

CAR 2021

SHARE THE VISION PARTAGER LA VISION

PROGRAMME

April 27 – May 2, 2021
27 avril – 2 mai 2021



VIRTUAL EVENT



Canadian Association of Radiologists
L'Association canadienne des radiologues

#CAR2021 CARadiologists
www.car.ca info@car.ca

CAR 2021

SHARE THE VISION

April 27-May 2, 2021 **VIRTUAL EVENT**

THANK YOU TO THE OFFICIAL SPONSORS OF CAR 2021

Platinum Sponsors



GE Healthcare



Gold Sponsors



Silver Sponsors



Contributors



Table of Contents

Tables des matières

Programme Information Renseignements sur le programme.....	4
Annual Scientific Meeting Standing Committees Comités permanent du congrès annuel scientifique	7
Agenda Sommaire du programme	8
Presentations Présentations.....	16
Tuesday, April 27, 2021.....	17
Wednesday, April 28, 2021.....	21
Thursday, April 29, 2021.....	25
Friday, April 30, 2021.....	31
Saturday, May 1, 2021.....	36
Sunday, May 2, 2021.....	38
Oral Presentations and Posters Présentations orales et résumés	43
Research Presentations	44
Scientific Research Project Oral Presentations.....	44
Departmental Clinical Audit Project Oral Presentations	49
Radiologist-in-Training Research Project Oral Presentations.....	54
Value of Radiology Research Project Oral Presentations.....	60
Scientific Poster Abstracts.....	64
Departmental Clinical Audit Project.....	64
Radiologist-In-Training Research Project	69
Scientific Research Project	86
Educational Exhibit Abstracts.....	93
Faculty Corps professoral	121

Programme Information

The Canadian Association of Radiologists Annual Scientific Meeting (ASM) provides collaborative learning opportunities to enhance radiologists' knowledge and competencies in diagnostic and therapeutic medical imaging to help deliver optimal quality healthcare for patients and the Canadian public at large.

Learning Objectives

After attending and actively participating in the CAR 2021 ASM, participants will be able to:

- Identify and implement practical strategies to improve the management of radiology departments in community hospitals and clinics. CanMEDS roles: Collaborator, Communicator, Leader, Professional
- Recognize, identify, and avoid common misinterpretation and blind spots in each of the following subspecialties: neuroradiology, musculoskeletal, abdominal (GI/GU), thoracic and cardiac imaging. CanMEDS roles: Professional, Scholar, Health Advocate
- Discuss the differential diagnoses of common pathologies in a selection of multimodality, multidisciplinary cases. CanMEDS roles: Scholar, Health Advocate
- Adopt an evidence-based approach to common radiologic findings to enable the formulation of an appropriate differential diagnosis. CanMEDS roles: Scholar
- Discuss characteristic appearances and distinguishing imaging features related to emergencies in radiology in each of the following subspecialties: neuroradiology, thoracic, abdominal (GI/GU), and pediatric. CanMEDS roles: Medical Expert

Presentations

Unless otherwise indicated under individual sessions, each presentation is scheduled for approximately 20 minutes. Participants are encouraged to ask questions throughout the sessions using the chat function. A designated Q&A section has been allotted at the end of each series for speakers to answer questions from the audience. Every session has been designed as an educational offering to advance practitioners' professional development and the profession.

Renseignements sur le programme

Le congrès scientifique annuel de l'Association canadienne des radiologues offre des possibilités d'apprentissage collaboratif qui permettent aux radiologues de renforcer leurs connaissances et leurs compétences en imagerie médicale diagnostique et thérapeutique, assurant ainsi des soins de santé de qualité optimale à leurs patients et au public canadien dans son ensemble.

Objectifs d'apprentissage

Après avoir assisté et participé activement à l'édition 2021 du congrès scientifique annuel de la CAR, les participants seront en mesure de réaliser les actions suivantes :

- Repérer et mettre en application des stratégies pratiques visant à améliorer la gestion des services de radiologie dans les cliniques et les hôpitaux communautaires. Postes du référentiel CanMEDS concernés : collaborateur, communicateur, leader et professionnel
- Reconnaître, repérer et éviter les erreurs d'interprétation et les angles morts courants de chacune des sous-spécialités suivantes : neuroradiologie, radiologie musculosquelettique, radiologie abdominale (gastro-intestinale/génito-urinaire), imagerie thoracique et imagerie cardiaque. Postes du référentiel CanMEDS concernés : professionnel, érudit et promoteur de la santé
- Discuter des diagnostics différentiels de pathologies communes en s'appuyant sur un certain nombre de cas multimodaux et multidisciplinaires. Postes du référentiel CanMEDS concernés : érudit et promoteur de la santé
- Adopter une approche des résultats radiologiques fondée sur des preuves afin de permettre la formulation d'un diagnostic différentiel adapté. Poste du référentiel CanMEDS concerné : érudit
- Discuter des aspects caractéristiques et des éléments distinctifs en matière d'imagerie pour les urgences en radiologie dans chacune des sous-spécialités suivantes : neuroradiologie, radiologie thoracique, radiologie abdominale (gastro-intestinale/génito-urinaire) et radiologie pédiatrique. Poste du référentiel CanMEDS concerné : expert médical

Présentations

Sauf indication contraire sous la séance concernée, chaque présentation devrait durer environ 20 minutes. Nous encourageons les participants à poser des questions pendant les séances à l'aide de la fonctionnalité de clavardage. Une séance de questions-réponses aura lieu à la fin de chaque série de présentations afin de permettre aux intervenants de répondre aux questions du public. Chaque séance a été conçue comme un outil pédagogique permettant de faire progresser les praticiens sur le plan professionnel, mais aussi la profession en général.

Programme Information

Abstracts (Electronic Posters)

Participants are encouraged to view the abstract electronic posters (ePoster) area during the wellness and lunch breaks and throughout the meeting. Reading ePosters is a Self-learning Activity, under Section 2 of the Maintenance of Certification (MOC) Program of the Royal College and is eligible for a maximum of 1 credit per electronic posters.

Accreditation

Participants should only claim the credits commensurate with the extent of their participation in the activity.

CAR 2021 Annual Scientific Meeting is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada and approved by the Canadian Association of Radiologists. The CAR 2021 scientific program is approved for a maximum of 20.25 credit hours (Section 1).

Participants in the **CAR Trainee Day** are eligible to claim an additional a maximum of 4.5 hours under Section 1 (Group Learning Activity) of the MOC Program of the Royal College. These credits are in addition to the CAR 2021 scientific program which is approved for a maximum of 20.25 credit hours (Section 1).

Accredited Symposia

The accredited symposia are Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada and approved by the Canadian Association of Radiologists.

Participants in the **Clinical Perspective and Radiologic Screening for Chronic Thromboembolic Pulmonary Hypertension (CTEPH)** symposium are eligible to claim 1 hour under Section 1 (Group Learning Activity) of the MOC Program of the Royal College.

Participants in the **Physician Wellness – Burnout in Canadian Radiology: Stories from the Trenches** symposium are eligible to claim a maximum of 1 hour under Section 1 (Group Learning Activity) of the MOC Program of the Royal College.

AMA Accreditation Statement

Through an agreement between the Royal College of Physicians and Surgeons of Canada and the American Medical Association, physicians may convert Royal College MOC credits to AMA PRA Category 1 Credits™. Information on the process to convert Royal College MOC credits to AMA credits can be found at <https://edhub.ama-assn.org/pages/applications>.

Renseignements sur le programme

Résumés (affiches dématérialisées)

Nous encourageons les participants à consulter la zone où sont regroupées les affiches dématérialisées durant les pauses bien-être et dîner et tout au long du congrès. Lire les affiches dématérialisées est une activité d'auto-apprentissage telle que définie dans la Section 2 du programme de Maintien du certificat (MDC) du Collège royal et est admissible à un maximum de 1 crédit par affiche.

Agrément

Les participants doivent réclamer leurs unités de formation (crédits) proportionnellement à leur participation à l'activité.

Le Congrès scientifique annuel de la CAR 2021 constitue une activité d'apprentissage collectif agréée (Section 1) telle que définie par la Programme de Maintien du certificat (MDC) du Collège royal des médecins et chirurgiens du Canada et approuvée par la CAR. Le programme scientifique de l'édition 2021 du Congrès de la CAR pourra rapporter un maximum de 20,25 crédits (Section 1).

Les participants à la **Journée pour les stagiaires** peuvent obtenir, au maximum, 4,5 heures (les crédits sont calculés automatiquement) sous la Section 1 activité d'apprentissage collectif agréée du programme de MDC du Collège royal.

Colloques agréés

Les colloques agréés sont des activités d'apprentissage collectif agréée (Section 1) telle que définie par la Programme de Maintien du certificat (MDC) du Collège royal des médecins et chirurgiens du Canada et approuvée par la CAR.

Les participants à Atelier interactif : **Clinical Perspective and Radiologic Screening for Chronic Thromboembolic Pulmonary Hypertension (CTEPH)** peuvent obtenir, 1 heure sous la Section 1 activité d'apprentissage collectif agréée du programme de MDC du Collège royal.

Les participants au séance **Physician Wellness – Burnout in Canadian Radiology: Stories from the Trenches** peuvent obtenir, 1 heure sous la Section 1 activité d'apprentissage collectif agréée du programme de MDC du Collège royal.

Énonces d'agrément de l'AMA

En vertu d'une entente entre le Collège royal des médecins et chirurgiens du Canada et l'American Medical Association, les médecins peuvent convertir les crédits du programme de MDC en crédits de catégorie 1 de l'AMA PRAMC.

Des informations sur le processus de conversion des crédits MDC du Collège royal en crédits AMA PRAMC sont disponibles à l'adresse <https://edhub.ama-assn.org/pages/applications>.

UEMS-EACCME Accreditation Statement

Live educational activities recognized by the Royal College of Physicians and Surgeons of Canada as Accredited Group Learning Activities (Section 1) are deemed by the European Union of Medical Specialists (UEMS) eligible for ECMECR.

Certificate of Attendance

After the event, participating radiologists will be able to access and complete their certificate of attendance at car-asm.ca.

Participants can document their learning in the Royal College's MAINPORT at <https://rclogin.royalcollege.ca/oamlogin/login.jsp>.

Disclaimer

No responsibility is assumed by the CAR for any injury and/or damage to persons or property as a matter of product liability, negligence or otherwise, or from any use or operations of any methods, products, instructions, or ideas contained in materials distributed or described during presentations throughout CAR 2021. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made.

Although all advertising material available on the CAR 2021 platform is expected to conform to ethical (medical) standards, inclusion in this event does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer and representatives.

Disclosure of Conflict of Interest

The CAR has a formal policy regarding the need for authors and presenters to inform CAR attendees of any conflict of interest (COI). A COI includes, but is not limited to, employment, ownership of stock, membership on a standing advisory council or committee, or being on the board of directors or publicly associated with a company or its products. Other potential areas of real or perceived conflict of interest could include receiving honoraria, consulting fees, or grants.

Énonces d'agrément de l'UEMS

La participation en direct à des activités éducatives reconnues par le Collège royal des médecins et chirurgiens du Canada rend les participants admissibles à des crédits européens de formation continue (ECMEC®) attribués par l'Union européenne des médecins spécialistes (UEMS).

Certificat de participation

Après l'événement, les radiologues participants pourront accéder et remplir leur certificat de participation à car-asm.ca.

Les participants peuvent documenter leur apprentissage sur le portail MAINPORT du Collège royal des médecins et chirurgiens du Canada (CRMCC) au <https://rclogin.royalcollege.ca/oamlogin/login.jsp>.

Avis de non-responsabilité

La responsabilité de la CAR ne saurait en aucune façon être engagée pour tout préjudice ou dommage aux personnes ou aux biens découlant du fait des produits, de la négligence ou autre, ou encore de l'utilisation ou de l'application de produits, de méthodes, d'instructions ou d'idées contenus lors du Congrès scientifique annuel de la CAR. En raison notamment des progrès rapides du domaine des sciences médicales, un contrôle indépendant des diagnostics et de la posologie devrait être effectué.

Bien que tout matériel publicitaire disponible sur la plate-forme virtuelle soit tenu de respecter les normes d'éthique (du domaine médical), la présence lors de cet événement de tel matériel ne constitue en rien une garantie, ni ne vient appuyer la qualité ou la valeur des produits ou les promesses du fabricant ou de ses délégués à leur égard.

Déclaration de conflit d'intérêts

En vertu de la politique de la CAR, les auteurs et les conférenciers doivent aviser les participants du Congrès de tout conflit d'intérêts. Les conflits d'intérêts incluent, sans s'y limiter, l'emploi, la propriété d'actions, l'appartenance à un conseil ou à un comité consultatif permanent, ou la participation au conseil d'administration d'une entreprise, ou toute affiliation publique à celle-ci ou à ses produits. Il peut également y avoir conflit d'intérêts réel ou perçu si le conférencier reçoit des honoraires, des frais d'expert-conseil ou des subventions.

The CAR wishes to extend its sincere thanks to the volunteer members of the CAR 2021 ASM Planning Standing Committee and ASM Scientific and Educational Competitions Judging Standing Committee. It is their dedication, expertise and pursuit of excellence that has shaped this year's outstanding educational programme.

La CAR souhaite transmettre ses remerciements les plus sincères aux membres bénévoles du Comité permanent de la planification du congrès annuel scientifique 2021 et du Comité permanent de la sélection des compétitions scientifiques et éducatives du congrès annuel scientifique 2021. Leur dévouement, leur expertise et leur volonté d'exceller ont façonné l'excellent programme de formation de cette année.

ASM Planning Standing Committee

Comité permanent de la planification du congrès annuel scientifique

Michael Patlas (Chair)

Aline Khatchikian

Kyle Moulton

Gilles Soulez

Basma Al-Arnawoot

Iain Kirkpatrick

Devang Odedra

Michelle Zhang

Tanya Chawla

Mario Kontolemos

Angela Pickles

Connie Hapgood

Caitlin McGregor

Elena Scali

ASM Scientific and Educational Competitions Judging Standing Committee

Comité permanent de la sélection des compétitions scientifiques et éducatives du congrès annuel scientifique

Andreu Costa (Chair)

Ramy El-Jalbout

Daria Manos

Dejana Radulovic

Mostafa Alabousi

Marco Essig

Matthew McInnes

Jai Shankar

Tanya Chawla

Faisal Khosa

Emily Pang

Vivek Virmani

Suki Dhillon

Mark Levental

Francesca Proulx

Charlotte Yong-Hing

Agenda

Sommaire du programme



CAR 2021



Canadian Association of Radiologists
L'Association canadienne des radiologues

SHARE THE VISION
PARTAGER LA VISION
April 27–May 2, 2021
VIRTUAL EVENT

- Plenaries | Séances plénierées
- Educational Sessions | Séances éducatives
- Research Presentations | Présentations de recherche

- Accredited Symposia | Symposiums accrédités
- Wellness Break | Pauses santé
- CAR and CRF AGMs | Assemblées générales de la CAR et de la FRC
- Social Events | Événements sociaux

Virtual CAR 2021 AGENDA / PROGRAMME

CAR Annual Scientific Meeting

Trainee Day

Tuesday, April 27



Visit the Scientific and Educational Electronic Posters - Available All Day On Demand

11:00 – 11:50	Opening Plenary: Practical Promotion of Diversity, Equity, and Inclusion in Radiology <i>Moderator: Aline Khatchikian Panelists: Emil Lee, Anand Narayan, Lucy Spalluto, and Charlotte Yong-Hing</i>	
11:50 – 12:20	Wellness Break	
12:20 – 14:50	MSK Bootcamp <i>Moderator: Cameron Hague</i>	
12:20 – 12:40	Shoulder MRI with Emphasis on the Rotator Cuff <i>Zaid Jibri</i>	
12:40 – 13:00	Imaging Approach to Arthritis <i>Bruce Forster</i>	
13:00 – 13:20	Extremity Trauma <i>Stephany Pritchett</i>	
13:20 – 13:50	Wellness Break	
13:50 – 14:10	Imaging of Metabolic Bone Disease <i>Eric Pike</i>	
14:10 – 14:30	Hip MRI – The Ins and Outs <i>Isabelle Dupuis</i>	
14:30 – 14:50	MSK Neoplasms <i>Adnan Sheikh</i>	
14:50 – 15:20	Wellness Break	
15:20 – 17:00	Junior Hot Seats <i>Isabelle Dupuis Stephany Pritchett</i>	Senior Hot Seats <i>Eric Pike Zaid Jibri</i>
20:00 – 21:30	Radiologists-in-Training Speed Mentorship Program (Trainees Only)	
21:30 – 22:30	Radiologist-in-Training Virtual Party (Trainees Only)	



■ Educational Sessions | Séances éducatives ■ Wellness Breaks | Pauses santé

11:00 – 13:00	Diffuse Lung Disease <i>Moderators: Anastasia Oikonomou and Visal Pen</i>
11:00 – 11:20	Interstitial Lung Disease: A Practical Approach for 2021 <i>Cameron Hague</i>
11:20 – 11:40	Is this IPF? Challenging Cases: The Radiologist's Approach <i>Carolina Souza</i>
11:40 – 12:00	Is this IPF? The Clinician's Perspective <i>Deborah Assayag</i>
12:00 – 12:20	Deep Dive into Hot Topics in 2021 <i>Daria Manos and Jana Taylor</i>
12:20 – 13:00	Discussion and Q&A
13:00 – 13:15	Wellness Break and visit the Electronic Posters
13:15 – 15:15	Lung Cancer Screening <i>Moderators: Carole Dennie and Daria Manos</i>
13:15 – 13:30	The US Approach <i>Caroline Chiles (STR President)</i>
13:30 – 13:45	The European Perspective <i>Mathias Prokop (ESTI Representative)</i>
13:45 – 14:00	The Alberta Pilot <i>Mike Bristow</i>
14:00 – 14:15	The Ontario Pilot <i>Heidi Schmidt</i>
14:15 – 14:30	Lung Cancer Screening: Where We Are and Where Do We Need to Go <i>Martin Tammemagi</i>
14:30 – 15:15	Panel Discussion: Where Do We Go from Here?
15:15 – 15:30	Closing Remarks <i>Carole Dennie (CSTR President) and Daria Manos (CSTR Vice President)</i>

CSTR 2021 - On-Demand Content

Available to all ASM participants to stream at any time, no live or interactive component.

Cardiovascular Imaging and Research Sessions
Coronary CTA in Clinical Practice: A Paradigm Shift <i>Elsie Nguyen</i>
TAVR CT Going Mainstream: What You Need to Know <i>Philip Blanke</i>
CSTR Research Consortium <i>Narinder Paul</i>
Pulmonary Vascular Disease Sessions
Acute Pulmonary Embolism (PE): Overdiagnosis and the Subsegmental PE Conundrum <i>Jana Taylor</i>
Pulmonary Hypertension: From Imaging to Bedside <i>Elena Peña</i>
CTEPH: Don't Miss it <i>Carole Dennie</i>

Thursday, April 29

CAR 2021 Scientific Program

Visit the Scientific and Educational Electronic Posters - Available All Day On Demand

11:00 – 11:10	Opening Remarks <i>Michael Barry (CAR President) and Michael Patlas (CAR SPC Chair)</i>		
11:10 – 12:00	Keynote Lecture: Whole Body Trauma Imaging: Radiology Impacts Patient Management <i>Savvas Nicolaou</i>		
12:00 – 13:00	Lunch Break and visit the Electronic Posters		
13:00 – 14:30	CETARS* Presents: Emergency Neuroradiology <i>Moderator: Carlos Torres</i>	CSAR** Presents: LI-RADS <i>Moderator: Alison Harris and Ania Kielar</i>	Scientific Research Project Oral Presentations <i>Moderator: Julia Niles</i>
13:00 – 13:20	Updates on Spinal Trauma: What You Need to Know <i>Jason Talbott</i>	Screening for Hepatocellular Carcinoma (HCC) and LI-RADS <i>Alison Harris</i>	Judges: <i>Emily Pang</i> <i>Francesca Proulx</i> <i>Jai Shankar</i> <i>Vivek Virmani</i>
13:20 – 13:40	Spontaneous Intracranial Hemorrhage: Key Concepts! <i>Laurent Letourneau-Guillon</i>	Contrast-Enhanced Ultrasound and LI-RADS <i>Tae Kim</i>	
13:40 – 14:00	Blunt Cerebrovascular Injury: Current Guideline Recommendations and Controversies <i>Savvas Nicolaou</i>	CT/MRI LI-RADS Version 2018 <i>An Tang</i>	
14:00 – 14:20	Acute Myelopathies, Ischemia and Mimics <i>Carlos Torres</i>	LI-RADS Tumour Response Algorithm <i>Ania Kielar</i>	
14:20 – 14:30	Q&A	Q&A	
14:30 – 15:00	Wellness Break		
15:00 – 16:10	CETARS* Presents: Imaging of Thoracic Trauma <i>Moderator: Savvas Nicolaou</i>	Sharing the Vision in Artificial Intelligence Research Management <i>Moderator: Roger Tam</i>	Departmental Clinic Audit Project Oral Presentations <i>Moderator: Julia Niles</i>
15:00 – 15:20	Trauma of the Thoracic Boundaries <i>Nicolas Murray</i>	Challenges and Opportunities in NLP for Medical Imaging <i>Tim O'Connell</i>	Judges: <i>Andreu Costa</i> <i>Suki Dhillon</i> <i>Matthew McInnes</i>
15:20 – 15:40	Imaging and Management of Traumatic Injuries to the Thoracic Aorta and Pulmonary Trunk: What Matters Clinically <i>Ferco Berger</i>	Managing a Multidisciplinary Research Team: The IVADO Experience <i>An Tang</i>	
15:40 – 16:00	Imaging of Penetrating/Blunt Trauma to the Heart: Pearls and Pitfalls <i>Savvas Nicolaou</i>	Creative Label Curation Strategies for Radiology AI Development <i>Jaron Chong</i>	
16:00 – 16:10	Q&A	Discussion and Q&A	
17:00 – 18:00	Welcome Reception		
18:00 – 19:00	CETARS* Networking Event		

*Canadian Emergency, Trauma and Acute Care Radiology Society

**Canadian Society of Abdominal Radiology

Friday, April 30

Visit the Scientific and Educational Electronic Posters - Available All Day On Demand

11:00 – 12:10	CETARS* Presents: Abdominal Emergencies <i>Moderators: Michael Patlas and Emil Lee</i>	Controversies & Conundrums in Canadian Radiology <i>Moderator: Tanya Chawla</i>	Radiologists-in-Training Research Project Oral Presentations <i>Moderator: Julia Niles</i>
11:00 – 11:20	Imaging of Acute Female Pelvis: Gynecological Aspects <i>Anthony Hanbidge</i>	Controversies in Radiology <i>Tanya Chawla</i>	Judges: <i>Marco Essig</i> <i>Faisal Khosa</i> <i>Mark Levental</i>
11:20 – 11:40	Abdominal Emergencies in Cancer Patients <i>Raffaella Basilico</i>	Breast Imaging Guidelines <i>Jean Seely</i>	
11:40 – 12:00	Penetrating Abdominal Trauma <i>Michael Patlas</i>	Productivity Metrics in Radiology – To RVU or Not to RVU! <i>Kawan Rakhra</i>	
12:00 – 12:10	Q&A	Q&A	
12:10 – 13:00	Lunch Break and visit the Electronic Posters		
13:00 – 14:10	CSAR** Presents: Incidentalomas: Now What? <i>Moderator: Iain Kirkpatrick</i>	Practical Considerations for the Community Radiologist <i>Moderator: Bruce Forster</i>	Value of Radiology Research Project Oral Presentations <i>Moderator: Julia Niles</i>
13:00 – 13:20	Managing the Incidental Renal Mass in Adults <i>Iain Kirkpatrick</i>	Creating a Culture of High Value Patient Centered Care <i>Geraldine McGinty</i>	Judges: <i>Ramy El-Jalbout</i> <i>Daria Manos</i> <i>Charlotte Yong-Hing</i>
13:20 – 13:40	Managing Incidental Hepatobiliary Findings in Adults <i>Jeff Bird</i>	Social Media in Radiology Practices <i>Geraldine McGinty</i>	
13:40 – 14:00	Incidental Intra-Abdominal Nodal and Splenic Findings <i>Gary Brahm</i>	Generating Better Outcomes in the Procurement of Diagnostic Imaging Equipment <i>Lise Patry</i>	
14:00 – 14:10	Q&A	Q&A	
14:10 – 14:30	Wellness Break and visit the Electronic Posters		
14:30 – 15:30	Plenary Panel: Radiology and the COVID-19 Pandemic: What We've Learned and Where We Go from Here <i>Moderator: Ania Kielar</i> <i>Panelists: Mark Baerlocher, Devang Odedra, Ciaran Redmond and Jana Taylor</i>		
15:35 – 16:25	Virtual Wellness Activity		
18:00 – 19:00	CSAR** Networking Event		

*Canadian Emergency, Trauma and Acute Care Radiology Society

** Canadian Society of Abdominal Radiology

Saturday, May 1

Visit the Scientific and Educational Electronic Posters - Available All Day On Demand

10:00 – 10:50	CAR Annual General Meeting & CRF Annual General Meeting	
11:00 – 12:30	CanSPR* Presents: Pediatric Emergencies for the General Radiologist <i>Moderator: Elka Miller</i>	Easily Missed Fractures <i>Moderator: Adnan Sheikh</i>
11:00 – 11:25	Pediatric Chest Emergencies <i>Katya Rozovsky</i>	Emergency Radiology: Shoulder and Elbow Trauma <i>Hema Choudur</i>
11:25 – 11:50	Pediatric Abdominal Emergencies <i>Govind Chavhan</i>	Pelvic Trauma <i>Ferco Berger</i>
11:50 – 12:15	Pediatric Neurological Emergencies <i>Elka Miller</i>	Ankle and Foot Trauma <i>Adnan Sheikh</i>
12:15 – 12:30	Q&A	Q&A
12:30 – 13:00	Wellness Break and visit the Electronic Posters	
13:30 – 14:30	Accredited Symposium: Clinical Perspective and Radiologic Screening for Chronic Thromboembolic Pulmonary Hypertension (CTEPH) Interactive Workshop <i>Featuring: Narinder Paul, John Granton, Marc de Perrot, Sebastian Mafeld and Micheal McInnis</i>	
14:30 – 14:40	Wellness Break and visit the Electronic Posters	
14:40 – 15:40	Accredited Symposium: Physician Wellness – Burnout in Canadian Radiology: Stories from the Trenches <i>Featuring: Michael Patlas, Mostafa Alabousi, Andrea Lum and Alexandre Menard</i>	
15:40 – 16:00	Wellness Break	
16:00 – 17:30	CAR Awards Ceremony	

*Canadian Society of Pediatric Radiology

Sunday May 2, 2021

Visit the Scientific and Educational Electronic Posters - Available All Day On Demand

11:00 – 11:50	Plenary Lecture: Multimodality Imaging of the Placenta <i>Jamie Marko (AIRP)</i>
11:50 – 12:30	Wellness Break and visit the Electronic Posters
12:30 – 15:10	Mistakes We All Make <i>Moderator: Mark Levental</i>
12:30 – 12:50	Neurological Imaging <i>Stephanie Lam</i>
12:50 – 13:10	ENT Imaging <i>Eugene Yu</i>
13:10 – 13:30	Obstetrics <i>Jamie Marko</i>
13:30 – 13:40	Q&A
13:40 – 14:00	Wellness Break and visit the Electronic Posters
14:00 – 14:20	Pitfalls in Chest Imaging <i>Francesca Proulx</i>
14:20 – 14:40	Diagnostic Pitfalls in Cross-Sectional Abdominal Imaging <i>Jaron Chong</i>
14:40 – 14:55	Musculoskeletal Imaging <i>Nathalie Bureau</i>
14:55 – 15:10	Musculoskeletal Imaging <i>Linda Probyn</i>
15:10 – 15:20	Q&A
15:20 – 15:30	Closing Remarks <i>Michael Patlas (CAR SPC Chair)</i>

CAR 2021 - Virtual Accredited Symposium

Clinical Perspective and Radiologic Screening for Chronic Thromboembolic Pulmonary Hypertension (CTEPH) Interactive Workshop

Featuring

Dr. Narinder Paul, Dr. Marc de Perrot,
Dr. Micheal McInnis and Dr. Kongteng Tan

Saturday, May 1, 2021

13:30 - 14:30

Register at car-asn.ca

Co-developed by:



Canadian Association of Radiologists
L'Association canadienne des radiologues



Chronic thromboembolic pulmonary hypertension (CTEPH) affects 4% of patients following acute pulmonary embolism. This is approximately 3000 Canadians annually. If untreated, CTEPH leads to progressive right heart failure and death. It is a preventable cause of death as early recognition leads to surgical endarterectomy and cure. CT pulmonary angiography is a common technique performed in all Canadian Hospitals and routinely interpreted by radiologists. There is limited recognition of the signs for CTEPH and improving this recognition could lead to earlier diagnosis and referral for therapeutic intervention. This workshop aims to improve recognition of CTEPH on CTPA studies.

This interactive workshop will feature two 20-minute introductory talks: discussing the evaluation and surgical management of CTEPH patients and describing the radiological signs of CTEPH. These didactic lectures will be followed by a 40-minute interactive case discussion reviewing selected case histories that illustrate the spectrum of diagnostic imaging appearances and treatment options.

Learning Objectives

By the conclusion of this session, participants will be able to:

1. Identify radiological signs of CTEPH on CT pulmonary angiography;
2. Describe the essential information required by the surgeon to assess CTEPH patients for endarterectomy; and
3. Apply different imaging methods to the diagnosis and evaluation of CTEPH patients.

CAR 2021 - Virtual Accredited Symposium

PHYSICIAN



W E L L N E S S

Burnout in Canadian Radiology: Stories from the Trenches

Saturday, May 1, 2021
14:40-15:40

Co-developed by:



Canadian Association of Radiologists
L'Association canadienne des radiologues



MD Financial
Management

Featuring: Dr. Michael Patlas,
Dr. Mostafa Alabousi, Dr. Andrea Lum
and Dr. Alexandre Menard

Register at car-asm.ca

Building resilience in the workplace and managing stress ensuring a better quality of life and promoting balance. This activity is aimed at self improvement and speaks to the CanMEDS Professional, Leader and Medical Expert roles. By ensuring wellbeing of physicians, we are also promoting safer healthcare to patients.

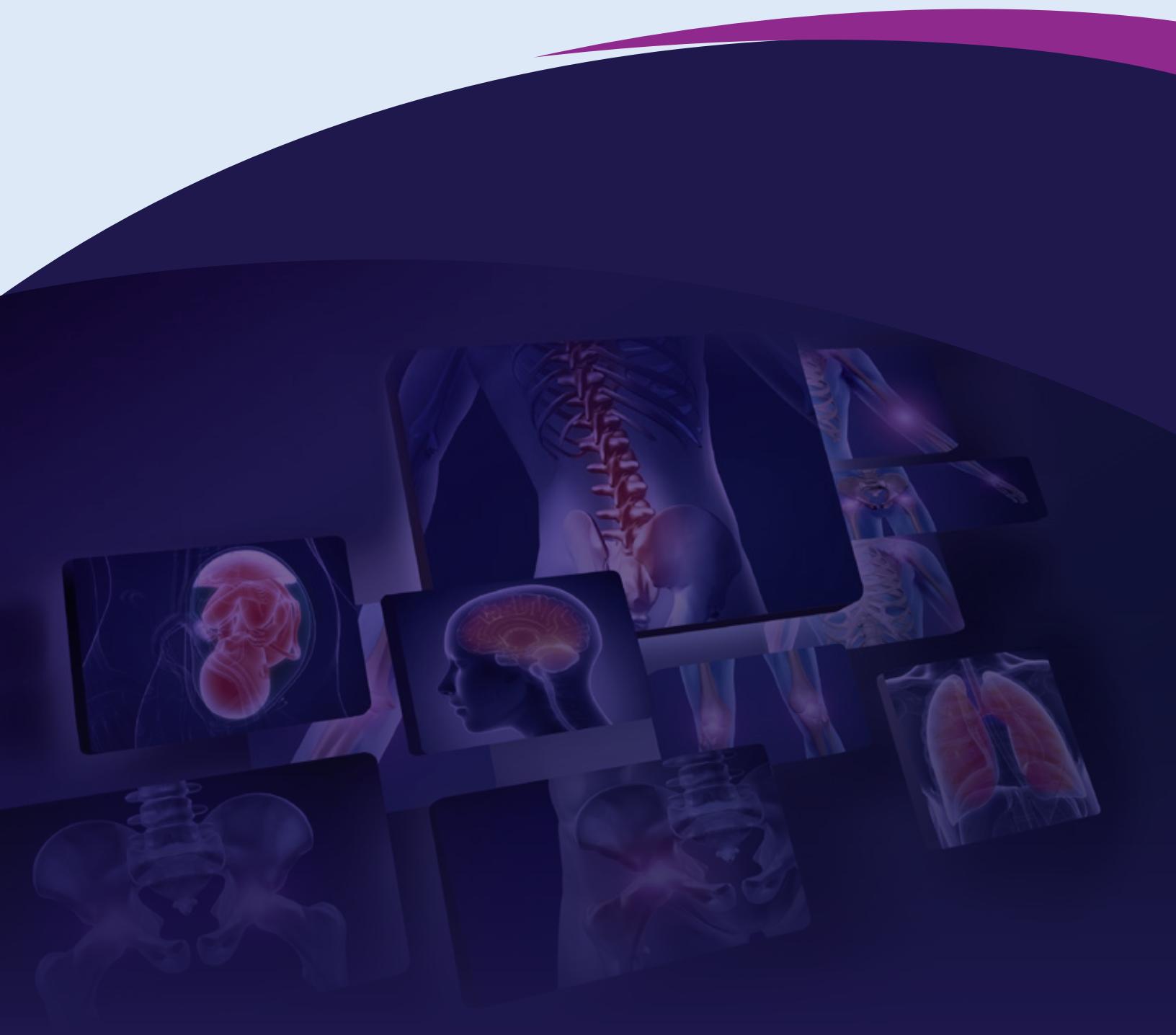
The session will feature four speakers who will discuss prevalence of burnout in Canadian radiological community and provide practice-based mitigation strategies. Different challenges related to burnout will be described by radiology trainee, interventional radiologist, and senior leaders in our field. This session will be followed by a 20-minute round table discussion.

Learning Objectives

By the end of this session, participants will be able to:

1. Identify characteristics and traits of physician burnout.
2. Recognize the indicators of stress in their individual practices.
3. Apply identified techniques to help minimize stress and prevent the effects of physician burnout in the workplace.

Presentations Présentations



TUESDAY, APRIL 27, 2021

11:00– 11:50

Opening Plenary

Moderator: Aline Khatchikian

Panelists: Emil Lee, Anand Narayan, Lucy Spalluto, and Charlotte Yong-Hing

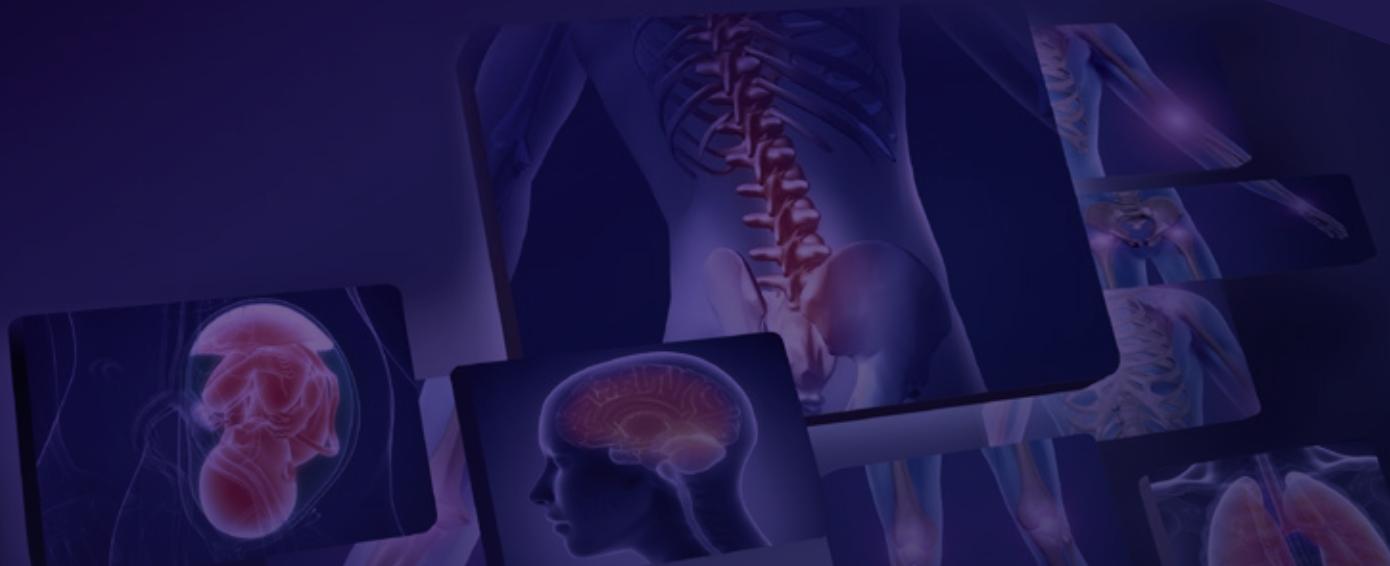
Practical Promotion of Diversity, Equity and Inclusion in Radiology

Equity, diversity, and inclusion (EDI) initiatives are an increasingly visible aspect of work and interaction in radiology departments, training programs, and professional life. This panel discussion brings together radiologists from across North America to discuss the EDI projects, programs, and practical initiatives at their institutions. They will also provide their perspectives on how radiology has been affected by increased awareness and interest in these issues, and how it may evolve in the future. The presentations will be followed by 25 minutes of panel discussion and live Q&A with the virtual audience.

Learning Objectives

By the end of this session, participants will be able to:

1. Compare and contrast various model EDI programs which have been implemented at the departmental or institutional level.
2. Describe how efforts to increase EDI have shaped and impacted radiology training, patient care, and professional interaction, in order to encourage cultural shifts within their own departments, programs, or institutions.
3. Apply the foundational principles of EDI to implement similar programs at their own departments or institutions.



TUESDAY, APRIL 27, 2021

12:20 – 14:50

Musculoskeletal Bootcamp

Moderator: Cameron Hague

Shoulder MRI with Emphasis on the Rotator Cuff

Zaid Jibri

This presentation will provide an overview on the role of MRI in shoulder assessment with emphasis rotator cuff tendon pathologies.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognise the normal rotator cuff MRI anatomy.
2. Differentiate the different types rotator cuff tendon pathologies.

Imaging Approach to Arthritis

Bruce Forster

This presentation will concentrate on the classic plain radiographic findings in inflammatory, degenerative and metabolic arthritides, allowing classification into these categories, and then a specific dx. The role of US and MRI in the modern digital radiography (DX) and monitoring of rheumatoid arthritis will also be covered.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the five categories of analysis for plain radiographic assessment of arthritis.
2. Apply these to categorize the arthritis into one of the three main groups.
3. Recognize radiographic findings related to specific common arthritides within these groups.
4. Describe the changing role of the radiologist in DX and monitoring of inflammatory arthritis.

Extremity Trauma

Stephany Pritchett

This is an interactive case-based tour of upper and lower extremity trauma with an emphasis on radiography. We will review key findings in some of the most common fractures/dislocations and present imaging pearls useful for diagnosing some of the most commonly missed injuries.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the radiographic appearance of selected fractures and dislocations.
2. Recognize some commonly missed injuries and apply strategies to reduce error.
3. Review critical findings that radiologists must convey to clinicians which can directly influence patient treatment and outcomes.

Imaging of Metabolic Bone Disease

Eric Pike

Metabolic bone disease refers to a broad group of diseases that diffusely affect the mass or structure of the skeleton and lead to subsequent abnormalities in bone mass, mineral homeostasis, bone turnover and bone growth. The conditions can be genetic and acquired.

The mention of the topic often strikes fear into residents and staff who might prefer discussing an arthropathy or fracture!

This presentation will review the radiographic findings of selected disorders with illustrative cases and review what conditions we should include when discussing metabolic bone disease and hopefully ease any anxiety when seeing these conditions.

Learning Objectives

By the end of this session, participants will be able to:

1. List the most common metabolic bone diseases and their causes.
2. Review the characteristic imaging findings seen with these metabolic bone diseases.

Hip MRI - The Ins and Outs

Isabelle Dupuis

This session will feature a review of the anatomy of the hip and periarticular structures on MRI as well as a review of intra and extra-articular pathologies that can be found on hip MRI.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize common pathologies of the hip based on clinical symptoms.
2. Identify important anatomical landmarks when reading hip MRIs.
3. Develop a search pattern when reading hip cases.

MSK Neoplasms

Adnan Sheikh

In this presentation we will discuss a systematic approach to the differential diagnosis of bone tumors and tumor-like lesions. The differential diagnosis mostly depends on the imaging findings, location of the lesion and the age of the patient.

Learning Objectives

By the end of this session, participants will be able to:

1. Identify the imaging findings of bone neoplasm.
2. Describe the clinical and radiologic features peculiar to benign and malignant bone tumour.

TUESDAY, APRIL 27, 2021

15:20-17:00

Junior and Senior Plain Film Hot Seat Sessions

Plain Film Hot Seat Sessions: Junior Room

Isabelle Dupuis and Stephany Pritchett

This session will provide participating trainees (PGY-1, 2, 3) with a foundation for approaching cases in preparation for various settings and examinations. This case-based discussion will cover a range of musculoskeletal disorders with an emphasis on the plain radiographic appearances in a “hot seat” type set up. The focus of this session is to demonstrate a systematic approach in reporting plain radiographs and allow trainees to practice their observational and interpersonal skills in the detection of MSK plain radiographic abnormalities.

In this group session format, the cases will be discussed, and feedback will be given to individuals as well as to the group.

Learning Objectives

By the end of this session, participants will be able to:

1. Assimilate and apply pertinent differential diagnoses in radiology related to the sample cases.
2. Apply a patterned approach to radiographic disease via a case-based approach.
3. Analyze feedback received from the moderators and use it to improve skills while interpreting cases orally.

Plain Film Hot Seat Sessions: Senior Room

Zaid Jibri and Eric Pike

This session will provide participating trainees (PGY-3, 4, 5) with a foundation for approaching cases in preparation for various settings. This case-based discussion will cover a range of musculoskeletal disorders with an emphasis on the plain radiographic appearances in a “hot seat” type set up. The focus of this session is to demonstrate a systematic approach in reporting plain radiographs and allow trainees to practice their observational and interpersonal skills in the detection of MSK plain radiographic abnormalities.

In this group session format, the cases will be discussed, and feedback will be given to individuals as well as to the group.

Learning Objectives

By the end of this session, participants will be able to:

1. Employ a systematic approach in reporting the plain radiographs in a range of musculoskeletal disorders.
2. Demonstrate their observational and interpretational skills in the detection of the various MSK plain radiographic abnormalities.
3. Analyze feedback received from the moderators and use it to improve skills while interpreting cases orally.

WEDNESDAY, APRIL 28, 2021

11:00– 13:00

CSTR 2021 - Focus on Lung Screening Diffuse Lung Disease

Moderators: Anastasia Oikonomou and Visal Pen

Interstitial Lung Disease: A Practical Approach For 2021

Cameron Hague

This session will review the updates to diagnostic guidelines of idiopathic pulmonary fibrosis (IPF) and discuss how to integrate these guidelines as well as their new terms into an imaging report.

Learning Objectives

By the end of this session, participants will be able to:

1. Provide succinct and useful reports on high-resolution computed tomography (HRCT) studies with fibrotic lung disease utilizing currently accepted terminology.
2. Apply a stepwise approach to HRCT interpretation of fibrotic interstitial lung disease cases based on a simple algorithm that can be utilized in the real world.

Is This IPF? Challenging Cases: The Radiologist's Approach

Carolina Souza

In this lecture, difficult real-life cases will be presented in a case-based format to discuss the role and limitations of HRCT of the chest in the diagnosis of fibrotic interstitial lung disease (ILD). A systematic approach to the diagnosis of challenging cases not easily categorized according to current guidelines will be provided with emphasis on HRCT findings that can support or disfavor a usual interstitial pneumonia (UIP) / idiopathic pulmonary fibrosis (IPF) diagnosis. The role of radiology in the multidisciplinary diagnosis of IPF as well as in the management of fibrotic ILD deemed unclassifiable will be discussed.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss cases of fibrotic ILD that pose a diagnostic challenge with emphasis on HRCT diagnosis.
2. Apply a systematic approach and HRCT clues that facilitate the diagnosis of cases not easily categorized according to current guidelines for the diagnosis of IPF.
3. Recognize the importance of radiological and clinical correlation in the diagnosis of fibrotic ILD and the role of the radiologist in multidisciplinary discussion.

Is This IPF? The Clinician's Perspective

Deborah Assayag

Discuss the clinical challenges in the diagnosis and management of IPF.

Learning Objectives

By the end of this session, participants will be able to:

1. Review insight in the pathophysiology and natural history of IPF.
2. Review some of the clinical challenges for the diagnosis of IPF.
3. Discuss the management options of patients with IPF.

Deep Dive Into Hot Topics in 2021

Daria Manos and Jana Taylor

This presentation will provide an in-depth exploration of vaping-associated lung disease and fatty-airways disease including an up-to-date review of the underlying pathology. A detailed review of the imaging features of COVID-19 pneumonia will also be presented.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe controversies and difficulties in diagnosing vaping-related lung injury, review the current evidence regarding the underlying pathology and recognize when to consider the diagnosis.
2. Distinguish the underlying pathology of small airways disease in obese patients and the importance of making this diagnosis.
3. Discuss the typical and atypical imaging appearance of COVID-19 pneumonia and its temporal evolution.

WEDNESDAY, APRIL 28, 2021

13:15 – 15:15

CSTR 2021 – Focus on Lung Screening Lung Cancer Screening

Moderators: Carole Dennie and Daria Manos

The US Approach

Caroline Chiles

This overview of lung cancer screening in the United States will address regulations in the screening process imposed by the Centers for Medicare and Medicaid Services, including shared decision making, the use of Lung RADS, and uploads of data to the American College of Radiology (ACR) registry.

Learning Objectives

By the end of this session, participants will be able to:

1. Identify at least three barriers to lung cancer screening in the United States.
2. Review recent revisions to Lung RADS.

The European Perspective

Mathias Prokop

This presentation provides an overview of the various European screening efforts and why screening is still opposed in many European countries. It explores some of the issues about ethics and acceptability, participant selection and accrual, gender, follow-up protocols, the rising role of AI and ideas on how to re-think lung screening altogether.

Learning Objectives

By the end of this session, participants will be able to:

1. Name three issues that need to be solved to provide wider (European) government support of lung screening.
2. Recognize what to look for in AI support for lung screening programs.

The Alberta Pilot

Mike Bristow

This session will review the Alberta Lung Cancer Screening Pilot Study with discussion of the multidisciplinary team approach and integration of a synoptic reporting system. Discuss the challenges in securing further support for ongoing screenings in Alberta.

Learning Objectives

By the end of this session, participants will be able to:

1. Identify advantages of the multidisciplinary approach to lung cancer screening programs.
2. Identify the strengths of an integrated synoptic reporting system.
3. Identify the challenges in gaining support for a provincial-wide, publicly funded lung cancer screening program.

The Ontario Pilot

Heidi Schmidt

Cancer Care Ontario initiated a pilot for lung cancer screening to inform the implementation of a province-wide initiative in Ontario. The screening pathway includes recruitment strategies, a risk prediction model to determine screening eligibility, smoking cessation services and an end-to-end navigator model. This presentation focuses on the radiology quality assurance in the pilot, which covers facility readiness, low-dose CT, radiologist training, structured reporting and standardized follow up of nodules and incidental findings.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize the steps required for implementation of a lung cancer screening program.
2. Identify the elements of a robust radiology quality assurance for a high-quality lung cancer screening program.

Lung Cancer Screening: Where Are We and Where Do We Need to Go

Martin Tammemägi

The National Lung Screening Trial (NLST) and NELSON lung cancer screening trials demonstrated that lung cancer screening with low-dose computed tomography (LDCT) can reduce mortality in high-risk individuals. Although the designs of these trials were suitable for clinical studies, they are suboptimal for lung cancer screening (LCS) programs in clinical/public health practice. Since publication of the NLST results in 2011 a great deal has been learned about how to better implement programmatic lung cancer screening, although many good ideas have yet to be implemented in practice.

This presentation discusses multiple issues regarding how to better implement LCS, including:

- Identification of high-risk individuals for screening using risk prediction models.
- Overcoming disparities in lung cancer screening.
- Improving uptake of LCS.
- Nodule management.

Future areas requiring research efforts include:

- Incorporation of biomarkers into identification of high-risk individuals and high-risk indeterminate pulmonary nodules identified on screening.
- Identification of optimal screening interval or tailoring, personalizing interval to reflect an individual's risk.
- Development and application of Artificial Intelligence/Machine Learning to accurately classify results and guiding management of abnormal screens.

In summary, several topics of importance to LCS will be updated.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize deficiencies of applying NLST design to programmatic implementation of lung cancer screening in practice.
2. Describe current optimal methods of identifying high-risk individuals for screening.
3. Identify important current issues regarding lung cancer screening methodology.
4. Identify important areas of research regarding lung cancer screening.

Panel Discussion: Lung Cancer Screening: Where Do We Go From Here?

Panelists: Mike Bristow, Caroline Chiles, Mathias Prokop, Heidi Schmidt, Martin Tammemägi

This interactive question and answer session with the panelists and the audience will explore the practical issues of moving lung screening into standard clinical practice in Canada from coast to coast.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss controversies, obligations and opportunities related to performing lung screening CT outside an organized screening program.
2. List methods of recruiting patients currently underrepresented in screening programs.
3. Identify ways to advocate for lung cancer screening as a national society.

THURSDAY, APRIL 29, 2021

11:10-12:00

Keynote Lecture

Savvas Nicolaou
University of British Columbia

Whole Body Trauma Imaging: Radiology Impacts Patient Management

Discussion of Whole-Body Trauma Imaging protocoling and its applications in the acute setting.

Learning Objectives

By the end of this session, participants will be able to:

1. Compare advantages of whole body computed tomography (WBCT) vs. focused multiple detector CT (MDCT) protocol.
2. Discuss the benefits of single vs split bolus contrast injection.
3. Discuss the effects of arm positioning with relation to radiation dose and image quality.
4. Discuss the advantages of arterial / portal venous phase.
5. Describe the rationale for screening blunt vascular nec injuries in the setting of WBCT in the evaluation of the Polytrauma patient.
6. Describe the role of cardiac CT and magnetic resonance cholangiopancreatography (MRCP) in the severely injured patient.
7. Relate findings that are critical to the surgical management.

THURSDAY, APRIL 29, 2021

13:00-14:30

CETARS Presents: Emergency Neuroradiology

Moderator: Carlos Torres

Updates on Spinal Trauma: What You Need to Know

Jason Talbott

This talk will briefly review the role of MRI in the acute phase of traumatic spinal cord injury. Both conventional and advanced quantitative imaging techniques will be discussed. The diagnostic and prognostic features of MRI will be reviewed.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize the imaging features on T2-weighted sequences which best correlate with patient injury severity and prognosis.
2. Enable translation of CT and MRI findings in spine trauma to updated stability classification systems, including AOSpine Injury Classification.
3. Identify advantages and limitations of quantitative imaging techniques such as diffusion tensor imaging for assessing the acutely injured spinal cord.

Spontaneous Intracranial Hemorrhage: Key Concepts!

Laurent Letourneau-Guillon

This presentation will briefly cover common and uncommon sources of spontaneous intracranial hemorrhage. Spontaneous intra- and extra-axial hemorrhage will be discussed with an emphasis of key imaging findings.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize the key imaging features of common and infrequent non-traumatic intracranial hemorrhage.
2. Discuss the differential diagnosis in spontaneous intracranial hemorrhage.

Blunt Cerebrovascular Injury: Current Guideline Recommendations and Controversies

Savvas Nicolaou

Discussion of imaging modalities, findings and guidelines for diagnosis and treatment of Blunt Cerebrovascular Injury (BCVI).

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the scope and implications of Blunt Carotid/Vertebral Arterial injury.
2. Describe the rationale for screening for blunt cerebrovascular injuries (BCVI).
3. Describe imaging modalities used for screening for BCVI and address new imaging techniques.
4. Discuss CTA technical aspects in BCVI imaging.
5. Discuss the spectrum of imaging findings for BCVI.
6. Review the latest diagnosis and treatment guidelines.

Acute Myelopathies, Ischemia and Mimics

Carlos H. Torres

Patients with acute myelopathy may present with pain, motor or sensory deficits, abnormal reflexes and urinary dysfunction. Myelopathy is considered acute when the symptoms progress to the nadir within 21 days of onset. Since compression is the most frequent cause of myelopathy, it must be excluded first, and MRI is the imaging modality of choice. Other causes of acute myelopathy include ischemia, infection and inflammatory processes. In this lecture, we will review the different entities that can lead to acute myelopathy using a case-based approach.

Learning Objectives

By the end of this session, participants will be able to:

1. Review common and infrequent causes of acute myelopathy, using a case-based approach.
2. Describe their key imaging features on MRI.

THURSDAY, APRIL 29, 2021

13:00-14:30

CSAR Presents: LI-RADS

Moderators: Alison Harris and Ania Kielar

Screening For Hepatocellular Carcinoma (HCC) and LI-RADS

Alison Harris

This session provides a brief overview of ultrasound (US) LI-RADS, reviews the appropriate population for application of US LI-RADS. It outlines how US LI-RADS is applicable to the Hepatocellular Carcinoma (HCC) screening and surveillance populations.

Learning Objectives

By the end of this session, participants will be able to:

1. Outline US LI-RADS and its application to the HCC screening and surveillance patient groups.
2. Describe how the categories and visualization scores with examples.

Contrast-Enhanced Ultrasound and LI-RADS

Tae Kyoung Kim

Contrast-enhanced ultrasound (CEUS) is excellent to evaluate nodule perfusion utilizing real-time evaluation of enhancement and purely intravascular contrast. LI-RADS for CEUS has recently been announced in LI-RADS version 2017. CEUS LI-RADS provides a diagnostic algorithm which categorizes liver nodules from CEUS LR-1 (definitely benign) through CEUS LR-5 (definitely HCC) and CEUS LR-TIV (tumor in vein). LR-5 nodules can be treated as HCC without biopsy. LR-M nodules usually require biopsy because they may represent non-HCC malignancies such as cholangiocarcinoma or HCC.

Learning Objectives

By the end of this session, participants will be able to:

1. Review CEUS LI-RADS categorization algorithms, particularly on the differences between LR-5 and LR-M.
2. Review the indications and roles of CEUS in the diagnostic algorithms of liver nodules in patients at risk for HCC.

CT/MRI LI-RADS Version 2018

An Tang

Contrast-enhanced computed tomography and magnetic resonance imaging are frequently used for the non-invasive diagnosis of hepatocellular carcinoma (HCC). This presentation will discuss the need for the Liver Imaging Reporting And Data System (LI-RADS). Emphasis will be on the organization of the current LI-RADS version 2018. We will summarize the evidence supporting the use of LI-RADS categories, major features, and ancillary features. We will discuss the potential benefits of using LI-RADS and future directions.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the need for LI-RADS.
2. Summarize evidence supporting the use of LI-RADS.
3. Describe the potential benefits of using LI-RADS.

LI-RADS Tumour Response Algorithm

Ania Kielar

Patients with HCC can have various types of therapy, including thermal, embolization and radiation-based interventions. Subsequent to these locoregional therapies, imaging is used to determine the efficacy of the intervention. However, interpretation can be challenging with expected temporal changes in the appearances of the HCC after treatment. Having a standardized way of describing the imaging findings is important for optimizing communication between radiologists, surgeons and oncologists as well as the rest of the patient's care team. Therefore, a LI-RADS treatment algorithm was developed.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the categories associated with the LI-RADS tumor response algorithm.
2. Apply LI-RADS tumor response algorithm after various types of locoregional therapies, including post radiofrequency ablation, post trans-arterial catheter ablation and after radiation therapy.

THURSDAY, APRIL 29, 2021

15:00-16:10

CETARS Presents: Imaging of Thoracic Trauma

Moderator: Savvas Nicolaou

Trauma of the Thoracic Boundaries

Nicolas Murray

Imaging findings of non-vascular thoracic injuries in the context of blunt and penetrating trauma will be presented in addition to interpretation pearls and pitfalls.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the prevalence and imaging findings of non-vascular thoracic injuries, including injuries to the chest wall and diaphragm.
2. Describe common pearls and pitfalls in interpretation of thoracic trauma.

Imaging and Management of Traumatic Injuries to the Thoracic Aorta and Pulmonary Trunk: What Matters Clinically

Ferco Berger

This presentation will deal with injuries to the major vasculature in the chest after trauma. Imaging strategies and findings will be discussed, together with associated injuries and management.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize key injuries to the thoracic major vasculature occurring after trauma.
2. Discuss the trauma mechanism that predisposes to traumatic aortic injury and associated injuries.

Imaging of Penetrating/Blunt Trauma to the Heart: Pearls and Pitfalls

Savvas Nicolaou

Discussion of the role of MDCT in penetrating and blunt cardiac trauma in acute settings.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the role of MDCT in the work-up of Blunt and Penetrating cardiac trauma in the Emergency Department, including benefits, limitations and optimization.
2. Describe expansion of role of Cardiac MDCT for traumatic emergencies with regards to patient outcomes.
3. Describe future potential applications.

THURSDAY, APRIL 29, 2021

15:00-16:10

Sharing the Vision in Artificial Intelligence Research Management

Moderator: Roger Tam

Challenges and Opportunities in NLP for Medical Imaging

Tim O'Connell

In today's world of cheap disk space and computing power, the tools to discover the needles in our haystacks of clinical data are ubiquitous. However, much of our medical data is unstructured text, is opaque to simple analysis tools, and requires laborious manual labour for information extraction. This talk will introduce the audience to natural language processing, discuss some of the opportunities and challenges in the use of such software, and discuss multiple use cases for big data information extraction from clinical documents.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe medical natural language processing and identify some available open-source options.
2. Recognize the applicability of NLP in the extraction of data for big research projects.
3. Consider and compare the limitations and challenges in using medical NLP.

Managing a Multidisciplinary Research Team: The IVADO Experience

An Tang

Interest for machine learning in radiology has increased tremendously in the past decade due to the high achievable performance for computer vision tasks such as detection, segmentation, classification, monitoring, and prediction. This presentation will provide step-by-step practical guidance for conducting a project that involves machine learning in radiology. Specifically, we will provide an overview of clinical use cases; describe the composition of multi-disciplinary team; and summarize current approaches to patient, data, model, and hardware selection.

Learning Objectives

By the end of this session, participants will be able to:

1. Provide an overview of clinical use cases of machine learning.
2. Describe the composition of multi-disciplinary team.
3. Summarize current approaches to patient, data, model, and hardware selection.

Creative Label Curation Strategies for Radiology AI Development

Jaron Chong

This presentation will review novel strategies for accelerating radiology AI development through often the most time-consuming stage, label curation, focusing on accelerating patient cohorting, common image annotations tools, as well as examining future trends to make labeling curation more efficient or perhaps unnecessary.

Learning Objectives

By the end of the session, participants will be able to:

1. Describe the common stages and bottlenecks to AI algorithm development.
2. Identify common image annotation tools and labeling workflows.
3. Analyze local opportunities for local label re-use or extraction.

FRIDAY, APRIL 30, 2021

11:00-12:10

CETARS Presents: Abdominal Emergencies

Moderators: Michael Patlas and Emil Lee

Imaging of Acute Female Pelvis: Gynecological Aspects

Anthony Hanbidge

Determining the cause of acute pelvic pain in the female patient is often a clinical challenge. Diagnosis based solely on the history, physical examination and simple laboratory data is frequently inaccurate, so imaging is critical to management. Ultrasound is accurate, safe, relatively inexpensive, portable and readily accessible. It should always be the initial imaging modality when evaluating the young female patient with acute pelvic pain. An endovaginal scan is included as a general rule.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the value of ultrasound when evaluating acute pelvic pain in the young woman.
2. Describe the ultrasound technique for optimal detection and characterization of gynecological disease when imaging women with emphasis on the endovaginal scan.
3. Identify the imaging features of acute conditions of the ovaries, uterus and adnexa that can cause acute pelvic pain in the nongravid woman of reproductive age including hemorrhagic ovarian cysts, pelvic inflammatory disease, endometriosis, ovarian torsion, adenomyosis and degenerating uterine fibroids.

Abdominal Emergencies in Cancer Patients

Raffaella Basilico

Abdominal emergencies among cancer patients could be the initial presentation of an underlying abdominal malignancy or can be related to treatment directed towards the disease. A number of different therapies, including surgery, by means of laparoscopic approach or minimally invasive robotic surgery, radiotherapy, chemotherapy and immunotherapy, may be effectively used to treat abdominal tumors. However, these kinds of treatments are not devoid of complications and, last, abdominal emergencies may occur also after therapies used for extra-abdominal tumors. Cross-sectional imaging and particularly CT play a crucial role in the diagnosis and management of most common abdominal emergencies after tumor therapies.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize the spectrum of abdominal complications associated with cancer disease.
2. Identify the most common and less typical abdominal emergencies following tumor therapies.

Penetrating Abdominal Trauma

Michael Patlas

The presentation will discuss the role of focused assessment of sonography in trauma (FAST) and multidetector computed tomography (MDCT) in patients with penetrating abdominal injuries. We will review the indications for the urgent laparotomy. MDCT technique will be presented with in depth discussion of strengths and weaknesses of the administration of intraluminal contrast.

Learning Objectives

By the end of this session, participants will be able to:

1. Review the radiological and surgical literature of the potential pitfalls in diagnosis of abdominal trauma.
2. Describe imaging findings in penetrating bowel injuries.
3. Identify factors affecting detection of penetrating injuries in additional abdominal organs.

FRIDAY, APRIL 30, 2021

11:00-12:10

Controversies And Conundrums in Canadian Radiology

Moderator: Tanya Chawla

Controversies in Radiology

Tanya Chawla

This session aims to reflect some current controversies/issues facing our speciality. We will discuss the role of productivity metrics in clinical practice, breast imaging guidelines and point-of-care ultrasound (POCUS) and how it impacts ultrasound practice by radiologists.

Learning Objectives

By the end of this session, participants will be able to:

1. Consider the utility of metrics in clinical/academic practice and their employment if routine practice.
2. Discuss current breast imaging guidelines and their rationale.
3. Define POCUS and its impact on the practice of ultrasound by radiologists.

Breast Imaging Guidelines

Jean Seely

The 2018 Canadian Task Force on Preventative Health Care (CTFPHC) guidelines are outdated and utilize data that is more than 30 years old. The guidelines ignore new research that incorporates the use of newer technologies and which show a 40-60% reduction in breast cancer mortality. Examples of false claims, exaggeration of harms and underestimation of benefits of screening mammography will be illustrated with a focus on the importance of activism to educate physicians, administrators and politicians about breast imaging in Canada.

Learning Objectives

By the end of this session, participants will be able to:

1. Recount the recent data supporting breast cancer screening in women 40 years and older.
2. Summarize the 2018 Canadian Task Force on Preventative Health Care (CTFPHC) guidelines on breast cancer screening.
3. Identify two important action items for radiologists in the area of education, organization and/or activism to raise awareness about breast cancer screening guidelines.

Productivity Metrics in Radiology – To RVU or Not to RVU!

Kawan Rakhra

Metrics are being increasingly used in radiology to track clinical, educational and research productivities. Successful application of metrics requires strategies for design, quantitative analysis and dissemination in order to effectively drive desired behaviors and outcomes. There are several pros and cons of metrics that require consideration prior to their implementation.

Learning Objectives

By the end of this session, participants will be able to:

1. Apply principles of metrics-based analyses for the evaluation of radiologist productivity.
2. Recognize the pros and cons of applying metrics-based systems in a radiology department.
3. Develop an approach for implementing metrics-based analyses.

FRIDAY, APRIL 30, 2021

13:00-14:10

CSAR Presents:

Incidentalomas: Now What?

Moderator: Iain Kirkpatrick

Managing the Incidental Renal Mass in Adults

Iain Kirkpatrick

This presentation will summarize recommendations for the management of the incidental renal mass in adults, published in 2019 by the CAR Incidental Findings Working Group. Areas where the recommendations differ from the American College of Radiology (ACR) White Paper will be highlighted.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the management of incidental renal masses detected on noncontrast or contrast-enhanced CT.
2. Describe the management of incidental renal masses detected on ultrasound.
3. Discuss the management specifically of incidental cystic masses, solid masses, and masses containing fat.

Managing Incidental Hepatobiliary Findings in Adults

Jeff Bird

This presentation will review recommendations for managing incidental hepatobiliary findings in adults, per the guideline published in 2020 by the CAR Incidental Findings Working Group.

Learning Objectives

At the end of this session, participants will be able to:

1. Describe the management of an incidental mass detected on CT or ultrasound.
2. Describe the management of specific incidental findings of the gallbladder and biliary tree.
3. Apply the recommendations from the 2020 Management of Incidental Hepatobiliary Findings guideline to their own practice.

Incidental Intra-Abdominal Nodal and Splenic Findings

Gary Brahm

Incidental findings on CT are an everyday challenge which radiologists must learn to deal with. This presentation will explore incidental splenic and intra-abdominal nodal findings, with particular attention around how to manage these incidental findings.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the management of incidental splenic lesions discovered on CT or MRI.
2. Describe the management of incidental intra-abdominal lymph node findings on CT or MRI.

FRIDAY, APRIL 30, 2021

13:00-14:10

Practical Considerations for the Community Radiologist

Moderator: Bruce Forster

Creating a Culture of High Value Patient-Centered Care

Geraldine McGinty

The American College of Radiology's (ACR) Imaging 3.0 initiative seeks to highlight the value delivered by radiologists. Shifting the perception of radiologists from "invisible" to "valued members of the care team" requires culture change, the appropriate tools and aligned incentives. This session will discuss the challenges radiologists face in this endeavor and highlight success stories that can inspire change.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize the imperative to demonstrate the value of imaging in patient care.
2. Employ change management tactics to support your practice in making this transition.
3. Recognize success stories in other practices.

Social Media in Radiology Practices

Geraldine McGinty

Although social media is a relatively new phenomenon, its dominance in our daily lives means that it cannot be ignored in our professional lives. It has become an important tool for practices and individual physicians who wish to create brand identity and reach patients and other stakeholders. The pitfalls are numerous, however, and learning how to effectively harness the power of social media will be the focus of this session.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe how radiologists and radiology practices are using social media.
2. Recognize the caveats and pitfalls related to the use of social media.
3. Employ the techniques and practices identified to create and implement a social media strategy for their practice.

Generating Better Outcomes in the Procurement of Diagnostic Imaging Equipment

Lise Patry

Diagnostic Imaging (DI) equipment is seen as a cost centre in hospitals - it is often viewed a means to an end, namely the prescribed treatment. Hospital CFOs or administrators often set-up RFPs to source the cheapest available DI solution resulting in equipment that doesn't meet the need and ends up costing more over time. What can be done about this lowest common denominator approach to DI equipment procurement? This presentation will provide strategies for generating better outcomes and include a high-level review of the procurement process for public sector bodies like hospitals.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe the fundamental elements of a typical procurement process.
2. Identify key strategies radiologists and radiology managers can adopt to influence better procurement outcomes.

FRIDAY, APRIL 30, 2021

14:30-15:30

Plenary Panel

Moderator: Ania Kieler

Panelists: Mark Baerlocher, Devang Odedra, Ciaran Redmond and Jana Taylor

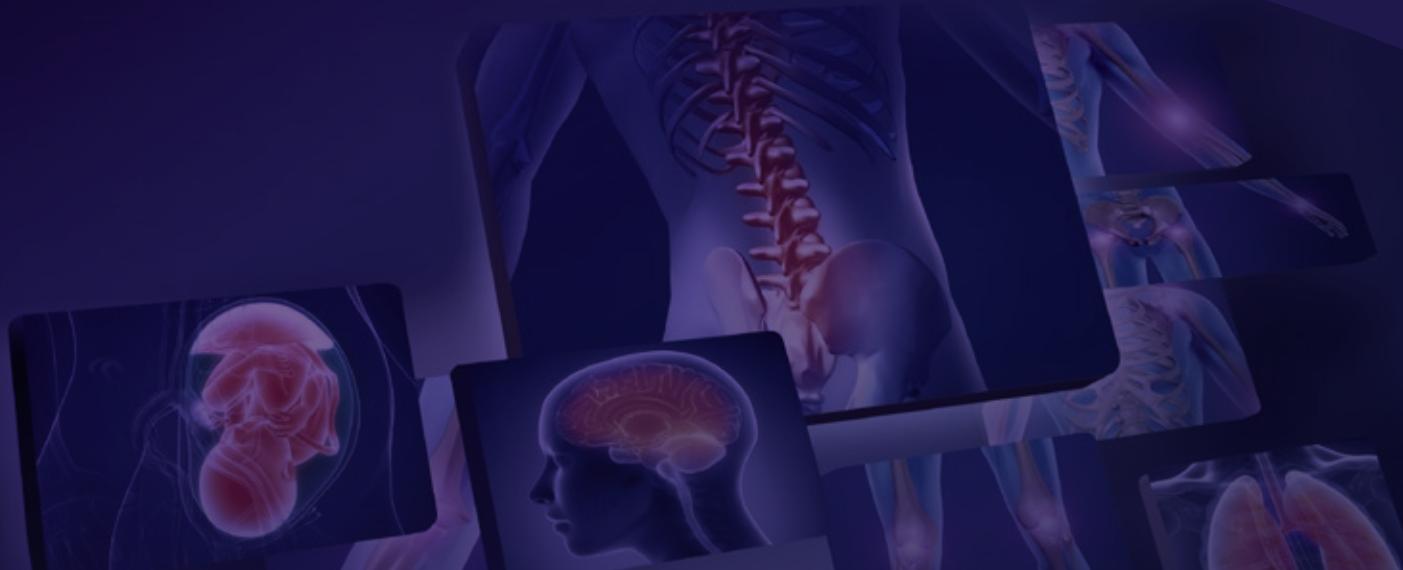
Radiology and the COVID-19 Pandemic: What We've Learned and Where We Go From Here

The COVID-19 pandemic has fundamentally altered the delivery of healthcare services in Canada and has had a particularly acute effect on radiology. This panel brings together radiologists from across Canada to offer their perspectives on the way that the pandemic has affected radiology training, teaching, practice and patient care. Speakers representing the trainee experience, academic program directors, emergency/trauma radiology, and community practice will each give presentations about the manner in which their workload, practice patterns, and overall professional experience were impacted by COVID-19, adaptations or adjustments that have been made, and their view of how radiology may change in the future. The presentations will be followed by 25 minutes of panel discussion and live Q&A with the audience.

Learning Objectives

By the end of this session, participants will be able to:

1. Assess the impact of the COVID-19 pandemic on radiology training, teaching, practice, and patient care, nationally and at the institutional level.
2. Plan and prioritize future learning or professional development to prepare for additional disruptions to radiology service delivery.
3. Recognize the challenges faced by radiology during the COVID-19 pandemic and how those challenges were addressed by individuals and institutions across Canada.



SATURDAY, MAY 1, 2021

11:00-12:30

**CanSPR Presents: Pediatric Emergencies
for the General Radiologist**

Moderator: Elka Miller

Pediatric Chest Emergencies

Katya Rozovsky

Prompt and correct interpretation of the radiological findings in pediatric chest emergencies is crucial as children are prone to complications, including rapid respiratory failure. Recognizing thoracic emergencies in pediatric patients can be challenging. This is a case-based presentation, with the special focus on how the radiological presentation of thoracic emergencies varies with patient age.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize and describe the most important and life-threatening pediatric chest emergencies and their radiological presentation.
2. Identify thoracic emergencies in neonates and young infants through the interpretation of neonatal chest images.
3. Develop the appropriate approach to the interpretation of specific radiological findings of thoracic emergencies in accordance to the patient's age.

Pediatric Abdominal Emergencies

Govind Chavhan

This will be a case-based illustration of common abdominal emergencies in children. Imaging modalities to diagnose these conditions will be discussed and salient imaging features of these conditions will be illustrated. Next steps in diagnosis and management will also be emphasized.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe imaging features of common pediatric abdominal emergencies.
2. Discuss next steps in the imaging workup of these conditions.

Pediatric Neurological Emergencies

Elka Miller

This is a case-based presentation of pediatric neuroradiological emergencies with an emphasis on the differential diagnosis and obtaining a sense of which imaging modality is most appropriate.

Learning Objectives

By the end of this session, participants will be able to:

1. Review a spectrum of pediatric brain pathologies seen in the emergency room.
2. Review critical findings that radiologists must convey to clinicians which can directly influence patient treatment and outcomes.

SATURDAY, MAY 1, 2021

11:00-12:30

Easily Missed Fractures

Moderator: Adnan Sheikh

Emergency Radiology: Shoulder and Elbow Trauma

Hema Choudur

This session will discuss cases of missed trauma of the shoulder and elbow in the emergency setting; will include inadequate technique/views, hidden and occult areas, erroneous interpretations; will provide tips to identify which cases will benefit with cross sectional imaging. The discussion will aid radiology residents, ER trauma and MSK fellows and practicing radiologists in their day to day practice.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe appropriate plain radiographic views and techniques for trauma of the shoulder and elbow.
2. Identify major and minor abnormal findings in shoulder and elbow trauma.
3. Identify subtle plain radiographic findings that need cross sectional imaging for confirmation and further management.
4. Recognize the usually missed plain radiographic findings in shoulder and elbow trauma.

Pelvic Trauma

Ferco Berger

This presentation will provide the audience with knowledge about traumatic injuries to the pelvis. Imaging strategies and findings will be discussed, together with associated injuries. The dependence of management on local logistics will be discussed.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss imaging techniques, classification and injury patterns of pelvic fractures.
2. Recognize the factors that influence management of pelvic injury, depending on institution specific logistics.

Ankle and Foot Trauma

Adnan Sheikh

Foot and ankle sprains, strains, and fractures are common injuries that can result from a sports injury, fall, or accident. Regardless of the cause, these conditions can make it difficult or painful to walk. This talk is aimed to better understand the mechanism and imaging findings of ankle and foot injuries.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the clinical features and mechanisms of low-energy and high-energy traumatic injuries of the foot and ankle.
2. List the imaging findings of ankle and foot injuries, focusing on radiographs.

SUNDAY, MAY 2, 2021

11:00-11:50

Plenary Lecture

Jamie Marko

American Institute for Radiologic Pathology

Multimodality Imaging of the Placenta

The session will be a discussion of the radiologic, pathologic and clinical features of important placental abnormalities.

Learning Objectives

By the end of this session, participants will be able to:

1. List the radiologic and pathologic features of placenta accreta spectrum.
2. Discuss the radiologic and pathologic features of gestational trophoblastic disease.
3. Describe the radiologic and pathologic features of placental chorangioma.



SUNDAY, MAY 2, 2021

12:30-15:10

Mistakes We All Make

Moderator: Mark Levental

Neurological Imaging

Stephanie Lam

Through selected cases, we will discuss mimics of common diagnoses that can lead to misdiagnoses or missed findings if not considered when appropriate.

Learning Objectives

By the end of the session, participants will be able to:

1. Describe common and less common differential diagnoses for neurological imaging findings.
2. Suggest further investigation when diagnoses are unclear.
3. Apply strategies to reduce interpretive errors.

ENT Imaging

Eugene Yu

This session will review a selection of case examples that demonstrate common mistakes or pitfalls that can occur when interpreting head and neck imaging studies.

Learning Objectives

By the end of this session, participants will be able to:

1. Identify imaging nuances that help distinguish clinical entities that can mimic one another in the head and neck.
2. Recognize areas in head and neck anatomy that may harbor disease but that are commonly missed during interpretation.

Obstetrics

Jamie Marko

The presentation will be a case-based discussion of pitfalls in obstetric (OB) ultrasound (US) and how to avoid them.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss 1st trimester OB US pitfalls and how to avoid them.
2. Discuss 2nd and 3rd trimester OB US pitfalls and how to avoid them.
3. Review important general concepts in OB US.

Pitfalls in Chest Imaging

Francesca Proulx

Thoracic Imaging including radiographs and CT-scans of the chest constitute the cornerstone of a modern general radiology practice. A solid knowledge of the anatomy of the chest and unusual presentation of common diseases is fundamental to a successful and safe career as a radiologist. This case base presentation will provide the audience with tools to identify subtle findings on CT-scan and radiographs of the chest and review important concepts of common thoracic anatomical variants. The presentation will also cover key imaging findings of frequent diagnoses with uncommon chest presentation and tools to improve the formulation of a list of differential diagnoses.

Learning Objectives

By the end of this session, participants will be able to:

1. Recognize thoracic vascular anatomical variants.
2. Identify and describe rare thoracic manifestations of common diagnoses.
3. Discuss the importance of detecting subtle findings on CT-scans of the chest.
4. Review the features of EVALI (e-cigarette or vaping product use associated lung injury).

Diagnostic Pitfalls in Cross-Sectional Abdominal Imaging

Jaron Chong

This presentation will describe various common patterns of diagnostic errors made in the interpretation of cross-sectional abdominal imaging. Mitigation strategies and structure approaches to help minimize errors will additionally be discussed.

Learning Objectives

By the end of the session, participants will be able to:

1. Classify common categories of cross-sectional abdominal examination technique, detection, and characterization mistakes.
2. Recognize common patterns of detection mistakes made in abdominal imaging.
3. Apply a structured approach to avoiding abdominal imaging diagnostic errors.

Musculoskeletal Imaging

Nathalie Bureau

We will use a case-based approach to improve detection and image interpretation of commonly missed fractures.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe factors that may contribute to misinterpretation.
2. Recognize some fractures that are frequently missed on radiographs.
3. Apply strategies to reduce imaging errors.

Musculoskeletal Imaging

Linda Probyn

This session will review case examples demonstrating common pitfalls related to the detection and interpretation of musculoskeletal imaging studies and will provide strategies to avoid making mistakes.

Learning Objectives

By the end of this session, participants should be able to:

1. Identify common pitfalls in the detection and interpretation of musculoskeletal cases with various imaging modalities.
2. Describe strategies reduce errors when reviewing musculoskeletal imaging studies.



Cardiovascular Imaging and Research Sessions

Coronary CTA in Clinical Practice: A Paradigm Shift

Elsie Nguyen

This presentation will provide an overview of updated guidelines on utilization of coronary computed tomography angiography (CTA) in daily clinical practice and how results from recent randomized controlled trials have informed these guidelines.

Learning Objectives

By the end of this session, participants will be able to:

1. List two important clinical trials that have changed the way coronary CTA is performed or utilized in daily practice.
2. List two advantages of using coronary CTA as a first line test in the evaluation of chest pain in both the emergency and outpatient settings.

CSTR Research Consortium

Narinder Paul

This didactic lecture will describe the learnings from a recent pan-Canadian CSTR survey designed to assess which research topics are of priority to the Canadian cardiothoracic radiology community; and to assess the potential for multi-site pan-Canadian research collaborations.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the findings of a pan-Canadian CSTR research survey.
2. Provide an overview of potential pan-Canadian CSTR research topics.

Pulmonary Vascular Disease Sessions

Acute Pulmonary Embolism (PE): Overdiagnosis and the Subsegmental PE Conundrum

Jana Taylor

In recent years, the number of CT scans performed for the diagnosis of acute pulmonary embolism has steadily increased. There has also been a concomitant increase in the detection of subsegmental pulmonary embolus and increasing interest in evaluating the clinical implications of these findings. This presentation will review the current literature on the detection and management recommendations of acute subsegmental pulmonary embolus.

Learning Objectives

By the end of this session, participants will be able to:

1. Discuss the diagnosis challenges in the diagnosis of acute subsegmental pulmonary embolus.
2. Recognize the clinical impact of the diagnosis of acute subsegmental pulmonary embolus.



Pulmonary Hypertension: From Imaging to Bedside

Elena Peña

The presentation will provide an overview of the role of the different imaging modalities in the work up of patients with pulmonary hypertension (PH). We will review the classification and classic imaging findings of PH on CT and MR and learn about the diseases that cause PH and have specific imaging findings.

Learning Objectives

By the end of this session, participants will be able to:

1. Outline the role of imaging in the diagnostic work up of PH.
2. Identify diseases that have typical imaging findings and cause PH.

CTEPH: Don't Miss It!

Carole Dennie

Chronic thromboembolic pulmonary hypertension (CTEPH) accounts for 19% of patients with pulmonary hypertension (PH). It is the only type of PH that can be cured with surgery, and the majority of patients are surgical candidates. Most patients have a history of acute pulmonary embolism (PE) in the past, but 25% do not, and 5% present with acute pulmonary embolism superimposed on chronic PE. Ventilation perfusion (V/Q) scanning essentially excludes CTEPH and should be performed in all patients with unexplained PH. The role of CT pulmonary angiography is to rule out CTEPH mimics and to assess if the disease is surgically accessible, but it should not be used as a screening tool because some patients have very subtle imaging findings.

Learning Objectives

By the end of this session, participants will be able to:

1. Describe utility of V/Q and CT imaging to evaluate patients with suspected chronic thromboembolic pulmonary hypertension (CTEPH).
2. List typical and subtle imaging features of CTEPH.
3. Discuss CTEPH mimics.

Oral Presentations and Posters

Présentations orales et résumés



THURSDAY, APRIL 29, 2021

Scientific Research Project Oral Presentations

Judges: Emily Pang, Francesca Proulx, Jai Shankar, Vivek Virmani

13:00 – 14:30

14

Predictors of Extra-Pulmonary Metastatic Disease in Patients with Recurrent Lung Cancer

Tyler Grey, Abdullah Alabousi, Mostafa Alabousi, Ehsan Haider

Department of Radiology, McMaster University, St. Joseph's Healthcare Hamilton

OBJECTIVE: Lung cancer is one of the leading causes of cancer-related mortality worldwide. Its poor prognosis is associated with late detection and high recurrence rates. We evaluated the imaging characteristics of lung cancer recurrence and assessed for predictors of extra-pulmonary metastatic disease.

METHODS: We conducted a retrospective study of all patients at our institution with lung cancer recurrence detected on post-treatment imaging between January 2014–October 2019. Research ethics board approval was obtained. Included patients underwent pre-treatment imaging, surgical resection, and post-treatment imaging. Imaging characteristics and pathological findings of the pulmonary lesions were analyzed. Univariate logistic regression was performed to assess for potential predictors of extra-pulmonary metastatic disease. The variables evaluated were age, gender, original and recurrent lesion size and imaging characteristics, recurrence location, presence of chest wall or mediastinal invasion, lymphadenopathy, and malignancy subtype.

RESULTS: A total of 76 patients were included (33 males; mean age 70.9, standard deviation [SD] 7.7). The primary lesions were adenocarcinoma (N=50), squamous cell carcinoma (N=21), and other (N=5). The mean time to recurrence was 24.3 months (SD=18.8) from the date of surgical excision. The two significant predictors of extra-pulmonary metastatic disease were: having >1 recurrent lesion (odds ratio [OR], 8.1; p=0.004), and the presence of suspicious lymphadenopathy at the time of recurrence (OR, 14.1; p<0.001).

CONCLUSION: In lung cancer recurrence, the presence of >1 recurrent lesion and suspicious lymphadenopathy at the time of recurrence were significant predictors of extra-pulmonary metastatic disease. These findings may help guide the risk stratification and management of patients with recurrent lung cancer.

54

Automatic Classification of Multiple Catheters in Neonatal Radiographs with Deep Learning

Robert Henderson, Xin Yi, Scott Adams, Paul Babyn

Department of Medical Imaging, University of Saskatchewan

OBJECTIVE: To develop and evaluate a single deep learning algorithm to be able to classify multiple catheters on neonatal chest and abdominal radiographs.

METHODS: A convolutional neural network (CNN) was trained using a dataset of 777 paediatric chest and abdominal radiographs, with a split of 80%-10%-10% of radiographs used for training-validation-testing, respectively. We employed ResNet-50 (a CNN), pre-trained on the ImageNet dataset. Ground truth labelling was limited to tagging each image (with so-called weak labels) indicating the presence or absence of endotracheal tubes (ETTs), nasogastric tubes (NGTs), and umbilical arterial and venous catheters (UACs, UVCs). The dataset included 561 images containing 2 or more catheters or tubes, 167 images with only one catheter or tube, and 49 with none. Performance was measured with average precision (AP), calculated from the area under the precision-recall curve.

RESULTS: The algorithm achieved an AP of 0.977 (NGTs), 0.989 (ETTs), 0.979 (UACs), and 0.937 (UVCs). For the set of 58 test images consisting of 2 or more catheters, AP was 0.975 (NGTs), 0.997 (ETTs), 0.981 (UACs), and 0.937 (UVCs).

CONCLUSION: Automatic detection and classification of multiple catheters in individual radiographs was implemented with a deep learning approach using a weak labelling technique in which images were annotated to indicate only the presence or absence of a catheter of interest. Such an algorithm may be used by radiologists as a time-saving mechanism to semi-automatically report catheters on radiographs. To our knowledge, this is the first report of a deep learning classification algorithm applied to multiple catheters on neonatal radiographs.

Research Presentations

67

Trends in Endovascular Procedure Rates in Australia

Andrew O'Brien, Warren Clements, Emma Poon
Department of Radiology, Alfred Health

OBJECTIVE: Endovascular interventions represent advances in procedural medicine, forming an important pillar of radiological practice. These techniques, often pioneered by interventional radiologists, have expanded the potential scope for radiologist-led intervention. This analysis presents current procedural trends for endovascular interventions in an Australian context.

METHODS: Data from the Australian Department of Health and Humans Services was extracted with Medicare Benefit Schedule (MBS) numbers representing publicly funded stroke thrombectomy (ST) (2017-2020), carotid artery stenting (CAS) (2010-2020), uterine artery embolization (UAE) (2010-2020), peripheral arterial/venous embolization (PAVE) (2010-2020), cyanoacrylate embolization (CYE) (2018-2020), endovenous laser ablation (EVLT) (2012-2020) and endovenous radiofrequency ablation (EVRFA) (2013-2020). Graphing and statistical analysis was conducted using GraphPad Prism 9 (La Jolla, California) with one-way ANOVA and Holm-Sidak post-hoc correction, statistical significance was set at p-value <0.05.

RESULTS: ST (14.2% \pm 16.9%), UAE (11.9% \pm 22.77%), PAVE (7.5% \pm 9.9%), EVLT (1.5% \pm 7.8%) and EVRFA (35.9% \pm 45.7%) all showed increased procedural rates during MBS funded years. However, CAS (-0.2% \pm 12.55%) and CYE (-3.27% \pm 10.4%) had decreased rates. UAE, PAVE and EVRFA all had significant increased usage rates. There was not a year-over-year statistically significant change in rates in any intervention. All intervention rates dropped in 2020.

CONCLUSION: Most minimally invasive procedures have had an increase in usage likely owing to their ability to improve patient outcomes through earlier discharge and faster recovery, with resultant direct and indirect cost benefits. Interventional radiology is uniquely suited to develop procedural advances, while taking a stronger clinical role. Comparison of procedural rates between peer national representative bodies will allow for best practice development.

85

Neural Networks Predict PAM50 Subtypes Risk of Recurrence from Clinical and Mammogram Features

Raheem Remtulla, Athithan Ambikkumar
Faculty of Medicine, McGill University

OBJECTIVE: The relationship between breast cancer genetic expression and clinical outcomes has been well described since the advent of genome sequencing. Gene expression microarrays have allowed for the determination of PAM50 gene signatures that can predict rates of recurrence. In 2018, Tamez-Peña et al. identified an association between mammographic information and molecular signatures in breast cancer patients. Using this database, a machine learning approach was taken to predict the PAM50 determined risk of recurrence score subtype.

METHODS: A single layer 10-node automated neural network was developed in MatLab 2020a and applied to raw patient data available in Tamez-Peña et al. Input variables include age, menopausal status, and 543 radiographic features from mammograms. The target outcome was the PAM50 subtype risk of recurrence. Data was divided into a training, validation, and test sets with a 70/15/15 ratio.

RESULTS: 72% of the 68 patients included were found to have a PAM50 subtype with a high risk of recurrence. Network training completed in 18 epochs and the overall accuracy of the network was 93.8%, 90% and 100% in the training, validation and test set respectively with appropriate specificities and sensitivities across all sets (Table 1).

CONCLUSION: The above work provides proof of concept that a machine learning approach can be used to predict PAM50 risk of recurrence breast cancer. With a deep learning approach, a similar network could be used to predict the PAM50 molecular subtype. Such a network could be used to predict PAM50 molecular subtype in sites unable to perform gene expression microarrays.

Research Presentations

94

Cochrane 'Living' Systematic Review on Diagnostic Accuracy of Imaging for COVID-19: Update 2

Nayaar Islam, Sanam Ebrahimzadeh, Jean-Paul Salameh, Sakib Kazi, Nicholas Fabiano, Lee Treanor, Marissa Absi, Zachary Hallgrimson, Mariska MG Leeflang, Lotty Hooft, Christian B van der Pol, Ross Prager, Samanjit S Hare, Carole Dennie, René Spijker, Jonathan J Deeks, Jacqueline Dinnis, Kevin Jenniskens, Daniël A Korevaar, Jérémie F Cohen, Ann Van den Bruel, Yemisi Takwoingi, Janneke Van De Wijgert, Johanna AAG Damen, Junfeng Wang, Matthew DF McInnes, Sanam Pirshahid University of Ottawa, Ottawa Hospital Research Institute

OBJECTIVE: To evaluate the diagnostic accuracy of chest imaging (computed tomography (CT), X-ray and ultrasound) in individuals with suspected COVID-19.

METHODS: The Bern COVID-19 Living Database, Cochrane COVID-19 Register, and CDC Library were searched through 30/9/2020. Diagnostic accuracy studies involving participants with suspected COVID-19 were included. Screening, data extraction, and risk of bias assessments using the QUADAS-2 tool were completed independently, in duplicate. Pooled accuracy estimates and 95% confidence intervals (CI) were determined using a bivariate random effects model. Modalities were compared using meta-regression. The complete protocol is published in the Cochrane Library.

RESULTS: Fifty-two studies (20789 participants, 10756(52%) with COVID-19) assessing 56 modalities were included; the reference standard was reverse transcriptase polymerase chain reaction (RT-PCR) in all studies. Risk of bias concerning participant selection was high in 10(19%) and unclear in 23(44%) studies; risk of bias concerning reference standard was high in 21(40%) and unclear in 22(42%) studies. Chest CT (42 studies, 17147 participants) had pooled: sensitivity=88.2%(95%CI 85.0-90.8); specificity=79.1%(73.4-83.8). Chest X-ray (9 studies, 3694 participants) had pooled: sensitivity=80.6%(69.1-88.6); specificity=71.5%(59.8-80.8). Ultrasound (5 studies, 446 participants) had pooled: sensitivity=86.4%(72.7-93.9); specificity=54.6%(35.3-72.6). Chest CT had a higher specificity ($p=0.018$) than ultrasound.

CONCLUSION: Chest CT and X-ray appear to be sensitive and moderately specific for diagnosing individuals with suspected COVID-19, while ultrasound appears to be sensitive, but not specific. Chest CT, X-ray and ultrasound may be useful for ruling out COVID-19, but not for distinguishing COVID-19 from other illnesses. However, the high or unclear risk of bias of included studies limits confidence in these findings.

119

Association Between Patient and Physical Acquisition Parameters and Mammography Positioning Errors

Mohamed Abdolell^{1,2}, Nicole Paquet², Kaitlyn Tsuruda⁵, Penny Barnes^{1,2}, Peter Brown^{1,2}, Judy Caines³, Jennifer Payne¹, Olivia Tong¹, Sian Iles^{1,2,3}

¹Dalhousie University, ²Nova Scotia Health, ³IWK Breast Health Centre, ⁴Nova Scotia Breast Screening Program, ⁵Oslo Breast Screening Registry

OBJECTIVE: The purpose of this study was to identify which mammographic image positioning errors are associated with patient and physical acquisition parameters in the general screening population.

METHODS: Image quality assessments were performed on mammograms of 9259 subjects included in a population-based case control study. The following mammography positioning errors were assessed (densitas qualityaiTM) on MLO and CC images from each subjects' most recent screening exam; exaggeration, skin folds, portion cut-off, patient related artefacts, posterior tissues missing, improper pectoralis muscle positioning, inadequate IMF, sagging, proper height on image receptor. Logistic regression was used to model the presence of positioning errors as a function of patient/physical acquisition parameters including age, breast volume, and compression pressure partitioned into deciles. The Mantel-Haenszel test for linear trend was used to assess a dose response relationship between risk of errors and patient/physical acquisition parameters.

RESULTS: When examining individual patient/physical acquisition parameters, patient age was found to be linearly associated with 10 of the 13 errors ($p < 0.05$), and breast volume and compression pressure were each found to be associated with 12 of the 13 errors ($p < 0.05$).

CONCLUSION: This study shows that patient and physical acquisition parameters, such as age, breast volume, and compression pressure are related to elevated or diminished risk of mammography image positioning errors during a screening exam.

Research Presentations

120

Evaluating the Feasibility of Fully Automated Mammography Image Positioning Assessments

Mohamed Abdolell^{1,2}, Nicole Collier^{1,2}, Ryan Duggan¹, Solveig Hofvind⁵, Nisha Sharma⁴, Sian Iles^{1,2,3}

¹Dalhousie University, ²Nova Scotia Health, ³IWK Breast Health Centre, ⁴Nova Scotia Breast Screening Program, ⁵Oslo Breast Screening Registry

OBJECTIVE: The purpose of this study was to evaluate the level of agreement between an automated mammography image positioning assessment tool, and a panel of experts to determine if such a tool may be practically integrated in routine breast screen activities.

METHODS: 672 FFDM studies rejected due to positioning errors were independently reviewed by 5 Radiographers and 2 Radiologists. Reviewers evaluated studies for positioning errors including: (1) portion cut off, (2) inadequate inframammary fold (IMF), (3) pectoralis muscle position, (4) pectoralis muscle thickness. Inter-rater agreement was evaluated between the consensus of the 7 reviewers and the automated tool using weighted Fleiss' Kappa.

RESULTS: Inter-rater agreement between the algorithm and the panel of experts ranged from good to excellent ($\kappa = 0.546-0.84$).

CONCLUSION: An automated mammography image positioning error algorithm demonstrates good to excellent agreement with a consensus of experts and may be effective for continual quality assurance efforts in routine breast screening activities.

131

Competence By Design in Radiology: Experience with a Custom-Built Learner Evaluation Software Program

Sukhvinder Dhillon, Cody Surgin, Mikus Lorencs, Anna Oswald, Catherine Harnois, Hollis Iai
University of Alberta

OBJECTIVE: The Royal College of Physicians and Surgeons of Canada (RCPSC) has initiated the competency by design (CBD) approach to resident training. This involves changes in the training approach and organization within programs. Radiology training experience can be categorized by modality and anatomy for diagnostic reporting and procedures. This aligns with most activities required in the profession. These experiences, and their assessments, can form required entrustable professional activities (EPA). The purpose of our project is to demonstrate how CBD Radiology training can be assessed by using a new learning evaluation software.

METHODS: Our institution has developed a comprehensive software program for CBD learner assessment. The program is available on desktop, tablet and mobile. The RCPSC guidance documents have been modified to develop competency statements and milestones specific to radiology. Current usage and refinement are within the fellowship program as an iterative process. The competency statements facilitate an objective evaluation of a learner's performance. Assessment is learner initiated and it takes 15 seconds to input data. The software also populates a learner portfolio. Data can be interrogated to track learner experience and performance.

RESULTS: To date we have 6 months experience using the software program. Staff were hesitant prior to testing and concerned about time commitment. Feedback comments: Easy, Simple, quick, statements helpful, objective.

CONCLUSION: Preceptors are able to track over time a learner's performance using multiple objective data points from multiple staff interactions. The software was easy to use and provided an opportunity for constructive discussion between staff and learner.

Research Presentations

153

Internet-Based Collaborative Technology Trends: Radiologist and Resident Awareness, Use and Willingness to Incorporate Online Tools into Practice and Education

Katrina Bartellas, Alex Botsford, Angus Hartery
Memorial University of Newfoundland

OBJECTIVE: The purpose of this study was to determine: 1) The awareness of internet-based collaborative tools by radiologists and residents, 2) Trends in the use of these tools over a five-year period and 3) The willingness to adopt widespread use of these tools in residency education.

METHODS: A cross-sectional online survey was distributed to radiologists and residents at a local academic institution in 2014 and 2019. Descriptive and correlative statistics assessed the extent to which demographic variables predicted data-sharing awareness and use. Correlative and regression analyses were used to assess five-year trends in data-sharing.

RESULTS: The use of email, online calendars, note-taking tools, task lists and file sharing technology by staff was significantly higher in 2019 compared to 2014 (Mean Collaborative Technology Score 3.96 vs 3.26, p=0.000). Surprisingly, these platforms were used significantly more by staff in 2019 than by residents (1.98 vs 1.88, p=0.001). The use of online storage, screen sharing technology, Wiki pages and social media platforms was significantly higher for both residents and staff in 2019 in comparison to their 2014 counterparts (Resident Mean Technology Score 1.88 vs 1.80, p=0.019; Staff Mean Technology Score 1.98 vs 1.79, p=0.023).

CONCLUSION: There is evidence that resident and staff use of online collaborative technologies has significantly increased in the last five years. These online platforms demonstrate great potential to enhance residency education and aid in the expansion of the role of the radiologist in everyday clinical settings.

158

Can CTA Discriminate Between Free-Floating Thrombus and Plaque in Patients with Stroke/TIA? A Canadian Multi-Centre Study

Paulo Puac Polanco¹, Cheemun Lum¹, Ronda Lun¹, Dar Dowlatshahi¹, Grant Stotts¹, Michel Shamy¹, Aditya Bharatha², Dylan Blacquiere¹, Bijoy Menon³, Franco Momoli¹, Dave Prasham¹, Rebecca Thornhill¹, Carlos Torres¹

¹The Ottawa Hospital & University of Ottawa, ²St. Michael's Hospital & University of Toronto, ³Foothills Medical Centre & University of Calgary

OBJECTIVE: To validate a previously proposed filling defect length threshold of >3.8 mm on CT-angiography (CTA) to discriminate between free-floating thrombus (FFT) and plaque of atheroma.

METHODS: Prospective multicenter observational study of 100 participants presenting with TIA/stroke symptoms and a carotid intraluminal filling defect on initial CTA. Follow-up CTA was obtained within one week, and at weeks 2 and 4 if the intraluminal filling defect was unchanged in length. Resolution or decreased length was diagnostic of FFT, whereas its static appearance after 4 weeks was indicative of plaque. Diagnostic accuracy of FFT length was assessed by receiver operating characteristic analysis.

RESULTS: Ninety-five participants (mean age [standard deviation], 68 [13] years; 61 men; 83 participants with FFT; 12 participants with a plaque) were evaluated. The >3.8 mm threshold had a sensitivity of 88% (73/83) (95% confidence interval [CI]: 78%, 94%) and specificity of 83% (10/12) (95% CI, 51%, 97%) (area under the curve [AUC], 0.91, p<.001) for the diagnosis of FFT. The optimal length threshold was >3.64 mm with a sensitivity of 89% (74/83) (95% CI, 80%, 95%) and specificity of 83% (10/12) (95% CI, 51%, 97%). Adjusted logistic regression showed that every 1 mm increase in intraluminal filling defect length is associated with an increase in odds of FFT of 4.6 ([95% CI] 1.9-11.1; p=.01).

CONCLUSION: CTA enables accurate differentiation of FFT versus plaque using craniocaudal length thresholds.

THURSDAY, APRIL 29, 2021

Departmental Clinical Audit Project Oral Presentations

Judges: Andreu Costa, Suki Dhillon, Matthew McInnes

15:00 – 16:10

10

Out of Sight, Out of Mind: Improving IVC Filter Insertion and Removal Rates at a Tertiary Care Centre

Victoria Linehan, Claire Woodworth, Anuj Dixit, Melissa Skanes

Memorial University of Newfoundland

PRESENTER'S LEVEL OF TRAINING: Medical Student

PRINCIPAL LOCATION OF AUDIT: University Hospital Site

BACKGROUND AND AIM: Retrievable inferior vena cava (IVC) filters provide prophylaxis against pulmonary embolism (PE) for high-risk patients with contraindication to anticoagulation. Although removal should occur when risk subsides to prevent complications (filter emboli, IVC perforation, and thrombosis), retrieval rates in the literature are only 12-45%. We thus evaluated retrieval rates at our center to assess patient safety.

AUDIT TARGET: IVC filter removal in 100% of eligible patients when the transient risk of PE has subsided.

METHODS: We performed two audit cycles of all retrievable IVC filter insertions between 2009-2014 and 2017-2019. Indication, patient demographics, and retrieval were recorded. An intervention was performed in January 2017.

RESULTS: In both cycles, contraindication to anticoagulation was the primary indication for IVC filter insertion. Pre-intervention, the retrieval rate was 17.6% (56/318 patients) with a success rate of 94.6% (6 failures). Post-intervention, insertion rate significantly decreased from 4.68 to 1.42 filters/month. Retrieval rate increased to 46.8% (22/47 patients with 5 failures) with no difference in average dwell time. Hematology was consulted for 72.3% of cases and was associated with higher retrieval rates (61.8% vs 7.7%).

INTERVENTIONS / ACTION PLAN /DISCUSSION: The initial low retrieval rate combined with safety warnings from Health Canada prompted a policy change for IVC filter insertion. We circulated a formal document outlining IVC filter indications and stipulated mandatory reviews of insertion requests by radiology and hematology consultations for follow-up.

CONCLUSIONS: Our intervention improved patient safety by decreasing the number of unindicated IVC filter insertions and securing appropriate hematology follow-up for patients with IVC filters in situ.

Research Presentations

62

Ruling Out a Foreign Body: Using a Marker to Improve Detection

Colbey Taylor, Nicolas Murray, Tim Friesen
University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: Academic Hospital

BACKGROUND AND AIM: Ruling out a foreign body is a common reason for obtaining an X-ray in the emergency department. Detection of a foreign body can be difficult and easy to miss if the history does not guide the radiologist. Radiopaque markers can be used to improve detection.

AUDIT TARGET: 80% of radiographs performed to rule out a extremity foreign body should have a radiopaque marker identifying the site of concern.

METHODS: Use the local PACS system to identify the last 100 extremity X-ray films performed for localization of a foreign body. Record for each radiograph whether or not a radiopaque marker is present.

RESULTS: 0/100 X-rays performed for localization of a foreign body had a radiopaque marker identifying the area of concern.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Radiopaque markers were placed throughout the department for technologists to use for extremity X-rays asking to rule out a foreign body. The area of concern would be indicated by the patient.

SECOND CYCLE RESULTS: 7 months since the intervention 24/56 extremity X-rays to rule out a foreign body had a radiopaque marker.

DISCUSSION: It can take multiple interventions to implement a new policy. Furthermore, departmental constraints during a pandemic likely contributed to not meeting the target.

CONCLUSIONS: All X-ray films to rule out a foreign body should have a radiopaque marker to identify the area of concern to improve detection.

71

Diabetic Foot: How to Investigate Better

Aisín Ibrahim¹, Moncef Berkache², Sooheib Andoulsi³, Philippe Morency-Potvin³, Daniel Juneau³, Martial Koenig³, Karine Bourduas³, Véronique Freire³

¹McGill University, ²Laval University, ³University of Montréal

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University-based practice

BACKGROUND AND AIM: Diabetic foot infections are associated with substantial morbidity, mortality, and costs. The radiological examination remains heterogeneous across institutions. The aim of this study is to document current guideline adherence in foot osteomyelitis (OM) in diabetic patients, and to re-audit the adherence after an intervention.

AUDIT TARGET: Adherence should reach 75%.

METHODS: A retrospective study including all adult patients with diabetes mellitus presenting with suspected foot OM was performed (378 patients). Patients with no radiological investigations, pregnant or had an OM recurrence were excluded. Medical records were reviewed for guideline adherence using the ACR Appropriateness Criteria.

RESULTS: 223 patients included (168 males, 55 females). Adequate adherence was 43%. Foot radiographs obtained 83% of the time. Gallium scintigraphy (48%) preferred over MRI (44%) and performed simultaneously in 7% of patients.

INTERVENTIONS / ACTION PLAN /DISCUSSION: A local committee of multidisciplinary expert physicians was created. Using the Delphi method, an investigation algorithm for foot OM was created and shared in Grand Rounds with clinicians. Re-audit of the adherence was performed between 12/2019 and 06/2020. 110 patients were screened and 74 patients included (62 males, 12 females). Adequate adherence was 76% with a significant statistic improvement of 33% ($p<0,001$). Foot radiographs obtained 89% of the time. MRI (51%) preferred over gallium scintigraphy (23%) and performed simultaneously in 4% of patients. Significant statistic decrease in scintigraphy (25%, $p<0,0001$) versus mild increase in MRI (7%, $p=0,27$).

CONCLUSIONS: Interval improvement in adequate adherence while reducing unnecessary examinations for patients and decreasing costs for the health care system.

Research Presentations

83

Optimizing the CT Oral Contrast Service during the Covid-19 Pandemic

Mary Renton, Ania Kielar, Satheesh Jeyaraj, Corwin Burton, Mary May, Daniel Toubassy
Joint Department of Medical Imaging

PRESENTER'S LEVEL OF TRAINING: Fellow

PRINCIPAL LOCATION OF AUDIT: Multicentre university outpatient CT service

BACKGROUND AND AIM: The Covid-19 pandemic necessitated a reduction in patient waiting room exposure. Therefore, we reduced routine abdominal CT oral contrast use and created a new, shorter oral contrast regime, where oral contrast was still necessary.

AUDIT TARGET: The new oral contrast regime and reduced turnaround time (TAT) should be achieved in 100% of oral contrast CTs.

METHODS: Multidisciplinary stakeholders collaborated to implement departmental guidance for reduced oral contrast use and the new oral contrast regime. We reviewed one month of outpatient CT and compared this to pre-intervention groups, from during and before the pandemic. We calculated TAT for oral contrast CTs, performed an oral contrast cost analysis and conducted a voluntary patient questionnaire.

RESULTS: Post-intervention oral contrast was used in 767 of 2507 (30.6%) CTs, which is a 17.8-28.0% reduction compared to pre-intervention groups of 1499/2586 (58.0%) and 1144/2392 (47.8%). Post-intervention TAT was 55 minutes, compared to 72-74 minutes (23.6-25.7% reduction). Total cost for oral contrast post-intervention was reduced by \$4254.62 - \$6432.78 per month, a 64.8-73.6% saving.

174 patients completed the questionnaire (15.7% response rate). Feedback was very positive, including 94.7% reporting the new regime gave adequate time to drink and 97.7% having a similar or improved experience compared to previous.

INTERVENTIONS / ACTION PLAN /DISCUSSION: We will develop change management strategy to incorporate the new departmental guidance into standard practice.

CONCLUSIONS: By optimizing our CT oral contrast use, our multi-stakeholder endeavor reduced patient turnaround times, reduced costs and improved patient experience.

114

Appropriateness of Coronary CTA Requests in Patients Presenting to Emergency Department with Acute Chest Pain

Ormid Ebrahimzadeh, Tony Sedlic, Praveen Indraratna, Ming-Yu (Anthony) Chuang
Department of Radiology, University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: Tertiary ED with 24/7 CCTA service coverage

BACKGROUND AND AIM: CCTA has become an important part of acute chest pain patients' assessment in the ED, helping safe and timely disposition with a non-invasive approach. The utility of this excellent "rule-out" test decreases significantly in high-risk patients and in patients with known CAD and therefore is not recommended. Additionally, in patients with suspected ACS who have significantly elevated or rising Troponin, CCTA is not appropriate. Use of CCTA in particularly young patients with an alternative diagnosis or patients with a recent negative CCTA should be also limited.

This audit was conducted to assess the percentage of appropriate CCTA requests in this setting.

AUDIT TARGET: Meet/exceed 90% for appropriate patient selection.

METHODS: Retrospective review of CCTAs for 136 patients with chest pain in ED in 6 months period was done. Medical records were evaluated for demographics, risk-factors, investigations, and subsequent disposition. Data was analyzed for percentage of "Appropriate" and "Not Appropriate" requests.

RESULTS: 90.4% of the CCTA requests were deemed appropriate. The inappropriate requests were due to high/rising Troponin levels, known CAD, alternative diagnosis, and recent negative CCTA.

INTERVENTIONS / ACTION PLAN /DISCUSSION: As the target was met, no intervention was performed.

CONCLUSIONS: Although the target was met, there is room for improvement. Familiarity of the radiologists with the current guidelines and potential pitfalls would facilitate appropriate patient selection upon triaging requests.

146

Optimizing Distal Colostogram Technique in Infants with Anorectal Malformation

Naoya Shatani¹, Juvel Lee², Heather Bray¹, Robert Baird³, Dan Rosenbaum¹

¹Department of Radiology, ²Faculty of Medicine, ³Division of Pediatric General Surgery, BC Children's Hospital, University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University-based practice

BACKGROUND AND AIM: Pressure augmented distal colostogram is performed for surgical planning in infants with anorectal malformation. Discussion with a referring surgeon suggested that optimal technique for distal colostogram was not being consistently followed at our institution, prompting this audit.

AUDIT TARGET: Each of seven criteria for technically optimal study met in 90% of studies performed.

METHODS: Review of literature on technical performance of distal colostogram identified seven criteria for a technically optimal study.

All distal colostogram studies performed at our institution between 2013-2018 (n=25) were reviewed to determine if seven criteria of an optimal study had been met: perineum marker, ability to measure, inflated catheter balloon, distended rectum, full lateral view, anterior view, and voiding fistulogram.

Following intervention, studies performed in 2019-2020 (n=4) were reviewed using the same criteria.

RESULTS: Distal colostogram studies performed in first cycle (2013-2018) fell below audit target in all criteria: Perineum marker (16%), ability to measure (40%), inflated balloon (32%), distended rectum (64%), full lateral view (48%), anterior view (60%), voiding fistulogram (24%).

Post-intervention, second cycle studies (2019-2020) surpassed audit target in five criteria. Two criteria fell below the target but did improve from first cycle.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Intervention was conducted through education sessions for department radiologists in 2019. Procedure technique protocol and dictation template were created and available for second cycle studies.

CONCLUSIONS: Radiologist education and protocol development resulted in improved technique; surpassing audit target in 5 of 7 criteria and with improvement in all.

Research Presentations

152

Optimized CT Characterization of Arterial Bleeds in Traumatic Abdominal Injury with Extension of Angiographic Imaging to the L3 Level

Michael Pereira, Signy Holmes
University of Manitoba

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University Hospital Site

BACKGROUND AND AIM: Characterizing arterial injury in the acute trauma patient is crucial in coordinating endovascular treatment, as delay beyond one hour can lead to poor outcomes. Arterial phase imaging below the diaphragm guides therapy, but increases radiation dose to the overall trauma patient population.

This audit compares need for repeat extended arterial imaging using L1 versus L3 as the caudal level of initial arterial scan.

AUDIT TARGET: Reduce repeat arterial scans to zero.

METHODS: Retrospective review of patients undergoing trauma imaging (CTA chest and CT abdomen/pelvis) from May 2019 to April 2020 to quantify urgent repeat arterial scans for an incompletely characterized injury. A modified protocol was implemented extending the angiographic phase of imaging from L1 to L3. Patients from May 2020 to December 2020 were then reviewed. Comparison was performed with the Chi-squared test.

RESULTS: In the 12 months preceding the protocol change 4 of 1735 patients (0.23%) required urgent repeat extended arterial imaging to enable endovascular treatment decision-making. Following the change, only 1 of 1475 patients (0.07%) required repeat imaging, a nonsignificant trend ($p = 0.24$).

DATA COLLECTION/ANALYSIS: 25 hours.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Proposed change was discussed in a Radiology departmental meeting prior to trial protocol implementation May 2020 with support from the Trauma service. The plan is to complete the audit a full 12 months following the protocol implementation.

CONCLUSIONS: A relatively minor caudal extension of arterial phase imaging may be adequate to sufficiently characterize traumatic arterial abdominal injury for purposes of planning endovascular treatment.

156

Appropriateness of Skull Radiographs for Diagnosis of Craniosynostosis Prior to Specialist Referral

Saba Moghimi, Michael Sargent, Heather Bray
University of British Columbia, BC Children's Hospital

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University Hospital Site

BACKGROUND AND AIM: The diagnostic accuracy of skull radiographs in the setting of craniosynostosis is low. Clinical assessment is the primary mode of diagnosis and additional radiograph and cross-sectional studies can be performed in clinically ambiguous cases. Performing radiographs prior to specialist referral can delay diagnosis, expose children to unnecessary radiation, and result in missed diagnosis. Our goal was to assess appropriateness of performing skull radiographs for diagnosis of craniosynostosis prior to specialist referral.

AUDIT TARGET: Skull radiographs have at least 90% concordance rate with clinical assessment by specialists.

METHODS: A retrospective search of children who were assessed at the head shape clinic at BC Children's Hospital was performed. Electronic charts, operative notes, specialist notes, and the imaging studies performed were reviewed.

RESULTS: 130 subjects were identified and reviewed. 46 (age: 5.5 ± 4.8 months) subjects underwent a skull radiograph and 54 underwent a brain CT. 21 subjects underwent both skull radiograph and brain CT, among which 16 plain films (76%) were discordant and 5 (24%) were concordant with the CT findings. Among the 46 patients who underwent skull radiography, 5 (11%) had clinically ambiguous features, 24 (52%) had discordant radiographic findings compared to the specialist assessment, and 17 (37%) had concordant findings. The target was not achieved and the concordance rate with clinical impression was no more than 48%.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Results of the audit will be presented to the Family medicine, Pediatrics, and Genetics specialist physicians. The departmental imaging guideline policy will also be discussed. A subsequent re-audit will investigate the compliance with the new policy.

CONCLUSIONS: Lack of concordance between skull plain films and clinical assessment supports the opinion that performing skull radiographs prior to specialist referral is not indicated. An intervention based on education will be performed prior to the re-audit phase.

FRIDAY, APRIL 30, 2021

Radiologist-in-Training Research Project Oral Presentations

Judges: Marco Essig, Faisal Khosa, Mark Levental

11:00 - 12:10

30

Non-EPI Propeller DWI Sequence on MRI to Depict Cholesteatoma in Children with Non-operated Chronic Ear Disease

Kiana Lebel¹, Sam Daniel^{2,3}, Melanie Duval^{2,3}, Christine Saint-Martin^{2,3}

¹University of Sherbrooke, ²McGill University, ³Montreal Children's Hospital

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: McGill University

OBJECTIVE: To show usefulness of non-EPI diffusion sequence to depict cholesteatoma in children with otoscopic evaluated high risk of cholesteatoma.

METHODS: A prospective study evaluated the accuracy of non-EPI diffusion sequences to depict cholesteatoma in pediatric chronic ear disease, in the absence of prior ear surgery. 1.5 Tesla MRIs of consecutive patients were compared to pediatric ENT follow-up exams if MRI was negative for cholesteatoma, and to pathology post-surgery if MRI was positive for cholesteatoma.

RESULTS / DISCUSSION: 32 pediatric patients (15 males, 17 females), mean age 11.4 years (16 months-17 years) with chronic ear disease underwent non-EPI diffusion sequence (n=40). 2 patients (n=5) were excluded due to susceptibility artifacts from unremovable devices. Unilateral positive restricted diffusion was found on 7/35 examinations and confirmed on pathology to be cholesteatoma in 6. False positive diffusion restriction was due to superimposed acute infection and resolved on repeat MRI after antibiotics. One false negative diffusion sequence was due to the small size and the tegmen location of the cholesteatoma. The 22 patients with negative diffusion sequence (25 MRIs), were followed clinically for a mean of 39 months (3-60 months), with stable audiology tests, further healing and spontaneous closure of the tympanic membrane perforation in 14 patients or further tympanoplasty in six.

CONCLUSION: In children with high otoscope suspicion of cholesteatoma, non-EPI Diffusion sequence has high sensitivity (85.7%) and specificity (96.3 %) to identify cholesteatoma. Hence, we suggest CT indication could be narrowed to patients with positive MRI, prior to cholesteatoma surgery, in order to decrease overall unnecessary radiation.

Research Presentations

39

Can CT Based Kidney Measurements Replace Nuclear Renography for Deciding which Kidney to Use for Living Kidney Donation?

Kelly Harper¹, Matthew McInnes^{1,2}, Jean-Paul Salameh², Natasha Akhlaq¹, Edward Clark³, Wanzen Zeng⁴, Brian Blew⁵, Kevin Burns³, Manish Mood^{2,3}, Ann Bugeja³

¹Department of Radiology, The Ottawa Hospital, ²Ottawa Hospital Research Institute Clinical Epidemiology Program,

³Department of Medicine, Division of Nephrology, The Ottawa Hospital, ⁴Department of Nuclear Medicine, The Ottawa Hospital, ⁵Department of Surgery, Division of Urology, The Ottawa Hospital, University of Ottawa

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Ottawa

OBJECTIVE: Streamlining kidney donor evaluation is a patient priority and delayed by use of both nuclear renography and computed tomography (CT) to determine kidney function asymmetry. We compared CT measurements with renography in assessment of split kidney function (SKF) and their correlations with post-donation kidney function.

METHODS: A retrospective cohort study was conducted of all living kidney donors from January 1, 2009-July 31, 2019 at a tertiary center.

Renography and CT measurements were reviewed by 2 investigators for SKF agreement and correlations with post-donation kidney function.

RESULTS / DISCUSSION: Among 248 donors, intra- and inter-rater agreement (intra-class correlation, ICC) were fair to excellent: renography 0.92 and 0.86; CT volume 0.60 and 0.64; modified ellipsoid 0.57 and 0.64; craniocaudal dimension (CC) 0.66 and 0.72. Bland-Altman agreement (bias, 95% limits of agreement) for renography vs: CT volume, 0.76%, -7.60-9.15%; modified ellipsoid, 1.01%, -8.38-10.42%; CC, 0.44%, -7.06-7.94. Predicted and observed post-donation eGFR at 31(21) months were significantly correlated for renography and all CT measurements (Pearson's correlation coefficient, R): renography R=0.32, CT volume R=0.41, modified ellipsoid R=0.41, CC R=0.42; p<0.01.

CONCLUSION: Renography and CT demonstrate similar agreement and reproducibility for determining SKF and correlation with post-donation eGFR. CT alone can determine SKF and predict post-donation kidney function.

47

To Scan or Not to Scan: Utility of Computed Tomography of the Head for Altered Mental Status in the Inpatient Setting

Alexander Tsibulski, Mehrvaan Kaur, Jeffrey MacLean, Barakat Ogunde, Kaitlin Zaki-Metias, Christopher Zarour, Zahraa Al-Bahbahane, George Pappas
St. Joseph Mercy Oakland Hospital

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: St. Joseph Mercy Oakland Hospital

OBJECTIVE: This study aims to determine how frequently noncontrast head CT was ordered for altered mental status (AMS) in the inpatient setting in patients without focal deficits or known intracranial pathology, and the proportion of studies with positive findings.

METHODS: A retrospective analysis of inpatient head CTs ordered for AMS at a single institution in 2019 was performed. Patients with known acute stroke, focal deficits, or other intracranial pathology, as well as patients in the emergency department, intensive care unit, or cardiac care unit were excluded.

RESULTS / DISCUSSION: A total of 1142 noncontrast head CTs were ordered for AMS in 2019, with 168 meeting inclusion criteria. Mean patient age was 73.5 years ± 11.9. Of the 168 studies, 2.4% (n=4) were positive for clinically significant findings.

AMS has an immense impact on resource utilization in healthcare. The majority of patients with AMS have no focal symptoms and are found to have a metabolic derangement or delirium. Head CT performed on patients without focal deficits or history of a fall has been demonstrated to infrequently result in clinically relevant or treatment-altering findings.

CONCLUSION: There is a low diagnostic yield for head CT ordered on inpatients with AMS and without focal symptoms. Many patients with positive findings on head CT have known risk factors for intracranial pathology. The use of physician tools such as the American College of Radiology Appropriateness Criteria and the Canadian Association of Radiologists Referral Guidelines has the potential to reduce the unnecessary or repetitive use of ionizing radiation imaging studies for non-focal symptoms.

Research Presentations

49

Diagnostic Evaluation of the Posterior Fossa with Antenatal and Post-mortem MRI: Looking Beyond the Grave

Neetika Gupta¹, Claudia Martinez-Rios¹, Dina El Demellawy³, Nick Barrowman³, Elka Miller¹

¹Department of Medical Imaging, ²Pathology, ³Research Institute Children's Hospital of Eastern Ontario

PRESENTER'S LEVEL OF TRAINING: Fellow

INSTITUTIONAL AFFILIATION: Children's Hospital of Eastern Ontario, University of Ottawa

OBJECTIVE: The role of conventional autopsy (CA) in post-mortem evaluation is undisputed, but it poses difficulty with small, macerated fetuses and increasing parental refusal. Alternatively, post-mortem magnetic resonance imaging (PMMRI) is less invasive and an acceptable technique. This study is an attempt to evaluate the qualitative and quantitative differences of PMMRI in assessing the brain and posterior fossa (PF) when compared to antenatal magnetic resonance imaging (ANMRI) and CA.

METHODS: A retrospective, single-center study of ten fetuses referred for ANMRI and PMMRI from August 2010 to May 2018. CA was the gold standard. A qualitative and quantitative evaluation was done to assess the brain and posterior fossa abnormalities. All the measurements were evaluated by 2 pediatric neuroradiologists and a pediatric radiology fellow.

RESULTS / DISCUSSION: Twenty MRI exams were assessed. The median gestational age at ANMRI was 21.7 weeks. The median age at termination of pregnancy (TOP) and PMMRI was 23.7 weeks. There was good congruence between ANMRI and PMMRI for qualitative findings further confirmed by CA, with complete congruence in 50% of cases, partial congruence in 50% and no incongruence was noted. Quantitative evaluation in PMMRI compared to ANMRI showed statistically significant enlargement of the brain in the PF with smaller CSF-filled spaces (p -value < 0.05), except for the thickness of the medulla.

CONCLUSION: Our study concludes that virtual autopsy using PMMRI is an effective tool for the evaluation of posterior fossa. ANMRI and PMMRI are complementary, as both studies can contribute to the information provided for counselling the families.

59

Evaluating Efficacy of PI-RADS v2.1 in the Diagnosis of Previously Reported False Positives in PI-RADS 3, 4 and 5 Lesions on MRI Prostate

Paul NG, Divyajeet Rai, Paul Hayworth, Jason Zhang
Queensland Health, Australia

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Gold Coast University Hospital, QLD, Australia

OBJECTIVE: The objective was to assess if PI-RADS 2.1 reduced the rate of false positives compared to older PI-RADS versions in clinically significant lesions (PIRADS 3-5).

METHODS: Patients undergoing MRI prostate with histology available performed at the Gold Coast University Hospital (QLD, Australia) before 2019 were included. N=31 were found to be false positives at histology. These cases were retrospectively reviewed using PIRADS 2.1 guidelines, by a consultant radiologist (FRANZCR).

RESULTS / DISCUSSION: There were n=31 false positive cases (PIRADS 3-5) using older PIRADS when compared to available histology from TRUS biopsy. This was reduced to n=9 with PIRADS 2.1. N=10 PIRADS 4 lesions were downgraded to PIRADS 2 lesions, n=1 PIRADS 5 lesion downgraded to PIRADS 2, and n=10 PIRADS 3 lesions downgraded to PIRADS 2 lesions.

CONCLUSION: The Prostate-Imaging-Reporting and Data system (PI-RADS 1.0) guidelines were introduced in 2012 to improve standardization and reporting of prostate MRI exams. More recently PI-RADS 2.1 (2019) was introduced to improve detection and characterisation of suspected cancer. Previous research indicates causes of false positives in prostate MRI reporting include experience of the radiologist, and zonal location of the suspected neoplasia.

Our data validates the use of the PIRADS 2.1 reporting system in reducing false positives in the detection of clinically significant prostate neoplasia in our patient cohort. Adherence to standardised reporting potentially could lead to improved patient outcomes.

Research Presentations

81

Correlation of Faculty Gender and Resident Gender at Canadian Radiology Residency Programs

Morgan Lawley, Jessica Dobson, Francine Heelan, Daria Manos
Department of Diagnostic Radiology, Dalhousie University

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Dalhousie University

OBJECTIVE: Women are underrepresented in radiology. Gender disparity is present in many subspecialties, as well as leadership and academic positions. To address this and increase gender diversity in radiology, more information is needed. The purpose of our study is to determine if a correlation exists between the number of female faculty at an institution, and the number of female residents matching to the residency program.

METHODS: We reviewed faculty lists on the websites of each Canadian diagnostic imaging residency program and identified faculty gender based on name, and profile picture when available. Where unclear, gender information was obtained from the provincial registry. We excluded non-radiologist faculty based on indications in the faculty list, as well as physician registry and google searches when no differentiation was provided. We obtained resident gender data from resident and institution websites. The data was analyzed using Pearson's correlation coefficient.

RESULTS / DISCUSSION: Resident and faculty information was available for 9 and 15 of the 16 programs respectively. The mean percentage of faculty members who were women was 32% (range 20-48%, IQR 12%), and 40% for residents (range 16-70%, IQR 14%). A moderate correlation was identified, with a Pearson's R of 0.51. However, this was not statistically significant at the 0.05 probability level.

CONCLUSION: At Canadian diagnostic imaging residency programs, there are fewer women faculty and residents. More female residents may match to programs where there is greater female representation among faculty, however further analysis including data from more programs would be beneficial.

91

Clinical Pregnancy Success Rates Post Fallopian Tube Recanalization: A Retrospective Cohort Study in Edmonton, Alberta

Ali Poonja, Rahim Samji, Murad Bandali, Sara Ilnitsky
University of Alberta

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Alberta

OBJECTIVE: Previous studies have suggested that pregnancy success rates following fallopian tube recanalization (FTR) are in the range of 25-30%. Our objective is to identify patients in the Edmonton Region that underwent fluoroscopy guided FTR between 2016-2019 and investigate clinical pregnancy outcomes.

METHODS: This retrospective study included females treated at a primary care centre that underwent both a hysterosalpingogram and FTR between 2016-2019. 233 women were assessed for eligibility, of whom 65 were excluded due to incomplete charts. No other exclusion criteria were used. Characteristics including location of tubal occlusion, gravidity/parity status and body mass index were recorded.

RESULTS / DISCUSSION: 168 women with 224 obstructed fallopian tubes were analyzed (n=112 unilateral tubal obstruction; n=56 bilateral tubal obstruction). The technical success rate of FTR was 91% (206 of 224 tubes). Complications including catheter dissociation (n=1) and allergic reaction (n=2) were documented.

The overall rate of conception was 38% (64/168), of whom 17 underwent in vitro fertilization and 17 spontaneously aborted. 71% (46/64) had a proximal tubal occlusion. 25% (43/168) had secondary infertility, of whom 17 were able to achieve a clinical pregnancy following FTR. The mean time between FTR to confirmed pregnancy was 380 days and the mean body mass index of patients achieving clinical pregnancy was 29.

CONCLUSION: FTR offers a safe intervention with a high technical success rate that should be considered for patients seeking treatment to infertility due to tubal occlusion.

Research Presentations

111

Ultrasound LI-RADS in HCC Surveillance

Rohith Bhargavan, Christopher Lunt, Alison Harris
University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of British Columbia

OBJECTIVE: To evaluate the 2017 US LIRADS standardized reporting system and assess sensitivity, specificity and inter examination variation in the detection of HCC in at risk patients.

METHODS: 720 patients meeting LIRADS criteria for screening US examination were assessed over a 2.5 year period from July 2017. Results of screening and surveillance examinations were recorded using the 2017 US LIRADS categories for findings and liver visualisation score using a standardised proforma. Examinations were reported by fellowship trained abdominal radiologists. All follow up imaging was reviewed for occurrence of HCC defined as LR5 findings on contrast enhanced CT or MR imaging.

RESULTS / DISCUSSION: 347 patients were female (48.2%), mean age 59 years (range 19-94 years).

In the majority of patients were screened due to Hepatitis B virus (68%) or Hepatitis C virus (16%)

Positive predictive value of US2 and US3 for the subsequent diagnosis of HCC/LRM was 43.0%. Negative predictive value of US1 for subsequent diagnosis of HCC/LRM was 92.3%.

The overall sensitivity of US2/3 results for the diagnosis of HCC was 47.9% and the specificity was 90.8%.

In patients with severe limitations to visualisation both sensitivity (30.0%) and NPV (36.4%) were reduced.

CONCLUSION: LIRADS US categories provide a useful screening tool for the detection of HCC in at risk patients, however the sensitivity and NPV of US is reduced in patients with poor visualisation. This may reflect both the difficulty in locating tumours in very abnormal liver parenchyma and also an increased incidence of HCC in patients with more severe disease.

134

Deep Learning-Based Automatic Tumour Segmentation in Breast-Conserving Surgery Navigation Systems

Zoe Hu¹, Tamas Ungi², Jay Engel¹, Gabor Fichtinger², Doris Jabs¹

¹School of Medicine, ²School of Computing, Queen's University

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: Queen's School of Medicine, Queen's School of Computing

OBJECTIVE: Breast-conserving surgery (BCS) is the preferred therapeutic procedure in early detected breast cancers. The challenge with BCS lies in maximizing healthy tissue retention while maintaining complete tumour excision to prevent recurrence. NaviKnife is a computer-aided navigation system which has been demonstrated to provide significantly more confidence for surgeons in maximizing tissue conservation and recognizing tumour margins during BCS. However, the current workflow of NaviKnife requires intraoperative manual segmentation of the tumour by radiologists. This study aims to determine the feasibility and accuracy of a deep learning approach in place of manual segmentation in BCS navigation systems.

METHODS: The convolutional neural-network U-Net was altered and optimized for breast tumour segmentation using an annotated intraoperative dataset. Network training and testing were completed with 5-fold cross-validation. Statistical analysis of the U-Net model's performance was completed by computing the pixel-based Dice similarity coefficient (DSC), segmentation sensitivity, and intersection over segmentation area (AUC). Select radiologists with experience working with breast ultrasounds were also surveyed on the quality and useability of the automatic tumour contours.

RESULTS / DISCUSSION: The clinical dataset consisted of 7318 images obtained from 33 non-palpable BCS patients. The mean DSC of the resulting model was 0.65, with a sensitivity of 0.92, and AUC of 0.94. The automatic tumour contours were reviewed by breast radiologists who found them visually promising with an average rating of 80%.

CONCLUSION: The modified U-Net provides robust tumour segmentations with high sensitivity and AUC values. These findings suggest that deep learning approaches are a promising alternative to manual segmentation in surgical navigation systems.

137

D-dimer Based Screening Algorithms for COVID-19 Associated VTE/ PE: Exposure and Cost Reduction Benefits

Dana Safavian, Atul Gupta
Rochester General Hospital

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Rochester General Hospital

OBJECTIVE: Venous and arterial thromboembolic events are among the leading causes of morbidity and mortality in COVID-19 patients. The American Society of Hematology has recommended weight-based thromboprophylaxis in hospitalized COVID-19 patients with consideration of dose escalation in the patients with markedly elevated d-dimer levels. Patient screening for venous thromboembolism (VTE) using ultrasound or CT pulmonary angiography (CTPA) leads to higher exposure risks and costs. In our institution we have devised a thromboprophylaxys escalation algorithm for COVID-19 patients which stratifies patients based on their D-dimer levels and clinical symptoms.

METHODS: In order to validate the algorithm we conducted a retrospective case study of 140 patients investigating the correlation between D-dimer levels and ultrasound or CTPA proven deep vein thrombosis or pulmonary arterial embolism.

RESULTS / DISCUSSION: While the data demonstrated elevated D-dimer levels in 99% of COVID-19 positive patients, likely as an acute phase reactant, the mean D-dimer levels were statistically significantly higher among COVID-19 patients with sonographic or CTPA evidence of VTE. We observed an odds ratio of 1.76 for every 1000 units increase of the D-dimer level with a 95% confidence interval.

CONCLUSION: In summary, this study demonstrates the use D-dimer levels in thromboprophylaxis algorithm as a viable alternative to CTPA or US screening in asymptomatic COVID-19 patients, ultimately reducing exposure risks and healthcare costs.

FRIDAY, APRIL 30, 2021

Value of Radiology Research Project Oral Presentations

Judges: Ramy El-Jalbout, Daria Manos, Charlotte Yong-Hing

13:00 - 14:10

29

Unnecessary Diagnostic Conventional Coronary Angiography (CCA) in Patients without Known Cardiac Diseases: Are Radiologists to Blame?

Kiana Lebel¹, Alexandre Semionov², José Correa², Karl Sayegh², Stéphane Breault³, Jaramie Thomas- Gittens³, Josephine Pressacco²

¹Sherbrooke University, ²McGill University, ³University of Montréal

OBJECTIVE: Coronary artery disease (CAD) is a major cause of death in developed countries, diagnosed either by conventional coronary angiography (CCA), an invasive modality that can offer immediate intervention or by coronary CT angiography (CCTA), a non-invasive imaging modality. This study was conducted to assess the diagnostic yield of CCA performed in patients without known coronary artery disease, who could have benefited from a non-invasive CCTA.

METHODS: Retrospective study that identified patients without known coronary artery disease who underwent CCA between January 2015 and December 2017. The patients' age, gender, clinical information and results of CCA were collected. CCA reporting >49% coronary artery stenosis (CAS) were considered positive, requiring interventional treatment. CCA showing 0-49% CAS, were considered negative for the purpose of this study.

RESULTS: 3693 patients underwent CCA. Out of 1409 women, 606 (43%) had a positive examination, and out of 2284 men, 1455 (63.7%) had a positive examination.

CONCLUSION: This study shows similarity to the results of Patel et al., conducted a decade ago where obstructive CAD was observed in only 37.6% of patients. Our results highlight the lack of improvement in patient selection, even more so in women, with respect to choosing a CCA over CCTA in patients without known CAD. Multiple trials demonstrated the high diagnostic accuracy of CCTA supporting its role as a non-invasive tool to exclude significant CAD. Radiologists with cardiac imaging expertise are therefore ideally positioned to integrate the cardiac treatment team, helping guide management and improve the diagnostic yield of cardiac catheterization at a lower cost.

Research Presentations

64

Expediting Specialist Referral for Patients with Suspected Lung Cancer through Standardization of Radiologist Recommendations

Breanne Golemiec¹, Monica LL Mullin¹, Sophia Linton¹, Gurmohan Rob Dhillon², Dominique DaBreo², Christopher M Parker¹, Geneviève C Digby¹

¹Department of Medicine, ²Department of Radiology, Queen's University, Kingston Health Sciences Centre

OBJECTIVE: Lung cancer (LC) diagnostic pathways are initiated following suspicious clinical and radiologic findings. We identified delays from first thoracic imaging suspicious for LC to specialist evaluation in a rapid assessment clinic [Lung Diagnostic Assessment Program (LDAP)]. We conducted a quality improvement initiative to reduce diagnostic pathway delays through standardization of Computed Tomography (CT) reporting recommending LDAP referral.

METHODS: Retrospective chart review of LDAP-referred patients established baseline data (January – December 2018). Improvement initiatives included (i) implementation of a standardized LDAP referral recommendation at an academic center for patients with suspected LC by thoracic imaging (January 2019), and (ii) uptake of standardized LDAP referral recommendation at three community hospitals (March 2019). Prospective chart review (January - September 2019) evaluated for improvement. Data include dates of CT chest, LDAP referral/assessment and specific phrasing of radiology recommendations. Continuous data are reported as medians, categorical data as percentages; Mann-Whitney U and chi-squared tests assess for significance.

RESULTS: We reviewed 1244 LDAP referrals (697 baseline; 547 post-standardization). Patients with a radiologist recommendation for LDAP referral had faster times from CT to referral (median[75th, 90th percentile]) (5[9, 15] vs 6[16, 33] days) and specialist assessment (20[27, 35] vs 22[33, 50] days) (Figure 1). Following standardization, the percentage of LDAP-referred patients with a radiologist recommendation for referral increased (29.2% to 48.3%; P<.001), significant for the academic center (50.2% to 61.8%; P=.006) and community hospitals (12.1% to 35.3%; P<.001).

CONCLUSION: Standardized radiologist reporting and specialist referral recommendations for patients with imaging suspicious for LC leads to faster patient referral and assessment.

69

First Steps towards Implementation of a Standardized MRI Protocol to Improve Care for People with MS in British Columbia

David Li, Hae Jung Min, Samuel Yim, Adelia Adelia, Shelly Au, Jason Shewchuk, Laura Barlow, Laura Harvey, Shannon Kolind, Roger Tam, Bruce Forster, Monty Martin, Carolyn Rudden, Lori Saslow, June Halper, Anthony Traboulsee
University of British Columbia

OBJECTIVE: Magnetic resonance imaging (MRI) is important in the diagnosis and monitoring of people with multiple sclerosis (MS). Using a standardized protocol is key. The objective was to assess the use of the Consortium of MS Centers (CMSC) recommended protocols in British Columbia (BC).

METHODS: BC hospitals with MRIs were surveyed regarding scanning protocols for MS patients.

RESULTS: Only 2 of 15 MRI centres fully satisfied CMSC recommendations for a standardized brain MRI protocol (Figure 1). FLAIR (Fluid Attenuated Inversion Recovery) and T2 scans were performed in all centres (except 1, FLAIR but no T2), however 10/15 FLAIR and 12/14 T2 scans used thicker slices (>or= 4mm vs recommended <or= 3mm) with slice gaps (0.5-1.0 mm vs recommended no gap). 3D T1 scans were routinely obtained in only 4/15 centres with 3 meeting CMSC slice thickness recommendation of <or= 1mm and 1 with thicker slices (1.2 mm). Of 9 centres responding, 3 used the recommended subcallosal plane for consistent prescription of axial slices.

CONCLUSION: Recommendations for a standardized MRI for MS patients have been proposed and updated since 2001, but disappointingly are still not widely used. Having reviewed these survey results, the BC Medical Imaging Advisory Committee, a group that provides advice and recommendations to the BC Ministry of Health to support continuous improvement in medical imaging, has committed to implementing the CMSC protocols as the provincial standardized MRI protocol for MS patients to improve care. A follow-up survey is planned for 2021.

Research Presentations

138

Incremental Value of Artificial Intelligence to Inform Lung Nodule Management at Baseline Lung Cancer Screening

Scott J. Adams¹, Erika Penz², Chung-Chun Tyan², Prosanta Mondal³, Hyun Lim³, Paul Babyn¹

¹Department of Medical Imaging, ²Division of Respirology, Critical Care and Sleep Medicine, Department of Medicine,

³Department of Community Health and Epidemiology, University of Saskatchewan

OBJECTIVE: To develop a lung nodule management strategy combining Lung-RADS with an artificial intelligence (AI) malignancy risk score and determine its impact on follow-up investigations and associated costs following baseline lung cancer screening.

METHODS: Secondary analysis of a dataset consisting of AI malignancy risk scores and Lung-RADS classifications from six radiologists for 192 baseline low-dose CT (LDCT) studies was undertaken. LDCT studies were weighted to model a representative cohort of 3197 baseline screening patients with each LDCT study read by six radiologists. An AI risk score threshold was defined to match average sensitivity of six radiologists applying Lung-RADS. Cases initially Lung-RADS category 1 or 2 with high AI risk scores were upgraded to category 3, and cases initially category 3 or higher with low AI risk scores were downgraded to category 2. Follow-up investigations resulting from Lung-RADS and the AI-informed management strategy were determined. Investigation costs were based on Ontario-specific cost data in 2020 Canadian dollars.

RESULTS: The AI-informed management strategy increased specificity to 96% compared to average specificity of six radiologists using Lung-RADS of 66% (with sensitivity maintained at 91%). Using the AI-informed management strategy, 41 (0.2%) category 1 or 2 classifications were upgraded to category 3, and 5750 (30%) category 3 or higher classifications were downgraded to category 2. Minimum net cost savings using the AI-informed management strategy was determined to be \$50 per patient screened.

CONCLUSION: An AI risk score combined with Lung-RADS may add value at baseline lung cancer screening by reducing the number of follow-up investigations and associated costs.

143

Use of an Instant Messaging Platform to Improve Communication Between the Emergency Department and Medical Imaging After Hours

David C Wang, Eric Bartlett, Heidi Schmidt, Joseph Choi
Diagnostic Radiology, University of Toronto

OBJECTIVE: There is frequent communication between the emergency physician (EP) and the radiology resident (RR) on-call after regular working hours. To improve communication processes, we explored the use of a secure instant messaging platform to observe its effects on after-hours communication between the EP and RR on-call.

METHODS: This project used Microsoft Teams, which has been approved for Personal Health Information (PHI) use at our academic teaching hospital. EPs had the option to message the RR on-call via MS Teams during the after-hours period for non-emergent questions and consultation. We aimed to have a response time of less than 10 minutes for 80% of messages sent from the EP to the RR within 3 months of using the instant messaging platform. This is compared to the current institutional policy to return pages within 10 minutes of receipt.

RESULTS: Between July 1-Sept 30 2020, 16 EPs and 28 RRs participated. A total of 458 messages were sent from the EP to the RR during the after-hours period. The median response time was 1 minute (range: 0-80 min). 94% of messages had a response time less than 10 minutes and 73% of messages had a response time of less than 5 minutes. Approximately 2% of messages had no response.

CONCLUSION: The goal of 80% response rate within 10 minutes by the RR was achieved. We have demonstrated that communication using a PHI-approved instant messaging platform between the ED physician and RR for non-emergent issues is viable and effective, allowing for rapid response between the two parties.

150

Shear-Wave Elastography Screening Reduces Hepatologist Referral Rates for NAFLD

Christopher E Smith¹, Alexandra Medellin¹, Abdel Aziz Shaheen², Deepak Bhayana¹, Mark G Swain²

¹Department of Radiology, ²Division of Gastroenterology and Hepatology, University of Calgary

OBJECTIVE: To describe our local experience setting up and running a community-based shear-wave elastography (SWE) liver fibrosis screening program in patients with non-alcoholic fatty liver disease (NAFLD) to improve patient outcomes and reduce unnecessary hepatology referrals and liver biopsies.

METHODS: Ultrasound shear-wave elastography (SWE) is a non-invasive, simple, reproducible and inexpensive quantitative ultrasound-based alternative to biopsy with high sensitivity for significant fibrosis (87-90%), defined as METAVIR score > F1. It involves measuring the differential deflection of tissue when exposed to ultrasonic waves which is highly correlated to tissue stiffness and therefore degree of fibrosis. After a clinical diagnosis of probable NAFLD the patient is referred for an outpatient SWE measurement. If the SWE result is <8.0KPa, the patient is considered low risk for significant liver fibrosis and lifestyle and risk factor modification is recommended to be managed by the patient's primary care physician with repeat SWE screening every 3 years. If the result is >8.0KPa (or inconclusive), the patient is high risk for fibrosis and is referred to see a hepatologist to assess for need for biopsy and treatment.

RESULTS: Between March 2018 and Dec 2020, we have screened a total of 7817 NAFLD patients with SWE, of whom 7053 (90.2%) were classified as be low risk (<8kPa), 437 (5.6%) as high risk, 317 (4.1%) as indeterminate. 10 had a failed SWE.

CONCLUSION: Widespread use of similar SWE-based liver fibrosis screening programs has the potential to improve patient outcomes while also decreasing costs and patient burden by decreasing biopsies and unnecessary referrals to hepatologists in patients with NAFLD risk factors.

Scientific Poster Abstracts

Departmental Clinical Audit Project

8

Risky Business: Audit of the Surgical Upgrade Rate of Atypical Ductal Hyperplasia, a High-Risk Breast Lesion

Csilla Egri, Juvel Lee, Marguerite Nguyen, Christine Wilson, Charlotte Yong-Hing
University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University affiliated cancer center mammography department

BACKGROUND AND AIM: Atypical ductal hyperplasia (ADH) is a high risk breast lesion. The American Society of Breast Surgeons (ASBrS) consensus statement quotes a surgical upgrade rate of greater than 20% to either DCIS or invasive carcinoma. In effort to maintain best practice and ensure our referral for routine surgical excision aligns with ASBrS, we've audited our institutions surgical upgrade rate of ADH.

AUDIT TARGET: Surgical upgrade of at least 20%.

METHODS: Retrospective analysis of 1187 CNBs and associated surgical pathology between Nov 11 2013 - Mar 27 2018.

RESULTS: 35% (n=420) of all biopsies were benign, 22% (n=267) were benign with follow up, 2% (n=23) were indefinite, 15% (n=182) were ADH, and 25% (n=294) were neoplastic. Of the ADH lesions, 85% (n=154) underwent surgical excision. Total surgical upgrade rate to either ductal carcinoma in situ, lobular carcinoma in situ, or invasive carcinoma was 34% (n=43).

We found a large range in core biopsy samples taken, with an average of 9 and range of 3 – 41. There was no statistical difference between number of cores and malignant vs. non-malignant results for ADH lesions.

INTERVENTIONS / ACTION PLAN /DISCUSSION: We have met our target, our surgical upgrade rate of ADH is 34%.

We will continue to advocate surgical management of ADH lesions. We anticipate our audit will help facilitate informed decision making in our patient population.

Our additional findings regarding our biopsy techniques will serve as a new quality improvement project.

CONCLUSIONS: We will continue to recommend surgical excision of ADH lesions. To encourage others to conduct their own audits, our core biopsy data base is available for distribution.

Scientific Poster Abstracts

37

Review of Pediatric Hip Ultrasounds: Are we Performing to North American Standards?

Tyson Keddie, Eileen Tu, Teresa Liang
University of Alberta

PRESENTER'S LEVEL OF TRAINING: Other Student

PRINCIPAL LOCATION OF AUDIT: Pediatric Radiology Department

BACKGROUND AND AIM: No absolute contraindications exist for assessing developmental hip dysplasia(DDH) ultrasounds; however, recommendations in North America suggest performing scans after 4 weeks to minimize physiological hip laxity findings, and before 6 months (femoral head ossification limits utility), with accepted indications/risk factors. Non-compliance can lead to unnecessary studies, increased follow-ups, and potentially erroneous interventions. The aim was to assess adherence to these recommendations.

AUDIT TARGET: 90% adherence to ACR and CAR recommendations for age(4 weeks-6 months), accepted indications/risk factors, and reporting standards for DDH ultrasounds.

METHODS: 12 consecutive months of pediatric hip ultrasounds were reviewed. Trauma studies excluded, 599 total scans for 474 patients were reviewed. Each study was assessed for age, indication/risk factor, documented descriptors, and diagnosis.

RESULTS: 53/474 patients' ages were below 4 weeks, while 4/474 patients were over 6 months. 91/474 patient referrals did not include clinical reasoning/risk factor. 163/599 scans did not annotate acetabular morphology. 595/599 scans provided alpha angles and femoral coverage. The target was not achieved.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Results were discussed in subgroup presentation. Departmental protocol was revised to perform DDH ultrasounds between 4 weeks and 6 months, unless orthopedic referral. Indications/risk factors are now required for all referrals. A standardized template has been updated for DDH reporting.

CONCLUSIONS: Re-audit is ongoing and will assess compliance and progress. We will present the re-audit and possible factors leading to the target not being met.

Scientific Poster Abstracts

52

A Single-Centre Audit of the ACR BI-RADS 3 Assessment Category Utilization

Jessica Common¹, Peri Abdullah², Abdullah Alabousi³,

¹Faculty of Medicine, Department of Radiology, McMaster University, ²Department of Kinesiology, York University,

³Department of Radiology, McMaster University, St. Joseph's Healthcare Hamilton

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: Department of Diagnostic Imaging at an academic hospital

BACKGROUND AND AIM: To evaluate 24-month outcomes of breast lesions assessed at our centre as probably benign (Breast Imaging Reporting and Data System [BI-RADS] category 3) with an expected malignancy rate of <2%.

AUDIT TARGET:

Sensitivity = 100%

Cancer yield <2%

METHODS: All female patients with a mammographic and/or ultrasound finding assessed as BI-RADS 3 at our institution between January 1-December 31, 2017 were included. Sensitivity and cancer yield were calculated at 24 months.

RESULTS: Among 517 women (median age, 52 years; range, 13-89 years) with a BI-RADS 3 assessment, 349 completed 24 months of follow-up (68%). 168 women were lost to follow-up (32%). A total of 30 lesions were biopsied at or before 24 months, and 6 were classified as malignant (cancer yield, 6 of 349 women [1.7%]; positive biopsy rate, 6 of 30 women [20.0%]). No lesions downgraded to BI-RADS 1 or 2 were classified as malignant at 24 months (false negative, 0; sensitivity, 100%).

INTERVENTIONS / ACTION PLAN /DISCUSSION: We are meeting audit targets in women who complete 24 months of follow-up. However, our 32% loss to follow-up rate is very high. We plan to implement automatic scheduling of follow-up studies for BI-RADS 3 lesions at the time of the baseline study, develop a patient-centred educational handout explaining the probably benign assessment category, and re-audit at 24 months post implementation.

CONCLUSIONS: Utilization of the BI-RADS 3 assessment category at our institution is appropriate with 100% sensitivity and a 1.7% cancer yield at 24 months. However, the 32% loss to follow-up rate is very high, and warrants intervention.

66

Positivity Rates of Advanced Imaging Modalities for Assessment of Occult Scaphoid Fractures

Katrin Resch, Sukhvinder Dhillon, Annie Hutchison
University of Alberta

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University-based

BACKGROUND AND AIM: Approximately 80% of scaphoid fractures are detected on initial radiographs. Immobilization and follow up imaging are indicated in patients with ongoing pain to assess for occult fracture. The aim is to assess our current positivity rates for scaphoid fracture using advanced imaging after initial normal radiographs.

AUDIT TARGET: Our positivity rates should be within published range based on a Cochrane review. Lower rates may indicate overutilization. A target of at least 25% positivity was set for CT, MRI, and bone scan. A target of 15% was set for radiographs.

METHODS: 141 consecutive adult patients with suspected scaphoid injury but normal radiographs were reviewed. All follow up studies were assessed for the presence of fractures.

RESULTS: Occult scaphoid fractures were found on 1/46 radiographs (2%), 0/6 CTs, and 4/20 bone scans (20%). Other (non-scaphoid) fractures were found on 2/46 radiographs (4%), 3/6 CTs (50%), and 5/20 bone scans (25%). No patients had MRI.

INTERVENTIONS / ACTION PLAN /DISCUSSION: The ER physician and DI staff on the audit team will discuss and revise the imaging protocols as needed between the two departments.

CONCLUSIONS: Positivity rates were less than the target for scaphoid fracture. However, a significant number of other unexpected fractures were identified. This may explain the clinical decision for follow up imaging. The results suggest follow up imaging has value in identifying occult fractures when investigating for occult scaphoid fracture.

Scientific Poster Abstracts

80

Evaluation of the Adequacy of Requisition Completion for Common Inpatient Imaging Exams at a Tertiary Care Center

Maria Koleva, Gerald Legiehn, Mehran Chitsaz, Rosalin Chiu, Rina Patel
University of British Columbia

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: Radiology Department at a Teaching Tertiary Care Center

BACKGROUND AND AIM: The clinical histories provided on exam requisitions are essential to appropriate protocol selection and image interpretation. We strongly rely on our clinical colleagues to communicate the clinical information and ask a pertinent diagnostic question. The aim of this audit was to grade the adequacy of information provided on imaging study requisitions using both the recently proposed Reason for Exam Imaging Reporting and Data System (RI-RADS) and an analogous subjective score.

AUDIT TARGET: 100% of imaging requisitions should score at least RI-RADS C, 75% at least RI-RADS B and 50% RI-RADS A.

METHODS: 419 inpatient CT, US and radiograph requisitions were collected over 10 consecutive business days and assigned a RI-RADS grade and an analogous subjective score (I-IV) by a third-year radiology resident.

RESULTS: 84% of requisitions were graded RI-RADS C or better, 54% RI-RADS B or better and only 15% RI-RADS A. RI-RADS B was the most common grade overall and the analogous subjective score followed a similar distribution, but was more lenient.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Distribute the results and the RI-RADS framework to the relevant clinical teams and explain why good clinical information is crucial.

CONCLUSIONS: The RI-RADS framework can be used to grade the quality of imaging exam requisitions. The first cycle results showed that only 15% of requisitions had "adequate" clinical information provided. We will repeat the grading process after communicating our results with the clinical teams to see if this will improve the results.

117

Computed Tomography Pulmonary Angiography – Review and Optimization of Current Protocol Parameters

Lauren Kiri, Stephanie Schofield, Lisa Pretty, Daria Manos
Nova Scotia Health, Dalhousie University

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University-based quaternary care centre

BACKGROUND AND AIM: Computed tomography pulmonary angiography (CTPA) relies on complex interactions of protocol parameters, including contrast timing and volume, for visualizing the pulmonary arterial tree. It has been hypothesized our protocol acquires images prematurely, before peak arterial enhancement. This study reviewed current protocol quality and explored effects of adjusting scan trigger delay.

AUDIT TARGET: Main pulmonary artery (MPA) density >300 HU, superior vena cava density (SVC)<MPA density, and complete contrast injection prior to scan trigger.

METHODS: 100 CTPA examinations in non-obese, non-pregnant patients were evaluated for diagnostic enhancement (density at 10 predefined sites), excess precardiac contrast (SVC>MPA density), and incomplete contrast/chaser delivery.

RESULTS: Table 1 outlines findings at each site. A total of 98% of studies demonstrated SVC>MPA density. Incomplete contrast administration was observed in 80% of studies, with incomplete chaser delivery in the remaining cases.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Our CTPA protocol results in excess precardiac contrast and incomplete contrast/chaser administration. We increased the trigger delay by 2 seconds to better accommodate patients with poor cardiac output and evaluated 52 post-intervention CTPA studies. This intervention reduced incomplete contrast delivery to 44% of cases; however, incomplete chaser administration was again observed in all remaining cases. MPA density was not significantly changed, but SVC density remained high (94% of studies demonstrated SVC>MPA density), suggesting patients continue to receive unnecessary contrast.

CONCLUSIONS: Increased trigger delay decreased incomplete contrast injection without deteriorating quality. This study suggests opportunity to decrease contrast volume, decreasing nephrotoxic risk, improving image quality, and enabling healthcare savings.

Scientific Poster Abstracts

135

Re-envisioning On-Call Resident Workflows: Impact on Resident Experience

Ja Ae Kim, Kenneth Mascola, Yoan Kagoma
McMaster University

PRESENTER'S LEVEL OF TRAINING: Resident

PRINCIPAL LOCATION OF AUDIT: University hospital site

BACKGROUND AND AIM: An internal review revealed residents desired more detailed feedback on their on-call reports. Prior studies have shown that information technology (IT) tools such as automated report change comparison can help to facilitate meaningful feedback, motivate residents to compare reports more frequently, and increase satisfaction. Our aim was to minimize barriers to feedback and improve learning experience for on-call residents.

AUDIT TARGET: Improvement in resident satisfaction of on-call report feedback.

METHODS: Graduated changes were made to the on-call workflow based on the A3 problem solving method to determine factors contributing to decreased resident satisfaction on quality of on-call feedback. Changes included workflow reorganization to match the daytime workflow, use of structured report templates, and implementation of automated report comparison function. Anonymous surveys were conducted pre- and post-implementation.

RESULTS: 22 and 15 residents responded to the pre-implementation and 7-weeks post-implementation surveys, respectively. Results were overall positive. 87% of residents agreed that the changes were beneficial to overall call experience and learning. 55% felt they received adequate on-call feedback post-implementation compared to 23% pre-implementation. Post-implementation respondents identified technical barriers as the main limitation to follow-up.

INTERVENTIONS / ACTION PLAN /DISCUSSION: Next steps include addressing the technical barriers and developing an interface for residents to access personalized statistics such as discrepancy rates, turnaround times, and reporting volumes. Re-audit will assess the effectiveness.

CONCLUSIONS: Incorporating IT solutions can improve resident satisfaction on quality of on-call report feedback. Facilitating automated and targeted feedback will be of increased importance as we approach the era of Competency Based Medical Education.

Scientific Poster Abstracts

Radiologist-in-Training Research Project

12

Needle in a Safe Track: Complications in Image-Guided Retroperitoneal Biopsy

Jacob Gordner, Nabil Hawwa, Alexandre Menard
Kingston Health Sciences Centre

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Kingston Health Sciences Centre

OBJECTIVE: The objective of the study was to identify the complication rate associated with image-guided retroperitoneal biopsies, with a secondary purpose of determining timing between procedure and onset of complications to help develop an appropriate post-procedure observation period.

METHODS: We reviewed all image-guided retroperitoneal biopsies performed at our institution from January 2008 to April 2019. All biopsies were performed with the use of either cone-beam CT or ultrasound guidance.

RESULTS / DISCUSSION: A biopsy-related complication occurred in 2 patients (1.5%). Minor complications, defined as vasovagal reaction or bleeding without the need for transfusion occurred in 2 patients (1.5%). Major complications, defined as hemoperitoneum requiring transfusion, colon or other organ puncture, unremitting pain, infection (abscess, peritonitis, etc.), anesthetic reaction or shock, occurred in 0 patients (0%). Patient characteristics did not significantly differ between those who did and did not experience complications in the study.

CONCLUSION: The low minor complication rate and the absence of major complications in our study suggests the post-procedure observation time could be safely reduced.

Scientific Poster Abstracts

13

The Use of Breast Ultrasound in a Newfoundland Cohort

Sarah Hogan, Connie Hapgood
Memorial University of Newfoundland

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Memorial University of Newfoundland

OBJECTIVE: Breast ultrasound should be appropriately indicated 100% of the time.

METHODS: All patients who underwent a breast ultrasound for breast pain at our center from 2016 through 2018 were identified. The results were recorded as normal or abnormal. Variables collected were age, sex, breast lump, nipple discharge, and cancer.

RESULTS / DISCUSSION: 12.8% of breast ultrasounds between 2016 and 2018 were completed for pain, accounting for \$116,200 healthcare dollars. Most patients had no clinical finding associated with their pain (64%). There were no abnormal findings in patients under 20, and only 6.5% of patients between 21 and 30 with no clinical findings had abnormal ultrasounds, none of which were cancer. Palpable lump was a significant predictor of breast cancer ($p=0.002$, $B=-1.373$, $SE=0.472$, $\text{Wald}=8.466$).

These results will be presented to the radiology department to help guide decision making when protocolling ultrasounds for patients with pain.

CONCLUSION: Patients from 17-30 years of age had the lowest rates of abnormal ultrasound, and no cancerous outcomes. These results support prudent use of breast ultrasound for young patients.

27

CT Guided Percutaneous Lung Biopsies in Newfoundland: A Comprehensive Chart Review

Allison Kavanagh, Ning Su, Ravindra Gullipalli
Memorial University of Newfoundland

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Memorial University

OBJECTIVE: The objective of the study is to describe CT guided percutaneous biopsies, pathology findings and survival rates of patients diagnosed with Non Small Cell Lung Cancer (NSCLC) in Eastern Health, the primary tertiary referral health authority for lung biopsies in Newfoundland and Labrador.

METHODS: In total, 1129 adult patients who underwent a CT guided percutaneous biopsy were identified between 2012 and 2016 and their charts were systematically reviewed. All patients were followed retrospectively to 2018. The results were stratified and survival time was calculated for the NSCLC group by stage and by treatment type.

RESULTS / DISCUSSION: Biopsy findings were stratified into categories, including non-diagnostic (2.9%), primary lung malignancy (75%), metastasis (9.8%), infectious/inflammatory disease (4.7%) and normal (7.4%). The primary lung malignancy group was then subdivided into subcategories, in terms of histologic subtypes, and radiologic stages. Overall, surgical intervention seemed to provide the best survival advantage for NSCLC in all stages.

CONCLUSION: This retrospective study explores all CT guided percutaneous lung biopsies completed between 2012 and 2016, and perhaps can serve as a descriptive outlook at the lung malignancy landscape within the province. Limitations to the study include censored data (patients still living by 2018), method of capturing deaths through online medical chart and bias towards earlier stages more likely to present for biopsy.

Scientific Poster Abstracts

31

Multi-parametric MRI Prostate PIRAD Scoring in a District General Hospital: Correlating PIRADS 3 Results with Histological Findings

Jeffrey Tsang, Sarmad Aslam, Ian Bickle, S. Gurhan
Lincoln County Hospital, UK

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Lincoln County Hospital

OBJECTIVE: Our aim is to determine the correlation of PIRADS 3 prostatic lesions with histology proven, clinically significant cancer.

METHODS: We performed a retrospective review on a cohort of 143 consecutive patients. Each patient underwent a mp-MRI scan of their prostate given a PIRADS score. PIRADS 3 lesions were analysed further based on histology and categorised into malignant and non-malignant lesions. PSA results and prostatic volume of PIRADS 3 lesions were also analysed.

RESULTS / DISCUSSION: We identified forty five patients with PIRADS 3 lesions out of 143 patients. Thirty-two patients subsequently underwent trans-rectal/trans-perineal ultrasound guided biopsy. 43% of patients were found to have had a malignant prostatic adenocarcinoma on histology. The remaining 56% had non-malignant findings. Of those with malignant disease, there was a higher median PSA and lower mean prostatic volume.

- Margin of difference between malignant and non-malignant disease is small – hence, supporting/reinforcing the “equivocal” nature of PIRADS 3 lesions
- Small sample size – only forty five patients with PIRADS 3 lesions were analysed
- This was a single centre study and given the wide variation in the literature of the prevalence/likelihood of prostate cancer in biopsied PIRADS 3 lesions, these findings cannot be generalised.
- Patient factors not taken into account e.g. frailty, functional status, past medical history, anticoagulants, risk factors - ? in comparison to other Trusts, do we a higher than average detection rate

CONCLUSION: Ultimately, an ultrasound-guided prostate biopsy in patients with PIRADS 3 remains of paramount importance when distinguishing malignant versus non-malignant lesions. A multicentre data of MRI findings with PIRADS 3 scores is required to yield a sample size large enough to carry out statistical analysis.

34

Quantification of Aortic Valve Calcifications in Patients with Severe Aortic Stenosis Using Cardiac Magnetic Resonance Imaging

Issac Yang¹, Marco Spaziano², Karl Sayegh¹, NicoloPiazza², Josephine Pressacco¹, Giuseppe Martucci², Nadia Giannetti¹, Benoit Gallix^{1,3}, and Matthias G. Friedrich^{1,2}

¹Department of Diagnostic Radiology, McGill University Health Centre, ²Division of Cardiology, Department of Medicine, McGill University Health Centre, ³Institut hospitalo-universitaire(IHU), Institute for Minimally Invasive Hybrid Image-Guided Surgery, Université de Strasbourg

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: McGill University

OBJECTIVE: The poor visualization of cardiovascular calcifications is an important yet under-addressed deficiency of cardiovascular magnetic resonance (CMR) imaging. Previously, CMR using a proton density-weighted, in-phase stack-of-stars (PDIP-SOS) technique was proven to be able to accurately assess and quantify aortoiliac and iliofemoral vascular calcifications. The goal of the present study is to determine if this sequence can be applied to the aortic valve to assess the degree of aortic valve calcifications using CMR.

METHODS: Patients who are undergoing work up for transcatheter aortic valve implantation (TAVI) were sequentially recruited for our study. The volumes of aortic valve calcification on CMR and CT images were analyzed and compared using a semi-automated signal intensity analysis tool from a commercially available software.

RESULTS / DISCUSSION: We prospectively enrolled 17 patients with calcified aortic valve stenosis as identified by echocardiography. There was a very good correlation between CMR and both, CTA measured calcification volume ($r=0.85$, $p<0.001$) and the Agatston score ($r=0.84$, $p<0.001$). Although CMR-derived volumes were numerically lower than those measured by CT (680.8mm³ (208.5 mm³ - 1535.5 mm³) vs. 755.1 mm³ (221.5 mm³ - 1411 mm³), this was not statistically significant ($P=0.23$)).

CONCLUSION: In patients with aortic valve stenosis, the volume of aortic valve calcifications can be quantified by MRI. While MRI systematically underestimates the volumes by about 10%, the results show a very good correlation with the CT calcium volume and the Agatston score. MRI may be an alternative to CT for the assessment of aortic valvular calcification.

Scientific Poster Abstracts

38

Do Selective Citation Practices Exist in the Imaging Diagnostic Accuracy Literature when Accounting for the Nature of Citations?

Marissa Absi^{1,2}, Lee Treanor^{1,2}, Nicholas Fabiano^{1,2}, Zachary Hallgrimson^{1,2}, Robert Alan Frank^{1,2}, Jean-Paul Salameh^{3,4,5}, Sakib Kazi^{1,2}, Anahita Dehmoobad Sharifabadi^{1,2}, Matthew McInnes^{1,3}

¹Division of Radiology, The Ottawa Hospital, ²Faculty of Medicine, University of Ottawa,

³Ottawa Hospital Research Institute, ⁴School of Epidemiology and Public Health, University of Ottawa,

⁵Faculty of Medicine, Queen's University

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: University of Ottawa, Faculty of medicine

OBJECTIVE: To assess the risk of citation bias in imaging DTA research by evaluating whether studies with positive conclusions/titles and supporting or mentioning nature of citation are cited more frequently than those with contradictory nature of citation.

METHODS: MEDLINE was searched for DTA meta-analyses published from January 2005 to April 2016. Primary studies from the meta-analyses were screened; those that assessed the diagnostic accuracy of an imaging test and reported sensitivity and specificity were included. Study topic (modality/subspecialty), study design, sample size, impact factor, publication date, times cited, sensitivity and specificity were extracted for each study. Nature of citations was classified using scite.ai to determine if the citation is supporting or contradicting the study findings. Negative binomial regression analysis was performed to evaluate for association of nature of citation and citation rate (times cited per month since publication).

RESULTS / DISCUSSION: Imaging accuracy study reports with positive conclusions are cited more frequently than those with negative ones, suggesting that selective citation practices persist despite accounting for nature of citations in the imaging literature (Conclusion positivity with 'citation statement positivity rate' = $p < 0.05$).

CONCLUSION: An association persists between diagnostic accuracy studies with positive conclusions and citation rate, when accounting for nature of citation, indicating there is evidence of citation bias in imaging diagnostic accuracy literature. Overestimation of imaging test accuracy may contribute to patient harm from incorrect interpretation of test results.

43

Evaluating the Impact of Peer Review on the Quality of Reporting in Imaging Diagnostic Test Accuracy Research

Sakib Kazi, Robert A Frank, Jean-Paul Salameh, Nicholas Fabiano, Marissa Absi, Alex Pozdnyakov, Nayaar Islam, Daniel Korevaar, Jeremie Cohen, Patrick Bossuyt, Mariska Leeflang, Kelly Cobey, David Moher, Mark Schweitzer, Yves Menu, Michael Patlas, Matthew McInnes
University of Ottawa

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: University of Ottawa

OBJECTIVE: We evaluate whether peer-review of diagnostic test accuracy (DTA) studies submitted to imaging journals is associated with changes in completeness of reporting, transparency for risk of bias assessment, and spin of results.

METHODS: Published articles from: Journal of Magnetic Resonance Imaging (jMRI), Canadian Association of Radiologists Journal (CARJ), European Radiology (EurRad) published before March 31, 2020 were screened consecutively in reverse chronological order to reach >23 articles per journal (sample size required to detect >1 item change). Anonymous initial submission and final published versions of manuscripts were scored independently by two investigators blinded to version. Completeness of reporting was evaluated for adherence to STARD-2015 and STARD-Abstracts guidelines. Transparency of reporting for risk of bias assessment was evaluated based on QUADAS-2. Actual and potential spin were evaluated using published criteria. A one-tailed t-test was performed to compare scores between initial and final versions.

RESULTS / DISCUSSION: 84 studies (jMRI=30, CARJ=23, EurRad=31) were included. Completeness of reporting according the STARD-2015 increased between initial and final versions (average reported items: 16.67 vs 17.47, $P < 0.001$). No difference was found for the reporting of STARD-Abstracts (5.28 vs 5.25, $P = 0.37$), QUADAS-2 (6.08 vs 6.11, $P = 0.43$), actual spin (2.36 vs 2.40, $P = 0.37$) or potential spin (2.93 vs 2.81, $P = 0.11$) items.

CONCLUSION: Peer review is not associated with substantial improvements in reporting of imaging DTA research. Although 'significant', improvement in STARD-2015 reporting was minor (<1 item). Peer review represents an untapped opportunity to improve completeness of reporting.

Scientific Poster Abstracts

57

Assessing T1 Parametric Map Based Analysis in Differentiating Myocardial Tissue Changes in Cardiomyopathies in a Single-Region Patient Population

Kristopher Hoover, Scott Harris
Memorial University of Newfoundland

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: Memorial University of Newfoundland

OBJECTIVE: Cardiac Magnetic Resonance (CMR) parametric maps have shown promise for diagnosis of cardiomyopathies. Due to equipment and population variations, parametric map data has limited generalizability between institutions. This study assessed the capability of T1 parametric map (T1PM) analysis for differentiating the myocardial tissue characteristics present in those with and without myocardial disease within a single-institution regional patient population.

METHODS: T1PM data, age, CMR study indication, and imaging findings were collected from 204 patients. Groupings based on CMR findings were then produced. Findings with fewer than 5 individuals and individuals with multiple findings were excluded. Patients with no CMR findings were grouped ("Normal CMR group"). Additionally, 11 patients without suspected myocardial disease were added to the study ("True Normal group"). Levene's test demonstrated unequal variance among the study groups. Thus, a Welch's one-way test was used to compute for significant differences between the groups. Differences between groups were specified using a Games-Howell post-hoc analysis. Significance was defined using a p-value of 0.05.

RESULTS / DISCUSSION: Significant differences were found between the True Normal (TN) and the Myocardial Infarction (MI) groups ($p=0.02$), TN and Hypertrophic Cardiomyopathy (HCM) groups ($p=0.02$), Suspected Cardiac Sarcoidosis (SCS) and MI groups ($p=0.05$), SCS and HCM groups ($p<0.01$), and Normal CMR and HCM groups ($p=0.01$). No significant difference was determined between the sub-diagnostic hypertrophy or dilated cardiomyopathy groups and any other group.

CONCLUSION: T1PM analysis showed significant differences between patients with no CMR findings and those diagnosed with select cardiomyopathies. This adds evidence that it is a useful tool for diagnosing myocardial disease.

68

LI-RADS US Visualization Score: Interobserver Variability and Correlation with Cause of Liver Disease, Sex, and Body Mass Index

Lauren Kiri, Mohamed Abdolell, Andreu Costa, Valerie Keough, Judy Rowe, Robinette Butt, Sharon. E. Clarke
Nova Scotia Health, Dalhousie University

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Dalhousie University

OBJECTIVE: To evaluate interobserver agreement of Ultrasound Liver Reporting and Data System (US LI-RADS) visualization score and assess for correlation between visualization score and cause of liver disease, sex, and body mass index (BMI).

METHODS: This retrospective, cross-sectional study evaluated 237 HCC surveillance US examinations. Five abdominal radiologists reviewed anonymized examinations and assigned US LI-RADS visualization scores (A, no/minimal limitations; B, moderate limitations; C, severe limitations). Interobserver agreement was assessed with weighted Kappa coefficient. Correlation between visualization score and cause of liver disease, sex, and BMI was evaluated using univariate and multivariate analyses.

RESULTS / DISCUSSION: Average weighted kappa for all raters was 0.51. The majority of radiologists gave visualization scores as follows: C, 30/237 (12.7%) cases; B, 99/237 (41.8%); either B or C, 148/237 (62.4%) cases; A, 89/237 cases (37.6%). Figure 1 shows examples where all radiologists agreed on visualization scores. Multivariate analysis showed visualization scores of B and C were significantly associated with cause of liver disease ($p=0.014$) and BMI ($p<0.001$). Subjects with viral liver disease were 3.32 times (95% CI: 1.44-8.38) more likely to have a score of A than those with non-alcoholic steatohepatitis ($p=0.007$). There was no association between sex and limited visualization ($p=0.521$). The adjusted odds ratio of visualization with no limitations was 0.249 (95% CI: 0.13-0.48) amongst those with BMI $\geq 25 \text{ kg/m}^2$ compared to $<25 \text{ kg/m}^2$.

CONCLUSION: Interobserver agreement for US LI-RADS visualization score was only moderate. The majority of examinations were scored as having moderate or severe limitations, and this was significantly associated with non-alcoholic steatohepatitis and increased BMI.

Scientific Poster Abstracts

70

Prevalence and Severity of Complicated Diverticulitis Among a Canadian Arctic Population

Heba Osman, Javeria Munir, Cynthia Walsh, Michael Saba, Blair Macdonald
University of Ottawa

PRESENTER'S LEVEL OF TRAINING: Fellow

INSTITUTIONAL AFFILIATION: The Ottawa University

OBJECTIVE: Diverticular disease is one of the most frequent bowel emergencies constitutes 3.8 % of causes with acute abdomen presented to the emergency departments. Patients from northern populations deemed to be at high risk for developing unusual severe diverticulitis. Diverticulitis in this population occurs at a younger age with more complications and more morbidity. Fistulizing disease to the bowel with associated pelvic sepsis, abscesses, and perforation leading to bowel resection are common complications. Liver abscess and osteomyelitis are also seen. These conditions should be promptly diagnosed and intensively treated in order to prevent increased morbidity and mortality. Approximately 10 %–25 % of patients with known colonic diverticulosis will have diverticulitis in their lifetime.

METHODS: We reviewed the demographic data, clinical features, CT findings and complications of a cohort of patients who presented with acute diverticulitis from January 2014 to December 2019 and compared that with the literature of patients in North American and international epidemiological references. The CT images are produced using GE medical system (Helical mode manufacture model optima CT660). An axial images, 1.25 slice thickness were obtained with coronal and sagittal reconstruction. A dose of 1.5 mg/ kg intravenous contrast (Omnipaque) may or may not administered. Each study was interpreted by one of the staff radiologists with subspecialty training.

RESULTS / DISCUSSION: A total of 1087 reports were reviewed, from which a 61 patient has the diagnosis of acute diverticulitis. The Minimal age of acute complicated diverticulitis was 23 (Median age is 50 and Maximum is 86). Of the 61 patients, 30(49.2%) have complicated diverticulitis, 26(42.6%) have free or local extraluminal gas, 16 (26.2%) have abscesses, 10(16.4%) have fistulas, 3(4.9%) have bowel obstruction and (1.6%) have liver abscess or osteomyelitis.

CONCLUSION: Our experience over 6 years running a CT scanner in the Canadian Arctic suggests that the spectrum of diverticula disease is more severe and presents at an earlier age compared with North American and International epidemiological references. This may be due to the prevalence of multiple know risk factors and the geographic separation of populations from health services. Further study will be helpful to determine what can be modified to improve outcomes.

74

The Added Value of Cinematic Rendering in Oncology on Clinical Assessment and Patient Management

Khadijah Alhussaini, Abdulaziz Aljohani, Mohammed F Mohammed
Ministry of the national Guard, Health Affairs, Medical Imaging Department

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: King Saud bin Abdulaziz University for Health Sciences, King Abdullah International Medical Research Center, Ministry of the national Guard, Health Affairs, Medical Imaging Department - King Abdulaziz Medical City, Riyadh, Saudi Arabia.

OBJECTIVE: The aim of this study is to assess the role of cinematic rendering (CR) in improving physician's understanding and appreciation of regional anatomy and their opinion regarding its role in improving patient management and education.

METHODS: Cinematic rendered images of 10 oncology cases were generated using (Syngo.Via VB 20, Forchheim, Germany). A survey was sent out to attending physicians. The survey used interval scale type, case specific questions and general questions to assess comprehension of clinical findings as well as subjective opinion on clinical impact of CR on patient care. the answers were evaluated on a 5 point likert scale.

RESULTS / DISCUSSION: 25 attending physicians completed the questionnaire and consisted of radiologists (44%), surgeons (36%) and oncologists (16%) as well as 1 ICU physician. There was an overall positive agreement with the role of cinematic rendering in enhancing patient care. 88% felt the CR would influence the potential surgical approach, 80% agreed that it could accelerate finding a consensus in interdisciplinary case discussions and is helpful with explanations during informed consent. 76% see that it could improve the subjective sense of security management and influence resectability decisions, other applications of CR were less agreed on.

CONCLUSION: CR shows promise in helping with patient management and in surgical procedure planning by providing a better understanding of the anatomy and disease complexity.

It may also aid with informed consent.

Scientific Poster Abstracts

78

Emergency MRI Requests for Cauda Equina Syndrome – A Clinical Audit

Ke Chen¹, Lilyanne Saleh², Laurent Létourneau-Guillon³, François Guilbert³, Emmanuelle Jourdenais³, Daniel Shedid³, Céline Bard³
Université de Montréal

¹Diagnostic Radiology Program, Université de Montréal, ²Diagnostic Radiology Program, University of Toronto,
³Centre Hospitalier de l'Université de Montréal

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Université de Montréal

OBJECTIVE: All patients that presented to our emergency department with symptoms of Cauda Equina Syndrome between January 2017 to January 2018 and September 2019 to September 2020.

METHODS: We collected clinical history, MRI results and therapeutic decision on all patients. Data were collected through our Picture Archiving Communication System (PACS), Radiological Information System (RIS) and Clinical Information System (CIS).

RESULTS / DISCUSSION: The change of practice resulted in a decrease of 69% of annual emergency MRIs requested for suspicion of Cauda Equina Syndrome, while conserving an equivalent rate of detection at imaging and rate of therapeutic intervention when compared to pre-audit data.

Prior to our clinical audit, no indication criteria were available for emergency MRI of patients with suspected Cauda Equina Syndrome (CES). We required our emergency physicians to provide at least one clinical sign or symptom specific to CES. Non-specific clinical presentations such as pain or paresthesia were not accepted.

CONCLUSION: Collaboration with our consultants and implementation of more specific criteria for emergency MRI of Cauda Equina Syndrome lead to optimization of imaging resource.

84

Prostate Artery Embolization: An Audit of the Calgary Experience

Killian Newman, Oliver Halliwell, Ani Mirakhur
University of Calgary

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Calgary, Rockyview General Hospital

OBJECTIVE: To assess prostate artery embolization (PAE) program implementation by comparing validated outcome measures of local cases to published data.

METHODS: An internal audit was performed to identify patients who had undergone prostate artery embolization from January 2014 to January 2020. Inclusion criteria for PAE were chronic lower urinary tract symptoms with moderate to severe symptoms by International Prostate Symptoms Score (IPSS) refractory to medical management, hematuria of prostatic origin, or indwelling catheter (IDC) with suitable arterial anatomy and enlarged prostate $\geq 40\text{mL}$. Major outcomes measures were technical success defined as bilateral embolization, clinical success defined as decrease of one IPSS category at 6 months post-procedure, removal of IDC and cessation of hematuria, and complications. Prostatic volume (PV) was measured on preprocedure CTA and follow-up MR.

RESULTS / DISCUSSION: PAE was performed on 75 patients with 6 re-interventions for 81 cases. Bilateral embolization was achieved in 59/81 and unilateral in 17/81. Clinical success was achieved in 44/81 cases (intention to treat). 4 major and 8 minor complications, significant improvements ($p < 0.05$) in IPSS (21.9 vs 11.4), quality of life score (QoL) (4.6 vs 2.3) and PV (142 vs 108 mL, mean 307 days) with no significant change in erectile function score were demonstrated (15.9 vs 15.7). Average procedure time was 37.2 ± 14.0 min and average kerma area product was $28413 \pm 21154 \mu\text{Gy}\cdot\text{m}^2$.

CONCLUSION: PAE resulted in significant decreases in IPSS, QoL and PV with acceptable technical and clinical outcomes for recent implementation.

Scientific Poster Abstracts

82

Addition of CT to Improve the Diagnostic Confidence for the Detection of Sacroiliac Joint Erosions in Patients with Equivocal MRI Findings

Ibrahim Nadeem, Sohaib Munir, Vincent Leung, Euan Stubbs
McMaster University

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada

OBJECTIVE: To determine if low dose CT can improve the diagnostic confidence for the detection of sacroiliac joint (SIJ) erosions in patients with equivocal MRI findings.

METHODS: A retrospective analysis of adult patients who had a dedicated SIJ MRI from September 2017 to September 2019, and subsequent CT within 12 months, was conducted. Using a 5-point Likert scale, two reviewers evaluated the de-identified MRI and CT images in randomized order and in separate sessions to answer the question: 'Does the patient have SIJ erosions?'. A Fisher's exact test was used to analyze the difference in diagnostic confidence, and intraclass correlation coefficient (ICC) was used to determine interrater reliability.

RESULTS / DISCUSSION: 54 patients were included in the analysis (average age, 43.9 years). The average time interval between initial SIJ MRI and subsequent CT was 14.4 weeks (range, 5.6 to 50.3 weeks). CT resulted in significantly more cases with definitive diagnostic confidence than cases with probable or equivocal confidence compared to MRI ($p<0.001$). Amongst cases with equivocal findings on MRI, 73.2% of cases had definitive diagnoses on CT. There was moderate interrater agreement for MRI, with an ICC of 0.490 [95% CI, 0.258 – 0.669], and excellent agreement for CT, with an ICC of 0.832 [95% CI, 0.728 – 0.899].

CONCLUSION: Overall, CT led to significantly increased diagnostic confidence and higher interrater reliability for the detection of SIJ erosions compared to MRI. Judicious use of CT may be useful in detecting SIJ erosions in patients with equivocal MRI findings.

90

Canadian Assessment of Global Outreach in Diagnostic and Interventional Radiology

Aline D. Khatchikian¹, Baljot Chahal², Jessica L. Dobson³, Alanna Supersad², Louis-Martin Boucher¹

¹ Department of Radiology McGill University, ²Department of Radiology, University of Alberta, ³Department of Radiology, Dalhousie University

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: McGill University

OBJECTIVE: With over half of the world's population lacking access to radiology services, there is a considerable need to improve access to medical imaging in low resource regions. The objectives of this study were to assess the degree of participation, the level of interest, and the perceived barriers for Canadian radiologists and radiology trainees in engaging in global outreach in radiology (GOIR) initiatives.

METHODS: A cross-sectional electronic survey was distributed to Canadian radiologists and radiology trainees through the Canadian Association of Radiologists, the Canadian Association for Interventional Radiology, radiology program administrators, and social media.

RESULTS / DISCUSSION: 104 respondents completed the survey: 37.5% radiology residents (n=39), 4.8% radiology fellows (n=5), and 57.7% staff radiologists (n=60). 36.5% of participants were specialized in interventional radiology. Despite the majority (95.2%) granting importance to GOIR and 54.8% aware of GOIR opportunities, only 14.4% (n=15) had previously participated in such initiatives with organizations like road2IR, Mercy Ships, and RAD-AID. Barriers to participation included a lack of time (79.8%) and information on how to get involved (53.8%). A majority of respondents (75%, n=78) indicated an interest in participating in GOIR in the future (Figure 1) and learning more about the field (92.3%).

CONCLUSION: Among the surveyed Canadian radiologists and radiology trainees, there was marked interest in getting involved in and learning more about GOIR despite a previously low participation rate. This feedback can have important implications for the promotion of future GOIR initiatives.

Scientific Poster Abstracts

93

Prescribing Lumbar Spine Computed Tomography Scans in the Assessment of Low Back Pain: A Practice that Must Be Reviewed

Nedjla Bouhelis, Luc J. Hébert, Vanessa Quinn-Laurin
Laval University

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Laval university

OBJECTIVE: To maintain universal access to care and minimize costs, imaging tests should be ordered only when indicated. Using a database of lumbar spine computed tomography scans (Ls-CTS) performed at our hospital, the aims of this study were to: a. determine the proportion of Ls-CTS requests considered complete, and b. evaluate the proportion of Ls-CTS deemed indicated.

METHODS: This retrospective study included 150 randomly selected Ls-CTS from a database of 1587 scans performed over a one-year period. Each request for Ls-CTS was analyzed; the request was deemed complete when it contained sufficient information allowing to determine if the Ls-CTS request met the American College of Radiology (ACR) and Canadian Association of Radiologists (CAR) prescription criteria. Requests and electronic medical records were analyzed to assess if the Ls-CTS were indicated using the same criteria. Descriptive (proportions) and inferential (Chi-square, Spearman's rank correlation coefficient) statistics were used.

RESULTS / DISCUSSION: Only 29.3% Ls-CTS requests were deemed complete and 40.8% Ls-CTS indicated. There was no difference ($p=0.63$) in the proportion of indicated Ls-CTS prescribed between general practitioners (36.6%) and specialists (54.3%). The proportion of indicated Ls-CTS coming from the emergency department (70.8%) was higher ($p<0.001$) compared to those from outpatients (26.3%). Results also showed a significant relationship ($p<0.001$) between a Ls-CTS prescription deemed indicated and the origin of the request (from emergency department versus outpatients) ($rs=0.43$), and a request deemed complete ($rs=0.77$).

CONCLUSION: These findings indicate that Ls-CTS requests for low back pain are most often incomplete and too often unnecessarily prescribed, a practice that must be reviewed.

97

Non-Invasive Angiographic Results of Surgically or Endovascularly Treated Intracranial Aneurysms: An Inter and Intra-Observer Reliability Study

Anass Benomar¹, Behzad Farzin¹, Robert Fahed², William Boisseau¹, Laurent Létourneau-Guillon¹, Daniela Iancu¹, François Guilbert¹, Daniel Roy¹, Alain Weill¹, Tim Darsaut³, Jean Raymond¹

¹Centre Hospitalier de l'Université de Montréal, ²The Ottawa Hospital - Civic campus,

³Walter C. Mackenzie Health Sciences Centre

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Montreal

OBJECTIVE: Non-invasive angiographic modalities are commonly used to assess the outcome of surgical or endovascular treatments of intracranial aneurysms. A standardized method to report CTA and MRA results that would facilitate comparisons between endovascular and surgical treatments is needed. We sought to assess whether the application of a simple 3-grade classification system could reliably be applied to both CTA and MRA.

METHODS: An electronic portfolio composed of CTAs of 30 clipped and MRAs of 30 coiled aneurysms was independently evaluated by 24 raters of diverse experience and training backgrounds. Twenty raters independently performed a second evaluation one month later. Raters were also asked which follow-up management would be most appropriate for each case. Agreement was analyzed using Krippendorff's Alpha (α_k) statistics, and the relationship between angiographic grade and clinical management choice was assessed using Fisher's exact and Cramer's V tests.

RESULTS / DISCUSSION: In this work, substantial inter-rater agreement was found when MRA was used to assess the results of coiling ($\alpha_k=0.69$, 95%CI, 0.57–0.76), while agreement for the CTA results of clipping was moderate ($\alpha_k=0.59$; 95%CI, 0.44–0.70). Intra-rater agreements varied from substantial to almost perfect. The decision of how to follow-up these patients was strongly correlated to the judged angiographic grade (Cramer's $V=0.77\pm0.14$).

CONCLUSION: A simple 3-grade scale was found to be reliable, which is a step towards being able to compare results when either CTA or MRA are used to assess the angiographic results of surgical or endovascular treatment of aneurysms.

Scientific Poster Abstracts

101

Diagnostic Performance of Ultrasound in Patients with Pancreatic Ductal Adenocarcinoma: A Multi-Centered Population-Based Observational Study

Jessie Kang, Mohamed Abdolell, Andreu Costa
Dalhousie University

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Dalhousie University

OBJECTIVE: To evaluate the performance of ultrasound (US) in diagnosing patients with pancreatic ductal adenocarcinoma (PDAC) in our region.

METHODS: Patients diagnosed with PDAC between 2014-15 were identified by Cancer Registry data. Their US Requisitions, images and reports were reviewed independently by a radiology resident and abdominal radiologist and finalized in consensus. Examinations were excluded if a pancreatic lesion was known at the time of US.

The following data elements were extracted: clinical suspicion of PDAC; comment on image quality; detection of tumor; location; size; detection of secondary signs and liver metastases; suspicion of neoplasm raised and follow-up recommendations. US were graded as true positive, indeterminate or false negative. One-way ANOVA and chi-square tests were performed according to these subgroups.

RESULTS / DISCUSSION: 113 US examinations on 107 patients (53 men, 54 women; mean 70 +/- 13 years) were included. Cancer was suspected clinically in 49 patients. 35/113 (31.0%) examinations commented on image quality, however only 49/113 (43.4%) visualized the tumor. There were 50 true positives, 40 indeterminates and 23 false negatives. There was no difference in age, weight, tumor location or size across subgroups. However, sex distribution, clinical suspicion of PDAC, comment on US quality, visualization of tumor, detection of secondary signs and liver metastases were significantly different ($p<0.005$). The number of examinations reporting suspicion of neoplasm or recommending follow-up also varied significantly ($p<0.0001$).

CONCLUSION: Assessment of PDAC with US is unreliable in our region, with a large proportion of indeterminate and false negative studies. These results have important implications for radiologists reporting US and referring physicians relying on US for patient work-up.

103

Complications of Balloon Retention Radiologically Inserted Gastrostomy Tube Insertion: A Retrospective Single-Center Study

Abdullah Alenezi, Neeral Patel, Khaled Almohaimede, Ganesh Annamalai
University of Toronto

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Toronto

OBJECTIVE: To evaluate rate and types of complications post balloon retention radiologically inserted gastrostomy tube (BR-RIG) which are commonly inserted for a wide variety of disorders.

METHODS: Research ethics board approved a retrospective review of patients who underwent BR-RIG insertion at our center between January 1st, 2019, and December 31, 2019. Electronic patient records were reviewed for patient demographics, gastrostomy indication and post-procedural complications on discharge or follow-up. Picture archiving and communication system was reviewed for technical success (defined as intragastric position of the tube at the end of procedure), total fluoroscopy time and complications on follow-up imaging. Post-procedural complications were classified according to the Society of Interventional Radiology (SIR) adverse event guidelines.

RESULTS / DISCUSSION: Study cohort consisted of 340 patients of median age 62 years ± 13.8 (240 male, 100 female). Indication was head and neck cancer in 243/340 (71.4%) with remaining patients had impaired swallowing (neurological disorder, aspiration risk, esophageal strictures and malnutrition) 97/340 (28.5%). Gastropexy was used in only 35/340 (10.3%) of patients. Average fluoroscopy time was 2.2 mins. Successful BR-RIG insertion at first attempt was achieved in 329/340 (96.7%). Minor complications were seen in 109/340 (32%) and major complications in 9/340 (2.6%). Major complications included peritonitis 2/342 (0.6%) and intrabdominal abscess 7/340 (2%). All intrabdominal abscesses were managed by percutaneous drain. One patient with peritonitis had laparoscopic exploration that revealed a displaced gastrostomy tube due to burst balloon without collection or colonic perforation.

CONCLUSION: This study demonstrates a low rate of major complications in patients undergoing BR-RIG insertion.

Scientific Poster Abstracts

109

Utility of the 2-Hour Radiograph in the Prevention of Delayed Post-Discharge Pneumothorax Following Lung Biopsy

Elton Law, Mirek Mychajlowycz, Abdullah Alabousi, Oleg Mironov
Department of Radiology, McMaster University, St. Joseph's Healthcare

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: McMaster University

OBJECTIVE: All patients received a chest radiograph 1-hour post lung biopsy to exclude a significant pneumothorax. The objective of this study is to evaluate the utility of an additional radiograph performed 2-hours post biopsy following resumption of normal activity for the prevention of delayed post-discharge pneumothorax.

METHODS: All CT-guided lung biopsies performed at our institution from January 1, 2017 - April 30, 2020 were reviewed. Cases were excluded if a pneumothorax was detected on intra-procedural imaging. All included patients received a 1-hour post-biopsy radiograph (1HR). Some patients received 2-hour radiography (2HR) if they had a negative 1HR study.

RESULTS / DISCUSSION: A total of 900 cases were included in the analysis. The 1HR group had 782 cases, while the 2HR group had 118 cases. A post-biopsy pneumothorax was detected in 81 cases, 74 (91%) were detected in the 1HR group, 31 of which required a chest tube. Seven (9%) cases of pneumothorax were seen only in the 2HR group, with 4 (57%) requiring a chest tube. Nine post-discharge pneumothoraces occurred in the 1HR group; these were detected a median of 86 hours (range 23-193) post-discharge. Of these, 5 (56%) required a chest tube. No post-discharge pneumothorax was found in the 2HR group.

CONCLUSION: An additional radiograph at 2-hours post lung biopsy, following an hour of normal activity, identified additional pneumothoraces and prevented delayed post-discharge pneumothoraces.

121

The Added-Value of Ultrasound Shear Wave Elastography (SWE) in Assessing Solid Breast Masses: Our Initial Experience

Reem Al Mazrouai, Abdullah Alabousi, Faten Al-Douri, Boylan Colm
Department of Radiology, McMaster University, St. Joseph's Healthcare

PRESENTER'S LEVEL OF TRAINING: Fellow

INSTITUTIONAL AFFILIATION: Department of Radiology, McMaster University, St. Joseph's Healthcare, Hamilton, ON, Canada

OBJECTIVE: To evaluate the added-value of shear-wave elastography (SWE) in the ultrasound assessment of solid breast masses in differentiating between benign and malignant lesions. A secondary aim was to determine an optimal cut-off value for mean elasticity (Em) for differentiating malignant and benign lesions.

METHODS: Patients who underwent breast ultrasound with SWE at our institution from January-September 2020 were reviewed. Patients were included if histopathological correlation was available and/or imaging stability over 2 years was established. The ultrasound characteristics and quantitative SWE parameters were compared.

RESULTS / DISCUSSION: One hundred and thirty-two women (mean age: 53.9 years; range, 23-84) with 136 breast lesions were included. Of these, 31 (22.8%) lesions were malignant and 105 were benign (77.2%). For the benign lesions, 29 were confirmed with histopathology, while the remaining 76 showed imaging stability for 2 years. The average Em of malignant lesions (84.4 kPa) was significantly higher than that of benign lesions (22.6 kPa) ($P < 0.001$). Using an Em with a cut-off value at 40 kPa showed sensitivity of 87.1 %, specificity of 84.8% and accuracy of 85.29%. Using this cut-off value, the PPV was 62.8% and the NPV was 95.7%. Out of the biopsy-proven benign masses (29 lesions), 6 lesions demonstrated Em greater than 40 kPa; thus 23 (79.3%) unnecessary biopsies could have been prevented.

CONCLUSION: The utilization of SWE parameters may improve the diagnostic accuracy of breast ultrasound in distinguishing benign and malignant lesions and may help reduce unnecessary biopsies.

Scientific Poster Abstracts

124

Use of Radial Access Sheaths for Transfemoral Neuroendovascular Procedures in Children

Winston Ha, Adam A Dmytriw, Suzanne Bickford, Afsaneh Amiradabi, Venessa Rea, Prakash Muthusami
Neuroradiology & Interventional Radiology, the Hospital for Sick Children, University of Toronto

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: SickKids Hospital

OBJECTIVE: Pediatric neuroendovascular procedures require special considerations. Given small vessel sizes, risk for arterial injury must be weighed against use of larger devices -- sheath diameter being a known association with arterial complications. We recently transitioned to using thin-walled radial sheaths for transfemoral angiography in children, given their lower profile. Here, we report on these sheaths' success and complications, comparing against a historical cohort where regular vascular sheaths were employed to determine the feasibility of using radial-sheaths in children.

METHODS: We retrospectively recorded patient and procedural data from 168 consecutive procedures from September 2017 to January 2019 when radial-specific sheaths were exclusively used at our tertiary pediatric hospital. These results were compared to data from September 2015 to January 2017, when regular vascular sheaths were exclusively used in 152 consecutive procedures. Statistical analysis was performed using unpaired t-test or Chi-square test, with $p<0.05$ considered statistically significant.

RESULTS / DISCUSSION: Patient characteristics were not statistically different between the case and control group. No significant differences were found in the procedural data except heparin use which was higher in the radial-sheath cohort. There was a decrease in the rate of complications in the case group (1.2%) versus control group (2.6%), though not statistically different.

CONCLUSION: Radial-specific sheaths have numerous beneficial characteristics that make them well-suited to the pediatric population. In our study, we show that radial sheaths are equally effective and safe perioperatively. Follow up research may show if radial sheaths used transfemorally decreases long term complications such as limb-length discrepancy and mortality.

126

An Assessment of Transfer Learning in Automated Identification of Vertebral Fractures Using Convolutional Neural Networks

Steven Reda
University of Manitoba

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: University of Manitoba

OBJECTIVE: Transfer learning is a common technique to address the limitations of small medical image datasets in deep learning models. This study was performed to assess the effect of transfer learning on the capability of convolutional neural network (CNN) artificial intelligence models to detect vertebral fractures.

METHODS: A base CNN was trained using a dataset of 7287 single energy dual X-ray absorptiometry (DXA) vertebral fracture assessment (VFA) scans obtained from General Electric (GE) brand scanners. A dataset of 1901 VFAs from the Hologic brand scanners were then used to fine-tune the base CNN. The images in these datasets were labelled as having a fracture or no fracture by expert clinicians.

RESULTS / DISCUSSION: The fine-tuned CNN was tested with Hologic images and showed an AUC of 0.744, sensitivity of 39.5% (95% CI 36.2 - 42.8) and specificity of 90.0% (95% CI 88.0 - 92.0), which is a significant improvement over a model trained from scratch using the same dataset of Hologic images (AUC 0.543).

CONCLUSION: The results demonstrate that transfer learning has improved CNN performance for detecting vertebral fractures.

Scientific Poster Abstracts

130

Rate of Recommendation for MRI Follow-Up Post Musculoskeletal Shoulder Ultrasound: A Benchmarking Study

Scott Wong, Baljot Chahal, Sukhvinder Dhillon
University of Alberta

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: University of Alberta

OBJECTIVE: The purpose of this study was to establish an initial benchmark rate of recommendation for follow-up MRI post musculoskeletal shoulder ultrasound in a community clinic.

METHODS: Musculoskeletal ultrasound (MSKUS) imaging reports from April 30 - June 29, 2018 were consecutively reviewed. All reports were issued by fellowship-trained MSK staff. Ultrasound reports mentioning shoulders were included in the dataset. Ultrasound-guided procedure reports were excluded, and studies examining both shoulders were separated. Case reports were reviewed and parsed based on referral source, recommendation for MRI follow-up, fellowship trainee involvement, and indications for MRI recommendation.

RESULTS / DISCUSSION: One thousand reports were reviewed, and 350 were eligible for inclusion. A total of 6.0% (21/350) underwent subsequent follow-up shoulder MRI. MSK Staff recommended MRI follow-up in 8.2% of their cases (16/195). Fellow-led cases recommended follow-up in 3.2% of their cases (5/155). We hypothesize differences in MRI recommendation between fellow-led cases and Staff may be due to level of experience and case mix. Indications for MRI follow-up included: further rotator cuff evaluation (n=5), poor visualization (n=6), evaluate internal derangement (n=5), post-vaccination pain (n=1), soft-tissue mass (n=1), non-rotator cuff muscular injury (n=1), and unexpected trauma/fracture evaluation (n=2). The majority of referrals were General Practitioners 70.9% (248/350).

CONCLUSION: To our knowledge, this is the first study to examine rates of recommendation for MRI post MSKUS examination in a community setting. We have provided an initial benchmark with the hope that further research is performed to establish benchmarks to guide best practice.

139

Implementation of an Artificial Intelligence Chest X-Ray Disease Prediction System in the Radiological Education of Medical Students: A Pilot Study

Lan Dao, Sabrina Harmouch, Anne Chin, Tien Dao, Carl Chartrand-Lefebvre, Joseph Paul Cohen
University of Montreal

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: University of Montreal

OBJECTIVE: We aimed to evaluate the feasibility of implementing Chester, a novel web-based chest X-ray (CXR) interpretation artificial intelligence (AI) tool, in the medical education curriculum and explore its effect on the diagnostic performance of undergraduate medical students.

METHODS: Third-year trainees were randomized in experimental (N=16) and control (N=16) groups and stratified for age, gender, confidence in CXR interpretation, and prior experience. Participants filled a pre-intervention survey, a test exam (Exam1), a final exam (Exam2), and a post-intervention survey. The experimental group was allowed to use Chester during Exam1. All participants were forbidden from using any resource during Exam2. The diagnostic interpretation of a fellowship-trained chest radiologist was used as standard of reference. Chester's performance on Exam1 was 60%. A five-point Likert scale was used to measure students' self-assessed confidence before/after the exams as well as Chester's perceived usefulness and friendliness.

RESULTS / DISCUSSION: The experimental group's mean performance was 72.1% for Exam1 and 76.7% for Exam2, while the control group's was 68.8% and 78.3% respectively. On a scale of 1 (lowest) to 5 (highest), the experimental group's pre-test mean confidence was 2.3 and post-test, 3.2, while the control group's were 2.1 and 3.2 respectively. The experimental group rated Chester's usefulness at 3.7, its convenience at 4.25, and their likelihood to reuse it at 4.1. Further statistical analyses are in progress.

CONCLUSION: Our results highlight the interest of medical students in using AI tools as educational resource and their feasible implementation. A larger scale study still is warranted to assess its effect on interpretation performance.

Scientific Poster Abstracts

141

Sociodemographic and Geographic Factors Associated with Obstetrical Ultrasound Imaging Utilization: A Population-Based Study

Scott Adams¹, Shenzhen Yao², Prosanta Mondal³, Hyun Lim³, Paul Babyn¹

¹Department of Medical Imaging, University of Saskatchewan, ²Health Quality Council of Saskatchewan, ³Department of Community Health and Epidemiology, University of Saskatchewan

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: Department of Medical Imaging, University of Saskatchewan

OBJECTIVE: Obstetrical ultrasound imaging is an important part of prenatal care, though not all patients have readily available access to ultrasound services. This study aimed to identify sociodemographic and geographic factors associated with (1) having a second trimester complete obstetrical ultrasound, considered standard of care and (2) overall obstetrical ultrasound utilization.

METHODS: All pregnancies and obstetrical ultrasound exams performed from 2014-2018 in Saskatchewan, Canada were identified from provincial databases. Multivariate logistic and Poisson regression analyses were performed to identify variables associated with having a second trimester ultrasound and overall obstetrical ultrasound utilization, respectively.

RESULTS / DISCUSSION: A second trimester ultrasound was performed in 50,180 (87.7%) of 57,186 pregnancies carried to ≥ 23 weeks. Maternal age (adjusted odds ratio [aOR]=1.05 for each 1 year increment; 95% confidence interval [CI]: 1.04-1.06, p-value<0.0001) and income (aOR=2.43 for highest vs. lowest quintile; 95% CI: 1.98-2.99, p-value<0.0001) were independently associated with having a second trimester ultrasound. Registered Indian status (aOR=0.31; 95% CI: 0.27-0.35, p-value<0.0001), rural residence (aOR=0.56; 95% CI: 0.48-0.66, p-value<0.0001), and geographic remoteness (aOR=0.29 for greatest vs. least remoteness level; 95% CI: 0.21-0.41, p-value<0.0001) were associated with decreased odds of having a second trimester ultrasound. Poisson regression analysis showed that the same factors (except rural residence) were associated with overall obstetrical ultrasound utilization.

CONCLUSION: Findings suggest the need for radiology leaders to develop targeted approaches to ensure equitable access to obstetrical ultrasound for specific demographic groups, including patients in remote communities and Indigenous peoples, potentially through culturally-safe protocols, sonographer recruitment and retention, remote imaging technologies, and increased collaboration with referring clinicians.

144

Are Additional Coils Necessary for Flow Diversion in Giant and Paraophthalmic Aneurysms? A Systematic Review

Hang Yu¹, Khunsa Faiz¹, Sudharsana Rao Ande¹, Janice Linton¹, Zul Kaderali¹, Timo Krings², Jai Shankar¹

¹University of Manitoba, ²University of Toronto

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Manitoba

OBJECTIVE: There is limited data regarding the use of flow diverters (FD) in treating giant or paraophthalmic aneurysms and whether adjunctive coiling improves outcomes. The purpose of this systematic review was to evaluate the efficacy of using FDs with and without coiling for the treatment of intracranial aneurysms, especially in giant paraophthalmic aneurysms.

METHODS: A comprehensive search in Ovid MEDLINE and EMBASE was done. Two independent screeners evaluated the studies for patient and aneurysm characteristics, procedural details including success rate and complications, and follow-up imaging and clinical outcomes.

RESULTS / DISCUSSION: Of the original 289 articles, nine studies were eligible for inclusion. All were observational studies with five retrospective and four prospective. There were 318 patients with 318 aneurysms. Procedure-related mortality rate was 3.5% (11/318). Six months occlusion rate was 79.7% (149/187), 83.3% (5/6) for giant aneurysms, and 100% (8/8) for paraophthalmic aneurysms. There was no significant difference in occlusion rate in FD alone vs. FD with coils (RR: 0.99; 95% CI: 0.82-1.19; I²: 0%; p = 0.90) at six months. There did not seem to be a difference in morbidity, mortality, or clinical outcomes between FD alone and FD with coils. Limitations included the small number of studies, the heterogeneous study populations and types of aneurysm treated, and the significant heterogeneity in reporting outcomes and follow-up data.

CONCLUSION: Flow diverters alone are an effective way to treat giant and paraophthalmic aneurysms. The use of FD with coils was not shown to be superior to the use of FD alone.

Scientific Poster Abstracts

147

Research on Research: How Many Radiology Resident Research Day Projects Go on to CAR Presentation?

Martin Matusczak, David Leswick, Sarah Melendez
University of Saskatchewan

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Saskatchewan Department of Medical Imaging

OBJECTIVE: To determine how many radiology research projects presented at internal program research days across Canada go on to be presentation at the Canadian Association of Radiologists' (CAR) annual scientific meeting and if presentation at CAR is associated with increased rates of publication.

METHODS: A previously generated database of radiology resident research day presentations and publication status from 2012-2017 at seven Canadian radiology programs was utilized. Each presenting resident was searched in the CAR annual meeting programs from 2011-2019 and presentations by those residents were recorded. Data included presentation numbers, dates, and titles. Correlation with the resident research day presentations including publication status was then performed. Descriptive statistical analysis and calculation of likelihood ratios was performed.

RESULTS / DISCUSSION: From the 7 included residency programs, 208 residents presented 296 projects at internal research days. 93 of the 208 residents had a total of 195 presentations at CAR (mean 0.94 +/- 1.9 SD). 36/296 (12%) research day projects were presented at a CAR annual meeting of which 18/36 (50%) were published. 260 research day projects were not presented at CAR of which 83/260 (32%) were published. Presenting research day project at CAR was associated with an increased rate of publication (OR 2.19:1 p = 0.03). There was no significant association between presentation of other projects at CAR and publication of a research day project (p=0.28).

CONCLUSION: Although only 12% of resident research day presentations are presented at CAR, presentation at CAR is associated with an increased rate of individual research day project publication.

149

Radiographic Measurement of Ablative Margin as a Marker of Treatment Response After Locoregional Therapy for Hepatocellular Carcinoma in Patients Undergoing Liver Transplantation

Nancy Jiang, Anuradha Shenoy-Bhangle, Aamir Ali, Jesse Wei, Komal Manzoor, Ammar Sarwar
Department of Radiology, Beth Israel Deaconess Medical Center and Harvard Medical School

PRESENTER'S LEVEL OF TRAINING: Fellow

INSTITUTIONAL AFFILIATION: Beth Israel Deaconess Medical Center

OBJECTIVE: Treatment response to locoregional therapy may be evaluated using the LI-RADS LR-TR algorithm. Measurement of inadequate treatment margins may be an objective and reproducible marker for tumor recurrence. This study assessed the effect of treatment margins on histologically diagnosed residual tumor after liver transplantation.

METHODS: We reviewed multiphasic MR (n=80)/CT (n=40) performed within 1 month after thermal ablation or TACE for 120 consecutive liver transplant patients treated between 2000 to 2018, LR-TR response was determined by 3 independent readers. The ablative margin was defined as the difference between the maximum pre-treatment tumor diameter and minimal post-treatment cavity diameter. The primary outcome was complete pathological necrosis (CPN) on explant livers. Ablation location relative to the tumor was assessed for treatment adequacy. Area under the curve (AUC) analysis was performed to determine the cut-off for treatment margin.

RESULTS / DISCUSSION: In total, 120 patients (100 male, mean age 59.0 years) were analyzed. Of these, 57 (47.5%) patients had recurrence on explant liver and 63 (52.5%) achieved CPN. The mean wait time from post-treatment imaging to transplant is 10.1 months (ranges: 0.2-25.9 months). There are 102 cases in LR-TR non-viable, 9 in LR-TR equivocal, 3 in LR-TR viable, and 6 with insufficient data (AUC=0.43; 95% CI: 0.52-0.73, p=0.22). The mean treatment margin is 0.5 cm (Range: -2.8 to 3.1cm) A safety margin of >6 mm, was most predictive of CPN (AUC=0.63; 95% CI: 0.51-0.72, p=0.032). The sensitivity, specificity, and positive and negative predictive values of an insufficient treatment margin for predicting CPN were 53.2%, 71.0%, 67.4%, and 58.3%, respectively.

CONCLUSION: A treatment margin of > 6 mm on imaging is a fair predictive of achieving CPN in HCC after locoregional therapy and may be a useful ancillary feature in LR-TR algorithm.

Scientific Poster Abstracts

157

Factors Predictive of Publication of Original Research Abstracts Presented at the Canadian Association of Radiologists Scientific Meeting

Aida Ahrari¹, Aazad Abbas¹, Tali Fedorovsky¹, Rajesh Bhayana²

¹Temerty Faculty of Medicine, University of Toronto, ²Joint Department of Medical Imaging, University of Toronto

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: Joint Department of Medical Imaging, University of Toronto

OBJECTIVE: To determine factors predictive of publication of original research abstracts presented at the Canadian Association of Radiologists (CAR) Annual Scientific Meeting.

METHODS: Original research abstracts presented at the 2014-2017 CAR meetings were reviewed. The variables extracted included conference category, institution, country of origin, number of authors, subject category, study type, research methodology, and inclusion of human subject-based data. To identify full-text publication, PubMed and Google Scholar were searched from January 1, 2014 to December 31, 2020. Multivariate logistic regression analysis was done to assess association of extracted variables and full-text publication. Multiple models were tested to determine the variable configuration that generated the minimum Akaike Information Criterion with highest predictive accuracy.

RESULTS / DISCUSSION: A total of 163 abstracts were screened, of which 89 (54.6%) went on to full text publication. The majority of abstracts were published in CAR Journal (30.3%). The median impact factor of published abstracts was 1.63. Conference category was the sole variable predictive of future publication ($\chi^2 = 34.9$, $P < 0.05$). Odds ratios of publication by conference category, reported with 95% confidence interval (CI), include 1.06 for scientific exhibits [95% CI: 0.66, 1.70], 0.28 for clinical audits [95% CI: 0.12, 0.57], and 4.09 for radiologists in training [95% CI: 2.20, 8.32].

CONCLUSION: Conference category was the only factor predictive of publication. Authors should not be discouraged from submitting their work to journals based on these factors.

160

Appropriateness of Screening Breast MRI Use

Anne-Marie Brisson, May Lynn Quan, Yuan Xu, Shiying Kong
University of Calgary

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Calgary

OBJECTIVE: Breast MRI has become an essential component of breast imaging but its role in breast cancer screening remains debated and accessibility is limited. This study sought to determine the appropriateness of screening breast MRI use at our institution and establish patient and physician factors associated with inappropriateness.

METHODS: Retrospective cohort study of all patients who underwent a screening breast MRI at our center in 2017. The clinical indications of each study were dichotomized in "appropriate" or "inappropriate" based on the CAR guidelines. Ordering physicians specialty and several patient factors were collected from electronic medical records and administrative databases. Univariate and multivariable analyses were performed to assess the association between patient and physician factors and appropriateness of MRI use.

RESULTS / DISCUSSION: Amongst all 280 screening breast MRIs, 66 (24%) were deemed inappropriate. Patient factors including younger age and prior history of breast cancer as well as physician specialty were independently associated with inappropriateness. Compared with general practitioners (GP), geneticists were more likely to order MRI appropriately. Although not statistically significant, the odds of ordering inappropriate MRI were higher in medical and radiation oncologists, nurse practitioners, and surgeons.

CONCLUSION: This study suggests that younger age, prior history of breast cancer and physician speciality play a role in inappropriateness of screening breast MRI utilization. The variability in breast cancer risk assessment calculators and conflicting international guidelines could contribute to suboptimal use of resources. Awareness of these contributing factors should lead to targeted intervention to improve utilization of screening MRI.

Scientific Poster Abstracts

163

If You Build It, Will They Come Faster? The Effects of Opening a New Emergency Department with an in Department CT on CT Efficiency

Adam Frost, Joanna Smith, Prosanta Mondal, David Leswick
University of Saskatchewan

PRESENTER'S LEVEL OF TRAINING: Resident

INSTITUTIONAL AFFILIATION: University of Saskatchewan

OBJECTIVE: Examine efficiency of CT scanning for emergency department (ED) patients before and after the opening of a new emergency department including a dedicated CT scanner within.

METHODS: The new ED opened on September 29, 2019. All emergency department CT scans from August 1 through November 30, 2019 were assessed including time from (1) order entry to start of CT study, (2) order entry to study completion, (3) order entry to preliminary or final report, and (4) start of scan to preliminary or final report. Overall as well as daytime, evening, and overnight time periods were assessed. Wilcoxon non-parametric test was used to compare those times between before and after ED opening.

RESULTS / DISCUSSION: 2,389 scans were examined (1,082 prior and 1,307 post ED opening). Overall mean order to study begin time decreased by 18% after the ED opening (67.8 ± 71.2 minutes vs 82.4 ± 83.0 minutes, $p < 0.001$), while mean time to study completion decreased by 17% (80.5 ± 73.2 minutes vs 94.1 ± 83.8 minutes, $p < 0.001$). There was no significant difference in time from study order to preliminary report or final reports before and after JPCH opening.

Also to be presented: (1) time from CT scan to reports, (2) detailed results for daytime, evening, and overnight scans, and (3) subset analysis on stroke and trauma scans.

CONCLUSION: Opening an ED with a dedicated CT scanner did reduce turnaround time of CT scans, although there was no significant effect on efficiency of reporting.

Scientific Poster Abstracts

Scientific Research Project

20

Radiology and Anatomy Knowledge Among Medical Students in a Problem-Based Learning Curriculum

Danielle Walker¹, Natasha Larocque¹, Senthujan Gunaseelan¹, Sherif Ramadan², Crystal Fong¹, Vincent Leung¹, Stefanie Lee¹

¹Department of Radiology, McMaster University, ²Department of Health Sciences, McMaster University

PRESENTER'S LEVEL OF TRAINING: Medical Student

INSTITUTIONAL AFFILIATION: McMaster University

OBJECTIVE: Until recently, no formal undergraduate radiology curriculum has existed at McMaster University. We performed an assessment of the radiology knowledge of the last graduating class who received no formal radiology teaching. This data will serve as a baseline to gauge the longitudinal impact of a new curriculum, which includes a partnership with the Anatomy Department to improve the teaching of radiologic anatomy.

METHODS: A 50-question multiple-choice quiz was administered to graduating medical students covering the topics of radiologic anatomy, imaging interpretation and appropriate imaging ordering. The validated questions were obtained through an international database provided by the Alliance of Medical Student Educators in Radiology (AMSER). The web-based platform used to create/administer the quiz (Radiology ExamWeb) provides detailed statistical analysis on each question; as such, scores of McMaster students could be compared to international results.

RESULTS / DISCUSSION: A total of 172(83.5%) McMaster students completed the quiz. The mean score for McMaster students was 64.5% vs. 72.8% (international average) ($p=0.02$). McMaster students had lower scores on the radiologic anatomy (61.0% vs. 79.1%; $p=0.01$) and imaging interpretation (51.7% vs. 67.4%; $p=0.04$) sections. There was no difference between the groups on the questions involving appropriate imaging ordering (73.8% vs. 71.8%; $p=0.71$).

CONCLUSION: This study noted deficiencies in the knowledge of McMaster graduates in the areas of radiologic anatomy and image interpretation. Based on our quiz findings and feedback from student partners, our new curricular initiatives will focus on strengthening these areas. This includes new integrated Radiology-Anatomy lectures that thus far have been well received based on student

26

Value of Low Dose CT Chest Versus Chest Radiograph in Evaluating Cases of Empyema

Yasmine Sallam, Jaron Chong, Narinder Paul, Mohamed Abdelrazek

London Health Sciences Centre, Schulich School of Medicine & Dentistry, Western University

OBJECTIVE: Evaluate role of low-voltage lung computed tomographic(CT)scans versus conventional chest radiography(CXR)in follow up of empyema treated with chest tube and TPA.

METHODS: We searched our PACS database for patients from 20 to 80 years with clinical diagnosis of empyema that was treated with chest tube placement and TPA, between August 2018 and August 2020. Fifty patients receiving both chest scan with low-voltage(low dose)CT and CXR were enrolled in this study.

RESULTS: Our cohort of 50 patients that underwent CXR and low dose CT(LDCT)showed that CT was effective to guide management of empyema. In six patients, LDCT showed isolated pockets that were not reachable by chest tube, precisely determining location and size. Additional chest tubes were inserted in new pockets, successfully draining them.

In 10 patients, LDCT revealed no remaining pockets despite persistent opacities on CXR, this was explained by persistent atelectasis/consolidation. In one patient the right diaphragm was elevated and misinterpreted as persistent basal pocket on CXR.

In 4 patients, CT confirmed different intrathoracic pathologies that were not depicted on CXR like new pericarditis/pericardial effusion and mediastinal abscess.

Clinical improvement was observed in the rest of the patients, supported by CXR.This is confirmed by LDCT expediting tube removal and reducing hospital stay.

CONCLUSION: LDCT can play important role in managing hospitalized patients for empyema as superior to CXR without significantly increasing radiation dose. CXR is not always sufficient to assess the changes during treatment, justifying the slight increase in dose with LDCT

Scientific Poster Abstracts

42

Improving Eligible Patient Identification and Program Enrollment for Organized Enhanced High Risk Breast Screening In Ontario

Ingrid Ambus, Jessica Wilson, Petrina Causer
North York General Hospital

OBJECTIVE: To determine if collaboration between Diagnostic Imaging (DI) and Genetics identified additional women and increased enrollment in our institution's High-Risk Ontario Breast Screening Program (HR-OBSP).

METHODS: With patient consent, genetics was notified about those eligible for HR-OBSP assessment by DI. The most responsible physician (MRP) was contacted, communicating their patient was eligible for HR-OBSP assessment. To determine how successful the initiative was, we evaluated the following: notifications sent from genetics to the MRPs; genetic referrals sent back from the MRPs to genetics; genetic assessments performed in this referred group; patients eligible for the HR-OBSP from genetic assessments; patients assessed as eligible for genetic testing; patients positive for a genetic mutation; eligible HR-OBSP patients over 2 time periods, before and after the initiative (May 1, 2018 to February 28, 2019 and May 1, 2019 to February 28, 2020).

RESULTS: 217 notifications were sent to the MRPs, from 6270 screening mammograms. 129 (59%) genetic referrals were received and 76 (59%) were assessed. 11 (14%) were eligible for HR-OBSP, accounting for 6.5% of all eligible HR-OBSP assessments performed during that time. 29 (38%) of these patients assessed were eligible for genetic testing. 3 patients tested positive for a cancer-causing gene mutation (BRCA1, BRCA1, BRIP1). The number of OBSP referrals increased by 20% and the number of eligible patients increased by 14% from the same time the previous year.

CONCLUSION: This initiative increased MRPs awareness and the number of high-risk women with access to the HR-OBSP, and identified women and families with high-risk cancer gene mutations.

48

Diagnostic Accuracy of Rapid MR with Compressed Sensing for Diagnosis of Occult Hip Fracture

Catherine Harnois, Anna Marie Sorensen, Kenneth Lee, Andrew B. Ross
Department of Radiology, University of Wisconsin School of Medicine and Public Health

OBJECTIVE: To describe implementation and assess diagnostic accuracy of a Rapid MR protocol with compressed sensing for emergency department patients with suspected occult hip fracture.

METHODS: Following IRB approval, a retrospective search identified all patients aged 65 and over presenting to the Emergency Department between April 2018 and October 2020 with suspected hip fracture and negative radiographs who underwent a 5-minute rapid MRI protocol. Data collected included radiograph results, MRI results, treatment plan and disposition. Diagnostic accuracy of rapid MRI was assessed using 30-day clinical and imaging follow up.

RESULTS: 129 emergency encounters met our inclusion criteria. Radiographically occult, proximal femur fractures were diagnosed on rapid MR in 16 patients (12%) and further divided into femoral neck fractures (8; 6%), intertrochanteric fractures (7; 5%) and subtrochanteric fracture (1; 1%). The most common diagnoses made on rapid MR protocol were soft tissue injuries (47/129; 36%) and pelvic fractures (28/129; 22%). 12 patients (9%) required surgical management and a total of 78 patients were admitted (61%) to an inpatient ward. 37 patients (29%) had no acute injury on rapid MR and were subsequently discharged home. Of the 101 patients with clinical follow up, none had a missed fracture.

CONCLUSION: A rapid MR protocol is accurate in the diagnosis of occult fractures and soft tissue injuries that may be missed with conventional imaging. Implementing such a protocol in the emergency setting may expedite diagnosis and management leading to improved patient outcomes.

Scientific Poster Abstracts

55

Random Neural Network Features in Patients with Multiple Sclerosis

Gerd Melkus, Milad Hamwi, Simon Thebault, Lisa Walker, Santanu Chakraborty, Carlos Torres, Mark S. Freedman, Richard I. Aviv

The Ottawa Hospital Research Institute, University of Ottawa

OBJECTIVE: We used graph theory to examine longitudinal correlation between cortical health & function and cortical covariance network parameters in multiple sclerosis patients receiving autologous stem cell transplant, building on previous work in this field.

METHODS: We use voxel-based structural similarity determined from T1-weighted MRI scans of 23 patients followed over 3 years to compute cortical covariance network parameters using graph theory. We examined the strength and significance of associations between network measures of cortical integration (path length, lambda) or segregation (clustering) and biochemical/clinical measures of cortical health (NAA/Cr ratio, neurofilament (NfL), brain atrophy) or function (2-second PASAT) using Spearman correlation coefficients. $P<0.05$ was considered significant.

RESULTS: Path length increase was associated with markers of greater inflammation ($\beta=0.56, P<.046$) at baseline and reduced Naa/Cr ratio ($P<.041$) at 12 months. Reduced lambda was associated with markers of greater grey matter atrophy ($\beta=0.55, P<.019$) after 12 months and lower cognition ($\beta=0.56, P<.008$) at 12 months. Reduced clustering was associated with higher NfL ($\beta=-0.68, P<.010$) at baseline, greater white matter atrophy ($\beta=0.62, P<.006$) after 12 months, lower PASAT performance ($\beta=0.56, P<.011$) at baseline, and reduced Naa/Cr ratio ($P<.001$) at 12 months.

CONCLUSION: Reduced cortical integration and segregation (i.e. random network features) co-occur with unfavourable markers of cortical health and function in patients with multiple sclerosis receiving autologous stem cell transplant. Network features show promise as important longitudinal markers of both patient status and progression.

56

Assessment of Abdominal Computed Tomography (CT) Features in Predicting Hepatic Cirrhosis with Histopathologic Correlation

Julian Rubino¹, Christian van der Pol², Reza Nasirzadeh¹, Andrew Chung¹

¹Kingston Health Sciences Centre, Queen's University, ²Juravinski Hospital and Cancer Centre, McMaster University

OBJECTIVE: To retrospectively compare computed tomography (CT) signs of hepatic cirrhosis.

METHODS: All patients who had abdominal CT (non-contrast, portal venous phase contrast, and/or arterial phase contrast) performed <3 months prior to liver parenchymal biopsy at the Kingston Health Sciences Centre between 2008-2020 were identified from the electronic medical record. CT images were evaluated by a fellowship-trained abdominal radiologist, blinded to histopathology and history. Qualitative and quantitative imaging features of cirrhosis were assessed. Qualitative variables included hepatic surface nodularity, parenchymal heterogeneity, notch sign, lobar redistribution, expanded gallbladder fossa, and enlarged interlobar fissure. Quantitative variables included hilar periportal space, caudate-right lobe ratio, modified caudate-right lobe ratio, quadrate lobe diameter, and falciform space width. Chi square test was performed to compare qualitative variables, and multivariable logistic regression and receiver-operator characteristic (ROC) analysis were conducted for quantitative variables with cut point calculated using Youden's method.

RESULTS: 26 of 98 patients had cirrhosis. Qualitative features associated with cirrhosis included hepatic surface nodularity ($p<0.0001$), hepatic parenchymal heterogeneity ($p<0.0002$), lobar redistribution ($p<0.0001$), and an expanded gallbladder fossa ($p<0.0009$). There were no statistically significant differences for quantitative variables ($p>0.05$). Area under the curve from ROC analysis, which included all of the quantitative variables, was 0.65. Sensitivity and specificity for diagnosing hepatic cirrhosis was 96.2% and 34.7%, respectively.

CONCLUSION: Several qualitative CT features are associated with hepatic cirrhosis. Quantitative indicators, which are often more time-consuming to obtain, had no significant association for the same cohort and likely either have weak or no association.

Scientific Poster Abstracts

79

The Effect of Patient Preparation Selection on Rectal Distention and Image Quality in Prostate MRI

Lesley Latham, Signy Holmes, Iain Kirkpatrick

Department of Radiology, University of Manitoba

OBJECTIVE: To compare two patient preparations for prostate MRI (low residue diet vs. sodium phosphate enema) with respect to rectal distention and diffusion weighted image (DWI) quality.

METHODS: Consecutive patients were retrospectively studied at two academic prostate MR imaging centres, one of which uses a low residue diet bowel preparation and the other which uses sodium phosphate (Fleet) enemas. Exams were excluded if the preparation was not completed or if pelvic metal was present which would confound DWI assessment. All scans were reviewed by two investigators. Rectal distention was assessed using maximal anteroposterior and transverse measurements through the level of the prostate, as well as a five point Likert scale. DWI quality was scored using a five point Likert scale. Weighted Cohen's Kappa was performed to assess inter-rater agreement. Ordinal and continuous variables were compared using the Mann-Whitney U test and independent sample t-test respectively.

RESULTS: A total of 100 prostate exams per group were included in the analysis. Agreement between the reviewers for ordinal variables was substantial (wKappa values 0.78-0.86). There was no significant difference in rectal distention between the preparation groups (scaled volume assessment $p = 0.128$; area of greatest distention $p = 0.620$). There was no significant difference between groups for the scaled quality assessment of the diffusion weighted images ($p = 0.43$).

CONCLUSION: Neither patient preparation is superior with regard to rectal distention or DWI quality. It thus may be preferable for patients to follow the low residue diet as the better tolerated alternative.

99

Does the Denver Screening Protocol Reduce the Use of CT Angiography in Blunt Cerebrovascular Injury?

Mitchell Wagner, Imaan Hussein, Gavin Low, Rob Ashforth, Karim Samji

University of Alberta

OBJECTIVE: To retrospectively assess CT angiography (CTA) studies of the head and neck for suspected blunt cerebrovascular injury (BCVI) to determine which iteration of the Denver criteria (Original, Modified, or Expanded) is best to reduce unnecessary CTA imaging.

METHODS: After gaining REB approval, a retrospective chart review of 447 consecutive patients undergoing emergency CTA at two large central teaching hospitals, between January 2016 and June 2020, was performed. Studies were reviewed for the presence of risk factors from each of the Denver criteria iterations. We excluded cases with insufficient clinical or diagnostic information to allow accurate classification. Specificity, sensitivity, and predictive values were calculated. A two-sided Fisher exact test was used to evaluate the association between each iteration of the Denver criteria and BCVI.

RESULTS: The specificities of the Original, Modified, and Expanded Denver criteria were 43.58%, 34.32%, and 24.85% respectively. The positive predictive values (PPV) followed a different trend, with the Original, Modified, and Expanded Denver having PPV values of 2.77%, 3.06%, and 2.78% respectively. Sensitivity and negative predictive values (NPV) were found to be 100% for each criterion set. The Fisher exact test revealed a statistically significant association between BCVI and being positive for an Original Denver criterion ($p=0.021$, $n=443$), but not for the Modified ($p=0.100$, $n=345$) or Expanded Denver criteria ($p=0.202$, $n=333$).

CONCLUSION: Use of the modified and expanded Denver criteria leads to the overuse of cerebrovascular imaging on patients suffering blunt force trauma.

Scientific Poster Abstracts

108

Effects of kVp-pair Levels on Image Quality and Radiation Dose in Dual-source Dual-energy Computed Tomography Pulmonary Angiogram

Parmiss Mojtabaie¹, Siobhan O'Neill¹, James Hethay², Sophia Gardezy, Shu Min Yu¹, Savvas Nicolaou¹, Nicolas Murray¹

¹Radiology department, Vancouver General Hospital, University of British Columbia,

² University of British Columbia

OBJECTIVE: Dual-energy CT pulmonary angiogram (DE-CTPA) has gained wide interest in assessment of patients with clinical suspicion of PE however, optimal imaging parameters have not been defined. The purpose of this study was to compare radiation dose, objective and subjective image quality of dual-source DE-CTPA and lung perfusion map images obtained at four kVp combinations.

METHODS: This IRB-approved retrospective study examined DE-CTPA images acquired in the Emergency Department with one of four different kV pairings over a period of 300 days. 30 examinations were randomly selected from each acquisition group: 90/Sn150 kVp, 80/Sn150 kVp, 70/Sn150 kVp and 80/Sn140 kVp. Two radiologists, blinded to the CT parameters and patient specifics, evaluated the image quality of CTPA and lung perfusion maps using 5- and 3-point scale, retrospectively (higher score represented better quality). Attenuation of the PA was measured, and the radiation dose of the exam was recorded.

RESULTS: Lung perfusion maps derived from DE-CTPA at 90/Sn150 and 80/Sn 140 kVp yielded significantly higher quality (mean score: 2.4, p= 0.0027 and 0.0022) compared to 70/Sn150 kVp (1.4). However, perfusion map at 80/ Sn150 kVp (1.8) demonstrated no significant differences in quality compared to others. Similarly, no significant differences were detected in image quality of the DE-CTPA, PA attenuation or radiation dose among the four groups.

CONCLUSION: Imaging at 90/Sn150 and 80/Sn140 kVp provided best quality perfusion maps obtained from the DE-CTPA with no increase in radiation dose.

110

Fertility and Pregnancy Outcomes Following Uterine Artery Embolization

Alina Abbasi³, Malory Ross³, Sheryl Choo^{2,3}, Rob Gratton^{2,3}, Daniele Wiseman^{1,3}

³Department of Radiology, ²Department of Obstetrics and Gynaecology,

³Schulich School of Medicine and Dentistry, Western University

OBJECTIVE: To conduct a prospective study of fertility, pregnancy outcomes and complications following uterine artery embolization (UAE) for leiomyoma, arteriovenous malformation (AVM), and postpartum hemorrhage (PPH).

METHODS: The radiology database at London Health Sciences Centre was used to identify women who underwent UAE from 2011 to 2019. Prospective analysis of medical records identified subsequent pregnancies. Maternal characteristics and time since UAE were documented. Primary outcomes assessed were adverse pregnancy events. Background pregnancy and adverse event rates were calculated.

RESULTS: We identified 291 women who underwent UAE. Of those women, 18 pregnancies were identified from 11 patients (4 for leiomyomas, 4 for PPH, and 3 for AVM). Average maternal age at pregnancy completion was 31 years. The average gestational age at delivery for pregnancies continuing beyond the first trimester was 38 weeks 1 day, including two preterm births. Three pregnancies were electively terminated, and 2 ended in spontaneous abortion. Of the 11 remaining pregnancies born at term, mean interval from UAE to pregnancy completion was 42.7 months. Of these pregnancies, 36.4% were delivered by Caesarean section and 18.2% required peripartum hysterectomy. Fetal growth restriction occurred in two cases. Placental abnormalities were identified in 27% of the cases. No cases of maternal or neonatal mortality.

CONCLUSION: Patients undergoing UAE for benign gynaecological conditions should be informed of the risks regarding subsequent pregnancies. There may be an increased risk of utero-placental complications and peripartum hysterectomy. Interventional radiologists should address patients' desire for future pregnancies and inform them of potential fetal and placental abnormalities requiring increased surveillance.

Scientific Poster Abstracts

142

Arteriographic Standing Waves, The Key to the Mystery of “The Oldest Unexplained Problem in Physics”, The Cause of Turbulent Flow

Gavin Hamilton

Department of Medical Imaging (ret.), Western University

OBJECTIVE: To explore the biophysics behind arteriographic standing waves and related simple harmonic (SH) shear waves and the influence of the physics of SH sound in these waves and their effects. Also to examine the role of these fluid shear waves and related transverse SH amplified sound in producing the phenomenon of transition to turbulence.

METHODS:

1. Examine an example of a radiograph of SH arteriographic standing waves
2. Compare these waves with other fluid shear waves and waves produced by SH standing wave sound.
3. Examine freeze-frame stop-action turbulent efflux jets from Cooke arteriogram needles to determine the characteristics that cause efflux jets to change from a shiny bar-of-glass appearance in laminar flow to a frosted glass appearance in turbulence.
4. To research the literature to account for other SH shear waves and SH sound waves to find interconnections in physical cause.

RESULTS:

1. SH boundary layer oscillations (T-S waves) create SH transverse sound
2. In cylinders T-S waves are circumferential and the SH sound is trapped and amplified transversely.
3. Turbulent efflux jets from arteriogram needles in 1973 experiments in the photography department of Westminster Hospital showed simple harmonic rifled rotation suggesting the onset of cylinder turbulence induced axial rotation, an unrecognized phenomenon not documented again until 2010.
4. Nikuradse found transverse organized flows in turbulence in tubes with geometric cross-sections – a streaming flow from each mid-wall flanked by counter-rotating vortices, a signature flow pattern created by SH sound and ultrasound sources (which would be boundary layer T-S waves).
5. The isovelocity profile changes from parabolic shape to a flattened form as turbulence onsets.
6. In small calibre vessels blood cells are displaced away from the walls, with blood cells interlocking the laminae (Fahraeus-Lindqvist effect), with a flattening of the isovelocity profile.

CONCLUSION:

1. In cylinders, the SH axial rotation of the flow column in turbulence would prevent Nikuradse's 1930 technology from detecting transverse flows in cylinders.
2. In 1980, it was proposed that SH flow-generated transverse sound froze laminae, flattening the iso-velocity profiler. SH transverse sound produced Nikuradse-type centripetal radial flows in the plane of the disc-shaped flat iso-velocity profile, which collided in mid-stream, then recirculated back to the flow origins, encircling counter-rotating vortices.
3. In 2003, Faisst's Dissertation at Marburg-Lahn showed images of recurring flow patterns resembling those proposed in 1980, but they lacked the specific flow origins and courses suggested in 1980.
4. The reason Faisst (and subsequent researchers) failed to show Nikuradse patterns was the computerized transverse tomographic images were not freeze-frame. The axial rotation of the turbulent flow column interfered with accurate imaging of flow origins and caused overlapping of adjacent vortices, resulting in double-egg-yolk appearances (instead of two separate vortices) when there are more than three flow divisions.

Scientific Poster Abstracts

164

Université de Montréal Department of Radiology, Radiation Oncology and Nuclear Medicine Intramural Grant and Scholarship Program – Follow-up and Impact, 2012–2018

Vincent Truong, William Tanguay, Mathieu Dehaes, François Harel, Eve-Lyne Marchand, Cynthia Ménard, Alexandre Cengarle-Samak, An Tang, Jean-Paul Bahary, Gilles Soulez, Philip Wong, Carl Chartrand-Lefebvre

Université de Montréal Department of Radiology, Radiation Oncology and Nuclear Medicine

OBJECTIVE: To evaluate the scientific impact of our academic department grant and scholarship program and its leveraging impact to secure additional funds.

METHODS: Data were collected through grant reports completed by faculty who received funding from 2012–2018. Journal impact factors (IF) were obtained from the 2017 Journal Citation Reports.

RESULTS: Grant reports were available for 80 out of 99 grants (81%) funding 76 projects, for a total funding of \$345,572 (average of \$4,547 per project). Fifty-five publications were generated; 34 (45%) projects were followed by at least 1 publication. On average, the cost per publication was \$6,283 and journal impact factor was 3.4. The projects generated 117 presentations, of which 40 (34%) were international presentations. Eighteen projects (24%) subsequently led to \$6,431,662 in leveraging grants (19:1 ratio).

The program was also used to support summer students. A follow-up was available for 47 medical student summer scholarships out of 89 (53%), funding mostly research (41 projects). Thirty-four publications were generated. About half (51%) of projects led to at least 1 publication. The average impact factor by publication was 3.9. These projects led to 49 presentations, of which 20 (41%) were presented at international conferences. Three projects leveraged \$891,965 in additional funds.

CONCLUSION: The publication rate (45% for grants and 51% for scholarships) and substantial funding leveraged through this intramural academic grant and scholarship program should be highlighted in a future fundraising campaign.

Educational Exhibit Abstracts

9

The Black Hole: Imaging Spectrum of Pulmonary Cysts and Cavities

Mallory Granholm, Omar Alwahbi, , Abdullah Alabousi, Ehsan Haider

Department of Radiology, St. Joseph's Healthcare System, McMaster University

LEARNING OBJECTIVES: This exhibit will briefly review the definitions for and the spectrum of pulmonary cysts and cavities, as well as the radiographic and computed tomography findings of a variety of common and rare cystic and cavitary lung pathologies in adults. Some of these entities include pulmonary hydatid disease, Birt-Hogg-Dubé syndrome, lymphangioleiomyomatosis, vanishing lung syndrome, tracheobronchial papillomatosis, and pulmonary adenocarcinoma. For each entity, etiologies, clinical features, as well as common and uncommon multimodality imaging manifestations will be reviewed. Specifically, we will demonstrate the combined clinical and radiological features that helped make each diagnosis, with a focus on the radiological features that differentiate the diagnoses from each other (diagnostic pearls), including morphology and distribution, as appropriate. Differential considerations, as well as pitfalls and mimics, will also be reviewed.

BACKGROUND: Cystic and cavitary pulmonary pathologies constitute a spectrum of diverse disorders, which can cause clinical and radiological diagnostic dilemmas. Specific diseases within these categories are represented by a spectrum of both inherited and acquired pathologies. A multidisciplinary approach is required to reach a diagnosis, in which symptomatology and clinical history are key components. However, awareness of common and uncommon imaging features is invaluable as imaging plays a central role in diagnosis, as well as directing appropriate and timely management/follow-up.

CONCLUSION: A comprehensive understanding of both cystic and cavitary pulmonary pathologies strengthens the value of radiology in the multidisciplinary task of diagnosing these various diseases, which helps to guide appropriate and timely management for these patients.

15

BIRADS 3 Challenges and Pitfalls – To Follow or Not to Follow

Yen Zhi Tang, Randeep Khosla, Abdullah Alabousi

Department of Radiology, St Joseph's Healthcare Hamilton, McMaster University

LEARNING OBJECTIVES:

1. Identify common and uncommon lesions for which BIRADS 3 category can be attributed safely in Mammography, Ultrasound & MRI.
2. Identify features that can upgrade or downgrade the BIRADS category.
3. Recognize pitfalls and challenges involved in decision making with regards to BIRADS 3 lesions.

BACKGROUND: A finding placed in the BIRADS 3 category should have less than a 2% risk of malignancy. Such a finding is not expected to change over the follow-up interval, but it is nevertheless followed-up to establish its stability. While this category is often used to help reduce patient anxiety and reduce the rate of biopsies, there is much variability in the manner in which it is applied. Additionally, there are a number of complex cases that make it challenging to uniformly apply this category. Our aim is to explore common and uncommon scenarios for which BIRADS 3 can be used to maintain a balance between judicious use of the resources and avoiding harm to the patients.

CONCLUSION: Better understanding and application of the BIRADS 3 category by the radiologist is key to unlocking significant savings in terms of resources and most importantly mitigating unnecessary anxiety for patients in the long run.

Educational Exhibit Abstracts

16

CLOSE-ing the Gap in Identifying Sinus Anatomical Variants in Pre-operative Reporting for Sinus Surgery

Alexander Wong¹, Jordan Kavanaugh^{1,2}

¹Faculty of Medicine, Dalhousie Medicine New Brunswick, ²Department of Diagnostic Imaging, DMNB, Dalhousie University

LEARNING OBJECTIVES:

1. Review normal anatomy of sinus computed tomography (CT).
2. Educate the reader on the anatomical landmarks and normal variants seen on pre-operative sinus CTs which put the patient at increased risk for potential surgical complications.
3. Present the CLOSE checklist as a helpful guide to recall and describe these anatomical landmarks, thereby reducing the risk of surgical complications.

BACKGROUND: Chronic rhinosinusitis affects approximately 5% of the population in Canada and is associated with significant negative impact on quality of life, disability, and decreased productivity. While endoscopic sinus surgery is typically a very successful treatment, anatomical abnormalities of the paranasal sinuses and skull base have been associated with increased risk of surgical complications. The CLOSE checklist (Cribiform Plate, Lamina Papyracea, Onodi Cell, Sphenoid Sinus, Ethmoid Artery) lists 5 key anatomical abnormalities critical for identification on preoperative CT before sinus surgery.

CONCLUSION: In this exhibit, the major goals are to help readers become familiar with the CLOSE checklist, and be able to use it as a guide in recognizing anatomical variants in the paranasal sinuses on preoperative CT. Accurate and consistent identification of the 5 key anatomical abnormalities listed in the checklist will help the radiologist make comprehensive reports, and contribute to safer endoscopic sinus surgeries for patients.

17

Thinking Beyond Malignancy: Unusual Diseases of the Breast

Devang Odedra, Prasaanthan Gopee-Ramanan, Faten Al-Douri, Colm Boylan, Abdullah Alabousi
Department of Radiology, St. Joseph's Healthcare Hamilton, McMaster University

LEARNING OBJECTIVES:

1. To demonstrate scenarios when radiologists should consider uncommon diagnoses in breast imaging
2. To review the imaging appearances of some unusual pathologies pertaining to the nipple-areola complex, breast tissue and breast implants across various modalities
3. To provide some pearls and pitfalls to help recognize or consider some of the uncommon breast pathologies

BACKGROUND: A significant focus in breast radiology is typically on the detection and diagnosis of ductal and lobular carcinomas. However, the radiologist should also recognize and be familiar with situations where unusual and uncommon diagnoses should be considered in the differential. This exhibit will outline such scenarios with the aid of illustrative real-life, pathology-proven cases.

CONCLUSION: It is important for radiologists to be familiar with some of the less common pathologies of the breast world, as they may be able to play a significant role in helping make the correct diagnosis. In fact, the radiologist will in many cases be the first to suggest some of these unusual entities.

Educational Exhibit Abstracts

18

Computed Tomography Urography Made Easy - A Case-based Review

Ishaq Al Salmi¹, Suad Al Duwaiki¹, Mostafa Alabousi², Abdullah Alabousi², Ehsan Haider²

¹Seeb, Muscat/OM, ²McMaster University

LEARNING OBJECTIVES:

1. Normal Anatomy in CT urography
2. Common diseases encountered in CT urography
3. Uncommon diseases which may be encountered in CT urography

BACKGROUND: CT urography is commonly performed for patients with haematuria and patients with congenital anomalies of the urinary tract. It is a non-invasive technique for evaluating the urinary tract with good accuracy. Radiologists should be aware of the normal anatomy, common and uncommon diseases which could be encountered during their practice. This educational exhibit provides a simple case based review of different CT urography pathologies.

CONCLUSION: By the end of this educational exhibit, the radiologist would be competent on interpreting CT urography examinations and it would broaden their differential diagnosis to consider the less frequently forgotten conditions.

19

One Ring to Rule Them All: A Review of Vascular Rings with a Focus on Anatomy, Imaging Findings, and Embryology

Abtin Jafroodifar, Anand Majmudar, Ravikumar Hanumaiah

Department of Radiology, SUNY Upstate Medical University

LEARNING OBJECTIVES:

1. To simplify the imaging pattern of vascular rings by reviewing the important anatomy and exploring the multimodality approach to evaluating rings, with a focus imaging technique and imaging clues to look for, including identifying the 3D's (dimple, diverticulum, and descending aorta contralateral to the arch).
2. To explore a variety of patient cases that include different vascular rings configurations will be highlighted, including pulmonary slings.
3. To categorize rings in an easy-to-follow table format with their most common imaging findings and associations. Relevant embryological origin of the rings (Edward's Theory) (1,2) will be reviewed.

BACKGROUND: Vascular rings are anatomical variants of the aortic arch leading to variable extrinsic compression of the trachea and/or esophagus causing a variety of presenting symptoms. Vascular rings often present a diagnostic dilemma for new trainees due to their variable radiological presentation and their inconsistency from the expected anatomy that is most commonly displayed in reference material and taught in medical school. It's important for new trainees to recognize vascular configurations using a multimodality approach and identify the confusing variant entity.

CONCLUSION: Undoubtedly, vascular rings are often confusing to new trainees because of the variety of arrangements that they can present with and their odd-appearing deviation from the expected anatomy that is taught in medical school. Although daunting, it is important for new trainees to be familiar with the different imaging findings. We aim to ease the stress associated with this topic by reviewing the anatomy using a multimodality approach, presenting interesting patient cases, understanding the relevant embryology, and simplifying the diagnostic approach with the hope that trainees can be better equipped to make a reasonable diagnosis.

Educational Exhibit Abstracts

28

The Status of Diversity in Canadian Radiology – Where We Stand and What Can We Do About It

Kiana Lebel¹, Elizabeth Hillier², Lucy B Spalluto³, Wan Wan Yap⁴, Kiera Keglowitsch², Kathryn Darras⁴, Charlotte Yong-Hing⁴

¹University of Sherbrooke, ²University of Alberta, ³University of Vanderbilt,

⁴University of British Columbia

LEARNING OBJECTIVES:

1. Review the current data on gender in the Canadian field of radiology
2. Review the current data on race in the Canadian field of radiology
3. Review the current data on indigenous representation in the Canadian field of radiology
4. Review proposed solutions and strategies to increase diversity in the Canadian field of radiology

BACKGROUND: Radiology has been identified as one of the medical fields with the least gender, racial, and ethnic diversity. Despite the demonstrated benefits of gender and race diversity in medicine, including innovation, empathy and improved patient outcomes, diversity in radiology in Canada is still lacking.

Many solutions for national associations and radiology departments to improve diversity (gender, racial and indigenous) have been proposed.

CONCLUSION: Canadian radiology lacks diversity and inclusion in recruitment, leadership, remuneration, and representation. While attention has been placed on the positive changes made within the medical field, the ongoing diversity inequity in radiology must be reconciled. Canadian medical schools have successfully made gender equity a priority. Faculties of Medicine across the country have put out statements of equity, diversity, and inclusion, and have created strategic plans that include diversity hire targets and task forces to counter systemic gender and racial inequities. Radiology can follow this example. Mentorship programs, updated promotion merit metrics, addressing bias, understanding barriers, and offering earlier exposure to women and visible minority students in undergraduate medical education curricula are suggested steps that can be taken by radiology departments to increase diversity amongst applicants selecting, staying and thriving in radiology in Canada.

33

Premedication for Contrast Reactions: Much Ado About What Exactly? A Brief Overview and Analysis

Fanny Morin-Roy, Julie Robillard, Donato Terrone, Stephanie Tan, Matthieu Picard, Magali Pham
Université Laval

LEARNING OBJECTIVES:

1. To understand the concept of allergic-like reactions to contrast and rationale behind prophylaxis.
2. To analyze the historical landmark premedication protocol studies.
3. To review to most recent literature on contrast media reaction prophylaxis.
4. To present current premedication guidelines from around the world.

BACKGROUND: Allergy to contrast media (iodinated or gadolinium) is in essence a misnomer, as a true allergy to contrast is extremely rare and should first be proven by clinical testing. Therefore, it should be considered a type of hypersensitivity reaction, which can be immediate or delayed, and for which the value of premedication remains unclear. Premedication protocols were initially conceived for ionic hyperosmolar iodinated contrast media (HOCM) and were published in two landmark studies by Greenberger (1981) and Lasser (1987).

CONCLUSION: These premedication regimens are still being used today despite the fact that HOCM have been completely replaced by non-ionic low/iso-osmolar iodinated contrast media (LOCM) and that its use for gadolinium was never tested. The literature supporting the use of premedication for LOCM remains weak and there is little data showing its efficacy to prevent breakthrough reactions, delayed reactions, and moderate to severe reactions in high-risk patients. The American College of Radiology (ACR) and the Canadian Association of Radiology (CAR), along with many other medical associations, recommend corticosteroid premedication with or without an antihistamine for at-risk patients. However, the European Society of Urogenital Radiology (ESUR) no longer recommends such prophylaxis in their latest guidelines. It is evident that with evolving knowledge on contrast media reactions, the advice of an Allergy specialist has become essential in improving patient care, as they can help guide Radiologists to better manage high-risk patients and to offer safe access to contrast-enhanced diagnostic studies.

Adverse reactions to contrast do occur, but there is a clear lack of strong evidence supporting premedication protocols and Radiologists must remain cognizant of this fact. Prophylaxis does not protect against breakthrough reactions, delayed reactions, nor moderate to severe reactions in high-risk patients.

Educational Exhibit Abstracts

40

Chronic Thromboembolic Pulmonary Hypertension (CTEPH): Pearls and Pitfalls

Yasmine Sallam, Golmehr Sistani, Mohamed Abdelrazek
London Health Science Center

LEARNING OBJECTIVES:

1. Understand the role of various non-invasive imaging modalities in CTEPH diagnosis with specific emphasis on CT pulmonary angiography.
2. Review imaging findings of CTEPH using a case-based review.
3. Review treatment options and the role imaging can play in directing appropriate treatment.

BACKGROUND: CTEPH is subgroup of pulmonary hypertension that usually develop following massive/repeated PE. It is caused by chronic arterial occlusion due to incomplete thrombus resolution. Ventilation/perfusion scintigraphy is used in initial assessment due to low cost. Despite high sensitivity, alternative causes of mismatched defects(e.g. tumors) make CT important in establishing diagnosis. CTEPH remains underdiagnosed in many situations due to nonspecific symptoms and sometimes due to lack of disease awareness by physicians. Poor prognosis without treatment makes early diagnosis essential for management.

CONCLUSION: CTEPH is a debilitating underdiagnosed disease entity. We aim to enhance knowledge of the imaging modalities, their strengths and limitations and imaging features essential for a prompt diagnosis and appropriate management.

44

What's Wrong with this BMD Picture?

Steven Burrell
Department of Diagnostic Imaging, QEII Health Sciences Centre & Dalhousie University

LEARNING OBJECTIVES:

1. Review Bone Mineral Density (BMD) images in a variety of cases for unexpected findings, either involving the bone being assessed or other structures in the field-of-view.
2. Understand how these unexpected findings influence the determination of fracture risk, the key output of a BMD assessment.
3. Review a variety of unrelated medical conditions which can be revealed on BMD images.

BACKGROUND: BMD plays an important role in fracture risk assessment. Sometimes other medical conditions, which may not be known, are revealed on the “non-diagnostic” images obtained with BMD, and are often overlooked by radiologists. These findings may influence the assessment of bone density or of fracture risk.

This educational exhibit reviews 12 such BMD cases with interesting findings on the images, along with correlation with other imaging modalities. Some findings are common, others rare. Some are obvious, others are more subtle.

CONCLUSION: Although often overlooked, BMD images sometimes contain important information which may impact patient management. Reporting Radiologists should be aware of the importance of reviewing the images and should have knowledge of the scope of findings which may be revealed.

Educational Exhibit Abstracts

45

Osteoporotic Fractures of the Spine: What ALL Radiologists Need to Know

Steven Burrell

Department of Diagnostic Imaging, QEII Health Sciences Centre & Dalhousie University

LEARNING OBJECTIVES:

1. Understand the importance of osteoporotic fractures of the spine, including relevance to future fracture prediction.
2. Understand what imaging features denote an osteoporotic vertebral fracture.
3. Review the important roles of radiologists in reporting vertebral fractures.

BACKGROUND: Osteoporotic (“fragility”) fractures of the spine are a major healthcare issue, resulting in substantial morbidity and mortality. Vertebral fragility fractures predict future fractures, offering a key opportunity to intervene, and yet they are a “weak link” in fracture prediction and prevention. Only about half of incidentally present vertebral fractures are reported by radiologists. Conversely, radiologists frequently overcall minor compressions which are not fragility fractures, leading to inappropriate patient management.

CONCLUSION: Osteoporotic vertebral fractures are routinely encountered by radiologists, yet there is underappreciation of their importance and some uncertainty in how to assess and report them. This educational exhibit addresses this knowledge gap, with emphasis on the 2 main radiologic approaches to determining if there has been a true spine fracture, the Genant Semi-Quantitative Method (GSQ), and the modified Algorithm-Based Qualitative (mABQ) approach.

50

Artificial Intelligence Basics for Radiologists

Sarah Mohn, John Zijie Zhu, Maria Koleva, Nicolas Murray, William Parker, Savvas Nicolaou

University of British Columbia

LEARNING OBJECTIVES:

1. Gain an introductory understanding of artificial intelligence (AI), machine learning (ML), and deep learning (DL), and why they are suited for applications in radiology.
2. Understand that AI is predicted to become a powerful tool to assist radiologists in improving accuracy, efficiency, and patient care.
3. Gain an introductory understanding of the machine learning development process.
4. Review clinical applications for which AI algorithms are being developed, including pathology detection and non-detection applications.
5. Understand ethical challenges faced by the emergence of AI in radiology, including consent for data use, responsibility for errors, and the black box nature of machine learning algorithms.
6. Understand challenges currently faced by machine learning integration in radiology such as the need for very large datasets and the challenge of creating models which function equally well at different institutions.
7. Learn how a radiologist can become involved in AI projects.

BACKGROUND: Artificial Intelligence (AI) describes computer algorithms that are capable of mimicking human intelligence and problem-solving. A subset of AI, machine learning, allows for predictions to be made from data without being programmed with decision-making rules. Machine learning algorithms have the potential to make significant improvements to the radiology workflow, and research in this area is growing exponentially.

CONCLUSION: Artificial intelligence algorithms are likely to become powerful tools that will improve efficiency and accuracy of radiologists, thereby improving patient care. Algorithms will likely soon be able to perform tasks that will reduce radiologists' workload and physician burnout. Therefore, radiology trainees will benefit from being knowledgeable about artificial intelligence, and from understanding its strengths and weaknesses.

Educational Exhibit Abstracts

51

Emergence of AI in Emergency Radiology

John Zegie Zhu, Sarah Mohn, Maria Koleva, Nicolas Murray, William Parker, Savvas Nicolaou
University of British Columbia

LEARNING OBJECTIVES:

1. Recognize that radiological artificial intelligence (AI) has the potential of becoming a powerful tool to increase efficiency and accuracy in patient care in the age of mounting radiologist burden.
2. Describe how AI can potentially be integrated into the emergency radiology workflow.
3. List acute conditions to which machine learning (ML) techniques have been applied, in terms of detection, segmentation & classification of neurovascular, thoracic, orthopedic & abdominal pathologies.
4. Recognize that while a wide variety of AI algorithms exists, the same goal can be accomplished by vastly different approaches.
5. Describe challenges faced by current AI technologies related to development, ethics & adoption.
6. Recognize that while radiological AI is rapidly developing, it is not expected to replace all roles of radiologists in the foreseeable future.
7. Describe the roles radiologists play in the uptake of AI technologies, and how to get involved.

BACKGROUND: Artificial intelligence (AI), computer algorithms which are capable of problem solving normally done by humans, has the potential to revolutionize healthcare. One area of AI under heavy development regards applications in emergency radiology. Machine learning (ML) in particular, a subcategory of AI, has been extensively applied to image analysis in emergency radiology. Appropriate implementations of AI-enabled tools has great potential for seamless clinical integration to improve patient care through a multitude of tasks in the emergency radiology workflow.

CONCLUSION: AI incorporates a wide variety of computer algorithms, many of which are applicable to image analysis in radiology. Their core functions: classification, detection, segmentation and/or prediction can be integrated into many parts of the emergency radiology workflow, in applications such as computer aided detection, pathology characterization, and worklist prioritization. Unlocking the potential of improved accuracy and efficiency of AI can greatly benefit emergency department patients through timely and optimal management. Currently, image analysis ML algorithms have been applied with success to a number of acute conditions, such as neurovascular and thoracic pathologies, paving the way for clinical integration.

53

Modern Radiologic Diagnosis and Management of Acute Cholecystitis – What's New in the Hot Gallbladder

James P. Nugent, Jessica Li, Alison Harris
Department of Radiology, University of British Columbia

LEARNING OBJECTIVES:

1. Familiarize the radiologist with newer imaging techniques used in the diagnosis of acute cholecystitis, including dual energy CT (DECT) and MRCP.
2. Highlight uncommon complications of cholecystitis that are important not to miss.
3. Review imaging-guided management of acute cholecystitis, including standard percutaneous cholecystostomy drains and more novel endoscopic ultrasound (EUS) guided drainage and stent placement.

Demonstrate the role of imaging in identifying procedural complications.

BACKGROUND: While diagnosis and treatment of acute cholecystitis is well-established, novel imaging methods yield additional diagnostic information and minimally invasive procedures expand management options for non-surgical candidates. We emphasize the value of DECT in detecting non-calcified gallstones and gangrenous cholecystitis. Rare don't-miss complications are shown, including cystic artery pseudoaneurysm, emphysematous cholecystitis and bilioenteric fistulas. Imaging features of percutaneous cholecystostomy catheters and EUS-guided cholecystoduodenostomy / choledochoduodenostomy stents are summarized. Radiological findings of iatrogenic complications including stent migration, biliary strictures and dropped gallstones are reviewed.

CONCLUSION: Technological advancements provide new tools for the diagnosis and treatment of acute cholecystitis. Radiologist familiarity with these modalities and interventional techniques is invaluable in making prompt and accurate diagnoses and directing patients to appropriate management. Furthermore, awareness of rare but life-threatening complications is critical in minimizing patient morbidity and mortality.

Educational Exhibit Abstracts

60

Radiographic Assessment of Neonatal Catheters and Tubes in Common and Uncommon Positions

Robert Henderson, Serveh Padash, Scott J Adams, Xin Yi, Paul Babyn
University of Saskatchewan

LEARNING OBJECTIVES:

1. Describe the clinical indications for common neonatal catheters and tubes.
2. Review relevant anatomy for appropriate placement of neonatal catheters and tubes.
3. Describe the radiographic appearance and optimal position and of catheters and tubes commonly identified on neonatal radiographs, including umbilical arterial catheters, umbilical venous catheters, endotracheal tubes, and nasogastric tubes.
4. Review common and uncommon locations of malpositioned catheters and list potential complications that can subsequently arise.
5. Review modern literature on malposition frequencies for each of these common neonatal catheters and tubes.

BACKGROUND: Intravascular catheters and gastrointestinal and airway tubes (all henceforth referred to as catheters) are commonly used in clinical practice for life-supporting measures. Neonatal umbilical vessel catheters raise unique challenges; these can be more difficult to place, and rapid assessment is required to avoid increased risks from incorrect placement. The placement of these lines and tubes is generally assessed with radiography with their tip locations evaluated relative to both vertebral level and important anatomic landmarks.

CONCLUSION: Neonatal catheters are frequently malpositioned and rapid radiographic assessment is required. Umbilical venous catheters are the most likely to be malpositioned, at a rate of up to 90%, followed by umbilical arterial catheters at up to 60%, endotracheal tubes at up to 50%, and nasogastric tubes at up to about 9%. With such high frequencies for incorrect placement, radiologists have an important role in assessing the position of catheters on radiographs to minimize complications arising from incorrect placement.

61

Get Off the Fence: Revised Atlanta Classification and Modified CT Severity Index of Acute Pancreatitis through the Lens of Dual Energy CT

James P. Nugent, Aneta Kecler-Pietrzyk, Sarah Barrett
Department of Radiology, University of British Columbia

LEARNING OBJECTIVES:

1. Review common pitfalls in reporting the Revised Atlanta Classification of acute pancreatitis.
2. Highlight the emerging role of dual-energy CT (DECT) in classifying and grading acute pancreatitis.
3. Review the Modified CT Severity Index and provide examples of scoring.
4. Provide examples where pancreatic necrosis can be underestimated in early acute pancreatitis and the importance of appropriate follow-up imaging.
5. Practice applying a standardized reporting template to example cases of acute pancreatitis, with a focus on clarity and brevity.

BACKGROUND: Acute pancreatitis is not an uncommon entity in emergency radiology but there is wide variation in its reporting. The Revised Atlanta Classification and Modified CT Severity Index attempt to streamline nomenclature and measure severity objectively. These are demonstrated through DECT, which is particularly valuable in quantifying necrosis and detecting isoattenuating gallstones. We apply a suggested standardized reporting template to example cases. We outline indications for imaging, illustrate cases where the underlying etiology is identifiable on CT, and present common complications.

CONCLUSION: Using standardized Revised Atlanta Classification nomenclature and prognostic tools for acute pancreatitis empowers radiologists to communicate succinctly with clinicians. Familiarity with dual energy CT can improve radiologist confidence and clarity in applying these terms.

Educational Exhibit Abstracts

63

Women in Canadian Radiology: How to Implement an Equity, Diversity, and Inclusion Committee at Your Institution

Sabrina Fitzgerald¹, Kiana Lebel², Charlotte Yong-Hing³

¹University of Toronto Faculty of Medicine, ²University of Sherbrooke Faculty of Medicine, ³BC Cancer

LEARNING OBJECTIVES:

1. Recognize the current underrepresentation of women in Canadian radiology across the continuum of training and the need for more women in radiology.
2. Present Canadian Radiology Women and discuss creative grassroots initiatives that have been successfully implemented to mitigate the aforementioned gaps.
3. Present a framework for Canadians to start equity, diversity, and inclusion committees plus mentorship programs, based on what has been successfully implemented in other radiology department(s).

BACKGROUND: In 2019, 63% of Canadian medical graduates were women. However, according to the Canadian Medical Association only 31.6% of Canadian radiologists were women. To increase women in radiology, numerous solutions and strategies have been implemented at individual and system levels. One recent initiative is Canadian Radiology Women (CRW), founded in 2018, to offer women in radiology a community of support with goals to improve diversity in radiology's practice and leadership. Today, over 2,300 people are engaged in CRW.

CONCLUSION: Radiology has been identified as one of the medical specialties with the least gender diversity. Increasing gender equity in any workplace is undeniably valuable, but specifically when applied to radiology the literature shows improved patient and system level outcomes. There are several tangible, evidence-based solutions aimed at mitigating shortcomings present which impact the ability for gender equity to be attained in radiology; one being the creation of Equity, Diversity & Inclusion (EDI) working groups. Initiatives such as CRW are further striving to close the gaps identified. Through increasing visibility, improving exposure, providing mentorship, and unifying women in radiology across Canada, a need for a community of female radiologists was identified and met. CRW has been successful in its infancy towards its common goal of achieving workplace diversity in Canadian radiology, most recently submitting an EDI working group proposal to the Canadian Association of Radiologists that was unanimously supported. To follow this initiative, we present a framework for radiology departments to start EDI committees based on what has been successful in other radiology departments.

72

Frequently Missed Traumatic Fractures in Adults Presenting to the Emergency Department

Hadas Benhabib¹, Angela Atinga²

¹Department of Medical Imaging, University of Toronto, ²Department of Medical Imaging, Sunnybrook Health Sciences Centre

LEARNING OBJECTIVES:

1. Identify fractures commonly missed on plain radiograph following traumatic injuries.
2. Recognize the clinical implications of correctly or incorrectly diagnosing these injuries.
3. Establish a checklist of "review areas" when evaluating radiographs in the setting of traumatic injuries.
4. Describe elements leading to diagnostic error in the emergency setting and demonstrate ways to avert these causes.

BACKGROUND: Digital radiography remains the first-line in imaging detection of fractures and dislocations following trauma. There exist many challenges to the radiographic assessment of trauma patients, which serve as a potential catalyst for diagnostic errors. This review highlights commonly missed traumatic injuries including: upper extremity (e.g., scapular and elbow), pelvic ring and femur, and lower extremity (e.g., Lisfranc). We will also explore cognitive and systemic factors contributing to diagnostic errors in the emergency setting and methods to reduce misdiagnosis of fractures.

CONCLUSION: Radiographs are the fundamental imaging test for fracture assessment, particularly in the evaluation of patients with polytrauma. Timely and accurate diagnoses by radiologists are crucial to ensure proper patient care. Diagnostic errors can be costly to the patient and result in delayed treatment, surgical complications, and/or poor overall outcome. Injuries can be easily missed if the findings are occult or equivocal on radiographs. If there is a high clinical suspicion for fracture but radiographs are negative, radiologists should recommend additional or more appropriate imaging. This review aimed to highlight the spectrum of commonly missed traumatic fractures and emphasize the importance of having a checklist of areas to pay careful attention to, in order to reduce the frequency of diagnostic error.

Educational Exhibit Abstracts

73

Foreign Bodies and Their Imaging

Ivica Bratanovic, Salman Masood, Savvas Nicolaou, Nicolas Murray

Emergency and Trauma Radiology: Vancouver General Hospital, University of British Columbia

LEARNING OBJECTIVES:

1. Present and review characteristic radiologic manifestations specific to foreign bodies and their composition.
2. Recognize the diversity of foreign bodies and their common and uncommon complications with imaging (eg. obstruction, perforation, bleeding, septicemia, or distant embolization).
3. Discuss the use of multiple imaging modalities to investigate and detect foreign bodies to guide clinical management.
4. Integrate this knowledge to improve practice and enable an accurate and comprehensive assessment of patients with known or suspected foreign bodies.

BACKGROUND: Foreign bodies are uncommon but are clinically important and require immediate assessment when presented. Foreign bodies can enter the body through several mechanisms, but most commonly: ingestion, aspiration, purposeful insertion (including iatrogenic injury), and trauma. The diverse possibilities of what a foreign body can be comprised of and evaluation of complications requires careful knowledge and selection of imaging modalities that will best enable the radiologist to evaluate the specific clinical scenario.

CONCLUSION: Characteristics of foreign bodies are diverse, and their clinical management depends on their visualization. Efficient identification and localization of foreign bodies with multiple radiological interventions should be used to assess complications and guide clinical decision making.

75

Imaging Correlates of Glioma Genotypes

Namita Sharma¹, Fateme Salehi²

¹McMaster University Michael G. DeGroote School of Medicine, ²Department of Medical Imaging, McMaster University

LEARNING OBJECTIVES:

1. To review the range of imaging features of adult brain gliomas
2. To review molecular classification of adult gliomas
3. To review imaging features of adult gliomas that distinguish genotypic and molecular differences
4. To provide a summary of relevant imaging features of glioma genotypes as a tool for radiologists for precise diagnosis of gliomas on MRI prior to tumor biopsy

BACKGROUND: Glioma accounts for 80% of primary central nervous system malignancies. Its classification has recently been revised based on molecular expression of factors including IDH1, 1p/19q, BRAF and ATRX, with implications for treatment and survival. Increasingly, there is a need for more precise glioma radiological assessment, and imaging can provide clues to the underlying molecular biology and genotype. Particularly, MRI phenotypes can non-invasively identify molecular genotypes and guide clinicians in prognostication and management. The literature on this emerging topic remains scarce.

CONCLUSION: Using case examples from our tertiary care cancer center with a large population of glioma patients, we will highlight imaging features to create a concise reference guide that can be used to identify the specific glioma molecular phenotypes, ultimately facilitating non-invasive diagnosis and management of the gliomas.

Educational Exhibit Abstracts

76

Brainstem Lesions and Associated Syndromes

Namita Sharma¹, Fateme Salehi²

¹McMaster University Michael G. DeGroote School of Medicine, ²Department of Medical Imaging, McMaster University

LEARNING OBJECTIVES:

1. To review imaging features of neoplastic, vascular, inflammatory, and infectious etiologies of brain stem lesions.
2. To review the indications for brainstem imaging
3. To understand the clinical manifestations associated with distinct functional regions of the brainstem
4. To review imaging features of neoplastic, vascular, inflammatory, and infectious etiologies of brain stem lesions.
5. To review the common syndromes associated with the brainstem

BACKGROUND: The brainstem is the most primitive part of the brain and plays a critical role in vital functions, such as breathing and heart rate. It acts as a relay center for sensory and motor information and houses most cranial nerve nuclei. Due to its complexity and intricacy, it can be difficult to localize the precise region involved. It is essential to have a thorough understanding of brainstem anatomy and develop an approach to interpreting imaging findings to enable accurate diagnosis.

CONCLUSION: In this educational exhibit we will present a summary of brainstem pathologies, syndromes and imaging manifestations to enable earlier and accurate diagnosis.

77

The Ottawa Radiology Handbook Project

Sakib Kazi, Paul Rooprai, Neel Mistry, Dar'ya Semenova, Shahin Abtahi, Veronica Chan, Carolina Souza
University of Ottawa

LEARNING OBJECTIVES:

1. Understand the various imaging modalities and basics of radiation protection
2. Recognize common imaging features of high yield conditions across body systems
3. Determine imaging modality of choice for high yield conditions across body systems
4. Understand underlying pathology in relation to imaging findings

BACKGROUND: Radiographic interpretation is an essential component of a medical student's learning as many patients require some form of imaging during their care. Physicians from different specialties must be able to make decisions regarding when to order appropriate imaging tests and have the basic skills to interpret images. The goal of this project is to design a booklet that complements the undergraduate medical curriculum to teach students the fundamentals of radiology in a concise manner at the University of Ottawa.

CONCLUSION: The current radiology curriculum consists of weekly didactic lectures pertaining to the unit being studied. Students would greatly benefit from having a unifying booklet that amalgamates essential radiological concepts from each unit covered in pre-clerkship. Revisions to the undergraduate medical curriculum would be accompanied with updates to the radiology booklet in the form of new editions for years to come.

The handbook can be used at various levels in medical training. At the pre-clerkship level, it can facilitate learning fundamental radiologic concepts and aid students in preparation for their practical examinations. At the clerkship level, it can provide a quick refresher to help students succeed on the ward as basic radiographic interpretation skills are essential to many rotations.

Educational Exhibit Abstracts

86

Systematic Approach to Sonography of Testicular Masses

Kenneth Holmes¹, Shamir Rai², Savvas Nicolaou², Nicolas Murray^{1,2}

¹University of British Columbia, ²Vancouver General Hospital

LEARNING OBJECTIVES:

1. Review the differential diagnosis of testicular masses
2. Outline key clinical and epidemiologic features of common testicular masses
3. Recognize characteristic sonographic features of common testicular masses, especially those that may indicate systemic disease or obviate the need for orchietomy

BACKGROUND: While most masses arising within the testes represent malignancies, the differential diagnosis of a testicular mass remains broad, reflecting a range of benign and malignant etiologies. The role of imaging is primarily to delineate lesions within the testes from those in surrounding tissues to inform malignant potential. However, despite considerable radiologic overlap, sonographic characterization of testicular masses and appreciation of key clinical features may help identify etiologies associated with systemic involvement or allow radiologic diagnosis of a benign mass.

CONCLUSION: A robust understanding of the differential diagnosis of testicular masses as well as key clinical and imaging features can assist radiologists in identifying benign lesions or those associated with systemic manifestations.

87

Pseudo-tumoral Fibrosis May Occur After Renal Thermal Ablation or Partial Nephrectomy

Souleymane Maïga¹, Nicolas Grenier², Jean-Christophe Bernhard², Mokrane Yacoub², François Cornelis³

¹CHU of Sherbrooke, ²CHU de Bordeaux, ³Hôpital Tenon

LEARNING OBJECTIVES:

1. To report the imaging and pathology features of pseudo-tumoral fibrosis after renal thermal ablation or partial nephrectomy.

BACKGROUND: A retrospective search of our institutional PACS and UROCCR database was performed to identify patients who underwent secondary ipsilateral biopsy or surgery after nephron-sparing treatments for occurrence of a new mass after initial treatment. For all masses, histopathologic diagnosis was available after either a percutaneous biopsy (N=4) or a surgical resection (N= 1). Images were reviewed by three radiologists to identify imaging patterns. Uropathologist reviewed all tissue samples retrospectively. Five patients presenting proven pseudo-tumoral fibrosis were identified.

CONCLUSION: Pseudo-tumoral fibrosis may occur lately after nephron-sparing treatments and should be biopsied before performing any invasive procedures.

Educational Exhibit Abstracts

88

The Online Cross-Country Tour: Evaluation of a Novel National Online Series for Canadian Radiology Residency Programs and Future Implications for the Radiology CaRMS Process

Victoria Linehan, Prayash Katlariwala, Baljot S. Chahal, Aline D. Khatchikian, Alanna Supersad, Jessica L. Dobson
Dalhousie University

LEARNING OBJECTIVES:

2. Define the challenges of the undergraduate medical student residency application process
3. Describe an option for a national virtual residency program tour for medical students
4. Review feedback and implications for future iterations of medical graduates

BACKGROUND: The COVID-19 pandemic resulted in the cancellation of visiting radiology electives across Canada. In light of this, the Canadian Association of Radiologists Resident & Fellow Section (RFS) and Medical Student Network (MSN) developed a novel national online series to provide students the opportunity to learn about radiology residency programs across Canada with online presentations from the program directors and current residents. We present an evaluation of this program according to students and presenters.

CONCLUSION: In collaboration with fifteen of Canada's radiology residency programs, the CAR RFS and MSN hosted an online series for medical students to learn about programs outside their home institution, with 212 students attending at least one session. A statistically significant number of pre-CaRMS students noted the program positively affected their intention to apply to radiology. Both students and program representatives agreed that this program should be held in future years, regardless of whether health and travel restrictions are lifted. Feedback was thus highly positive with important implications for the future CaRMS iterations.

89

Evolving Role of Minimally Invasive Techniques in the Management of Symptomatic Bone Metastases

Hadas Benhabib¹, Elizabeth David²

¹Department of Medical Imaging, University of Toronto, ²Department of Interventional Radiology, Sunnybrook Health Sciences Centre
University of Toronto

LEARNING OBJECTIVES:

1. Review the basic principles of percutaneous cementoplasty and ablation techniques.
2. Recognize potential synergic benefits associated with simultaneous ablation and cement augmentation.
3. Identify suitable metastatic targets and patients that would be appropriate for treatment.
4. Underscore the evolving role of interventional radiology in the palliation of symptomatic bone metastases.

BACKGROUND: Bone metastases can be associated with significant decline in quality of life among cancer patients. The number of patients living with symptomatic bone metastases is increasing due to the rising incidence in malignancies overall and improved patient survival from new targeted treatments. The use of minimally invasive, image-guided locoregional techniques offers new tools in the management of these lesions while simultaneously preserving skeletal alignment, and maintaining patient mobility.

CONCLUSION: Bone metastases create a variety of issues that limit the functional status of patients, including pain, pathological fractures, and neurological compromise. Current conventional treatments include analgesics, bed rest, and radiation therapy (RT). While RT can be an effective treatment, it may take several weeks to provide pain relief and does not always address underlying structural instability, especially in significant weight bearing skeletal segments. Image-guided treatments offer minimally invasive, targeted approaches to address focal pain, preserve structural alignment, and maintain quality of life. The injection of cement into focal bone lesions, such as those in the vertebral body (vertebroplasty), sacrum (sacroplasty), or pelvis (osteoplasty), can enhance structural stability by sealing existing fracture clefts and filling in defects created by metastatic lesions. Local tumor control can also be addressed prior to cement injection either with RT, thermal ablation (RFA), or cryoablation. Furthermore, there is emerging evidence that combining these two techniques (ablation with cement augmentation) may offer synergistic effects in attaining rapid and durable pain control along with the benefit of maintaining structural stability. In summary, these evolving image-guided treatments are safe, effective, and may overcome many of the existing challenges associated with conventional treatments.

Educational Exhibit Abstracts

96

Wrist Trauma and its Complications

Pierre Boerkoel, Colbey Taylor, Hugue Ouellette, Adnan Sheikh, Nicolas Murray
University of British Columbia

LEARNING OBJECTIVES:

1. Recognize important radiologic manifestations of wrist trauma, including osseous and ligamentous injuries and describe the clinically relevant features
2. Recognize the common and uncommon complications of wrist trauma
3. Discuss a multimodality imaging approach in identifying wrist trauma and its complications

BACKGROUND: Wrist trauma is a common cause of Emergency Department visits, often resulting from a fall on an outstretched hand. Anatomical complexity and the fact that similar traumatic mechanisms can result in different pathologies make wrist fracture one of the most commonly missed fractures. Complications range from nerve damage in the immediate term to osteoarthritis in the long term. Plain radiographs are the imaging modality of choice for suspected fracture; CT and MRI may be used when clinical doubt persists.

CONCLUSION: Plain radiographs are the imaging modality of choice for wrist trauma in the ED. A multimodality approach may be required in negative radiographic evaluation and persistent clinical doubt, in complex or ligamentous injuries, or with suspected complications.

98

Gastrointestinal Diverticular Disease and its Complications

Pierre Boerkoel, Luck Louis, Faisal Khosa, Savvas Nicolaou, Nicolas Murray
University of British Columbia

LEARNING OBJECTIVES:

1. Recognize important radiologic manifestations of diverticular disease of the entire gastrointestinal tract, from the esophagus to the colon
2. Recognize the common and uncommon complications of gastrointestinal diverticular disease
3. Discuss a multimodality imaging approach in identifying gastrointestinal diverticular disease and their complications

BACKGROUND: Diverticula are abnormal outpouchings of the gastrointestinal lumen and are often discovered incidentally. Diverticula may be classified as true, protrusion through all layers of the gastrointestinal wall, or false, protrusion through the mucosa and submucosa. In asymptomatic individuals, this chronic condition is referred to as diverticulosis and does not typically require medical intervention. Of those with diverticulosis, approximately 20% develop a clinically relevant diverticular disease. Complications from diverticula include perforation, bleeding, stricture, diverticulitis and fistula formation among others.

CONCLUSION: Diverticula are often asymptomatic and are a common radiological finding. In symptomatic individuals, radiology may be used to assess complications and guide medical therapy.

Educational Exhibit Abstracts

100

To Leave Alone or Meddle Lesions of Petrous Apex in Children

Neetika Gupta¹, Shivaprakash Hiremath², Claudia Martinez-Rios¹, Santanu Chakraborty², Elka Miller¹

¹Children's Hospital of Eastern Ontario, ²The Ottawa Hospital

LEARNING OBJECTIVES:

1. Illustrate the relevant anatomy of the petrous apex and surrounding critical neurovascular structures.
2. Discuss various lesions commonly affecting the petrous apex in the pediatric population.
3. Demonstrate the role of cross-sectional imaging modalities in the diagnosis of the petrous apex lesions.
4. Propose a diagnostic algorithm based on imaging findings to aid in presurgical diagnosis and facilitate appropriate management.

BACKGROUND: Petrous bone is a cone-shaped medial extension of the temporal bone involved in a wide range of pathological conditions due to its precarious location and close relationship to major neurovascular structures. Clinical presentations of petrous apex lesions are quite variable and frequently depend on the structures involved and the age at presentation. We intend to depict the imaging approach based on the anatomical structure of origin of the petrous apex lesions in pediatrics.

CONCLUSION: An organized imaging approach to the myriad of petrous apex pathologies with understanding of the critical anatomy of the petrous apex help can facilitate adequate management of these lesions in the pediatric population. In this educational exhibit, we propose,

- Comprehensive discussion of the pediatric petrous apex lesions including the benign and malignant entities and describing their typical and distinguishing imaging findings.
- Provide a simplified imaging approach to the pediatric petrous apex lesions based on the imaging features alone.
- Classifies the pediatric petrous apex lesions based on CT and MRI as nonexpansile, expansile non-destructive and expansile destructive lesions.
- Nonexpansile lesions or “do not touch lesions” include asymmetric pneumatization, trapped fluid, prominent arachnoid granulation and aberrant internal carotid artery. Commonly encountered non-destructive expansile lesions are cholesterol granuloma, cholesteatoma, cephalocele, fibrous dysplasia and rarely mucoceles. The expansile destructive lesions of petrous apex in pediatric age group are Langerhans cell histiocytosis, metastasis, rhabdomyosarcoma and osteomyelitis.

102

Needs Assessment for Radiology Interest Groups: The Creation of a National Radiology Medical Student Network

Jessica L. Dobson, Baljot Chahal, Prayash Katlariwala, Aline D. Khatchikian, Alanna Supersad, Ali Bessisow Angus Hartery Dalhousie University

LEARNING OBJECTIVES:

1. Review the structure of medical student Radiology Interest Groups
2. Identify ways educators can engage students with radiology
3. Outline the structure of a national radiology medical student network

BACKGROUND: There has been increasing concern from multiple stakeholders regarding wavering medical student interest in and applications to radiology. Contributing factors include misinformation regarding job prospects, artificial intelligences, and patient contact. Medical student Radiology Interest Groups (RIGs) enhance radiology education through a series of extracurricular events and can serve as a recruitment forum for residency programs. The Canadian Association of Radiologists (CAR) Resident & Fellow Section (RFS) recently launched a national Medical Student Network (MSN) to assist in these information and recruitment initiatives.

CONCLUSION: We have completed a needs assessment of medical student RIGs in Canada, identifying their structure, common events, current resources, and areas in which additional support is needed. Following distribution, 24 student RIG leaders responded, representing 15 of the 17 Canadian medical schools. Of these, 92% were interested in partaking in a national radiology network for medical students. In 2020, the RFS launched the MSN, which has already hosted events reaching up to 600 Canadian medical students. We describe the structure and plans for the MSN, and how this educational initiative can help address medical student misconceptions about and interest in radiology.

Educational Exhibit Abstracts

104

Not All Pregnancies are Intrauterine

Christophe Vézina, Kim-Nhien Vu, Laurence Pélloquin
Faculté de médecine, Université de Montréal

LEARNING OBJECTIVES:

1. To review the female reproductive system anatomy.
2. To discuss the differential diagnosis of first trimester bleeding.
3. To discuss the role of transvaginal ultrasonography and magnetic resonance imaging (MRI) in the evaluation of suspected ectopic pregnancy.
4. To review the ultrasound and MRI findings of ectopic pregnancies in various locations.

BACKGROUND: Ectopic pregnancy is the most common cause of maternal mortality in the first trimester and accounts for approximately 2% of all pregnancies. The clinical presentation varies widely and the diagnosis is mainly based on the serum hCG measurement and transvaginal ultrasonography. It is important for the radiologist to be familiar with the radiological appearances of ectopic pregnancies of various locations in order to prevent the significant complications associated with this pathology.

CONCLUSION: Ectopic pregnancy is a condition with high morbidity. Although transvaginal ultrasound remains the initial modality of choice, magnetic resonance imaging is a useful complementary exam, especially in cases where ultrasound is nondiagnostic. It is important for the radiologist to be familiar with the radiological features of ectopic pregnancy in order to guide clinicians toward optimal management.

105

Cardiac Sarcoidosis and Amyloidosis: MRI vs. Radionuclide Studies

Golmehr Sistani, Yasmine Sallam, Ian Chan, Cigdem Akincioglu, Ali Islam, Mohamed Abdelrazek
London Health Science Center

LEARNING OBJECTIVES:

1. Overview of cardiac amyloidosis
2. Cardiac amyloidosis MRI findings
3. Amyloidosis pattern of uptake on 99mTc-Pyrophosphate and ASNC criteria
4. Overview of cardiac sarcoidosis
5. Cardiac sarcoidosis MRI findings
6. Sarcoidosis spectrum on 18F-FDG PET and 99mTc-sestamibi scan

BACKGROUND: Amyloidosis and sarcoidosis are multi-system diseases that result from the accumulation of abnormal proteins and noncaseating granulomas in tissues and various organs, respectively. The diagnosis of cardiac involvement is crucial as it can have fatal consequences. Endomyocardial biopsy is the gold standard. However, it is invasive and has a low yield. Evaluation with cardiac MRI and, more recently, nuclear medicine studies, including 99mTc-Pyrophosphate and 18F-FDG-PET/CT scans, provide non-invasive methods to diagnose and follow up the treatment of these patients.

CONCLUSION: Early diagnosis and therapy are the main contributors to improve the prognosis of infiltrative cardiomyopathy. Learning a multimodality imaging approach to cardiac amyloidosis and sarcoidosis can facilitate precise and early diagnosis.

Educational Exhibit Abstracts

106

A Review of the Radiological Appearances of Functional Neurosurgical Procedures

Aida Ahrari¹, Aaron Loh², Aazad Abbas¹, Andres Lozano², Alexandre Boutet³, Walter Kucharczyk³

¹Temerty Faculty of Medicine, ²Department of Neurosurgery, ³Joint Department of Medical Imaging
University of Toronto

LEARNING OBJECTIVES:

1. To briefly describe the clinical indications of the main functional neurosurgical procedures: Deep Brain Stimulation (DBS), MR-guided Focused Ultrasound (MRgFUS), Radiofrequency (RF) Ablation, and Gamma Knife Radiosurgery (GKRS).
2. To provide a pictorial summary of expected postoperative imaging findings.
3. To highlight imaging findings of post-operative complications including edema, hemorrhage, lead misplacement, and expanding necrosis.

BACKGROUND: Functional neurosurgery has revolutionized the treatment of movement disorders such as Parkinson's disease, essential tremor, and dystonia while providing promising hope for an array of psychiatric and cognitive disorders such as depression, anorexia, obsessive compulsive disorder, and Alzheimer's disease. This branch of neurosurgery involves procedures targeting aberrant brain circuits that are believed to underlie these disorders, the most common of which are DBS and MRgFUS and to a lesser extent RF ablation and GKRS.

CONCLUSION: To date, over 160,000 patients have received DBS, 500,000 have received GKRS, and 3000 have received MRgFUS. The rate at which functional neurosurgical procedures are performed is rapidly growing; consequently, radiologists are increasingly encountering their corresponding post-procedural imaging. Knowledge of the local anatomy of target brain areas – including the subthalamic nucleus, internal globus pallidus, and ventral intermediate nucleus of the thalamus – and familiarity with expected postoperative imaging findings, are essential for clinicians in making an accurate radiological assessment. Of particular importance is the recognition of potential complications such as edema, hemorrhage, DBS lead misplacement, and expanding necrosis on imaging. Herein, we present a pictorial summary of imaging findings relevant for radiologists in this rapidly expanding field. Recognition of each procedure's characteristic imaging manifestations is essential for radiologists to make accurate assessments and assist consulting physicians.

107

Classic Lines on Pelvis Radiography

Daniel McCarthy, Stephany Pritchett
University of Western Ontario

LEARNING OBJECTIVES:

1. Review common lines created by projection of bony landmarks on AP Pelvis Radiograph
2. Display abnormalities in each classic line, connecting imaging with pathology
3. Review each case with follow-up imaging (CT Scan)

BACKGROUND: Frontal pelvis radiography is a common test ordered for investigation of many pathologies. Timely acquisition and cost effectiveness make this modality very useful in for initial diagnostic evaluation. Radiographic projection creates predictable lines that are important to carefully examine. This article outlines normal and abnormal examples of bony lines on pelvis radiography with follow-up CT characterizing common pathologies. It is intended as a training tool for basic interpretation of pelvis radiography.

CONCLUSION: This educational exhibit will contribute to the practice of radiology by serving as a useful tool to train the basics of interpreting pelvis radiographs. Examples of pathology alongside normal images, illustrations and follow-up CT scans will help trainees to understand common pathologies and how they correlate to disruption of classic lines on plain films. This exhibit is a synthesis of classical lines visible on AP pelvis radiography with useful examples for educational benefit.

Educational Exhibit Abstracts

112

Underreported and Underrecognized: A Multi-Modal Imaging Review of Breast Injury

Helena Bentley, James Roberts, Tetyana Martin, Charlotte Yong-Hing, Nicolas Murray

Department of Radiology, University of British Columbia

LEARNING OBJECTIVES: Using illustrative cases from our tertiary, high-volume institutions we will review the multi-modal imaging findings of primary traumatic breast injury as well as secondary or iatrogenic breast injury.

This exhibit is intended: i) to explore the broad etiologies of breast injury and the settings in which each mechanism of injury may arise; ii) to present the multi-modal imaging findings of breast injury and sequelae of breast injury encountered in acute and chronic settings, with specific reference to computed tomography, ultrasound, mammography and magnetic resonance imaging; iii) to discuss the common radiological pitfalls that may lead to the misdiagnosis of breast injury and sequelae of breast injury; iv) to correlate the multi-modal imaging findings of breast injury and sequelae of breast injury with the Breast Imaging Reporting & Data System (BI-RADS); and v) to formulate evidence-based recommendations for the management of breast injury and sequelae of breast injury in acute and chronic settings.

The information presented in this educational exhibit is applicable to radiologists practicing in both community and academic settings and is intended to increase breast, trauma and general radiologists' awareness of breast injury and sequelae of breast injury.

BACKGROUND: Though breast injury is commonly encountered it is largely underreported and the true incidence of breast injury remains unknown. There are few guidelines or treatment algorithms for the management of breast injury and sequelae of breast injury. Awareness of breast injury is likewise limited thus further increasing the challenge to ensure its appropriate identification and subsequent management.

CONCLUSION: Correlation of multi-modal imaging with the clinical presentation of patients presenting with breast injury is essential. Radiologists' ability to recognize breast injury as well as to discern sequelae of breast injury from malignant processes and other disease is integral to the appropriate management of patients presenting with breast injury and the prevention of potentially unnecessary further evaluation and intervention.

113

Benign, Malignant or High Risk? The Challenges of Appropriate Management of Papillary Neoplasms of the Breast

Helena Bentley, James Roberts, Tong Wu, Charlotte Yong-Hing

Department of Radiology, University of British Columbia

LEARNING OBJECTIVES: Using illustrative cases from our provincial cancer treatment organization we will review the multi-modal imaging findings of papillary neoplasms of the breast (PNB), including intraductal papilloma, intraductal papillary carcinoma, encapsulated papillary carcinoma, and solid papillary carcinoma.

This exhibit is intended: i) to review the classification of PNB as per the World Health Organization classification of tumors of the breast; ii) to describe the variable clinical presentation of PNB; iii) to explore the multi-modal imaging findings of these breast lesions; iv) to present the common radiological pitfalls that may lead to inappropriate management of PNB; and v) to formulate evidence-based recommendations for the management of PNB and to correlate these recommendations with those outlined by the Breast Imaging Reporting & Data System (BI-RADS).

The information presented in this educational exhibit is applicable to radiologists practicing in both community and academic settings and is intended to increase breast and general radiologists' awareness of the challenges associated with the appropriate management of these breast lesions.

BACKGROUND: PNB are characterized by the presence of finger-like projections from which they derive their name. They are comprised of epithelial cell proliferation which is supported by arborized fibrovascular stroma either with or without an intervening myoepithelial cell layer. Attachment to the walls of ducts is distinctive of PNB and they may affect any area of the ductal tree. PNB may present as a palpable mass or as clear or blood-stained nipple discharge or they may be detected during breast screening.

CONCLUSION: PNB encompass a heterogeneous group of breast lesions. Appropriate diagnosis of PNB on imaging is challenging. PNB possess a broad spectrum of appearances on ultrasound, mammography and magnetic resonance imaging. Certain PNB may exhibit overlapping imaging features with other breast lesions. Differentiation of benign or malignant or high risk PNB on imaging is thus often not definitive and the variable malignancy potential of those PNB determined to be benign further possesses challenges for the subsequent management of these breast lesions.

Educational Exhibit Abstracts

116

Mucinous Breast Cancers: Typical Imaging Appearances and Mimics

Nishigandha Burute, Caitlin Ward, Fauzia Hasan, Richard Bitar, Meredith Lynch
Thunder Bay Regional Health Sciences Centre

LEARNING OBJECTIVES:

1. Familiarize the reader with imaging appearances of pure and mixed mucinous breast cancers.
2. Illustrate characteristic morphological features of mucinous cancers on mammography, sonography and MRI.
3. Describe benign mimics of mucinous cancers including fat lobules, complicated cysts, lipomas, papillary lesions and fibroadenomas.
4. Demonstrate imaging features that predict aggressiveness of mucinous cancers, to help prognosticate and select the site of aggressive tumor component for biopsy.

BACKGROUND: Mucinous breast cancers can present with imaging appearances typical of benign lesions, making identification challenging. Pure mucinous cancers may present as isoechoic lesions on sonography resulting in missed cancers. Sonographic appearances of mucinous cancers may overlap with fat lobules, complicated cysts and papillary lesions leading to deferred biopsies. Hyperintense T2 signal and benign enhancement kinetics on MRI make differentiation from fibroepithelial lesions challenging. Moreover pure and mixed mucinous tumors vary in imaging appearances and have different prognoses.

Familiarity with the imaging appearances of mucinous cancers and their mimics and knowledge of the caveats in imaging are essential to avoid missed cancers and deferred biopsies. Understanding imaging features that predict aggressiveness of mucinous cancers helps appropriate prognostication and selection of the site for image guided biopsy.

CONCLUSION: This educational exhibit demonstrates an array of imaging features of mucinous cancers on mammography, ultrasound and MRI with examples of benign mimics. It provides pearls and pitfalls in identifying pure and mixed mucinous cancers, predicting tumor aggressiveness and appropriately targeting site for biopsy.

122

Thoracic Hernias: A Pictorial Review

Andrew Fox, Taehoo Kim, Alexandre Semionov, Jana Taylor
Diagnostic Radiology, McGill University Health Centre

LEARNING OBJECTIVES:

1. Review anatomy, location and etiology of congenital and acquired thoracic hernias.
2. Describe multimodality imaging features of thoracic hernias and their mimics.
3. Recognize complications of thoracic hernias: incarceration, obstruction, and visceral necrosis.

BACKGROUND: Thoracic hernias, whether congenital or acquired, refer to a migration of thoracic contents outside their normal locations in the chest cavity or protrusion of abdominal contents into the thorax. They can present with a broad spectrum of clinical presentations. It is essential for a radiologist to recognize imaging features of thoracic hernias and their potential complications. This pictorial review will present multimodality imaging of the various types of thoracic hernias and describe their anatomic origins, potential complications, and management recommendations.

CONCLUSION: Thoracic hernias can occur in multiple locations in the chest and have a wide range of clinical presentations. There are multiple different mimickers of thoracic hernia which should be recognized. A comprehensive understanding of different types of thoracic hernias and their complications will allow prompt diagnosis and appropriate management.

Educational Exhibit Abstracts

123

Spectrum of Imaging Findings in Organizing Pneumonia

Reem Al Mazrouai, Abdullah Alabousi, Ehsan Haider

Department of Radiology, McMaster University, St. Joseph's Healthcare

LEARNING OBJECTIVES:

1. To review the spectrum of imaging patterns and presentations of Organizing Pneumonia.
2. We will review the typical CT features of organizing pneumonia and the various known aetiologies including drugs and connective tissue disorders.

BACKGROUND: Organizing Pneumonia (OP) is a clinicopathological entity related to non-specific response to lung injury characterized by granulation tissue lying within small airways and alveoli with chronic inflammation of the adjacent lung parenchyma. The causes of OP are numerous and include infections, iatrogenic causes (a reaction to drugs and radiation therapy), and autoimmune diseases. The idiopathic form is termed Cryptogenic Organizing Pneumonia (COP). For evaluating OP, HRCT is the imaging method of choice. This exhibit will focus on the most common HRCT finding which include patchy migratory areas of consolidations and ground-glass opacities predominantly with a subpleural, peribronchial distribution. Others classic HRCT signs include perilobular opacities, reverse halo sign and crazy paving pattern. It also can present as focal mass or nodule/multiple masses which can mimic metastasis. In addition, OP can overlap with other types of interstitial pneumonia, particularly idiopathic pulmonary fibrosis and nonspecific interstitial pneumonia and can mimic other pathologies like lymphoma, metastasis and atypical infection including Covid 19.

CONCLUSION: The exhibit will demonstrate spectrum of imaging appearances which may alert the radiologist to the presence of organizing pneumonia and subsequently has a significant impact on patient management.

125

Advanced MRI of the Rotator Cuff: Tough Stuff About the Cuff

John Karp¹, Prem Ruben Jayaram², Charlotte Yong-Hing³, Theresa Li-Cheng Lee⁴, Nancy Martin², Steven Bak-Siew Wong⁵, Gordon Andrews², Bruce Forster²

¹School of Medicine, Royal College of Surgeons in Ireland, ²Department of Radiology, Vancouver General Hospital, ³Diagnostic Imaging, BC Cancer Agency, ⁴PRP Diagnostic Imaging,

⁵Department of Radiology, Singapore General Hospital

LEARNING OBJECTIVES:

1. Recognize the MR imaging features of more complex and subtle rotator cuff tears (RCTs) and associated secondary findings.
2. Recognize related or adjunctive signs that would predispose the patient to progression of existing or new RCTs.
3. Develop a radiological differential diagnosis of clinical mimics to rotator cuff tears.
4. Incorporate this information into clinical practice to provide comprehensive reports of RCTs to provide a value-added service to clinicians.

BACKGROUND: RCTs are common injuries that belie their complex underlying anatomy and pathology. Delaminating tears, rotator cable tears, and internal impingement are examples of complicated RCTs. Secondary or predisposing MRI signs of rotator cuff tears are important to recognize, including greater and lesser tuberosity and intramuscular cysts, and osteophytic impingement. Non-rotator cuff shoulder pathologies can occur with similar symptoms and clinical findings and include bursitis, biceps tendon subluxation, adhesive capsulitis, avascular necrosis, muscle denervation, distal clavicular osteolysis and os acromiale pseudoarthropathy.

CONCLUSION: Enhanced recognition on MR imaging and understanding of the clinical implications of these lesser-known rotator cuff entities is important for improved diagnosis and treatment of rotator cuff pathology and will ultimately optimize clinical outcomes.

Educational Exhibit Abstracts

129

Arteriographic Standing Waves, The Key to the Mystery of “The Oldest Unexplained Problem in Physics”, The Cause of Turbulent Flow

Gavin Hamilton
Colborne-Central X-ray Ltd.

LEARNING OBJECTIVES:

1. Explaining the origin of the pressure bands that create the simple harmonic (SH) distension and narrowing of compliant arterial walls to create arteriographic standing waves
2. Explaining similarities to other similar flow-induced SH phenomena
3. Explaining effects of SH sound fields in creating SH waves
4. Explaining how the generation of SH Tollmien-Schlichting boundary layer oscillations (T-S shear waves) create SH amplified sound beats out of a myriad of different SH sounds created by the unique frequencies created by each boundary layer oscillating lamina.
5. Using water flow as an example, explaining how an oscillation of any mass in a fluid creates a sound wave and every SH laminar wave creates a unique SH frequency
6. Using water flow as an example, explaining how amplified transverse flow-generated sound, created by the T-S oscillations of late transition, passing perpendicularly through longitudinally flowing laminae, has the potential to freeze laminar slip (laminar interlocking), transferring resistance to the boundary, offering an explanation for turbulent flow resistance.

BACKGROUND: Cardiovascular radiologists as immersed in fluid dynamics, pressure pumps, catheter and needle flow and the study of the elements of the circulation of the blood. The examination of the mechanics of arteriographic standing waves and inter-related related periodic waves gives insight into the cause of transition to turbulence.

CONCLUSION: Arteriographic standing waves have disturbed radiologists since first described in 1955. This exhibit alerts them to be energized into being stimulated, not just disturbed, when “phenomena” are encountered. Phenomena are usually rarities, illusions (not seeing what you think you see) or happenings that should not occur under currently accepted theory. Arteriographic standing waves are an example of the last variety.

132

CT Evaluation of the Postoperative Thoracic Aorta: Review for Radiologists

Lauren E Mak, Joel Kosowan, Tami J Bang, Daniel Vargas, Dominique DaBreo
Department of Diagnostic Radiology, Kingston Health Sciences Centre, Queen's University

LEARNING OBJECTIVES:

1. Review common and novel CT imaging techniques of the postoperative thoracic aorta.
2. Summarize common and novel surgical interventions of the aortic valve, ascending aorta and aortic arch with their expected CT imaging appearance.
3. Summarize important thoracic aorta postoperative complications and their CT imaging appearance.

BACKGROUND: Pathology of the thoracic aorta including aneurysms, acute aortic syndrome, and valvular disease often require surgical intervention. Procedures include placement of a supracoronary ascending graft, with or without a valve prosthesis, an artificial composite graft, an ascending graft with preservation of the native valve and an arch repair with elephant trunk procedure. CT angiography is frequently used for routine and emergent evaluation of the postoperative aorta.

CONCLUSION: A variety of surgical techniques and materials are used to repair the thoracic aorta. Once the normal postoperative appearance is understood, complications such as infection, pseudoaneurysm, dehiscence, and dissection can be identified.

Educational Exhibit Abstracts

133

Neurosonography in Infants: Systematic Exploration Approach to the Newborn's Brain from Inside Out

Nfally Badji, Ramy El-Jalbout, Amélie Damphousse
CHU Sainte-Justine

LEARNING OBJECTIVES:

1. Recall the technical principles and the brain anatomy of the newborn on ultrasound.
2. Present a variety of pathologies of the central nervous system (hypoxic-ischemic lesions, corpus callosum agenesis, hemorrhages, tuberous sclerosis, white matter injury of prematurity, perinatal infections, et cetera.)
3. Apply a systematic exploration approach to the newborn's brain.

BACKGROUND: Ultrasound of the neonatal brain is an important tool for the assessment of newborns, especially premature infants. Although it is not possible to detect all anomalies, the respect of a systematic approach will help the radiologist to review all important anatomic brain structures.

We will present normal brain ultrasound anatomy and a variety of pathologies most commonly seen on ultrasound for the general radiologist.

Practical technical tips, which specialists use to limit the diagnostic range of etiologies, will be illustrated.

CONCLUSION: Cranial ultrasound is the first-line imaging modality for the morphological assessment of the brain of newborns. A systematic exploration approach will provide valuable diagnostic information for various neurological conditions. Knowledge of the anatomy and the radiological semiology of cerebral abnormalities allows better care of newborns. Abnormality can be suspected when the echogenicity of the white matter is similar to the adjacent choroid plexus. When faced with the possibility of meningitis, it is important to specifically assess for hyperechogenicity of the subarachnoid spaces using the high frequency surface probe. Irregular, nodular contours of the ventricles may be the calling point of subependymal nodules in the context of tuberous sclerosis. A focal enlargement of the subarachnoid spaces may be indicative of an adjacent gyration abnormality and should be the subject of detailed analysis.

136

Imaging Approach to Hemoptysis

Marshall Dunn, Michael Rivers-Bowerman, Daria Manos
Department of Diagnostic Radiology, Dalhousie University

LEARNING OBJECTIVES:

1. Describe a basic management pathway for patients with hemoptysis and the clinical information necessary to protocol imaging studies and make specific diagnoses.
2. Describe an approach to interpreting chest radiographs and CT scans in patients presenting with hemoptysis.
3. Describe the differential diagnosis of diffuse alveolar haemorrhage and the clinical information and imaging findings that suggest a specific diagnosis.
4. Describe the indications for and basic procedural steps of bronchial artery embolization for the management of massive hemoptysis.

BACKGROUND: Hemoptysis is a common indication for outpatient and emergency department imaging studies of the chest. The causes of hemoptysis are numerous, ranging from benign, self-limited lower respiratory tract infections to life-threatening disease entities that can rapidly lead to respiratory failure. Imaging plays an important role in the clinical work-up of hemoptysis and provides valuable information both to narrow the differential diagnosis and to guide initial treatment. Bronchial artery embolization should be considered in patients with life-threatening or refractory hemoptysis.

CONCLUSION: A comprehensive understanding of the role of imaging in diagnosis and management of hemoptysis will enable the general radiologist to provide timely, clinically relevant guidance to clinicians and thereby improve patient care.

Educational Exhibit Abstracts

140

Setting up a Community-base NAFLD-Related Fibrosis Screening Program Using Ultrasound SWE – Implementation, Technical Challenges and Pitfalls

Christopher Smith¹, Alexandra Medellin^{1,2}, Deepak Bhayana^{1,2}

¹Department of Radiology, University of Calgary, ²EFW Radiology

LEARNING OBJECTIVES:

Readers will learn how to:

- Implement an ultrasound Shear Wave Elastography (SWE) screening program and the evidence behind the low- and high-risk cutoff values.
- How to set up ultrasound scanners and optimize imaging technique for accurate SWE measurement.
- Pitfalls/limitations of SWE and how to minimize them.

BACKGROUND: Non-alcoholic fatty liver disease (NAFLD) is a major worldwide health concern with increasing prevalence in Canada. NAFLD can lead to cirrhosis, portal hypertension, hepatic insufficiency and hepatocellular carcinoma (HCC). Early detection of NAFLD-related liver fibrosis is imperative for early treatment, screening for complications and possible reversal of fibrosis. Liver biopsy is the gold standard for diagnosing and grading liver fibrosis. Shear-wave elastography (SWE) is a non-invasive, reproducible and inexpensive quantitative ultrasound-based alternative with high sensitivity for significant fibrosis (87-90%).

CONCLUSION: Widespread use of similar outpatient SWE NAFLD-related fibrosis screening programs has the potential to improve patient outcomes with the added benefit of decreased costs and patient burden by decreasing biopsies and unnecessary referrals to hepatologists.

148

Langerhans Cell Histiocytosis: Overview of Radiological Findings

Alex Pozdnyakov¹, Fateme Salehi²

¹Michael G Degroote School of Medicine, McMaster University, ²Department of Radiology, Juravinski Hospital, McMaster University

LEARNING OBJECTIVES:

1. To provide overview of epidemiological, pathophysiological, clinical and histological background of Langerhans Cell Histiocytosis (LCH)
2. To review the most common presentations of LCH as seen on various imaging modalities.
3. To illustrate imaging correlates of multi-organ involvement of this disease.
4. To discuss radiological differential diagnoses of LCH.

BACKGROUND: Langerhans cell histiocytosis is a rare multi-organ disorder that involves uncontrolled proliferation of Langerhans cells, resident dendritic cells in the skin. Langerhans cells histiocytosis can be both unifocal, also known as eosinophilic granuloma, or multifocal, which is associated with worse prognosis. Since proliferation occurs via lymphatic system, multiple organ systems can be involved, including, but not limited to skin, GI tract, lungs, CNS, endocrine glands and bones.

CONCLUSION: This educational exhibit will overview the current literature on the role of diagnostic imaging in LCH. Imaging features of LCH overlap with other diagnostic considerations and a thorough understanding of LCH will help radiologists provide a more precise differential diagnosis and help in treatment planning.

Educational Exhibit Abstracts

151

Expand Your Diagnostic Repertoire of Spinal Lesions: A Review of the Extramedullary Intradural Space

Sofia Velasco¹, Paulo Puac Polanco¹, Angela Guarnizo², Juan Pablo Cruz³, Fanny Moron⁴, Francisco Rivas⁵, Carlos Torres¹

¹University of Ottawa, ²IMEXHS-RIMAB, ³Pontificia Universidad Católica de Chile,

⁴Baylor College of Medicine, ⁵University of Michigan

LEARNING OBJECTIVES:

1. To review common and infrequent tumors in the intradural extramedullary space, emphasizing key imaging findings that lead to a diagnosis.
2. To discuss the appropriate use of different modalities, such as MRI, CT, and CT-myelography in the evaluation of extramedullary intradural tumors.
3. To highlight the associated syndromes that could be seen with some of the intradural extramedullary tumors.

To illustrate the surgical approaches to spinal tumors in this location and the associated complications.

BACKGROUND: Accurate lesion localization in the spinal canal is essential for diagnosis and treatment planning, especially when minimally invasive approaches are required. Among the different compartments within the spinal canal, the intradural extramedullary space harbors the majority of the spinal pathology. While neoplasms predominate in this location, other less considered processes can also be encountered in daily practice, such as infectious and granulomatous lesions, among others.

CONCLUSION: Being familiar with the key imaging features of lesions centered in the intradural extramedullary space is essential for diagnosis and treatment planning.

154

Papilledema: Pathophysiology, Imaging Findings and Mimics

Michele Bastianelli¹, Angela Guarnizo-Capera¹, Danah Albreiki², Juan Pablo Cruz³, Laurent Létourneau-Guillon⁴, Dana Iancu⁴, Carlos Torres¹

¹Department of Radiology, University of Ottawa, ²Department of Ophthalmology, University of Ottawa, ³Department of Neuroradiology, Pontificia Universidad Católica, ⁴Department of Radiology, Université de Montréal

LEARNING OBJECTIVES:

- To review the pathophysiology of papilledema.
- To highlight the key imaging findings of papilledema in cross sectional imaging.
- To discuss the entities that could lead to increased intracranial pressure including space occupying lesions, obstructive hydrocephalus, cerebral edema, infection, hemorrhage or venous flow obstruction. In addition, we will focus on the imaging findings and diagnosis of Idiopathic intracranial hypertension (IIH).
- To review some conditions that can cause optic disc swelling or pseudo papilledema pattern that can be confused with papilledema.

BACKGROUND: Papilledema is defined as optic disc swelling caused by increased intracranial pressure (ICP), transmitted into the subarachnoid space surrounding the optic nerve. The raised intracranial pressure leads to optic nerve edema, ischemia and high risk of visual loss. Early detection of papilledema on fundoscopy is therefore imperative to preventing vision loss in these patients. There is a wide array of etiologies that may lead to the clinical diagnosis of papilledema and imaging plays a critical role in detecting those pathologies.

CONCLUSION: Imaging plays a critical role in the detection of pathologies that can cause intracranial hypertension, and therefore papilledema. It is important to be familiar with the less common causes of papilledema and potential mimickers.

Educational Exhibit Abstracts

155

Cystic Spinal Lesions: Spectrum of Imaging Findings

Willem Calderon¹, Paulo Puac Polanco², Carlos Torres², Cristina Auger¹, Mauricio Castillo³, Àlex Rovira¹

¹Hospital Universitari Vall d'Hebron, ²University of Ottawa, ³University of North Carolina

LEARNING OBJECTIVES:

- To review & classify cystic spinal lesions based on their location & etiology.
- To describe key imaging features of common & infrequent cystic spinal lesions using a multimodality approach.
- To discuss the main differential diagnoses and treatment.

BACKGROUND: A wide variety of benign and malignant cystic lesions can involve the different compartments of the spine. Although an exact diagnosis may be challenging, distinct imaging features may be used to narrow the differential diagnosis. MRI is the imaging method of choice to identify and characterize spinal cysts, while ultrasound is often used as the initial imaging modality in pediatric patients. In this exhibit, key imaging findings of spinal cysts will be reviewed.

CONCLUSION: Spinal cysts demonstrate different imaging features that vary depending on their location and etiology. Early detection, localization, and characterization of these lesions are key in order to decide patient management. Radiologists should be familiar with the common and infrequent types of cysts that can involve the spine, in order to guide further work-up and/or management.

159

Intralobar Pulmonary Sequestrations: Changing CT Appearance Over Time

Joel Gamble, William Magnuson
University of Toronto

LEARNING OBJECTIVES:

1. To review the epidemiology, clinical presentations, and classification of pulmonary sequestrations.
2. To recognize the typical characteristics of intralobar pulmonary sequestrations and how markedly the imaging appearance may change over time.
3. To show how the area of affected lung and the size of the feeding arteries may decrease when a superimposed infection resolves.

BACKGROUND: Intralobar pulmonary sequestrations (IL-PS) are uncommon malformations where a lung segment is supplied by a systemic feeding artery, disconnected from the tracheobronchial tree, and shares the visceral pleura of the adjacent lobe. Via microscopic collateral connections, bacteria may seed IL-PS causing pneumonia. Rarely, life-threatening complications may also occur, arising from the feeding artery's rupture; consequently, surgical excision has traditionally been standard. However, with more attention being directed to the natural history of IL-PS, non-surgical management is increasingly seen as reasonable.

CONCLUSION: We show the natural history of an unresected intralobar sequestration with three CT scans spanning nine years. The first two were obtained when the patient was diagnosed with pneumonia. In the last CT, obtained when asymptomatic, the size of the affected lung is substantially reduced and the feeding artery appears narrower. Radiologists should recognize that the imaging appearance of pulmonary sequestrations is dynamic, and intralobar sequestrations manifesting as pneumonia have the potential to radiographically regress as symptoms resolve.

Educational Exhibit Abstracts

161

Interstitial Lung Disease: A Multidisciplinary Approach to Diagnostics and Management

Emre Aslan¹, Xue Yao Fang², Patrick Bourgouin¹, Andrei-Bogdan Gorgos¹, Julie Prénovault¹, Yves Provost¹, Anne Chin¹, Marie-Pierre Cordeau¹, Som Mai Le¹, Julie Morrisset³, Hélène Manganas³, Andréanne Gauthier³, Océane Landon-Cardinal⁴, Philippe Roméo⁵, Charles Leduc⁵, Jean Chalaoui¹, Carl Chartrand-Lefebvre¹

¹Department of Radiology, CHUM, ²Faculty of Medicine, University of Montreal, ³Department of Respirology, CHUM, ⁴Department of Rheumatology, CHUM, ⁵Department de Pathology, CHUM

LEARNING OBJECTIVES:

1. Describe common and rare interstitial lung diseases along with their clinical features.
2. Recognize the radiologic manifestations of different interstitial lung diseases.
3. Understand how input from different specialties in a multidisciplinary meeting format leads to more confident diagnoses and allow patients to receive appropriate treatment.

BACKGROUND: Interstitial lung diseases are rare and have bad prognosis. Patient's non specific symptoms and the heterogeneity in radiologic manifestations impede proper diagnosis. Despite terminology standardization in 2011, there is still some overlap in morphological characteristics of primary and secondary interstitial lung diseases. Advent of new antifibrotic treatments for idiopathic pulmonary fibrosis has increased the importance of accurate diagnoses.

CONCLUSION: Multidisciplinary meetings are currently recognized as the optimal management method for patients with interstitial lung diseases because it enables definitive diagnoses in most cases, it guides further testing for non classifiable cases and it sometimes changes the working diagnosis for complex cases. These meetings have demonstrated a decrease in mortality rate in patients with idiopathic pulmonary fibrosis. However, there is no consensus on the optimal way these meetings should be held.

This presentation contains clinical, radiological and pathological data from cases discussed in the CHUM's multidisciplinary meetings. The cases demonstrate how the input from different specialties are joined together to arrive to a final diagnosis. The CHUM evaluates over 200 cases a year with approximately 10 cases per meeting. These meetings are led by respirologists specialized in interstitial lung diseases and are attended by radiologists, pathologists, rheumatologists and residents. These meetings serve as continued medical education and act as valuable teaching sessions for residents.

Multidisciplinary meetings are essential for adequate management of interstitial lung diseases. They lead to more confident diagnoses compared to those established individually by respirologists, radiologists or pathologists.

Educational Exhibit Abstracts

162

Rheumatic Connective Tissue Diseases: Recognizing Abdominal Imaging Manifestations

Hamed Basseri¹, Azin Ahrari², Sana Basseri³, Jessica Li⁴, Alison Harris⁴

¹Department of Medical Imaging, Abbotsford Regional Hospital and Cancer Centre,

²Department of Rheumatology, University of British Columbia, ³Department of Radiology, Queen's University, ⁴Department of Radiology, University of British Columbia

LEARNING OBJECTIVES:

1. To review the epidemiology, clinical features, and classification criteria of rheumatic connective tissue diseases (CTDs) including systemic lupus erythematosus (SLE), systemic sclerosis (SSc), Sjögren's syndrome (SS), rheumatoid arthritis (RA) and inflammatory myositis.
2. Identify the spectrum of common and rare abdominopelvic manifestations of CTDs across multiple imaging modalities.
3. Recognize treatment related complications in CTDs, disease mimics and clinical associations.

BACKGROUND: CTDs are a heterogenous group of autoimmune conditions with multiorgan involvement. Given their diverse clinical presentation, relative infrequency, and variable imaging findings, these conditions pose a diagnostic challenge for the abdominal radiologist. Familiarity with the spectrum of findings across multiple imaging modalities, allows the radiologist to guide early diagnosis and assess disease severity. Furthermore, CTDs are commonly treated with lifelong immunosuppressive agents carrying a high risk for complication, in which imaging plays a critical role in recognition.

CONCLUSION: Rheumatic connective tissue diseases may present with heterogenous multisystem involvement. Recognizing the key abdominopelvic imaging manifestations in these conditions will allow the radiologist to accurately make the connection with the underlying illness, clinical association and treatment related complication. Herein we provide a case-based imaging review of both common and rare abdominal imaging manifestations seen in CTDs including systemic lupus erythematosus, systemic sclerosis, Sjogren's syndrome, rheumatoid arthritis and inflammatory myositis.

Faculty Corps Professoral



Faculty | Corps Professorial

Dr. Mostafa Alabousi McMaster University	Dr. Bruce B Forster University of British Columbia	Dr. Geraldine McGinty Weill Cornell Medicine Radiology	Prof. Mathias Prokop Radboud University Medical Centre
Dr. Deborah Assayag McGill University	Dr. John Granton University of Toronto	Dr. Micheal McInnis University of Toronto	Dr. Francesca Proulx Jewish General Hospital, McGill University
Dr. Mark Baerlocher Royal Victoria Hospital	Dr. Cameron Hague University of British Columbia	Dr. Alexandre Menard Queen's University	Dr. Kawan S Rakhra University of Ottawa
Dr. Michael Barry Saint John Regional Hospital	Dr. Anthony Hanbidge Toronto Joint Department of Medical Imaging, University of Toronto	Dr. Elka Miller Children's Hospital of Eastern Ontario	Dr. Ciaran Redmond University of British Columbia
Dr. Raffaella Basilico University of Chieti	Dr. Alison Harris Vancouver General Hospital	Dr. Nicolas Murray University of British Columbia	Dr. Katya Rozovsky Children's Hospital of Winnipeg, University of Manitoba
Dr. Ferco Berger Sunnybrook Health Sciences Centre, University of Toronto	Dr. Zaid Jibri The Ottawa Hospital	Dr. Anand Narayan Harvard Medical School	Dr. Heidi Schmidt Joint Department of Medical Imaging, University of Toronto
Dr. Jeffrey Bird University of Saskatchewan	Dr. Aline D Khatchikian McGill University	Dr. Elsie Nguyen University of Toronto, Toronto General Hospital	Dr. Jean Seely The Ottawa Hospital, University of Ottawa
Dr. Philip Blanke St Paul's Hospital	Dr. Ania Kielar University of Toronto	Dr. Savvas Nicolaou University of British Columbia	Dr. Adnan Sheikh University of British Columbia
Dr. Gary Brahm Schulich School of Medicine and Dentistry, London Health Sciences Centre	Dr. Tae Kyoung Kim University of Toronto	Dr. Tim O'Connell University of British Columbia	Dr. Carolina Souza The Ottawa Hospital, University of Ottawa
Dr. Mike Bristow University of Calgary	Dr. Iain Kirkpatrick University of Manitoba	Dr. Devang Odedra McMaster University	Dr. Lucy Spalluto Vanderbilt University School of Medicine
Dr. Nathalie J. Bureau Université de Montréal	Dr. Stephanie Lam McGill University	Dr. Anastasia Oikonomou Sunnybrook Health Sciences Centre, University of Toronto	Dr. Jason Talbott University of California
Dr. Govind Chavhan Hospital for Sick Children, University of Toronto	Dr. Emil Lee Langley Memorial Hospital	Dr. Michael Patlas McMaster University	Dr. Roger Tam University of British Columbia
Dr. Tanya Chawla Joint Department of Medical Imaging, University of Toronto	Dr. Laurent Létourneau-Guillon Université de Montréal	Ms. Lise Patry Patry Law	Dr. Martin Tammemägi Cancer Care Ontario, Brock University
Dr. Caroline Chiles Wake Forest Health Sciences Center	Dr. Mark Levental Jewish General Hospital, McGill University	Dr. Narinder Paul Western University, Schulich School of Medicine and Dentistry	Dr. An Tang Université de Montréal
Dr. Jaron Chong Western University	Dr. Andrea Lum University of Western Ontario, London Health Sciences Centre	Dr. Visal Pen Hôpital Cité de la Santé	Dr. Jana Taylor McGill University
Dr. Hema Choudur McMaster University	Dr. Sebastian Charles Mafeld University Health Network, Mount Sinai Hospital	Dr. Elena Peña The Ottawa Hospital	Dr. Carlos Torres University of Ottawa
Dr. Marc de Perrot University Health Network, University of Toronto	Dr. Daria Manos Dalhousie University	Dr. Eric Pike St. Clare's Hospital	Dr. Charlotte Yong-Hing BC Cancer Vancouver
Dr. Carole Dennie University of Ottawa	Dr. Jamie Marko American Institute for Radiologic Pathology	Dr. Stephany Pritchett London Health Sciences Centre, Western University	Dr. Eugene Yu University of Toronto
Dr. Isabelle Dupuis University of British Columbia		Dr. Linda Probyn University of Toronto	