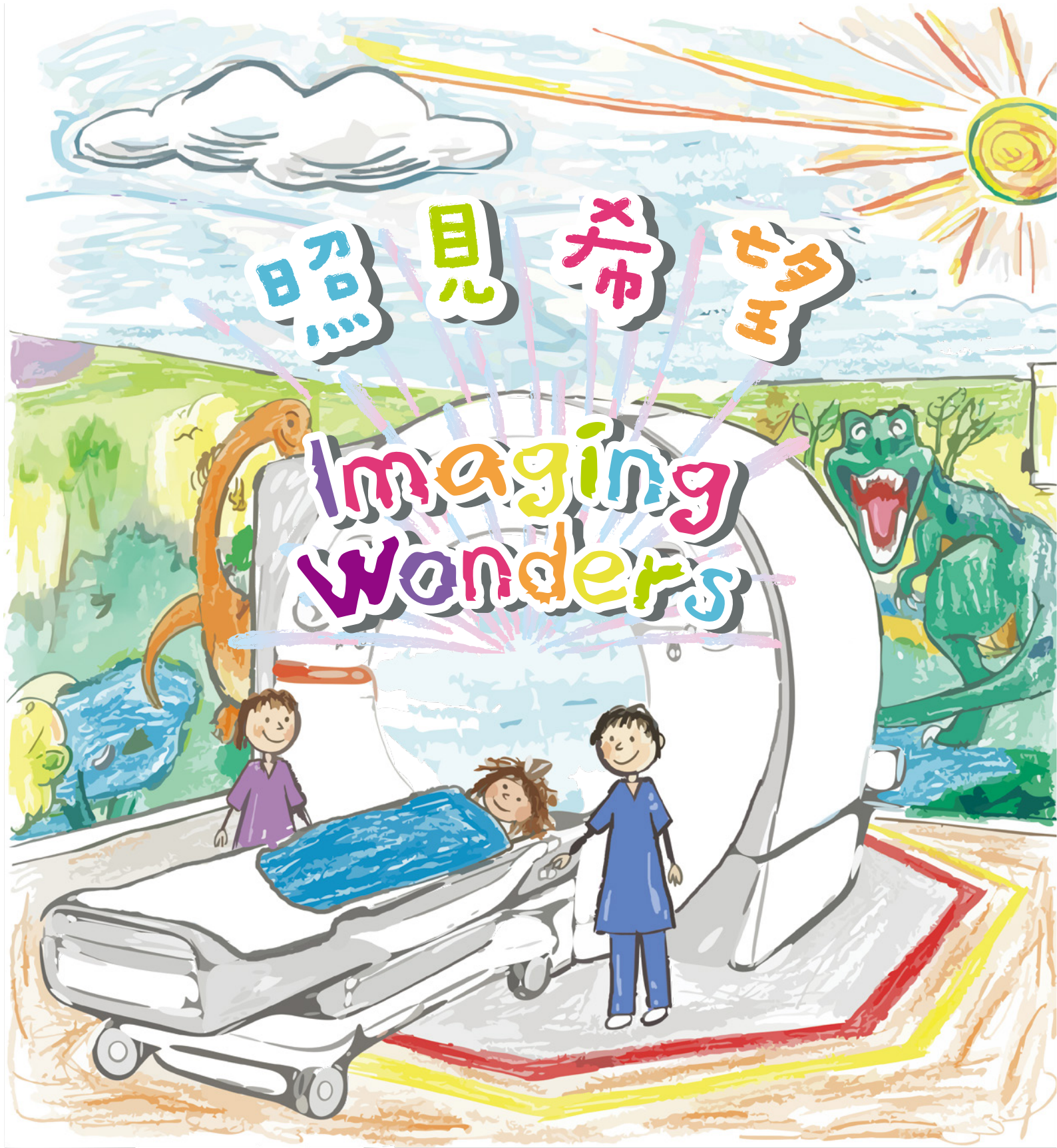
醫院管理局
HOSPITAL AUTHORITY

香港兒童醫院
Hong Kong Children's Hospital

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虛心求知 Learning

同理關懷 Caring

會心微笑 Smiling



院長的話

Shaping the future of paediatric care together
共建兒童醫療新里程

毗鄰香港兒童醫院的啟德醫院即將於十月展開首階段服務。回想 2018 年本院正式入伙，我們一路見證著這所新醫院從打地基到五座大樓拔地而起，深感時光飛逝，亦對未來充滿期待。

兩間醫院日後將由多條通道連接，組成一個四通八達的大型公營醫療綜合體。我們會在臨床服務上互相支援，涵蓋急症室、兒科、產科及放射治療等範疇，為病童提供更全面優質的服務。

醫務衞生局局長盧寵茂教授上月到本院視察，了解醫院的運作與未來發展。盧局長肯定本院的專業團隊、先進醫療設備，及兒童為本的貼心治療環境。他特別強調，本院必須配合政府政策方向，肩負起整合醫管局兒科服務的重任，持續擴展服務，接收更多種類和數量的病人，同時加強醫護人才培訓及科研發展。

這不僅是局長的殷切期望，更是我們全院上下共同的願景。本院醫療團隊憑藉專業知識、豐富經驗與無限熱忱，已做好準備迎接挑戰。相信日後與啟德醫院產生的協同效應，將進一步鞏固本院作為兒童專科卓越醫療中心的角色，實踐我們的核心使命。

醫院行政總監
李子良醫生

Kai Tak Hospital, adjacent to Hong Kong Children's Hospital, will launch its first phase of services this October. Since we moved into this location in 2018, we have watched this new hospital grow from its foundation into five grand towers. Time truly flies, and we look forward to the future with great anticipation.

The two hospitals will be connected by multiple walkways, forming a large-scale public healthcare complex. We will provide mutual support across clinical services—including the Accident and Emergency Department, paediatrics, obstetrics, and radiotherapy—to deliver more comprehensive and high-quality care for our paediatric patients.

Prof. Lo Chung-mau, the Secretary for Health, visited our hospital last month to learn about our operations and future development. He commended our expert teams, advanced medical equipment, and child-friendly therapeutic environment. He particularly emphasized that HKCH must align with the government's policy directions by taking on the responsibility of integrating paediatric services across different clusters under the Hospital Authority, continuously expanding our services to care for a wider variety and larger volume of patients, while also strengthening healthcare talent training and research development.

This is not only the Secretary's earnest expectation, but also the shared vision of our entire hospital. Harnessing deep expertise, rich experience and boundless passion, our teams are fully prepared to take on these challenges. I am confident that the upcoming synergy with Kai Tak Hospital will further consolidate our role as a paediatric centre of excellence and fully realize our core mandate.

Dr Lee Tsz-leung
Hospital Chief Executive


醫務衞生局局長盧寵茂教授（左二）參觀本院專科門診與其他臨床服務。
Secretary for Health Prof. Lo Chung-mau visits the specialist outpatient clinic and other clinical services.

專精造影 放射科照亮病童


放射科為病童進行磁力共振掃描，透過精準診斷，助他們步向康復。危重的新生兒會在專用保溫箱內接受檢查，確保安全。
The Department of Radiology performs MRI scans for children, offering precise diagnoses that guide them on their path to recovery. Critically ill newborns are put inside a special incubator to ensure safety.

Sub-specialized excellence: how radiology illuminates hope for young patients

為應對香港兒童醫院的複雜罕見個案，放射科發展了不同亞專科服務，包括胎兒造影、神經造影、心臟造影、肌肉骨骼造影，及介入放射服務，以高度專門的技術和經驗，推動兒童為本的服務，實現迅速診斷、智慧治療、精準預測。

To deliver highly specialized care for Hong Kong Children's Hospital's complex and rare cases, the Department of Radiology has developed subspecialty services including fetal imaging, neuroimaging, cardiac imaging, musculoskeletal imaging, and interventional radiology. Each is led by radiologists with dedicated expertise in their respective fields. Together, these subspecialties provide a truly child-centred imaging service—enabling earlier diagnosis, smarter treatment, and better prediction of outcomes for every child.

本院放射科處理的個案非常具挑戰性，當中涉及不少極年幼和危重的病童。近年，約四成個案轉介自新生兒／兒童深切治療部，及造血幹細胞移植中心。

放射科部門主管簡以靈醫生表示：「我們參考國際經驗並結合本院臨床需求，設立了不同的亞專科團隊，並安排各專責醫生到海外知名兒童醫院深造，有助他們深入研究相關領域的疾病及累積經驗，更精準判斷細微的臨床變化、檢查方法和時機，甚至開創嶄新的診斷與治療方案。」

The Department of Radiology manages highly challenging cases, many involving patients who are very young and ill. In recent years, about 40% of cases are referred from the Neonatal / Paediatric Intensive Care Unit and Haematopoietic Stem Cell Transplant Centre.

Chief of Service Dr Elaine Kan said, "Drawing on international experience and our clinical needs, we have developed sub-specialty teams. Our radiologists have undergone overseas training at renowned children's hospitals to accumulate profound knowledge and experience in their respective fields, allowing them to detect subtle abnormalities with greater precision, optimize the imaging modalities and timing, and even develop innovative diagnostic and treatment solutions."

在持續進修下，本院分別有放射科醫生及放射師完成以下海外培訓或考核：
Some of HKCH's radiologists and radiographers have undertaken the following overseas training or assessments:

- European Association of Cardiovascular Imaging: Cardiovascular Magnetic Resonance Congenital Heart Disease (Level 3) Certification
- European Society of Paediatric Radiology: European Diploma in Paediatric Radiology
- Cardiovascular and Interventional Radiological Society of Europe: European Board of Interventional Radiology
- University of Toronto, SickKids: Clinical Fellowship in Pediatric Interventional Radiology
- Monash Children's Hospital : Paediatric Imaging Fellowship
- Society for Cardiovascular Magnetic Resonance: Level III Competence in Cardiovascular Magnetic Resonance for Technologists



放射科團隊結合專業知識和豐富經驗，在各個治療階段守護病童。前排左起：趙彤醫生、吳穎琦醫生、部門主管簡以靈醫生、資深護師黃卓雯。後排左起：部門經理林燦斌、馮建勳醫生、陳沛君醫生、黃國俊醫生。

With specialized expertise, the radiology team safeguards young patients at every stage of their treatment journey. Front row, from left: Dr Milly Chiu, Dr Carol Ng, Chief of Service Dr Elaine Kan, Advanced Practice Nurse Wong Cheuk-man. Back row, from left: Department Manager Lam Tsan-pun, Dr Kevin Fung, Dr Joyce Chan, Dr Chris Wong.

理順流程　加快腫瘤診斷

本院是醫管局唯一的兒童癌症中心。放射科與各專科緊密合作，成功加快腫瘤診斷流程，提升治療成效。以惡性肝腫瘤為例，數據分析顯示病童由入院至接受腫瘤分期造影平均只需0.67日。由轉介抽取組織化驗，至開始化療的中位數僅3.5日，較本院投入服務前大幅減少六成時間。

簡醫生解釋背後關鍵：「有些病童來到時，腫瘤已壓住血管或器官。放射科收到轉介，便會盡快進行電腦掃描確診腫瘤類型及期數。我們常與血液及腫瘤科、外科、深切治療部、麻醉科等開會討論報告，研究需否抽組織或骨髓化驗，並同場置入中央靜脈導管預備輸注化療藥。這不僅加快診斷，更避免病童重覆麻醉。配合病理科迅速的化驗報告，大家便可及早制定針對性治療方案。」



數碼減影血管造影供醫生在影像導航下，為病童抽取組織作化驗、置入中央靜脈導管，及進行介入放射治療等程序。

Advanced digital subtraction angiography empowers radiologists to perform biopsies, place central lines, and deliver interventional radiology procedures under image guidance.

走在病人治療的前綫

放射科醫生更會「走到幕前」，參與聯合會診，包括骨骼診所和脈管病變診所。簡醫生稱：「透過面診，我們可親身了解病童情況及需要，建議最合適的檢查或介入放射程序。」

兒科放射科培訓中心　孕育人才

作為香港放射科醫學院認證的兒科放射科培訓中心，本院結集了專業團隊、多元複雜病例和先進儀器。凡選修兒童放射科的醫生必須到本院接受臨床培訓；修讀腫瘤放射科的醫生，以及進修介入放射科的醫生，亦可在本院累積兒科經驗。

Streamlining workflow to expedite tumor diagnosis

HKCH is the only paediatric cancer centre under the Hospital Authority. The Department of Radiology works closely with various specialties to streamline tumor diagnosis workflow for better patient outcomes. Taking malignant liver tumors as an example, an analysis of previous data shows that the mean time from admission to staging imaging is only 0.67 days, while the median time from biopsy request to commencement of chemotherapy has been reduced by 60% to 3.5 days, compared to before HKCH's service commencement.

Dr Kan explained the key to this efficiency, "Some patients present with tumors pressing on critical organs or blood vessels when they arrive, so every second counts. Upon receiving referral, we perform a CT scan to confirm the tumor type and stage as soon as possible. Findings are often discussed in a multi-disciplinary meeting with Haematology & Oncology, Surgery, ICU and Anaesthesiology etc. to decide on the need for biopsy and placing a central venous catheter in the same session. This not only accelerates diagnosis but also spare patients from repeated sedation. Combined with prompt lab results by Pathology, we can all lock in a targeted treatment plan promptly."

At the forefront of patient care

At HKCH, radiologists actively participate in multidisciplinary clinics, including bone clinic and vascular anomaly clinic. "Meeting patients in person, we can gain a first-hand understanding of their conditions and needs, and recommend the most suitable imaging or interventional radiology procedure."

Nurturing paediatric radiology talent for the future

As a Centre for Designated Training in Paediatric Radiology of the Hong Kong College of Radiologists, HKCH brings together an expert team, diverse complex cases, and advanced equipment. All radiologist trainees pursuing paediatric radiology as a sub-specialty must undergo clinical training at HKCH, while oncologic radiology trainees and radiologists training in interventional radiology can also gain paediatric experience here.



胎兒造影：為新生命鋪設安全之路
Fetal imaging: paving a safe path for new lives

產前超聲波是準父母滿懷期待的時刻，惟一旦發現胎兒異常，難免令人憂心。本院放射科為公立醫院產科轉介的個案進行胎兒磁力共振掃描，以高質影像偵查器官細微變化，在寶寶出生前與各專科攜手做好萬全準備。這服務亦是《施政報告》提出本院要重點發展的項目之一。

Antenatal ultrasound is a joyful milestone for expectant parents. However, detecting any fetal abnormality can be overwhelming. The HKCH Department of Radiology provides fetal MRI scans for cases referred by public hospitals. By delivering high-quality imaging, it works closely with various specialties to fully prepare for the baby's arrival. This is one of the key services of HKCH highlighted in the Policy Address.

胎動會引致影像模糊，放射科醫生與放射師需實時調整磁力共振掃描序列，拍攝高質素影像。

To prevent artefacts from fetal movement, radiologists and radiographers adjust MRI sequences in real time to capture high-quality images.

放射科部門主管簡以靈醫生稱：「以輕度孤立性腦室擴大為例，逾九成最終能正常發育。為排除潛在風險，若超聲波發現異常，我們會透過胎兒磁力共振提供關鍵影像，剖析有否大腦皮質畸形等嚴重疾病；並按需要轉介醫學遺傳科跟進，有助為父母評估再次生育的風險。」

放射科副顧問醫生張樂人補充：「一些嚴重個案需盡早介入，例如先天性下顎過小或後縮可引致嬰兒出生時氣管閉塞。胎兒磁力共振報告能讓產科醫生及早與父母溝通，並與各專科預先制定應變方案，避免延誤救治。」

跨院救治脊柱裂胎兒

本院曾處理一宗複雜個案，充份體現了胎兒磁力共振的重要性。一名孕婦在超聲波檢查中發現胎兒腦部和脊柱畸形，轉介至放射科進行磁力共振掃描後，確診脊柱裂和小腦扁桃體下疝畸形。

考慮到寶寶出生後脊柱神經外露將面臨嚴重損傷及感染，多個跨院團隊展開深入討論，周密規劃其出生過程、出生後治理、轉院和緊急手術。寶寶在廣華醫院出生當日，即由重症治療運送團隊，安全護送到本院新生兒深切治療部，隨即由本院神經外科及瑪麗醫院整形外科聯手完成脊柱裂修補手術。

精準診斷並非朝夕煉成。張醫生稱：「胎兒發育時，腦溝的形狀及摺數持續變化，我們要非常熟悉腦部結構及有豐富經驗，才能準確辨別異常。」

Dr Elaine Kan, Chief of Service of the Department of Radiology explained, "Taking isolated mild fetal ventriculomegaly (enlarged fluid spaces in the brain) as an example, over 90% of cases ultimately result in normal development. When an anomaly is detected by ultrasound, we utilize fetal MRI to provide critical images to rule out associations and severe conditions, like disorders of cortical malformations. Cases will be referred to the clinical genetics team if needed, helping parents assess future pregnancy risks."

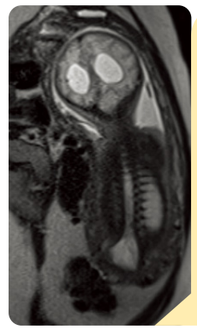
Associate Consultant (Radiology) Dr Claudia Cheung added, "Some critical conditions demand early intervention. For example, a small or recessed lower jaw can cause airway obstruction at birth. Our MRI report enables the obstetrician to counsel parents and formulate contingency plans with relevant specialties, avoiding any delay in care."

Cross-hospital intervention saves newborn with spinal dysraphism

A complex case previously treated in HKCH demonstrates the importance of fetal MRI. An ultrasound exam revealed brain and spinal malformations in a fetus. Upon referral to the Department of Radiology for MRI, the baby was diagnosed with spinal dysraphism and Chiari II malformation.

Anticipating severe damage and infection risks due to exposed spinal nerves after birth, various teams from different hospitals meticulously planned the baby's delivery, postnatal care, transfer and emergency surgery. On the day of birth at Kwong Wah Hospital, the baby was safely escorted by the critical care transport team to the HKCH neonatal intensive care unit. On the same day, a repair surgery was successfully performed by HKCH Neurosurgery and Queen Mary Hospital's Plastic and Reconstructive Surgery.

Accurate diagnosis is not built overnight. Dr Cheung explained, "As the fetus develops in the womb, the brain's sulcal pattern and lamination keep changing. Identifying abnormalities demands not only a thorough grasp of neuroanatomy but also extensive experience."



放射科為胎兒進行磁力共振掃描，精準診斷脊柱裂，讓跨專科團隊在產前制定全面治療方案，成功拯救小生命。

By performing an MRI scan on a fetus, the Department of Radiology accurately diagnosed its spinal dysraphism, enabling multidisciplinary teams to craft a comprehensive pre-birth treatment plan that successfully saved this little life.

腦神經造影：解碼大腦迷宮

Neuroimaging: decoding the maze of the brain



磁力共振掃描能提供高質素影像，協助精準診斷、規劃手術及監察病情。

MRI scans provide high resolution images for precise diagnosis, surgical planning and ongoing surveillance.

中樞神經掌管人體重要功能，但當出現異常時，小朋友往往難以清楚表達症狀。此時，腦神經造影扮演關鍵角色，能精準呈現腦部和脊椎的結構與組織問題，解開謎團。

The central nervous system governs crucial bodily functions, but children often struggle to articulate their symptoms when abnormalities arise. In these critical moments, neuroimaging plays a vital role in showing what's wrong in the brain and spine, solving complex medical mysteries.

神經造影應用範疇廣泛，除了腦腫瘤等神經外科疾病，及中樞神經系統病變等腦內科疾病外，亦包括新陳代謝病引發的腦和脊椎病變，加上不少病童情況危急，令診斷具挑戰性。

放射科顧問醫生黃國俊解釋：「有些神經系統疾病種類繁多但病例稀少，在不同年齡的表徵迥異。我們不僅解讀影像，更要深入剖析背後病理和基因突變，才能準確診斷。」

為手術實時精準導航

在複雜手術中，放射科會因應需要即時進行造影，為主刀醫生精準導航。曾有一名病童因腦部的「下視丘錯構瘤」引發頻密腦癇發作。本院神經外科、放射科及麻醉科，與瑪麗醫院神經外科合作，以「立體定位射頻熱凝術」阻斷病灶連接大腦的異常訊號，減少患者發作，開創全港兒科首例。

在術前，放射科醫生與神經外科醫生仔細分析病童的磁力共振影像，鎖定病灶及周邊的重要神經與血管位置，作為手術重要的藍圖。

黃醫生說：「手術當日，病童在手術室安裝好頭部外框架後，我們隨即於放射科進行電腦掃描，並採用金屬偽影消減技術。接著，神經外科醫生在手術室將此影像與術前的磁力共振影像融合，將頭架、腦部結構與病灶清晰呈現，然後絲毫不差地將電極植入腦部目標位置。經第二次電腦掃描確認無誤後，便成功以射頻截斷病灶訊號。」

Neuroimaging covers a vast spectrum, ranging from neurosurgical conditions such as brain tumors, to neurological disorders affecting the central nervous system. It also captures brain and spinal lesions caused by metabolic diseases. These complexities, coupled with patients' critical conditions, make diagnosis challenging.

Dr Chris Wong, Consultant (Radiology) explained, "Some neurological conditions are rare and come in many forms, showing very different symptoms across age groups. We don't just interpret images. We must delve deep into the underlying pathology and genetic mutations to deliver an accurate diagnosis."

Real-time precision navigation for surgeries

For complex surgeries, the radiology team may perform real-time intraoperative imaging to provide precise navigation for the surgeons. There was a child who suffered from frequent seizures caused by a hypothalamic hamartoma in the brain. HKCH Neurosurgery, Radiology, Anaesthesiology, and Queen Mary Hospital's Neurosurgery collaborated to perform a stereotactic radiofrequency thermocoagulation, successfully blocking the abnormal signals between the lesion and the brain. This significantly reduced the child's seizure frequency, marking the first paediatric case of its kind in Hong Kong.



放射科醫生、神經外科醫生與放射師於手術期間，分析病人的即時放射影像。

During surgery, radiologists, neurosurgeons and radiographers analyzing the real-time images captured of the patient.

Prior to the surgery, radiologists and neurosurgeons carefully analyzed the patient's MRI images, mapping the lesion, neural structures and blood vessels for surgical planning.

Dr Wong recalled, "On the day of surgery, once the child's head was secured in a stereotactic frame at the operating theatre, we immediately performed CT scan with metallic artefacts reduction technique in our department. Neurosurgeons then fused this CT image with the pre-operative MRI image, clearly visualizing the head frame, brain structures and lesion to precisely implant the electrodes into the targeted location in the brain at the operating theatre. Once the placement was confirmed with a second CT scan, radiofrequency was applied to successfully destroy the lesion signal ."



放射科醫生會在病房床邊為有臨床需要的一歲以下嬰兒進行腦部超聲波檢查，可避免其接受輻射及鎮靜麻醉。

For indicated babies under one year old, radiologists may perform bedside brain ultrasound scans. It is a safe option with no radiation and no need for sedation.

心臟造影：小心臟，大挑戰

Cardiac imaging: small heart, big challenge

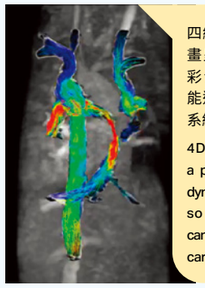
本院是全港兒童心臟病轉介中心，為此引入先進和獨有技術，為有複雜心臟問題（如單一心室循環、大動脈轉位、心臟移植等）的病童取得精準診斷。

As the designated referral centre of paediatric cardiac diseases in Hong Kong, HKCH has introduced cutting-edge imaging technologies to tackle conditions like single ventricle circulation, transposition of the great arteries and heart transplant, transforming how these tiny hearts are understood and treated.

精準影像輔助治療方案

本院是唯一提供「四維血流磁力共振」的公立醫院。放射科副顧問醫生趙彤解釋，相比傳統磁力共振，它能全方位展示心臟及血管的血流動態變化：「一幅好的醫學影像勝過千言萬語」。另一好處是免卻病童接受入侵性心臟介入程序和輻射。

每一個先天性心臟病的結構都是獨特的。放射科副顧問醫生吳穎琦表示，團隊與香港大學兒童及青少年科學系合作，將病人的掃描影像轉化為虛擬實境體驗和三維打印模型，協助主治醫生立體地了解病人心臟結構，更有效地制訂個人化的手術計劃。



四維血流磁力共振以動畫呈現血流方向（圖中彩色部份），醫護人員能透視病人整個心血管系統。

4D-flow MRI animates a patient's blood flow dynamics (shown in colour) so that healthcare staff can gain a full picture of the cardiovascular system.

爭分奪秒的影像任務

為兒童心臟造影絕非易事。他們的心臟很小，心跳亦較成人快，特殊個案更考驗團隊技巧和默契。吳醫生曾為一個接駁著人工心肺機的病童做心臟電腦掃描，惟過程中必須暫停這台他賴以維生的儀器。

聽起來驚險萬分的事，背後有周詳部署。「我們跟心臟科和兒童深切治療部評估風險，認為病童可承受停機40秒的窗口。為了節省每一秒，團隊先做一次預演，確保每人熟識流程。

掃描當天，各步驟無縫銜接，全速為病童完成檢查。她笑言：「每次處理類似個案，我的心跳比病人還要快！」

Precise imaging facilitates better treatment

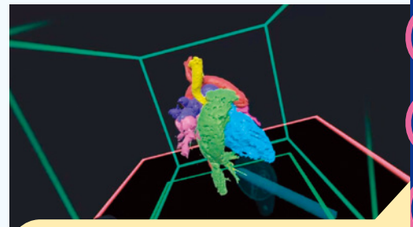
HKCH is the only public hospital that offers 4D-flow MRI. Associate Consultant (Radiology) Dr Milly Chiu explained that compared to traditional MRI, this technology comprehensively displays blood flow dynamics throughout the heart and blood vessels. "A good image speaks louder than words," she emphasized. It also spares patients from invasive cardiac catheterisation or ionizing radiation.

Every congenital heart defect is unique. Radiology collaborates with the Department of Paediatrics and Adolescent Medicine of the University of Hong Kong to transform patients' scan images into immersive virtual reality experience and realistic 3D-printed models. Associate Consultant (Radiology) Dr Carol Ng highlighted, "These tools help the attending doctors visualize the hearts' anatomy and formulate personalized surgical plans more effectively."



一比一的三維打印模形可呈現個別病人的異常心臟結構。

1:1 3D-printed heart models depict patients' abnormal cardiac anatomy.



香港大學醫學院兒童及青少年科學系系主任張耀輝教授透過虛擬實境，多角度檢視心臟結構。

Prof. Cheung Yiu-fai, Chairperson of Paediatrics and Adolescent Medicine, HKU Faculty of Medicine, reviews cardiac anatomy from multiple angles using virtual reality.



A mission against time

Cardiac imaging for children is challenging due to their small heart size and rapid heart rates. Rare cases further put the team's skills and coordination to the test. Dr Ng once performed a cardiac CT scan for a child on extracorporeal membrane oxygenation, but this life-sustaining device had to be briefly paused during the process.

While it sounded perilous, it was backed by thorough planning. "With the Cardiology and Paediatric Intensive Care Unit, we assessed that the child could tolerate a 40-second pause. We ran a full rehearsal beforehand so everyone was familiar with the workflow. On the day of the scan, the plan was seamlessly executed, saving every precious second." She said with a smile, "Every time I handle a case like this, my heart beats faster than the patient's!"



肌肉骨骼造影：突破傳統框架

Musculoskeletal imaging: breaking conventions

許多人認為，為兒童進行造影檢查多是因為骨折或意外創傷。本院放射科的肌肉骨骼造影團隊的主要服務對象，卻是患有肌肉骨骼罕見病症和癌症的兒童。團隊銳意打破傳統造影方法和觀念，為治療提供更豐富、更準確的影像資料。

陳沛君醫生（左一）參與跨專科門診，了解罕見病童的需要，度身訂造最有效和安全的造影方案。

Dr Joyce Chan (far left) joins a multidisciplinary clinic to understand the needs of children with rare disease and tailor the most effective and safe imaging plan.

Many people think that paediatric imaging is mostly used for acute fractures or injuries. However, in the HKCH Department of Radiology, the musculoskeletal imaging team mainly serves children with musculoskeletal rare diseases and cancers. The team is committed to breaking conventional imaging methods and mindsets, delivering richer and more accurate information to guide treatment.

動態灌注造影預測手術成效

放射科顧問醫生陳沛君以「股骨頭近端生長板滑脫症」為例說明：「傳統主要依賴 X 光或電腦掃描，但我們醫院會在術前進行磁力共振配合灌注造影，在六至七分鐘內連續拍攝，查看血管是否正常供血到目標部位，評估病人的骨枯風險，為骨科醫生預測手術成效。」

走出黑房 了解病人需要

罕見病種類繁多且個案差異極大，例如「骨骼發育異常」只是一個總稱，每位病童的症狀卻五花八門。陳醫生直言：「有別一般人對放射科醫生的印象，我們不是坐在黑房裡，也不能流水作業，而是走到前綫，和骨科、內分泌科、醫學遺傳科等在門診會診，360度了解病童面對的臨床和生活難題，度身制訂最合適的造影方案。」

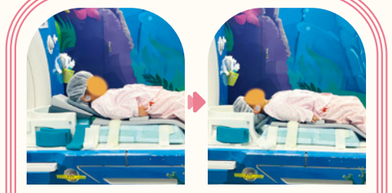
她指，本院獨有提供「屈伸態磁力共振造影」。相比平躺式的靜態掃描，它可清晰顯示頭頸在不同姿態下，脊髓有否受壓。然而，要為骨骼發育異常的病童做這項檢查，屬於高難度動作。由於其頸椎活動往往受限，任何強行扭動都會很危險。因此，整個醫療團隊包括專職醫療人員事前需要大量協調， 評估病人可以承受的幅度，和引導他們配合指令，確保安全完成。

Dynamic perfusion imaging predicts surgical outcomes

Consultant (Radiology) Dr Joyce Chan used slipped capital femoral epiphysis as an example, "Traditionally, diagnosis mainly relies on X-rays or CT scans, but our hospital performs MRI with dynamic perfusion imaging before the surgery. We continuously capture images over six to seven minutes, checking whether blood is flowing normally to the target area to evaluate the patient's risk of osteonecrosis. This helps orthopaedic surgeons predict the surgical outcomes."

Stepping out of the dark room

Rare diseases come in many varieties with significant differences between individual cases. For example, skeletal dysplasia is just an umbrella term, yet each patient may present with vastly different symptoms. Dr Chan said, "Contrary to the popular image of radiologists, we don't just sit in the dark room. We also can't use the same strategy for all cases. Instead, we join consultations with orthopedic surgeons, endocrinologists, clinical geneticists and other professionals in the clinic to gain an all-rounded understanding of the clinical and daily challenges of these children. This allows us to tailor the most suitable imaging modality for them."



屈伸態磁力共振造影能更有效地為罕見病童檢查脊髓，協助腦外科和骨科醫生作術前準備。

Flexion-extension MRI enables more effective spinal cord exam for children with rare diseases, assisting neurosurgeons and orthopaedic surgeons with pre-operative planning.

Dr Chan pointed out that HKCH offers a unique service – flexion and extension MRI. Unlike conventional static scans where patients lie flat, this method clearly shows whether the spinal cord is compressed when the head and neck move in different positions. Executing this scan for children with skeletal dysplasia is highly challenging. Since their neck is often restricted, any forced movement can be very dangerous. Therefore, the whole clinical team, including allied health professionals, coordinate extensively to assess the patient's tolerable motion range, and make sure they follow instructions to ensure the procedure is completed safely.



介入放射團隊與海外專家 Afshin Gangi 教授（左）合作，在電腦掃描導航下進行冷凍消融術，治療纖維瘤患者。

The IR team collaborating with overseas expert Prof. Afshin Gangi (left) to treat a patient with desmoid fibromatosis using CT-guided cryoablation.

介入放射：導航希望

Interventional radiology: navigating hope

提起放射科，多數人會聯想到各類影像檢查。事實上，香港兒童醫院放射科還提供一項重要服務，就是結合影像導航與微創程序的「介入放射」。

When people think of radiology, they often associate it with imaging exams. In fact, the HKCH Department of Radiology also provides an important service that combines image guidance with minimally invasive procedures — interventional radiology (IR).

放射科顧問醫生馮建勳表示，團隊利用超聲波、電腦掃描、磁力共振及 X 光等實時導航，將導管或穿刺針引導至病灶，進行診斷及治療。「我們不是打開病人肚皮做手術，而是透過影像導航去治療。」由於切口一般只有數毫米至數厘米，不但能減少病童承受的創傷及疼痛，亦會加快復原。

本院介入放射服務為腫瘤、腎血管性高血壓、血管畸形及淋巴系統疾病等提供經動脈化療栓塞術、熱／冷凍消融及淋巴介入治療等微創治療。

創新方案迎戰高難度個案

越具挑戰性的個案，越能夠體現介入放射的價值。一名出生兩周的早產嬰兒因肝臟長了巨大血管瘤引發心臟衰竭，情況危急。團隊決定以栓塞術阻截腫瘤血液供應，將它縮細。

馮醫生形容：「病人全身血容量只有約200毫升，相等於一罐迷你可樂，每一步都必須精準計算。更棘手的是嬰兒血管極纖幼，如果按一般做法由大腿動脈進入，導管本身已經和血管差不多粗，會有血栓風險。」

為了與時間競賽，團隊採用嶄新方法，把握嬰兒剛出生的黃金時機。醫生巧妙地利用當時仍然存在的臍帶血管作為入口，將導線穿過心臟附近尚未自然閉合的動脈導管，順利進入主動脈並抵達肝血管瘤，成功完成栓塞。

這個個案獲刊登於國際醫學期刊，亦獲選於大型介入放射年會分享，反映本院介入放射服務已達國際水平。

Dr Kevin Fung, Consultant (Radiology) explained that IR uses real-time ultrasound, CT, MRI and X-ray to guide catheters or needles precisely to the lesion for diagnosis and treatment. "Instead of opening up the body to perform surgery, we use medical imaging to guide treatment." With small incisions, IR reduces trauma and pain while promoting faster recovery.

At HKCH, the IR team provides image-guided minimally invasive treatments for a wide range of complex conditions, including tumours, renovascular hypertension, vascular malformations and lymphatic disorders.

Innovative solutions for complex cases

The value of paediatric IR is best demonstrated in the most challenging cases. A two-week-old premature baby developed heart failure caused by a massive congenital hepatic haemangioma. The team planned an embolization to block the tumour's blood supply. Dr Fung recalled, "The baby's total blood volume was only about 200 ml – roughly a mini can of cola. Every step had to be calculated with utmost precision. The biggest challenge was the extremely tiny blood vessels, making a conventional femoral approach risky for thrombosis."

To win the race against time, the team adopted an innovative approach – entering through the baby's umbilical cord, then advanced through her patent ductus arteriosus (which was still patent shortly after birth) near the heart, reaching the aorta and finally the tumour. The embolization was completed successfully.

This breakthrough method was published in an international medical journal. Dr Fung was selected to present the case at a leading international IR conference, underscoring HKCH's IR services have reached international standards.



馮建勳醫生（左）與介入放射團隊為初生女嬰進行緊急栓塞術，並採用創新方法，以臍帶血管作為導管入口。女嬰經治療後留醫近半年出院。

Dr Kevin Fung (left) and the IR team performed an emergency embolization on a newborn girl, innovatively using her umbilical vessel as the catheter access route. She was discharged after nearly six months.

病童的放射科歷程

Navigating the radiology journey

放射科是病童不可或缺的伙伴，從診斷、治療至監察病情，放射科均與各專科攜手合作，致力讓小朋友重拾健康。這裡以實體腫瘤療程為例，帶大家走進放射科世界，細看其在各階段的角色。

The Department of Radiology is an indispensable partner for patients. From diagnosis and treatment to ongoing surveillance, it works hand-in-hand with various specialties to help children thrive again. Using solid tumor management as an example, here is how radiology contributes to every stage of the patient journey.

1 病童懷疑有實體腫瘤，經轉介至本院
Suspected solid tumor case referred to HKCH



2 診斷 Diagnosis

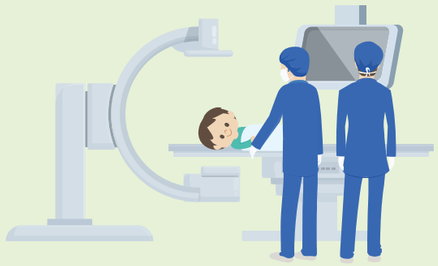


1. 放射科進行電腦掃描或磁力共振，確診腫瘤類型和分期
   Radiology performs CT or MRI scan to confirm tumor type and stage.

2. 跨專科團隊進一步商討治療計劃
   Discussion among multidisciplinary teams on optimal care plan.

3. 放射科為有需要病童抽取腫瘤組織，交予病理科化驗；為免重覆麻醉，可同時在超聲波及 X 光引導下，置入中央靜脈導管，供之後輸注化療藥物
   Radiology may perform biopsy and send tumor tissues to Pathology for testing. To avoid repeated sedation, a central venous catheter can be placed under ultrasound and X-ray guidance during the same session to deliver chemotherapy later.

3 治療 Treatment



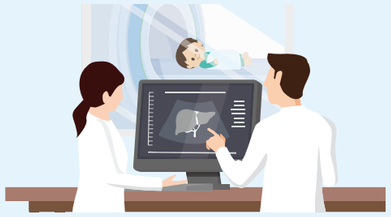
- 腦腫瘤手術前規劃：進行磁力共振掃描以定位掌管身體重要功能的神經結構，協助神經外科醫生在切除腫瘤時避開
  Pre-operative planning for brain tumor: perform MRI scan to map crucial neurological structures for critical bodily functions, guiding neurosurgeons to avoid them during tumor resection.

- 按需要進行介入放射程序，例如：
  - 化療栓塞術：將化療藥注入腫瘤，並阻斷腫瘤血液供應
  - 冷凍消融術：破壞腫瘤組織

  Interventional radiology as needed, e.g.:
  - Chemoembolization to inject chemotherapy into the tumor and block its blood supply
  - Cryoablation to destroy cancer cells

4 治療後 Post-treatment

- 進行磁力共振或電腦掃描以評估治療成效，及持續監察病情
  CT or MRI scans for assessing treatment response and ongoing surveillance



讓孩子安心愉快地檢查

Helping children complete scans with ease

走進本院放射科，小朋友會立即被四周的卡通圖案吸引。其實「兒童友善」不只限於裝飾。從流程規劃到運作細節，處處都蘊含細緻考慮。

Walking into the HKCH Department of Radiology, children are often drawn to the whimsical cartoon murals. But true child-friendliness goes beyond decorations. Every workflow, protocol and arrangement is designed to put children first.

輕鬆檢查 最低輻射

放射科致力令小朋友輕鬆完成檢查，避免不必要藥物鎮靜，留下良好回憶。

資深護師黃卓雯以電腦掃描室的馬戲團佈置為例：「當病童需要靜止時，可引導他們說出牆上氣球顏色。與其說『不要動』，這些容易理解的小任務更有效。」

放射科部門經理林燦斌則指，由採購機器到操作指引，均重視減低輻射量，因輻射令小朋友患癌的風險比成人高。本院的電腦掃描檢查設定為最低輻射量，並會按照年齡層再作調整；而專為骨骼造影的 EOS 系統則較傳統 X 光機減少輻射達八成。醫學物理學家亦定期檢視輻射使用量。「一旦有上升趨勢，我們會調整儀器參數，以最少輻射達致最佳診斷效果。」

Minimal stress, minimal radiation

One core philosophy of the department is to help children complete imaging exams in the most relaxed way, avoiding unnessecary sedation and leaving them with good memories.

Wong Cheuk-man, Advanced Practice Nurse used the circus-themed décor in the CT suite as an example, "When we need children to stay still, instead of saying 'don't move', we give them tasks like naming the colours of the balloons on the wall. This interactive approach is way more effective."

Additionally, Department Manager Lam Tsan-pun noted that minimising radiation is a priority from procurement to daily practice, as children face a higher radiation-related cancer risk than adults. For example, CT protocols are tailored to be as low in radiation dose as possible, and adjusted for different age bands, whereas the EOS system emits 80% less radiation than traditional X-ray scanners. Radiation usage is regularly reviewed by dedicated medical physicist. "If an increasing trend in radiation dose is observed, we adjust the machine parameters accordingly."

兒童友善措施 Children-friendly initiatives

1 貼心環境儀器
Thoughtful environment and equipment





- 檢查室以不同主題佈置，如太空艙、恐龍等，用有趣環境增加互動，令小朋友配合檢查
  Examination rooms are decorated with different themes, such as spaceship, dinosaurs etc. Such playful environment encourages interaction, so patients will better cooperate.

- EOS X 光系統的輻射量較低，適合需要持續接受追蹤的病童
  The EOS system delivers a much lower radiation dose, particularly suitable for children who require repeated X-ray exams.

2 良方減鎮靜
Smart ways to reduce sedation



- 利用嬰兒「食飽就睡」的習慣，配合餵食及檢查時間，在熟睡時完成檢查
  Align feeding and scan times so babies sleep through the exam

- 戴上專用耳機及眼罩，邊做磁力共振邊看喜歡的節目
  MRI-safe headphones and goggles keep children entertained with their preferred media.

- 如情況許可，家長可抱著子女做磁力共振儀檢查
  Where appropriate, parents may hold their children in the MRI scanner

- 如需鎮靜，由麻醉科醫生評估並全程監察
  If sedation is needed, anaesthesiologists would assess and monitor the whole procedure.

從抗拒到從容面對

八歲的奕桐接受電腦掃描前，智樂兒童遊樂協會的醫院遊戲師帶領她模擬過程。遊戲師特別提醒她真實檢查時要靜止不動。完成預演後，奕桐微笑著說：「我有信心！」

事實上，她前一晚心情非常緊張。媽媽回憶道，奕桐曾在別的醫院看見其他病童身上貼滿心電圖電極片，誤以為儀器會使人疼痛而拒絕做檢查：「當時只能強行完成。」

而這次在香港兒童醫院，醫院遊戲服務為奕桐派了「定心丸」。媽媽觀察到：「檢查前的遊戲互動有助女兒了解過程，減低焦慮，心情放鬆不少，我亦感到安心。」

From terror to triumph

Before undergoing her CT scan, eight-year-old Yik Tung took part in a simulation session led by a hospital play specialist from the Playright Children's Play Association. She was reminded to stay still during the scan. After the simulation, Yik Tung beamed a smile and announced, "I can do it!"



醫院遊戲師運用特製插畫，向奕桐講解電腦掃描的程序。

A hospital play specialist makes use of tailor-made illustrations to explain the procedures of CT scan to Yik Tung.



奕桐乖乖配合放射師的指示，冷靜地躺在電腦掃描儀上，順利完成檢查。

Following the radiographer's instructions, Yik Tung lies calmly on the scanner and completes the CT scan smoothly.

In fact, Yik Tung was anxious the night before. Her mother recalled a traumatic experience at another hospital, where Yik Tung saw other children covered in electrocardiogram electrodes, misunderstanding that it would cause pain. She panicked and refused the test. "We had no choice but to force our way through it," her mother shared.

At HKCH, the hospital play service put her at ease. Her mother said gratefully, "The pre-scan interactive play session helped my daughter understand the process and reduce anxiety. It also gave me a peace of mind."

有需要的兒童會在接受正式磁力共振掃描造影前，以模擬器進行預演，練習靜止不動、忍著呼吸，以及習慣機器聲響。

Children who need additional preparation will undergo a rehearsal using an MRI simulator before the actual MRI scan. They can practise staying still, holding their breath, and getting used to the sounds of the machine.



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如對本通訊有任何意見，歡迎電郵至 enquiry_hkch@ha.org.hk

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