New Clinical Sessions

Minimally Invasive Centre	
Booking & Enquiry: 2608 3383	Time Schedule
Clinical Psychology **Ms Lee Mary**	Thu 10:00-18:00 Sat 09:00-14:00

Specialty Clinic	
Booking & Enquiry: 2608 3315	Time Schedule
Internal Medicine / Geriatrics **Dr Lo See Kit, Raymond**	Thu 15:00-18:00

Union Hospital Polyclinic (Tsim Sha Tsui)	
Booking & Enquiry: 2375 3323	Time Schedule
Ophthalmology **Dr Far Ying, Nikki**	Tue 14:30-18:00 Thu 10:00-12:00 Fri 14:30-17:00

Union Hospital Polyclinic (Ma On Shan)	
Booking & Enquiry: 2608 3377	Time Schedule
Ophthalmology **Dr Far Ying, Nikki**	Tue 10:00-11:30 Wed 15:00-17:30 Fri 10:00-11:30

Regular Meetings

Meeting :	X-Ray Meeting	Clinical Pathologic Conference
Date : Time :	14 Aug 2024 (Wednesday) 8:30 a.m. – 9:30 a.m.	11 Sep 2024 (Wednesday) 8:30 a.m. – 9:30 a.m.
Co-ordinator:	**Dr Hui Ping Kuen, John** **Head, Department of Medical Imaging, Union Hospital**	**Dr Fung Ming Kit, Terence** **Deputy Head, Department of Surgery, Union Hospital** **Dr Lui Chi Wai, Philip** **Consultant in Pathology, Union Hospital**
Venue:	Training Room, 8/F MIC, Hospital Building, Union Hospital	
Booking & Enquiry:	2608 3160 (Quality Assurance and Training Department)	

New Clinical Members

Please extend a warm welcome to the following health professionals for joining our clinical team!

Dr Pang Lap Ian, Yennie
Specialist in Paediatrics

Dr Cheng Hi Shan
Specialist in Orthopaedics & Traumatology

Dr Lo See Kit, Raymond
Consultant in Geriatric Medicine

Ms Chan Hoi Ching, Bianca
Clinical Psychologist

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UNION connection

VOL 210
July 2024

Message from the Chief Hospital Manager

Dear Colleagues,

Continuing on the theme of my adventure in Australia in my medical career, I have to mention two benefactors/mentors who hailed from Sydney — Sir Kenneth Noad of the Australia Post-graduate Education Scheme and Professor Con Reed of Sydney Hospital. The former organized my training programme for two years in Sydney and Melbourne under the Leverhulme Exchange Scheme and the latter was the Exchange Professor to Hong Kong. I was the 'exchange trainee' in that scheme. Both of them and their spouses treated me and my newly-wedded wife Roseanna as family. They really made us feel at home in the foreign country down-under. Hence, I spent my first six months in St Vincent's Hospital Sydney as 'registrar' in cardiology. I participated in the post-operative care of the first Australian heart-transplant patient — Mr Richard Pye. This kindled my interest in transplant immunology and prepared me for my subsequent research work at the Clinical Research Unit of the Royal Melbourne Hospital which was linked with the Walter and Eliza Hall Institute neighbouring it. The unit was headed by Dr Ian Mackay who championed in autoimmune diseases, especially autoimmune hepatitis. The six-month sojourn in Sydney was really enjoyable even though I had to study hard for my College MRACP examination. Other junior doctors of St Vincent's Hospital taking the same examination were very helpful. We did mock vivas together and every now and then dined together, giving me and my wife a treat at their homes. Those were really happy days, especially when I learnt that I passed the College membership examination after the first attempt!

The subsequent year in Melbourne was quite different. There was no stipend from the research fellow appointment at the Walter and Eliza Hall Institute and we had to live on the meagre allowance of the Commonwealth Scholarship! To make ends meet I had to take up a weekend locum job for general practitioners in the neighbourhood and nearby suburbs. I had to carry a battery-operated radio walkie-talkie seeing patients at their homes for the GPs when a home visit was required, earning AU$2 per visit! I might have been the pioneer in the radio-locum service in Melbourne!

Another interesting piece of memory came up to my mind after my massage therapy session. In 1974, I was awarded a research fellowship at the world-renowned Sloan-Kettering Memorial Cancer Institute in New York City for one year with my sabbatical leave as lecturer in the University Department of Medicine at Queen Mary Hospital. The director of Sloan-Kettering was Dr Robert Good. Dr Good was a big guy with a prominent mid-section which was decorated with a huge 'G' Gucci buckle of his belt. It was rumoured that he would be the next candidate to be nominated for the Nobel prize in Life Sciences. However, he was plagued by the 'Summerlin scandal' when I reported duty at the Sloan-Kettering. Now Dr Summerlin was heading an important research on transplant immunology. He claimed that by manipulating the lymphocytes, he was successful in grafting a piece of skin from a black mouse onto a white mouse without rejection. His report was accepted by one of the top medical journals 'Science' for publication. However, it was found that Dr Summerlin was painting his mice for pictures supporting his laboratory work. The paper submitted to 'Science' had Dr Robert Good as co-author. So when the truth came out, Dr Good's aspiration for Nobel nomination also vanished as smoke in a gust of wind! Since then I have developed a skeptical mind on 'ground-breaking' findings reported in peer-reviewed journals of good standing.

I would like to end here with Best Wishes to you and your family during the summer break.

Most sincerely yours,

Dr Anthony K Y Lee
Chief Hospital Manager & Medical Director

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仁心、安心、貼您心
Caring • Reliable • Empathetic

New Installation of Dual Source Photon Counting CT – Siemens NAEOTOM Alpha Revolutionizing CT Imaging at Union Hospital

Dr Hui Ping Kuen, John
Head, Department of Medical Imaging
Union Hospital

First Hospital in Hong Kong installing Photon-Counting Computed Tomography (PCCT)

I am delighted to announce that Union Hospital has made a significant advancement in CT imaging with the installation of the Siemens NAEOTOM Alpha CT with Quantum Technology. This model is the world's first Photon-Counting Computed Tomography scanner (PCCT), bringing a major advancement in CT imaging in a decade. We are proud to be the first hospital in Hong Kong to offer this cutting-edge technology, which provides patients with exceptional image quality and numerous benefits.

The NAEOTOM Alpha CT scanner has been in full operation at Union Hospital since March 2024, and we have received excellent feedback from both clinicians and patients. Its remarkable imaging quality and advanced technology have made a significant impact on diagnostic capabilities and patient care.

Key Features of the NAEOTOM Alpha:

Photon-Counting Detector

At the core of the PCCT is its photon-counting detector, which equipped with an active detection layer composed of cadmium telluride crystal (CdTe). This cutting-edge detector plays a crucial role in enhancing the sharpness and contrast of CT images, resulting in unparalleled image quality. Unlike traditional CT technology that involves a two-step conversion process, the PCCT employs a one-step process, directly converting X-ray photons into digital electrical signals. This eliminates the loss of information encountered with standard energy integrating detectors used in conventional CT systems, ultimately producing sharper, clearer, and more detailed images without the need for higher radiation doses.

The midnight installation of the new Photon-Counting CT scanner aims at minimizing patient disturbance.

Many thanks to the teaching and guidance by Siemens CT specialists.
3rd Right: Mr Curt Gardiner, Siemens Headquarter Senior CT Application Specialist (Germany)
1ST Left: Ms Ko Li Chiu, Siemens CT application Manager (HK)
4th Left: Dr Anthony Lee, Union Hospital Chief Hospital Manager & Medical Director

Thanks to the strong support from Siemens Headquarters, the first installation of the NAEOTOM Alpha CT in Hong Kong at Union Hospital was made possible. Our CT team worked closely with Siemens specialists during the installation and calibration process.

The NAEOTOM Alpha's Quantum Technology ensures a balanced energy contribution for contrast-rich images, enabling clinicians to make accurate assessments. Furthermore, the smaller detector pixels provide higher spatial resolution without increasing radiation exposure for patients.

Ultra-high Resolution

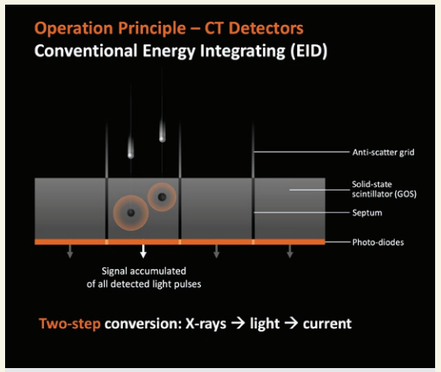
One of the key advantages of PCCT is its remarkable ability to achieve ultra-high resolution. This is accomplished by reducing the size of the detector pixels, allowing the scanner to capture images with an impressive spatial resolution of 0.11 mm (in-plane) and a slice thickness of 0.2 mm. As a result, PCCT enables the evaluation of fine lesions and intricate anatomical structures with unparalleled precision. This includes assessing small coronary vessels, evaluating stent patency, identifying plaques, examining bronchi in the lungs, detecting bone metastases, and visualizing complex anatomical structures. By providing such exceptional resolution, the PCCT opens up new possibilities for precise diagnoses and treatment planning.

Low Dose in Radiation & Contrast Medium (LDCT Thorax Equals to Only 2 CXR Radiation)

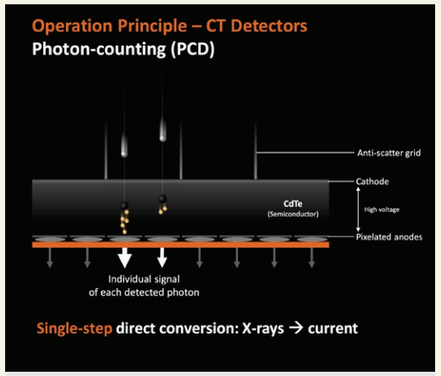
Patient safety is a top priority, and PCCT addresses this concern by significantly reducing both radiation and contrast medium doses. The advanced technology of the scanner allows for improved image quality by effectively differentiating the real signal from electronic noise. As a result, lower radiation doses can be used in preventive and follow-up examinations of the thorax. In fact, a Low-Dose CT Thorax using the PCCT is equivalent to only two chest x-ray radiations. This represents a remarkable 75% reduction in radiation compared to conventional CT scans.

Furthermore, the PCCT equal energy contribution enhances the iodine contrast-to-noise ratio. This has the potential to reduce the amount of contrast medium required for examinations. Not only does this contribute to a more comfortable experience for patients, but it also alleviates the burden on renal function.

By prioritizing patient safety and minimizing radiation and contrast medium doses, PCCT ensures a safer and more efficient imaging process.



Conventional CT technology uses an energy integrating detector, which involves a two-step process.

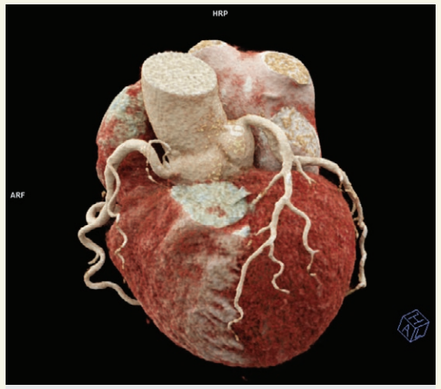


The NAEOTOM Alpha CT utilizes the QuantaMax ™ photon-counting detection principle, where photons are directly detected in the semiconductor material instead of requiring an intermediate scintillation step. This one-step process enables the direct conversion of X-ray photons to electrical signals, leading to improved detector efficiency and image quality.

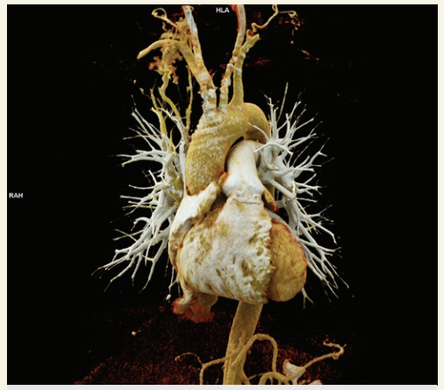
Patient Reach – Unlocked

The NAEOTOM Alpha sets a new standard for patient accessibility. Its rapid gantry rotation time of 0.25 seconds and impressive temporal resolution of 66ms enable swift scanning procedures. Lung screenings can be completed in a mere 0.5 seconds, while whole-body angiograms take just 1 second. This eliminates the need for elderly patients to hold their breath and eliminates the necessity of sedation for pediatric patients. Moreover, the scanner's wide gantry opening of 82 cm reduces feelings of claustrophobia, ensuring a more comfortable examination experience for patients.

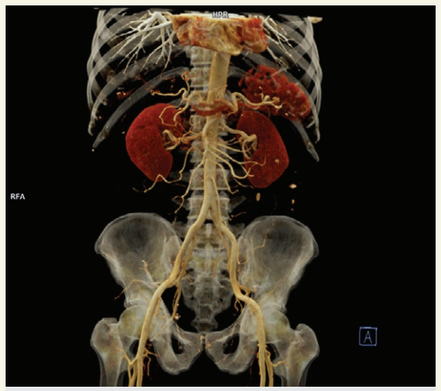
In conclusion, the introduction of our cutting-edge CT scanner, the photon-counting CT, marks a significant leap forward in CT imaging at Union Hospital. Equipped with its photon-counting detector, high spatial resolution, low radiation and contrast dose, and patient-centric features, this state-of-the-art scanner revolutionizes diagnostic capabilities. We are thrilled to offer our patients precise and comprehensive examinations while prioritizing their safety and comfort.



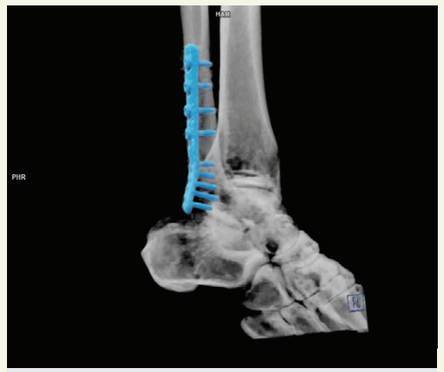
Experience the remarkable detail of a 3D CT Coronary Angiogram



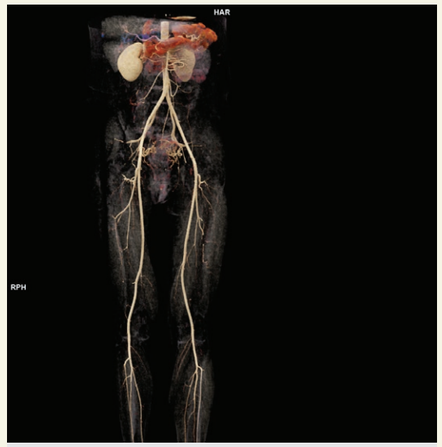
Experience the remarkable detail of a 3D CT Pulmonary Angiogram



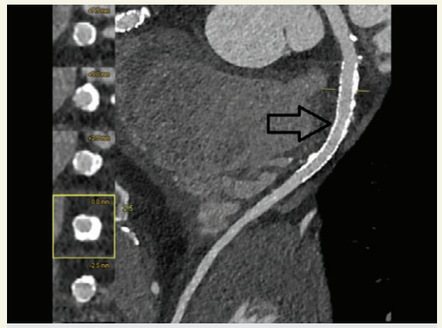
Experience the remarkable detail of a 3D CT Splanchnic Angiogram



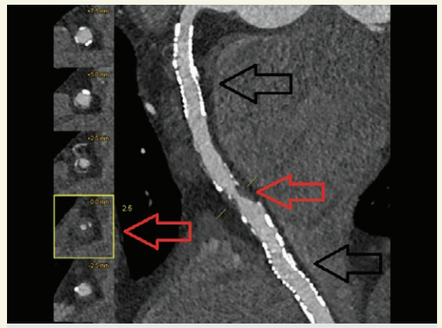
Experience the remarkable detail of 3D CT ankle reconstruction of ankle fracture with internal fixation metallic device.



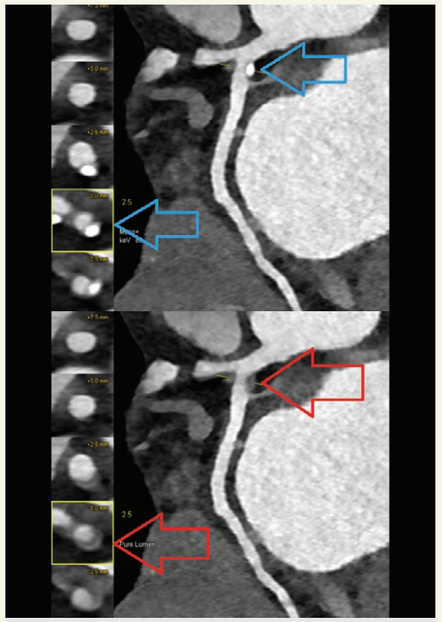
Experience the remarkable detail of a 3D CT Lower Limb Angiogram



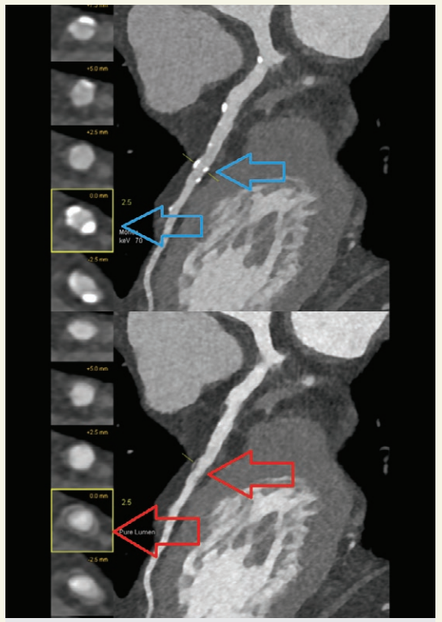
The black arrow indicates the site of the coronary stent, as shown by the hyperdensity along the coronary artery wall. This finding confidently suggests that the stent is patent and well perfused, without any signs of in-stent restenosis.



The black arrows indicate the site of the coronary stent, as shown by the hyperdensity along the coronary artery wall. This finding clearly indicates a patent stent without any signs of in-stent restenosis. Additionally, the red arrow points to another site where plaque is causing severe stenosis.



The Quantum PURE lumen (red arrow) technology virtually removes calcifications (blue arrow) from CTA exams, allowing for a confident evaluation of the vessel lumen without any impairment from blooming artifacts.



The Quantum PURE lumen (red arrow) technology virtually removes calcifications (blue arrow) from CTA exams, enabling a confident evaluation of the vessel lumen without impairment from blooming artifacts.

Home Phototherapy for Treatment of Neonatal Hyperbilirubinemia

Dr Yim Sau Wing
Consultant in Paediatrics
Union Hospital

Introduction

Hyperbilirubinemia is a highly prevalent condition among newborn infants, with over 80% of them experiencing some degree of jaundice after birth. Roughly 5-10% of these infants require phototherapy to reduce their bilirubin levels. Prompt and appropriate treatment is crucial, as elevated bilirubin levels can lead to acute bilirubin encephalopathy and kernicterus, which can negatively impact the neurodevelopment of newborns.

Inpatient treatment for neonatal hyperbilirubinemia

Total serum or plasma bilirubin (TSB) levels typically peak between 72 to 120 hours after birth and gradually decrease within the first 1 to 2 weeks. Nomograms have been developed to establish hour-specific normal values, as well as the 75th and 97th percentiles based on postnatal age and birth gestation. In Hong Kong, we generally adhere to the treatment guidelines provided by the American Academy of Pediatrics (AAP) for managing hyperbilirubinemia in newborns. These guidelines include hour-specific TSB thresholds for initiating phototherapy based on gestational age and risk factors for neurotoxicity.

In 2022, the AAP revised their clinical practice guideline for managing hyperbilirubinemia in newborn infants born at 35 or more weeks of gestation. According to the updated guideline, phototherapy should be initiated for newborns with TSB levels at or above the treatment threshold (Figure 1, 2) which are higher than those previously stated in the old guideline published in 2004.

For newborns with TSB levels near the threshold (within 34 micromol/L below the threshold), but at a high risk of requiring phototherapy subsequently, it is also recommended to initiate phototherapy. Risk factors include early onset jaundice (within 24 hours of life), alloimmune hemolytic disease, rapidly increasing bilirubin levels, significant bruising, or hematoma. For newborns with near-threshold TSB levels but without these risk factors, decisions regarding treatment initiation should be individualized and discussed with parents/caregivers.

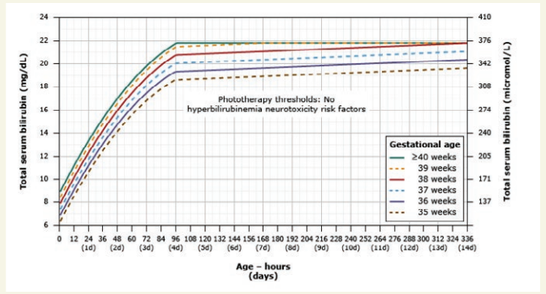


Figure 1. Hour-specific thresholds for phototherapy in newborns ≥ 35 weeks gestation with unconjugated hyperbilirubinemia in the absence of neurotoxicity risk factors. (Graph from UpToDate)

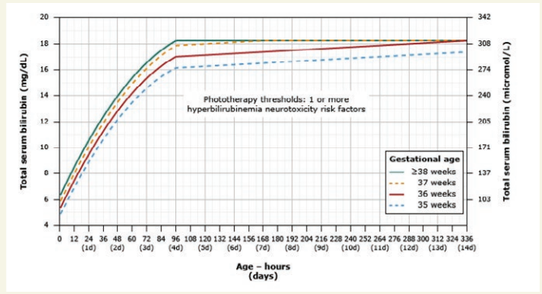


Figure 2. Hour-specific thresholds for phototherapy in newborns ≥ 35 weeks gestation with unconjugated hyperbilirubinemia and one or more neurotoxicity risk factors. (Graph from UpToDate)

Home Phototherapy

Traditionally, phototherapy has been administered only in a hospital setting. While phototherapy is a simple and effective treatment with minimal side effects, excessive prescribing can lead to unnecessary prolongation of hospitalization, which can affect maternal-child bonding and breastfeeding, particularly for newborns who have already been discharged but subsequently develop worsening jaundice.

With the development of fiber optic devices and safety data from various studies, home phototherapy has been incorporated into different guidelines, such as those provided by the National Institute for Health and Care Excellence (NICE) in the United Kingdom, Australasian Jaundice Management Guidelines, Canadian Paediatric Society, and American Academy of Pediatrics.

In the latest AAP guideline (2022), home phototherapy may be considered for newborn infants who meet the following criteria:

1. TSB levels near the phototherapy threshold (i.e., <34 micromol/L below to 17 micromol/L above the threshold).
2. Gestational age of 38 weeks or greater.
3. At least 48 hours old.
4. Clinically well with adequate feeding.
5. No known risk factors for hyperbilirubinemia neurotoxicity (Table 1).
6. No previous phototherapy.

Risk Factors

- Gestational age <38 wk and this risk increases with the degree of prematurity
- Albumin <3.0 g/dL
- Isoimmune hemolytic disease (ie, positive direct antiglobulin test), G6PD deficiency, or other hemolytic conditions
- Sepsis
- Significant clinical instability in the previous 24 hours

Table 1 Hyperbilirubinemia Neurotoxicity Risk Factors [From AAP guideline (2022)]

To effectively administer home phototherapy, an LED-based phototherapy device should be readily available, and families should be adequately instructed on its proper use at home. Commercially available options for phototherapy devices include overhead lights, beds/mattresses, and blankets. Blankets are preferred as they can be wrapped around the newborns while allowing for routine activities such as feeding. Treatment failure often occurs due to delayed or improper device usage; therefore, clear instructions should be provided, and phone support should be available to parents/caregivers.

For newborns receiving home phototherapy, TSB levels should be monitored daily until discontinuation. If TSB levels increase, the difference between the TSB level and the phototherapy threshold narrows, or the TSB level exceeds the threshold by 17 micromol/L despite home phototherapy, the infants should be admitted for inpatient phototherapy.

The cost-effectiveness of appropriately prescribed home phototherapy has been investigated in a randomized controlled trial, which found that only 4% of the patients allocated to home phototherapy required hospital admission subsequently. Furthermore, the duration of phototherapy, frequency of blood tests, and weight change did not exhibit statistically significant differences between home and inpatient phototherapy. Results of studies have shown that home phototherapy resulted in better parent-infant bonding at discharge and at 4 months after discharge.

Conclusion

With clear instructions and sufficient support for parents/caregivers, home phototherapy can serve as a safe and effective alternative for infants with moderate bilirubin levels at or near the treatment threshold. It offers the advantage of being less disruptive to family routines and allows for better parent-child bonding.

References

1. Kemper AR, Newman TB, Slaughter JL, et al. Clinical Practice Guideline Revision: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Pediatrics. 2022;150(3):e2022058859
2. Maisels MJ, Baltz RD, Bhutani VK, et al; American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. Pediatrics. 2004;114(1): 297–316
3. Pettersson M, Eriksson M, Albinsson E, Ohlin A. Home phototherapy for hyperbilirubinemia in term neonates-an unblinded multicentre randomized controlled trial. Eur J Pediatr. 2021; 180(5):1603–1610
4. Pettersson M, Eriksson M, Odlind A, Ohlin A. Home phototherapy of term neonates improves parental bonding and stress: findings from a randomized controlled trial. Acta Paediatr. 2022;111(4):760–766
5. Chang PW, Waite WM. Evaluation of home phototherapy for neonatal hyperbilirubinemia. J Pediatr. 2020; 220:80–85
6. Pettersson M, Eriksson M, Odlind A, Ohlin A. Home phototherapy of term neonates improves parental bonding and stress: findings from a randomized controlled trial. Acta Paediatr. 2022;111(4):760–766

Post-Event Highlights

Concerted efforts to foster regional collaboration in advancing development of Emergency Medicine (EM)

On 24-26 May 2024, the Hong Kong Society for Emergency Medicine and Surgery hosted the 1st Greater Bay Area Emergency Medicine Conference and the 8th Hong Kong Shenzhen Emergency Medicine Conference, a joint conference dedicated to professionals in the practice-based field with vigorous support from Union Hospital.

Representatives of Liaison Office of the Central People's Government and Department of Health of the Hong Kong SAR Government officiated at the opening ceremony, which featured an expertly performed 4-lion dance, underlining the joint conference's importance to the specialty's sustainable development in multi-dimensional approaches. The 1st Greater Bay Area Emergency Medicine Conference inaugurated a new era of regional collaboration that unites EM professionals practising in Hong Kong SAR, Shenzhen, Guangzhou, Zhuhai and Macao SAR.

With over 470 delegates attending the joint conference, the EM professionals demonstrated their commitment to innovations in teaching and learning for achieving impactful outcomes. POCUS Olympic games were staged, featuring interactive toxicology-related multiple choice quiz and costume contest to engage specialist trainees. The trainees also gained insights into research paper submission for publication in journal through active participation in a structured workshop. The event supported by devoted co-organisers and partners was concluded successfully.

Together, the EM professionals join hands and strive to pursue excellence with perseverance in the face of challenges, uncovering new opportunities for growth and revitalizing global partnerships for a more prosperous future of the specialty characterised by continuous evolution.

Officiating guests of the opening ceremony, including Dr Clara Wu, dot the lions' eyes.

Dr Clara Wu and Dr Sam Yang take photo in front of Union Hospital's booth at the joint conference.

The joint conference concludes with some guests in costumes.

CME Programme: 5 Step Plan for Maximum Penis Health (11 June 2024)

Dr Aaron Spitz, MD, Urologist and Orange County Urology Associates, shared with audience the 5 steps to maximise penis health, from diet, exercise, sleep to pornography probation and detoxification. The talk was followed by a fruitful discussion.

CME Programme: Updates in Systemic Therapy for Hepatocellular Carcinoma (21 June 2024)

Professor Chan Lam, Stephen, Assistant Dean (Health Systems) and Professor of Clinical Oncology at The Chinese University of Hong Kong, gave an inspirational and lively talk on hepatocellular carcinoma, covering the epidemiology, latest clinical trial data, treatment, and management of 'new' toxicity of its systemic therapy.

Trends of Cultured Pathogens

The Most Frequently Isolated Pathogens from Urine Cultures during January to April 2024

Most Common Pathogens Isolated	*Escherichia coli*	
Period	**Jan to April**	Sep to Dec
Number of Isolates per Admission (Total number of Urine Cultures)	**214 (1984) Including 60 ESBL & 2 CPE**	219 (2121) Including 51 ESBL & 1 CPE
Isolation Rate	**10.8%↑**	10.3%
Antibiotics	**Non-susceptible Rate**	
Amoxicillin/Clavulanic Acid	**17%↓**	26%
Ampicillin	**70%↑**	69%
Ampicillin/Sulbactam	**58%↓**	61%
Cefazolin (Oral)	**29%**	29%
Ceftriaxone/Cephalosporins 3G	**29%**	24%
Cefuroxime (Oral)	**34%**	34%
Cefuroxime (Parenteral)	**31%↑**	28%
Ciprofloxacin*	**50%↑**	49%
Ertapenem	**1%**	0.5%
Gentamicin	**20%↓**	26%
Imipenem	**1%↑**	0.5%
Levofloxacin*	**62%↓**	65%
Nitrofurantoin	**3%↑**	1%
Trimethoprim/Sulfamethoxazole	**35%↑**	33%

* Non-susceptible Rate of Levofloxacin & Ciprofloxacin is increased as the criteria for the interpretation of Susceptibility on Levofloxacin & Ciprofloxacin were changed on 1st April 2020.
CPE = Carbapenemase Producing Enterobacteraceae – E.coli

The Most Frequently Isolated Pathogens from Respiratory Secretion Cultures during January to April 2024

Period	**Jan to Apr 2024**		Sep to Dec 2023	
No of Request	**881**		746	
Pathogens	**Number of Isolates**	**Isolation Rate**	**Number of Isolates**	**Isolation Rate**
H. Influenzae	**101**	**11.5%↑**	62	8.3%
Pseudomonas aeruginosa	**35**	**4.0%↑**	19	2.5%
Staphylococcus aureus	**34 (included 4 MRSA)**	**3.9%↑**	45 (include 6 MRSA)	6.0%
Klebsiella pneumonia	**30 (included 3 ESBL)**	**3.4%↑**	21	2.8%

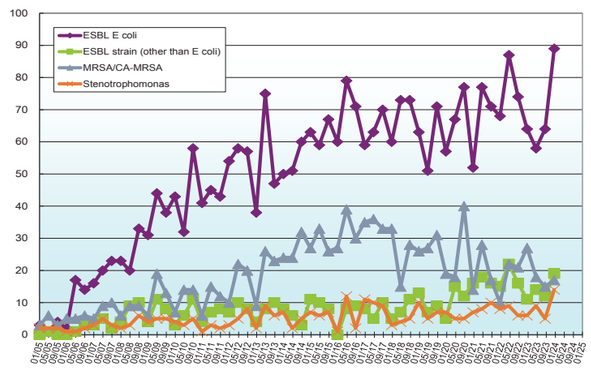
The Most Frequently Isolated Pathogens From Genital Cultures During January to April 2024.

Most Common Pathogens Isolated	*Group B Streptococci*		*Candida albicans*		*Yeast (Candida albicans excluded)*	
Period	**Jan to Apr 2024**	Sep to Dec 2023	**Jan to Apr 2024**	Sep to Dec 2023	**Jan to Apr 2024**	Sep to Dec 2023
Number of Isolates per Admission (Total number of Genital Cultures)	**149 (726)**	150 (802)	**84 (726)**	93 (802)	**26 (726)**	37 (802)
Isolation Rate	**20.5%↑**	18.7%↑	**11.6%**	11.6%	**3.6%↓**	4.6%↓
Antibiotics	**Non-susceptible Rate**					
Cefotaxime	**0.0%**	0.0%				
Clindamycin	**56.7%↑**	53.5%				
Levofloxacin	**13.3%↓**	13.5%				
Penicillin	**0.0%**	0.0%				
Vancomycin	**0.0%**	0.0%				

[1] Suspectible to penicillin can be considered susceptible to ampicillin, amoxicillin, amoxicillin/clavulanic acid, ampicillin/sulbactam, cefaclor, cefazolin, cefdinir, cefepime, cefprozil, cefotaxime, ceftriaxone, cefuroxime, cefpodoxime, ceftizoxime, cephalothin, cephapirin, imipenem, loracarbef, and meropenem.

Trend of ESBL, MRSA & Stenotrophomonas isolated from all specimen types by every four months

Trend of ESBL, MRSA & *Stenotrophomonas* isolated from all specimen types by quarter since 2005



	ESBL *E coli*	ESBL strain (other than *E coli*)	MRSA/ CA-MRSA	*Stenotrophomonas*
Jan-Apr 18	60	5	33	3
May-Aug 18	73	7	15	4
Sep-Dec 18	73	11	28	5
Jan-Apr 19	63	13	26	10
May-Aug 19	51	7	27	5
Sep-Dec 19	71	9	31	7
Jan-Apr 20	57	5	19	7
May-Aug 20	67	15	18	5
Sep-Dec 20	77	12	40	5
Jan-Apr 21	52	16	14	7
May-Aug 21	77	18	28	8
Sep-Dec 21	71	16	17	10
Jan-Apr 22	68	15	10	8
May-Aug 22	87	22	22	9
Sep-Dec 22	74	16	21	6
Jan-Apr 23	64	11	27	6
May-Aug 23	58	14	18	9
Sep-Dec 23	64	12	15	5
Jan-Apr 24	89	19	17	14

Antibiotics non-susceptible profile of commonly isolated bacterial pathogen at Union Hospital 2023

Pathogens	Acinetobacter sp.	Enterobacter sp.	Escherichia coli	Enterococcus sp. (1)	Haemophilus influenzae	Klebsiella sp.	Proteus sp.	Pseudomonas aeruginosa	Staphylococcus aureus	Salmonella sp.	Group B Streptococci
Antibiotics \ Count	46 +3CRAB	44	971 (220 ESBL + 1CPE)	221	156	308 (37 ESBL)	84 (5ESBL+ 1CPE)	164	593 (157 MRSA + 18 CA-MRSA)	261	542
Amikacin								0.6%			
Amoxicillin											
Amoxicillin/Clavulanic Acid		100%	24.3%		19.1%	28.6%	29.8%				
Ampicillin			71.3%	6.3%	48.4%	100%	34.5%			71.6%	
Ampicillin/Sulbactam	6.7%		59.9%			23.7%	20.2%				
Cefazolin/Cephalosporins 1G		100%	33.8%			46.2%	14.5%				
Cefepime								1.2%			
Cefotaxime					0.6%						0.0%
Ceftriaxone/Cephalosporins 3G		6.8%	23.9%		0.0%	14.0%	8.3%			8.8%	
Ceftriaxone (meningitis)											
Ceftriaxone (non-meningitis)											
Ceftazidime/Cephalosporins 3G	26.5%				5.2%			3.0%			
Cefuroxime (Oral)			33.9%		20.5%	20.8%	14.3%				
Cefuroxime (Parenteral)			28.1%			19.7%	14.3%				
Ciprofloxacin	10.2%	6.8%	46.5%			25.0%	21.4%	8.5%			
Clarithromycin					21.8%						
Clindamycin											52.2%
Erythromycin				78.0%					24.0%		
Ertapenem		0.0%	0.8%			0.0%	1.2%				
Gentamicin	6.1%	4.5%	21.1%			5.2%	17.9%	3.7%	5.8%		
Gentamicin (High Conc)											
Imipenem		0.0%	0.8%			0.6%	3.6%				
Levofloxacin		9.3%	59.8%	21.1%	0.6%	26.3%	21.4%	11.0%	20.6%	52.2%	12.2%
Meropenem	6.1%							2.4%			
Nitrofurantoin			3.3%	8.2%		89.3%	100%				
Oxacillin									29.5%		
Penicillin				7.2%					79.9%		0.0%
Penicillin Oral											
Penicillin parenteral (Men)											
Penicillin parenteral (NonMen)											
Piperacillin	16.3%							6.8%			
Tetracycline				85.8%					23.5%		
Trimethoprim/Sulfamethoxazole		10.0%	33.6%		47.4%	16.0%	33.3%		6.6%	25.3%	
Vancomycin				0.0%					0.0%		0.0%

100%	The highlighted non-susceptible antibiotics are due to intrinsically resistant to particular bacterial pathogen.
CPE	Carbapenemase producing *enterobacteriaceae*
ESBL	Extended-spectrum β-lactamases
MRSA/CA-MRSA	Methicillin-resistant *Staphylococcus aureus* / Community associated MRSA
(1)	Include *Enterococcus faecalis & Enterococcus faecium*