese tourists and the Taiwanese share a common language and history. Having direct conversations with physicians about private matters is more effective than relying on a translator. Based on this study, it has been found that the primary motivation for most consumers to opt for medical tourism is financial concerns or incentives. Additionally, the study highlighted other important factors, including the quality of care, the reputation of the provider, and the availability of medical procedures.

8 **Evaluation of bilateral pulmonary regurgitation in patients with repaired tetralogy of Fallot by MRI derived anatomic geometry**
用核磁共振取得幾何圖形來評估法洛氏四合症術後雙側肺動脈逆流

Ken-Pen Weng[1], Hui-Chung Teng[2], Kuang-Jen Chien[1], Chu-Chuan Lin[1], Ming-Ting Wu[2]
Department of Pediatrics [1], Department of Radiology [2], Kaohsiung Veterans General Hospital
翁根本[1]、鄧惠中[2]、簡光仁[1]、林竹川[1]、吳銘庭[2]
高雄榮民總醫院兒醫部[1]、放射線部[2]

Background: Pulmonary regurgitation (PR) is the most important sequela in patients with repaired tetralogy of Fallot (rTOF). Previous studies have shown that the branch pulmonary arteries in rTOF patients often have differential regurgitant fraction(RF) and contribute unequally to total PR. The purpose of this study was to compare MRI derived anatomic geometry between rTOF patients and normal controls and elucidate the mechanism.
Methods: A total of 79 rTOF patients and 20 normal age- and sex-matched controls undergoing cardiac MRI at Kaohsiung Veterans General Hospital were enrolled. MRI images were reconstructed for the measurement of pulmonary artery (PA) angles. The angle between the MPA and RPA was calculated as follows: θM-R = 180 – θR-AP + θM-AP. The angle between the MPA and LPA was calculated as follows: θM-L = 180 – θM-AP – θL-AP. RF and cross-sectional area (CSA) of MPA, RPA, and LPA, and lung area were measured. The correlation of the parameters were analyzed.
Results: θM-AP and θM-R were larger in matched rTOF patients than normal controls ($p < 0.001$), whereas θM-L was smaller ($p < 0.001$). In terms of RF, LPA, RPA, and MPA correlated with each other significantly. Left lung ratio correlated inversely with RF of LPA, RPA and MPA. RF of RPA correlated with CSA of RPA ($p = 0.001$). RF of MPA correlated with CSA of MPA ($p = 0.001$). RF of LPA correlated inversely with θM-L/θM-R ratio ($p < 0.001$), and RF of RPA also correlated inversely with θM-L/θM-R ratio ($p = 0.04$). Predictors of LPA RF include CSA of MPA, θM-L/θM-R ratio, age at surgery and BFV of MPA ($R2 = 0.511$). Predictors of RPA RF include the RF of MPA, left lung area ratio, CSA of LPA and CSA of RPA ($R2 = 0.613$). Predictors of MPA RF include left lung area ratio and CSA of MPA ($R2 = 0.223$).
Conclusions: Our study demonstrated that a reduced ratio of θM-L/θM-R results in a more substantial RF of LPA. Chronic volume overload from pulmonary regurgitation contributes to right ventricular dilatation and main pulmonary artery elongation, which in turn exacerbates LPA kinking. Correction of LPA kinking is essential during surgical intervention.

9 **Limited Predictive Ability of Current Guidelines for Sudden Cardiac Death Risk in Pediatric Hypertrophic Cardiomyopathy**
對於兒童肥厚型心肌病心因性猝死以現行治療指引預測能力有限

Shuenn-Nan Chiu, Jyh-Ming Jimmy Juang[1], Wei-Chieh Tseng, Ni-Chung Lee[2], Chun-An Chen, Ming-Tai Lin, Chun-Wei Lu, Jou-Kou Wang, Mei-Hwan Wu
Departments of Pediatrics, Internal Medicine[1], and Medical Genetics[2], College of Medicine, National Taiwan University, National Taiwan University Hospital, Taipei, Taiwan
邱舜南、莊志明[1]、曾偉杰、李妮鍾[2]、陳俊安、林銘泰、盧俊維、王主科、吳美環
台大醫學院，台大醫院小兒部、內科部[1]、基因醫學部[2]

Background: Sudden cardiac arrest (SCA) represents a significant mortality factor in hypertrophic cardiomyopathy (HCM). Nevertheless, the validation of the risk prediction in current guideline in the pediatric population remains insufficiently explored. The primary objective is to assess the applicability of the current risk factors outlined in the AHA and ESC guidelines.
Methods: All individuals diagnosed with HCM below 20 years of age between 2000 to 2020 were enrolled. We excluded HCM secondary to hemodynamic causes and those with genetic syndromes (except RASopathy). Whole-exome sequencing was employed to detect potential genetic variants

or mutations.
Results: A total of 80 HCM patients were enrolled, male/female ratio was 52/28. The mean onset age was 7.8± 7.2 years. Half of the patients (50%) received genetic test. Males predominated in whole groups except for RASopathy. The catastrophic symptoms with collapse or syncope presented in 11.4% of the patients, but occurred in 31.2% of patients in the Sarcomere group. After a mean follow-up of 8.0 ± 7.1 years, the 10-year heart transplant-free and SCA event-free survival rates were 86.9% and 74.4% respectively. SCA incidence was significantly higher in the Sarcomere group (56.2%), with most occurrences in the age range of 12-18 years. Cox regression analysis identified the Sarcomere group was the highest risk factor of SCA (odds ratio 13.6, p = 0.004). The AHA and ESC risk score systems demonstrated low predictive value in this pediatric HCM cohort. In the Sarcomere group, SCA showed a low association with a specific genetic variant, but the new PRiMACY score showed a promising prediction power.
Conclusions: The disease progression and outcomes of HCM in the pediatric population exhibit considerable diversity. SCA is frequently observed in cases related to sarcomere gene mutations. The risk score system of current guideline showed limited predictive value for SCA occurrences.

10 **Declining Incidence of Kawasaki Disease During the COVID-19 Pandemic in Taiwan: A Time Series Analysis**
川崎氏症之發生率在新冠肺炎大流行期間顯著下降: 使用時間序列分析之研究

Yi-Hsuan Lin[1,3], Ming-Chih Lin[1,3], Ching-Heng Lin[2]
Children's Medical Center, Taichung Veterans General Hospital, Taichung, Taiwan[1]; Department of Medical Research, Taichung Veterans General Hospital, Taichung, Taiwan[2]; Department of Post-Baccalaureate Medicine, College of Medicine, National Chung Hsing University, Taichung, Taiwan[3]
林怡瑄[1,3]、林明志[1,3]、林敬恒[2]
台中榮民總醫院兒童醫學中心[1]、研究部[2]、國立中興大學學士後醫學系[3]

Background: Kawasaki disease (KD) is characterized by acute systemic vasculitis involving the coronary artery and mainly affects children under 6 years of age. The etiology remains unclear. In 2020, Taiwan experienced a dramatic disruption of daily life due to measures aimed at limiting the spread of coronavirus disease 2019 (COVID-19), including social distancing, mask wearing, and school closures, although domestic COVID-19 cases were extremely low. This provided a chance to investigate the epidemiology and possible triggers of KD without the interference of multisystem inflammatory syndrome in children (MIS-C).
Methods: Taiwan's National Health Insurance Research Database (NHIRD) was the main data source. To detect the change of KD incidence in children less than 6 years old during the period of social distancing policy in 2020, a time series analysis using the ARIMA (Autoregressive Integrated Moving Average) model based on seasonal variation and the increasing trend of KD incidence over the past 10 years prior to the COVID-19 pandemic. The timeline of COVID-19 mitigation measures, trends in population mobility, and other common pediatric infectious diseases were also analyzed to observe their effects on KD incidence.
Results: The predicted monthly incidence (95% CI) of KD in April, May, and June 2020 were 5.26 (3.58-6.94), 5.45 (3.70-7.20), and 5.41 (3.61-7.21) per 100,000 person-months. The actual observed incidences were 2.41, 2.67, 2.60 per 100,000 person-months, respectively, representing a 51.2%, 51.0%, and 51.9% reduction in incident rates in the 3-month period of stringent COVID-19 mitigation measures. There was a rebound peak in July 2020, coincident with the lifting of the social distancing policy. The trend was not proportionate to the profound decline of common infectious cases.
Conclusions: KD incidence decreased by approximately 50% during the period of stringent COVID-19 mitigation measures in 2020 in Taiwan. Human-to-human contact may be a potential KD trigger, but factors other than infection likely also contributed.

11 **To Investigate Down-Sizing Strategy in the Percutaneous Closure of Hemodynamically Significant Patent Ductus Arteriosus in Premature Infants < 2 Kg**
早產兒(＜2kg) 之開放性動脈導管關閉器尺寸選擇與如何避免併發症之探討

Chun-Chia Lin[1,2], I-Hsin Tai[2], Yun-Ching Fu[3], Kai-Sheng Hsieh[2], Yi-Chin Peng[2], Christian Chuang[2], Chieh-Mao Chuang[3], Tsung-Cheng Shyu[2]
Department of Pediatrics, Chang Bing Show Chwan Memorial Hospital[1] 、 Department of Cardiology, China Medical University Children's Hospital[2]、Pediatric Center, Taichung Veterans General Hospital[3]
林俊嘉[1,2]、戴以信[2]、傅雲慶[3]、謝凱生[2]、彭義欽[2]、莊子瑤[2]、莊傑貿[3]、徐宗正[2]
彰濱秀傳醫院兒科部[1]、中國醫藥大學兒童醫院心臟科[2]、台中榮總兒童醫學中心[3]

Background: The available evidence indicates that transcatheter device closure of hemodynamically significant patent ductus arteriosus (HSPDA) in prematurity is associated with improved clinical outcomes and reduced pulmonary comorbidities. Nevertheless, the existing device selection criterion (waist +1-3mm) frequently leads to procedure-related complications, such as stenosis of the left pulmonary artery (LPA) or coarctation of the aorta.
Methods: We retrospectively enrolled all premature neonates weighing ＜ 2 kg, who had hemodynamically significant patent ductus arteriosus (HSPDA) and underwent transcatheter device closure using Amplatzer Piccolo Occluder (APO) or VPII (2018-2023). We grouped the subjects based on the device's nominal waist, comparing those with a waist ≥ (over-size group) or ＜ (down-size group) than PDA waist + 1.5mm (determined by echocardiography or angiography). The demographic data were analyzed, and clinical outcomes, as well as complications, were recorded from the catheterization date to 6 months.
Results: Eleven premature neonates (of 61 with HSPDA) underwent device closure during their first admission. Mean age: 24.7 days (6-60 days), mean weight at catheterization: 1.37 kg (0.9-1.9 kg). Device selection based on nominal waist: five neonates ≥ waist +1.5mm (over-size group), six neonates ＜ waist +1.5mm (down-size group). No residual shunt, embolization occurred or coarctation occurred in both groups. LPA stenosis in two cases of over-sized group: 3.4mm PDA closed by APO5-4 with PA disc causing obstruction due to device elongation; 4.1 x 12 mm, type C

PDA closed by 6mm VPII (intra-ductal placement) causing LPA compression, spontaneously resolved. Another two cases successfully closed using APO with a waist less than +1mm without residual shunt or embolization, indicating APO disc may contribute to occlusion as well.
Conclusions: It seems safe and feasible to use APO to close a premature PDA with a nominal device size no greater than PDA waist +1.5mm, which may reduce the complication rates.

12 **Is There Cardiovascular Impact In Children Age Under 18 Years Old suffered From Post Acute Sequelae of SARS-CoV-2 Infection (PASC)**
後新冠症候群對於未成年族群是否有心臟血管的影響

Yi-Chin Peng[1], Pang-Yan Liu[2], I-Hsin Tai[1], Tzu-Yao Chuang[1], Tsung-Cheng Shyu[1], Kai-Sheng Hsieh[1,2], Jiu-Yao Wang[3]
Division of Pediatric Cardiology, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan[1];Division of Medical Research, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan[2];Center of Allergy, Immunology and Microbiome (A.I.M), China Medical University Hospital and Children's Hospital, Taichung, Taiwan[3]
彭義欽 [1]、劉邦衍 [2]、戴以信 [1]、莊子瑤 [1]、徐宗正 [1]、謝凱生 [1,2]、王志堯 [3]
中國醫藥大學兒童醫院兒童心臟科 [1];中國醫藥大學附設醫院醫研部 [2];中國醫藥大學附設醫院 過敏免疫與微菌叢研究中心 [3]

Background: Post-acute sequelae of SARS-CoV-2 infection (PASC) is a condition that affects patients after recovering from acute coronavirus disease 2019 (COVID-19)。 Fatigue, chest pain, dyspnea and palpitation were most complained in daily clinical. We were very curious about the impact in cardiovascular systems in people under 18years old suffered from PASC.
Methods: In PASC group the participants were recruited in DISCOVER cohort (conducted at the China Medical University Children's Hospital (CMUCH), a single medical tertiary center in central Taiwan) from July 1, 2022, to July 31, 2023 during the Omicron variant, SARS-CoV-2 coronavirus indigenous pandemic in Taiwan, which started in April 2022. The non-PASC comparison group, the participants were recruited by retrospect chart review for children come to CV OPD with similar chief complain during 2018. We also excluded all kinds of congenital heart diseases and documented cardiac arrhythmia diseases as well.
Results: Among 133 study children completed the ECG, echocardiography, and 24hours-Holter examination. We divided PASC group into different subgroups according to (1) different age. (1)0-6y, (2) 7-12y, (3) 13-18y. (2) different symptoms, chest pain, palpitation, dyspnea. We also compared all gathered data before (2018) and after SARS-CoV-2 outbreak in age match, head to head comparison. The echocardiography were all within normal limited among all different grounds. The arrhythmia rate were similar in PASC and control group. The biomedical tests result in PASC group were also similar among subgroups. The only different among PASC and non PASC(2018) groups were the heart rate variation and tachycardia rate. The PASC group seems had more tachycardia among all age groups.
Conclusions: The cardiac function compared in echocardiography were all in normal limited. The PASC seems will not cause significant cardiac function impairment. The noncardiogenic chest pain seems benign and will relief with time. The tachycardia in PASC group seems related to elevated sympathetic nervous system which was trigger by the immune response after SARS-CoV-2 infection.

13 **Comparative Analysis of Atrial Fibrillation Catheter Ablation in Adult Congenital Heart Disease: Insights from a Single Operator's Experience**
心導管消融治療成人期先天性心臟病與非先天性心臟病之心房顫動之個案對照研究

Chieh-Mao Chuang[1], Wen-Po Fan[2], Yun-Ching Fu[1], Ming-Chih Lin[1], Sheng-Lin Jan[1], I-Hsin Tai[3], Yu-Shin Lee[4], Ying-Hsuan Peng[5], Pi-Chang Lee[1]
Division of Pediatric Cardiology, Children's Medical Center, Taichung Veterans General Hospital[1]; Division of Pediatric Cardiology, Department of Pediatrics, Taipei Veterans General Hospital[2]; Department of Cardiology, China Medical University Children's Hospital[3]; Division of Pediatric Cardiology, Department of Pediatrics, Chang Gung Memorial Hospital, Linkou Branch [4]; Division of Pediatric Cardiology, Department of Pediatrics, Chung Shan Medical University Hospital[5]
莊傑貿 [1]、范文博 [2]、傅雲慶 [1]、林明志 [1]、詹聖霖 [1]、戴以信 [3]、李昱昕 [4]、彭瀠萱 [5]、李必昌 [1]
台中榮民總醫院兒童心臟科 [1];台北榮民總醫院兒童心臟科 [2];中國醫藥大學附設兒童醫院兒童心臟科 [3];林口長庚醫院兒童心臟科 [4];中山醫學大學附設醫院兒童心臟科 [5]

Background: Atrial fibrillation (AF) is the most prevalent arrhythmia in adult congenital heart disease (ACHD). Catheter ablation, a well-established rhythm control technique for AF in non-ACHD patients, poses unique challenges in ACHD due to complex anatomy and diffuse surgical scarring. This study aims to present the clinical outcomes of AF ablation in ACHD, drawing insights from a single operator's experience.
Methods: A retrospective investigation was conducted on consecutive AF patients undergoing ablation, with or without ACHD, at multiple centers from 2018 to 2023. The study compared acute success rates, complication rates, recurrence rates, procedure time, and ablation time between the two groups.
Results: The study comprised 91 patients: 34 in the ACHD group and 57 in the non-ACHD group. Demographic data were comparable, except for a higher prevalence of heart failure (64.7% vs. 42.1%, $p = 0.037$) and pulmonary hypertension (32.4% vs. 3.5%, $p < 0.001$) in the ACHD group. Congenital heart disease (CHD) severity varied (mild: 70.6%, moderate: 23.5%, severe: 5.9%). ACHD patients showed diverse AF classifications (paroxysmal: 41.1%, persistent: 17.7%, long-standing persistent: 41.2%). The ACHD group employed more radiofrequency needles and fewer BRK needles for transseptal puncture, with differences in ablation strategies, such as increased cavotricuspid isthmus linear ablation (91.2% vs. 71.9%, $p = 0.03$). Despite longer procedure times in the ACHD group (304.5 vs. 283 minutes, $p = 0.03$), nonfluoroscopic ablation ratios remained similar (58.8% vs. 63.2%). Comparable recurrence rates, 1-year complete freedom from AF or atrial flutter, and 3-year AF or AFL-free survival were observed between groups. ACHD patients

exhibited less pulmonary vein stenosis (0 vs. 12.3%, p = 0.04).
Conclusions: AF ablation demonstrates efficacy and safety in ACHD patients, comparable to non-ACHD counterparts. The study provides valuable procedural insights based on a single operator's experience.

14 **Risk factor analysis of postoperative supraventricular tachycardia after congenital heart disease surgery and long term follow up outcome**
先天性心臟病術後上心室頻脈之危險因子分析及長期追蹤結果

Nai-Yun Chang[1], Pei-Yuan Wu[2], Shuenn-Nan Chiu[1], Yih-Sharng Chen[1], Shu-Chien Huang[1], Jou-Kou Wang[1], Mei-Hwan Wu[1], Ming-Tai Lin[1], Chun-Wei Lu[1], Chun-An Chen[1]
Department of Pediatrics, National Taiwan University Children Hospital[1]; National Taiwan Ministry of Health and Welfare[2]
張乃勻[1]、吳佩圜[2]、邱舜南[1]、陳益祥[1]、黃書健[1]、王主科[1]、吳美環[1]、林銘泰[1]、盧俊維[1]、陳俊安[1]
國立臺灣大學醫學院附設醫院兒童醫院[1]; 中華民國衛生福利部[2]

Background: Postoperative supraventricular tachycardia (post-OP SVT) after congenital heart disease (CHD) surgery was occasionally seen in early postoperative period but its clinical significance and long-term outcome was not clear.
Methods: From 2010 to 2015, aged ＜ 18 y/o, who had early post-OP SVT after cardiopulmonary bypass surgery for CHD in our institution were reviewed. The definition of SVT includes atrial arrhythmia and PSVT and JET was excluded. For peri-OP risk factors, we performed propensity score matching method with study: control 1:3.
Results: Totally 1404 pts were enrolled. Median age of OP was 0.56 y/o, 58.2% were male, and 2.4% had history of SVT before this surgery. Cyanotic CHD accounted for 50.9% of pts. There were 1650 surgeries performed in these1404 pts. Among them, 32 (2.3%) of pts developed SVT in early post-OP stage: mean age of SVT was 0.37 y/o. The most common type of SVT was AT 56%, followed by PSVT 28%. Heterotaxy syndrome and TGA had the highest incidence (9.7% and 6.6%) of SVT. The multivariate analysis showed that previous SVT history and complex cyanotic CHD, especially heterotaxy syndrome and TGA, were independent risk factors of early post-OP SVT. CPB time showed a marginal predictor factor for post-OP SVT(P=0.0563) All SVT could be controlled by acute treatment with 68% required IV amiodarone, and 13% received DC cardioversion. The length of post-OP hospital stay of pts with SVT was significantly longer(median 27 vs. 21 days), but the perioperative mortality was similar. The median medication treatment duration for SVT was 137 days after discharge. For long-term follow up study in the propensity score match group, 4 of 26 cases with post-OP SVT had recurrence of arrhythmia during long term follow up, which was higher than those without post-op SVT (2/74, p= 0.01916).
Conclusions: Early post-OP SVT is common after CHD surgery especially for those with complex CHD and cyanotic CHD. Previous hx of SVT and disease type, especially heterotaxy syndrome and TGA were prediction factors. CPB time showed a marginal predictor factor. Secondly, long-term follow up showed post-operative SVT is a prediction factor for arrhythmia happening during long-term follow up.

15 **Single-center Experience in the Comparison of Transcatheter Versus Surgical Pulmonary Valve Implantation**
單一中心經心導管與外科手術置換肺動脈瓣膜之比較

Yu-Ning, Cheng[1], Chun-An Chen[1], Wei-Chieh Tseng[1], Shuenn-Nan Chiu[1], Ming-Tai Lin[1], Chun-Wei Lu[1], Shu-Chien Huang[2], Yih-Sharng Chen[2], Jou-Kou Wang[1], Mei-Hwan Wu[1]
Department of Pediatrics, National Taiwan University Hospital[1];Department of Surgery, National Taiwan University Hospital[2]
鄭又寧[1]、陳俊安[1]、曾偉杰[1]、邱舜南[1]、林銘泰[1]、盧俊維[1]、黃書健[2]、陳益祥[2]、王主科[1]、吳美環[1]
國立台灣大學醫學院附設醫院小兒部[1]、外科部[2]

Background: Transcatheter pulmonary valve implantation (TPVI) has emerged as an alternative to surgical pulmonary valve replacement (SPVR) in patients with pulmonary valve dysfunction. Aside from faster recovery, little is known about the actual benefits of TPVI in terms of costs and clinical outcomes compared to SPVR.
Methods: Using our institutional database, we identified 331 patients underwent PVR (n=262 in SPVR, and n=69 in TPVI) between January 2010 to October 2022. Patients received SPVR were further divided into two groups according to the concomitant surgical procedure performed during SPVR (no additional procedure, simple SPVR, n=109; with additional procedure, complex SPVR, n=153). Cardiac MRI data, hospital costs, length of stay, 30-day readmission, reinterventions, complications, and survival at follow-up were compared.
Results: Baseline MRI data were similar between TVPI and simple SPVR groups, but RV function was poorer in patients receiving complex SPVR. Patients received TPVI had significantly shorter hospital stay (TPVI 4.4±2.2 days versus simple SPVR 15.8±11.2 days and complex SPVR 22.1±14.4 days, p ＜ 0.001), shorter ICU stay (1.1± 0.5 days versus 4.2±6.2 days and 7.3±10.2 days, p＜0.001). At follow-up, overall survival was excellent in TVPI (100%) and simple SPVR (99%) (93% in complex SPVR), and the extent of RV reverse remodeling was similar in both groups. However, TPVI group had lower reintervention rates (average: 6% versus 18% and 22%, p=0.001). There was no difference in re-do PVR, 30-day readmission, the rate of infectious endocarditis. The overall hospital costs were similar among three groups. Before NHI reimbursement of TPVI, self-paid costs were significantly higher compared to SPVR (average NTD 593,035 versus NTD 60,919 and NTD 79,200, p ＜0.001). There was no difference in self-paid costs between three groups after NHI reimbursement.
Conclusions: Patients received either TPVI or simple SPVR had similar clinical outcomes, except for more reinterventions in those received SPVR. In addition, considering about shorter hospital stay and similar hospital costs, TPVI would be a reasonable and attractive alternative to SPVR in selected patients with pulmonary valve dysfunction.

16 **Maternal Diesel Particle Exposure Alters Gut Microbiota and Induces Lung Injury in Neonatal Rats**
母鼠柴油顆粒暴露改變新生大鼠的腸道微生物群並誘發肺損傷

Chung-Ming Chen[1,2], Yu-Chen S.H. Yang[3], Hsiu-Chu Chou[4]
Department of Pediatrics[1], Taipei Medical University Hospital; Department of Pediatrics[2], Joint Biobank, Office of Human Research[3], Department of Anatomy and Cell Biology[4], Taipei Medical University, Taipei, Taiwan.
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]

Background: Maternal air pollution exposure impairs fetal lung growth. Diesel exhaust particles (DEP) are a mixture of various chemical components from automobile engines and are one of the most significant contributors to PM2.5. The effects of maternal DEP exposure on the maternal and offspring's gut microbiota and lung development remained unknown and need further study.
Methods: Time-dated pregnant Sprague-Dawley rats received intranasal administration of either 100 μl of PBS or DEP (250 μg) in 100 μl of PBS from gestational days 16 to 21. The dams were allowed to deliver vaginally at term. Maternal fecal samples were collected on postnatal day 0. On postnatal days 0 and 7, lung and intestinal microbiota were sampled from the left lung and lower gastrointestinal tract. The right lung and terminal ileum were harvested for histology, cytokines, and 8-hydroxy-2′-deoxyguanosine (8-OHdG) analyses.
Results: On postnatal day 0, α-diversity was not significantly different between the control and DEP groups. The DEP group exhibited substantially lower Pseudomonas abundance and significantly higher Enterococcus abundance than the control group at the genus level. On postnatal day 7, the DEP group showed significantly higher α-diversity than the control group. The DEP group exhibited substantially lower Dubosiella, Clostridium_sensu_stricto_1, Enterococcus, Staphylococcus, and Escherichia/Shigella abundance and significantly higher Romboutsia and Lactobacillus abundance than the control group at the genus level. Rats born to DEP-exposed dams exhibited significantly lower intestinal tight junctional protein expression, higher lung 8-OHdG and cytokine levels, and substantial lung injury compared with rats born to control dams on postnatal days 0 and 7.
Conclusions: Maternal DEP exposure during late pregnancy induces lung injury, probably through the modulation of gut microbiota in neonatal rats.

17

Changes in Regional Disparities in Neonatal Mortality and Associated Complications in Taiwan, 2008 to 2022
台灣新生兒死亡率的地區差異分析：2008 至 2022 年

Chia-sui Chou[1,2,3], Tsung-Hsueh Lu[4], Yu-Sheng Lee[1,2,3], Pei-Chen Tsao[1,2,3], Mei-Jy Jeng[1,2,3], TNM study group
Neonatal Medical Care Center and Section of Neonatology, Department of Pediatrics, Taipei Veterans General Hospital, Taipei, Taiwan, R.O.C.[1]; Institute of Emergency and Critical Care Medicine, School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan, R.O.C.[2]; 3 Department of Pediatrics, School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan, R.O.C.[3]; Department of Public Health, College of Medicine, National Cheng Kung University, Tainan, Taiwan [4]
周佳穗 [1,2,3]、呂宗學 [4]、李昱聲 [1,2,3]、曹珮真 [1,2,3]、鄭玫枝 [1,2,3]、台灣新生兒死因研究小組
臺北榮民總醫院兒童醫學部新生兒醫療中心暨新生兒科 [1]; 國立陽明交通大學急重症醫學研究所 [2]; 國立陽明交通大學醫學院兒科 [3]; 國立成功大學醫學院公共衛生系 [4]

Background: The neonatal mortality rate is a critical indicator of public health and socioeconomic progress. Investigating the long-term patterns and regional differences in these rates helps in identifying underlying causes of infant mortality in Taiwan and reducing them further. Our study assesses the regional variations to neonatal deaths in Taiwan.
Methods: Analysis was conducted utilizing birth statistics from the Health Promotion Administration and “Cause of Death Statistics” provided by the Ministry of Health and Welfare for the period of 2008 to 2022. We stratified the study population according to the six medical care regions: Taipei Metro, Northern, Middle, Southern, Eastern, and KaoPing Districts, to facilitate regional comparative analysis. The data set included demographic information; birth rates; mortality rates for early-neonatal (0-6 days), post-neonatal (7-28 days), neonatal (＜28 days), and infants (＜12 months). Comparative analyses were also executed among the six municipalities in Taiwan to discern urban versus regional disparities in neonatal and infant health outcomes.
Results: During the study period, Taiwan registered 2,821,136 births with 7,016 resulting in neonatal fatalities, equating to a mortality rate of 2.49 per 1000 live births. Over the course of 15 years, there was a significant drop in the birth rate, from 8.02 to 6.48 births per 1,000 population. Within the six municipalities, Kaohsiung City exhibited the most elevated neonatal (3.84‰) and infant mortality (5.27‰) rates, with the highest incidence found in the 0-6 day age group (3.38‰) during 2020 to 2022. Nonetheless, the post-neonatal mortality rate (0.45‰) was similar to that of other cities. Examining the six administrative districts, both the Eastern and KaoPing districts observed increased early-neonatal (3.65‰ &2.85‰) mortality rates in comparison to other regions (1.37-2.01‰).
Conclusions: There are significant regional disparities in neonatal and infant mortality in Taiwan, with the most pronounced rates encountered in the Eastern and KaoPing areas, and the highest mortality concentrated in the early-neonatal phase. Our findings suggest prioritization of preventive measures at the early-neonatal period.

18

Cesarean Section and Maternal Antibiotics Usage Increase the Risk of Early-onset Sepsis in Full-term Infants: Nationwide Population Based Study
剖腹產和母親使用抗生素會增加足月嬰兒早發性敗血症的風險：全國人口研究

Hao-Yuan Lee[1], Ming-Luen Tsai[2,3], Shang-Po Shen[3], Yin-Ting Chen[3], Hsiao-Yu Chiu[4], Hsiang-Yu Lin[2,3], Wen-Yuan Lee[1], Hao-Wen Cheng[3], Hung-Chih Lin[3,4]
Department of Pediatrics and Neurosurgery, Wei Gong Memorial Hospital, Miaoli, Taiwan [1]; Graduate Institute of Biomedical Sciences, China Medical University, Taichung, Taiwan [2]; Division of Neonatology, China Medical University Children’s Hospital, Taichung, Taiwan [3]; Department of Pediatrics, Asia University Hospital, Asia University, Taichung, Taiwan [4]
李浩遠 [1]、蔡明倫 [2,3]、沈上博 [3]、陳映廷 [3]、邱曉郁 [4]、林湘瑜 [2,3]、李文源 [1]、鄭皓文 [3]、林鴻志 [3,4]
為恭紀念醫院小兒科 [1]; 中國醫藥大學臨床醫學研究所 [2]; 中國醫藥大學兒童醫院新生兒科 [3]; 亞洲大學附屬醫院兒科 [4]

Background: Early-onset sepsis (EOS) remains an important public health issue because it consistently emerges as one of the leading causes of neonatal morbidity and mortality. We aimed to identify maternal and neonatal risk factors of EOS to early risk detection which might reduce the prevalence of EOS.
Methods: We identified pairs of pregnant individuals and their full-term offspring between 1 January 2010 and 31 December 2019 from the National Health Insurance Research Database. We collect all EOS cases diagnosed by specialized physicians in Taiwan within three months after birth and exclude unlikely cases which had no blood culture, no antibiotics treatment or hospitalized less than 10 days. Control group is selected by matching 1:5 numbers ratio from all live births excluding whom had been diagnosed as sepsis and been hospitalized. Risk analyses were performed by comparing data of EOS group to control group. A multivariate logistic regression analysis was conducted to adjust for covariates.
Results: Among 1,694,043 term neonates born from 2010 to 2019, a total of 13,350 newborns (0.79%) suffered from sepsis. More than a half (63.73%) neonates with sepsis was found in their first three days after birth. By adjusted stepwise logistic regression, full-term infants with sepsis correlated with chorioamnionitis, maternal pneumonia, Cesarean section (C-section) delivery, maternal diabetes mellitus, maternal antibiotic usage, premature or prolonged rupture of membranes (PROM), birth weight (BW) (all $P < 0.001$), as well as maternal genitourinary tract infections ($P = 0.004$).
Conclusions: Efforts to prevent early-onset sepsis (EOS) in full-term infants should prioritize minimizing the C-section rate, reducing unnecessary maternal antibiotic usage, preventing maternal diabetes and infections such as chorioamnionitis and maternal pneumonia, as well as neonatal urinary tract infections. Additionally, avoiding premature rupture of membranes (PROM) and increasing the birth weight of neonates, as indicated by our findings, are essential strategies.

19 **Renal pyelectasis in neonates: incidence, perinatal characteristics and follow-up outcomes**
新生兒腎盂擴大: 發生率，周產期特徵與追蹤預後

Daniel Tzeng[1], Yi-Li Hung[1;2;3], Chung-Min Shen[1;3], Lung-Huang Lin[1;3], Wu-Shiun Hsieh[1;4]
Department of Pediatrics, Cathay General Hospital, Taipei, Taiwan[1]; School of Medicine, National Tsing-Hua University, Hsinchu City, Taiwan[2]; School of Medicine, Fu Jen Catholic University, New Taipei City, Taiwan[3]; Department of Pediatrics, National Taiwan University College of Medicine, Taipei, Taiwan[4]
曾涵泰 [1]、洪依利 [1;2;3]、沈仲敏 [1;3]、林隆煌 [1;3]、謝武勳 [1;4]
國泰醫療財團法人國泰綜合醫院 [1]; 國立清華大學醫學院 [2]; 天主教輔仁大學醫學院 [3]; 國立臺灣大學醫學院 [4]

Background: Renal pyelectasis is not uncommon in neonates. Despite its frequency, the significance and management remain controversial. We assessed the incidence, the perinatal characters and the following up outcomes in healthy neonates with diagnosis of pyelectasis after routine sonographic screening.
Methods: Full term or healthy late preterm newborns without congenital anomaly (GA≥35 weeks) born at a single medical center underwent abdominal sonography screening after birth from September, 2017 to July, 2020. Pyelectasis was defined as renal pelvis diameter (RPD) larger than 3 mm. Mild pyelectasis was defined as RPD 3-6 mm, moderate pyelectasis as RPD 6-10 mm, and severe pyelectasis as RPD above 10 mm. Neonates with pyelectasis were followed up at out-patient clinic regularly. Clinical outcomes were analyzed.
Results: Totally 1699 cases were enrolled and 359 (21.1%) newborns had RPD larger than 3 mm documented by abdominal sonography after birth. The average RPD at first examination was 3.98 mm (ranged 3~12.2 mm). 230 neonates (64.1%) were male. Right side and left side pyelectasis were noted in 98 (27.3%) and 187 (52.1%) neonates, respectively. 74 (20.6%) neonates had bilateral pyelectasis. 248 infants completed regular following up. Pyelectasis resolved spontaneously within 12 months in 158 (63.7%) infants and the RPD was stationary in 74 (29.8%) infants. The RPD was increased in 16 (6.5%) infants, severe pyelectasis was observed in 4 of them with a maximum diameter of 13 mm. No vesicoureteral reflux (VUR) nor renal failure was found among these sonographic increasing RPD during follow up. However, grade III VUR with urinary tract infection was noted in one infant with resolved pyelectasis. Right ureteral duplication was incidentally found in one infant in the stationary group.
Conclusions: Most of neonates with renal pyelectasis would be resolved or remained stationary. A small part of them might progress to severe pyelectasis without clinical impacts in our short term follow up study. Long term follow up would be mandatory for these infants. In addition, VUR or renal system anomaly might be found in cases with resolving or stationary pyelectasis which warrants early detection and further management.

20 **How Often and What are the Common Errors in Filling Neonatal Death Certificates in Taiwan**
台灣新生兒死亡證明書上常見的填寫錯誤

I-Hsyuan Wu[1,3], Reyin Lien[1,3], Ming-Chou Chiang[1,3], Tsung-Hsueh Lu[2,3]
Division of Neonatology, Department of Pediatrics, Chang Gung Memorial Hospital, Linkou Branch[1]; Department of Public Health, College of Medicine, National Cheng Kung University[2]; Taiwan Neonatal Mortality (TNM) study group[3]
吳怡萱 [1,3]、林瑞瑩 [1,3]、江明洲 [1,3]、呂宗學 [2,3]
林口長庚紀念醫院兒童內科部新生兒科 [1]; 成功大學醫學院公共衛生研究所 [2]; 台灣新生兒死因研究小組 [3]

Background: Accurate completion of death certificates is closely tied to subsequent cause-of-death (COD) statistics whereas failure to do may lead to inaccuracy in mortality statistics and incorrect estimates of healthcare disparities, which in turn may hinder government public health policies. Facing the gradually rising neonatal mortality rate (NMR) in Taiwan, we consider proper death certificate filing and proper cause of death analysis to be a key element to clarify.
Methods: We used entity-axis data in multiple CODs file provided by Office of Statistics, Ministry of Health and Welfare (grant number M1211009) to get the information on position of each condition entered on the death certificate. Three significant errors were analyzed, including: 1) inputting more than one diagnosis on a single line, 2) the last line of part 1 of the death certificate containing a diagnosis that does not explain the preceding conditions, but a causal sequence ends with the terminal condition, and 3) no causal

sequence in part 1 of death certificate. To determine if the causal sequence is correct or not, the information on selection rules applied in selecting the underlying cause of death from automated coding system (Iris) was used. We manually classified the quality of COD statement.
Results: Over the five-year period from 2018 to 2022, there were 2082 neonatal death certificates filed in Taiwan, with 474 in 2018, 413 in 2019, 387 in 2020, 425 in 2021, and 383 in 2022. The occurrence rates of these errors were as follows: Error 1: 25.1%, 26.9%, 27.9%, 28.5%, 30.8%; Error 2: 12.0%, 11.9%, 11.4%, 11.3%, 13.6%; and Error 3: 6.8%, 7.0%, 7.5%, 7.8%, 5.7%. Except for a decrease in Error 3 in 2022, Errors 1 and 2 showed an increasing trend over time.
Conclusions: Our study showed that neonatal death certificates in Taiwan are often erroneous, and the quality of death certificate completion has not improved over the five-year period. Introduction of systematic training for death certificate completion is urgently needed to safe-guard neonatal mortality statistics.

21

Downregulation of Notch-Hes1 signaling pathway in intrauterine growth-restricted rat lungs and hypoxic alveolar epithelial cells
子宮內生長遲滯大鼠肺和缺氧肺泡上皮細胞降低了 Notch-Hes1 訊號路徑

Liang-Ti Huang[1,2], Po-Nien Tsao[5,6], Hsiu-Chu Chou[3], Chung-Ming Chen[2,4]
Department of Pediatrics, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan [1]; Department of Pediatrics, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan [2]; Department of Anatomy and Cell Biology, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan [3]; Department of Pediatrics, Taipei Medical University Hospital, Taipei, Taiwan [4]; Department of Pediatrics, National Taiwan University Hospital, Taipei, Taiwan [5]; The Research Center for Developmental Biology and Regenerative Medicine, National Taiwan University, Taipei Taiwan [6]
黃亮迪[1,2]、曹伯年[5,6]、周秀珠[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]; 台灣大學附設醫院兒科部 [5]、臺灣大學發育生物學與再生醫學研究中心 [6]

Background: Intrauterine growth retardation (IUGR) is associated with impaired lung development in the neonatal animals. The most prevalent cause of IUGR is uteroplacental insufficiency (UPI), which affects roughly 10% of human pregnancies. Notch signaling plays an essential role in lung development, and its dysregulation is linked to the pathogenesis of various lung diseases. The aim is to define the potential role of the Notch-Hes1 pathway during postnatal lung development in intrauterine growth-restricted rats and hypoxia cell culture.
Methods: Timed pregnant Sprague–Dawley rats were randomized to the IUGR group (bilateral uterine artery ligation on gestation day 17) or the control group (sham operation). All rats were delivered naturally at term. The rat pups were randomly selected from the control and IUGR group on postnatal days 0 and 7, and the lungs were excised for histological and Western blot analyses. For in vitro experiments, RLE-6TN cells (rat alveolar type II epithelial cells) transfected with Hes1 plasmid were exposed to hypoxia, and the cells were analyzed for Notch-Hes1 expression.
Results: The IUGR rat pups had significantly lower mean body weights than the control rat pups on postnatal days 0 and 7, indicating that UPI triggered IUGR. The IUGR rat pups exhibited significantly larger radial alveolar count and lower Notch1, Notch3, and Hes1 expression than control rats on postnatal days 0 and 7. The hypoxia RLE-6TN cells showed lower Notch 1, Notch 3, and Hes 1 expression than control cells. Compared to hypoxia RLE-6TN cells without intervention, hypoxia RLE-6TN cells transfected with Hes 1 plasmid exhibited higher Notch 1, Notch 3, and Hes 1 expression in Hes1 overexpression status and lower Notch 1, Notch 3, Hes 1 expression in Hes 1 knockdown status.
Conclusions: The Notch-Hes1 signaling pathway may be necessary for mediating impaired alveolarization caused by UPI in IUGR rat lungs.

22

Neonatal Jaundice is Associated with Increased Risks of Congenital Anomalies of the Kidney and Concomitant Urinary Tract Infection
新生兒黃疸與先天性腎臟異常及併發的尿路感染風險增加有關

Yi-Shiuan Lin[1], Hsin-Hsu Chou[2,3], Lin-Chih Huang[2], Yu-Chia Chang[4,5], Shang-Po Shen[1], Ming-Luen Tsai[1], Hung-Chi Lin[1]
China Medical University Children's Hospital, China Medical University[1]; Department of Pediatrics, Ditmanson Medical Foundation Chia-Yi Christian Hospital[2]; Department of Bioinformatics and Medical Engineering, Asia University[3]; Department of Healthcare Administration, College of Medical and Health Science, Asia University[4]; Department of Long-Term Care, College of Health and Nursing, National Quemoy University[5];
林怡璇[1]、周信旭[2,3]、黃琳淇[2]、張育嘉[4,5]、沈上博[1]、蔡明倫[1]、林鴻志[1]
中國醫藥大學兒童醫院 [1]; 戴德森醫療財團法人嘉義基督教醫院兒童醫學部 [2]; 亞洲大學生物資訊與醫學工程學系 [3]; 亞洲大學醫學暨健康學院健康產業管理學系 [4]; 國立金門大學健康護理學院長期照護學系 [5];

Background: The link between neonatal jaundice and urinary tract infection (UTI) remains debated, with congenital kidney and urinary tract anomalies (CAKUT) potentially playing a role.
Methods: This population-based study aimed to analyze the correlations between neonatal jaundice, CAKUT, and concomitant UTI. The study cohort consisted of 2,078,122 live births from 2004 to 2014. We linked several population-based datasets in Taiwan to identify infants with unexplained neonatal jaundice and their mothers. The primary outcome was the rate of CAKUT occurring within 3 years after delivery, and the presence of concomitant UTI during neonatal jaundice hospitalization.
Results: Infants with neonatal jaundice had a significantly higher risk of CAKUT (adjusted odds ratio [aOR] 1.24, 95% confidence interval [CI] 1.11-1.38) during early childhood. Among the subtypes of CAKUT, obstructive uropathy, vesicoureteral reflux and other CAKUT were associated with an increased risk of neonatal jaundice. Infants who underwent intensive phototherapy, had a late diagnosis (> 7 days of postnatal age) or underwent a prolonged duration of

phototherapy (> 3 days) exhibited a higher risk of concomitant UTI compared to other infants with jaundice.
Conclusions: This study highlights the importance of vigilant monitoring and timely interventions for neonates presenting with jaundice to reduce the risk of UTIs and potential complications associated with CAKUT.

23 **Neonatal Intestinal Metabolic Alterations in Uteroplacental Insufficiency-Induced Intrauterine Growth Restriction**
子宮胎盤功能不全引起子宮內生長受限的新生大鼠腸道代謝變化

Sheng-Yuan Ho[1,2], Merryl Esther Yuliana[3,4], Hsiu-Chu Chou[5], Chung-Ming Chen[2,3,6,7]
Department of Pediatrics, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan[1]; Graduate Institute of Clinical Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan[2]; International Ph.D. Program in Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan[3]; Faculty of Medicine, Christian University of Indonesia, Jakarta, Indonesia[4]; Department of Anatomy and Cell Biology, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan[5]; Department of Pediatrics, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan[6]; Department of Pediatrics, Taipei Medical University Hospital, Taipei, Taiwan[7]
何昇遠 [1,2]、Merryl Esther Yulian[3,4]、周琇珠 [5]、陳中明 [2,3,6,7]
國防醫學院三軍總醫院兒科部 [1]；臺北醫學大學醫學院臨床醫學研究所 [2]、國際博士學程 [3]；印尼基督教大學醫學院 [4]；臺北醫學大學醫學院解剖學與細胞生物學系 [5]、小兒學科 [6]；臺北醫大學附設醫院兒科 [7]

Background: Uteroplacental insufficiency (UPI) is a leading cause of intrauterine growth restriction (IUGR) in 10% of pregnancies. Neonatal IUGR is associated with intestinal barrier dysfunction, apoptosis, and growth retardation. Transketolase (TKT) deficiency results in intestinal epithelial cell death, barrier abnormalities, and growth retardation. The impact of UPI on the intestinal metabolome of IUGR offspring remains unknown. We employed a UPI-induced IUGR rat model to investigate neonatal intestinal metabolomics on postnatal days 0 and 7.
Methods: On gestational day 17, pregnant Sprague Dawley rats were randomly assigned to the IUGR or control group. The IUGR group underwent bilateral uterine vessel ligation, while the control group underwent sham surgery. Rat pups were born naturally on gestational day 22, and a subset of each group were randomly selected for the removal of intestinal tissue for Western blot and metabolomic analysis on the postnatal days 0 and 7.
Results: On postnatal day 0, IUGR pups exhibited significantly lower body weights than the control pups. Additionally, IUGR significantly decreased TKT, ZO-1, and occludin levels ($p < 0.05$) in affected offspring. Twelve metabolites displayed statistically significant differences between the two groups ($q < 0.05$). Metabolic pathway analysis revealed significant intergroup differences in the pentose phosphate pathway, pentose and glucuronate interconversions, and alanine, aspartate and glutamate, purine and pyrimidine metabolism.
Conclusions: UPI-induced IUGR causes alterations in the intestinal metabolism of neonatal rats, compromising the integrity and barrier function of the intestine. These findings may offer new insights into novel biomarkers and metabolic mechanisms underlying IUGR-induced intestinal changes.

24 **The impact of intrauterine growth retardation in body composition and feeding of preterm-born children at school age**
子宮內胎兒生長遲滯對學齡期之極低體重早產兒的體組成及飲食影響

Chien-Yi Chen[1], Hui-Ling Weng[2], Po-Nien Tsao[1], Hung-Chieh Chou[1]
Department of Pediatrics, National Taiwan University Children Hospital[1]; Section of Dietetics, National Taiwan University Cancer center[2]
陳倩儀 [1]、翁慧玲 [2]、曹伯年 [1]、周弘傑 [1]
國立台灣大學醫學院附設兒童醫院小兒部 [1]; 國立臺灣大學醫學院附設醫院癌醫中心分院 [2]

Background: Early nutritional is important for preterm infants and may impact the long-term growth, neurodevelopment and metabolic outcome. Although early aggressive nutrition is the standard care and globally implemented in neonatal units, early nutrition deficit caused by intrauterine growth retardation may still impact the long-term outcome. The aim of this study is to evaluate the growth, feeding behavior, daily intake and body composition of very low birth weight preterm infants with and without small for gestational age (SGA) who have reached school age.
Methods: The cross-sectional study invited ex-preterm children who were born with birth weight below 1500g between 2008-2015 and follow-up at our outpatient clinic for this study by mail. After informed consent, the caregivers of the participants were asked to record 3-5 days diet dairy and fill in a questionnaire to evaluate their knowledge and attitude of nutrition and feeding behavior of their children. All participants measured body weight (BW), body length (BL), mid-upper arm circumference (MUAC), and body composition by bioelectrical impedance analysis (Inbody S10).
Results: A total of 46 participants complete the study, and 22 of them were SGA, the other 24 were AGA. The growth assessment of BW, BL, and MUAC were not statistically significant in both groups. Underweight (BMI < 3%) was noted in 7 participants in SGA group and 3 in AGA group. The participant in the SGA group have higher percentage of carbohydrate intake (54.3±6.1% vs 49.5±5.5%, p=0.028), lower daily protein intake (47.9±11.7 vs 56.8±14.7 g/day, p=0.038), more feeding problem (6 vs 8, p=0.018) and less fat free mass index (12.4±0.7 vs 12.9±0.8 kg/m2, p=0.039) compared to AGA groups.
Conclusions: The preterm-born children with SGA at birth still have higher nutritional risk at school age, including suboptimal dietary intake, more feeding problem and less fat free mass.

25 **Vitamin D Level and Genetic Polymorphisms of Vitamin D Metabolism Genes in High-Risk Pregnancies**
維生素 D 濃度與維生素 D 代謝基因遺傳多態性在高風險懷孕中之關聯

Miao-Hsi Hsieh[1], Chih-Yi Yang[2], Ming-Luen Tsai[3], Pei-Chi Chen[1], Lawrence Shih-Hsin Wu[1], Jiu-Yao Wang[1]
Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[1]; Department of Obstetrics, China Medical University Hospital[2]; Department of Neonatology, China Medical University Children's Hospital[3]
謝妙禧 [1]、楊智怡 [2]、蔡明倫 [3]、陳佩琪 [1]、吳世欣 [1]、王志堯 [1]
中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [1]; 中國醫藥大學附設醫院婦產部 [2]; 中國醫藥大學兒童醫院新生兒科 [3]

Background: Chronic diseases among mothers and their fetuses are a major cause of maternal mortality and morbidity. In a previous study, vitamin D levels were associated with adverse pregnancy outcomes, including preeclampsia, preterm labor, and gestational diabetes. Our study aimed to investigate whether genetic polymorphisms in the vitamin D metabolism might play a role in the development of high-risk pregnancies in the presence of vitamin D.
Methods: The study involved 404 pregnant women, including 80 with chronic diseases (High-Risk) and 324 without chronic diseases (Control). High-risk pregnant women with chronic diseases were further categorized into diabetic, hypertensive, and immune disease groups. We analyzed concentrations of 25-hydroxyvitamin D3 (vitamin D) using Chemiluminescence. Gene variants of vitamin D signaling genes, such as the vitamin D receptor (rs11574010, rs1544410, rs2228570, rs731236, rs7975232), vitamin D binding protein (rs4588, rs4752, rs7041), and CYP27B1 (rs10877012), were examined using the MassARRAY™ system. Chi-square tests and logistic regression were employed to assess associations between vitamin D-related gene polymorphisms, vitamin D levels, and the potential for high-risk pregnancies.
Results: The vitamin D levels in pregnant women at high risk were significantly higher than those in controls (28.76± 9.90 vs. 25.30± 9.65 ng/ml, p =0.0044). Furthermore, only pregnant women with immune disorders had higher vitamin D levels than pregnant women without immune disorders (31.50±10.51 vs. 25.63± 9.65 ng/ml, p= 0.0043). There was no difference in vitamin D levels between pregnant women with diabetes or hypertension and those without. The SNP rs10877012 (in the CYP27B1 promoter region) G-carriers (GG+GT) were less prevalent in diabetic pregnant women than in non-diabetic pregnant women (OR: 0.469, 95% CI: 0.242-0.908, p=0.0247; adjusted for age and vitamin D level).
Conclusions: Our results revealed that the genetic polymorphism rs10877012 in CYP27B1 is associated with an increased risk of high-risk pregnancy with diabetes.

26

Maternal Risk Factor, Postnatal Complication and One-Year Growth Outcome within Small-for-Gestational-Age Infant
比較胎兒小於妊娠年齡的孕期危險因子、產後併發症及周歲前的生長發育狀況

Shu-Ping Tsui[1], Wei-Yu Chen[1,2,3], Chia-Sui Chou[1,2,3], Yu-Cheng Lo[1,2,3], Pei-Chen Tsao[1,2,3], Yu-Sheng Lee[1,2,3], Mei-Jy Jeng[1,2,3]
Department of Pediatrics, Children's Medical Center, Taipei Veterans General Hospital, Taipei, Taiwan[1]; Department of Pediatrics, Faculty of Medicine, School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan[2]; Institute of Emergency and Critical Care Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan[3]
崔舒評 [1]、陳威宇 [1,2,3]、周佳穗 [1,2,3]、羅宇成 [1,2,3]、曹珮真 [1,2,3]、李昱聲 [1,2,3]、鄭玫枝 [1,2,3]
台北榮民總醫院兒童醫學部 [1]; 國立陽明交通大學醫學院醫學系小兒學科 [2]; 國立陽明交通大學急重症醫學研究所 [3]

Background: Small for Gestational Age (SGA), defined as birth weight below the 10th percentile, encompasses both asymmetric and symmetric subtypes with associations to congenital infections, postnatal complications, and growth delays. This study seeks to compare postnatal complications and one-year growth outcomes between infants with asymmetric and symmetric SGA.
Methods: Newborns admitted to Taipei Veterans General Hospital NICU and ICN (Jan. 1, 2021, to June 30, 2022) with birth weight below the 10th percentile and gestational age exceeding 36 weeks were enrolled. Data on maternal history (including maternal body weight, body height, BMI, gestational diabetes mellitus status, pregnancy-induced hypertension), TORCH serology (Toxoplasma IgG/M, CMV IgG/M, HSV IgM, Rubella IgM), hearing screening, brain echo, and postnatal complications (including NICU admission or respiratory support necessity, occurrence of respiratory distress) were collected. Subsequent one-year height and weight changes were investigated.
Results: Among 77 asymmetric and 35 symmetric SGA infants, asymmetric SGA exhibited significantly higher birth weight and percentiles ($P < 0.0001$). No significant differences were observed in TORCH serology, hypoglycemia episodes, hearing screening, or brain echo. Regarding postnatal complications, a higher incidence of respiratory distress was noted in the asymmetric SGA group (33/77 for asymmetric SGA vs. 8/35 for symmetric SGA, $P = 0.042$), and a higher occurrence of polycythemia was noted in the symmetric SGA group (4/76 vs. 6/35, $P = 0.042$). There was no significant difference in maternal body weight, body height, BMI, gestational diabetes mellitus status, or pregnancy-induced hypertension between the symmetric and asymmetric groups. In the one-year follow-up, the asymmetric group caught up with the 15th percentile body weight at 2 months, while the symmetric group caught up at 4 months.
Conclusions: In conclusion, no significant differences were found in TORCH serology, hypoglycemia episodes, hearing screening, or brain echo findings. Both the asymmetric and symmetric groups caught up with the 15th percentile body weight at 2 and 4 months, respectively.

27

The Hidden Variable: Postnatal Management Options and Their Impact on Neonatal Mortality Rate at a Single Medical Center
隱藏變數：新生兒產後處置的選擇對單一醫療中心新生兒死亡率的影響

Chia-Huei Chen[1,3,4], Shin-Pin Pang[1], Hung-Yang Chang[1,4], Sung-Tse Li[2,4], Tsung-Hsueh Lu[5], Chun-Chih Peng[1,4], Jui-Hsing Chang[1,4], Chyong-Hsin Hsu[1,4], Wai-Tim Jim[1,4], Chia-Ying Lin[1,4]
Department of Pediatrics, MacKay Children's Hospital,

Taipei, Taiwan [1]; Department of Pediatrics, Hsinchu MacKay Children's Hospital, Hsinchu, Taiwan [2]; Institute of Emergency and Critical Care Medicine, School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan [3]; Department of Medicine, MacKay Medical College, New Taipei, Taiwan[4]; Department of Public Health, College of Medicine, National Cheng Kung University, Tainan, Taiwan[5]
陳佳慧 [1,3,4]、逢芯品 [1]、張弘洋 [1,4]、李松澤 [2,4]、呂宗學 [5]、彭純芝 [1,4]、張瑞幸 [1,4]、許瓊心 [1,4]、詹偉添 [1,4]、林佳瑩 [1,4]
馬偕兒童醫院新生兒科 [1]; 新竹兒童醫院小兒神經科 [2]; 國立陽明交通大學急重症醫學研究所 [3]; 馬偕醫學院醫學系 [4]; 國立成功大學公共衛生研究所 [5]

Background: Neonatal mortality is a key indicator of healthcare service quality. Over the past decade, the neonatal mortality rate in Taiwan have consistently risen. According to Taiwanese law, parents can choose either active or expectant management, which means refusing resuscitation after birth, for pregnancies before 24 weeks. This study examines trends in neonatal mortality at one single medical center, and explores the impact of postnatal management strategies on neonatal mortality rates over a decade (2013-2022).
Methods: This retrospective cohort study involved the collection of live birth data from 2013 to 2022 at one medical center. We collected data on live birth newborns, including their gestational age, birth weight, gender, and postnatal management. Neonatal mortality was defined as deaths occurring within 28 days of birth. We assess the trends in crude neonatal mortality rate, mortality rate of newborns receiving active management, and rate of prematurity at less than 24 weeks of gestation. Pearson correlation coefficients were used to analyze the relationships among these variables.
Results: Over the study period, 33,165 live births were enrolled, including 324 prematurity born before 24 weeks of gestation. Of the 424 neonatal deaths, only 140 received active postnasal management. The crude neonatal mortality rate (RR: 1.066; p=0.041) and the rate of prematurity at less than 24 weeks (RR: 1.092; p=0.026) significantly increased over the study period. However, the neonatal mortality rate of total newborns receiving active management did not show a significant change (P=0.711). Notably, only a small percentage (10.4%) of newborns born at less than 24 weeks received active management (≦22weeks: 1.9%, 23weeks: 43.3%). Correlation analysis revealed a strong positive correlation (0.965, $p < 0.001$) between neonatal mortality rate and the rate of newborns who received expectant management after birth.
Conclusions: Although there is an increasing trend in crude neonatal mortality, the mortality rate among neonates receiving active management did not increase. This finding highlights the necessity to investigate concealed variables that may be impacting these outcomes.

28

Influence of Prenatal Vitamin D Concentrations on Offspring's Susceptibility to Allergic Diseases
維生素 D 濃度對後代過敏性疾病的影響

Ming-Luen Tsai[1,2], Chih-Sung Lan[2], Hsiao-Han Yang[2], Hao-Wen Cheng[2], Yin-Ting Chen[2], Shang-Po Shen[2], Hsiang-Yu Lin[1,2], Hsiao-Yu Chiu[2], Hung-Chih Lin[2,3], Jiu-Yao Wang[4,5]
Graduate Institute of Biomedical Sciences, China Medical University Taichung, Taiwan[1]; Division of Neonatology, China Medical University Children's Hospital, Taichung, Taiwan[2];Department of Pediatrics, Asia University Hospital, Asia University, Taichung, Taiwan[3]; Center for Allergy, Immunology, and Microbiome (A.I .M.), China Medic al University Hospital, Taichung, Taiwan[4]; Department of Allergy, Immunology, and Rheumatology (AIR), China Medical University Children's Hospital, Taichung, Taiwan[5]
蔡明倫 [1,2]、藍智嵩 [2]、楊曉涵 [2]、鄭皓文 [2]、陳映廷 [2]、沈上博 [2]、林湘瑜 [1,2]、邱曉郁 [2]、林鴻志 [2,3]、王志堯 [4,5]
中國醫藥大學生物醫學研究所 [1]; 中國醫藥大學兒童醫院新生兒科 [2];亞洲大學附屬醫院兒科部 [3]; 中國醫藥大學兒童醫院過敏免疫與微菌叢研究中心 [4]; 中國醫藥大學兒童醫院兒童過敏免疫風濕科 [5]

Background: Vitamin D is an essential nutrient that plays a crucial role in maintaining overall health and wellbeing. Contemporary research has highlighted that a deficiency in vitamin D during the gestational period may elevate the risk of developing allergic diseases among the offspring. Our objective was to assess the correlation between serum vitamin D levels and the development of atopic diseases in early infancy.
Methods: This longitudinal and prospective birth cohort study was conducted at the China Medical University Hospital and China Medical University Children's Hospital. It measured the serum levels of 25-hydroxyvitamin D (25[OH]D) and total immunoglobulin E (IgE) in maternal and cord blood plasma post-delivery. Parents of the enrolled infants completed a standardized questionnaire facilitated by trained investigators when the infants were 6 to 12 months old.
Results: In this study, we recruited 302 pairs of pregnant women and infants. The mean serum 25[OH]D concentrations of maternal and umbilical cord blood was 26.2 ± 9.8 and 15.4 ±6.1ng/mL, respectively. Total IgE levels in cord blood were generally low (1.2±5.8 IU/ml). Our findings revealed no significant correlation between blood 25(OH)D3 and total IgE levels in both maternal and cord blood. Additionally, no link was observed between the maternal or cord blood 25[OH]D levels and clinical respiratory symptoms or eczema during early infancy
Conclusions: There is a notable prevalence of vitamin D insufficiency/deficiency in Taiwan's neonatal cord blood. However, our data did not establish a correlation between blood 25(OH)D3 levels and allergic disorders. Future research will include specific antigen analysis to further explore the impact of vitamin D.

29

Treatment of Neonatal Respiratory Distress in Premature Infants by Inhaled Exogenous Surfactant- a Pilot Study
以噴霧方式給予表面張力素治療早產兒之新生兒呼吸窘迫症之初步研究報告

Hsiu-Lin Chen[1,2], Shu-Ting Yang[1,2], Pin-chun Su[1], Tzyy-Rong Huang[3]
Department of Pediatrics, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan[1]; Department of Respiratory Therapy, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan[2]; Division of Respiratory Therapy, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan [3]
陳秀玲 [1,2]、楊書婷 [1,2]、蘇品淳 [1]、黃子融 [3]
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]、高雄醫學大學附設中和紀念醫院呼吸治療組 [3]

Background: This study investigates the effectiveness of a vibrating mesh nebulizer for administering surfactant therapy in preterm infants with Neonatal Respiratory Distress Syndrome (RDS). RDS commonly affects preterm infants due to their underdeveloped lungs and lack of surfactant. The traditional method of surfactant administration can cause complications like airway obstruction, leading to bradycardia and unstable oxygen levels. The vibrating mesh nebulizer is proposed as a safer alternative, transforming the surfactant into aerosol particles for better lung deposition and potentially minimizing side effects.
Methods: Our study included preterm infants (gestational age under 37 weeks) at Kaohsiung Medical University Hospital's neonatal intensive care unit (NICU) who required exogenous surfactant for RDS. Participants were divided into two groups: the study group received surfactant via a vibrating mesh nebulizer, while the control group was treated using either an endotracheal tube or Minimally Invasive Surfactant Therapy (MIST).
Results: The study involved 39 preterm infants, with 21 in the study group and 18 in the control group. The groups were similar in gestational age (GA) and birth weight (BW) (mean GA 29.5 vs. 29.7 weeks, p=0.919; mean BW 1321.0 g vs. 1398.9 g, p=0.736). The intubation rate at birth was 38.1% in the study group compared to 61.1% in the control group (p=0.152). The control group exhibited higher pre-surfactant FiO2 levels. However, other measures, such as pre-surfactant peak inspiratory pressure (PIP), post-surfactant FiO2, post-surfactant PIP, and total surfactant doses did not differ significantly between the groups. The incidence of bronchopulmonary dysplasia was also comparable.
Conclusions: This pilot study successfully demonstrates the potential of using a vibrating mesh nebulizer for surfactant delivery in preterm infants in the NICU, with or without the need for intubation. This innovative approach shows promise for a safer and more effective treatment of RDS in preterm infants, indicating a significant advancement in neonatal care practices.

30 **Transcriptomic profiling in mothers and neonates of preeclampsia**
子癇前症母親和新生兒的轉錄組學分析

I-Chun Lin[1], Yun-Ju Lai[2], Ching-Chang Tsai[2], Yu-jun Zheng[1], Hong-Ren Yu[1], Mao-Meng Tiao[1], Jiunn-Ming Sheen[1]
Department of Pediatrics [1], Department of Obstetrics and Gynecology [2], Kaohsiung Chang Gung Memorial Hospital and Chang Gung University, College of Medicine, Kaohsiung, Taiwan
林宜君 [1]、賴韻如 [2]、蔡慶章 [2]、鄭妤君 [1]、于鴻仁 [1]、刁茂盟 [1]、沈俊明 [1]
台灣高雄長庚醫院 兒童內科部 [1]; 高雄長庚醫院婦產部 [2]

Background: To explore the individual transcriptomic profiles in mothers and neonates of preeclampsia (PE) and to verify the genes commonly affected.
Methods: In this case-control study, the mother-neonate pairs of PE and normotension were prospectively recruited. The gene-expression profiles of antepartum maternal (MBLs) and cord blood leukocytes (CBLs) were studied using RNA-sequencing and bioinformatic analysis, and further validated.
Results: The transcriptomic profiles of MBLs and CBLs were delineated, revealing that 10 genes were commonly affected in both mothers and neonates. The real-time RT-PCR results showed that lamin A/C (LMNA) mRNA expression levels were significantly higher in both PE MBLs and CBLs (PE n= 44, Normotension n= 50). In CBLs, the mRNA expressions of ADAM metallopeptidase with thrombospondin type 1 motif 2, gamma-aminobutyric acid A receptor epsilon (GABRE), microtubule associated serine/threonine kinase family member 4 (MAST4), oncostatin M, and solute carrier family member 1 were significantly higher, and matrix metallopeptidase 8 (MMP8) was significantly lower in PE. In the adjustment model of gestational age, LMNA expression remained higher (adjusted odds ratio (95% CI) (1.68 (1.11–2.54) in PE MBLs. The MAST4 (2.55 (1.19–5.47) and GABRE expressions (1.66 (1.04–2.64) remained higher, and MMP8 (0.54 (0.29–1.01) which was independently determined by maternal blood pressures, remained lower in PE CBLs.
Conclusions: In this study, we demonstrated the transcriptomic profiles and 10 genes commonly affected in mothers-and-neonates of PE. The results may provide a basis for future research to explore pathogenetic mechanism underlying cardiometabolic disorders following the exposure to PE.

31 **Can Caffeine Prevent Intestinal Failure-Associated Liver Disease in Very Low Birth Weight Preterm Infants?**
咖啡因是否能減少極低出生體重早產兒腸衰竭相關肝病的發生?

Mei-Chi Chen, Chien-Chung Lee, Mei-Yin Lai, Kai-Hsiang Hsu, Ren-Huei Fu, Chi-Ming Chu, Reyin Lien, I-Hsyuan Wu, Chang-Yo Yang, Ming-Chou Chiang
Division of Neonatology, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan, Taiwan
陳美淇、李建忠、賴美吟、許凱翔、傅仁煇、朱世明、林瑞瑩、吳怡萱、楊長佑、江明洲
林口長庚紀念醫院兒童內科部新生兒科

Background: Intestinal failure-associated liver disease (IFALD) is commonly seen in preterm neonates who usually had prolonged use of parenteral nutrition. The cause of IFALD is complex. Liver steatosis, inflammation and fibrosis may be seen in IFALD. Caffeine had shown protective effects in inflammatory process in liver in adults. Caffeine is frequently used in very low birth weight (VLBW) infants. We hypothesize that caffeine, with its anti-inflammatory effects, can prevent the occurrence of IFALD in VLBW infants.
Methods: This is a retrospective study conducted in our NICU between July 1 and December 31, 2022. We enrolled VLBW infants who were born with gestational age less than 32 weeks and birth weight less than 1500 grams. The diagnosis of IFALD was defined as use of TPN for more than 14 days and having cholestasis. Cholestasis was diagnosed as direct bilirubin level >1 mg/dL when total bilirubin level $\leqq$ 5mg/dL or direct bilirubin level more than 20% of total serum bilirubin. VLBW infants without cholestasis born during the same period were compared. Common factors related to the development of cholestasis were collected and compared. Besides, use of caffeine, total duration of caffeine and cumulative dose of caffeine between two groups were compare as well.
Results: A total of 64 infants were included in the study after exclusion of death, TPN duration less than 14 days and other causes of cholestasis such as biliary atresia. Fourteen VLBW

infants (21.9%, 14/64) were diagnosed with cholestasis. Birth weight was 889.4±278.3 gm and 1002.7±288.8 gm in cholestasis and without cholestasis groups, respectively (p=0.986). There was no difference in caffeine use between cholestasis and without cholestasis groups [6 (42.9%) and 32 (64%), p value= 0.22]. Median duration of caffeine in cholestasis and without cholestasis groups is 0 and 9.5 respectively (p value=0.52). Median cumulative doses (mg/kg) of caffeine in cholestasis and without cholestasis group is 0 and 57.5 respectively (p value= 0.438).
Conclusions: Compared with VLBW infants with cholestasis, preterm infants without cholestasis were tended to use caffeine more frequently.

32 **Clinical Manifestations and Urgent Management for Intra-abdominal Contrast Medium Leakage in Neonates**
新生兒腹腔顯影劑滲漏的臨床表徵與急性處置

Chin-Chieh Hu[1], Kai-Hsiang Hsu[1], Ming-Chou Chiang[1], Chao-Jan Wang[2], Chih-Chen Chang[2], Jin-Yao Lai[3], Yung-Ching Ming[3], Jen-Fu Hsu[1], Chi-Ming Chu[1], Reyin Lien[1]
Division of Neonatology, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan, Taiwan[1]; Department of Radiology, Chang Gung Memorial Hospital, Taoyuan, Taiwan[2]; Department of Pediatric Surgery, Chang Gung Memorial Hospital, Taoyuan, Taiwan[3]
胡晉傑[1]、許凱翔[1]、江明洲[1]、王超然[2]、張志丞[2]、賴勁堯[3]、明永青[3]、徐任甫[1]、朱世明[1]、林瑞瑩[1]
林口長庚紀念醫院兒童內科部新生兒科[1]；林口長庚紀念醫院影像診療科[2]；林口長庚紀念醫院小兒外科[3]

Background: Intestinal perforation before or during lower gastrointestinal (LGI) series can lead to contrast medium leakage into intra-abdominal cavity. Owing to high osmolarity of the contrast medium, the leakage would cause the shift of intravascular volume into peritoneal space, resulting in hypovolemic shock. While management for pediatric cases have been suggested, there is a lack of reported cases in neonates. This study aimed to investigate the prevalence of contrast medium leakage during LGI series in neonates, as well as the manifestations and managements.
Methods: We retrospectively reviewed the images of infants ＜ 3 months who underwent LGI during 2008-2023 to identify cases with intra-abdominal contrast medium leakage. Their clinical manifestations, managements and outcomes were analyzed.
Results: Of 710 LGI series among young infants in 16 years, our hospital used contrast medium for LGI series and 3 index cases were identified. The incidence of with intra-abdominal contrast medium leakage in young infants was calculated 0.42%. All 3 cases involved neonates: two term infants were diagnosed of ileal atresia and meconium plug syndrome, and the other one was an extremely preterm infant (gestational age 22 weeks, birth weight 640 g) who underwent LGI series at postmenstrual age 28 weeks for meconium ileus. All leakages were recognized immediately, and those cases were sent to the intensive care unit. Two cases manifested hypotension, tachycardia, desaturation and oliguria. Urgent managements included volume resuscitation, inotropic support, electrolyte monitoring and broad-spectrum antibiotics. Emergent surgery was arranged to wash contrast medium away and to repair bowel perforation. One case developed acute kidney injury (AKI), necessitating a 4-day continuous veno-venous hemofiltration. All cases recovered from the events.
Conclusions: While rare, intra-abdominal contrast medium leakage is a severe complication during LGI series, particularly in neonates. Immediate recognition is crucial, and intensive care, including emergent surgery to remove contrast medium and repair bowel perforation, advanced life support to manage hypovolemic shock, and awareness of AKI, are key of effective management.

33 **Ranking of Prematurity as the Leading Cause of Death: A Comparison of Two Classification Schemes**
早產在主要死因中的排序：比較兩種不同的分類法

Yu-Shan Chang[1], Tsung-Hsueh Lu[2]
Department of Emergency Medicine, Chi Mei Medical Center, Tainan, Taiwan[1]; Department of Public Health, College of Medicine, National Cheng Kung University, Tainan, Taiwan[2]
張毓珊[1]、呂宗學[2]
奇美醫院急診醫學部[1];國立成功大學醫學院公共衛生學科暨研究所[2]

Background: Prematurity ranked as the third leading cause of death (COD), preceded by congenital malformation and respiratory disorder, according to official published mortality statistics of Taiwan. Researchers have indicated that the official published mortality statistics underestimated the number of prematurity-related deaths because of coding instruction. Alternative classification scheme combining the complications of prematurity with prematurity together has been proposed to solve the problem of underestimation. We aimed to compare the ranking of prematurity as the leading COD among infant deaths according to official versus Dullfus classification scheme in Taiwan for years 2010, 2014, 2018 and 2022.
Methods: The ICD-10 codes in official classification scheme for prematurity were P05-P08. The ICD-10 codes in Dullfus classification scheme for prematurity-related deaths include P07, P10-P15, P22, P25-P29, P52-P54, P77. Data on the number of deaths in each category for two classification schemes for each study year were obtained from COD open datasets released by the Ministry of Health and Welfare. The rank, percentage and mortality rate (deaths per 1000 live births) for prematurity-related deaths were presented.
Results: According to official classification scheme, the rank, percentage, and mortality rate for prematurity-related deaths was the fifth, 4.7%, and 19.8 in 2010; the fourth, 5.5%, and 19.9% in 2014; the third, 7.3%, and 30.4% in 2018; and the third, 10.8%, and 48.0 in 2022. However, according to Dullfus classification scheme, prematurity-related deaths ranked the first in each study year. The percentage and mortality rate were 27.8% and 117.7 in 2010, 27.9% and 100.3 in 2014, 33.2% and 138.4 in 2018, and 35.9% and 159.4 in 2022.
Conclusions: The Dollfus classification scheme could better reveal the mortality burden of prematurity-related deaths. Further studies are needed to delineate the possible factors associated with the increase of prematurity-related deaths.

34 **AAV9 Gene Therapy in Pank2 Knockout Mice: a preliminary study**
Pank2 敲除小鼠的 AAV9 基因治療：初步研究

Syuan-Yu Hong[1,2,3], Paul Wuh-Liang Hwu[4]
Department of Medicine, College of Medicine, China Medical University, Taichung, Taiwan[1];Institute of Biomedicine, China Medical University, Taichung, Taiwan[2];Department of Pediatric Neurology, China Medical University Children's Hospital, Taichung, Taiwan[3];China Medical University Hospital, Taichung, Taiwan Center for Precision Medicine, Taichung, Taiwan[4]
洪宣羽 [1,2,3]、胡務亮 [4]
中國醫藥大學醫學院醫學系 [1];中國醫藥大學生物醫學研究所 [2];中國醫藥大學兒童醫院小兒神經科 [3];中國醫藥大學附設醫院精準醫學中心 [4]

Background: Keywords：gene therapy, PANK2 deficiency, neurodegeneration PKAN, stemming from PANK2 gene mutations, affects the youth, causing Coenzyme A scarcity and neurodegeneration with symptoms like dystonia, dysarthria, and retinal degeneration. While gene therapy holds promise, the absence of a murine model in Taiwan impedes progress. Our plan at National Taiwan University involves generating Pank2-/- mice through a ketogenic diet to induce symptoms. Gene therapy, using AAV vectors expressing human PANK2, will be administered via intracisternal injection for efficacy comparisons with pantothenate supplementation.
Methods: In the first year, we established an animal model, assessed symptoms, explored gene therapy, and monitored progress. In the second year, Experiment 1 characterized disease post-ketogenic diet in 80 mice, Experiment 2 focused on pantethine administration in 30 mice, Experiment 3 used AAV9-GFP in 10 mice, and Experiment 4 explored AAV9-PANK2 gene therapy in 30 mice, all under ketogenic conditions. The third-year plan involves comparative analysis, clinical relevance, progress monitoring, and data analysis, with ongoing risk assessment and strategy consideration integral throughout the research phases.
Results: Preliminary results involved preparing Pank2-/- mice, ensuring gene KO accuracy despite structural differences in the Pank protein family. A targeted vector successfully deleted exon 2 of the Pank2 gene, confirmed through genotyping. Construction of PANK2-HA-pcDNA3 with the CMV promoter in the pAAV-MCS vector was achieved. Immune fluorescence and protein analysis used the Transfection HA-PANK2-pcDNA3/HA-PANK2-3UTR-pcDNA3 in cells.
Conclusions: Successfully creating the PANK2 cDNA expression cassette in pcDNA3.1, confirming its expression, and transferring it to the AAV vector, the AAV Core Lab at Academia Sinica produced the vector for intracerebral injection. Assessing if AAV injection improves symptoms in ketogenic diet-induced Pank2-/- mice and comparing gene therapy with pantothenate supplementation and early versus late treatments holds promise for PKAN patients and advances research capabilities.

35

The Feasibility and Effectiveness of Healthcare Facilities Organizing Parent-Child Shared Reading Workshops

醫療院所舉辦親子共讀工作坊的可行性和成效

Chung-Hao Wang[1], Pei-Wei Wang[1], Li-Jung Fang[1], Pao-Chuan Torng[2], Hsiu-Yun Ai[2], Wei-Shan Chang[2], Hsin-I Wang[2]
Department of Pediatrics, Heping Fuyou Branch, Taipei City Hospital, Taipei, Taiwan[1]; Department of Speech Language Pathology and Audiology, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan[2]
王中豪 [1]、王培瑋 [1]、方麗容 [1]、童寶娟 [2]、艾秀芸 [2]、張維珊 [2]、王心宜 [2]
臺北市立聯合醫院和平婦幼院區小兒科 [1];國立臺北護理健康大學語言治療與聽力學系 [2]

Background: Numerous healthcare facilities in Taiwan have actively advocated for parent-child shared reading. However, as of yet, there is no research evidence confirming the feasibility and effectiveness of utilizing "Parent-Child Shared Reading Workshops".
Methods: In 2023, this prospective study conducted 24 "Parent-Child Shared Reading Workshops" with the aim of enhancing shared reading skills through educational activities and practical exercises. The participants comprised preschool-aged children accompanied by their parents, and sessions were categorized into two age groups: 0-3 years old and 3-6 years old. We documented changes in behaviors (frequency, duration, home book usage) and awareness (book selection, environmental arrangements, resource utilization, strategies and methods) before and after the workshops.
Results: A total of 251 families participated in this study, including 168 children (86 males and 82 females) aged 0-3 years and 83 children (41 males and 42 females) aged 3-6 years. Statistically significant improvements were observed in frequency ($p = 0.04$), book selection ($p = 0.03$), environmental arrangements ($p = 0.02$), resource utilization ($p < 0.01$), and strategies and methods ($p < 0.01$).
Conclusions: The promotion of parent-child shared reading by healthcare facilities through the organization of "Parent-Child Shared Reading Workshops" is feasible. This approach resulted in families demonstrating increased frequency in shared reading activities and enhanced awareness in this area.

36

Pediatric COVID-19 Associated with Neurological Symptoms during Omicron Wave in 2022-2023: One-Center Experience in Taiwan

兒童新冠肺炎(Omicron)感染後引發之神經症狀回顧(2022-2023)

Shiang-Hao Yu, Shyi-Jou Chen, Jhao-Jhuang Ding, Hung-Hsiang Fang, Li-Fan Pai, Tzu-Hsiang Tseng
Department of Pediatrics, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan
游翔皓、陳錫洲、丁肇壯、方泓翔、白立凡、曾梓翔
國防醫學中心附設三軍總醫院內湖總院區小兒科部

Background: Since April 2022, another wave of the Omicron variant has spread through Taiwan rapidly, and a part of infected children presented neurological complications with variable severity from self-limited condition to mortality. We conducted this study and provided an overview of neurological complications in pediatric cases of COVID-19 in one center.
Methods: We enrolled patients confirmed through rapid antigen testing and RT-PCR testing. Patients' data were obtained from hospital records and medical files with approval by IRB (TSGH IRB No. C202205070). The data were statistically investigated by using SPSS software (version 20.0) and subjected to correlation on analysis based on neurological performance.
Results: Among a total of admitted 159 pediatric patients with COVID-19, the average age was 3.78 Y/O, and 57.23% (n = 91) were boys. We categorized into two groups, group 1

with neurological symptoms/signs (n= 34 (21.4%)) and group2 without symptoms/signs. The most common neurological symptoms were simple febrile seizures (n=11, 32.3%) followed by complex febrile seizures accounted for 26.5% (n=9). Group 1 displayed higher a serum procalcitonin level, increased neutrophil count, and prolonged prothrombin time experiencing fever compared to group 2 (p-value $<$ 0.05). Patients with neurologic symptoms (n=8, 23.5%) required intensive care unit (ICU) admission, a higher proportion than in group 2 (n=4, 3.2%, p $<$ 0.01). Cases in ICU exhibited a higher incidence of pneumonia than cases in ordinary wards.
Conclusions: Our findings indicate that simple and complex febrile seizures were the most common neurologic manifestations. Patients presenting with fever, higher serum PCT levels, or prolonged prothrombin time may serve as indicators of neurological complications. In summary, neurologic complications among COVID-19-infected children present some clues including higher levels of inflammatory markers and diverse clinical characteristics, thus monitoring these features should be highlighted for potential COVID-19-infected patients with neurologic complications.

37

Tubular Aggregate Myopathy: A Case Series Analysis
管狀聚集性肌肉病變之分析: 系列病例報告

Chen-Hua Wang[1], Wen-Chen Liang[2,4,5], Yuh-Jyh Jong[2,3,5]
Departments of Pediatrics, Kaohsiung Municipal Siaogang Hospital, Kaohsiung, Taiwan[1]; Departments of Pediatrics[2], and Laboratory Medicine[3], Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan; Department of Pediatrics, School of Medicine[4], and Graduate Institute of Clinical Medicine[5], College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan
王晨華[1]、梁文貞[2,4,5]、鐘育志[2,3,5]
高雄市立小港醫院小兒科[1]；高雄醫學大學附設醫院小兒科[2]、檢驗醫學科[3] ；高雄醫學大學醫學院 醫學系小兒學科[4]、臨床醫學研究所[5]

Background: Tubular aggregate myopathy (TAM) is a rare muscle disease characterized by tubular aggregates on muscle pathology. Either hereditary or acquired factors could be the cause of TAM. Multiple causative genes such as STIM1, ORAI1, GFPT1, DPAGT1, SCN4A, KCJN2 have been identified. This study aims to analyze the clinical and genetic features of TAM patients in a referral center for neuromuscular diseases.
Methods: In Kaohsiung Medical University Hospital, between July 2013 and December 2023, four patients were diagnosed by pathological findings of muscle biopsy. We reviewed the medical records and further analyzed.
Results: The mean age was 16 years and mean follow-up duration was 5.8 years. The age of onset varied from 1.5 years to 4 years. The peak creatine kinase was ranged from 904 to 3,971 IU/L. Three patients had STIM1 mutations and one patient had KCNJ2 mutation. STIM1 mutation: One patient had STIM1 c.910C$>$T and the other two patients had STIM1 c. 326A$>$G. All patients with STIM1 mutation had hypocalcemia and none of them had respiratory insufficiency or cardiac problem. Noteworthy, two patients had osteoporosis since childhood. The patient with STIM1 c.910C$>$T was confirmed as Stormorken syndrome, showing miosis, hyposplenia and thrombocytopenia as well. The other two patients demonstrated some of these features but not all. The muscle imaging of two patients showed severe fatty infiltration in satorius. KCNJ2 mutation: One patient with KCNJ2 c.652C $>$ T was diagnosed as Andersen-Tawil syndrome. He had periodic paralysis, ventricular tachycardia and restrictive lung disease since childhood. The muscle weakness of this patient is more severe than patients with STIM1 mutation at similar age. However, the muscle imaging revealed very mild fatty infiltration, which is disproportional to clinical severity.
Conclusions: Our study showed that early sartorius involvement was present in STIM1 patients and there was no selective pattern in KCNJ2 mutation. Our case series also highlighted that TAM patients often presented with multi-organ involvement and some comorbidity requires early intervention. Therefore, comprehensive systemic survey is important in TAM patients.

38

Real Experiences of Stiripentol for Dravet Syndrome in Eastern Taiwan
針對卓飛症候群 stiripentol 在東台灣之實際應用

Man-Hin Cheung[1], Yu-Hsun Chang[1,2], Chuan-Yu Wang[1,2]
Department of Pediatrics, Hualien Tzu Chi Medical Center, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan(1); Pediatric Department, School of Medicine, College of Medicine, Tzu-Chi University, Hualien, Taiwan(2)
張旻軒[1]、張宇勳[1,2]、王傳育[1,2]
佛教慈濟醫療財團法人花蓮慈濟醫學中心小兒部[1]；慈濟大學醫學院醫學系小兒學科[2]

Background: Dravet syndrome (DS) is an epileptic encephalopathy with drug-resistant seizures and comorbidities. Stiripentol has been approved in Taiwan since 2019 and the international consensus for DS management in 2022 introduced as second-line therapy. We share experiences with stiripentol in two cases.
Methods: Case 1, a 17-year-old male, had intractable epilepsy since 6 months old and diagnosed with DS (SCN1A codon 276). The EEG showed bursts of diffuse spike and wave on the left during the sleep. Prominent nocturnal seizure(10-15 times/week), generalized tonic-clonic seizure (GTC)(10-15 times/week), hemiconvulsion(3-4 times/week), and atypical absence(5-10 times/week) were noted under valproate, topiramate, levetiracetam and clonazepam. Case 2, a 13-year-old female, had intractable epilepsy since 4 months old and diagnosed with DS(SCN1A codon 61). The EEG showed diffuse 2.5-3Hz slow spike and wave on the left. Prominent nocturnal seizure(15-20 times/week), hemiconvulsion(5-15 times/week), atypical absence(1-2 times/week), GTC(15-20 times/week), and rare myoclonus (hands, legs: 1X/1-2M) were noted under valproate, levetiracetam and clonazepam.
Results: After 2 months of stiripentol, their severity and frequency of seizures decreased, especially hemiconvulsion at first and atypical absence finally. After 1 year, case 1 decreased in nocturnal seizures(1 time/2 months), GTC(1 time/2 months), and no hemiconvulsion, no screaming during GTC. After 1.5 years, case 2 decreased in nocturnal seizures(4-5 times/week), GTC(4-5 times/week), and no hemiconvulsion or myoclonus. She improved in social activity, with vocabulary increased to 20-50 words and could make 2-word sentences. They had no ER visits, only decreased appetite and mild somnolence noted.
Conclusions: In eastern Taiwan, stiripentol showed efficacy

as a second-line treatment for DS. Seizure reduction rates were substantial (75% and 90%). Improved life quality and social activity observed. EEG findings in DS may contain multifocal or diffuse epileptiform discharges. Based on current evidence, stiripentol, as an adjunct to clobazam and valproate, is beneficial and well-tolerated for DS patients. The significant reduction in GTC and hemiconvulsion highlights its potential impact.

39 **Exercise Habits and Health-Related Quality of Life in Adolescents with Epilepsy**
癲癇青少年的運動習慣和健康相關的生活品質

Chi Fan[1], Chang-Jhih Song[3], Huei-Shyong Wang[1,2], Cheng-Yen Kuo[1], Wen-Yu Liu[4], Kuang-Lin Lin[1,2]
Division of Pediatric Neurology, Department of Pediatric, Chang Gung Children's Hospital and Chang Gung Memorial Hospital[1]; College of Medicine, Chang Gung University[2]; Development of rehabilitation, Far Eastern Medical Foundation Far Eastern Memorial Hospital[3];Department of Physical Therapy and Graduate Institute of Rehabilitation Science, College of Medicine, Chang Gung University[4]
范琦 [1]、宋承智 [3]、王煇雄 [1,2]、郭政諺 [1]、劉文瑜 [4]、林光麟 [1,2]
林口長庚醫院兒童神經內科 [1];長庚大學醫學院 [2];亞東紀念醫院復健部 [3];長庚大學物理治療系 [4]

Background: Epilepsy is a chronic neurological disorder and influences significantly the person's quality of life (QoL). Exercise in people with epilepsy had the favorite effect in QoL and the survey in Taiwan is scant. This study explores the relationship between exercise habits and QoL in adolescents with epilepsy.
Methods: This cross-sectional study in one senior high school in Taiwan uses the questionnaire to investigate between-group comparisons that are made to assess exercise habits, differentiating between good and poor exercise habits, and their impact on the QoL, specifically in relation to active or inactive seizure frequency.
Results: Of the enrolled 25 adolescents with epilepsy, aged from 12 to 18 years old(mean: 15 years old) and 12(48%) were male. Preliminary findings indicate that 11(44%) of the adolescents with epilepsy engaged in good exercise habits. The quantity of exercise is significantly related to the preference for exercise but not correlated to the seizure frequency. Poor exercise(14, 56%) was identified as a seizure-related factor in 27% of cases. There was no observed correlation between active seizure frequency and exercise habits or QoL in the study. Only 4% of participants consider that exercise will induce seizures. The study had a relatively small sample size and other factors that may influence QoL.
Conclusions: The interplay between exercise habits and QoL in adolescents with epilepsy is essential for tailoring interventions for adolescents with epilepsy. Further research is needed to develop targeted strategies that empower adolescents with epilepsy.

40 **Psychometric Assessment of the Post-Acute Sequelae of SARS-CoV-2 Infection Condition in Pediatric Patients in Taiwan**
臺灣兒童後新冠患者的心理評估研究

Chi-Hung Wei[1], Pei-Chi Chen[2], Chung-Ying Lin[3], Lawrence Shih-Hsin Wu[2], Miao-Hsi Hsieh[2], Jiu-Yao Wang[2]
Department of Medical Research, China Medical University Children's Hospital[1]; Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[2]; Institute of Allied Health Sciences, College of Medicine, National Cheng Kung University[3]
魏吉宏 [1]、陳佩琪 [2]、林宗瑩 [3]、吳世欣 [2]、謝妙禧 [2]、王志堯 [2]
中國醫藥大學兒童醫院醫研部 [1]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [2]; 國立成功大學醫學院健康照護研究所 [3]

Background: The study was conducted to examine the effect of the Post-Acute Sequelae of SARS-CoV-2 Infection Condition (PASC) on health-related quality of life (QoL) in children. The PASC severity and QoL was also investigated.
Methods: The KINDL®, a generic instrument for assessing Health-Related Quality of Life in children and adolescents aged 3 years and older, was used to assess the participants' QoL via 24 items all rated on a five-point Likert scale (1=never; 5=all the time). The five-point scale was then converted into a 0-100 scale applied to six domains (physical, psychological, self-esteem, family, friend, and school QoL) and the entire QoL. The present study let children below 12 years to complete the KINDL together wither their parents; and let adolescents 12 years or older to complete the KINDL by themselves. Children's Somatic Symptoms Inventory (CSSI) and the PASC questionnaire were used to evaluated the PASC symptoms. The correlation between KINDL score and PASC symptom scores was examined. Furthermore, KINDL score in this study was compared with previous study in healthy children and adolescents.
Results: In this study, the sample comprised 46 children (mean age ± standard deviation = 8.74 ± 1.77 years; 41.3% girls) and 38 adolescents (mean age ± standard deviation = 14.50 ± 1.56 years; 44.7% girls). The KINDL score was negative correlation with CSSI (Correlation coefficient: -0.43640, $p < 0.0001$) and PASC symptom scores (Correlation coefficient: -0.36101, p=0.0010)。Compared to the previous child cohort (published in 2010), the current children exhibited significantly lower KINDL scores in physical QoL ($p < 0.001$), psychological QoL (p=0.018), self-esteem ($p < 0.001$), and friend QoL (p=0.004). In contrast, the present adolescents, in comparison to the previous adolescent cohort (published in 2008), demonstrated significantly higher KINDL scores in family QoL ($p < 0.001$) and school QoL (p=0.049).
Conclusions: The KINDL scores of pediatric patients with PASC showed a correlation with the number of somatic symptoms. Notably, distinct findings emerged when comparing these scores to data from previous studies on healthy children and adolescents.

41 **Diagnostic Gap in Pediatric Brain Tumors**
兒童腦瘤的診斷落差

Yao-Lun Yang[1], Ching-Shiang Chi[1], Hsiu-Fen Lee[1,2], Pei-Yu Wu[1], Shu-Ning Liu[1]
Division of Pediatric Neurology, Children's Medical Center, Taichung Veterans General Hospital[1];Department of Post-Baccalaureate Medicine, College of Medicine, National Chung Hsing University[2]
楊曜綸 [1]、遲景上 [1]、李秀芬 [1,2]、吳珮瑜 [1]、劉書寧 [1]

台中榮民總醫院兒童醫學中心兒童神經科 [1];國立中興大學學士後醫學系 [2]

Background: Brain tumors account for the highest proportion of solid tumors in children. Since most of the initial symptoms are non-specific and slowly progressive, early diagnosis is still a challenge for clinicians. The purpose of this study was to identify factors that may lead to prolonged pre-diagnostic symptomatic interval in pediatric brain tumors.
Methods: This was a retrospective cohort study conducted from Jan 1996 to December 2023 in a single medical center. Individuals diagnosed with brain tumor were included. Exclusion criteria comprised of age onset older than 18 years old and no clinical symptoms documented in medical records. Demographic data, initial presentation, tumor location, and pre-diagnostic symptomatic interval were analyzed.
Results: The cohort consisted of 21 males and 26 females. Median age at disease onset was 5 years old. Initial presentation included unsteady gait (23.5%), seizures (15.7%), vomiting (15.7%), headache (13.7%), focal neurologic signs (11.8%), dizziness (7.8%), ocular problem (5.9%), endocrine problem (3.9%), and others (21.6%). Median pre-diagnostic symptomatic interval was 4 months. Individuals with ocular problem (mean, 5 months) or endocrine problem (mean, 14.5 months) had a longer pre-diagnostic symptomatic interval. Tumor location was infratentorial (33.3%), supratentorial (31.4%), or midline (21.6%). Longer diagnostic delay was significantly found in male gender (p=0.035) and midline brain tumor (p=0.007).
Conclusions: The symptoms of pediatric brain tumor are diverse. Ocular problem and endocrine problem, which are the characteristics of midline brain tumor, are the most easily overlooked. Clinical physicians need to be vigilant and arrange neuroimaging as early as possible.

42

Neonatal EEG Seizures without Clinical Observations: a case-series study

新生兒無臨床觀察到的腦波抽搐: 病例系列研究

Ssu-Yu Chen[1,2], Yin-Chi Chao[1,2], Swee-Hee Wong[1,2], Inn-Chi Lee[1,2]
Division of Pediatric Neurology, Department of Pediatrics, Chung Shan Medical University Hospital, Taichung, Taiwan[1]; Institute of Medicine, School of Medicine, Chung Shan Medical University, Taichung, Taiwan[2]
陳思宇 [1,2]、趙英棋 [1,2]、黃瑞喜 [1,2]、李英齊 [1,2]
中山醫學大學附設醫院 兒童部 兒童神經科 [1]; 中山醫學大學醫學系 [2]

Background: Newborn infants are particularly at a higher risk of brain disorders. Diagnosing seizures in these infants based solely on clinical observations often proves inaccurate, especially since seizures detected by electroencephalography (EEG) without corresponding clinical signs are more common. Therefore, early detection and appropriate management of both clinical and subclinical seizures are crucial.
Methods: We studied the EEG monitor recordings of 30 non-consanguineous cases diagnosed clinically with neonatal seizures or encephalopathies. An EEG seizure was defined as sustained rhythmic activity on the EEG lasting longer than 10 seconds.
Results: The detection ratio of EEG seizures without clinical observations was 9 out of 31 cases (29.0%). All 9 infants exhibited subclinical seizures and had abnormal MRIs. The ictal EEG seizures manifested as focal paroxysmal delta or theta waves in one or both hemispheres. In patients experiencing EEG seizures, whether or not accompanied by clinical seizures, severe background brain dysfunction as detected in aEEG was present in 2 (22.2%) out of 9 cases, compared to 7 (31.8%) out of 22 cases with both clinical and EEG seizures. Moderate background abnormalities were identified in 3 (33.3%) of the 9 cases, in contrast to 10 (45.5%) out of 22 cases in the group with both clinical and EEG seizures. Meanwhile, mild background abnormalities were observed in 4 (44.4%) out of 9 cases, versus 5 (22.7%) out of 22 cases in the group with both EEG and clinical seizures. Although the prevalence of moderate-to-severe abnormalities in aEEG background was higher in the group experiencing both EEG and clinical seizures, this difference was not statistically significant between the two groups.
Conclusions: EEG seizures without clinical observations may imply the clinical need for further examination to investigate potential underlying abnormalities, which are nearly equivalent to the presence of clinical seizures and EEG abnormalities. The EEGs recorded during EEG seizures can show continuous delta-theta waves without accompanying clinical seizures.

43

Enhancing Skeletal Muscle Fiber Type Transition through Substrate Coating Alteration

透過改變基底塗層增強骨骼肌纖維類型轉變

Hsi Chang[1, 2], Min-lan Tsai[1, 2], Feng-Chin Lee[1], Chih-Chuan Li[2], Yhusi Karina Riskawati[2]
Department of Pediatrics, Taipei Medical University Hospital[1]； Department of Pediatrics, School of Medicine, College of Medicine, Taipei Medical University[2],
張璽 [1, 2]、蔡明蘭 [1, 2]、李逢卿 [1]、李芷娟 [2]、Yhusi Karina Riskawa[2]
臺北醫學大學附設醫院 小兒科 [1]；臺北醫學大學醫學院 醫學系小兒學科 [2]

Background: Skeletal muscle diseases are major clinical challenges. This highlights the need for innovative cell therapy and regenerative medicine approaches, such as tissue engineering, which combines cells, biomaterials, and growth factors to create functional tissues. Within these strategies, extracellular matrix (ECM) components are commonly used. However, an underexplored avenue in skeletal muscle tissue engineering is the manipulation of muscle fiber type (fast and slow type) transitions. Different muscles possess dominant fiber types with unique metabolic and functional characteristics, suggesting that understanding how to control this transition could open new therapeutic avenues. This study aims to fill this existing gap in the research by employing foundational tissue engineering strategies. Specifically, the focus is on the critical step of substrate coating to guide the differentiation of C2C12 myoblasts into distinct muscle fiber types.
Methods: In this study, C2C12-GFP (Green Fluorescence Protein) myoblasts were differentiated on various substrate coatings, including Laminin (L), Fibronectin (F), Collagen I (CI), Collagen IV (CIV), Gelatin (G), Matrigel™ (M), and Geltrex™ (Gx), into myotubes. The distinct expression of fast (f) and slow (s) Myosin Heavy Chain (MyHC) proteins were analyzed using Western blot, mRNA expression of fast

and slow MyHC genes with qPCR, and differences in myotube morphology of selected coatings through immunocytochemistry. Furthermore, the activation of signaling pathways and gene expression patterns driving muscle fiber type transitions on selected coatings were investigated via RNA sequencing.
Results: On day 7 of differentiation, substantial changes in myotube development were observed. Fast Myosin Heavy Chain (f-MyHC) levels increased significantly in coatings F, L, CIV, G, M, and Gx. Conversely, slow Myosin Heavy Chain (s-MyHC) expression increased in CI coatings.
Conclusions: The findings of this study indicate that specific substrate coatings impact the transition of myofiber types, providing valuable insights for developing targeted therapies for skeletal muscle disorders and volumetric muscle loss injuries.

44 **The Quartile Levels of Thyroid-Stimulating Hormone by Newborn Screening Stratified Risks of Neurodevelopmental Impairment in Extremely Preterm Infants – A Population Cohort Study**
以新生兒篩檢促甲狀腺激素之四分位濃度分層極度早產兒神經發展障礙風險-人口世代研究

Li-Wen Chen[1], Chi-Hsiang Chu[2], Yung-Chieh Lin[1], Chao-Ching Huang[1,3]
Department of Pediatrics, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan [1]; Department of Statistics, Tunghai University, Taichung, Taiwan [2]; Department of Pediatrics, College of Medicine, Taipei Medical University, Taipei, Taiwan [3]
陳俐文 [1]、朱基祥 [2]、林永傑 [1]、黃朝慶 [1,3]
國立成功大學醫學院附設醫院小兒部 [1];東海大學統計系 [2];臺北醫學大學醫學院小兒部 [3]

Background: To evaluate whether thyroid-stimulating hormone (TSH) by newborn screening (NBS) at birth and at discharge can be surrogate markers for neurodevelopmental impairment (NDI) in extremely preterm infants.
Methods: The population cohort enrolled infants born ＜29 weeks' gestation in 2008 – 2020 in southern Taiwan. Infants with a maternal history of thyroid disorders and infants who required thyroxine supplementation during hospitalization were excluded. TSH levels by NBS at birth and at term-equivalent age (TEA)/discharge were respectively categorized into the lowest quartile, the interquartile range, and the highest quartile, which were correlated to NDI outcomes.
Results: Among 392 patients with paired TSH data, 358 (91%) were prospectively followed until corrected age 24 months. At birth, infants with lowest-quartile TSH had higher NDI risks (OR 2.3, 95% CI 1.3 – 4.1, P = 0.004) compared to infants with interquartile-range TSH. Conversely, by TEA/discharge, infants with highest-quartile TSH had increased NDI (OR 1.9, 1.0 – 3.4, P = 0.03). By paired TSH categories, infants persistently in the lowest TSH quartile (48%, aOR 4.4, 1.4 – 14.5, P = 0.01) and those with a shift from interquartile range to the highest quartile (32%, aOR 2.7, 1.0 – 7.4, P = 0.046) had increased NDI risks compared with the reference with consistent interquartile-range TSH.
Conclusions: Extremely preterm infants persistently in the lowest-quartile TSH level at birth and at discharge had the highest NDI risk. TSH quartile levels by NBS may serve as a population surrogate biomarker for assessing NDI risks in infants born extremely preterm.

45 **Effects of Extracorporeal Shock Wave Therapy on Motor Functions in Children with Cerebral Palsy: A Systematic Review and Meta-Analysis**
體外震波治療對於腦性麻痺兒童的運動功能影響之系統性回顧與統合分析

Hui-Hui Peng[1], Ming-Jie Sung[1], Lien-Chieh Lin[2]
School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan[1]; Department of Physical Medicine and Rehabilitation, Shuang Ho Hospital, Taipei Medical University, Taipei, Taiwan[2]
彭彙惠 [1]、宋明杰 [1]、林廉傑 [2]
臺北醫學大學醫學系 [1]; 雙和醫院復健醫學部 [2]

Background: Recent trials reported that extracorporeal shock wave therapy (ESWT) may be effective in addressing spasticity, balance, gait patterns, and functional assessment in patients with cerebral palsy (CP). However, additional high-quality evidence is required to investigate the effects of ESWT in CP patients. While previous meta-analyses have been conducted, none have comprehensively explored spasticity, balance, gait, and functional assessment in CP children, nor included a larger number of randomized controlled trials (RCTs). Therefore, this study aims to assess the effects of ESWT on crucial clinical outcomes in children with CP.
Methods: We systematically searched PubMed, EMBASE, Cochrane Library, Web of Science, and ClinicalTrials.gov until November 2023. We included RCTs that specifically determined the effects of ESWT combined with other therapies compared to using other therapies alone in children with CP. Two authors independently extracted data from eligible studies. All the outcomes reported in this review were continuous variables. Pooled estimates for all outcomes were calculated using a random-effects model. Our primary outcomes were the Modified Ashworth Scale (MAS) and speed. Secondary outcomes included cadence, stride length, Pediatric Balance Scale (PBS), and Gross Motor Function Measure-88 (GMFM-88).
Results: This analysis included a total of 9 RCTs, comprising 315 children with CP. Comparison between the ESWT group to the control group revealed significant improvements in MAS (standard mean difference [SMD]: -0.90, 95% confidence interval [CI]: -1.32 to -0.48, p ＜0.0001), speed (MD: 0.12, 95% CI: 0.02 to 0.23, p= 0.02), cadence (MD: -3.01, 95% CI: -6.03 to 0, p= 0.05), stride length (MD: 0.22, 95% CI: 0.16 to 0.28, p ＜0.0001), PBS (MD: 2.3, 95% CI: 0.40 to 4.19, p= 0.02), and GMFM-88 (MD: 7.45, 95% CI: 1.57 to 13.34, p= 0.02).
Conclusions: Our findings suggest that combining ESWT with conventional physiotherapy, botulinum toxin type A injection, or ankle-foot orthosis had positive effects on spasticity, balance, and gait. To further validate the therapeutic benefits of ESWT in CP children, additional well-structured RCTs with larger participant cohorts are essential.

46 **What is the earliest functional predictor of mental function in child?**
什麼是兒童心智最早的功能性預測因子？

Huang-Tsung Kuo[1], Yen-Ting Chen[2], Yueh-Tang Weng[3], Hsiu-Man Lin[1], Ming-Luen Tsai[4], Ya-Lun Wu[3], Chen-Yu Yeh[3], Wei-Chun Wang[3], Shu-Tsen Liu[1]
Parenting and Child Development Study Group, Division of Child and Adolescent Development and Mental Health, Children's Hospital of China Medical University, Taichung [1];Mackay Memorial Hospital, Taipei[2];AI Center for Medical Diagnosis, China Medical University Hospital, Taichung[3];Neonatal Department, Children's Hospital of China Medical University, Taichung, Taiwan[4];
郭煌宗 [1]、陳妍廷 [2]、翁岳塘 [3]、林秀縵 [1]、蔡明倫 [4]、吳亞倫 [3]、葉宸妤 [3]、王韋竣 [3]、劉書岑 [1]
中國醫藥大學兒童醫院兒少發展暨心智行為科 親職及兒童發展研究小組 [1];馬偕醫院 [2];中國醫藥大學附設醫院 AI 中心 [3];中國醫藥大學兒童醫院 新生兒科 [4]

Background: Service for children with developmental delays is a large system in Taiwan since 1996, and it has helped over 6% of children before 7 years old with developmental delays. Most of them can have functional improvement and yet, only very limited patients can be cured. With the title question, we ask ourselves "can we find those child earlier?", and then we can't help them earlier.That is the reason why, we started this follow up study paraelles to VLBW infant care system in our hospital.
Methods: After clean all the detail of data parts, till now, we have collected 384 complete dataset with each of them 4 times of assessment results (including 6,12,24 and 60 months of age). All of them have received 3 times Bayley and 1 time of WPPSI assessments.The aims of this study contains two topics. First, it aims to realize the correlation of evaluations at four different ages. Second, we will estimate a robust regression model via regularization with the demography and biological data. For the purpose of comparison, PR value was used in those assessment results.
Results: The WPPSI's result is defined as final outcome is this study, and all the Bayley's result will be compared with it. The biological data shows insignificant consistent findings, and nor socioeconomic datas. The functional result, yet, shows quiet constant result, which are 1). the closer to the age to 5 y/o, the power of consistency is higher in comparison, 2). the correlation of language and motor to cognitive function are positive and are consistent among 6, 12, 24 m/o to 5 y/o, 3). motor shows significantly higher in correlation to cognitive function, in compare to language to cognitive function.
Conclusions: In the past years, among early intervention methods and principles , we used deficit compensation philosophy. Which is we give patient intervention content, which is deficit and no principles of priority or weight. So, it became a kind of global compensation. According to this finding, we could suggest early intervention for children with developmental delays could include motor function content in a relative early stage, even before 6 months of age.

47

Mismatch of Auditory and Visual ERP P300 Latency Serves as an Indicator for Verification of Learning Disabilities in Mandarin Learning Environment
視知覺與聽知覺於事件相關電位之 P300 潛時不匹配可成為華語文學習環境中學習障礙者診斷之指標

Hsin-I Wang[1], Wun-Tsong Chaou[2], Pao-Chuan Torng[3], Shih-Ming Weng[3,4]
Department of Rehabilitation, National Taiwan University Hospital Bei-Hu Branch[1]; Department of Pediatric Neurology, Puli Christian Hospital[2]; Department of Speech Language Pathology and Audiology, National Taipei University of Nursing and Health Sciences[3]; Department of Pediatric Neurology, Wan Fang Hospital, Taipei Medical University[4]
王心宜 [1]、趙文崇 [2]、童寶娟 [3]、翁仕明 [3,4]
臺大醫院北護分院復健科 [1]; 埔基醫療財團法人埔里基督教醫院小兒神經科 [2]; 國立臺北護理健康大學語言治療與聽力學系所 [3]; 臺北市立萬芳醫學中心小兒神經科 [4]

Background: Learning disability (LD), or specific learning disorder, serves as a type of neurodevelopmental disorder that affects information processing and impedes the ability to learn or use basic academic skills, such as reading, writing, and/or arithmetic. The incidence of LD is about three to five percent of overall pupils. In general, the recognition process for characters in the Mandarin learning environment is influenced by the identification of logographeme rather than that of phoneme. Here we reported a about eight year old dyslexic case whom ever been misdiagnosed with ADHD and/or autistic behavioral patterns, however, after we identified LD via the mismatch latency of auditory and visual P300 peaks in the event-related potential (ERP) analysis.
Methods: This eight year old boy was first evaluated with our modified CPT tests and with odd-ball signaled auditory(A) and visual(V) ERP studies. General language proficiency exams has also been performed via PPVT and TCLA tests, and nonverbal TONI showed his IQ was in the normal range.
Results: Later our ERP report showed his auditory P300 latency was in normal range (within 280-350ms),, though his visual P300 latency delayed to about 500ms, causing a huge A/V mismatch in between two perceptual processes. This typical A/V mismatch is the unique indicator, as published from our group previously, of LD students in the Mandarin learning environment. We further arranged individualized language treatment plans, such as logographeme recognition training, Chinese character and vocabulary/phrase rebuilding skills, advanced sentence making and scaffolding composition teaching, etc. For more than half a year rehabilitation, now he is capable of equivalent textbooks reading and writing compared to other co-learners in his original class.
Conclusions: Although it is only a case report verified for our application of a newly introduced LD detection method with ERP, we have already shed a light for preventing more misdiagnosis of LD pupils and waste of medical resources. Additionally, we either proved that individualized precise language treatment plans are quite effective in assisting LD students.

48

Anti-Nucleocapsid IgG as a Biomarker for Assessing Severity in Pediatric Post-Acute Sequelae of COVID-19 (PASC)
以新冠病毒抗核衣殼蛋白抗體作為評估兒童後新冠嚴重程度的生物指標

Zong-Zu Lee[1], Pei-Chi Chen[2], Lawrence Shi-HsinWu[2], Miao-Hsi Hsieh[2], Wen-Shuo Kao[2], Jiu-Yao Wang[2]
Department of Allergy and Immunology, China Medical University Children's Hospital[1]; Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[2]
李宗儒 [1]、陳佩琪 [2]、吳世欣 [2]、謝妙禧 [2]、郭文碩 [2]、王志堯 [2]

中國醫藥大學兒童醫院過敏免疫科 [1]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [2]

Background: The ongoing global impact of the COVID-19 pandemic has prompted an exploration into post-acute sequelae of SARS-CoV-2 infection (PASC) in children. Understanding the lingering effects of the virus in pediatric patients becomes paramount. This study sought to unravel the clinical and immunological dimensions of PASC in a dedicated cohort.
Methods: The Diagnosis and Support for COVID Children to Enhance Recovery (DISCOVER) cohort, initiated in July 2022, enrolled children seeking care for PASC conditions. A specialized PASC condition scale was developed, encompassing cardiovascular, respiratory, gastrointestinal, musculoskeletal, and neuropsychiatric symptoms. Biomedical tests, including SARS-CoV-2 antibody and nucleocapsid gene measurements, were performed to correlate immunological responses with clinical features.
condition scale was developed, encompassing cardiovascular, respiratory, gastrointestinal, musculoskeletal, and neuropsychiatric symptoms. Biomedical tests, including SARS-CoV-2 antibody and nucleocapsid gene measurements, were performed to correlate immunological responses with clinical features.
Results: Among 92 participants, the mean PASC condition scale score was 33.48±23.89, with higher scores for cardiovascular (8.37±8.55) and persistent respiratory symptoms (7.39±6.57). Positive correlations were observed between PASC scores and monocytes, neutrophils, and hsCRP. Negative correlations were found with eosinophils and lymphocytes. Virus persistence was minimal, yet anti-N IgG levels positively correlated with RDW and monocytes. ROC curve analysis identified anti-N IgG as a predictor for PASC severity, with an optimal cutoff value of 11. Children with anti-N IgG levels above this threshold exhibited higher mean PASC scores (45.82±19.78), emphasizing the predictive potential of anti-N IgG for PASC severity.
ty.
Conclusions: This study provides comprehensive insights into the clinical features and potential predictors of PASC in pediatric patients. The specialized PASC condition scale, along with the analysis of anti-SARS-CoV-2 antibodies, highlights the multifaceted nature of post-COVID symptoms in children. Importantly, anti-N IgG emerges as a promising biomarker for predicting and assessing the severity of PASC. These findings contribute to the broader understanding of PASC and hold implications for targeted interventions in pediatric populations experiencing prolonged symptoms after SARS-CoV-2 infection.

49

Factors predicting Better Treatment Response among Juvenile Idiopathic Arthritis Patients under Adalimumab Treatment

Adalimumab 使用於兒童特發性關節炎的良好治療反應預測因子

Bo-Han Huang[1], Chao-Yi Wu[1], Li-Chen Chen[2], Kuo-Wei Yeh[1], Syh-Jae Lin[1], Wen-I Lee[1], Liang-Shiou Ou[1], Tsung-Chieh Yao[1], Su-Guan Wen[1], Jing-Long Huang[2]
Department of Pediatrics, Division of Allergy, Asthma, and Rheumatology, Chang Gung Memorial Hospital, Taoyuan, Taiwan[1], Department of Pediatrics, New Taipei Municipal TuCheng Hospital, New Taipei City, Taiwan[2]
黃柏翰 [1]、吳昭儀 [1]、陳力振 [2]、葉國偉 [1]、林思偕 [1]、李文益 [1]、歐良修 [1]、姚宗杰 [1]、蘇冠文 [1]、黃璟隆 [2]
林口長庚紀念醫院兒童過敏氣喘風濕科 [1], 新北市立土城醫院兒童內科 [2]

Background: Adalimumab (ADA), a tumor necrosis factor alpha inhibitor, is approved for the treatment of juvenile idiopathic arthritis (JIA). Factors predicting treatment responses among JIA patients treated with ADA, especially the presence of anti-drug antibodies, were investigated.
Methods: Patients with JIA who underwent ADA treatment over 12 months, between 2000 and April 2022, at a tertiary medical center in Taiwan, underwent retrospective review. Demographic characteristics, laboratory parameters, therapeutic regimen and treatment outcome were carefully recorded. Anti-ADA antibodies were evaluated after six months of treatment, employing a commercially accessible ELISA kit. Disease status was assessed based on the Wallace criteria.
Results: Sixty-five patients (age 9.72 ± 3.88 years; male 61.5%) were included in the study. The duration of ADA used was 4.73 ± 4.68 years and the duration of disease follow up was 7.76 ± 5.52 years. Enthesitis related arthritis was the single largest category of JIA (64.6%), followed by seronegative polyarthritis (20%). Fifty-four patients (83.1%) achieved inactive disease status following ADA treatment. And among them, thirty-five patients (53.8%) experienced relapse. Temporomandibular joint (TMJ) involvement ($p = 0.038$) and presence of anti-ADA antibodies more than levels of 7.43 ng/mL ($p = 0.037$) are risk factors of persistent active disease status following treatment. Elongating of dose interval of ADA is a risk factor for relapse ($p = 0.053$).
Conclusions: Involvement of TMJ and the presence of anti-ADA antibodies serve as risk factors for non-response to treatment. Additionally, extending the dosing intervals of ADA stands out as a risk factor for relapse.

50

Comparison of Pediatric and Adult Anaphylaxis: A Retrospective Study in a Taiwan Medical Center

兒童與成人全身型過敏性反應之分析

Pei-Jung Chung[1], Li-Chieh Wang[1], Bor-Luen Chiang[1,2]
Department of Pediatrics, National Taiwan University Children's Hospital, Taipei, Taiwan[1]; Genome and Systems Biology Degree Program, College of Life Science, National Taiwan University, Taipei, Taiwan[2]
鍾佩蓉 [1]、王麗潔 [1]、江伯倫 [1,2]
國立台灣大學醫學院附設醫院小兒部 [1];國立台灣大學生命科學院基因體與系統生物學學位學程 [2]

Background: Anaphylaxis is a potentially fatal, acute severe systemic allergic reaction. The incidence of anaphylaxis is reported to be increasing globally in recent years. However, the epidemiology of anaphylaxis is widely varied in different regions and there is little recent data reported in Taiwan.
Methods: We retrospectively reviewed charts of patients diagnosed with anaphylaxis in the emergency department (ED) of the National Taiwan University Hospital from 2012 to 2022. The clinical presentations, triggers, management and outcomes of the patients with different ages were collected. We aimed to analyze the difference in clinical manifestations and outcomes in pediatric and adult patients.
Results: A total of 158 anaphylaxis patients (133 adults) were enrolled. The mean age was 44.6 years. There was an ascending trend in anaphylaxis incidence, rising from 9.2

per 100000 persons in 2012 to 16.7 per 100000 persons in 2022. Medications were the most common trigger in adults (53%), while foods were the most common trigger in children (76%). In both children (24%) and adults (14%), seafoods were the most common cause of food anaphylaxis. The most common culprit medications were non-steroidal anti-inflammatory drugs (12%) followed by contrast media (11%) and antibiotics (6%). For clinical presentations, skin involvement was the most common (86%), followed by cardiovascular (69%) and respiratory presentations (60%). Children presented with respiratory symptoms more frequently than adults (76% vs. 56%). Overall, corticosteroids (91%) and antihistamines (92%) were most frequently administered medications followed by intravenous fluid (72%). Bronchodilator usage was significantly higher in children than adults (60% vs. 29%, p=0.003). Epinephrine was prescribed in only 68% of the patients and more frequently prescribed in children (84% vs. 65%). The rates of hospitalization and admission to intensive care units were 6% and 4%. No fatalities were noted in this study.
Conclusions: The incidence of anaphylaxis patients visiting the ED increased from 9.2 per 100000 persons in 2012 to 16.7 per 100000 persons in 2022. Drugs were the most common triggers in adults and foods were the most common culprits in children.

51 **Differential Impact of Maternal First Trimester Urinary Extracellular Vesicles from Preterm and Fullterm on Trained Immunity**

早產與足月產孕婦尿液胞外體具有不同調節訓練免疫力的機轉研究

Kuender D. Yang[1,2,3], Chia-Hsueh Lin[1,2], Chih-Wen Tseng[1], Jian-Pei Huang[3]
Mackay Children's Hospital[1], Institute of Clinical Sciences, National Yang Ming Chao Tong University[2], Departments of Obstetrics and Medical Research, Mackay Memorial Hospital[3]
楊崑德 [1,2,3]、林佳學 [1,2]、曾芝文 [1]、黃建霈 [3]
馬偕兒童醫院 [1], 陽明交通大學臨醫所 [2], 馬偕紀念醫院婦產科、醫研部 [3]

Background: The programming of the body's immune responses during pregnancy significantly influences the outcome, determining whether it progresses to term birth (TB) or results in preterm birth (PB). This study delves into the concept of maternal 'trained immunity' residing in leukocytes, affecting intergenerational pregnancy experiences and subsequent birth outcomes. We investigated the potential of urinary extracellular vesicles (UEVs) during early pregnancy becomes pivotal due to their shared developmental connections.
Methods: In this research, UEVs isolated from first-trimester urine samples of both preterm and full-term pregnancies were examined to understand their impact on trained immunity programming. Using a birth cohort study design, UEVs from pregnant women's first-trimester urine samples, both with and without preterm birth occurrence, were studied. These UEVs were then analyzed to assess their effects on trained immunity programming, focusing on M1/M2 differentiation, microRNAs, glycolysis, and epigenetic chromatin modifications.
Results: The study revealed a notable increase in UEVs carrying specific exosome markers during the first trimester compared to non-pregnant samples. UEVs from PB demonstrated significantly higher levels of IL-6 ($p<0.041$), IL-17A ($p<0.007$), TNF ($p<0.004$), and IFN ($P<0.030$) than those from TB, indicative of altered M1 and Th17 differentiation. Further investigation demonstrated that UEVs from full-term births significantly decreased the glucose consumption ($p<0.01$) and suppressed M1 (iNOS mRNA) and Th17 (RORrT) expression associated with better Treg differentiation compared to those from preterm births. Conversely, UEVs from preterm births induced higher expression of chromatin modification at H3K4me3, accompanied by increased production of cytokines like IL-8 and TNFα.
Conclusions: This pioneering study highlights the potential for early detection of altered immune programming within UEVs derived from the first trimester. The better regulation of the trained immunity by UEVs derived from TB than that from PB may offer a promising avenue for predicting and possibly preventing subsequent preterm births.

52 **HPV9 Vaccination Decreased New Onset Juvenile Idiopathic Arthritis: A study before and during COVID-19 Pandemic**

九價人類乳突病毒疫苗降低幼年型關節炎的發生--COVID-19 大流行前後的研究

Ming-Chin Tsai[1], Lin-Shien Fu[1,2]
Department of Pediatrics, Taichung Veterans General Hospital[1]; Department of Post-Baccalaureate Medicine, College of Medicine, National Chung Hsing University[2]
蔡明瑾 [1]、傅令嫻 [1,2]
臺中榮民總醫院兒童醫學中心 [1]; 國立中興大學學士後醫學系 [2]

Background: Whether human papillomavirus vaccine (HPV) causes juvenile rheumatoid arthritis (JRA) has been a concern of many years. Though general population studies revealed no increase in JRA incidence in those receiving HPV 2 or HPV 4 valence vaccines, there is still some debate. Now, HPV 9 valence is available for many years. This study used US Collaborative Network (UCN) containing complete electronic record of more than 100 million patients in 57 health care organizations in USA to study if HPV 9 valence vaccine carries higher risk for JRA
Methods: Two major studies were obtained from UCN. The first study contains two cohorts from from July.2015 to Jun.2017 (before COVID-19 pandemic). One cohort contains 9-16 years old girls receiving HPV 9 valence vaccine, without previous JRA (N=75020, ICD10=M08). The other is the control cohort (N=1706906). The second study contains two cohorts from Jan.2020 to Dec.2021 (During COVID-19 pandemic). One cohort contains 9-16 years old girls receiving HPV 9 valence vaccine, without previous JRA (N=81984, ICD10=M08). The other is the control cohort (N=1644829). After matching in age and race, the number of new onset JRA(ICD10=M08) patients in 1.5 years after vaccination (or health center visit) under different conditions were calculated as outcome percentage, odds ratio with 95% confidence interval
Results: The occurrence of new onset JRA between July.2015 to Jun.2017 and Jan.2020 to Dec.2021 was lower in HPV vaccination group (0.039% vs 0.20% $p < 0.0001$; 0.023% vs 0.082% $p < 0.0001$). The odds ratio of HPV group was 0.193 (95% CI=0.190~0.287) and 0.271

(95% CI=0.163~0.450),respectively. The rates of new onset JRA after the date of vaccination before and during COVID-19 pandemic were similar at 3m, 6m, 12m and 18m after the index date.
Conclusions: HPV 9 vaccine carries lower risks of new onset JRA in 1.5 years after vaccination before and during COVID-19 pandemic according to research data from the US Collaborative Network. This trend was noted in short term and relatively long term follow up.

53

Serositis as a Poor Prognostic Factor for Long-term Outcome in Pediatric Systemic Lupus Erythematosus
漿膜炎作為兒童全身性紅斑性狼瘡不良長期預後之預測因子之探討

Wei-Chen Kao[1,4], Ya-Chiao Hu[1], Jyh-Hong Lee[1], Li-Chieh Wang[1], Yu-Tsan Lin[1], Yao-Hsu Yang[1], Bor- Luen Chiang[1,2,3], Hsin-Hui Yu[1]
Department of Pediatrics, National Taiwan University Hospital, Taipei, Taiwan [1]; Department of Medical Research, National Taiwan University Hospital, Taipei, Taiwan [2]; College of Life Science, National Taiwan University, Taipei, Taiwan [3]; Department of Pediatrics, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei, Taiwan [4]
高瑋辰 [1,4]、胡雅喬 [1]、李志鴻 [1]、王麗潔 [1]、林于粲 [1]、楊曜旭 [1]、江伯倫 [1,2,3]、俞欣慧 [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臨床醫學研究所 [2]、國立台灣大學生命科學院 [3]、佛教慈濟醫療財團法人台北慈濟醫院兒科部 [4]

Background: Systemic lupus erythematosus (SLE) is an autoimmune disease manifested with chronic inflammation of multiple organs along with high mortality if untreated, especially in the pediatric group. Mortality related to high disease activity, severe infection, and CNS involvement has been reported in the previous studies. However, which patient would progress to such scenarios remained uncertain. This study aimed to evaluate the clinical characteristics of the subgroup with serositis to observe whether manifestation of serositis predicts poor outcomes in pediatric SLE patients.
Methods: All records of admission from pediatric-onset SLE patients diagnosed at the National Taiwan University Hospital from January 2002 to December 2022 were retrospectively reviewed. The recruited patients were divided into subgroups with serositis (pleurisy and/or pericarditis with at least a small ($>$0.6cm) amount of effusion) and without. Mortality was viewed as the primary outcome. Associated factors, including disease activity, comorbidities, types and severity of infection with culture results, and the regimen of the treatment, were also analyzed.
Results: A total of 189 patients were enrolled, and 39 (20.6%) of them were diagnosed with serositis. The mean age at diagnosis of SLE was 12.20±3.30 years old, and 34 (87.1%) patients were female. The mean SLEDAI-2K was 17.87±4.74, and the modified SLEDAI-2K (excluding scores from serositis) was 14.56±4.92 at diagnosis of serositis. An increased mortality rate (38.4%) in the serositis group was observed compared to the control group (3.3%, $p < 0.001$). Furthermore, we divided the subgroup with serositis into early-onset (interval$\leqq$1 year from diagnosis of SLE, 20 patients, 51.2%) and late-onset (interval$>$1 year, 19 patients, 48.8%) and found a higher mortality rate (57.8%) in the late-onset group compared to the early-onset group (20%, $P = 0.03$).
Conclusions: The presence of serositis in pediatric SLE patients might predict worse outcomes, especially in the late-onset group. This may provide clinical insight for caregivers to utilize appropriate treatment to improve the overall survival of this selective subgroup of patients.

54

Environmental exposures and Greenness related to nasal and gut microbiota among children with asthma
環境曝露與綠化對氣喘病童鼻腔及腸道菌相的影響

Jiu-Yao Wang[1], Aji Kusumaning Asri[2], Tsunglin Liu[3], Hui-Ju Tsai[4], Chih-Da Wu[2]
Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[1]; Institute of Geomatics, Cheng Kung University[2]; Institute of Population Health Sciences, National Health Research Institute[3]; Department of Biotechnology and Bio-industrial Sciences, National Cheng Kung University[4]
王志堯 [1]、Aji Kusumaning Asri[2]、劉宗霖 [3]、蔡慧如 [4]、吳治達 [2]
中國醫藥大學兒童醫院過敏免疫科，過敏免疫及微菌叢研究中心 [1]; 國立成功大學測量及空間學系 [2]; 國家衛生研究院群體健康研究所 [3]; 國立成功大學生物科技及產業科學系 [4]

Background: The gut microbiota plays an essential role in human health and is susceptible to alterations induced by the surrounding environment. While previous studies have probed into the impact of environmental exposures on gut microbiota, they have often neglected sensitive subjects. This study aimed to investigate the linkage between environmental exposures, i.e., air pollution and greenspace, with gut microbiota among asthmatic children.
Methods: Collecting data during the recovery period, gut microbiota indices were assessed from 41 eligible children. Air pollution was estimated using an ensemble learning model that integrated hybrid kriging-land use regression and machine-learning algorithms. Greenspaces were represented by satellite-derived vegetation index and green land-cover datasets. Both air pollution and greenspace were assessed in short and long-term measurements within certain buffers from each children's location. Statistical association between gut microbiota and environmental exposures was then examined using a generalized additive model.
Results: The results revealed significant negative associations during short exposure to NO2, indicating that one-unit increment in NO2 significantly decreased observed bacteria and bacterial richness (-1.130; 95%CI -2.287, 0.027 and -2.420; 95%CI -4.987, 0.146). Conversely, a significant positive association was identified between greenspace-NDVI and gut microbiota indices (observed bacteria: 8.311; 95%CI 0.530, 16.090 and bacterial richness: 15.414; 95%CI 0.265, 30.560). In terms of long exposure, PM2.5 and O3 showed significant negative associations with observed species, while greenspace-NDVI exhibited positive associations with observed bacteria and bacterial richness. Furthermore, we also found a notable linkage between air pollution and greenspace with bacterial abundances such as Streptococcus.
Conclusions: By discovering a pivotal association between environmental exposures and gut microbiota, this study require for comprehensive investigations on how environmental exposures may affect the immunity of

sensitive subjects through alterations in their gut microbiota composition.

55

Genetic Variations in Vitamin D Binding Protein (VDBP) Impact Vitamin D level and Asthma Susceptibility Across Diverse Ethnic Populations

維生素 D 結合蛋白基因型對維生素 D 濃度及氣喘發生率的影響: 跨種族研究

Chien-Hui Lin[1], Miao-Hsi Hsieh[2], Lawrence Shih-Hsin Wu[2], Natalia Paramonova[3], Brigita Sitkauskiene[4], Sonomjamts Munkhbayarlakh[5], Jiu-Yao Wang[2]
China Medical University Children's Hospital[1]; Research Center of Allergy, Immunology, and Microbiome (A.I.M.), China Medical University Hospital[2]; Laboratory of Genomics and Bioinformatics, Faculty of Medicine, University of Latvia, Riga, Latvia[3]; Department of Immunology and Allergology, Lithuanian University of Health Sciences, Kaunas, Lithuania[4]; Department of Pulmonology and Allergology, School of Medicine, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia[5]
林芊慧 [1]、謝妙禧 [2]、吳世欣 [2]、Natalia Paramonova[3]、Brigita Sitkauskiene[4]、Sonomjamts Munkhbaya[5]、王志堯 [2]
中國醫藥大學兒童醫院 [1]; 中國醫藥大過敏免疫及微菌叢研究中心叢 (AIM)研究中心 [2]; 拉脫維亞大學醫學院基因體及生物資訊研究室 [3]; 立陶宛健康科學大學醫學院過敏及胸腔學科 [4]; 蒙古人民共和國國立大學醫學院 [5]

Background: Pulmonary disorders, including asthma, have been linked to the vitamin D axis, comprising vitamin D, vitamin D binding protein (VDBP), and the vitamin D receptor. Genetic variants of VDBP, particularly rs7041 and rs4588, have been associated with circulating vitamin D levels. However, existing data on the relationship between these genetic variants and asthma are inconsistent, and little is known about potential ethnic variations in this association.
Methods: In this cross-ethnic investigation, we assessed vitamin D levels and VDBP polymorphisms (rs7041 and rs4588) in diverse ethnic populations, including Taiwanese, Mongolian, Lithuanian, and Latvian individuals. Our study subjects comprised asthmatic subjects (n=363) and non-asthma controls (n=481). Genotyping was conducted to rs7041 and rs4588, and serum 25-hydroxyvitamin D [25(OH)D] concentrations, IgE levels were measured. Statistical analyses, including chi-square tests and logistic regression, were employed to evaluate associations between VDBP polymorphisms, vitamin D levels, and asthma.
Results: Significant differences in vitamin D levels were observed among ethnic groups, with higher concentrations in non-asthmatic individuals from Taiwan (Taiwan: 69.05; Lithuania: 24.24; Latvia: 24.68 (ng/ml)). VDBP polymorphisms were associated with asthma in Latvian (rs7041, p= 0.0159; rs4588, p= 5.90×10^{-3}), but not in Taiwanese and Mongolian populations (rs7041, p= 0.468; rs4588, p= 0.868).
Conclusion: Our cross-ethnic investigation highlights the complex interplay between VDBP genetic variants, vitamin D levels, and asthma susceptibility. The association between VDBP polymorphisms and asthma appears to vary among populations, emphasizing the need for a nuanced understanding of these relationships. The study contributes valuable insights into the role of VDBP genetics in asthma across diverse populations and underscores the importance of considering both genetic and environmental factors in future research.

56

Association of COVID-19 Infection with Incident of Allergic Diseases: A Real-World Investigation Using U.S. Electronic Health Records

新冠肺炎後是否會增加過敏性疾病發生的機率?以美國電子病歷資料庫探勘結果

Su-Boon Yong[1], James Cheng-Chung Wei[2], Jiu-Yao Wang[3]
Department of Allergy and Immunology, China Medical University Children's Hospital[1];Institute of Medicine, Chung Shan Medical University[2];Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[3]
楊樹文 [1]、魏正宗 [2]、王志堯 [3]
中國醫藥大學兒童醫院過敏免疫科 [1]; 中山醫學大學醫學研究所 [2]; 中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [3]

Background: Allergic diseases are prevalent illnesses globally and featured with chronic inflammation and immune response. COVID-19 infection is known for the cytokine storm, which is an overwhelming activated innate immunity and subsequently down-regulated type 1 immune response. Link between two entities remain unclear. The aim of this study is to clarify the relationship between COVID-19 infection and the risk of allergic diseases, we conducted this retrospective cohort study to evaluate the issue.
Methods: The TriNetX platform was utilized to extract medical data of patients from the US Collaborative network and for statistical analysis. Two cohort of patients under 18 years old without underlying allergic diseases, including one cohort with positive results of COVID-19 PCR test and another with negative results as a control cohort, were established. Kaplan-Meier survival analysis was performed to compared the cumulative probability of allergic diseases after infected by COVID-19. Cohorts in this study had been matched based on propensity score of demographic features and comorbidities. Furthermore, subgroup analyses and sensitivity analyses were also performed.
Results: Significant higher risks of developing allergic diseases, atopic dermatitis, allergic rhinitis and asthma were found among the COVID-19 cohort compared to the normal control. Respectively, HR was 1.211 and the 95% CI was 1.189-1.235 for allergic diseases, HR was 1.252 and 95% CI was 1.216-1.290 for asthma, HR was 1.223% and 95% CI was 1.188-1.259 for allergic rhinitis, and HR was 1.179 and 95% CI was 1.140-1.219 for atopic dermatitis.
Conclusions: COVID-19 is related with an increased risk of allergic diseases including atopic dermatitis, allergic rhinitis, and asthma.

57

Clinical and Laboratory Features of 26 Patients with Type 1 Diabetes and Pediatric Graves' Disease from 3 Medical Centers in Northern Taiwan

台灣北部 3 個醫療中心 26 例第 1 型糖尿病合併小兒 Graves 病患者的臨床和實驗室特徵

Guann-Lin Chiou[1,2], Fu-Sung Lo[1], Chiao-Fan Chiu[1], Yen-Chun Huang[1], Ching-Chih Huang[1]
Division of Pediatric Endocrinology & Genetics, Chang Gung Memorial Hospital Linkou[1]; Department of Pediatrics, Taipei Medical University Hospital[2]
邱冠霖 [1,2]、羅福松 [1]、邱巧凡 [1]、黃彥鈞 [1]、黃敬之 [1]
林口長庚醫院兒童內分泌暨遺傳科 [1]; 台北醫學大學附設

醫院小兒科 [2]

Background: Graves disease (GD) was reported to be more prevalent than Hashimoto thyroiditis in Taiwanese children and adolescent with type 1 diabetes (T1D) recently. Our objective was to examine the clinical and laboratory features of our patients with both T1D and GD.
Methods: In this study, we conducted a retrospective review of medical records from Chang Gung Children's Hospital, covering the period from 1996 to 2023. A total of 330 subjects diagnosed with GD were included in the initial review. Among them, 26 patients (8%) with both T1D and GD were selected for further analysis. We assessed the age of onset, laboratory data, treatment duration and utilization of anti-thyroid drugs (ATD) in these patients.
Results: The study included 26 patients, consisting of 19 females (73.1%) and 7 males (26.9%). Regarding the relationship between the two diseases, 16 patients (61.5%) were initially diagnosed with T1D, 4 (15.5%) diagnosed with GD before T1D, and 6 (23.1%) diagnosed with both conditions simultaneously. Among these patients, only 1 individual successfully discontinued ATD treatment, but later developed Hashimoto's disease after 15 years. The remaining patients either experienced relapses or continued long-term use of ATD. Positive results for Thyrotropin binding inhibiting immunoglobulins (TBII) were observed in 20 patients (76.9%), while 25 patients (96.2%) tested positive for Antithyroid peroxidase antibodies (Anti-TPO). Additionally, 13 patients (50%) exhibited positive results for thyroglobulin autoantibodies (Anti-THYG).
Conclusions: Regular thyroid screening is essential for T1D to ensure early detection and management. Conversely, T1D can also occur in patients with hyperthyroidism, especially when there are symptoms of diabetes. T1D is highly correlated with hyperthyroidism and clinical professionals should be cautious in clinical practice.

58

Differential Gut Microbiota Patterns in Pediatric PASC Patients and Their Correlation with Varied Long COVID Symptoms.
兒童多樣化後新冠症狀與腸道微菌叢的相關性研究

Pei-Chi Chen[1], Tsung-Lin Liu[2], Lawrence Shih-Hsin Wu[1], Miao-Hsi Hsieh[1], Yu-Lung Hsu[3], Wen-Jue Soong[4], Kai-Sheng Hsieh[5], I-Ching Chou[6], An-Chyi Chen[7], Jiu-Yao Wang[1]
Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[1]; Department of biotechnology and bio-industrial sciences, National Cheng Kung University [2]; Dept. of Infection[3], Dept. of Pulmonology[4], Dept. of Cardiology[5], Dept. of Neurology[6], Dept. of Gastroenterology[7], China Medical University Children's Hospital.
陳佩琪 [1]、劉宗霖 [2]、吳世欣 [1]、謝妙禧 [1]、許玉龍 [3]、宋文舉 [4]、謝凱生 [5]、周宜卿 [6]、陳安琪 [7]、王志堯 [1]
中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心 [1]; 國立成功大學生物科技及產業科學系 [2]; 中國醫藥大學兒童醫院 感染科 [3]，胸腔科 [4]，心臟科 [5]，神經科 [6]，胃腸科 [7]

Background: Recent investigations have illuminated the occurrence of microbiome dysbiosis in the gastrointestinal system of critically ill COVID-19 patients. The commensal microbiota in intestinal tracts plays a pivotal role in defending against viral infections, with its metabolites and axis links contributing to anti-inflammatory actions and maintaining homeostasis in various organs. This study seeks to explore the hypothesis that Post-Acute Sequelae of SARS-CoV-2 infection (PASC) in children may be linked to perturbations in the gut microbiota following the viral infection.
Methods: Approximately 80 pediatric patients experiencing PASC were enrolled through the Diagnosis and Support for COVID Children to Enhance Recovery (DISCOVER) program at China Medical University Children's Hospital in Taiwan. Participants completed the PASC condition questionnaire, and rectal swabs were collected for analysis. The gut microbiome was assessed by sequencing the V3-V4 region of the 16S rRNA gene obtained from rectal swabs, utilizing the Illumina MiSeq™ sequencing platform.
Results: Comparison of the gut microbiome between PASC children with (PC group) and without (NC group) gastrointestinal symptoms revealed no significant differences in α-diversity measured by Shannon indices. However, β-diversity analysis demonstrated a substantial increase in both unweighted and weighted UniFrac distances in the PC group compared to the NC group ($P < 0.0001$). LEfSe analysis identified significantly higher relative abundances of Propionibacteriaceae in the PC group, while Ndongobacter massiliensis and Schaalia radingae were significantly higher in the NC group.
Conclusions: Distinct microbiome compositions were observed among PASC patients exhibiting different long COVID symptoms, suggesting a potential association between gut microbiota dysbiosis and the manifestation of gastrointestinal symptoms in pediatric PASC. Further research is crucial to unravel causative relationships and underlying mechanisms, offering avenues for targeted interventions and a more profound understanding of the gut microbiome's role in PASC.

59

Correlations between COVID-19 outcomes and individuals with asthma using inhaled corticosteroids.
使用吸入型類固醇氣喘病患與 COVID-19 醫療使用之相關研究

Zhung-Ru Li, Su Boon Yong, Chang-Ching Wei, Jiu-Yao Wang
Department of Allergy and Immunology, China Medical University Children's Hospital, Taichung, Taiwan
李宗儒、楊樹文、魏長菁、王志堯
中醫大兒童醫院小兒過敏免疫風濕科

Background: The impact of inhaled corticosteroids (ICS) on the relationship between asthma, COVID-19, and associated outcomes remains unclear. This study aims to delve into the risk of COVID-19 and its ramifications in asthma patients, drawing a distinction between those utilizing and abstaining from inhaled corticosteroids.
Methods: Employing the TriNetX Network, a global federation comprising 55 healthcare organizations in the United States, we conducted a retrospective cohort study spanning from January 2020 to December 2022. The study included patients diagnosed with asthma, both with and without ICS, and utilized propensity score matching for cohort alignment. We scrutinized the risks associated with COVID-19 incidence and medical utilization.
Results: Among the 64,587 asthmatic patients, those using ICS exhibited a heightened COVID-19 incidence (Hazard Ratio, HR: 1.383, 95% Confidence Interval, CI: 1.330-1.437). Conversely, ICS users demonstrated a significantly

reduced risk of hospitalization (HR: 0.664, 95% CI: 0.647-0.681), emergency department visits (HR: 0.774, 95% CI: 0.755-0.793), and mortality (HR: 0.834, 95% CI: 0.740-0.939). During various phases of the COVID-19 pandemic, specifically during the prevalence of Alpha (2020/12/20 to 2021/4/10), Delta (2021/7/18 to 2021/11/13), and Omicron variants (2021/11/21 to 2022/3/12). Regardless of the dominant virus variant, the ICS cohort showed higher rates of COVID-19 compared to the control group. Notably, significant differences in statistics were only observed during the Delta variant wave (HR: 1.167, 95% CI: 1.042–1.307). In all phases of viral prevalence, the ICS cohort had a notably lower risk of hospitalization and visits to the emergency department.

Conclusions: Asthmatic patients employing ICS face a significantly elevated risk of COVID-19 compared to non-users. These findings may offer valuable insights for primary care physicians in assessing the COVID-19 risk among their asthmatic patients.

60

Extracellular Vesicles from Umbilical Cord Mesenchymal Stromal Cells (MSCs) with Hypoxia Culture Rescued Senescence of MSCs with Normoxia Culture thru Glycolysis and AKT activation

在低氧培養條件下培養的臍帶間質幹細胞(MSCs)所分泌的外泌體通過調控糖代謝和 AKT 活化途徑拯救一般氧培養的 MSCs 衰老現象

Chia-Hsueh Lin[1], Chie-Pein Chen[2], Kuender D. Yang[1,2]
Mackay Children's Hospital[1]; Departments of Obstetrics and Medical Research, Mackay Memorial Hospital[2]
林佳學 [1]、陳治平 [2]、楊崑德 [1,2]
馬偕兒童醫院 [1];馬偕紀念醫院婦產科、醫研部 [2]

Background: Extracellular vehicles (EVs) play a pivotal role in intercellular communication. Variations in culture conditions may influence the functions of ucMSCs and the composition of EVs derived from MSCs. In pursuit of a more effective therapeutic approach to rescue senescent MSCs, this study delves into the impact of diverse culture conditions on the contents and functions of EVs derived from ucMSCs.

Methods: ucMSCs, harvested from the umbilical cord Wharton's jelly. Flow cytometry assessed the surface markers of ucMSCs and EVs. Contents in hypoxia EVs (hEVs) and normoxia EVs (nEVs) were quantified via multiplex beads assay.SA-β-gal staining gauged cell senescence. The size and concentration of EVs were scrutinized using a Nanoparticle Tracking Analyzer. Western blots and qPCR were deployed to analyze the cellular senescence pathway.

Results: ucMSCs cultured in hypoxia condition grew better than those in normoxia condition on the cell growth with a shorter doubling time at 35.1hrs vs. 43.5hrs ($p < 0.05$), and longer passages at 23 vs. 9 passages ($p < 0.05$). In β-gal staining, we found that β-gal staining of senescence was significantly higher in ucMSCs cultured at normoxia than at hypoxia condition ($p < 0.01$). Normoxia culture significantly reduced the expression of stemness factors Sox2, and Nanog, but increased p16 expression. In addition hypoxia culture increased LDHA expression, but decreased PDH expression, suggesting glycolysis over oxphos. The hEVs exhibited a higher quantity but smaller size compared to the nEVs, along with significantly increased levels of growth factors such as HGF ($p < 0.05$),and VEGF ($p < 0.05$). Notably, the addition of hEVs, but not nEVs, resulted in a significant decrease in the expression of SA-β-gal, along with AKT phosphorylation in normoxia-cultured ucMSCs.

Conclusions: ucMSCs cultured in hypoxic condition displayed enhanced proliferation, prolonged propagation, and reduced cell senescence. hEVs derived from MSCs under hypoxic cultures, rich in growth factors, effectively mitigated cell senescence in normoxia-cultured MSCs through glycolysis and AKT activation, suggesting the potential application of hEVs for the rejuvenation of connective tissues.

61

The Effects of Different Fine Particulates in Animal Model

不同細懸浮微粒對動物模型的影響

Yu-Syuan Chen[1], Jiunn-Liang Ko[2], Yu-Tzu Lee[2], Pei-Fen Liao[1], Min-Sho Ku[1,2], Hai-Lun Sun[1,2], Ko-Huang Lue[1,2]
Allergy, Immunology, and Rheumatology, Department of Pediatrics, Chung Shan Medical University Hospital[1]; Institute of Medicine, School of Medicine, College of Medicine, Chung Shan Medical University[2]
陳育萱 [1]、柯俊良 [2]、李育慈 [2]、廖培汾 [1]、顧明修 [1,2]、孫海倫 [1,2]、呂克桓 [1,2]
中山醫學大學附設醫院 兒童部 過敏免疫風濕科 [1]; 中山醫學大學 醫學院 醫學系 醫研所 [2]

Background: Air pollutions, especially fine particles, poses a significant threat to respiratory diseases, and the associated pathogenic mechanisms leading to disease exacerbation and even the induction of non-respiratory diseases have not been fully elucidated to date. However, in environments with persistently high levels of air pollution, we need to clear disease induction, potential preventive mechanisms, and treatment approaches for inflammation and disease exacerbation caused by fine particles matter.

Methods: In this study, animal experiments were conducted using PM2.5 and PM10, constituents of fine particles matter, coupled with single-cell RNA sequencing analysis utilizing precise medical technologies. The research aimed to explore various mechanisms, disease exacerbation, and relevant biomarkers associated with the induction of respiratory inflammatory diseases by fine particulate matter.

Results: The results reported that both PM2.5 and PM10 induced significant respiratory inflammation (inflammation score NC=1.6±0.03; PM2.5=12.5±1.09, p value =0.034; p-value=0.037; PM10=10.5±2.39, p-value=0.042) and airway hyperresponsiveness (NC=1.23±0.331; PM2.5=11.243±6.67, P value=0.0144; PM10=12.0341±2.85, P value=0.0026) in Balb/c mice. Furthermore, in the expression of cell cytokines in serum, PM10 appeared to induce more non-Th2 cell cytokines (IL6=151.34±12.58 p value=0.022; IL8=458.31±56.41 p value=0.0067; IL25=612.39±52.46 p value=0.0024 and IL33=343.51±20.93 p value=0.041). In terms of inflammatory cell infiltration in the lungs, although Eosinophils (Eosinophils =57.21 $x10^4$, P value< 0.001) increased in the PM10 group, the cell count of neutrophils (neutrophils=60.34 $x10^4$, P value< 0.001) was highest.

Conclusions: While both PM2.5 and PM10 belong to fine particulate matter in air pollutants, our study suggests that the induced respiratory inflammatory phenomena by these two differ in pathogenic mechanisms and tissue damage. Therefore, a clear understanding of these distinct induction mechanisms could provide more precise insights into inflammatory response diseases induced by these particles,

leading to the identification of optimal prevention and treatment.

62 **Differential Impact of Mesenchymal Stem Cell Extracellular Vesicles (MEV) and Dexamethasone (DXMS) on Trained Immunity**
間質幹細胞外泌體調節訓練免疫力不同於類固醇的作用機轉研究

Elim Cheng[1], Chia-Hsueh Lin[1,2], Chih-Wen Tseng[1], Chie-Pein Chen[3], Kuender D. Yang[1,2,3]
Mackay Children's Hospital [1], Institute of Clinical Sciences, National Yang Ming Chao Tong University [2], Departments of Obstetrics and Medical Research, Mackay Memorial Hospital [3]
鄭以琳 [1]、林佳學 [1,2]、曾芝文 [1]、陳治平 [3]、楊崑德 [1,2,3]
馬偕兒童醫院 [1], 陽明交通大學臨醫所 [2], 馬偕紀念醫院婦產科、醫研部 [3]

Background: Umbilical Cord Mesenchymal Stem Cell Extracellular Vesicles (MEVs) have been demonstrated to induce cell differentiation, immune modulation, angiogenesis in various degenerative, and inflammatory diseases. These diseases are frequently associated with the innate immune proinflammatory response, and traditionally treated using steroids such as Dexamethasone (DXMS). Our study investigated the distinct mechanisms through which MEVs modulate trained immunity different from DXMS.
Methods: In this study, we prepared MEVs and peripheral blood mononuclear cells using Ficoll-Paque centrifugation in vitro. A model of trained immunity involving Bacillus Calmette-Guerin (BCG) training and subsequent lipopolysaccharide (LPS) re-exposure was used to compare the immunomodulatory differences between MEVs and DXMS. This comparison included analysis of glucose consumption, cell surface receptor expression (TLR 2/4 and Siglec-3/7/9), intracellular signaling, epigenetic imprinting, and cytokine/chemokine production.
Results: In the early BCG-induced trained immunity, MEVs significantly increased glucose consumption while DXMS did not (215±4 vs 187±4 mg/dL; $p<0.05$). DXMS promoted TLR2 and Siglec-3 expression (63176±6575 vs 94988±13389; $p<0.05$)(16706±2961 vs 22366±4262; $p<0.05$), whereas MEVs notably inhibited TLR2 and Siglec-3 expression under exposure to LPS stimulation (63176±6575 vs 50711±6383; $p<0.05$)(16706±2961 vs 14131±2566; $p<0.05$). MEVs inhibited the production of IP-10 chemokine, whereas DXMS inhibited TNF-α and IFN-γ cytokines production.
Conclusions: MEVs and DXMS exhibit distinct roles in modulating trained immunity. They differ in glucose metabolism, expression of cell surface receptors TLR2 and Siglec-3, and cytokine production. Therefore, it is inferred that MEVs and DXMS have different mechanisms and applications in different inflammatory diseases, warranting further investigations on precision medicine of immunotherapies.

63 **Metabolomic Profiling of Multiple Biofluids Insights into Childhood Allergic Rhinitis and Asthma**
多種生物體液代謝體學分析深入了解兒童過敏性鼻炎和氣喘

Chih-Yung Chiu[1,2], Meng-Han Chiang[2], Chieh-Ni Kuo[1], Kuan-Wen Su[3], Kuo-Wei Yeh[3], Jing-Long Huang[4]
Division of Pediatric Pulmonology, Department of Pediatrics, Chang Gung Memorial Memorial Hospital at Linkou, and Chang Gung University, Taoyuan, Taiwan[1];Clinical Metabolomics Core Laboratory, Chang Gung Memorial Hospital at Linkou, Taoyuan, Taiwan[2]; Division of Allergy, Asthma, and Rheumatology, Department of Pediatrics, Chang Gung Memorial Hospital, and Chang Gung University, Taoyuan, Taiwan; Department of Pediatrics, New Taipei Municipal TuCheng Hospital, Chang Gung Memorial Hospital and Chang Gung University, Taoyuan, Taiwan.[4]
邱志勇 [1,2]、江孟翰 [2]、郭捷妮 [1]、蘇冠文 [3]、葉國偉 [3]、黃璟隆 [4]
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];長庚醫療財團法人臨床代謝體學核心實驗室 [2];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 [3];長庚醫療財團法人新北市立土城醫院兒科 [4]

Background: Childhood rhinitis and asthma are allergic respiratory diseases triggered by common allergens, but they affect different parts of the respiratory system, leading to distinct symptoms. However, a comprehensive multiple biofluid metabolomics-based approach to uncover valuable insights into childhood allergies and allergen sensitization remains unaddressed.
Methods: Seventy-six children, comprising 26 with rhinitis, 26 with asthma, and 24 healthy controls, were enrolled. Fecal, blood, and urine metabolomic analyses using 1H-nuclear magnetic resonance (NMR) spectroscopy were conducted. An integrative analysis of their associations with allergen-specific IgE levels in the context of allergic rhinitis and asthma were also assessed.
Results: The analysis of 228 various biofluid samples revealed strong positive correlations between stool and blood metabolites, while blood metabolites exhibited negative correlations with most urine metabolites. Five and nineteen metabolites were significantly different in children with rhinitis and asthma, respectively ($P < 0.05$). Among them, blood isovaleric acid correlated positively with stool IgE levels in rhinitis, while stool butyric acid and acetic acid in asthma exhibited strong negative correlations with total serum and mite allergen-specific IgE levels ($P < 0.01$). Blood metabolic profiles appeared to have the highest area under the curve (AUC) of 0.732 for rhinitis, whereas stool metabolic profiles had the highest AUC of 0.799 for asthma.
Conclusions: Multiple biofluid metabolomics provides comprehensive insights into childhood allergies, with blood profiles associated with allergic rhinitis and fecal profiles linked to asthma. Their short-chain fatty acid metabolites related to IgE levels emphasize the significant role of the gut microbiota in childhood rhinitis and asthma.

64 **House Dust Mite Enhances Alarmin-induced Epithelial-Mesenchymal Transition Mediated by ROS signaling**
塵蟎經氧化壓力訊息傳遞調節增強警報素誘導上皮-間質轉換

Chih-Hsing Hung[1,2,3], Mei-Lan Tsai[4]
Department of Pediatrics, Kaohsiung Medical University Hospital[1], Department of Pediatrics, Kaohsiung Medical University[2], Department of Pediatrics, Kaohsiung Municipal Hsiao-Kang Hospital, Kaohsiung, Taiwan[3], Teaching and

Research Center, Kaohsiung Municipal Siaogang Hospital[4] Graduate Institute of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan
洪志興 [1,2,3]、蔡美蘭 [4]
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] 高雄醫學大學醫研所 [4]

Background: Airway remodeling is associated the decline in lung function and the increased need for medications in asthma. Alarmin, composed of IL-25, IL-33, and thymic stromal lymphopoietin (TSLP), is released from epithelial cells triggered by pollutants (heavy metals) and plays a crucial role in initiating inflammation in asthma. Epithelial-mesenchymal transition (EMT) is a vital process in airway remodeling. Additionally, common asthma triggers, such as house dust mites (HDM), contribute to this process. We aimed to assess the impact of alarmin followed by HDM co-treatment on EMT regulation in airway remodeling and investigated its underlying intracellular mechanism.
Methods: IL-33 and copper, employed as an alarmin inducer, were used to examine its effects on lung epithelial cells, A549. The EMT phenomenon was assessed using a cell migration assay. The production of alarmin was measured, and the markers of EMT or autophagy were identified through enzyme-linked immunosorbent assay (ELISA) or Western blot, respectively. N-acetylcysteine (NAC), Mito-TEMPO, and an anti-IL-33 monoclonal antibody were employed to investigate the role of oxidative stress and IL-33 in airway remodeling.
Results: Following exposure to the alarmin inducer, IL-33 expression stimulated by copper significantly increased (control: 49.09±1.468 vs copper 10 μM: 87.41±9.371 (pg/mL, mean±SEM), p = 0.0156) and was further enhanced by HDM co-treatment (copper 10 μM alone vs copper 10 μM+HDM 1μM: 117.9±3.125, p = 0.0367). Alarmin inducer-induced cell migration was intensified following HDM co-treatment. Additionally, the expression of E-cadherin, an epithelial marker, decreased, while the expression of the mesenchymal marker N-cadherin, fibrosis marker fibronectin, transcription factor snail, and autophagy marker LC3 increased. Inhibition of reactive oxygen species (ROS) reduced the enhanced alarmin inducer-induced IL-33 expression by HDM. Neutralization of IL-33 decreased the level of cell migration induced by alarmin inducer followed by HDM stimulation. Furthermore, the reversed expression of EMT markers and LC3 indicated a regulatory role of IL-33 in this process.
Conclusions: The results suggested that HDM enhanced alarmin inducer-induced EMT mediated by ROS regulation. Our finding might provide new therapeutic targets in airway remodeling.

65

Associations between physical fitness and asthma severity among junior high school students in Taoyuan, Taiwan
台灣桃園地區國中學童體適能與氣喘調查分析

Wing Hin Stanford Siu[1,2], Tsung-Chieh Yao[1,3], Kuo-Wei Yeh[1,3], Wen-I Lee[1,3], Li-Chen Chen[1,4], Jing-Long Huang[1,4], Liang-Shiou Ou[1,3]
School of Medicine, College of Medicine, Chang Gung University, Taoyuan City, Taiwan[1]; Department of Medical Education, Chang Gung Memorial Hospital, Taoyuan City, Taiwan[2]; Division of Allergy, Asthma and Rheumatology, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan City, Taiwan[3]; Department of Pediatrics, New Taipei Municipal TuCheng Hospital, Tucheng District, New Taipei City, Taiwan[4]
蕭永軒 [1,2]、姚宗杰 [1,3]、葉國偉 [1,3]、李文益 [1,3]、陳力振 [1,4]、黃璟隆 [1,4]、歐良修 [1,3]
長庚大學醫學院 [1]、林口長庚紀念醫院教學部 [2]、林口長庚紀念醫院兒童過敏氣喘風濕科 [3]、新北市立土城醫院兒童內科 [4]

Background: The impact of asthma and the extent of asthma control on physical fitness of adolescents are important to their overall health. This study aims to examine associations between physical fitness and asthma severity in junior high school students in Taoyuan.
Methods: We surveyed 7120 eighth-grade students from 18 randomly selected junior high schools in Taoyuan from 2012 to 2013, with a response rate of 92% (6550 children). The standardized methodology of Phase III of the International Study of Asthma and Allergies in Childhood (ISAAC) was used. Evaluated physical fitness included cardiopulmonary fitness (boys: 1600m run, girls: 800m run), sit-ups, and seated forward bends.
Results: Among second-year junior high school students, those with asthma and recent symptoms showed significant differences in cardiopulmonary fitness compared to their non-asthmatic peers. (Boys: 589.4 vs 563.7 seconds, p-value=0.001; girls: 295.7 vs 289.2 seconds, p-value=0.005). Students with exercise-induced wheezing in the past year exhibited lower cardiopulmonary fitness levels compared to asthmatics without exercise-induced wheezing. (Boys: 602.0 vs 565.1 seconds, p-value=0.001; girls: 301.1 vs 289.8 seconds, p-value=0.026). If well-controlled, individuals without asthma symptoms in the past year showed no significant differences from the general population. (Boys: 565.1 vs 563.7 seconds; girls: 289.8 vs 288.9 seconds). There were no differences between asthmatics and non-asthmatics in terms of sit-ups and seated forward bends.
Conclusions: Effective asthma control is crucial for maintaining optimal cardiopulmonary fitness in adolescents. Contrary to common belief, well-controlled asthma does not correlate with exercise incapacity or lower physical fitness levels.

66

Major Histocompatibility Complex Compatibility may Determine B cell Engraftment and Functional Outcome after Hematopoietic Stem Cell Transplantation in Infants with Severe Combined Immunodeficency
主要組織相容性複合體相容性可能影響嚴重複合型免疫缺乏症病人接受骨髓移植後 B 細胞功能回復

Chih-An Chen[1], Ching-Wei Lin[1], Yuan-Ning Yang[1], Jiann-Shiuh Chen[1], Chi-Chang Shieh[1,2]
Department of Pediatrics, National Cheng-Kung University Hospital, Tainan, Taiwan[1];Institute of Clinical Medicine, College of Medicine, National Cheng-Kung University Hospital, Tainan, Taiwan[2]
陳志安 [1]、林靜微 [1]、楊媛甯 [1]、陳建旭 [1]、謝奇璋 [1,2]
國立成功大學醫學院附設醫院小兒部 [1];國立成功大學醫學院附設醫院臨床醫學研究所 [2]

Background: Severe combined immunodeficency (SCID) is a genetically heterogeneous primary immunodeficiency

disease that may result in severe T cell lymphocytopenia and lack of adequate T-cell and B-cell responses which are fatal in first two years unless adequate immune reconstruction achieved. Although the incidence is low, the early detection of SCID and transplantation before serious infection episodes is crucial for the SCID patients. Transplantation techniques for patients with primary immunodeficiencies have improved survival rate.

Methods: We aimed to analyze the outcomes of hematopoietic-cell transplantation (HCT) in children with severe combined immunodeficency (SCID) in a referral tertiary center in southern Taiwan from 2005 to 2023. We tried to identify factors associated with transplantation outcome.We collected data retrospectively from six infants with SCID who received HCT and followed up at National Cheng Kung University Hospital .

Results: All patients survive during observation period. 100% T cell chimerism are noted in all patients. Stable mixed chimerism are seen in our patients. However, two of the patients receiving haploidentical donors seem to have poor immune reconstitution on B cell engraftment.

Conclusions: T cell receptor excision circle assay combined in newborn screen panel successfully identifies patient with SCID and early hematopoietic-cell transplantation helps them have better outcome in life quality. Haploidentical stem cell transplantation may result in poor immunoglobulin recovery and require life-long immunoglobulin replacement.

67

FIP-Fve Could Improve Airway Inflammation which Induce with PM2.5 and Allergen

金針菇免疫調解蛋白(FIP-fve)可以改善 PM2.5 和過敏原誘發的氣道發炎

Jo-Ching Chen[1], Jiunn-Liang Ko[2], Yu-Tzu Lee[2], Pei-Fen Liao[1], Min-Sho Ku[1,2], Hai-Lun Sun[1,2], Ko-Huang Lue[1,2]
Allergy, Immunology and Rheumatology, Department of Pediatrics, Chung Shan Medical University Hospital[1] ; Institute of Medicine, School of Medicine, College of Medicine, Chung Shan Medical University[2]
陳若晴 [1]、柯俊良 [2]、李育慈 [2]、廖培汾 [1]、顧明修 [1,2]、孫海倫 [1,2]、呂克桓 [1,2]
中山醫學大學附設醫院 兒童部 過敏免疫風濕科 [1]; 中山醫學大學 醫學院 醫學系 醫研所 [2]

Background: The impact of air pollution on health has long been a world prioritized concern, particularly in relation to respiratory allergies, which are diseases easily induced or worsened by air pollutants. However, in actual living environments, air pollutants or dust mite allergens rarely exist in isolation, and allergy sufferers often experience stimulation from multiple allergens. Therefore, given the high prevalence of respiratory inflammatory diseases, various medications and supplements that can prevent or alleviate related inflammatory symptoms have been actively developed. FIP-fve, an immunomodulatory protein extracted from the F. velutipes, is known for its anti-inflammatory, anti-virus, anti-tumor and immune-regulating abilities.

Methods: This study, animal experiment inducing airway inflammation with PM2.5 and dust mite allergens was conducted, incorporating the use of FIP-fve. The aim was to investigate whether FIP-fve has an ameliorative effect on PM2.5 and allergens induced airway inflammation.

Results: According to the results, PM2.5 and allergens, when stimulating mice, significantly induced airway inflammation (compared with NC score 1.05±0.04; PM2.5 9.5±0.18, p=0.034; allergen 11.6±2.31, p= 0.0051; co-treated PM2.5 & allergen 12.5±3.73, p=0.029), and mice co-stimulated by PM2.5 & allergen exhibited simultaneous Th2 and non-Th2 inflammatory phenomena. Moreover, mice exposed to PM2.5 and allergens, whether in the pre or post stages, showed significant improvement or reduction in the severity of respiratory inflammation after receiving FIP-fve (In PM2.5 pre-FIP score 2.5±0.76, p=0.0029; post-FIP 3.7±2.58, p=0.017; In allergen pre-FIP 2.1±1.13, p=0.012; post-FIP 3.2±4.36, p=0.035; co-treated PM2.5 & allergens pre-FIP 2.9±1.33, p=0.019; post-FIP 4.5±2.98, p=0.041).

Conclusions: From the findings, it is evident that the inflammatory response becomes more severe under the stimulation of multiple allergens. However, with the intervention of FIP-fve, effective improvement and prevention of respiratory inflammation were observed. Therefore, we believe that FIP-fve may serve as a therapeutic adjuvant for inflammation induced by PM2.5 and allergens.

68

Efficacy and Safety of Macrolide in Treatment for Asthma in Children: A Meta-analysis and Systematic review

巨環類抗生素於小兒氣喘治療的效果及安全性：系統性文獻回顧與統合分析

Po-Hsiung Chang[1,3], Yu-Tsan Lin[3], Po-Sheng Chang[2], Bor-Luen Chiang[3]
Division of Allergy, Immunology and Rheumatology, Department of Pediatrics, Far-Eastern Memorial Hospital, New Taipei City, Taiwan[1]; Division of Gastroenterology, Department of Pediatrics, Far-Eastern Memorial Hospital, New Taipei City, Taiwan[2]; Division of Allergy, Immunology and Rheumatology, Department of Pediatrics, National Taiwan University Hospital and College of Medicine, Taipei, Taiwan[3]
張博雄 [1,3]、林于粲 [3]、張博勝 [2]、江伯倫 [3]
亞東紀念醫院小兒部過敏免疫風濕科 [1]; 亞東紀念醫院小兒部肝膽胃腸科 [2]; 國立台灣大學醫學院附設醫院小兒部過敏免疫風濕科 [3]

Background: Asthma is a common pediatric wheezing illness with chronic airway inflammation. Whereas some children with asthma do not fully respond to current medications, macrolide is a promising therapy used for pediatric asthma despite limited and inconsistent data. Herein, we systematically reviewed and evaluated the efficacy and safety of macrolide for asthma in children.

Methods: We searched for articles in the PubMed, EMBASE, Cochrane Library databases, Scopus and Web of Science up to December 2023. Randomized controlled trials (RCT) are included if assessing the pulmonary function, cytokine concentration and survival outcomes of treatments of interest, including macrolides (any macrolide), placebo or standard treatment in children up to 18 years with diagnosis of asthma.

Results: Of 3079 records identified from the preliminary search, 10 studies involved a total of 1249 children were enrolled in the final qualitative review and quantitative meta-analysis. Compared with standard treatment, macrolide-based therapy had lower acute exacerbation rate (RR, 0.59; 95% CI, 0.44-0.79). Lower risk of adverse events, mainly gastrointestinal symptoms with diarrhea (RR 0.82; 95% CI, 0.69-0.97) were also significantly shown in macrolide-based therapy. However, there was no significant difference

in time to disease exacerbation and time to symptoms resolution as other primary outcomes. The secondary outcomes with pooled effects of macrolides on pulmonary function test, including FEV1 and FEF 25%~75% were not significantly different.
Conclusions: This current meta-analysis suggested that macrolides are beneficial in improving acute exacerbation of asthma in children and decreased in adverse events. Further research are required because of the inadequate sample size in several RCT studies and immeasurable clinical outcomes.

69

Pediatric Eosinophilic Esophagitis Experience in a Tertiary Center in Northern Taiwan
兒童嗜伊紅性食道炎：台灣北部一間醫學中心的經驗

Wen-Yu Tseng[1, 2], Hsun-Chin Chao[2, 3], Kuan-Wen Su[4,5], Ming-Wei Lai[2,3,6], Chien-Chang Chen[2,3]
Department of Pediatrics, Jen Ai Hospital, Dali Branch [1]; Division of Pediatric Gastroenterology, Department of Pediatrics, Chang Gung Children's Medical Center, Linkou Chang Gung Memorial Hospital [2]; College of Medicine, Chang Gung University [3]; Division of Pediatric Allergy, Asthma, and Rheumatology, Department of Pediatrics, Chang Gung Children's Medical Center, Chang Gung Memorial Hospital, Linkou Branch [4]; Department of Pediatrics, Keelung Chang Gung Memorial Hospital [5]; Liver Research Center, Chang Gung Memorial Hospital, Linkou Branch
曾文禹 [1, 2]、趙舜卿 [2, 3]、蘇冠文 [4,5]、賴明瑋 [2,3,6]、陳建彰 [2,3]
仁愛長庚合作聯盟大里仁愛醫院 [1]; 林口長庚紀念醫院兒童內科部兒童腸胃科 [2]、兒童風濕免疫科 [4]; 長庚大學醫學院 [3]; 基隆長庚紀念醫院兒童內科 [5]; 林口長庚紀念醫院肝臟研究中心 [6]

Background: The acknowledgement of eosinophilic esophagitis (EoE) is increasing in these 2 decades. The prevalence of this disease is relatively low in Eastern countries compred to Western countries. We aimed to investigate the clinical presentation and treatment of these pediatric population in a tertiary center in Northen Taiwan.
Methods: We reviewed the medical records of those children who were diagnosed with EoE in Chang Gung Children's Medical Center from Jan 2005 to Dec 2023. EoE is diagnosed based on the presence of clinical symptoms and histologically-proven EoE with a peak of ≥15 eosinophils/hpf, excluding diseases and conditions inducing secondary esophageal eosinophilia. Patients were categorized into younger-age (Y) group: less than 10 years of age, and older-age group (O): age equal to or greater than 10 years old based on clinical presentations. The demographics, symptoms and signs, laboratory results, radiographic findings, endoscopic findings, and outcomes were collected and analyzed. Fisher's exact test, independent sample t-test, and Mann-Whitney test were used for comparative analysis as appropriate.
Results: A total of 48 children (Y group, n= 25; O group, n= 23) were included. Abdominal distention, constipation, poor appetite and failure to thrive were significantly more common in the Y group compared to O group. However, O group had higher prevalence of abdominal pain and better weight gain after treatment. Therapeutic effect was achieved in patients with high-dose PPI, topical steroid (swallowed budesonide, 1mg/day), or biologic agent (Dupilumab, anti-IL-4 & IL-13). Dupilumab (at a dose of 300 mg weekly or every 2 weeks) was used in four cases, and all patients achieved therapeutic effects after 4 doses. The time to diagnosis, treatment duration (PPI, or steroid), and prognosis did not differ significantly between the two groups.
Conclusions: Although rare, EoE can cause serious complication if left untreated. Timely detection and treatment of EoE is crucial in pediatric population.

70

Risk Factors and Outcome of Infantile Colic: A Nationwide Population Based Study
嬰兒腸絞痛的危險因子與預後

Fang-Min Liao[1], Shang-Po Shen[2], Ming-Luen Tsai[2], An-Chyi Chen[1], Shu-Fen Wu[1], Yu-Chia Chang[3], Hung-Chih Lin[2]
Division of Pediatric Gastroenterology, Hepatology & Nutrition, China Medical University Children's Hospital, China Medical University, Taichung, 40447, Taiwan[1]; Division of Neonatology, China Medical University Children's Hospital, China Medical University, Taichung, 40447, Taiwan[2]; Department of Long Term Care, College of Health and Nursing, National Quemoy University, Kinmen County, Taiwan[3]
廖舫敏 [1]、沈上博 [2]、蔡明倫 [2]、陳安琪 [1]、吳淑芬 [1]、張育嘉 [3]、林鴻志 [2]
中國醫藥大學兒童醫院兒童腸胃肝膽及營養科 [1]、新生兒科 [2]; 金門大學長期照護學系 [3]

Background: Recent studies have shown several associations between infantile colic and other diseases, such as functional GI disorders, allergic disorders, and behavioral disorders of childhood. We aim to analyze the risk factors and outcomes which are associated with infantile colic, and the long-term health implications for infants.
Methods: This nationwide, case-control study enrolled infants born between January 2010 and December 2015 in Taiwan. Two databases were used, the Maternal and Child Health Database and the National Health Insurance Research Database. The inclusion criteria of the infantile colic group were 2 or more related ICD coding between 1-month-old to 6-month-old. The control group was matched by maternal age, gender, and gestational age. The specific disease occurrence at 5 years old was defined as outcome measurement.
Results: Totally 916,074 newborns were included in this study. There were 19,191 infants fulfilled the definition of infantile colic; after matching, 95,955 infants without diagnosis of infantile colic were in the control group. We found several risk factors associated with infantile colic, including antibiotic use during neonatal period (adjusted OR 1.15, $P<0.001$), Cesarean section (adjusted OR 1.17, $P<0.001$), maternal atopic disease (adjusted OR 1.32, $P<0.001$), maternal major depressive disorder (adjusted OR 1.35, P=0.022) and maternal IBS (adjusted OR 1.35, P=0.001). At 5-year-old follow-up, the incidence rate of several diseases was significant higher in infantile colic group, including functional diarrhea (adjusted HR 1.77, $P<0.001$), functional constipation (adjusted HR 1.47, $P<0.001$), IBS (adjusted HR 1.69, $P<0.001$), other functional abdominal pain disorders (adjusted HR 1.22, $P<0.001$), ADHD (adjusted HR 1.20, P=0.015), and atopic diseases (adjusted HR 1.11, $P<0.001$).
Conclusions: The risk factors of infantile colic include antibiotic use during neonatal period, Cesarean section, maternal atopic disease, maternal major depressive disorder, and maternal IBS. Infantile colic-associated diseases in

childhood include functional GI disorders, ADHD, and atopic diseases.

71

Maternal Prenatal Infection And Biliary Atresia in Offspring

母親產前感染與兒童膽道閉鎖的關係

Wei-Hao Wang[1,2], Fang-Yu Chiu[3,4], Tzu-Tung Kuo[5], Yu-Hsuan Shao[2,6]
Department of Pediatrics, Changhua Christian Children's Hospital[1]; Graduate Institute of Biomedical Informatics, College of Medical Science and Technology, Taipei Medical University[2]; Department of Obstetrics and Gynecology and Women's Health, Taichung Veterans General Hospital[3]; Department of Obstetrics and Gynecology, Lienchiang County Hospital[4]; Health Data Analytics and Statistics Center, Office of Data Science, Taipei Medical University[5]; Clinical Big Data Research Center, Taipei Medical University Hospital[6]
王唯豪[1,2]、邱方榆[3,4]、郭芷彤[5]、邵于宣[2,6]
彰化基督教兒童醫院兒科部[1]; 臺北醫學大學醫學資訊研究所[2]; 臺中榮民總醫院婦女醫學部[3]; 連江縣立醫院婦產科[4]; 臺北醫學大學數據處健康資料加值暨統計中心[5]; 臺北醫學大學附設醫院臨床大數據研究中心[6]

Background: Investigations into the association of antepartum maternal infections on the pathogenesis of biliary atresia (BA) in human offspring are insufficient. We performed this study to examine the association between prenatal maternal infections and the development of BA in children.
Methods: This population-based case-control study obtained administrative data from the Taiwan National Health Insurance Research Database with linkage to the Taiwan Maternal and Child Health Database. The cohort comprised 2 905 978 singleton live births among mother-infant dyads between January 1, 2004, and December 31, 2020. The case group of infants with BA was identified by International Classification of Diseases diagnostic codes for BA and subsequent Kasai procedure or liver transplant. The control group was randomly selected from infants without BA, representing approximately 1 in 1000 study population. Exposure of interest are prenatal maternal infections. We performed an inverse probability weighting analysis by building a logistic regression model to estimate the probability of the exposure observed for a particular person and using the predicted probability as a weight in our subsequent analyses. The weighted odds ratio (OR) estimated by logistic regressions was then used to assess the risk of BA in babies after exposure to prenatal maternal infections.
Results: During study period, we identified 447 infants with BA. The control group consisted of 2912 mother-infant dyads without BA. We observed that infants exposed to prenatal maternal intestinal and genitourinary tract infections exhibited a significantly higher risk of BA. The weighted OR was 1.46 (95% CI 1.17-1.82) and 1.22 (95% CI 1.05-1.41), respectively. Furthermore, maternal intestinal infection (weighted OR 6.05; 95% CI 3.80-9.63) and genitourinary tract infections (weighted OR 1.55; 95% CI 1.13-2.11) occurred during the third trimester and were significantly related to an elevated risk of BA in offspring.
Conclusions: We observed a significant association between prenatal maternal intestinal, genitourinary tract infection, and BA in offspring. Further studies are warranted to explore the underlying mechanisms behind this relationship.

72

The Effect of Probiotics on Decolonization of Vancomycin-Resistant Enterococci from Human Gut: Systemic Review and Meta-Analysis of Randomized Clinical Trials

探討益生菌對人體腸道抗萬古黴素腸球菌之去定植作用：隨機臨床試驗之系統性回顧與統合分析

Fei-Hsia Fan[1,2.], Yi-Jyuan Lin[1,2], Jin-Hua Chen[3,4,5], Shiuh-Bin Fang[1,2,6,7]
Department of Pediatrics, School of Medicine, College of Medicine, Taipei Medical University, Taipei City, Taiwan[1];Division of Pediatric Gastroenterology and Hepatology, Department of Pediatrics, Shuang Ho Hospital, Taipei Medical University, New Taipei City, Taiwan[2];Graduate Institute of Data Science, College of Management, Taipei Medical University, New Taipei City, Taiwan[3];Master Program in Applied Molecular Epidemiology, College of Public Health, Taipei Medical University, New Taipei City, Taiwan[4];International Ph.D. Program in Biotech and Healthcare Management, College of Management, Taipei Medical University, New Taipei City, Taiwan[5];Master Program for Clinical Genomics and Proteomics, College of Pharmacy, Taipei Medical University, Taipei City, Taiwan[6];Research Center for Digestive Medicine, Taipei Medical University, Taipei City, Taiwan[7]
范翡夏[1,2.]、林以娟[1,2]、陳錦華[3,4,5]、方旭彬[1,2,6,7]
臺北醫學大學醫學院醫學系小兒學科[1]、部立雙和醫院小兒部小兒消化科[2]、大數據科技及管理研究所[3]、應用流行病學碩士學位學程[4]、國際生技醫療管理博士學位學程[5]、藥學院臨床基因體學暨蛋白質體學碩士學位學程[6]、消化醫學研究中心[7]

Background: Enterococci are one of the commensal floras. Vancomycin-resistant enterococci (VRE) can colonize in human and cause opportunistic infections. Pediatric inpatients have considerably high carriage and clinical infection rates of VRE. Probiotics showed a potential effect for VRE decolonization, with unclear efficacy, dosage, and treatment duration. Thus, this study aimed to investigate whether probiotics are effective in VRE decolonization.
Methods: PubMed, Embase, and Medline using 12 keywords related to “probiotic”, “colonization”, and “enterococcus” have been searched for randomized controlled trials (RCTs) after excluding papers with insufficient data, case reports, or without placebo groups. The overall effects by forest plot of the probiotic group and the control group were analyzed and shown as (Peto odds ratio [OR], [95% CI], p value) using the fixed-effects model with Review Manager version 5.4.1. Long-duration ($>$ 12 weeks)/short-duration ($<$ 12 weeks) treatment groups, Lactobacillus rhamnosus GG (LGG)/non-LGG probiotics groups, and pediatric ($<$ 18 years)/adult ($>$ 18 years) groups were also compared.
Results: Six RCTs with 7 sets of data and 584 patients (297 probiotic, 287 placebo) were analyzed. The probiotic group showed an significantly increased overall effect for the decolonization of VRE outcome (OR 2.81, [1.68-4.68], p = 0.0001) relative to the control group. In addition, the short-duration treatment showed a significant effect of VRE decolonization by probiotics (OR 3.65, [1.87-7.12], p = 0.0001) but the long-duration treatment did not (OR 1.82, [0.85-3.9], p = 0.03). LGG (OR 4.57, [2.49-8.37], p

＜0.00001) was significantly more effective than the other Lactobacillus spp. (L. rhamnosus Lcr35, L. reuteri RC-14, and L. GR-1) (OR 1.14, [0.31-4.12], p = 0.84) on VRE decolonization. Either the pediatric group (OR 5.24, [1.72-19.92], p = 0.004) or the adult group (OR 2.22, [1.24-3.96], p = 0.007) showed significantly effective VRE decolonization by probiotics.
Conclusions: Short-duration treatment of probiotics for ＜12 weeks can decolonize VRE from human gut, with higher efficacy in LGG than the other probiotic strains but effective in both pediatric and adult populations.

73

Association of NUDT15 Gene Variants with Neutropenia in Taiwanese Inflammatory Bowel Disease
台灣發炎性腸道疾病中 NUDT15 基因變異與中性球低下之關聯

Wei-Ting Chen[1], Chih-Hsiang Yu[4], Yung-Li Yang[2,3], Jia-Feng Wu[2]
Department of Pediatrics, National Taiwan University Hospital Hsin-Chu Branch[1];Department of Pediatrics, National Taiwan University Hospital[2];Department of Laboratory Medicine, National Taiwan University Hospital[3];Institute of Statistical Science Academia Sinica[4]
陳韋廷[1]、游智翔[4]、楊永立[2,3]、吳嘉峯[2]
國立台灣大學醫學院附設醫院新竹分院小兒部[1];國立台灣大學醫學院附設醫院小兒部[2];國立台灣大學醫學院附設醫院檢驗醫學部[3];中央研究院統計科學研究所[4]

Background: In inflammatory bowel disease (IBD), thiopurines play an important role in maintenance of steroid-free remission but possess risk of life-threatening neutropenia, which is associated with gene variants of NUDT15 in Asians. In order to better incorporate thiopurines in clinical practice, we aim to summarize the prevalence and impacts of NUDT15 variation in IBD in Taiwan.
Methods: The study included 64 patients (36 males, 28 females) diagnosed with IBD in National Taiwan University Children's Hospital from June 2005 to June 2023. The mean diagnostic age was 10.9 years old. Thirty-eight patients (59%) had Crohn's disease, and 26 patients (41%) had ulcerative colitis. Thiopurine was administered in 49 patients (77%). Genotypes of NUDT15 were analyzed and correlated to likely phenotypes, classified as normal, intermediate and poor metabolizers. Absolute neutrophil counts (ANC) were collected and analyzed for correlation.
Results: In a total of 64 patients, 12 patients (19%) were intermediate metabolizers and 4 patients (6%) were poor metabolizers. Among patients who had thiopurine usage, 8 patients (16%) were intermediate metabolizers and 4 patients (8%) were poor metabolizers. Nine patients (18%) had neutropenia (ANC ＜ 1500/microL), including 3 patients (6%) had severe neutropenia (ANC ＜500/microL). About these 3 patients, all of them were poor metabolizers. After logistic regression analysis, the risk of neutropenia is higher in NUDT15 intermediate and poor metabolizers (OR=17.9, 95% CI=3.2-100.5, p=0.001).
Conclusions: In this study, the prevalence of NUDT15 gene variants was 25% in the Taiwanese IBD group and was significantly related to neutropenia in thiopurine users. Preemptive NUDT15 gene testing should be considered for IBD patients in Taiwan to reduce possible life-threatening neutropenia.

74

Alternations of Gut Metabolomics in Newborns of Mothers with Gestational Diabetes Mellitus
妊娠糖尿病母親之新生兒腸道代謝物質的改變

Wan-Hsin Su[1], Chien-Chang Chen[1], Ming-Chou Chiang[2], Ren-Huei Fu[2], Ming-Wei Lai[1], Hsun-Chin Chao[1], Pai-Jui Yeh[1], Mi-Chi Chen[1], Yi-Wei Wang[1]
Division of Pediatric Gastroenterology, Department of Pediatrics, Chang Gung Children's Medical Center, Chang Gung Memorial Hospital, Taoyuan City, 33305, Taiwan[1]; Division of Neonatology, Department of Pediatrics, Chang Gung Children's Medical Center, Chang Gung Memorial Hospital, Taoyuan City, 33305, Taiwan[2]
蘇莞心[1]、陳建彰[1]、江明洲[2]、傅仁輝[2]、賴明瑋[1]、趙舜卿[1]、葉栢睿[1]、陳米琪[1]、王宜薇[1]
林口長庚兒童肝膽腸胃科[1]; 林口長庚新生兒科[2]

Background: Gestational Diabetes Mellitus (GDM) is one of the common complications during pregnancy, associated with not only various perinatal risks in mothers but heightened risks of long-term obesity and metabolic syndrome in children. Understanding how a mother's GDM influences early infant health is crucial. The colonization of an infant's gut has sparked significant interest due to its critical impact on health and potential role in later diseases. Despite some studies attempting to understand the gut microbiota and its role during early infancy, there is still a lack of comprehensive understanding regarding various factors that impact the neonatal gut microbiota and metabolome. Therefore, in this study, we conducted an integrated analysis of the neonatal meconium microbiota and metabolome to understand how GDM from mothers affects microbial colonization in an infant's early life.
Methods: Healthy-term neonates born to GDM and normoglycemic mothers during March 2022 and September 2022 in Chang Gung Memorial Hospital (Linkou branch) were enrolled in this study. Infants who required sepsis workup, medication treatments, or transfer from the baby room to wards, as well as mothers with pre-existing chronic or metabolic diseases, were excluded from the study. The feces were collected in a sterilized container before the infants turned five days old. Meconium microbiota was analyzed using 16S rRNA gene sequencing, while the meconium metabolome was examined via Proton nuclear magnetic resonance (1H NMR).
Results: Neonates born to mothers with diet-controlled Gestational Diabetes Mellitus (GDM) exhibit a notable decrease in α-diversity and a shift in β-diversity compared to infants born to normoglycemic mothers. Among the identified metabolites, 6 showed significant decreased in the GDM group, included xanthine and tryptophan. Other metabolites such as bile acid and short chain fatty acid also decreased in GDM group. Past studies have found that these metabolites may be associated with the products of specific enteric bacteria, such as Prevotella spp., Bifidobacterium spp., Bacteroides spp., Clostridium spp. and Veillonella spp. This could potentially explain our research findings.
Conclusions: These findings highlight the potential impact of pregnancy complications on the establishment of gut bacteria in neonates. Further comprehensive studies are required to understand the implications of these microbial changes for the long-term health of infants.

75 **In Vitro Investigation of Multi-strain Probiotics and Their Antibiotic Synergism for Inhibiting Multidrug-Resistant Nontyphoidal Salmonella**

體外探討可抑制多重抗藥性非傷寒沙門氏桿菌之多重益生菌株及其對抗生素之加乘作用

Yi-Jyuan Lin[1,2], Fei-Hsia Fan[1,2], Buyandelger Batsaikhan[1,2], Shiuh-Bin Fang[1,2,3,4]
Department of Pediatrics, School of Medicine, College of Medicine, Taipei Medical University, Taipei City, Taiwan[1];Division of Pediatric Gastroenterology and Hepatology, Department of Pediatrics, Shuang Ho Hospital, Taipei Medical University, New Taipei City, Taiwan[2];Master Program for Clinical Genomics and Proteomics, College of Pharmacy, Taipei Medical University, Taipei City, Taiwan[3];Research Center for Digestive Medicine, Taipei Medical University, Taipei City, Taiwan[4]
林以娟[1,2]、范翡夏[1,2]、吳凱[1,2]、方旭彬[1,2,3,4]
臺北醫學大學醫學院醫學系小兒學科[1]、部立雙和醫院小兒部小兒消化科[2]、藥學院臨床基因體學暨蛋白質體學碩士學位學程[3]、消化醫學研究中心[4]

Background: Pediatricians often prescribe probiotics for infectious diarrhea. However, the probiotic efficacy in the treatment of salmonellosis remain obscure. We aimed to study if multi-strain probiotics could inhibit growth of multidrug-resistant Salmonella, and synergistically enhance the anti-bacterial effect of the uneffective antibiotic.
Methods: The multidrug-resistant Salmonella strain (NHRI-172) and 10 probiotic strains (Bacillus coagulans, Bifidobacterium bifidum, B. longum subsp. infantis, Lactobacillus GG, L. lactis, L. plantarum, L. reuteri, L. acidophilus, Sporolactobacillus inulinus, and Streptococcus thermophilus) were utilized. NHRI-172 and 10 probiotics were co-cultured for 48 hours (harvest at 0, 24 & 48 h) for duration searching, and then for 36 hours (harvest at 0, 12, 24 & 36 h) in four groups: (i) Gr. A: NHRI-172+MRS broth (negative control), (ii) Gr. B: NHRI-172+10 probiotics, (iii) Gr. C: NHRI-172+ceftriaxone, and (iv) Gr. D: NHRI-172+10 probiotics+ceftriaxone. Upon harvest, solutions were collected, serially diluted, and plated out for quantifying live NHRI-172. Amounts of HNRI-172 in Gr. B/C/D were compared with those of Gr. A using Student's t test. $p < 0.05$ was defined as statistical significance.
Results: In the duration-searching study, NHRI-172 survived after co-culturing with 10 probiotics for 24 h but not for 48 h. In the in vitro inhibition assay, Gr. C had similar non-significantly decreased amounts of live NHRI-172 to Gr. A at 4 time points. At 12 h, no differences existed between Gr. B/C/D and Gr. A. At 24 h, Gr. B (4400 ± 3800 CFU/mL, $p < 0.05$) showed significantly fewer live NHRI-172 than Gr. A (6.2 ± 2.9 x10^5 CFU/mL), but Gr. D (6.5 ± 2.9 x10^5 CFU/mL, $p > 0.05$) did not. At 36 h, Gr. B (37 ± 37 CFU/mL, $p < 0.05$) and Gr. D (4633 ± 2751 CFU/mL, $p < 0.05$) showed significantly lower amounts of live NHRI-172 related to Gr. A (6.3 ± 2.9 x 105 CFU/mL), with a stronger inhibitory effect of Gr. B than Gr. D.
Conclusions: The 10 probiotics showed can duration-dependently inhibit multidrug-resistant Salmonella in vitro, and their co-treatment with ceftriaxone exerted a postbiotic synergism on suppressing ceftriaxone-resistant Salmonella with time.

76 **Molecular Epidemiology of Hospitalized Acute Gastroenteritis During the COVID-19 Pandemic, 2020–2022 in a Medical Center in Northern Taiwan**

新冠肺炎大流行期間的急性胃腸炎分子流行病學-北台灣一家醫學中心之經驗

Yung-Jia Yang[1], Shih-Yen Chen[1,2], Wen-Chuan Lin[1,3], Sheng-Chieh Lin[1,4]
Department of Pediatrics, Shuang Ho Hospital, Taipei Medical University[1], Division of Pediatric Gastroenterology[2], Division of Pediatric Infectious Diseases[3], Division of Allergy, Asthma and Immunology[4]
楊詠家[1]、陳世彥[1,2]、林文川[1,3]、林聖傑[1,4]
衛生福利部雙和醫院(委託臺北醫學大學興建經營)[1]、兒童腸胃科[2]、兒童感染科[3]、兒童過敏氣喘免疫科[4]

Background: During the coronavirus disease 2019 (COVID-19) pandemic, infectious gastroenteritis, with clinical symptoms of diarrhea, fever, vomiting, and dehydration, remained rampant and often led to the requirement for hospitalization.
Methods: Between January 2020 and December 2022, patients hospitalized at Shang-Ho Hospital with a diagnosis of acute gastroenteritis (AGE) were enrolled in this study. Age, sex, onset date, and season of occurrence were recorded. Gastrointestinal pathogens were identified from fecal samples using molecular detection methods and the FilmArray platform.
Results: Among the 918 AGE patients enrolled in the study, enteric pathogens were identified in 250 (27.2%), including enteric viral pathogens in 59 out of 253 (23.3%) patients and enteric bacterial pathogens in 191 of 665 (28.7%) patients. Among the 435 children with AGE, 189 were surveyed for viral pathogens, with norovirus (37; 19.6%) predominating followed by astrovirus (6; 3.2%), rotavirus (2.1%), sapovirus (1.6%), adenovirus (1.1%), and norovirus with sapovirus (1.1%). Among the 246 children surveyed for bacterial pathogens, Salmonella was the dominant pathogen (n = 89; 36.2%), followed by campylobacter (n = 70; 28.5%). Among the 483 adults with AGE, only 64 were surveyed for viral pathogens but only norovirus (n = 2; 3.1%) was identified. Among the 419 patients surveyed for bacterial pathogens, Salmonella was most commonly identified (n = 18; 4.3%), followed by Shigella (1.4%), and Campylobacter (0.5%). Among children aged 0–6 years, norovirus and Salmonella were the most common viral and bacteria pathogens, with prevalence rates of 24.7% and 39.9%, respectively. Norovirus infection occurred most often in winter and spring, and Salmonella infection in autumn, with a prevalence > 50%.
Conclusions: During the COVID-19 pandemic of 2020–2022, the proportion of patients with severe AGE requiring hospitalization was high, especially among children. Norovirus and Salmonella were the dominant pathogens. Our study highlights the continued importance of developing active vaccines and infection control strategies for emerging enteric pathogens such as norovirus, Salmonella, and Campylobacter.

77 **The Characteristics and Outcomes of Jejunoileal Atresia: A 10-year experience at a single medical center**

空迴腸閉鎖的特色及預後：一家醫學中心的 10 年臨床經驗

Chih-Yu Lin[1,2], Ming-Wei Lai[1], Hsun-Chin Chao[1], Chien-Chang Chen[1], Pai-Jui Yeh[1], Mi-Chi Chen[1]
Department of Pediatric Gastroenterology, Linkou Chang Gung Memorial Hospital, Taoyuan, Taiwan[1]、 Department of Pediatric, Keelung Chang Gung Memorial Hospital, Keelung,Taiwan[2]
林芝羽[1,2]、賴明瑋[1]、趙舜卿[1]、陳建彰[1]、葉栢睿[1]、陳米琪[1]
林口長庚紀念醫院 兒童胃腸科[1]、 基隆長庚紀念醫院 小兒科[2]

Background: Jejunoileal atresia (JIA) accounts for about one-third of all neonatal intestinal obstructions. Over the past decades, advancements in intensive care, surgical techniques, and artificial nutrition have significantly improved survival rates. This study aims to compare the clinical characteristics and outcomes of patients with and without intraoperative findings of small bowel volvulus.
Methods: We conducted a retrospective review of jejunoileal atresia cases that underwent surgery at Chang Gung Memorial Hospital, Linkou branch from January 2013 to May 2023. Patients with jejunoileal stenosis, additional digestive tract atresia (esophageal, duodenal, colonic, or anorectal), complicated meconium ileus, and gastroschisis were excluded from the analysis. We analyzed clinical manifestations, imaging findings, intraoperative observations, and outcomes.
Results: A total of 39 cases of JIA were included. The male-to-female ratio was 23:16, the median gestational age and birth weight were 36.4 weeks and 2,665 g, respectively, and the mean age at the time of operation was 3.3 days (range 0-14). Prenatal diagnosis was recorded in 56% of cases. Fifteen patients (38%) had associated anomalies, and Meckel's diverticulum was the most common. The rate of achieving full enteral nutrition was 95%, and the median time was 19 days. The mean hospital stay for survivors was 46 days, and overall survival was 97.7%. Otherwise, JIA patients with intraoperative findings of small bowel volvulus [N=10] had significantly low birth weight (2,190g vs. 2,772g), higher CRP level before operation (30.2 vs. 4 mg/L), longer time to achieve full enteral feeding (median, 48 vs. 18 days), a higher rate of reoperation (50% vs. 14%) during their hospital stay. However, three patients without volvulus became PN-dependent.
Conclusions: In this case series of JIA, high success rates in achieving full enteral feeding and low mortality were documented. However, JIA associated with volvulus leads to a longer time to achieve full enteral feeding and risk of re-operation.

78

Autoantibodies against Type I Interferons in Children with Severe COVID-19 Infections

兒童新冠病毒感染重症中抗第一型干擾素自體抗體之探討

Chen-Yen Kuo[1,2], Shao Hsuan Hsia[1], Jainn Jim Lin[1], Wei-Te Lei[3], Chien-Yu Lee[4], Kai-Sheng Hsieh[5], Ming-Fang Cheng[6], Cheng Lung Ku[1,2], Yhu Chering Huang[1], Tzou-Yien Lin[1]
Division of Infectious Diseases, Department of Pediatrics, Linkou Chang Gung Memorial Hospital、 Division of Pediatric Critical Care Medicine [1]；Laboratory of Human Immunology and Infectious Diseases, Graduate Institute of Clinical Medical Sciences, Chang Gung University [2]； Allergy-Immunology-Rheumatology Division, Department of Pediatrics, Hsinchu Mackay Memorial Hospital [3] Department of Pediatrics, Tao-Yuan General Hospital, Ministry of Health and Welfare, Taoyuan [4]； Department of Pediatric Cardiology, China Medical University Children's Hospital, China Medical University, Taichung [5]； Department of Pediatrics, Kaohsiung Veterans General Hospital [6]
郭貞孍[1,2]、夏紹軒[1]、林建志[1]、雷偉德[3]、李倩瑜[4]、謝凱生[5]、鄭名芳[6]、顧正崙[1,2]、黃玉成[1]、林奏延[1]
林口長庚醫院兒童感染科、兒童加護科[1]；長庚大學臨床醫學研究所人類免疫與感染醫學實驗室[2]；新竹馬偕紀念醫院兒童過敏免疫科[3]；部立桃園醫院小兒科[4]；中國醫藥大學兒童醫院小兒科[5]；高雄榮民總醫院小兒感染科[6]

Background: Type I interferons (IFN-I) are crucial in defending against early viral infections, but inborn immune system errors, particularly in the IFN-I pathway, can lead to severe infections. Recent studies have found that autoantibodies neutralizing IFN-α2 and IFN-ω impair IFN-I immunity, resulting in severe COVID-19 pneumonia. These autoantibodies hinder IFN-I's biological functions, increasing susceptibility to viral infections. Therefore, it's proposed that these anti-type I IFN autoantibodies contribute to the severity of COVID-19 infections.
Methods: Our study involved enrolling children with severe COVID-19 from 13 Taiwanese medical centers. We used a luciferase reporter assay to detect low levels of anti-type I IFN autoantibodies in plasma, MSD Immunoassays for measuring IFN-α2 levels, and intracellular staining to identify phosphorylated STAT1 (pSTAT1), a downstream marker of type I IFN. These techniques were crucial for quantifying the inhibitory effects of these autoantibodies.
Results: In our study of 134 children with severe COVID-19, we found that 15 (11.2%) carried autoantibodies (auto-Abs) neutralizing IFN-α2 and/or IFN-ω. Specifically, 1 patient (0.7%) had auto-Abs against IFN-α2, 9 (6.7%) against IFN-ω, and 5 (3.7%) had auto-Abs for both. Notably, 11 of these patients (73%) were diagnosed with Multisystem Inflammatory Syndrome in Children (MIS-C). Patients with neutralizing auto-Abs against IFN-α2 had undetectable levels of this cytokine, aligning with our expectations.
Conclusions: Our study found that 11.2% of children with critical COVID-19 had neutralizing autoantibodies (auto-Abs) against IFN-α2 and/or IFN-ω. The presence of these auto-Abs, coupled with undetectable IFN-α2 in serum and reduced pSTAT1 signaling, indicates impaired immune responses in these patients. Furthermore, there's a strong association between these auto-Abs and the increased occurrence of severe COVID-19, particularly Multisystem Inflammatory Syndrome in Children (MIS-C). This suggests a pivotal role for auto-Abs against IFN-α2 and/or IFN-ω in driving the severity of COVID-19 in pediatric patients, especially in the onset of MIS-C.

79

Investigation of Epidural Labor Analgesia Use and Infection Rate in Full-term Neonates Delivered Vaginally during 2018~2021 at a Medical Center of Northern Taiwan

2018 年至 2021 年間在台灣北部單一醫學中心經陰道分娩的足月新生兒使用無痛分娩麻醉的使用情況和感染率的調查。

Chang Chia-Ning, Wang Chih-Chien
Department of Pediatrics, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan
張佳寧、王志堅

國防醫學院三軍總醫院小兒科部

Background: Epidural analgesia, a regional anesthesia technique which enable parturients to lessen labor pain effectively, which relieves pain of childbirth partially but not thoroughly eliminate it. It's widely recognized that epidural analgesia is related to more frequent intrapartum fever.In order to distinguish the associations between epidural analgesia and neonatal infections , we investigated the connection between epidural analgesia use in labor and neonatal infection in a cohort of full-term parturiants encountering vaginal delivery.
Methods: This retrospective study was conducted from 2018 to 2021 at a 1400-bed tertiary medical center in northern Taiwan. Electronic medical record data of deliveries at TSGH between March 21, 2018, and December 31, 2021, were used for analysis. Only vaginal deliveries were assessed because most intrapartum cesarean delivery should be associated with maternal and neonatal diseases.
Results: A total of 2519 parturient women with singleton pregnancy underwent vaginal delivery between 2018 and 2021. Of these, 1636 parturient women (64.9%) received epidural analgesia. Accordingly, there were 1557 (61.8%) neonates in the epidural analgesia group and 818 (32.5%) neonates in the no epidural analgesia group included in the final analyses of neonatal outcomes. In the epidural analgesia group, 63 infants (63/1557，4%) were transferred to NICU under the impression of neonatal infection because of newborn fever or other morbidities such as shortness of breath, small for gestational age, etc ; we individually evaluated the parturient women who received epidural analgesia and analyzed their neonatal outcome, since there might be an association between congenital illness and neonatal infection. On the other hand, in the no epidural analgesia group, 23 neonates (23/818 ， 2.8%) were transferred to NICU under the impression of neonatal infection because of newborn fever or other morbidities such as shortness of breath, small for gestational age, etc.
Conclusions: While our study indicated a higher incidence of neonatal infections in the epidural analgesia group compared to the no epidural group, the difference was not statistically significant.

80 **COVID-19 Infection Rate, The Incidence and Clinical Characteristics of Post-COVID Syndrome in Children**
新型冠狀病毒感染率、新冠後症候群之發生率和臨床特徵在兒童族群之探討

Yu-Ting Zhou[1,4], Tu-Hsuan Chang[5], Chi-Yung Shang[2], Shur-Fen Gau[2], Chia-Wei Lin[3], Sue-Huei Chen[6], An-Ti Shih[7], Fen-Ling Chen[7], Yen-Ju Chu[1], Luan-Yin Chang[1]
Department of Pediatrics, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan [1]; Department of Psychiatry, National Taiwan University Hospital and College of Medicine, Taipei, Taiwan [2]; Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and College Medicine, Taipei, Taiwan [3]; Department of Pediatrics, Tao-Yuan General Hospital, Tao-Yuan, Taiwan [4]; Department of Pediatrics, Chi Mei Medical Center, Tainan City, Taiwan [5]; Department of Psychology, National Taiwan University, Taipei, Taiwan [6]; Department of Social Work, National Taipei University, Taipei, Taiwan [7]
周昱廷 [1,4]、張圖軒 [5]、商志雍 [2]、高淑芬 [2]、林家瑋 [3]、陳淑惠 [6]、施佾玓 [7]、陳芬苓 [7]、朱彥儒 [1]、張鑾英 [1]
國立台灣大學醫學院附設醫院小兒部 [1] 、精神醫學部 [2]、復健部 [3];衛生福利部桃園醫院小兒部 [4];奇美醫院兒科部 [5]; 國立台灣大學心理系 [6]; 國立台北大學社會工作學系 [7]

Background: Taiwan encountered an outbreak of COVID-19 omicron variant in the end of March 2022. More than 1.8 million children got infected. The aim of the study was to understand the impact of post COVID syndrome on the quality of children life and biosocial effects.
Methods: This study was conducted through an online questionnaire survey from Jun. to Nov. 2023. Based on COVID-19 infection, study subjected were grouped into the confirmed group and the control group. We collected demographics, symptoms at the time of confirmation, the persistent physiological and psychological symptoms after recovery from COVID. Various clinical assessment scales including the Modified Medical Research Council (mMRC), the Pediatric Quality of Life Inventory Multidimensional Fatigue Scale (PedsQL), Patient Health Questionnaire-9 (PHQ-9), WHO-5 Well-Being Index, and Family APGAR were used in our questionnaire survey for evaluation.
Results: A total of 1,724 elementary school students, and 310 junior high school students received questionnaire investigation. There were 802 valid questionnaires, with 751 from elementary school students and 51 from junior high school students and above. Of 802 study subjects, 573 (71%) were confirmed cases and 229 (29%) cases were not infected. 20% (112/573) of confirmed cases continued to experience symptoms after recovery. 25% (28/112) of individuals reported symptoms lasting for over three months. The major clinical manifestations included physiological symptoms (11.2%), psychological symptoms (6.4%), persistent fatigue (7.2%), and persistent attention deficit (6.6%). It was significantly different in memory impairment between the confirmed (4.4%) and control (0.4%) groups ($P < 0.005$). In a series of assessment questionnaires, the confirmed cases had higher percentages of high grade mMRC (P=0.012) than the control, and no significant difference was found in other assessments.
Conclusions: This study highlighted that the incidence rate and characteristics of post-COVID syndrome in children. About 20% had post-COVID syndrome and memory impairment was the most significant problem, and higher mMRC score in COVID-19 children.

81 **Comparative Analysis of Clinical Characteristics between RSV and hMPV Infections in Hospitalized Pediatric Patients in Central Taiwan**
中台灣單一醫學中心兒童住院患者中感染呼吸道融合病毒和人類間質肺炎病毒的臨床特徵分析比較

Yu-Ting Chiu, Hsiu-Mei Wei, Jiun-An Chen, Huan-Cheng Lai, Yan Yi Low, Yu-Chang Chang[1], Chiung-Tzu Hsiao[1], Yu-Lung Hsu, Hsiao-Chuan Lin, Kao-Pin Hwang
Pediatric Infectious Diseases, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.; Department of Laboratory Medicine, China Medical University Hospital, China Medical University, Taichung, Taiwan. [1]
邱玉婷、衛琇玫、陳俊安、賴奐丞、劉衍怡、張煜昌 [1]、蕭瓊子 [1]、許玉龍、林曉娟、黃高彬
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院檢驗醫學部 [1]

Background: Respiratory Syncytial Virus (RSV) and Human metapneumovirus (hMPV) are common pathogens that cause respiratory tract infections in infants and young children. This study aims to provide a comprehensive analysis of the clinical presentations and outcomes in hospitalized infants and young children with RSV and hMPV infections.
Methods: This retrospective observational study was conducted at China Medical University Children's Hospital (CMUCH) from January 2020 to December 2021. This study enrolled patients aged under 5 years old who were admitted due to respiratory tract infections with RSV or hMPV detection based on a commercial respiratory panel using real-time polymerase chain reaction. Demographic information, clinical manifestations, and outcomes were collected and analyzed to enable comparative evaluations.
Results: A total of 145 pediatric patients were enrolled in our study. Of these, 82 patients had RSV detection and 63 patients had hMPV detection. The RSV and hMPV groups showed no significant differences in age and gender distribution. Fever, cough, and rhinorrhea were common symptoms in both groups without significant differences. There was no significance observed between the two groups in terms of white blood cell count (8850 vs 8500 per uL, p=0.412) and high-sensitivity C-reactive protein levels (1.1 vs 1.3 mg/dL, p=0.499). Medical treatment did not significantly differ between both groups. However, the hMPV group had a significantly higher rate of antibiotic use than the RSV group (90.5% vs 57.3%, $p < 0.001$). Additionally, there were no significant differences in the duration of hospital stay (5 vs 5 days, p=0.110), need for oxygen (36.6% vs 25.4%, p=0.151), and intensive care unit (ICU) admission (14.6% vs 9.5%, p=0.355) between the two groups. Only one patient with RSV required intubation, and there were no reported mortalities in either group during the study period.
Conclusions: The findings indicate that RSV and hMPV infections have similar clinical presentations, highlighting diagnostic challenges in the absence of molecular methods. Patients with hMPV are more likely to receive antibiotic treatment.

82

Blood Transcriptomic Stratification for Acute Encephalitis/encephalopathy and Croup in Children with Omicron Infection

兒童 Omicron 變異株感染所致急性腦炎/腦病變和哮吼的血液轉錄體分層分析

Chong-Wei Huang[1], Wei-Chao Liao[2], Ian Yi-Feng Chang[2], Jainn-Jim Lin[3], Chen-Yen Kuo[4], Chih-Jung Chen[4], Yhu-Chering Huang[4], Cheng-Hsun Chiu[4], Chih-Ho Chen[5], Yu-Chia Hsieh[4]
Department of Pediatrics, Chang Gung Memorial Hospital, Keelung Branch [1]; Molecular Medicine Research Center, Chang Gung University [2]; Division of Pediatric Critical Care, Department of Pediatrics, Chang Gung Memorial Hospital [3]; Division of Infectious Disease, Department of Pediatrics, Chang Gung Memorial Hospital [4]; Division of Pediatric Infectious Diseases, Department of Pediatrics, Kaohsiung Chang Gung Memorial Hospital [5]
黃崇瑋 [1]、廖威超 [2]、張益峯 [2]、林建志 [3]、郭貞孍 [4]、陳志榮 [4]、黃玉成 [4]、邱政洵 [4]、陳志和 [5]、謝育嘉 [4]
基隆長庚兒童內科 [1]; 長庚大學分子醫學研究中心 [2];林口長庚兒童重症加護科 [3];林口長庚兒童感染科 [4]; 高雄長庚兒童感染科 [5]

Background: Omicron poses significant concerns, leading to two severe complications, encephalitis and croup in children. Neutrophil predominance and lymphopenia were observed in severe cases. We propose a distinctive blood RNA signature to characterize COVID-19's immune landscape, potentially aiding in differentiating severe from mild cases in pediatric patients, with implications for clinical management.
Methods: The case-control cohort spanned two medical centers, Chang Gung Memorial Hospital, Linkou/Kaohsiung branches. Enrolled patients, with confirmed acute SARS-CoV-2 infection, were categorized into mild febrile disease, croup, or encephalitis/encephalopathy. A total of 61 children participated, with 29 mild febrile illness, 14 croup, and 18 encephalitis/encephalopathy cases. Samples collected a median of 2 (1-2) days post-symptom onset underwent RNA sequencing. Differences in gene expression and functional pathways were analyzed.
Results: A total of 1780 and 136 differential expression genes (DEGs) were identified in the comparison of mild disease vs. encephalitis/encephalopathy and mild disease vs. croup, respectively. The results of GOBP and KEGG enrichment analyses revealed the commonly identified DEGs predominantly clustered in the up-regulation of neutrophil function, TNF-alpha signaling pathway, NF-kappa B complex and the downregulation of T cell activation in COVID-19 encephalitis group. The CIBERSORT analysis revealed distinct immunological profiles in the encephalitis group, characterized by elevation in neutrophils, activated dendritic cells and follicular helper T cells, alongside diminished counts of CD4、CD8 T cells, monocytes and naïve B cells. The overexpression of systemic inflammation in severe COVID-19 infection may be attributed to the impaired bridge from innate immunity to adaptive immunity.
Conclusions: In this study, we delineated the immune landscape and functional pathways linked to severe COVID-19 complications in the pediatric population, specifically emphasizing encephalitis. Our findings hold potential for enhancing the precision of diagnosing encephalitis/encephalopathy in pediatric COVID-19 patients.

83

Streptococcus pneumoniae Meningitis in Chang Gung Memorial Hospital, 2011 to 2023

長庚紀念醫院 2011-2023 年間肺炎鏈球菌腦膜炎研究

Ching Min Tang[1,4], Jainn-Jim Lin[1,2,3,4], Kuang-Lin Lin[1,2], Cheng-Hsun Chiu[5,6]
Division of Pediatric Neurology, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan Taiwan[1]; School of Medicine, College of Medicine, Chang Gung University, Taoyuan, Taiwan[2]; Division of Pediatric General Medicine, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan, Taiwan[3]; Division of Pediatric Critical Care, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan, Taiwan[4]; Division of Pediatric Infectious Diseases, Department of Pediatrics, Chang Gung Memorial Hospital, Taoyuan, Taiwan[5]; Molecular Infectious Disease Research Center, Chang Gung Memorial Hospital, Taoyuan, Taiwan[6]
唐青敏 [1,4]、林建志 [1,2,3,4]、林光麟 [1,2]、邱政洵 [5,6]
林口長庚紀念醫院兒童神經科 [1]; 長庚大學醫學系 [2]; 林口長庚紀念醫院一般醫學科 [3]; 林口長庚紀念醫院兒童重症加護科 [4]; 林口長庚紀念醫院兒童感染科 [5]; 林口長庚紀念醫院傳染疾病分子研究中心 [6]

Background: Streptococcus pneumoniae is among the most important causes of bacterial meningitis in both adults and children, often leading to mortality within 24 hours without appropriate treatment. Despite the significance of pneumococcal meningitis as a clinical condition, a comprehensive case series in children is lacking in the PCV13 era.
Methods: We presented a case series including the clinical presentations, laboratory findings, serotypes, outcomes, and complications of 16 patients, including 5 children and 11 adults, with pneumococcal meningitis at a tertiary hospital from 2011 to 2023 in Taiwan.
Results: In children, the mean age was 3.6 years. Majority of the isolates are non-PCV13 serotypes (35B, 23A, and 15B). Two patients had meningitis caused by PCV13 serotypes; however, neither of them received PCV13. Clinical characteristics at admission included fever, productive cough, headache, and decreased consciousness (mean Glasgow Coma Scale:11). Susceptibility to antibiotics were similar, with most of the isolates being resistant to penicillin and ceftriaxone but susceptible to vancomycin. The in-hospital mortality rate was 40% (2/5). Most survivors suffered from complications, including empyema and multiple infarctions following vasculitis. In adults, the mean age was 45.2 years old, and majority of the serotypes were non-PCV13 serotypes. Most had comorbidities, and the complications following meningitis were diverse. Overall, 37.5% of the patients (6/16) had meningitis attributed to PCV13 serotypes; all were non-immunized and occurred before 2015.
Conclusions: We conclude that acute central nervous system complications and chronic neurological sequela of pneumococcal meningitis are common, and PCV13 conferred protection against meningitis to children during the PCV13 era.

84 **Correlation of Vitamin D Level and Post-Acute Sequelae of SARS-CoV-2 Infection Condition Questionnaire in Children**
維生素 D 與兒童新冠感染後遺症的相關性研究

Hung-Hsuan Wang[1], Pei-Chi Chen[2], Lawrence Shih-Hsin Wu[2], Miao-Hsi Hsieh[2], Jiu-Yao Wang[2]
China Medical University Children's Hospital[1]; Allergy, Immunology, and Microbiome (A.I.M) Research Center, China Medical University Children's Hospital[2]
王鈦玄[1]、陳佩琪[2]、吳世欣[2]、謝妙禧[2]、王志堯[2]
中國醫藥大學兒童醫院兒童內科部[1];中國醫藥大學兒童醫院過敏免疫及微菌叢研究中心[2]

Background: COVID-19 may lead to persistent and potentially debilitating clinical symptoms, termed post-acute sequelae of SARS-CoV-2 infection (PASC). Some patients experience subacute, multiorgan symptoms 1 to about 3 months after initial COVID-19 symptoms, a time when replication-competent SARS-CoV-2 is no longer isolatable. Vitamin D, an immunomodulatory hormone, has proven efficacy against upper respiratory tract infections. It inhibits hyperinflammatory reactions and accelerates healing, particularly in lung tissue. Vitamin D deficiency is linked to the severity and mortality of COVID-19, with a high prevalence in cases of acute respiratory failure. Hence, there are compelling reasons to examine the significance of vitamin D levels in children with PASC.
Methods: The PASC condition questionnaire evaluates five common symptoms—persistent respiratory symptoms, cardiovascular symptoms, gastrointestinal symptoms, musculoskeletal symptoms, and neuropsychiatric symptoms—in children with PASC. The vitamin D level, along with anti-N IgG, anti-RBD IgG, anti-S1 IgG, and anti-S2 IgG, was examined in the blood of enrolled PASC patients. Spearman correlation was employed to assess the relationship between the PASC condition questionnaire and the parameters collected from the patients' blood.
Results: The blood vitamin D level exhibited a negative correlation with the score on the PASC condition questionnaire (r: -0.30051; p = 0.0109), indicating that individuals with lower concentrations tended to have higher questionnaire scores. There was no correlation observed with the blood concentrations of the four antibodies tested.
Conclusions: The Vitamin D level is associated with the severity of PASC, with lower concentrations correlating to a greater number of symptoms. However, the Vitamin D level is unrelated to antibody concentrations, whether they are protective or non-protective.

85 **Clinical Characteristics and Risk Factors of Severe Parainfluenza Infection in Hospitalized Children**
副流感病毒感染住院兒童臨床表徵與發展為重症之風險因子分析

Meng-Chiu Pai, Yun-Chung Liu, Ting-Yu Yen, Kuan-Ying Huang, Chun-Yi Lu, Jong-Min Chen, Ping-Ing Lee, Luan-Yin Chang, Li-Min Huang
Department of Pediatrics, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan
白孟丘、劉允中、顏廷聿、黃冠穎、呂俊毅、陳中明、李秉穎、張鑾英、黃立民
台大兒童醫院小兒感染科

Background: Parainfluenza virus infection (PIV) is a common cause of childhood respiratory illness requiring hospitalization in Taiwan. The aims of this study were to investigate clinical severity and identify risk factors predisposing for severe disease in hospitalized children with PIV.
Methods: We included hospitalized patients with lab-confirmed PIV from 2007 to 2018. We collected the demographic and clinical characteristics of the patients. Patients with ventilator support, intravenous inotropic agents, and extracorporeal membrane oxygenation were defined as severe cases.
Results: There were 554 children hospitalized for PIV. The median age was 1.2 years, 518 patients had non-severe PIV infection whereas 36 patients (6.5%) had severe PIV infection. 266 (48%) patients had underlying diseases and 190 patients (34.3%) had evidence of bacterial co-infection. Children with severe PIV infection were more likely to have bacterial co-infections than those without (52.8% vs 33.0%, p = 0.02). Patients with neurological disease (adjusted OR 4.77, 95% CI 1.94-11.68), lung consolidation/patch (adjusted OR 6.64, 95% CI 2.80-15.75) and effusion (adjusted OR 11.59, 95% CI 1.52-88.36) had significantly higher risk to have severe PIV infection.
Conclusions: Neurological disease and lung consolidation/patch or effusion were the most significant predictors associated with severe PIV infection.

86 **Clinical characteristics and associated factors of Bacillus cereus bacteremia**
仙人掌桿菌菌血症的臨床特徵及相關因素

Hsiao-Lun Huang[1,2], Ting-Yu Yen[1], Song-Ming Huang[3], Yee-Chun Chen[4], Ling Ting[5], Tu-Hsuan Chang[2], Luan-Yin Chang[1], Chun-Yi Lu[1], Kuan-Ying A. Huang[1], Li-Min Huang[1]
Division of Pediatric Infectious Diseases, Department of Pediatrics, National Taiwan University Hospital, Taipei, Taiwan[1]; Department of Pediatrics, Chi Mei Medical Center, Tainan, Taiwan[2]; Department of Pediatrics, Fu Jen Catholic University Hospital, New Taipei City, Taiwan[3]; Division of Infectious Diseases, Department of Internal Medicine, National Taiwan University Hospital, National Taiwan University College of Medicine, Taipei, Taiwan[4]; Center for Infection Control, National Taiwan University Hospital, Taipei, Taiwan[5]
黃筱倫[1,2]、顏廷聿[1]、黃崧銘[3]、陳宜君[4]、丁菱[5]、張圖軒[2]、張鑾英[1]、呂俊毅[1]、黃冠穎[1]、黃立民[1]
國立台灣大學醫學院附設醫院小兒部、小兒感染科[1]; 奇美醫療財團法人奇美醫院兒科部[2];天主教輔仁大學附設醫院兒童醫學部[3]; 國立台灣大學醫學院附設醫院內科部、感染科[4];國立台灣大學醫學院附設醫院感染管制中心

Background: Bacillus cereus is an environmental microorganism that may cause opportunistic infection, particularly in immunocompromised patients and preterm neonates. Bacillus cereus positive isolates are often considered a contaminant, and the risk of severe infection is easily overlooked. The study was to explore clinical characteristics and factors associated with Bacillus cereus bacteremia.
Methods: We conducted a retrospective cohort study to enroll inpatients with Bacillus cereus bacteremia in a tertiary hospital in Taiwan from January 2014 to December 2022. Electronic medical records were reviewed to collect demographics, clinical characteristics, laboratory data, treatment outcomes, and relevant complications. Factors associated with treatment success or not were analyzed.
Results: Totally 97 patients were enrolled. The median age was 52 years (interquartile range (IQR), 14.5–68.0 years), and 26 patients (26.8%) were younger than eighteen years old. Eighty-four patients (86.6%) had underlying comorbidities. Treatment was successful in 60 cases (61.9%) and 37 cases (38.1%) failed, including 21 cases of persistent bacteremia, five cases of recurrent bacteremia, four cases of critical against advice discharge, and seven deaths. Patients with administration of parenteral amino acid solution (aOR: 5.173, 95% CI: 1.676-15.967) had a higher risk of treatment failure. Five patients (5.1%) were complicated with central nervous system infection, and all of them had underlying diseases (three leukemia and two preterm infants).
Conclusions: Parenteral amino acid solution is associated with treatment failure of Bacillus cereus bacteremia. Clinicians should be alert to the possibility of concurrent central nervous system infection in patients who have hematological malignancies or premature birth.

87 **Assessment of Clinical Characteristics and Vaccination Effects in Children with Post-Acute Sequelae of COVID-19 in Central Taiwan**
中台灣兒童新冠感染後遺症的臨床特徵和疫苗效果分析

Yu-Lung Hsu, Pei-Chi Chen[1], Lawrence Shih Hsin Wu[2], Yi-Fen Tsai[3], Huan-Cheng Lai, Hsiao-Chuan Lin, Chi-Hung Wei; Kai-Sheng Hsieh[4], Kao-Pin Hwang, Hui-Ju Tsai[3], Jiu-Yao Wang[1,5]
Division of Pediatric Infectious Diseases, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.; Center of Allergy, Immunology and Microbiome (A.I.M), China Medical University Hospital and Children's Hospital, Taichung, Taiwan.[1]; Graduate Institute of Biomedical Sciences, China Medical University, Taichung, Taiwan.[2]; Institute of Population Health Sciences, National Health Research Institutes, Zhunan, Taiwan.[3]; Division of Medical Research, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.[4]; Division of Pediatric Allergy, Immunology and Rheumatology, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.[5];
許玉龍、陳佩琪[1]、吳世欣[2]、蔡宜芬[3]、賴奐丞、林曉娟、魏吉宏; 謝凱生[4]、黃高彬、蔡慧如[3]、王志堯[1,5]
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院過敏免疫及微菌叢研究中心[1]; 中國醫藥大學生物醫學研究所[2]; 國家衛生研究院群體健康科學研究所[3]; 中國醫藥大學兒童醫院醫學研究部[4]; 中國醫藥大學兒童醫院兒童過敏免疫風濕科[5]

Background: To determine whether COVID-19 vaccination impacts the clinical features experienced by children with PASC during both the acute and post-COVID-19 phases of the Omicron pandemic in central Taiwan.
Methods: Children under 18 years with a history of SARS-CoV-2 infection and PASC symptoms for over 4 weeks were enrolled. Data included demographics, clinical information, vaccination status, and symptom persistence after 4 weeks. Logistic regression models were used to compare symptoms in the acute and post-COVID-19 phases and assess the association of vaccination with symptoms in these two phases.
Results: Among 500 children, vaccinated individuals had increased odds of experiencing acute symptoms such as cough (AOR = 1.58; 95% CI:1.03-2.44), nasal congestion (AOR = 1.75; 95% CI:1.14-2.69), sneezing (AOR = 1.67; 95% CI:1.02-2.75), sputum production (AOR = 1.90; 95% CI:1.14-3.17), headache (AOR = 1.70; 95% CI:1.02-2.82), and muscle soreness (AOR = 2.32; 95% CI:1.13-4.79). Conversely, vaccinated children in the post-COVID-19 phase exhibited lower odds of abdominal pain (AOR = 0.49; 95% CI:0.25-0.94) and diarrhea (AOR = 0.37; 95% CI:0.17-0.78).
Conclusions: This study revealed clinical features and vaccination effects in children with PASC in central Taiwan. Vaccination may reduce some gastrointestinal symptoms in the post-COVID-19 phase. Further studies are needed to elucidate the mechanisms and long-term outcomes of vaccination in children with PASC.

88 **Exploration of Clinical Characteristics and Identification of Risk Factors Related to Post-Acute Sequelae of SARS-CoV-2 Infection in Children after Hospital Discharge from SARS-CoV-2 Infection.**
兒童 SARS-CoV-2 感染住院患者的後新冠症候群：臨床特點及風險評估

Huan-Cheng Lai[1], Yu-Lung Hsu[1,2], Pei-Chi Chen[3], Yi-Fen Tsai[4], Chi-Chung Wei[5], Kai-Sheng Hsieh[5], Chien-Heng Lin[6], Kao-Pin Hwang[1], Hui-Ju Tsai[4], Jiu-Yao Wang[3]
Division of Pediatric Infectious Diseases, China Medical

University Children's Hospital, China Medical University – Taichung, Taiwan[1], Graduate Institute of Biomedical Sciences, China Medical University – Taichung, Taiwan[2], Center of Allergy, Immunology and Microbiome (A.I.M), China Medical University Hospital and Children's Hospital – Taichung, Taiwan[3], Institute of Population Health Sciences, National Health Research Institutes – Miaoli, Taiwan[4], Division of Medical Research, China Medical University Children's Hospital - Taichung , Taiwan[5], Division of Pediatric Pulmonology and Intensive Care, China Medical University Children's Hospital, China Medical University – Taichung, Taiwan[6]
賴奐丞[1]、許玉龍[1,2]、陳佩琪[3]、蔡宜芬[4]、魏吉宏[5]、謝凱生[5]、林建亨[6]、黃高彬[1]、蔡慧如[4]、王志堯[3]
中國醫藥大學兒童醫院兒童感染科[1], 中國醫藥大學生物醫學研究所[2], 中國醫藥大學過敏免疫及微菌叢研究中心[3], 國家衛生研究院[4], 中國醫藥大學兒童醫院醫學研究部[5], 中國醫藥大學兒童醫院兒童胸腔科[6]

Background: Comprehension of the post-acute sequelae of SARS-CoV-2 infection (PASC) in children previously admitted for COVID-19 remains inadequate. The objective of this research is to recognize the clinical characteristics and risk factors of PASC in pediatric COVID-19 patients after their discharge.
Methods: This retrospective cohort investigation carried out at China Medical University Children's Hospital in Taiwan involved individuals aged 3-18 who were admitted due to acute COVID-19 during the Omicron pandemic spanning from April 2022 to July 2023. Post-acute sequelae of SARS-CoV-2 infection (PASC) were evaluated through telephone conversations, electronic correspondence, or face-to-face follow-ups. Information covering demographics, clinical manifestations, laboratory findings, and acute-phase interventions was gathered and compared between pediatric patients with and without PASC. A clinical score was assigned to each child based on acute-phase symptoms and treatments, subsequently assessed for its correlation with the presence of PASC.
Results: Among the 143 children who were discharged, PASC developed in 35.7% of cases. Children experiencing PASC tended to be of an older age (average age: 7.6 vs. 6.3 years, p=0.05) and had a higher body weight (29.1 vs. 23.7 kilograms, p=0.05). PASC-afflicted children demonstrated higher cycle threshold (Ct) values in reverse transcriptase-polymerase chain reaction (RT-PCR) testing (17.1 vs. 14.2, p=0.04). No significant differences were observed in various laboratory results, duration of ICU stays, bacterial co-infections, oxygen supplementation, or medication usage between the two groups. Notably, children with PASC exhibited elevated total clinical symptom scores (37.6 vs. 31.5, p=0.03).
Conclusions: The manifestation of PASC in children post-COVID-19 discharge is a relatively common phenomenon in Taiwan. Factors such as older age, increased body weight, and higher RT-PCR Ct values during the acute phase are recognized as potential risk factors contributing to the PASC. The development of a clinical scoring system is essential to predict the probability of PASC occurrence in children following their discharge from COVID-19 treatment.

The Influence of Epstein-Barr Virus in Children with Post-Acute Sequelae of COVID-19 in Central Taiwan
Epstein-Barr 病毒對兒童新冠感染後遺症的影響

Yu-Lung Hsu, Pei-Chi Chen[1], Lawrence Shih Hsin Wu[2], Kai-Sheng Hsieh[3], Huan-Cheng Lai, Hsiao-Chuan Lin, Kao-Pin Hwang, Jiu-Yao Wang[1,4]
Division of Pediatric Infectious Diseases, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.; Center of Allergy, Immunology and Microbiome (A.I.M), China Medical University Hospital and Children's Hospital, Taichung, Taiwan.[1]; Graduate Institute of Biomedical Sciences, China Medical University, Taichung, Taiwan.[2]; Division of Pediatric Cardiology, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.[3]; Division of Pediatric Allergy, Immunology and Rheumatology, China Medical University Children's Hospital, China Medical University, Taichung, Taiwan.[4];
許玉龍、陳佩琪[1]、吳世欣[2]、謝凱生[3]、賴奐丞、林曉娟、黃高彬、王志堯[1,4]
中國醫藥大學兒童醫院兒童感染科; 中國醫藥大學附設醫院過敏免疫及微菌叢研究中心[1]; 中國醫藥大學生物醫學研究所[2]; 中國醫藥大學兒童醫院兒童心臟科[3]; 中國醫藥大學兒童醫院兒童過敏科[4]

Background: Post-acute sequelae of COVID-19 (PASC) is a condition that can affect children following their recovery from COVID-19. Epstein-Barr virus (EBV) has previously been linked to the severity of acute COVID-19 and the development of PASC in adults. However, the role of EBV in children recovering from COVID-19 remains not fully understood. This study aims to explore the connection between EBV detection and PASC in pediatric patients.
Methods: This study includes participants from the DISCOVER (Diagnosis and Support for COVID Children to Enhance Recovery) study cohort conducted at China Medical University Children's Hospital in central Taiwan during the Omicron pandemic. Children aged 3-18 years, previously confirmed with SARS-CoV-2 infection through polymerase chain reaction (RT-PCR) or antigen rapid tests, diagnosed with PASC, were enrolled between October 1, 2022, and August 15, 2023. Clinical characteristics were assessed in children with PASC, and EBV presence was determined through serum analysis. To assess the impact of EBV in children with PASC, participants were divided into two groups: those with EBV detection and those without.
Results: Among the 113 children diagnosed with PASC, eight (7.1%) showed evidence of EBV detection. The mean age of all PASC children was 9.4 years, with 63 (55.8%) being male. Common acute-phase symptoms included fever (61.9%), cough (60.2%), and rhinorrhea (57.5%). The most prevalent symptoms in PASC were chest pain (46.0%), palpitations (38.9%), and fatigue (37.2%). Children with PASC and EBV detection were typically younger (7.3 vs. 9.9 years, p=0.009) and had higher rates of nausea during the acute phase (37.5% vs. 6.7%, p=0.021) and PASC (62.5% vs. 14.3%, p=0.003) compared to those without EBV detection.
Conclusions: Our findings suggest a relatively low incidence of Epstein-Barr Virus detection in children with PASC during the Omicron pandemic. EBV detection may be linked to PASC in children, particularly when accompanied by nausea as a prominent symptom. Further research is required to elucidate the pathogenesis and clinical implications of EBV detection in pediatric COVID-19 patients.

Clinical Characteristic of Traditional Chinese Medicine Usage in Pediatric Post-Acute COVID-19 Syndrome: A

Retrospective Observational Study
兒童後新冠症候群使用傳統中醫的臨床特色：回顧性觀察研究

Miao-Chun Tsai[1], Yu-Chih Hsu[1], Szu-Yu Pan[1], Fen-Wei Huang[3], Hung-Rong Yen[2,4], Jiu-Yao Wang[5,6], Wan-Yu Lai[1,2]
Department of Chinese Medicine,China Medical University Hospita;Department of Chinese Medicine Pediatrics,Taichung,Taiwan[1];School of Chinese Medicine,College of Chinese Medicine,China Medical University,Taichung,Taiwan[2];Department of Medical Research,China Medical University Hospital,Taichung,Taiwan[3];Department of Chinese Medicine,China Medical University Hospita;Department of Integration of Chinese and Western Medicine,Taichung,Taiwan[4];Department of Allergy and Immunology , Children's Hospital, China Medical University,Taichung,Taiwan[5];Research Center of Allergy, Immunology, and Microbiome(A.I.M.),China Medical University Children's Hospital,Taichung,Taiwan[6]
蔡妙君[1]、許有志[1]、潘思佑[1]、黃芬緯[3]、顏宏融[2,4]、王志堯[5,6]、賴琬郁[1,2]
中國醫藥大學附設醫院中醫部、中醫兒童科[1];中國醫藥大學中醫學院[2];中國醫藥大學附設醫院醫學研究部[3];中國醫藥大學附設醫院中醫部、中西醫結合科[4];中國醫藥大學兒童醫院兒童過敏免疫風濕科[5];中國醫藥大學附設醫院過敏免疫與微菌叢研究中心[6]

Background: The utilization rate of Traditional Chinese Medicine (TCM) among children is 22.5% in Taiwan. Some children experiencing sequelae after COVID will seek TCM treatment. However, there have been no reports on the characteristics with post-acute COVID-19 syndrome among children. The study aims to analyze the clinical features of pediatric patients for post-acute COVID-19 syndrome.
Methods: We included patients under 18 years old diagnosed with post-acute COVID syndrome at the Children's Hospital of China Medical University from July,2022, to January,2023. Patients are divided into two groups based on the treatment after diagnosis, namely the TCM users and the non-TCM users. A cross-sectional study was conducted to analyze the differences between two groups based on variables such as age, gender, body shape, vaccination status, past experience of complementary therapy, acute COVID symptoms, and post-acute symptoms.
Results: The study enrolled 435 patients, categorized into TCM users (n=72) and non-TCM users (n=363). In these two groups, the majority are male and normal body shape. Comparing with non-TCM users, TCM users were older in age (9.1±3.8 vs.7.6±5.2, $P < 0.05$), a significant higher proportion receiving covid vaccinated (68.3% vs. 52.3%, $P < 0.05$), and a higher past complementary therapy experience (55.6% vs. 9.6%, $P < 0.01$). A significant higher proportion of following acute symptoms during COVID diagnosis in TCM users, chilliness, fatigue, headache, sneeze, productive cough, nausea, diarrhea, abdominal pain, and muscle pain. A significant higher proportion symptoms of post-acute COVID syndrome in TCM users, including shortness of breath (41.3%), fatigue (57.1%), reduced stamina (41.3%), muscle pain (23.8%), joint pain (14.3%), sore throat (46%), and limited activity (55.6%).
Conclusions: The study provides the characteristics of children with post-acute COVID-19 syndrome and focused on the utilization of TCM. We can infer that TCM users had awareness of health with higher covid-vaccinated rate and multi-symptom discomforts during acute and post-acute COVID. It can offer valuable insights for healthcare strategies and investigations.

Parental Perception of Child's Weight and Its Role in Childhood Obesity: Insights from Hsinchu County, Taiwan
從新竹縣的群體調查探討家長對兒童體重的認知與兒童肥胖問題

An-Kuo Chou[1, 2], Chun-Hua Liao[1], Chien-Ting Hsu[1], Wei-Li Hung[1], Meng-Ju Li[1], Yao-Hsu Yang[1, 3], Duan-Ruan Chen[4, 5]
Department of Pediatrics, National Taiwan University Hospital Hsin-Chu Branch Hsinchu, Taiwan[1]； Institute of Health Policy and Management, College of Public Health, National Taiwan University, Taipei, Taiwan [2]； Department of Pediatrics, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan [3] ； Population Health Research Center, National Taiwan University, Taipei, Taiwan [4]； Institute of Health Behaviors and Community Sciences, College of Public Health, National Taiwan University, Taipei, Taiwan [5]
周安國[1, 2]、廖君樺[1]、徐千婷[1]、洪瑋勵[1]、李孟如[1]、楊曜旭[1, 3]、陳端容[4, 5]
國立臺灣大學醫學院附設醫院新竹臺大分院小兒部[1]；國立臺灣大學公共衛生學院健康政策與管理研究所[2]；國立臺灣大學醫學院醫學系小兒部[3]；國立臺灣大學公共衛生學院群體健康研究中心[4]；國立臺灣大學公共衛生學院健康行為與社區科學研究所[5]

Background: Childhood obesity is a significant health issue worldwide and in Taiwan, with rates in school-age children now at 26.4%. This study investigates the impact of parental perceptions of their child's weight on childhood obesity in Hsinchu County, Taiwan.
Methods: Concentrating on a cohort of children aged 10-11 years and their parents, this study included 3,620 children from 30 schools, selected using a probability-proportional-to-size approach. This sample represents 15.23% of the target age group in Hsinchu County. Data from 2868 parent-child dyads were gathered, with 2507 dyads yielding valid responses (93.33% validation rate). The anonymous survey collected data on family socioeconomic indicators, parental BMI, perceptions of child adiposity, and children's activity patterns. Item-level missing data were minimal (1.2%), with multiple imputation techniques applied to analyze validated questionnaires.
Results: The prevalence of overweight/obesity (OW/OB) was 24.42%. Univariate and multivariate logistic regression analyses illuminated health disparities in childhood obesity, influenced by socioeconomic and perceptual parental variables. Duration of outdoor activity emerged as a pivotal behavioral factor, with extensive activity ($>$ 90 minutes) inversely correlated with OW/OB (AOR = 0.65, p=0.012). Screen time trends suggested an association with increased OW/OB risk, albeit not reaching statistical significance. Parental underestimation of child weight status was significantly linked to increased OW/OB risk (AOR = 3.06 for fathers, 2.54 for mothers, $p < 0.001$), underscoring the need for enhanced parental awareness. Mothers' higher educational attainment emerged as a protective factor against childhood OW/OB (AOR = 0.67, p=0.005). Notably, residing outside Zhubei was associated with increased OW/OB risk

(AOR = 1.38, p=0.004), signifying regional health disparities.
Conclusions: The study emphasizes the critical role of parental perception in addressing childhood obesity, advocating for public health strategies that encompass family and environmental interventions to effectively manage and prevent obesity.

92 **Clinical Characteristics in BK Polyomavirus Infection After Pediatric Kidney Transplantation**
小兒腎移植後 BK 病毒感染的臨床特徵

Chung-Wei Wu, Ching-Yung Lin
Division of Pediatric Nephrology, Children's Hospital, China Medical University, Taichung, Taiwan
吳重緯、林清淵
中國醫藥大學兒童醫院

Background: BK virus (BKV) is a significant cause of chronic kidney injury in kidney transplant recipients that results in allograft loss. The common clinical manifestations range from asymptomatic viral viremia to BKV-associated nephropathy. The study's aim was to determine the clinical characteristics of those who had BK viremia versus those who did not.
Methods: The retrospective case-control study was conducted from January 2008 to July 2022 in the Children's Hospital, China Medical University. The subjects were composed of a total of 32 pediatric KTRs and 12 with BKV viremia, in which 5 of 12 had BKVN were obtained. Peripheral blood mononuclear cells (PBMCs) were collected during episodes of BKV viremia.
Results: The mean time for BK detection was 4.1 months after renal transplantation. Percent rise in serum creatinine correlated with intensity of viral load. There were no significant differences in sex, age, type of transplantation donor and type of renal diagnosis (glomerulonephritis, non-glomerulonephritis or monogenic gene defect), induction and maintenance therapy. The first-line therapy after identification of BKV viremia was a decreased dosage in Tacrolimus (100%) and intravenous immunoglobulin, and discontinuing mycophenolate mofetil. When reduction in immunosuppressant was not sufficient to decrease viral load, 4/12 (33.3%) of patients received leflunomide.
Conclusions: Patients with the highest viral loads and longest duration of BKV viremia are at risk of BKVN. BKV viremia may be a surrogate marker for adjusting immunosuppressant reduction and intravenous immunoglobulin treatment.

93 **The Association of HLA Alleles with IgA Nephropathy in a Taiwanese Population**
人類白血球抗原基因與 IgA 腎炎之關聯: 一台灣族群之研究

Yung-Chieh Huang[1,5,7], I-Chieh Chen[2], Tzu-Hung Hsiao[2,6], Yi-Ming Chen[2,3,4,5], Lin-Shien Fu[1,4,5]
Department of Pediatrics[1], Department of Medical Research[2], Division of Allergy, Immunology and Rheumatology, Department of Internal Medicine[3], Taichung Veterans General Hospital, Taichung, Taiwan; School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan[4]; Department of Post-Baccalaureate Medicine, College of Medicine[5], Institute of Genomics and Bioinformatics[6], Rong Hsing Translational Medicine Research Center[7], National Chung Hsing University, Taichung, Taiwan
黃永杰[1,5,7]、陳怡潔[2]、蕭自宏[2,6]、陳一銘[2,3,4,5]、傅令嫻[1,4,5]
台中榮總兒童醫學中心[1]、醫學研究部[2]、內科部過敏免疫風濕科[3]；國立陽明交通大學醫學院[4]；國立中興大學醫學院學士後醫學系[5]、基因體暨生物資訊學研究所[6]、榮興轉譯醫學研究中心[7]

Background: IgA nephropathy (IgAN) has been reported to be associated with certain human leukocyte antigen (HLA) alleles, but the results in the literature varied greatly among different countries or ethics. We investigated the association of biopsy-proven IgAN and HLA alleles in a Taiwanese population.
Methods: We analyzed the data from Taiwan Precision Medicine Initiative retrospectively as a case-control study. We identified 157 patients with biopsy-proved IgAN between January 2011 and August 2022 in Taichung Veterans General Hospital. The data were analyzed by comparing variables to 1570 non-IgAN individuals.
Results: The alleles frequencies of HLA-C*08:01, DQA1*01:05, DQA1*03:01, DQA1*03:03, DQB1*03:02, DQB1*04:01, DRB1*04:03, DRB1*04:05, and DRB1*10:01 were significantly higher among IgAN patients than non-IgAN individuals. On the other hand, HLA- B*58:01, DQA1*05:01, DQB1*02:01, and DRB1*03:01 were significantly lower among IgAN patients.
Conclusions: Some of the alleles we found in this study have been reported in other populations/ethics, but C*08:01, DQA1*01:05, DQA1*03:01, DQA1*03:03, DRB1*10:01 were found to be associated with IgAN for the first time; B*58:01 and DQA1*05:01 have not been reported to be protective in previous reports. Further studies of HLA alleles associated with IgAN are necessary to understand the disease pathogenesis of IgAN.

94 **The Implementation of Whole-genome Sequencing Analysis in Pediatric Frequent Relapsing Nephrotic Syndrome for Personalized Therapeutic Strategies**
應用全基因定序分析進行兒童頻繁復發性腎病症候群的個人化治療策略

Yi-Hsuan Tang[1,2], Hsin-Hui Wang[1,2], Chien-Hung Lin[1,2], Hui-Lan Chen[1,2]
Department of Pediatrics, Division of Pediatric Immunology and Nephrology, Taipei Veterans General Hospital, Taipei, Taiwan[1]. National Yang Ming Chiao Tung University, Taipei, Taiwan[2]
唐翊軒[1,2]、王馨慧[1,2]、林建宏[1,2]、陳惠蘭[1,2]
臺北榮總兒童醫學部兒童免疫腎臟科[1], 國立陽明交通大學[2]

Background: Frequent relapsing nephrotic syndrome (FRNS) is a relatively uncommon and often idiopathic condition in pediatric group with varied prevalence based on geographic location and population demographics. Exploring alternative immunosuppressants or consider personalized therapeutic strategies plays a crucial role in FRNS are at high risk of developing steroid dependence to affects growth and development in childhood. This study aims to identify specific genetic mutation through whole-genome sequencing (WGS) analysis contributing to FRNS and implement it to

optimize treatment efficacy and minimize side effects.
Methods: This cohort study enrolled twenty-three patients diagnosed with FRNS since childhood. All patients underwent comprehensive WGS analysis. Additionally, we conducted a thorough analysis of clinical characteristics, including blood and urine examinations, and kidney ultrasonography.
Results: Fifteen (65.2%) are male. The mean age is 14.9 years (range: 5-36 years) The mean relapsing interval is 5.5 months (range 3.2-16). The majority of cases, diagnosed through biopsy-proven analysis, indicate minimal change disease nephropathy in 30.4% (n=7). Additionally, IgA nephropathy is observed in 17.4% (n=4), and focal segmental glomerulosclerosis is identified in 8.7% (n=2). Among the cohort, eight patients (34.8%) received immunomodulation therapy with Rituximab or high-dose intravenous immunoglobulin, resulting in a proteinuria-free status, and are currently undergoing the tapering of corticosteroid dosage. The results of WGS analysis in FRNS showed PKD are the most mutation positions. NPHS1, MUC1, RUNX1, RP1L1 and WT1 are also reported.
Conclusions: Tailoring therapeutic strategies based on the personalized genetic profile holds the potential to implement more precise and targeted approaches in the intervention for FRNS. With WGS-based precision medicine, there is the prospect of reducing the reliance on corticosteroids and mitigating their impact on growth and development. Hence, implementation with WGS can achieve the best possible outcomes and potential long-term effects on the healthcare of a child with FRNS.

94 **The Implementation of Whole-genome Sequencing Analysis in Pediatric Frequent Relapsing Nephrotic Syndrome for Personalized Therapeutic Strategies**
應用全基因定序分析進行兒童頻繁復發性腎病症候群的個人化治療策略

Yi-Hsuan Tang[1,2], Hsin-Hui Wang[1,2], Chien-Hung Lin[1,2], Hui-Lan Chen[1,2]
Department of Pediatrics, Division of Pediatric Immunology and Nephrology, Taipei Veterans General Hospital, Taipei, Taiwan[1]. National Yang Ming Chiao Tung University, Taipei, Taiwan[2]
唐翊軒[1,2]、王馨慧[1,2]、林建宏[1,2]、陳惠蘭[1,2]
臺北榮總兒童醫學部兒童免疫腎臟科[1], 國立陽明交通大學[2]

Background: Frequent relapsing nephrotic syndrome (FRNS) is a relatively uncommon and often idiopathic condition in pediatric group with varied prevalence based on geographic location and population demographics. Exploring alternative immunosuppressants or consider personalized therapeutic strategies plays a crucial role in FRNS are at high risk of developing steroid dependence to affects growth and development in childhood. This study aims to identify specific genetic mutation through whole-genome sequencing (WGS) analysis contributing to FRNS and implement it to optimize treatment efficacy and minimize side effects.
Methods: This cohort study enrolled twenty-three patients diagnosed with FRNS since childhood. All patients underwent comprehensive WGS analysis. Additionally, we conducted a thorough analysis of clinical characteristics, including blood and urine examinations, and kidney ultrasonography.
Results: Fifteen (65.2%) are male. The mean age is 14.9 years (range: 5-36 years) The mean relapsing interval is 5.5 months (range 3.2-16). The majority of cases, diagnosed through biopsy-proven analysis, indicate minimal change disease nephropathy in 30.4% (n=7). Additionally, IgA nephropathy is observed in 17.4% (n=4), and focal segmental glomerulosclerosis is identified in 8.7% (n=2). Among the cohort, eight patients (34.8%) received immunomodulation therapy with Rituximab or high-dose intravenous immunoglobulin, resulting in a proteinuria-free status, and are currently undergoing the tapering of corticosteroid dosage. The results of WGS analysis in FRNS showed PKD are the most mutation positions. NPHS1, MUC1, RUNX1, RP1L1 and WT1 are also reported.
Conclusions: Tailoring therapeutic strategies based on the personalized genetic profile holds the potential to implement more precise and targeted approaches in the intervention for FRNS. With WGS-based precision medicine, there is the prospect of reducing the reliance on corticosteroids and mitigating their impact on growth and development. Hence, implementation with WGS can achieve the best possible outcomes and potential long-term effects on the healthcare of a child with FRNS.

95 **Genetic contribution to Acquired cystic kidney disease in young age end-stage renal disease**
年輕末期腎病合併囊性腎病變的遺傳因素

Hsin-Pei Yang, Yi-Hsuan Tang, Hui-Lan Chen, Chien-Hung Lin, Hsin-Hui Wang
Department of Pediatrics, Divison of Pediatric Nephrology and Immunology, Taipei Veterans General Hospital
楊芯霈、唐翊軒、陳蕙蘭、林建宏、王馨慧
臺北榮民總醫院兒童醫學部兒童免疫腎臟科

Background: Acquired cystic kidney disease (ACKD), characterized by the formation of fluid-filled cysts in the kidneys, is predominantly associated with aging and advanced chronic kidney disease (CKD). However, the mechanisms leading to ACKD in young individuals with end-stage renal disease (ESRD) remain unclear.
Methods: In this report, we present three cases of young individuals with ESRD undergoing regular peritoneal dialysis. Renal sonography revealed bilateral enlargement of the kidneys with multiple cyst lesions. The underlying causes of ESRD in these cases were focal segmental glomerulosclerosis (FSGS), systemic lupus erythematosus (SLE), and an allergy to cisplatin, respectively. Notably, the duration of dialysis ranged from 4 to 20 years.
Results: To explore the potential genetic contributions to ACKD in these young ESRD patients, genomic profiling was conducted. Interestingly, genetic mutations were identified in all three cases. Importantly, these mutations were distinct from those typically associated with polycystic kidney disease and were not directly linked to the underlying renal diseases causing ESRD. This discovery suggests that genetic factors beyond those associated with the primary renal conditions may play a role in the development of ACKD in young individuals with ESRD. The identification of specific genetic mutations unrelated to the underlying diseases underscores the complexity of ACKD's pathogenesis.
Conclusions: Understanding the intricate interplay between genetic and disease risk factors is essential for developing targeted interventions and personalized treatment approaches for ACKD. Future studies will delve deeper into unraveling the specific interactions between the underlying diseases and

genetic predispositions, providing valuable insights into the complex etiology of ACKD in young age ESRD patients.

96 **Comparative Analysis of Spleen Tyrosine Kinase Expression in Pediatric and Adult Patients with IgA Nephropathy**

兒童與成人 IgA 腎病變患者脾臟酪胺酸激酶表現的比較分析

Mei-Ching Yu[1,2], Li-Jia Wu[1], Tai-Di Chen[3]
Department of Pediatric Nephrology, Lin-Kou Chang Gung Memorial Hospital[1];College of Medicine, Chang Gung University[2];Department of Anatomic Pathology, Lin-Kou Chang Gung Memorial Hospital[3]
余美靜 [1,2]、吳莉佳 [1]、陳泰迪 [3]
林口長庚紀念醫院 兒童腎臟科 [1];長庚大學 醫學系 [2];林口長庚紀念醫院 解剖病理科 [3]

Background: Spleen tyrosine kinase (SYK), a cytosolic protein tyrosine kinase expressed in various leukocytes, plays a crucial role in the signaling pathways of immunoreceptors such as B-cell and Fc receptors, as well as certain integrins and C-type lectins. Consequently, targeting SYK has emerged as a potential therapeutic strategy for a range of immune and inflammatory diseases, including IgA nephropathy (IgAN). In this study, we aim to investigate the expression of SYK in the kidneys of both pediatric and adult patients with IgAN.
Methods: This retrospective study involved an analysis of 31 pediatric patients (18 years or younger) (Age: 12.0±4.5 years, female/male=9/22) and 49 adult patients (Age: 40.9±12.0, female/male=28/21) diagnosed with IgAN through renal biopsy. Archived paraffin-embedded kidney tissue sections were obtained from the Lin-Kou Chang Gung Memorial Hospital tissue bank. To measure total SYK expressions in the glomeruli and/or tubulointerstitium, immunohistochemistry was employed. Additionally, clinical and laboratory data were collected from the patients' medical records
Results: In adult IgAN patients, the total expression of SYK in both glomeruli (median: 19.71, interquartile range [IQR]: 17.63-22.99) and tubulointerstitium (median: 22.48, IQR: 20.28-25.27) was significantly higher compared to the glomerular SYK expression observed in pediatric IgAN patients (median: 0.08, IQR: 0.04-0.15). This difference was statistically significant ($P<0.05$) as determined by the Mann-Whitney test using OriginPro software.
Conclusions: Clinically, pediatric IgAN tends to have more favorable outcomes compared to adult IgAN. Our study noted that pediatric IgAN patients exhibited lower total SYK expression in their kidneys compared to adults. This discrepancy may be attributed to variations in immune system maturity, differences in disease pathology, and/or the progression and duration of the disease.

97 **Urine Neutrophil Gelatinase-Associated Lipocalin/Creatinine and Albumin/Creatinine in Early Differentiating Pediatric Urinary Tract Infection, Roseola Infantum and Kawasaki Disease**

尿液嗜中性白血球明膠酶相關運載蛋白/肌酸酐比值和白蛋白/肌酸酐比值在早期區分小兒尿路感染、玫瑰疹及川崎病的應用

Nai-Wen Fang[1,2], Yu-Shan Huang[2], Song-Lin Wu[2], Cai-Sin Yao[3], Ken-Pen Weng[4], Yee-Hsuan Chiou[2]
Department of Pediatrics, Pingtung Veterans General Hospital, Taiwan[1], Division of Pediatric Nephrology, Department of Pediatrics, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan[2], Department of Medical Education and Research, Kaohsiung Veterans General Hospital, Taiwan[3],Congenital Structural Heart Disease Center, Department of Pediatrics, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan[4]
方乃文 [1,2]、黃鈺珊 [2]、吳松霖 [2]、姚采忻 [3]、翁根本 [4]、邱益煊 [2]
屏東榮民總醫院小兒科 [1];高雄榮總兒童醫學部兒童腎臟科 [2];高雄榮總教學研究部 [3];高雄榮總兒童醫學部先天性結構性心臟病中心 [4]

Background: Urinary tract infection (UTI) is prevalent among children and often diagnosed through pyuria (defined as urine white blood cells $>$ 5 per high power field) and positive urine culture. However, pyuria is observed in 13% and 79.8% of children with roseola infantum and Kawasaki disease (KD), respectively, leading to a clinical challenge in treating febrile children with pyuria. Neutrophil gelatinase-associated lipocalin (NGAL) is expressed in α-intercalated cells in the kidney's collecting duct. We aim to utilize urine NGAL/creatinine (uNGAL/Cr) and urine albumin/creatinine ratio (UACR) as biomarkers for distinguishing UTI, roseola infantum, and KD in the early febrile stage.
Methods: We enrolled febrile children aged 4 months to 6 years at Kaohsiung Veterans General Hospital from Jan/2019 to Dec/2023. UTI is defined by pyuria and positive urine culture. Roseola infantum is identified in children with 3-5 days of fever, sudden defervescence, and subsequent trunk maculopapular rash. Control group includes children with fever from respiratory or gastrointestinal infections. We measured uNGAL/Cr (ng/mg) and UACR (mg/mg) during the febrile stage and before intervention. Patient demographics and laboratory data were collected for comparison.
Results: We enrolled 167 children (71 with UTI, 28 with Roseola infantum, 21 with KD, and 33 in the control group). The mean age is 19 months. Urine tests were done on average on the 2.4th day of fever onset. During the febrile stage, uNGAL/Cr in the UTI group is significantly higher than in the Roseola or control group (Mean: 902(516-1288)ng/mg, 121(61-181)ng/mg, $P = 0.009$, and 44(25-64)ng/mg, $P < 0.001$, respectively). UACR is also higher in the UTI group compared to Roseola or control (0.53(0.34-0.71)mg/mg, 0.04(0.03-0.05)mg/mg, $P < 0.001$, and 0.04(0.03-0.05), $P < 0.001$, respectively); however, uNGAL/Cr and UACR are similar in the UTI and KD groups. The AUC-ROC values for uNGAL/Cr and UACR are 0.806 and 0.844, respectively. With uNGAL/Cr at 57.6 ng/mg and UACR at 0.04, sensitivity is over 90% for detecting urinary tract infections.
Conclusions: uNGAL/Cr and UACR may be useful urine biomarkers in early differentiating pediatric UTI from roseola infantum.

98 **Perinatal Citrulline Supplementation Rescues Hypertension in Adult Male Offspring from Uremic Mother Rats**

針對尿毒症雌鼠產前瓜胺酸的補充能避免成年雄性後代罹患高血壓

Hsin-Jung Lee[1], ou-Lin Tain[2,3,4], Chih-Yao Hou[5], Guo-Ping Chang-Chien[6,7,8], Sufan Lin[6,7,8], Chien-Ning Hsu[9,10*]
Department of Pediatric, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung 833, Taiwan [1]; Division of Pediatric Nephrology, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung 833, Taiwan [2]; College of Medicine, Chang Gung University, Taoyuan 330, Taiwan[3]; Institute for Translational Research in Biomedicine, Kaohsiung Chang Gung Memorial Hospital 833, Taiwan[4]; Department of Seafood Science, National Kaohsiung University of Science and Technology, Kaohsiung 811, Taiwan[5]; Institute of Environmental Toxin and Emerging-Contaminant, Cheng Shiu University, Kaohsiung, 833301, Taiwan [6]; Super Micro Mass Research and Technology Center, Cheng Shiu University, Kaohsiung 833, Taiwan [7]; Center for Environmental Toxin and Emerging-Contaminant Research, Cheng Shiu University, Kaohsiung 833, Taiwan[8]; Department of Pharmacy, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung 833, Taiwan[9]; School of Pharmacy, Kaohsiung Medical University, Kaohsiung 807, Taiwan[10]
李欣蓉 [1]、田祐霖 [2,3,4]、侯智耀 [5]、張簡國平 [6,7,8]、林淑芬 [6,7,8]、許茜甯 [9,10*]
高雄長庚兒童內科部 [1]; 高雄長庚兒童腎臟科 [2]; 長庚大學醫學院 [3]; 高雄長庚醫院生物醫學轉譯研究所 [4]; 國立高雄科技大學海洋生物學系 [5]; 正修科技大學環境毒物與新興污染研究機構 [6]; 正修科技大學超微量研究科技中心 [7]; 正修科技大學環境毒物與新興污染研究中心 [8]; 高雄長庚藥劑部 [9]; 高雄醫學大學藥學系 [10]

Background: It is increasingly recognized that maternal chronic kidney disease (CKD) is implicated in fetal programming, contributing to the future risk of offspring hypertension. Possible mechanisms include oxidative stress, gut microbiota dysbiosis, and activation of the renin-angiotensin system (RAS). Citrulline not only increases nitric oxide (NO) production but also serves as an antioxidant with antihypertensive properties. We investigated whether perinatal citrulline administration can reverse high blood pressure (BP) in offspring born to dams with CKD.
Methods: Both normal and adenine-induced CKD-modeled male rat offspring were randomly divided into four groups (8 animals each) as follows: 1) control, 2)CKD, 3)citrulline-treated control rats, and 4)citrulline-treated CKD rats.
Results: Citrulline supplementation significantly reversed high BP in male offspring from maternal CKD. The protective actions of perinatal citrulline supplementation were associated with augmented NO pathway, reduced renal (pro)renin receptor expression, and alterations in gut microbiota. Citrulline supplementation caused a decreased abundance of the genera Monoglobus and Streptococcus and an increase in Agothobacterium Butyriciproducens.
Conclusions: It is concluded that perinatal citrulline treatment increased NO availability and decreased elevated blood pressure caused by maternal CKD in rat offspring.

99

Impact of Acute Kidney Injury and Associated Risk Factors in a Taiwanese Pediatric Intensive Care Unit
台灣兒童加護病房內急性腎損傷影響和風險因子分析

Jeng-Hung Wu[1,2], Teng-Hung Chang[3], Siang-Rong Lin[3], Ching-Chia Wang[1], En-Ting Wu[1], Frank Leigh Lu[1], Chia-Ching Chou[3], Luan-Yin Chang[1], I-Jung Tsai[1]
Department of Pediatrics, National Taiwan University Children's Hospital[1];Department of Medicine, National Taiwan University Hospital Jinshan branch[2];Institute of Applied Mechanics, National Taiwan University[3]
吳政宏 [1,2]、張登紘 [3]、林湘容 [3]、王景甲 [1]、吳恩婷 [1]、呂立 [1]、周佳靚 [3]、張鑾英 [1]、蔡宜蓉 [1]
國立臺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金山分院醫療部 [2];國立臺灣大學應用力學研究所 [3]

Background: Acute kidney injury (AKI) causes high morbidity and mortality in pediatric intensive care units (PICUs). With the recent renew of AKI definition by Kidney Disease: Improving Global Outcomes (KDIGO) consensus, the epidemiology, associated risk factors and outcomes of AKI in PICU remained unclear especially in Taiwan. This study aims to assess the incidence, risk factors and outcomes for children diagnosed of AKI in the PICU.
Methods: We retrospectively collected data of hospitalized children (age < 18 years old) who admitted to our PICU from 2017 to 2021. The definition of AKI was based on KDIGO AKI consensus 2012 by evaluation of serum creatinine and urine output and advanced AKI was defined as stage 2 and stage 3 AKI. The outcomes included mortality and length of stay (LOS) in PICU.
Results: From 2017 to 2021, 3350 pediatric patients admitted to PICU with mortality of 4.3% and the median LOS in PICU of 6 days. Pediatric AKI was diagnosed in 1759 (52.5%) patients, including 266 patients with advanced AKI (7.9%). Compared to patients without AKI, patients with AKI had higher mortality (7.4 vs 0.8%, $p < 0.001$) with longer median LOS in PICU (12 vs 3 days, $p < 0.001$) and presented with less initial urine output (2.42 vs 3.14 ml/kg/hr, $p < 0.001$), which was significantly improving after 72 hours of PICU treatment (3.62 vs 3.58, $p = 0.762$). The multivariable analysis showed the diagnosis of genetic and metabolic disease, intubation with ventilator support, and high initial lactate level (lactate > 2 mg/dl) were independent risk factors for AKI with adjusted odds ratio (aOR) of 1.5 (95% CI: 1.2-1.8), 1.9 (1.6-2.2), and 1.6 (1.4-1.8) respectively and AKI is also the major independent risk factor for mortality in PICU with aOR of 7.0 (3.9-12.5).
Conclusions: Pediatric AKI is common, especially in patients with diagnosis of genetic and metabolic disease, intubation, and high initial lactate level, and leads to high mortality and longer LOS in PICU. This study highlighted this common and serious complication in critically ill children and the urgency of Taiwanese consensus for early managements of AKI in PICU.

100

Clinical Characteristics and Outcomes in Neonates with Respiratory Failure Requiring Venoarterial Extracorporeal Membrane Oxygenation Support – Experiences of a Tertiary Referral Hospital in Taiwan
新生兒呼吸衰竭使用體外維生循環之臨床表現及預後 – 台灣醫學中心之經驗

Ying-Hao Yu[1], Jeng-Hung Wu[1,2], Ching-Chia Wang[1], En-Ting Wu[1], Frank Leigh Lu[1], Heng-Wen Chou[3], Shu-Chien Huang[3], Yih-Shurng Chen[3]
Department of Pediatrics, National Taiwan University Children's Hospital[1]; Department of Medicine, National Taiwan University Hospital Jinshan branch[2]; Department of Surgery, National Taiwan University Hospital[3]
余英豪 [1]、吳政宏 [1,2]、王景甲 [1]、吳恩婷 [1]、呂立 [1]、周恒文 [3]、黃書健 [3]、陳益祥 [3]
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金山分院醫療部 [2]; 國立台灣大學醫學院附設醫院外科部 [3]

Background: Extracorporeal membrane oxygenation (ECMO) support, first applied to pediatric patients in the 1950s, has made tremendous progress. Owing to developments of the prenatal examination, neonatal intensive care, and the ventilator application, the outcome of newborns with respiratory failure improves drastically. Therefore, ECMO supports are aimed at neonates with more refractory medical conditions nowadays, and this study investigates the clinical characteristics and outcome of these patients.
Methods: A retrospective one-hospital-based cohort study was conducted by chart review of neonatal patients receiving ECMO support for respiratory failure in National Taiwan University Hospital from 2009 to 2021. The diagnosis of respiratory failure is based on the blood saturation level, the oxygenation index, or hypercapnia, and the etiologies were identified according to the prenatal examination, perinatal history, and the chest radiograph. The cardiovascular etiologies were ruled out according to the echocardiography.
Results: Total 50 neonates required ECMO support at median age of 2 days old. The top 3 etiologies included congenital diaphragmatic hernia (38%), persistent pulmonary hypertension of the newborn (30%), and meconium aspiration syndrome (14%). Twenty-six patients (52%) expired before discharge. The one month and six months survival rate were 72% and 52% respectively. Low birth weight (HR=2.32, p=0.008) and prematurity (HR=3.03, p=0.006) had higher mortality, and expired patients had higher proportion of bicarbonate level lower than 20 within 24 hours (HR = 3.86, p=0.002), and renal replacement therapy reception (HR = 2.95, p=0.007).
Conclusions: Prematurity and low birth weight predicts poor outcomes of receiving ECMO support, emphasizing the importance of early intervention and acquirements of further care plans for these patients. Timely correction of the metabolic acidosis and early resuscitation may play a role in improving survival.

101 **Hemodynamic Analysis of Neuroblastoma Patients Receiving Naxitamab Infusion**
接受 Naxitamab 治療的神經母細胞瘤病患之血液動力學分析

Wei-Feng Peng[1,2], Jeng-Hung Wu[1,3], Meng-Yao Lu[1], Hsiu-Hao Chang[1], Yung-Li Yang[1], Shu-Wei Chou[1], Ching-Chia Wang[1], En-Ting Wu[1], Frank Leigh Lu[1]
Department of Pediatrics, National Taiwan University Children's Hospital[1];Department of Medicine, National Taiwan University Hospital Yulin branch[2];Department of Medicine, National Taiwan University Hospital Jinshan branch[3]
彭偉峰 [1,2]、吳政宏 [1,3]、盧孟佑 [1]、張修豪 [1]、楊永立 [1]、周書緯 [1]、王景甲 [1]、吳恩婷 [1]、呂立 [1]
國立臺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雲林分院小兒部 [2];國立台灣大學醫學院附設醫院金山分院醫療部 [3]

Background: Naxitamab is a humanized anti-GD2 monoclonal antibody for patients with relapsed or refractory neuroblastoma, while hypotension is a common adverse effect during infusion. The Aesculon (Osypka medical) is a hemodynamic monitoring system with electrical cardiometry technique for the non-invasive determination of hemodynamic parameters in critical patients. This study aims to assess the incidence, risk factors of hypotension in patients receiving Naxitamab infusion.
Methods: We retrospectively collected data of patient who admitted to PICU for infusion of Naxitamab from 2022 to 2024. The hemodynamic parameters were determined by the Aesculon. Echocardiography was performed prior to the initiation of chemotherapy or Naxitamab infusion.
Results: From 2022 to 2024, 7 patients (Male: Female=6:1) was admitted to PICU for Naxitamab infusion with median age of 6 years old. Simultaneous and continuous hemodynamic monitoring with Aesculon was performed in 52 cycles of infusion, hypotension was observed in 19 cycles (36.5%), while volume expansion was given in 14 cycles (26.9%) and vasopressor was given in 5 cycles (9.6%). Systemic Vascular Resistance Index (SVRI, p=0.004) instead of Cardiac Index (CI, p=0.492) is significant lower during the hypotension when comparing to the baseline measurements. Variation of Index of Contractility (VIC, p=0.038) and Left Ventricular Ejection Time (LVET, p=0.015) are differentiated in baseline measurements whether receiving hypotension management. Greater LV end-diastolic diameter to BSA ratio (LVEDD/BSA, 61.2 vs 49.6, p=0.03) is observed in the patients not receiving hypotension management at the first time Naxitamab infusion.
Conclusions: Hypotension during Naxitamab infusion may contribute to the lowering of SVR. Lower VIC and higher LVET at the baseline measurement of Aesculon may predict fewer hypotensive adverse event during Naxitamab infusion. This study highlighted the importance of non-invasive hemodynamic monitoring to the infusion of Naxitamab in children and further studies should be performed to optimize the infusion protocol of Naxitamab by early detection and prediction of hypotensive adverse effect.

102 **Validation of an IoT Medical Automated Urine Drainage Data Recording System**
自動連續尿液線上紀錄系統之評估

Wei-Ting Guo[1], Kai-Sheng Hsieh[1,2], Tsung-Cheng Shyu[1], Tzu-Yao Chuang[1], I-Hsin Tai[1], Yi-Chin Peng[1], Jen-Yang Hsieh[3], Sung-Tsun Shih[3]
Department of Pediatric Cardiology, China Medical University Children's Hospital, Taichung, Taiwan[1], Structural/Congenital Heart Disease and Ultrasound Center[2];Department of Electronics Engineering, Cheng Shiu University, Taiwan[3]
郭威廷 [1]、謝凱生 [1,2]、徐宗正 [1]、莊子瑤 [1]、戴以信 [1]、彭義欽 [1]、謝仁仰 [3]、施松村 [3]
中國醫藥大學兒童醫院小兒心臟科 [1]、結構/先天性心臟病及超音波中心 [2];正修科技大學電子工程研究所 [3]

Background: Recording of urine amount at various time intervals throughout the day is an essential routine in critical care unit. However, up to now this work is still done by nursing staff's hand-made note. The execution of daily urine amount consumes a large amount of workload. This first stage, in-vitro study aimed to evaluate an automated recording system integrated with urine collecting bag for continuous recording and transmitting urine amount on line.
Methods: The device comprises of a sensor connected on the urinary tube-bag system. The sensor is capable of continuously measuring the urine flow rate /volume and the data instantaneously transmitted to the computer in the

nursing station. In this in-vitro test, the phantom bladder-urinary catheter-collecting bag system and applied the fluid measurement sensor. The data was stored and compiled in the computer. The volume of fluid delivered to the phantom system and the volume shown on the screen of computer through automatic reading were compared. Totally 5 runs (50ml, 100ml, 150ml, 250ml and 500ml) of fluid through the phantom urinary bag was assessed.

Results: The true delivered volume of fluid was compared with the automatically measured volume was compared using a linear regression equation. The equation could be expressed as follows: Y (true volume)=0.8959X(measured volume)+24.667. The total accumulated volume true volume was 267.1+-141.3 ml; while the total measured volume was 270.8+-155.9 ml without difference $p > 0.05$.

Conclusions: This in-vitro study revealed that the novel automatic urine amount measurement system could measure the fluid amount satisfactorily in this in-vitro test. The implementation of this system into clinical practice will be able to reduce the workload for nursing staff in the ICU. An in-vivo test is now undergoing to test this system.

103 **A Reappraisal of Capillary Refilling Time**
微血管再充血時間的再思

Yi-Syuan Lin[1], Kai-Sheng Hsieh[1,2], Tsung-Cheng Shyu[1], Tzu-Yao Chuang[1], I-Hsin Tai[1], Yi-Chin Peng[1], Jen-Yang Hsieh[3], Sung-Tsun Shih[3]
Department of Pediatric Cardiology, China Medical University Children's Hospital, Taichung, Taiwan[1], Structural/Congenital Heart Disease and Ultrasound Center[2];Department of Electronics Engineering, Cheng Shiu University, Taiwan[3]
林怡璇[1]、謝凱生[1,2]、徐宗正[1]、莊子瑤[1]、戴以信[1]、彭義欽[1]、謝仁仰[3]、施松村[3]
中國醫藥大學兒童醫院小兒心臟科[1]、結構/先天性心臟病及超音波中心[2];正修科技大學電子工程研究所[3]

Background: Capillary refilling time (CRT) is a simple clinical assessment test for evaluation of peripheral circulation. Since its introduction into clinical practice last century, CRT has been used widely as an easily performed clinical bedside as assessment. However, the conventional practice of CRT is by visual perception of skin color. In this study, we aimed to evaluate CRT assessed by current technology.

Methods: CRT assessment was performed among 20 healthy young individuals aged between 16 to 36 years old at room temperature. All the measurements were done at resting, relaxed sitting position. Palm pad of the distal phalanges of the middle finger or index finger were compressed and then rapidly released while the whole process was video recorded. The time from releasing of pressure on the finger-pad to recovery of baseline skin color was recorded. The data were then analyzed digitally.

Results: A total of 20 individuals underwent the CRT test. The CRT for this test cohort was 1.28+-0.46 sec. Th maximal CRT was 3.0sec, while minimum CRT was 0.7 sec. Majority of the CPT was below 2.0sec.

Conclusions: This study revealed that CRT can be measured accurately through digital method. This contrasts with the conventional concept that CRT is below 2 or 3 seconds. This is due to the limitation of conventional CRT assessment by visual perception only which bears very poor time discrimination ability. Further study is now undertaken to apply this new method f or digital assessment of CRT.

104 **Eosinophilia in the Evaluation of Kawasaki Disease in Febrile Children**
嗜酸性白血球增多症在發燒兒童評估川崎症的應用

Chih-Min Tsai, Ho-Chang Kuo, Ling-Sai Chang, Ying-Hsien Huang
Department of Pediatrics, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung, Taiwan
蔡智閔、郭和昌、張鈴偲、黃瀛賢
高雄長庚醫院 兒童內科部

Background: Some recent studies have confirmed the novel weight of increased eosinophils in children with Kawasaki disease (KD), but it was not included in the laboratory findings speculated by the Kawasaki Disease Committee of the American Heart Association while evaluating children with incomplete KD. We aimed to evaluate the advantage of adding eosinophil laboratory findings to assess KD in febrile children.

Methods: We conducted a retrospective cohort study which included 65,158 febrile control (FC) and 1,970 KD subjects. Each patient's platelet count, white blood count, hemoglobin level, and alanine aminotransferase (ALT) were examined. These laboratory tests are speculated by AHA and are almost checked in children with fever. In addition, the cut-off level of eosinophil count was calculated by Youden index to see the difference of eosinophil between children with KD and febrile controls.

Results: Among all KD subjects, 80.8% KD children's eosinophil percentages are higher than 0.85% (53.0% in FC) and 74.3% KD children's eosinophil counts are higher than 133/mm3 (37.1% in FC). Among these five laboratory findings (anemia, platelet count $>$450000/mm3, white blood cell $>$ 15000/mm3, ALT $>$ 40 U/L, and eosinophil), the proportion of KD children with high eosinophil (80.8%) was higher than thrombocytosis (20.5%), leukocytosis (37.0%), and ALT (45.7%). For all five laboratory findings, 81.7% KD children have at least 2 abnormality (26.0% in FC) and 49.0% KD children have at least 3 abnormality (6.2% in FC). In subgroup analysis, 84.4% and 52.4% KD with high CRP have at least 2 and 3 abnormalities, respectively.

Conclusions: Eosinophilia is an important feature in children with KD and it could be a good indicator in screening children with KD.

105 **Trends and Clinical Features of Pediatric Psychiatric Visits to the Emergency Department: a 7-Year Retrospective Analysis in a Regional Hospital in Taiwan**
急診兒科精神病患就診之趨勢與臨床特徵: 台灣某區域醫院七年之回溯性分析

Ching-Yi Cho[1,2], Hung-Chieh Chang[1], Boon-Fatt Tan[3], Kuan-Wu Lo[3], Yun-Chang Chen[4], Shan-Han Chang[4]
Institute of Health Policy and Management, National Taiwan University[1],Dianthus MFM Clinic Taoyuan[2], National Taiwan University Hospital Hsin-Chu Branch[3], National Taiwan University Hospital Yunlin Branch[4]
卓靜怡[1,2]、張弘潔[1]、陳文發[3]、羅光武[3]、陳雲昶[4]、張善涵[4]
台灣大學公衛學院健康管理研究所[1],禾馨桃園婦幼診所[2],國立台灣大學附設醫院新竹台大分院[3],國立台灣大學附

設醫院雲林分院 [4]

Background: Steep rise of mental disorders among children had become a major public health concern that reflected the urgent but unmet demand of psychiatric health care. Pediatric emergency departments (PED) are usually the first checkpoint of entry into health system. Children with mental disorders have limited chances to receive comprehensive evaluation and management. Our objectives are to explore (1) trend and characteristics; (2) distribution of psychiatric diagnoses; (3) medical need and utilization of psychiatric PED visits.
Methods: A retrospective study, recruiting patients aged 0-18 years, presenting to PED, at National Taiwan University Hospital Hsin-Chu Branch, from January 2015 to December 2021 was conducted. Patients with the psychiatric diagnoses were further identified. Analyses were performed to present the trend of PED utilization, and association between demographic and clinical factors, including age, gender, time of arrival, consultant received, length of stay, and discharge status.
Results: Over the 7-year study period, a total of 105976 PED visits were identified, with 925 (0.87%) had mental health diagnoses. Despite annual visits decreased gradually, the proportion of psychiatric requested reached a tenfold increase. The surge was heavily driven in 2020, when COVID-19 started raging. Youths accounted for 71.78% of all psychiatric visits, and female preponderance was found. Depressive disorder, anxiety disorder, and suicide remained the leading diagnoses and their cumulative growth increased by more than 100%. Fewer than one third patients were checked by psychiatric professionals. Mentally ill children had longer length of stay and more frequent return. Their admission rate almost doubled during study years.
Conclusions: This was the first research identifying psychiatric PED visits in Taiwan, demonstrating a rising trend, highlighting the complex interplay in PED setting and patients' clinical condition. The research addressed the shortage of mental health providers and less prepared facilities, signaling health system malfunctioning. The multidisciplinary cooperation focusing on manpower relocation, risk screening system buildup, and process refinement at PED must be engaged.

106 **Comparison of Fractional Exhaled Nitric Oxide, Impulse Oscillometry System, and Spirometry for Evaluation Childhood Asthma**
比較呼出一氧化氮、脈衝振盪測量系統和肺活量測定法評估兒童氣喘

Tung-Yi Huang[1], Chien-Heng Lin[2], Chien-Ho Chen[2], Wen-Jue Soong[2]
China Medical University Children's Hospital[1]; Division of Pediatric Pulmonology and Critical Care Medicine, China Medical University Children's Hospital[2]
黃東毅 [1]、林建亨 [2]、陳傑賀 [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 胸腔暨重症科 [2]

Background: Fractional exhaled nitric oxide (FeNO), Impulse oscillometry (IOS) and spirometry are three kinds of noninvasive methods for the assessment of childhood asthma. The aim of this study is to evaluate the correlation between these three methods for evaluation childhood asthma.
Methods: From the CMUH Clinical Research Data Repository (CRDR), we identified pediatric patients with asthma (6-12 years old) who underwent FeNO, IOS, and spirometry on the same day. The data of the FeNO, IOS and spirometry reports were extracted from the report text. We plotted the correlation matrix between FeNO and IOS (resistance and reactance); between FeNO and spirometry (FEV1/FVC ratio), and calculated the Pearson correlation coefficient (r) and p-value.
Results: A total of 337 children with asthma aged 6-12 (male to female 60.8%:39.2%) were included. The median values of FeNO was 21 ppb and the median FEV1/FVC and FEV1 values was 87% and 98.2%, respectively. A significantly negative correlation between FeNO and FEV1/FVC ratio was observed (r = -0.174, p-value = 0.002). However, there is no significant correlation between FeNO and parameters of IOS.
Conclusions: The FeNO, IOS and spirometry are important methods for evaluation of childhood asthma. In our study, FEV1/FVC ratio was observed to be negative correlation to FeNO, which is no significant correlation with parameters of IOS. We concluded that combination of FeNO, IOS and spirometry is the best strategy to evaluate childhood asthma.

107 **Quantification of Post-COVID Symptoms and Pulmonary Functional Capacity in Children after COVID-19**
感染新冠肺炎孩童的後新冠症狀及功能性肺功能的量化分析

Jeng-Hung Wu[1,2], Ching-Chia Wang[2], Frank Leigh Lu[2], En-Ting Wu[2]
Department of Medicine, National Taiwan University Hospital Jinshan branch[1]; Department of Pediatrics, National Taiwan University Children's Hospital[2]
吳政宏 [1,2]、王景甲 [2]、呂立 [2]、吳恩婷 [2]
國立台灣大學醫學院附設醫院金山分院醫療部 [1]; 國立台灣大學醫學院附設醫院兒童醫院小兒部 [2]

Background: Children with COVID-19 present with mild pulmonary disease and frequent developments of post-COVID-19 but limited studies focus on the impact of COVID-19 on aerobic capacity and quantification of post-COVID symptoms. This study aimed to quantify post-COVID fatigue, dyspnea and pulmonary functional capacity and explore associated factors in children after SARS-CoV-2 infection.
Methods: This prospective cohort study enrolled 6- to 12-year-old children who ever had COVID-19. Parents of participants completed questionnaires assessing post-COVID fatigue (Pediatric Quality of Life Inventory Multidimensional Fatigue Scale, including general, sleep, and cognition, high score indicate less severity) and dyspnea (Modified Medical Research Council Dyspnea Scale). Six-minute walk tests (6MWT) were performed with records of distances to assess their pulmonary functional capacity.
Results: Twenty-one children were enrolled and seven (33%) children reported persistent symptoms after one month of SARS-CoV-2 infection, who had less proportion of COVID-19 vaccination (57% vs 100%, p = 0.026), and lower score of sleep related fatigue scale (69.0 vs 80.4, p = 0.043) in comparisons to those in children without persistent symptoms. Nineteen children performed 6MWT with the mean distance of 623 meters (standard deviation, SD: 231) and the mean Z-score of 2.8 (SD: 1.4). Linear regression analysis identified older age as risk factors for fatigue scale (beta coefficient -0.45, p = 0.040) and cognition related

fatigue scale correlated with Z-score of 6MWT distances (beta coefficient: -0.56, p = 0.013).
Conclusions: Children with post-COVID-19 symptoms had less COVID-19 vaccination and heightened sleep related fatigue levels. Older children tended to have more severe post-COVID-19 fatigue and the performance of 6MWT correlated with cognition related fatigue scale. This study highlights the significance of quantifying post-COVID-19 symptoms and assessing their relationship with pulmonary functional capacity.

108 **Impulse Oscillometry for measurement of Pulmonary Function in Children with Long COVID Syndrome**
脈衝式震盪儀測定後新冠症候群兒童之肺功能

Chieh-Ho Chen[1], Heng-Jhih Guo[2], Chi-Yao Wang[3]
China Medical University Children's Hospital, Division of Pulmonology & Critcal Care[1]; China Medical University Children's Hospital, Division of General Pediatrics[2]; China Medical University Children's Hospital, Division of Allergy, Immunology, and Rheumatology[3]
陳傑賀 [1]、郭恆志 [2]、王志堯 [3]
中國醫藥大學兒童醫院胸腔暨重症科 [1]; 中國醫藥大學兒童醫院一般兒科 [2]; 中國醫藥大學兒童醫院免疫風濕科 [3]

Background: The ongoing COVID-19 pandemic has raised concerns about the potential long-term effects of the disease in pediatric populations. This study aimed to investigate the post-COVID symptoms in children, focusing on demographic features, impulse oscillometry, and pulmonary function test (PFT) results. Understanding the prevalence and characteristics of post-COVID symptoms in pediatric patients is crucial for optimizing clinical management and improving outcomes in this vulnerable population.
Methods: A total of 236 pediatric cases with post-COVID symptoms were included in the analysis. Demographic features, including age, sex, height, body weight, and vaccination status, were recorded. Impulse oscillometry and PFT were performed to assess respiratory function in the study population. Logistic regression analysis was conducted to explore associations between chronic symptoms and vaccination status.
Results: The mean age of the study population was 9.2 +/- 4.2 years. The majority of patients were in the 6-11 age range (51.3%), and a slight predominance of male patients was observed (54.7%). The mean height and body weight of the study population were 131.1 cm and 33.4 kg, respectively. Notably, 66.95% of the cases had a history of vaccination. Impulse oscillometry revealed significant variations in respiratory parameters, with substantial airway resistance and distinct patterns of small airway diseases and obstructive lung disease. PFT results indicated airflow limitations and reduced lung volumes in children with post-COVID symptoms. Logistic regression analysis identified significant associations between chronic symptoms and vaccination status, highlighting the potential impact of vaccination on the development of specific symptoms such as headache, dyspnea, palpitation, chest pain, depression, lack of motivation, and chronic cough.
Conclusions: Younger children may have a higher risk of experiencing respiratory abnormalities following COVID-19 infection, yet it was not solely attributed to vaccination status but may be influenced by other factors, including the impact of COVID-19 infection on the respiratory system in pediatric patients.

109 **Comparative Analysis of Virtual Reality Training and Traditional Education in Teaching Pediatric Difficult Airway Diseases**
虛擬實境用於兒科困難氣道疾病教學應用之研究

Wen-Ching Hsu[1,3], Mei-Jy Jeng[1,2]
Institute of Emergency and Critical Care Medicine, National Yang-Ming Chiao- Tung University,Taipei,Taiwan[1];Neonatal Medical Care Center and Section of Neonatology, Department of Pediatrics, Taipei Veterans General Hospital,Taipei,Taiwan[2];Division of Respiratory Therapy, Department of Chest Medicine, Taipei Veterans General Hospital,Taipei,Taiwan[3].
許文菁 [1,3]、鄭玫枝 [1,2]
國立陽明交通大學急重症醫學研究所 [1];臺北榮民總醫院兒童醫學部新生兒科 [2];臺北榮民總醫院胸腔部呼吸治療科 [3]

Background: Pediatric difficult airway diseases present unique challenges due to children's smaller airways and dynamic anatomy. Prompt recognition and specialized management are crucial to prevent life-threatening airway obstruction and long-term respiratory complications. This study aimed to compare the impact of virtual reality and traditional educational approaches on knowledge acquisition, knowledge application, motivation, and satisfaction among respiratory therapy students specializing in pediatric difficult airway diseases.
Methods: Clinical students specializing in pediatric respiratory therapy were recruited and randomly assigned to a virtual reality (n=22) or traditional education group (n=21). The virtual group received a virtual learning package while the traditional group experienced classroom-based education. Equivalent content was delivered to both groups. All students underwent a theoretical test using multiple-choice questions and an objective structured clinical examination (OSCE). Data were analyzed, with linear regression applied to confirm the relevance of the factors.
Results: A total of 43 participants completed the investigation. The mean OSCE scores ($p < 0.05$) and satisfaction survey scores ($p < 0.05$) were higher in the virtual education group (14.6 ± 2.9 and 10.2 ± 2.7, respectively) compared to the traditional education group. In both educational methods, the mean scores of the theoretical test before education were lower than those immediately after instruction, although this difference was not statistically significant ($p > 0.05$). The type of education significantly influenced the OSCE score ($p < 0.005$) but had no significant effect on the theoretical test ($p = 0.288$).
Conclusions: Virtual reality training resulted in higher OSCE scores compared to traditional lecture-based methods for improving knowledge application in teaching pediatric difficult airway diseases. To enhance students' knowledge acquisition, it is recommended to refine the virtual educational program, with a focus on disease pathophysiology

110 **The Communication in one Outpatient Pediatric Clinic**
兒科門診裡的溝通

Bo-Yu Hsu[1], Chu-Yi Tsai[1], Shao-Yin Chu[2,1]
School of Medicine, Tzu Chi University[1]; Department of Pediatrics and Medical Education, Tzu Chi Medical Center[2]

許伯瑜[1]、蔡楚翊[1]、朱紹盈[2,1]
慈濟大學醫學系[1]; 花蓮慈濟醫院兒科部/教學部[2]

Background: 慈濟大學醫學系為大一新生開設了一門選修課，名為 Early Clinical Exposure (ECE)，其學習目標不在傳授專業知識，而是透過接觸臨床環境，與典範醫師的互動，觀察醫病關係、溝通技巧、職業態度等，以促進學習熱忱與醫學人文的涵養。本文為二位醫學生自訂「如何與兒童溝通」學習目標後，在臨床醫師的安排下，總共參與了 3 次同一位兒科醫師的門診觀摩與學習後所書寫的反思內涵。
Methods: 透過觀摩門診前的繪本閱讀，跟診中的觀察，下診後的 3 次討論，書寫學習心得，再針對醫病互動書寫內容進行結構性的呈現。
Results: 1. 孩子是什麼?： 每一個孩子都不同，有些孩子喜歡自己做決定、有些則否。有些孩子不回答問題，總是轉頭看向媽媽。多數的孩子面對是否要打針的回應總是當機立斷的拒絕。大多數孩子不知道為何就被安排就醫了，未社會化孩子們的臉上總是掛著情緒，非常容易觀察。孩子是容易被滿足的；貼紙、簡單的塗鴉、言語上的鼓勵，能帶來友善的關係連結，也能緩和醫病之間的緊張關係，互動有了信任的基礎後較能促進孩子配合治療的意願。 2. 多樣化的溝通技巧： 哭也是在溝通；在兒科診間裡，可以聽到各種哭吼聲，有些聲嘶力竭，有些嚶嚶低泣都是在表達，原來學習與嬰幼兒溝通需先學會分辨哭泣背後的原因。打針抽血是最嚴峻的溝通內涵了，當醫師問「能不能抽血檢查?」「你可以接受打針嗎？」時，孩子們都會展現了極大的情緒反應，此時的溝通不太像溝通，幾乎都變成執行的單向指令。 孩子和大人一樣喜歡被聆聽，藉由點頭、適當回應，使他們感覺到被重視，拍拍孩子、比個讚，讓孩童得到鼓勵，語言外的肢體動作也能增進孩子們的溝通意願。善用天馬行空的想法，在溝通上利用充滿想像力的描述，讓枯燥甚至可怕的檢查或療程變的有趣，較能貼近孩童的思考。提前為孩子做好心理準備，也將有利於治療的進行。展現同理心是極為重要的溝通技巧，告知孩子換成醫師也是害怕打針的，與孩子站在同一國，當然也要告知醫療處置裡醫師的期望，以及需要孩子的配合與承諾，因而許多溝通的內涵(醫囑)會化為回家的作業。遵醫囑性差的孩童，有時會收到醫師較強勢的回應，甚至有些許威脅恐嚇的話語出現。延伸至診間外的溝通，還可用手寫紙張輔助，除了增進孩子、家長甚至學校老師的理解，醫病溝通原來並非一蹴可及，很多時候是長遠的來回商榷。
Conclusions: 如何建立平等的溝通對成年人而言是重要的，但對一個還無法全權做出決定的孩子而言，很多時候是做不到的，最後的決定通常是家長和醫師。但在溝通過程中，盡量做到讓孩子參與到最大的程度。在不對等關係下，孩子相對是易脆的，如何尊重孩子的意願，看見每一個孩子的獨特性，給于個別化的溝通是非常複雜的過程，充滿了情緒互動與敘事技巧。

111 **Teaching Medical Students and Postgraduate Year Doctors About Child Growth and Development through Flipped Classroom and Self-Made Board Games**
以翻轉教室及自製桌上遊戲教導醫學生及 PGY 醫師兒童生長發育

Chih-Wei Ten[1], Mary Hsin-Ju Ko[2], Chun-Chih Peng[1]
MacKay Children's Hospital[1];Hsinchu MacKay Children's Hospital[2]
田智瑋[1]、柯信如[2]、彭純芝[1]
馬偕兒童醫院[1];新竹馬偕兒童醫院[2]

Background: 建立正確之兒童生長發育里程碑、了解如何診斷發展遲緩以及轉介時機，一直是兒科重要之核心課程與教學目標，也是國家考試之必考題目。然而目前醫學生及畢業後醫師對於兒童生長發育皆以背誦為主要之學習型態，且以短期記憶為主，因此我與小兒神經科柯醫師討論，設計了一桌上遊戲期待能引起學生之興趣，並加深學習成效及記憶存留。 課堂中使用翻轉教室做為學生文本閱讀的方式，這是一種新穎的教學方法，其主要思想是將傳統教室中的學習活動重新組織，將一部分學習內容的傳遞移到課堂之外，讓學生在課堂上進行更深入的理解和應用。這種教學方法的好處包括個別化學習、加深學習深度、教師能夠更好地利用有限的課堂時間進行深度學習和互動。 遊戲化教學是近幾年熱門之話題，其特色在於輕鬆有趣的設計能引起學生之學習動機。其中如線索、計分、團隊合作及競爭…等，皆是引人入勝之要素。 本課程設計目標是希望學生能確立正確之生長發育里程碑概念，並且能夠在未來執業時轉診疑似發展遲緩之個案。教學對象包括醫學生與 PGY 醫師。
Methods: 起初的研究設計僅是簡單的前測與後測，使用的測驗題目為兒科專科醫師國家考試題目，由小兒神經科醫師確認其答案無爭議。研究族群為醫學生及 PGY。課程前會請參加者完成前測 。接下來會傳送翻轉教室連結給學生，內為小兒神經科針對兒童生長發育安排之教學課程，採用課堂講授方式，時間為一個半小時。上課當日不進行知識簡介，只會明確說明學習目標：(1) 確立正確之生長發育里程碑概念，並且能夠在未來執業時轉診疑似發展遲緩之個案 (2) 運用遊戲化教學引起動機，並加深學習成效及記憶存留。接下來開始進行桌上遊戲，遊戲中的生長發育卡牌分成四大類：包含粗動作、細動作、語言、社交與使用工具，每一類有 12 張卡牌，正面為生長里程碑，背後則為平均年齡及細節解說。桌遊採用兩種遊玩方式，第一種為排序，第二種為比大小。並引入遊戲化元素：運氣成分、計分板、分組競賽、獎勵與快速回饋…等機制。遊戲結束後進行分數結算及後測，獲勝組別整組獲得獎品(自選貼紙)。 統計時發現學生進步程度顯著不一。為了更加了解其背後因素，在新的課程中將問卷前後測縮短為各五題國考題，且內容不相同以避免重複效應，後測加入心流及團體效能問卷，並為遊戲化元素評分(皆採用李克特氏 5 點量表，得分越高表示團體效能或心流狀態越好)。一周後以 Email 方式請參加者填寫記憶存留測試，五題國考題且內容與前後測相異。
Results: 重新設計問卷前，總計有 30 名參加者，其中有 25 名醫學生及 5 名 PGY。25 名醫學生前測得分平均為 5.28 分(滿分 10 分,3-7,標準差 1.4 分)，後測得分平均為 7.6 分(滿分 10 分,3-10,標準差 1.55 分)。T test 顯示前後測得分有顯著差異($P < 0.01$)。5 名 PGY 前測得分平均為 2.8 分(滿分 10 分,0-6,標準差 2.17 分)，後測得分平均為 7.4 分(滿分 10 分,range 5-9,標準差 1.52 分)。T test 顯示前後測得分有顯著差異($P < 0.01$)。 重新設計問卷後，一共有 16 名參加者，其中有 10 名醫學生及 6 名 PGY。由於重新設計後進行時間短與個案較少，故將兩族群整合

在一起做分析。前測得分平均為 1.438 分(滿分 5 分,0-3, 標準差 0.96 分)，後測得分平均為 3.94 分(滿分 5 分,3-5, 標準差 0.77 分)，一週後記憶留存測試有 9 人作答，平均得分為 3.44 分(滿分 5 分,2-4,標準差 0.73 分)。使用 Student T test 顯示前後測得分有顯著差異($P<0.01$)。若取有回答留存測是之 9 人做分析，前測與記憶留存測試得分有顯著差異($P<0.01$)，而後測與記憶留存測試則無顯著差異($P=0.079$)。若將後測與前測差別≥3 分者與≤2 分者分為兩組進行分析，每組人數皆為 8 人。發現此兩組人在團體效能，心流(控制、專注、樂趣)皆無差異。但對於遊戲化元素的認同度前者較高（4.82 vs 4.54, $P=0.015$）。團體效能得分為 4.78。心流：控制度 4、專注度 3.97、樂趣 4.69。皆採用李克特氏 5 點量表，大於 2.5 則視為偏向符合此行為。遊戲化元素中得分最高五者依序排序為：獎品(4.93)、快速回饋和總結(4.88) 、卡牌設計(4.81)、逐漸增加難度(4.81) 、遊戲規則簡單(4.63)。

Conclusions: 以翻轉教室及自製桌上遊戲教導醫學生及 PGY 醫師兒童生長發育對於立即之知識面學習成效有顯著幫助，且一週後進行記憶留存測試也顯著優於前測。分析進步較多者，其對於遊戲化元素的認同度較高，但團體效能與心流狀態皆無差異。參加者普遍顯示為高團體效能與心流狀態。對於遊戲化元素，參加者較認同：獎品、快速回饋和總結、卡牌設計、逐漸增加難度、遊戲規則簡單。未來此課程將持續改善並依循此設計方向，也教導更多的學生，以了解更多遊戲化教學的元素與可達成之效果。

112 **BETTY GOES BANANAS~ A Pediatrician's Reading Prescription**

貝蒂好想吃香蕉~兒科醫師的閱讀處方

Shu-Chuan Wu
Lo Hsu Medical Foundation Lotung Poh-Ai Hospital, Department of Pediatric
吳淑娟
羅東博愛醫院兒科

Background: 家長網路平台群組，常有以下類似的訴苦文： **A. 家長**: 我家孩子 1 歲 9 個月，原本都很乖，但最近不知為何變得很容易發脾氣，只要不順他意，就不顧一切的哭鬧。如果不理他，不但變本加厲倒在地上撞頭，甚至會哭到吐。 我們從不以高壓管教對孩子，都是用講道理的方式，孩子這些不好的行為從那兒學來的？我該怎麼教她？ **B.家長:**小女兒 2 歲 3 個月，大家都誇她聰明，但好像卻造成她驕縱、自以為是的性子。她要的東西，一定要讓她；她想做的事，明明自己做不好，但別人不能幫忙，否則她會大哭大鬧，甚至丟東西拍桌子，還會要求從頭來過。她的哭鬧，常使我招架不住，只好順從她，但我怕這樣讓她更驕縱，我應該如何改善她的行為及觀念？ **C.**有家長自我反省:孩子 2 歲後開始不聽話，我從溫柔講，好好講，嚴肅講，到最後用吼的加上愛的小手，好像才能讓孩子聽話。每晚孩子睡著後，我會反省自己，也提醒自己不要對孩子生氣，但第二天孩子又如常鬧脾氣，我實在很想將孩子塞回肚子。我是不是不適合當媽媽? **D.**更有家長自嘲: 孩子兩歲前，是溫柔媽，孩子兩歲後，媽媽變成酷斯拉! 少子化時代，政府補助越多，但為何生育率拉不上來? 很大原因也許不是來自經濟壓力，而是育兒教養壓力。現代兒科醫師幫得上忙嗎?。

Methods: 雖然這些訴苦文不是兒科門診的主訴。但當兒科醫師聽到以下的主訴時，如何處置呢？ **主訴 A:** 醫師，這孩子常常吐，持續好一段時間了，吃藥也沒改善，有帶去診所檢查，但醫師說腸道沒有問題，建議我帶來大醫院檢查? **主訴 B:** 醫師，孩子經常用頭撞地板，會不會傷害到腦部，需要做檢查嗎? **主訴 C:** 醫師，這孩子都很堅持己見，常常跟其他小朋友爭玩具，愛哭鬧，搞得我好累。有朋友建議我帶他來醫院評估，我是不是要帶她去心智科呢? 要做甚麼評估呢? 承接這些主訴，隨著兒科醫師詳細問診，那些網路訴苦文可能就變成是"病史"了。 兒科醫師應該很了解這些主訴和病史講的是" 幼兒自我中心期" ，那麼現代的兒科醫師可以給怎樣的醫囑和處方呢？

Results: 從兒童發展的角度來看，幼兒一歲半到兩三歲間處於自我中心期，喜歡為自己的事作主張，若稍不滿意就大哭大鬧或發脾氣。這時期幼兒的家長常會疑惑孩子怎麼突然變不乖了。其實這些家長眼中「反常行為」是基於孩子發展上的特性，及表達能力的限制，哭鬧就成了孩子抒發情緒的手段。父母若無法掌握處理的技巧，不但會養成習慣性的不良反應模式，親子衝突機會可能升高。而在繁忙生活中，家長如何能省時省力的學習面對讓人抓狂的幼兒自我中心期?這本" 貝蒂好想吃香蕉" 繪本，說的正是隨時會倒地大哭大鬧的幼兒，但重點是故事中大嘴鳥先生的角色。家長在與幼兒共讀時，除了享受親子互動時光，還能學習幼兒的心理發展，同理孩子的「乖張行為」不是故意的，更可以學習怎麼冷靜面對，讓自己不隨著孩子的情緒起舞變成酷斯拉!

Conclusions: 兒科醫學會已經呼籲家長要儘早進行親子共讀，促進孩子語言能力和認知能力，還可以奠定親子互動關係。然而繪本還有很大的功能，就是提升家長的親職教養能力。因為許多繪本故事裡講的正是幼兒發展中會表現出來的「問題」，可以讓家長了解原來孩子的行為是因發展所致，因而對孩子多一些同理。繪本還會提供「建議」，且往往是值得學習的正向教養態度，如此可減少親子衝突，營造溫馨的家庭氛圍。透過分享有意思的繪本給家長，兒科門診不再只能醫病，還能醫心！

113 **Epigenotype-Phenotype Correlations by Quantitative DNA Methylation Analysis and Netchine-Harbison Clinical Scoring System for Taiwanese Patients with Silver-Russell Syndrome**

根據定量 DNA 甲基化分析以及 Netchine-Harbison 臨床評分系統分析台灣西弗-羅素氏症候群患者的表觀基因型-表現型的相關性

Hsiang-Yu Lin[1,2,3,4,5], Shuan-Pei Lin[1,2,3,4,6], Chung-Lin Lee[1,3,4,5], Dau-Ming Niu[7], Yen-Yin Chou[8], Hui-Pin Hsiao[9], Meng-Che Tsai[8], Pao Chin Chiu[10], Pen-Hua Su[11], Yu-Wen Pan[8]

Department of Pediatric Genetics and Metabolism, MacKay Children's Hospital, Taipei, Taiwan[1]; Department of Medical Research, MacKay Memorial Hospital, Taipei, Taiwan[2]; Department of Medicine, MacKay Medical College, New Taipei City, Taiwan[3]; MacKay Junior College of Medicine, Nursing and Management, Taipei, Taiwan[4]; Department of Rare Disease Center, MacKay Memorial Hospital, Taipei, Taiwan[5]; Department of Infant and Child Care, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan[6]; Department of Pediatrics, Taipei Veterans General Hospital, Taipei, Taiwan[7]; Department of Pediatrics, National Cheng Kung University Hospital, Tainan, Taiwan[8];

Department of Pediatrics, Kaohsiung Medical University Chung Ho Memorial Hospital, Kaohsiung, Taiwan[9]; Department of Pediatrics, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan [10]; Department of Pediatrics, Chung Shan Medical University, Taichung, Taiwan[11]
林翔宇 [1,2,3,4,5]、林炫沛 [1,2,3,4,6]、李忠霖 [1,3,4,5]、牛道明 [7]、周言穎 [8]、蕭惠彬 [9]、蔡孟哲 [8]、邱寶琴 [10]、蘇本華 [11]、潘妤玟 [8]
馬偕兒童醫院兒童遺傳暨新陳代謝學科 [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]; 馬偕紀念醫院罕見疾病中心 [5]; 國立台北護理健康大學嬰幼兒保育系 [6]; 台北榮民總醫院兒童醫學部 [7]; 國立成功大學醫學院附設醫院小兒科部 [8]; 高雄醫學大學附設中和紀念醫院兒科部 [9]; 高雄榮民總醫院兒童醫學部 [10]; 中山醫學大學附設醫院兒科部 [11]

Background: Silver–Russell syndrome (SRS; OMIM #180860) is a clinically and genetically heterogeneous imprinting disorder characterized by prenatal and postnatal growth failure. The aim of this study was to identify the epigenotype-phenotype correlations in these patients using quantitative DNA methylation analysis.
Methods: One hundred and eighty-three subjects clinically suspected of having SRS were referred for diagnostic testing by the methylation profiling of H19-associated imprinting center (IC) 1 and imprinted PEG1/MEST regions using methylation-specific high-resolution melting analysis and methylation quantification with the MassARRAY assay. Correlations between quantitative DNA methylation status and clinical manifestations of the subjects according to the Netchine-Harbison (N-H) clinical scoring system for SRS were analyzed.
Results: Among the 183 subjects, 90 had a clinical diagnosis of SRS [N-H score ＞= 4 (maximum = 6)] and 93 had an SRS score ＜ 4. Molecular lesions were detected in 41% (37/90) of the subjects with a clinical diagnosis of SRS, compared with 3% (3/93) of those with an N-H score ＜ 4. The IC1 methylation level was negatively correlated with the N-H score. The molecular diagnosis rate was positively correlated with the N-H score. Thirty-one subjects had IC1 hypomethylation (IC1 methylation level ＜ 35% by the MassARRAY assay), seven had maternal uniparental disomy 7, and two had pathogenic copy number variants. Among the 90 subjects with an N-H score ＞= 4, the IC1 methylation level was significantly different between those with or without some clinical SRS features, including birth length ≤ 10th centile, relative macrocephaly at birth, normal cognitive development, body asymmetry, clinodactyly of the fifth finger, and genital abnormalities.
Conclusions: This study confirmed the suitability of the N-H clinical scoring system as clinical diagnostic criteria for SRS. Quantitative DNA methylation analysis using the MassARRAY assay can improve the detection of epigenotype-phenotype correlations, further promoting better genetic counseling and multidisciplinary management for these patients.

114 **Genotypic Complexity of Ehlers-Danlos Syndromes**
Ehlers-Danlos Syndromes 的基因型複雜性

Rai-Hseng Hsu[1,2,3], Ni-Chung Lee[1,2,3], Wuh-Liang Hwu[1,2,3,4], Hui-An Chen[1,2,3], Yin-Hsiu Chien[1,2,3]
Department of Medical Genetics, National Taiwan University Hospital[1]; Department of Pediatrics, National Taiwan University Hospital[2]; Department of Pediatrics, College of Medicine, National Taiwan University[3]; Center for Precision Medicine, China Medical University Hospital[4]
徐瑞聲 [1,2,3]、李妮鍾 [1,2,3]、胡務亮 [1,2,3,4]、陳薈安 [1,2,3]、簡穎秀 [1,2,3]
國立台灣大學醫學院附設醫院基因醫學部 [1]、小兒部 [2]; 國立台灣大學醫學院小兒科 [3]; 中國醫藥大學附設醫院精準醫學中心 [4]

Background: Ehlers-Danlos syndromes (EDS), a diverse spectrum of hereditary connective tissue disorders, exhibit a wide array of genotypic and phenotypic variations, characterized by joint hypermobility, skin laxity, and tissue vulnerability. The 2017 classifications, primarily clinically oriented, encompassed 13 subtypes. Despite identifying 20 genes linked to EDS, the molecular basis of the most prevalent type, hypermobile EDS (hEDS), remains elusive, posing a significant challenge.
Methods: Our study, spanning from January 2016 to December 2023, involved patients presenting with clinical suspicion of EDS subtypes. We cross-referenced these cases with individuals carrying pathogenic variants in known EDS-related genes.
Results: Among the cohort, we identified variants in 8 of the recognized EDS-related genes. Notably, the most prevalent variant was observed in the COL5A1 gene (8/19, 42%), correlating strongly with classical EDS, while COL3A1 gene (3/19, 16%) variants, predominantly associated with vascular EDS, were the second most common one. Remarkably, these variants did not recur across different families, underscoring the intricate nature of these collagen gene mutations. Noteworthy is the presentation of spondylodysplastic EDS in two patients, primarily characterized by short stature only, emphasizing the necessity for comprehensive molecular diagnostics in such cases. Our investigation of patients diagnosed with hEDS unveiled variants in TGFBI and FLNB genes. Subsequent functional analyses have suggested their potential pathogenic role in hEDS, fostering ongoing advancements in therapeutic modalities for this condition.
Conclusions: Though a wide range of patients with EDS can be genetically identified, there is still a significant amount of research required for hEDS of which genetic heterogeneity is likely. Beside the molecular level for etiology, more efforts are also needed exploring the cellular basis for future treatment.

115 **Newborn Screening Program for Mucopolysaccharidosis Type IVA and Long-term Follow-up of the Screen-positive Subjects in Taiwan**
台灣黏多醣症第四 A 型新生兒篩檢計畫與篩檢陽性個案之長期追蹤

Hsiang-Yu Lin[1,2,3,4,5], Shuan-Pei Lin[1,2,3,4,6], Chung-Lin Lee[1,3,4,5], Chih-Kuang Chuang[2], Ya-Hui Chang[1,3], Yuan-Rong Tu[2], Yun-Ting Lo[3], Dau-Ming Niu[7], Shu-Min Kao[8], Huey-Jane Ho[9]
Department of Pediatric Genetics and Metabolism, MacKay Children's Hospital, Taipei, Taiwan[1]; Department of Medical Research, MacKay Memorial Hospital, Taipei, Taiwan[2]; The Rare Disease Center, MacKay Memorial Hospital, Taipei, Taiwan[3]; Department of Medicine, MacKay Medical College, New Taipei City, Taiwan[4]; MacKay Junior College of Medicine, Nursing and Management, Taipei, Taiwan[5];

Department of Infant and Child Care, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan[6]; Department of Pediatrics, Taipei Veterans General Hospital, Taipei, Taiwan[7]; The Chinese Foundation of Health, Neonatal Screening Center, Taipei, Taiwan[8]; Taipei Institute of Pathology, Neonatal Screening Center, Taipei, Taiwan[9]
林翔宇 [1,2,3,4,5]、林炫沛 [1,2,3,4,6]、李忠霖 [1,3,4,5]、莊志光 [2]、張雅惠 [1,3]、塗元榕 [2]、羅允廷 [3]、牛道明 [7]、高淑敏 [8]、何慧珍 [9]
馬偕兒童醫院兒童遺傳暨新陳代謝學科 [1]; 馬偕紀念醫院醫學研究部 [2]; 馬偕紀念醫院罕見疾病中心 [3]; 馬偕醫學院醫學系 [4]; 馬偕醫護管理專科學校 [5]; 國立台北護理健康大學嬰幼兒保育系 [6]; 台北榮民總醫院兒童醫學部 [7]; 中華民國衛生保健基金會新生兒篩檢中心 [8]; 台北病理中心新生兒篩檢中心 [9]

Background: Mucopolysaccharidosis IVA (MPS IVA) is a rare lysosomal storage disorder caused by N-acetylgalactosamine-6-sulfatase (GALNS) deficiency, leading to the accumulation of glycosaminoglycans (GAGs) in the lysosomes of many tissues and organs, leading to progressive cellular dysfunction. An MPS IVA newborn screening program has been available in Taiwan since September 2019.
Methods: From September 2019 to May 2023, 241,610 newborns were screened for MPS IVA by dried blood spots using tandem mass spectrometry, of whom 89 suspected infants were referred to our hospital for confirmation. The diagnosis of MPS IVA was confirmed by GALNS enzyme activity assay in leukocytes, quantitative determination of urinary GAGs by mass spectrometry, and identification of the GALNS gene variant.
Results: Among the 89 referred infants, eight (9%) were diagnosed with confirmed MPS IVA (Group 1), 18 (20%) were classified as highly suspected MPS IVA (Group 2), 56 (63%) were classified as MPS IVA carrier (Group 3), and seven (8%) were classified as not having MPS IVA (Group 4). Thirty-three GALNS gene variants were identified in our MPS IVA newborn screening program. The variant of [c.857C＞T, p.T286M] (n=32) (30%) was the most prevalent hot spot, followed by [c.953T＞G, p.M318R] (n=20) (19%), and [c.887C＞T, p.A296V] (n=10) (9%). Long-term follow-up every six months was arranged for the infants in Groups 1, 2 and 3. Intravenous enzyme replacement therapy (ERT) was started in five patients at 0.3, 0.7, 1.6, 1.7 and 0.6 years of age, respectively. After ERT, GALNS enzyme activity and the quantity of urinary GAG and keratan sulfate significantly improved in all of these patients compared with the baseline data. The incidence of MPS IVA was estimated to be 3.31 per 100,000 live births.
Conclusions: Because of the progressive nature of MPS IVA, early diagnosis via a newborn screening program and timely initiation of ERT before the occurrence of irreversible organ damage may lead to better clinical outcomes. The findings of the current study could serve as baseline data for the analysis of the long-term effects of ERT in these patients.

116 **Kabuki Syndrome Under the Microscope: Dissecting Genetic and Phenotypic Variation in a Taiwanese Cohort**
以「歌舞伎綜合徵」為題,探索臺灣患者的遺傳與表現型差異

Chung-Lin Lee[1,2,3,4,5], Chih-Kuang Chuang[6,7], Huei-Ching Chiu[1], Yuan-Rong Tu[6], Yun-Ting Lo[3], Ya-Hui Chang[1,3], Hsiang-Yu Lin[1,3,4,5,6,8], Shuan-Pei Lin[1,3,4,6,9]
Department of Pediatrics, MacKay Memorial Hospital, Taipei, Taiwan [1]; Institute of Clinical Medicine, National Yang-Ming Chiao-Tung University, Taipei, Taiwan [2]; Department of Rare Disease Center, MacKay Memorial Hospital, Taipei, Taiwan [3]; Department of Medicine, Mackay Medical College, New Taipei City, Taiwan [4]; Mackay Junior College of Medicine, Nursing and Management, Taipei, Taiwan [5]; Division of Genetics and Metabolism, Department of Medical Research, MacKay Memorial Hospital, Taipei, Taiwan [6]; College of Medicine, Fu-Jen Catholic University, Taipei, Taiwan [7]; Department of Medical Research, China Medical University Hospital, China Medical University, Taichung, Taiwan [8]; Department of Infant and Child Care, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan [9]
李忠霖 [1,2,3,4,5]、莊志光 [6,7]、邱慧菁 [1]、塗元榕 [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]

Background: Kabuki syndrome (KS) is a rare congenital disorder characterized by distinctive facial features, intellectual disability, and other medical complications. The genetic basis is poorly understood, particularly in Taiwanese populations.
Methods: We conducted genetic testing and retrospective chart review for 23 Taiwanese pediatric KS patients. Mutation analysis of KMT2D and KDM6A was performed by sequencing and MLPA. Patients without detected mutations underwent whole exome sequencing. Clinical data was collected on facial dysmorphology, cognitive outcomes, growth patterns, congenital anomalies, and other medical conditions.
Results: Pathogenic KMT2D variants were found in 52.2% (12/23) of patients, including 2 truncating mutations. No secondary pathogenic variants were detected by whole exome sequencing. All patients exhibited intellectual disability, with 43.2% being moderate-severe. Distinctive facial features emerged over time. No genotype-phenotype correlations were found between mutation type or status and medical complications.
Conclusions: This study expands the understanding of KS genetics and clinical manifestations in Taiwanese patients. Further research in non-Caucasian populations is warranted to elucidate genotype-phenotype relationships in this rare, heterogeneous disorder.

117 **Illuminating the Genetic Basis of Congenital Heart Disease in Kabuki Patients**
探究歌舞伎症候群患者先天性心臟疾病的遺傳基礎

Chung-Lin Lee[1,2,3,4,5], Chih-Kuang Chuang[6,7], Huei-Ching Chiu[1], Yuan-Rong Tu[6], Yun-Ting Lo[3], Ya-Hui Chang[1,3], Hsiang-Yu Lin[1,3,4,5,6,8], Shuan-Pei Lin[1,3,4,6,9]
Department of Pediatrics, MacKay Memorial Hospital, Taipei, Taiwan [1]; Institute of Clinical Medicine, National Yang-Ming Chiao-Tung University, Taipei, Taiwan [2]; Department of Rare Disease Center, MacKay Memorial Hospital, Taipei, Taiwan [3]; Department of Medicine, Mackay

Medical College, New Taipei City, Taiwan [4]; Mackay Junior College of Medicine, Nursing and Management, Taipei, Taiwan [5]; Division of Genetics and Metabolism, Department of Medical Research, MacKay Memorial Hospital, Taipei, Taiwan [6]; College of Medicine, Fu-Jen Catholic University, Taipei, Taiwan [7]; Department of Medical Research, China Medical University Hospital, China Medical University, Taichung, Taiwan [8]; Department of Infant and Child Care, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan [9]
李忠霖 [1,2,3,4,5]、莊志光 [6,7]、邱慧菁 [1]、塗元榕 [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]

Background: Congenital heart defects (CHDs) affect 28-80% of Kabuki syndrome patients, but the types of defects and genotype-phenotype correlations are poorly characterized.
Methods: We conducted a retrospective analysis of 23 molecularly confirmed Taiwanese Kabuki syndrome patients seen from 2012-2023. Pathogenic KMT2D variants were identified in 22 patients. Literature review summarized CHDs in prior Kabuki cohorts.
Results: CHDs occurred in 17/23 (73.9%) patients, most commonly left-sided obstructive lesions (e.g. coarctation), bicuspid aortic valve, ventricular septal defects, and secundum atrial septal defects. Additional anomalies occurred sporadically. Literature review revealed similar patterns of predominantly left-sided defects.
Conclusions: Left-sided obstructive lesions, particularly aortic coarctation associated with mitral abnormalities resembling Shone complex, are highly prevalent in Taiwanese Kabuki syndrome patients with KMT2D mutations. Echocardiographic screening at diagnosis and annual monitoring, with a focus on left-sided anomalies, is recommended for clinical management. Further genotype-phenotype studies across ethnicities may advance understanding of the genetic basis of CHDs.

118 **Optical Genome Mapping plus Whole Genome Sequencing Solve Complex Chromosomal Structural Variations in Leukemias**
利用基因體測繪技術結合全基因組序列解析白血病中染色體的複雜結構變異

Meng-Ju Melody Tsai[1,2], Hsiao-Jung Kao[3], Hsiao-Huei Chen[3], Chih-Hsiang Yu[4], Yin-Hsiu Chien[5], Wuh-Liang Hwu[1,5,6], Pui-Yan Kwok[3], Ni-Chung Lee[5], Yung-Li Yang[1]
1Department of Pediatrics, National Taiwan University Hospital and College of Medicine, National Taiwan University, Taipei, Taiwan; 2Department of Pediatrics, National Taiwan University Hospital Yunlin Branch, Yunlin, Taiwan; 3Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan; 4Institute of Statistical Science, Academia Sinica, Taipei, Taiwan; 5Department of Medical Genetics, National Taiwan University Hospital, Taipei, Taiwan; 6Center for Precision Medicine, China Medical University Hospital, China Medical University, Taichung, Taiwan
蔡孟儒 [1,2]、高曉容 [3]、陳曉慧 [3]、游智翔 [4]、簡穎秀 [5]、胡務亮 [1,5,6]、郭沛恩 [3]、李妮鍾 [5]、楊永立 [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雲林分院小兒部 [2]; 中央研究院生物醫學科學研究所 [3]; 中央研究院統計科學研究所 [4]; 國立台灣大學醫學院附設醫院基因醫學部 [5]; 中國醫藥大學附設醫院總院精準醫學中心 [6]

Background: Chromosomal structural variations (SVs) play an important role in the formation of human cancers including leukemias. However, many complex SVs cannot be solved by conventional tools including karyotyping, fluorescence in situ hybridization, microarrays, and multiplex ligation-dependent probe amplification (MLPA).
Methods: Bionano optical genome mapping (OGM) and whole genome sequencing (WGS) were employed to analyze five leukemia samples with SVs detected by karyotyping, MLPA, and RNA-seq. OGM was performed using the Saphyr chip on a Bionano Saphyr system. Copy number variation and rare variant assembling analyses were performed with Bionano software v3.7. WGS was analyzed by the Menta program for SVs.
Results: The five leukemia samples had an average of 477 insertions, 457 deletions, and 32 inversions, significantly higher than those discovered from normal blood samples (p=0.016, 0.028, and 0.028, respectively). Each of the five cases revealed between one and seven SVs, along with the observation of multiple fusion genes. All breakpoint sequences were defined by WGS. The IGH-DUX4 fusion previous found by RNA-seq in Case 3 was not confirmed by the current study, because DUX4, with multiple pseudogenes, due to the refractory to OGM and WGS analyses.
Conclusions: OGM, as a single tool, may replace a multiply of conventional tools to solve complex SVs in leukemia samples, and WGS effectively closed the gaps of OGM mapping.

119 **Improved Sensitivity in Structural Variation Detection for Mitochondrial Genome Through Long-Read Sequencing**
長片段定序技術提升粒線體基因組結構變異之檢測敏感度

Hui-An Chen[1,2], Wuh-Liang Hwu[1,3], Chao-Szu Wu[1], Hsueh-Wen Hsueh[4], Wen-Chin Weng[2], Pi-Chuan Fan[2], Chih-Chao Yang[4], Yin-Hsiu Chien[1,2], Chia-Lang Hsu[5], Ni-Chung Lee[1,2]
Department of Medical Genetics, National Taiwan University Hospital, Taipei, Taiwan [1]; Department of Pediatrics, National Taiwan University Hospital, Taipei, Taiwan [2]; Graduate Institute of Integrated Medicine, China Medical University, Taichung City, Taiwan [3]; Department of Neurology, National Taiwan University Hospital, Taipei, Taiwan [4]; Department of Medical Research, National Taiwan University Hospital, Taipei, Taiwan [5]
陳薈安 [1,2]、胡務亮 [1,3]、吳兆斯 [1]、薛學文 [4]、翁奴謹 [2]、范碧娟 [2]、楊智超 [4]、簡穎秀 [1,2]、許家郎 [5]、李妮鍾 [1,2]
國立臺灣大學醫學院附設醫院基因醫學部 [1];國立臺灣大學醫學院附設醫院兒童醫院小兒部 [2];中國醫藥大學附設醫院精準醫療中心 [3];國立臺灣大學醫學院附設醫院神經部 [4]、醫學研究部 [5]

Background: Mitochondrial diseases are genetic disorders caused by deficiencies in oxidative phosphorylation, leading to varied clinical presentations and complicated inheritance patterns. The advent of next-generation sequencing (NGS)

has improved our understanding of these disorders, particularly in detecting point mutations, insertions, deletions, and complex genomic rearrangements (CGRs) in mitochondrial DNA (mtDNA). This study aims to evaluate the diagnostic efficacy of long-read sequencing using Oxford Nanopore Technologies (ONT) MinION compared to current short-read NGS methods.

Methods: We enrolled individuals suspected of having mitochondrial disorders associated with mtDNA copy number variations (CNVs), including single/multiple deletions, duplications, and mitochondrial deletion syndrome (MDS). Cases were identified through either clinical presentation or family segregation studies. Each participant underwent molecular testing for mtDNA using long-range PCR (LR-PCR), followed by both short-read NGS and Nanopore ONT MinION.

Results: The study enrolled 17 cases (7 males, 10 females). Short-read NGS revealed mtDNA CNVs in 11 patients (64.7%): including 6 with mtDNA single deletions, 3 with multiple deletions (including 2 MDS cases), and 2 with mtDNA duplications. Long-read sequencing identified CNVs in 13 samples (76.5%): 6 with single deletions, 5 with multiple deletions (including 2 MDS cases), and 2 with duplications. One patient, initially identified with a single deletion via short-read NGS, exhibited multiple deletions with ONT. Among the 6 patients without CNVs identified by short-read NGS, 2 displayed CNVs with ONT; one had multiple deletions detected by ONT and LR-PCR, while the other had a 6877 bp deletion undetected by short-read NGS or LR-PCR. The consistency rate between the two methods was 82.35% (14/17). Both methods identified multiple mtDNA deletions in MDS patients, though one was missed by LR-PCR.

Conclusions: Long-read sequencing approach exhibits superior capability in deciphering CGRs, such as multiple deletions, of mtDNA.

120 **Genetic Burden of the Leptin-Melanocortin Pathway in Pediatric Obesity**

兒童肥胖之瘦素-黑素皮質素途徑的遺傳負荷

Yu-Ming Chang, Yu-Wen Pan, Yen-Yin Chou, Meng-Che Tsai

Department of Pediatrics, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan

張聿民、潘妤玟、周言穎、蔡孟哲

國立成功大學醫學院附設醫院小兒部

Background: Obesity is conceived to result from complex interactions between environmental factors and genetics. We hypothesize that rare exonic variants with high predicted pathogenicity in the leptin-melanocortin pathway may predict an early onset of obesity in pediatric patients.

Methods: Individuals (N=144) aged 4 to 18 years with a body mass index (BMI) higher than 27 kg/m2 or the 95th percentile of the age- and sex-matched population were recruited for targeted exon sequencing of the candidate genes (POMC, BDNF, MRAP2, FTO, LEPR, PCSK1, MAGEL2, MC3R, MC4R, SIM1, LEP, and NTRK2). The control group included individuals (N=301) aged under 40 registered in Taiwan Biobank with a BMI between 18.5 and 25 kg/m2. We defined potential influential variants (PIVs) as rare variants (allele frequency $<$ 0.01) that were either nonsense, frameshift, splicing, or missense variants with a Combined Annotation Dependent Depletion (CADD) score $\geq$ 20. We compared the number and distribution of PIVs between obese individuals and controls. Further, the Sequence Kernel Association Test (SKAT) was employed to characterize the genetic burden, considering PIVs, associated with obesity.

Results: We found that obese individuals with obesity harbored more PIVs than controls (mean PIV count: 0.36 versus 0.21, $p < 0.01$). Moreover, 31% of obese individuals, as compared to 19% of controls, had at least one PIV ($p < 0.01$). PIVs were distributed in 7 genes (LEPR, PCSK1, SIM1, NTRK2, MC4R, MAGEL2, and MC3R). The SKAT revealed 3 genes (LEPR, PCSK1, and MAGEL2) significantly associated with early-onset obesity and higher BMI.

Conclusions: Rare variants in the leptin-melanocortin pathway predict a higher burden of childhood obesity. Genetic testing may unveil the genetic architecture and help identify patients for targeted therapeutic interventions.

121 **Clinical Spectrum of CHD7 disorders in Taiwan: A Retrospective Study**

台灣 CHD7 疾患之臨床表現光譜-回溯性研究

Chien-Yi Lai[1], Ni-Chung Lee[2,3], Yin-Hsiu Chien[2,3], Wuh-Liang Hwu[2,3]

Department of Pediatrics, National Taiwan University Hospital Hsinchu Branch, Hsinchu County, Taiwan[1]; Department of Pediatrics, National Taiwan University Hospital, Taipei, Taiwan[2]; Department of Medical Genetics, National Taiwan University Hospital, Taipei, Taiwan[3]

賴建亦[1]、李妮鍾[2,3]、簡穎秀[2,3]、胡務亮[2,3]

國立臺灣大學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小兒部[2]; 國立臺灣大學醫學院附設醫院基因醫學部[3]

Background: CHD7 is the causative gene of idiopathic hypogonadotropic hypogonadism (IHH) and CHARGE syndrome. The latter one is characterized by coloboma, heart defects, choanal atresia/stenosis, growth retardation, genital hypoplasia, and ear anomalies. This study aims to elucidate the clinical presentations of Taiwanese patients with CHD7 mutations.

Methods: Sixteen individuals with CHD7 variants were diagnosed and followed up at National Taiwan University Hospital (2012-2023). Genotypes were obtained through exome or CHD7 gene sequencing. Phenotypes were retrieved from chart records, imaging studies, and psychological assessments.

Results: Sixteen patients with CHD7 mutations (5 males, 11 females; mean age: 7.1 ± 6.6 years) were included. Nonsense variants (6/16, 35.7%) were most common, followed by frameshift (4/16, 25.0%), splice site (4/16, 25.0%), and missense (2/16, 12.5%) variants. Clinical features included ocular coloboma (10/11, 90.9%), inner ear anomaly (8/9, 88.9%), cardiovascular defects (14/16, 87.5%), growth deficiency (14/16, 87.5%), hearing loss (13/15, 86.7%), developmental delay (11/13, 84.6%), external ear anomaly (12/15, 80.0%), intellectual disability (6/8, 75.0%), facial palsy (9/15, 60.0%), feeding difficulties (8/14, 57.1%), genital hypoplasia (3/15, 20.0%), choanal atresia (2/13, 15.4%), anosmia (1/15, 6.7%), autism spectrum disorder (1/15, 6.7%), cleft lip/palate (1/16, 6.3%), tracheoesophageal fistula (1/16, 6.3%).

Conclusions: IHH and CHARGE syndrome share the same causative gene but have distinct presentations. Further studies

investigating the underlying disease mechanism are needed.

122 **A Genome-Wide Association Study of Pediatric Obesity in Taiwan**
台灣兒童肥胖的全基因關聯性研究

Hsin Ru Wu[1], Ting Yuan Liu[2], Chung-Hsing Wang[1], Fuu Jen Tsai[1]
Division of Medical Genetics, Pediatric Endocrinology & Metabolism, China Medical University Children's Hospital[1];Center for Precision Medicine and Epigenome Research Center, China Medical University Hospital[2]
吳信儒[1]、劉鼎元[2]、王仲興[1]、蔡輔仁[1]
中國醫藥大學兒童醫院醫學遺傳暨兒童新陳代謝內分泌科[1];中國醫藥大學附設醫院醫學研究部精準醫學中心[2]

Background: Between 1975 and 2016, the prevalence of obesity has risen from 0.7% to 5.6% in girls and 0.9% to 7.8% in boys. The recent studies in Taiwan revealed that 1 in 9 preschool children (aged 2 to 6 years) was obese. Obesity development is influenced by both genetic and environmental factors, with genetic factors contributing 50-80% according to previous studies. FTO was the first gene associated with obesity identified by a genome-wide association study (GWAS) in 2007. However, GWAS specifically focused on pediatric obesity are limited. Thus our study aims to investigate the genetic background of Taiwanese pediatric obesity.
Methods: The China Medical University Hospital Biobank served as the resource for our GWAS. Patients were individuals with a BMI above the 95th percentile for their age and sex based on the national growth chart. Controls included individuals with a BMI between the 3rd and 50th percentiles. The age range for both patients and controls was set between 2 and 17 years old. Genotyping was carried out using the TPMv1 customized SNP array in accordance with the manufacturer's instructions. Statistical analysis of genomic data between patients and controls was performed using PLINK V.1.90 software, with the genome-wide significance level set at 1×10-5.
Results: 4557 cases and 9742 controls were included in our GWAS analysis. The leading SNPs were rs79500119 in chromosome 2 and rs74617772 in chromosome 16. Polygenic risk score was established based on GWAS results and obesity cases had higher polygenic risk scores (p-value ＜ 0.05). PheWAS analysis showed pediatric obesity was highly associated with morbid adult obesity, metabolic diseases (such as T2DM), cardiovascular diseases (such as hypertension), respiratory diseases (such as asthma) and liver diseases. Network analysis with IPA found that inulin-AKT signaling plays an important role in childhood obesity.
Conclusions: This is the first GWAS in pediatric obesity in Taiwan, the findings in our study provide a direction for childhood obesity research. Further functional analysis is needed.

123 **Investigate the concentrations of leptin, adiponectin and vitamin D in 26 Taiwanese adolescents with obesity**
台灣 26 名肥胖青少年瘦體素、脂聯素及維生素 D 濃度調查

Hsin-Ju Lee, Fu-Sung Lo
Division of Pediatric Endocrinology & Genetics, Chang Gung Memorial Hospital Linkou, Taiwan
李心茹、羅福松
林口長庚醫院兒童內分泌暨遺傳科

Background: Leptin and adiponectin, recognized as adipokines, are hormones by adipose tissue. Leptin, often termed the "satiety hormone" plays a pivotal role in maintening energy balance. On the other hand, adiponectin possesses anti-inflammatory and enhances insulin sensitivity. Additionally, vitamin D, primarily associated with bone health, exerts influence over diverse metabolic processes.
Methods: This study involved the examination of blood levels of leptin, adiponectin, and vitamin D in 26 obese and 8 healthy Taiwanese adolescents. Additionally, various metabolic parameters, including BMI, waist circumference, blood pressure, glucose levels, lipid profiles, and liver enzymes were assessed as part of the research investigation.
Results: This study found that blood leptin levels in the obese group were significantly higher compared to the control group (35.1+-19.8 vs 7.73+-3.63 ng/ml, p = 0.0004). Conversely, blood adiponectin levels in obese group were lower than those in the control group (7.66+-3.39 vs 14.43+-3.83 ug/ml, p = 0.0015). No statistically significant differences were observed between the obese and control groups in term of blood vitamin D levels (16.64+3.87 vs 19.29+-5.98 ng/ml, p = 0.1425). Physical examinations of obese adolescents exhibited elevated BMI, hypertension, and increased waist circumference. Blood tests conducted on obese adolescents unveiled elevated fasting blood glucose, elevated total cholesterol and LDL, reduced HDL, and heightened levels of ALT and AST.
Conclusions: Blood leptin levels were significantly higher in the obese group, indicating potential disruptions in appetite control. Conversely, blood adiponectin levels were lower in the obese group, suggesting potential metabolic issues. Surprising, there were no significant differences in blood vitamin D levels between the two groups. Acknowledgments This study was supported by Grants MOST 111-2314-B-182A-141 and 112-2314-B-182A-010 from the Ministry of Science and Technology, Executive Yuan, Taiwan.

124 **The Effectives of Growth Hormone Treatment in Taiwanese individuals with Turner syndrome and its impact on their final adult height: A 25-year analysis conducted across three medical centers**
生長激素治療對台灣特納氏症患者的有效性及其對最終成年身高的影響：在三個醫療中心進行的 25 年分析

Yu-Ting Chang[1,2], Ying-Hua Huang[2], Fu-Sung Lo[1]
Division of Pediatric Endocrinology & Genetics, Linko Chang Gung Memorial Hospital[1]; Division of Pediatric Endocrinology & Genetics, Kaohsiung Chang Gung Memorial Hospital[2]
張毓庭[1,2]、黃映樺[2]、羅福松[1]
林口長庚醫院兒童內分泌暨遺傳科[1];高雄長庚醫院兒童內分泌暨遺傳科[2]

Background: Turner syndrome (TS) is a genetic condition resulting from the complete or partial absence of the X chromosome. TS is characterized by short stature, primary ovarian failure, and typic features such as a webbed neck, low posterior hairline, high-arched palate, cubitus valgus, hyperconvex fingernails, and heart defects. This study aims to assess the effectiveness of growth hormone (GH) treatment in girls with TS and its influence on their final adult height.

Methods: From 1998 to 2023, we identified 118 individuals diagnosed with TS, out of which 108 underwent GH therapy. Throughout the study, some patients reached their adult height. Most participants received a combination of estrogen and progesterone for the management of hypogonadism. Our analysis focused on evaluating the height velocity during growth hormone therapy in these individuals and assessing the ultimate height they attained.
Results: Patients underwent GH therapy at an average age of 11.1 years, with a mean duration of 4.4 years. The initial-year growth velocity averaged 7.03 cm/year, decreasing to 5.61 cm/year in the second year. The average age and height of the last GH treatment were 15.5 years and 146.1 cm, respectively. Among those who reached their adult height during the study, the mean height was 149.2 cm.
Conclusions: The use of recombinant GH markedly boosted height velocity and final adult stature in TS. Optimal effectiveness was observed during the first year of therapy. Earlier data from the Taiwanese population indicated a final height of 147 cm for TS patients. However, our study disclosed a more favorable final adult height of 149.2 cm following GH treatment.

125 **Artificial intelligence-assisted bone age assessment improves performance of physicians**
人工智能輔助骨齡判讀軟體可以改善醫師骨齡判讀之正確性

Yeong-Seng Yuh[1,2], Tien-Yu Chang[3], Ting-Ywan Chou[4,5]
Department of Pediatrics Cheng-Hsin General Hospital [1]、Department of Pediatrics National Defense Medical Center [2]、Department of Radiology Cheng-Hsin General Hospital [3]、Department of Radiology Cardinal Tien General Hospital [4]、College of Medicine Fu Jen Catholic University [5]
喻永生 [1,2]、張天祐 [3]、周定遠 [4,5]
振興醫院兒童醫學部 [1]、國防醫學院小兒學系 [2]、振興醫院放射診斷部 [3]、新店耕莘醫院放射診斷部 [4]、輔仁大學醫學系 [5]

Background: Radiographic bone age (BA) assessment by artificial intelligence (AI) software is precise and instantaneous. The aim of this study is to assess the impact of information from an AI software on the performance of the BA assessment of radiologists with different level of experiences.
Methods: In this prospective study, 6 radiologists with different levels of experience assessed radiographs from 200 standard BA radiograph test set. The test data set were equally divided into two equal sets- group A and group B. BA was assessed independently by each radiologist without additional information (group A) and with AI information (group B) in a randomized cross-over design. With the mean assessment of two experts as the ground truth, mean absolute difference (MAD) was calculated to evaluate accuracy. Moreover, the performance with AI information first and with information later were compared, and the radiologists were allowed to disagree with AI information.
Results: The accuracy of senior, mid-level, junior radiologists were significantly better ($P < 0.05$) with AI assistance (MAD: 0.354, 0.532, 0.463, 0.514, 0.299 and 0.598 years) than without AI assistance (MAD: 0.701, 0.768, 0.554, 0.692, 0.791 and 0.909 years). The proportion of improved (16.75%) was significantly higher than worsened (2.3%) BA prediction ($P < 0.001$). There was no significant difference between different timing of providing AI information. Most of the disagreements between radiologist and AI were in the young age group.
Conclusions: Information from AI software improved the accuracy of BA assessment of radiologists with different level of experiences.

126 **Investigating the In Vivo Role of Phosphor-Modified KLHL3 in the WNKs-Mediated NCC pathway**
探討磷酸化修飾的 KLHL3 在 WNK 介導 NCC 路徑中之體內作用

Yi-Xuan Ding[1], Chun-Hao Chu[2], Shih-Hua Lin[3], Chien-Ming Lin[1]
Department of Pediatrics, Tri-Service General Hospital, National Defense Medical Center[1], Department of Pediatrics, Zuoying Branch of Kaohsiung Armed Forces General Hospital, Kaohsiung, Taiwan[2], Division of Nephrology, Department of Medicine, Tri-Service General Hospital, National Defense Medical Center[3]
丁宜瑄 [1]、朱君浩 [2]、林石化 [3]、林建銘 [1]
國防醫學院三軍總醫院小兒部 [1]; 國軍左營總醫院小兒科 [2]; 國防醫學院三軍總醫院腎臟科 [3]

Background: We have successfully created missense Klhl3M131V/+ knockin (KI) mice (human M78V mutation in BTB domain) and nonsense Klhl3W523X/+ KI mice (human W470X mutation in Kelch domain) to decipher the molecular mechanisms of pseudohypoaldosteronism type II (PHAII). However, the phosphorylation site (S433) on KLHL3 regulated by several stimuli such as angiotensin II, insulin, calcineurin inhibitors or potassium (K+) in PHAII have not been examined in vivo.
Methods: We generated and analyzed two missense Klhl3 KI mice with phosphor-modified at S486 site. The phenotypes of phosphomimetic Klhl3S486D/+ mice (human KLHL3 S433D mutation) and phosphodefective Klhl3S486G/+mice (human KLHL3 S433G mutation) were examined. The associated protein expression of their kidney tissue was evaluated by western blot and immunofluorescence.
Results: Unlike the Wnks-dependent Spak/Osr1-Ncc activation in Klhl3M131V/+ and Klhl3W523X/+ KI mice, both Klhl3S486D/+ and Klhl3S486G/+mice recapitulating typical phenotypes of PHAII exhibited an enhanced phosphorylation of Spak/Osr1-Ncc but the “unchanged” Wnk1/4 and Klhl3 expression. Both phosphor-modified Klhl3S486D/+and Klhl3S486G/+ KI mice demonstrated a significantly increased expression of Cab39 known as mouse protein 25α (MO25α) interacting and stimulating Spak or Osr1, as compared to those in WT littermates and non-phosphor-modified Klhl3M131V/+ and Klhl3W523X/+ mice. In vitro study showed that endogenous Cab39 interacted with endogenous E3 complex (KLHL3 and Cul3), but not with WNK1/4. The simulation model to predict the Cab39 and KLHL3 interaction demonstrated that KLHL3-WT and phosphor-modified KLHL3 mutants have different binding regions with Cab39.
Conclusions: Phosphor-modified KLHL3 KI mice exhibiting PHAII reveal a novel Wnks-independent Spak/Osr1-Ncc activation. Whether the phosphorylated status of KLHL3 S433 could affect its binding ability with Cab39 as a substrate for ubiquitination by the E3 complex needs to be well validated.