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Inspiring The Future of Healthcare

# TO THE ICHAMS 2023 CONFERENCE



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## ICHAMS 2023

## Mission Statement

The International Conference for Healthcare and Medical Students (ICHAMS) is Ireland's first student-led conference, founded at the Royal College of Surgeons in Ireland (RCSI) in 2010. This annual international conference is organized by a group of full-time students studying medicine, pharmacy, and physiotherapy at RCSI in Dublin, Ireland.

At ICHAMS, we aim to inspire students to pursue and publish their research all while partaking in our engaging social program and learning through our hands-on workshops. ICHAMS is a conference where both undergraduate and graduate healthcare and medical students can come together to present their research to students and experts in the field, attend inspiring keynote lectures and engaging workshops, and network with like-minded peers and professionals from around the world.

Our first edition of ICHAMS in 2010 welcomed just 100 students to Dublin - recent conferences have had over 150 presenting students and over 350 total delegates, from 33 different countries. Conference participants have the opportunity to publish their abstracts in an online supplement with BioMed Central (BMC) Proceedings, one of the highest impact conference abstract publications.

1) To provide undergraduate and graduate healthcare students the opportunity to present their research findings in a formal setting with structured feedback

2) To provide a platform for career development and to help develop the clinical scientists of the future

3) To promote networking and collaboration amongst healthcare students from different countries and the exchange of research knowledge and experiences

4) To promote and encourage innovative thinking by exposing students to current cutting-edge research topics

5) To educate healthcare students on the importance of research in the broader medical fields and expose students to future research opportunities

# FOREWORDS

#### **Chair and Vice Chairs**

Sindhuja Naidoo, Jessica Lloyd & Nicole Melchior

## RCSI's Deputy Vice Chancellor of Academic Affairs

Professor Hannah McGee

#### **RCSI's Dean of Medical Programmes**

Professor Arnold Hill

#### **ICHAMS Faculty Advisor**

Professor Brona Murphy



### Foreword from ICHAMS Chair and Vice Chairs Sindhuja Naidoo, Jessica Lloyd & Nicole Melchior

Dear ICHAMS 2023 delegates,

Welcome to the 12th annual International Conference for Healthcare and Medical Students (ICHAMS)! We are delighted to have you join us as we return to a fully in-person conference at the Royal College of Surgeons in Ireland (RCSI) after our virtual and hybrid conferences in 2021 and 2022. We are so grateful for all the wonderful front-line workers whose continuous tireless efforts during the COVID-19 pandemic have allowed us to once again gather together in Dublin.

We would like to congratulate all of our presenters on completing inspiring and innovative research during these difficult times. We are looking forward to hearing your presentations over the course of the conference weekend. Whether or not you are presenting research, we hope our educational workshops, interactive social events, and keynote speeches make this weekend memorable.

This year's conference theme is Inspiring the Future of Healthcare. We chose this theme to reflect the constant evolution that research provides to medicine and the importance of participation in this process from individuals of all levels of experience and expertise. We feel particularly passionate about this as a student-run conference dedicated to student-led research. To complement our theme, we have selected the Irish Youth Foundation as our partner charity for ICHAMS 2023.

This year, our keynote speakers include Dr Alexei Mlodinow, plastic surgery resident and founder of SIA Health, who will be speaking on careers in business as a medical professional, and Dr Conor O'Brien, team doctor for the Irish Olympic and Leinster Rugby teams, who will speak on sports medicine and his experience working with athletes. We hope our keynote speakers provoke you all to reflect on past opportunities and difficulties that you have witnessed or experienced during your healthcare journey, and consider ways to contribute positive changes in your future healthcare careers.

ICHAMS would not be possible without the hard work and dedication of our organizing committee, composed of 32 RCSI students who have been working tirelessly for the past 12 months to prepare for this year's conference. We would also like to acknowledge the incredible support and generosity of RCSI's Deputy Vice-Chancellor Professor Hannah McGee, RCSI's Dean of Medical Programmes Professor Arnold Hill, and our wonderful ICHAMS faculty advisor Professor Brona Murphy. We are extremely grateful to everyone who has contributed to the successful planning and execution of this conference.

We hope you all enjoy this year's conference, and we hope to see you back next year for the 13th edition of ICHAMS!

Kind regards,

Sindhuja Naidoo, Jessica Lloyd & Nicole Melchior ICHAMS 2023 Chair, and Vice-Chairs Royal College of Surgeons in Ireland



Waidow dessien juya M.M.

## Foreword from ICHAMS Faculty Advisor Professor Brona Murphy

Dear students,

I am delighted and honoured to provide this forward. It is my great pleasure to extend to you a warm welcome to the 12th ICHAMS conference. Céad Míle Fáilte. It is fantastic to see full in person attendance once again. I am very excited about this year's programme. I anticipate it will encourage innovative thinking as you learn about each other's research knowledge and experiences. I sincerely hope ICHAMS will inspire you to continue in your chosen fields of biomedical research so that you can cultivate tomorrow's healthcare.

The busy and stimulating schedule would not have been possible without the huge efforts of our organising committee, ably led by our Chair, Sindhuja and our two Vice-Chairs, Jessica and Nicole. I commend you on an exceptional team effort!

The organising committee and I would like to sincerely thank our keynote speakers as well as our sponsors. We are very grateful to all of our chairs, reviewers and judges for their willingness to share their knowledge, time and effort for ICHAMS.

Finally, we are indebted to our Dean, Prof Hannah McGee and to our Head of School of Medicine, Prof Arnold Hill for their continuing support of our Conference. A very special thanks to Gordon Jamieson in the Alumni Office and Margaret McCarthy in the Dean's Office.

We hope you enjoy the conference.

Best wishes,

Brona Muphy



## Foreword from RCSI Deputy Vice-Chancellor Professor Hannah McGee

Dear students,

I am delighted to provide the foreword for the RCSI, University of Medicine & Health Sciences, International Conference for Healthcare and Medical Students (ICHAMS) 2023 abstract book.

RCSI ICHAMS is an undergraduate scientific student-led conference, now in its 12th consecutive year. The conference provides an opportunity for students to be inspired by science, improve their communications skills, present their research in an international setting and develop new friendships with peers from all over the world. The conference also provides a forum to highlight the significance and importance of early research for healthcare and medical students. The success of this conference is not only dependent on the dedication and commitment of students carrying out research, but also on their academic supervisors who have supported mnd encouraged their research projects.

As with all conferences, the success of ICHAMS is reliant on on the dedicated and enthusiastic team of organisers. My thanks to Professor Brona Murphy, Faculty Advisor and Academic Lead for ICHAMS and to the student organising team comprising: Sindhuja Naidoo (Chair); Nicole Melchior (Vice-Chair); Jessica Lloyd (Vice-Chair); Domonique Proceviat (Special Tasks Officer); Katelyn Gallo (Special Tasks Officer); Nayyara Mirdad (Design Officer); Mansi Potluri (Design Officer); Lulwa Behbehani (International Marketing & PR Officer); Annabella Stewart Miller (International Marketing & PR Officer); Sarah Chiodo (IT Officer); Caroline McCamus (IT Officer); Manmeet Gill (IT Officer); Muskan Sardana (IT Officer); Grace Tan (Media Officer); Saoirse O'Malley (Media Officer); Alyssa Francis (National Marketing & PR Officer); Simran Gupta (National Marketing & PR Officer); Niharika Rajesh (Head of Scientific); Arnavaz Hajizadeh (Scientific Officer); Sophia Downey (Scientific Officer); Iria Manas (Scientific Officer); Saumeh Saeedi (Scientific Officer); Avneesh Sachdev (Head of Sponsorships); Gina Rizq (Sponsorship Officer); Divyeshz Thakku Sivakumar (Sponsorship Officer); Swar Shah (Education & Workshops); Sarah Chitnis (Educations & Workshops Officer); Swar Shah (Education & Workshops Officer); Adam Jordan (Education & Workshops Officer); Wadeed Irfan (Head of Events); Mina Habaka (Events and Accommodation Officer).

Welcome to RCSI, University of Medicine & Health Sciences for the 12th ICHAMS Conference, for some of you welcome also to Dublin and to Ireland - Céad Míle Fáilte. I hope you all enjoy the 12th ICHAMS Conference.

Best Wishes,

Hand When

Professor Hannah McGee Deputy Vice Chancellor for Academic Affairs



## Foreword from RCSI Dean of Medical Programmes Professor Arnold Hill

Dear Students,

I am delighted and privileged to provide the foreword for the International Conference for Healthcare and Medical Students (ICHAMS) 2023 abstract book.

ICHAMS is widely recognised and highly regarded as the undergraduate scientific student-led conference. Now in its twelfth consecutive year it provides a fantastic opportunity for students to share their experiences with other students in an international setting and to foster early career innovations and leadership skills. We are delighted this year to return to the traditional in-person conference which we hope you will all enjoy.

As always the success of any conference is dependent on the dedication and commitment of the students carrying out the research and the academic supervisors who continue to support and encourage same. More importantly however such events can only happen through the hard work of a dedicated, focused, determined and enthusiastic team of organisers. I would therefore like to thank on your behalf: Professor Brona Murphy, Faculty Advisor and Academic Lead for ICHAMS and to the fantastic student organising team;

Chair: Sindhuja Naidoo Vice-Chairs: Nicole Melchior and Jessica Lloyd Special Tasks Officers: Domonique Proceviat and Katelyn Gallo Design Officers: Nayyara Mirdad and Mansi Potluri International Marketing/PR Officers: Lulwa Behbehani and Annabella Stewart Miller IT Officers: Sarah Chiodo, Caroline McCamus, Manmeet Gill and Muskan Sardana Media Officers: Grace Tan and Saoirse O'Malley National Marketing/PR Officers: Alyssa Francis and Simran Gupta Head of Scientific: Niharika Rajesh Scientific Officers: Arnavaz Hajizadeh, Sophia Downey, Iria Manas and Saumeh Saeedi Head of Sponsorship: Avneesh Sachdev Sponsorship Officers: Gina Rizg and Divyeshz Thakku Sivakumar Head of Education and Workshops: Bhavya Kapoor Education & Workshops Officers: Sarah Chitnis, Swar Shah, and Adam Jordan Head of Events: Wadeed Irfan Events & Accomodation Officers: Mina Habaka and Mariam Sharfi

During this conference I would like to extend the warmest welcome from RCSI to you all in person. I know you will enjoy the 12th ICHAMS conference and will leave enriched by the experience that the RCSI Organising Committee have arranged for you.

May I take this opportunity to wish ICHAMS all the best for the future in continuing to promote and encourage innovative thinking by exposing students to current cutting edge research topics and for promoting interactions among healthcare students from different countries and exchanging research knowledge and experiences. May the success of ICHAMS continue to flourish and thank you again to the team for organising this event.

With kind regards

Our due

Prof Arnold Hill MCh, FRCSI. Dean of Medical Programmes at RCSI



## **IRISH YOUTH FOUNDATION**

ICHAMS 2023



The theme of our 12th ICHAMS conference is "Inspiring the Future of Healthcare". We have chosen the Irish Youth Foundation as our partnered charity and are honoured to raise funds for such an incredible organisation.

The Irish Youth Foundation is a registered charity and grant making foundation in the Republic of Ireland dedicated solely to meeting the needs of children and young people from disadvantaged backgrounds.

"We do this by supporting a wide range of outstanding projects and organisations across the country and by working closely with Ireland's dedicated youth workers and project leaders to help give Ireland's underrepresented young people the tools needed to reach their full potential in life."

"From grassroots projects to local organisations, homework clubs and national charities: all the programmes we support are proven and evidence-based and have been carefully chosen on their ability to deliver real change where it's needed, in innovative and exciting ways."

We have decided to embrace our multifaceted theme "Inspiring the Future of Healthcare" through our chosen keynote speakers, workshops, and social programmes. Furthermore, we will be hosting 9 students from Newpark Comprehensive School over the weekend.. The students will be able to attend and participate in the conference and workshops.

Throughout the conference, we will be accepting donations through GoFundMe, where all proceeds raised will be donated to the Irish Youth Foundation.

# Our Organizing Committee



## ICHAMS 2023 Organizing Committee



**Sindhuja Naidoo** Chair



Domonique Proceviat Special Tasks



Nicole Melchior Vice-Chair



Niharika Rajesh Head of Scientific



Iria Manas Scientific Officer



**Jessica Lloyd** Vice-Chair



**Sophia Downey** Scientific Officer



**Bhavya Kapoor** Head of Workshops/Education



Wadeed Irfan Head of Events and Accomodation



Katelyn Gallo Special Tasks



Arnavaz Hajizadeh Barfejani Scientific Officer



Swar Shah Education Officer



Mariam Sharfi Events Officer



Saumeh Saeedi Scientific Officer



Adam Jordan Education Officer



Sarah Chitnis Education Officer

## **ICHAMS 2023** Organizing Committee



**Minatoullah Habaka Events Officer** 



Avneesh Sachdev Head of Sponsorships



Gina Rizq Sponsorships Officer



**Divyeshz Thakku** Sivakumar Sponsorships Officer



**Alyssa Francis** National Marketing/PR Officer



Grace Tan Social Media Officer



**Caroline McCamus** IT Officer



Lulwa Behbehani International Marketing/PR Officer



Mansi Potluri **Design Officer** 



Muskan Sardana IT Officer



Annabella Stewart Miller International Marketing/PR Officer



Nayyara Mirdad **Design Officer** 



**Manmeet Gill** IT Officer



Simran Gupta Officer



Saoirse O'Malley Media Officer



Sarah Chiodo IT Officer



National Marketing/PR



## ICHAMS 2023 AMBASSADORS



## ICHAMS 2023 Ambassadors



**Shova Sapkota** Nepal



**Okunola David Ayodele** Ukraine



Sophia Khan Ireland



Amir Anees India



Alexia Urtoi Romania



**Anne Harini** Malaysia



**Greetah Rajandrin** Malaysia



**Hassan Haidar** Turkey



**Michael Labib** Egypt/Canada

## ICHAMS 2023 Conference Schedule



## Day 1: Thursday, February 9th, 2023

10:00	<b>Registration Desk Opens</b>
11:00 - 13:00	<b>Workshops</b> -POCUS (Point of Care Ultrasound)
15:00 - 17:00	Workshops -Simulated Labour Experience
17:30	<b>Opening Remarks</b>
18:00	Keynote: Dr. Conor P. O'Brien
20:00	Pub Crawl Event



## Day 2: Friday, February 10th, 2023

9:00	<b>Registration Desk Opens</b>
10:00	Poster Session A
11:00 - 13:00	Workshops -Intubation -Orthopaedic Tools -Anatomy and Dissection
12:00	Oral Session A
14:00	Poster Session B
15:00 - 17:00	Workshops -Lamh Communication -CV Management and Headshots
16:00	Oral Session B
20:00	Trivia Event



## Friday SIM Lab Sessions

#### **Morning Sessions:**

09:00 - 10:00	Delegates with no Simulated Lab experience (Pre-Clinical Students)	
10:00 - 11:00	Delegates who have some previous Simulated Lab and/or Clinical Experience	
11:00 - 12:00	Delegates who have extensive Simulated Lab and/or Clinical Experience and are looking for a more challenging scenario	
Afternoon Sessions:		
13:00 - 14:00	Delegates with no Simulated Lab experience (Pre-Clinical Students)	
14:00 - 15:00	Delegates who have some previous Simulated Lab and/or Clinical Experience	
15:00 - 16:00	Delegates who have extensive Simulated Lab and/or Clinical Experience and are looking for a more challenging scenario	

## Day 3: Saturday, February 11th, 2023

09:00	<b>Registration Desk Opens</b>
10:00	Poster Session C
11:00 - 13:00	Workshops -Laparoscopic Skills -Suturing Skills - ECG Skills -Plaster Casting
14:00	Plenary Session
15:00	Poster Session D
16:00 - 18:00	Workshops -Plaster Casting -Chest Drains -Yoga & Mindfulness -Emergency Scenarios
18:00	Keynote: Dr. Alexei Mlodinow
20:00	Gala & Awards Ceremony



# KEYNOTE SPEAKERS

## Dr. Conor P. O'Brien

MB MSc DEMG, DMSK, DSM, FACSM, FRCPI, FFSEM, FFSEM(UK)

## Dr. Alexei Mlodinow

MD, MBA



## ICHAMS 2023 KEYNOTE SPEAKERS



## Dr. Conor P. O'Brien

MB MSc DEMG, DMSK, DSM, FACSM, FRCPI, FFSEM, FFSEM(uk)



Dr. Conor O'Brien is a Consultant Physician specialising in Sports Medicine and Neurophysiology. He has worked as a consultant in the private and public sector for the past 33 years. He is a graduate of the Royal College of Surgeons (Class of 1986). He completed post-graduate training in Dublin in General Medicine prior to embarking on specialist training in the UK and North America. He is a Fellow of the Royal College of Physicians. He is also a Founding Fellow of the Faculty of Sports & Exercise Medicine (RCPI and RCSI). He is the former chairman of the Irish Sports Council's committee on anti-doping and the Irish Heart Foundation's Exercise commission and a committee member of WADA.

He is the author of 7 books and many peer review academic papers. He has invented a number of devices relating to his clinical practice (Fitfone, a wearable fitness monitor and the Theratec golf glove ). His Sports Medicine practice has encompassed team doctor to Lansdowne FC and the Leinster Senior Rugby Football team, as well as serving as team physician to the Youth Olympics in 1992 and the Centennial Olympic Games at Atlanta in 1996. He was a keen sportsman playing competitive rugby and golf.



## ICHAMS 2023 KEYNOTE SPEAKERS



## Dr. Alexei S. Mlodinow





Alexei is a serial entrepreneur with two successful exits so far, and a plastic surgeon in training at Northwestern University in Chicago. In his most notable role as founding CEO of SIA, (an alum of this class) he led the company through FDA-clearance, commercialization, NIH grant funding for a "first-and-only" indication in a new market, and pivotal trial initiation to achieve that indication. SIA achieved all this in less than 4 years and with only \$6.3M in equity capital, while maintaining a developmental pipeline. After initiating a \$15M Series B fundraise that would later be oversubscribed and expanded, Alexei began his training in plastic surgery at Northwestern McGaw Medical center in the Summer of 2021. While in residency, he remained active on the board, and led the process that culminated in SIA being acquired by Integra LifeSciences (Nasdaq: IART) last month.

In addition to his work at SIA, in 2020, Alexei simultaneously co-founded RapidRona, a shared-economy platform that connects clinical laboratories directly to consumers, and one of the first companies to bring a home PCR test to market. They were acquired by DMH in 2021. He has authored over 20 peer-reviewed publications and book chapters, and he lectures on science and entrepreneurship at various schools at Northwestern, as well as national and international meetings. He is listed as inventor on multiple issued and pending patents. And he serves as an investor and board advisor to early-stage companies focused on nanotechnology, tissue engineering, radiofrequency ablation, and many more. Alexei was also named one of Forbes' "30 under 30" in 2018 and Crain's "20 in their 20s" in 2019.





## Workshops



## February 9th Thursday 2023

### PoCUS

Host: Miroslav Vobrosky Assisted by Carsten Opris

Point-of-care ultrasound (PoCUS) is a modality that allows practitioners to gain vital clinical information at the bedside.

It is a low-cost, no-radiation, and quick tool used to help with the diagnosis of various diseases in a multitude of specialties.

### Simulated Labour Experience

Host: Dr. Ronan Daly

Labour is an intensive process with many steps, complications, and interventions. Join Dr. Daly in an interactive workshop exploring the steps involved in labour and induction through **Ireland's only birthing simulator.** The simulation will substitute a real patient, down to the physiology and response to clinical interventions and vital signs.

#### Thursday February 9th 2023

#### 11am & 12pm

Point-of-care ultrasound (PoCUS)

## 3pm & 4pm

Simulated Labour Experience

## February 10th Friday 2023

#### **Intubation** Host: Jennifer Clarke

Intubation is an important lifesaving procedure that is part of every critical care doctor's arsenal of skills. Tracheal intubation allows for the maintenance of an open airway so that medications may be administered and ventilation may be sustained. This workshop gives you the opportunity to learn and practice this technique in RCSI's stateof-the-art Surgical Suite for a realistic experience. This workshop will also touch on indications for a cricothyrotomy. Dr. Jennifer Clarke, Consultant in Anaesthesia and Intensive Care Medicine at Beaumont Hospital, will guide you through this interactive learning experience.

#### **Ortho Tools**

Host: RCSI Orthopaedic Society Assisted by Matthew Macciacchera and Wadeed Irfan

Learn all about the wonderful and fanciful tools of orthopaedics.

You'll be well on your way to becoming a surgeon!

#### **Anatomy Dissection** Host: Dr. Fabio Quondamatteo

In this 2 hour long workshop, get a hands-on experience in the RCSI Anatomy Room! Delegates will first undergo a brief introduction on abdominal anatomy and the expectations of the workshop. You will then be instructed on how to perform an abdominal dissection with opening of the abdominal cavity, exploration of the organs in situ and exposure of the major abdominal arteries. This will be performed in groups of 2-3 under the supervision of RCSI Anatomy staff and according to instructions provided on the day. Disclaimer: This workshop requires a general understanding of the anatomy of the abdominal cavity. It is, therefore, expected that delegates will revise the structure of the anterior abdominal wall, the general organisation of the abdominal cavity, and the arterial supply of the organs. In order to be admitted to the workshop it is necessary that: · Delegates hold and present a valid student ID from a recognised medical school. Delegates maintain a high level of professionalism and strictly adhere to the instructions given on the day about their conduct in the Anatomy Room. In particular, photography and filming are strictly forbidden, and, no public discussion on activities in the Anatomy Room, including in electronic format and social media, are allowed. Please note that: You do not need to take in your books or notes. Instructions will be provided on the day to aid your work. Dissection instruments, disposable gowns, and gloves will be provided in the Anatomy Room.

#### **Lamh Workshop** Host: Lamh Ireland, Christine Delany

'An Introduction to Lámh' information session. Lámh is a key word signing system used by children and adults with intellectual disabilities and communication support needs, in Ireland. This session includes information about communication, intellectual disability, an introduction to augmentative and alternative communication (AAC), an overview of Lámh and its benefits. It will include a demonstration of 10 key Lámh signs that are functional for session attendees.

#### CV Management and Headshots

Host: Niamh Mullen, Sai Kham Hloi and Reem Alawai

This CV management session aims to provide students with the knowledge of how to deliver a professional, targeted resume and CV that stands out. It will address common mistakes students make on their CV, and how to best outline role-specific knowledge and skills for successfully securing your desired position. It will also provide tips on how to attain an effective headshot. Drop in to this session to get a professional headshot taken!

#### Friday February 10th 2023

#### Sim Lab Sessions

9am-12pm 1pm-4pm

#### 11am

Intubation Anatomy Dissection Orthopaedic Tools

#### 3pm

Lamh Workshop CV Management and Headshots

#### Anatomy Dissection 11am-1pm

#### 12pm

Intubation Orthopaedic Tools

#### 4pm

CV Management and Headshots

## February 11th Saturday 2023

#### Laparoscopic Skills Host: Charles O'Connor

The advancement into laparoscopy for surgery has revolutionised medical practice. It has dropped infection rates and post-operative care complications tremendously. This minimally invasive technique is crucial for many specialities and a very exciting thing to master. Come and enjoy this workshop to get a hands-on experience in laparoscopy skills!

#### Suturing Skills Host: RCSI Surgical Society

Suturing is a basic surgical skill that is vital for any doctor. This workshop aims at giving you hands-onexperience in suturing and wound-closure techniques. Whether you are looking to perfect existing skills or learn some new, this workshop will be sure to impress anyone!

#### **ECG Workshop** Host: Dr. Michael Daly

The ECG is is one of the most vital tools used clinically and helps diagnose cardiac rhythms, conduction system abnormalities, and myocardial ischemia. Join Dr. Daly in his EKG workshop in which he will go through the basics of reading the EKG and also important and common patterns to recognize clinically. This workshop will show students that reading the ECG can not only be easy, but enjoyable as well.

#### **Plaster Casting**

Host: Dr. Michael Hanlon,Ms. Maura Shanahan Assisted by; Allison Kelliher, Alexander Vincent

The ability to assess and manage fractures is an important practical skill for all medical professionals. This workshop will help students get hands-on experience with acute fracture management using plaster casting. This workshop is back by popular demand!

#### **Chest Drains** Host: Dr. Melanie Cunningham

Take full advantage of RCSI's state of the art simulation center with our workshop on chest drains. You will learn about indications for the placement of chest drains, management and complications, and have the opportunity to solve clinical problems with peers. This session is taught by Dr. Melanie Cunningham, an award-winning clinical lecturer from RCSI. Join us in this exciting immersive simulation!

#### **Yoga and Mindfulness** Host: RCSI Gym Team

Come enjoy an hour of relaxation and fitness with David and the rest of the crew from RCSI's own gym! We'll get you moving with some yoga to help the stress of the conference weekend melt away. This workshop is suitable for all experience levels, no fitness gear required!

#### Saturday February 11th 2023

#### 11am

Laporascopic Skills ECG Workshop Suturing Skills Plaster Casting

#### 4pm

Plaster Casting Chest Drains Emergency Scenarios Gym Team Yoga & Mindfulness

#### 12pm

Laporascopic Skills ECG Workshop Suturing Skills Plaster Casting

#### 5pm

Plaster Casting Chest Drains Emergency Scenarios Gym Team Yoga & Mindfulness

## Social Events



### Pub Crawl



Date: Thursday, February 9th 2023 Time: 8 pm

Join us for our first social event of the conference and get the opportunity to explore Dublin and Irish culture through a fun pub crawl!



Date: Friday, February 10th 2023 Time: 8 pm

Get to know your fellow delegates and test your general trivia knowledge at our Trivia Night!

## Gala

Date: Saturday, February 11th 2023 Time: 8 pm

Join us in your cocktail attire for an evening of fancy fun to wrap up this year's conference in style! Awards will be presented at the Gala.

## Judges





## ICHAMS 2023 JUDGES



Dr. Sudipto Das Dr. Fareeda Borhan Dr. Alexei Mlodinow Prof. Maria Morgan Dr. Judith Coppinger Dr. Lameese Alhaddah Dr. Melanie Focking Dr. Chiara DeSanti Dr. Debbi Stanistreet Dr. Jaideep Cherakka Kesavan Dr. Tomas Carroll Dr. Grace Hogan Dr. Cathy Richards Dr. Claire Stenson

Dr. Gordon Daly

Prof. Frances Horgan

Dr. Sonia Gera

Dr. Christopher Torrens

Dr. Claire Hevican

Dr. Kerri O'Hare

Dr. Navya Lakkappa

Dr. Charlie O'Connor

Dr. Anna Bogdanska

Dr. Muhammed Waleed Baig

Dr. Nafisah Borhan

Dr. Roisin McAvera

Dr. Anish Engineer

Dr. Arnavaz Hajizadeh Bejafah



## Abstracts

**Plenary Sessions** 

**Oral Sessions** 

**Poster Sessions** 





Saturday, February 11, 2023 2:00pm-3:00pm



#### ETV6 Deficiency Unlocks ERG-Dependent Microsatellite Enhancers to Drive Aberrant Gene Activation in B-Lymphoblastic Leukemia

Dr Rohan Kodgule<sup>1</sup>, Dr Joshua Goldman<sup>1</sup>, Mr Alexander Monovich<sup>1</sup>, Mr Travis Saari<sup>1</sup>, Mr Cody Hall<sup>1</sup>, Ms Athalee Aguilar<sup>1</sup>, **Ms Niharika Rajesh<sup>1</sup>**, Ms Juhi Gupta<sup>1</sup>, Mr Shih-Chun Chu<sup>1</sup>, Ms Li Ye<sup>1</sup>, Dr Aishwarya Gurumurthy<sup>1</sup>, Mr Ashwin Iyer<sup>1</sup>, Dr Noah Brown<sup>1</sup>, Dr Mark Chiang<sup>1</sup>, Dr Marcin Cieslik<sup>1</sup>, Dr Russell Ryan<sup>1</sup>

<sup>1</sup>University of Michigan, Ann Arbor, MI, USA

Introduction: Distal enhancers play critical roles in sustaining oncogenic gene expression programs. The ETV6-RUNX1 (E-R) fusion oncogene defines a common B-acute lymphoblastic leukemia (B-ALL) subtype, 52 representing about 25% of pediatric B-ALL. However, the mechanism 59 by which ETV6 dysfunction contributes to leukemia is poorly understood. We identify aberrant enhancer-like activation of GGAA tandem repeats as a characteristic feature of B-ALL with genetic defects of the ETV6 transcriptional repressor, including ETV6-RUNX1+ and ETV6-null B-ALL. Methods: A variety of basic and advanced laboratory methods were utilized to obtain our results. These include STR analysis to identify cell lines, cell culture, lentivirus vector generation for ETV6 transgene experiments, FISH analysis, Western blotting, WGS, ChIP-Seq protocols, ATAC-Seq nuclei isolation and library preparation, RNA-seq, gene expression analysis, chromatin data analysis, comparative genomic analysis, CRISPR-interference and Flow cytometry. Results: We show that GGAA repeat enhancers are direct activators of previously identified ETV6-RUNX1+/- like B-ALL "signature" genes, including the likely leukemogenic driver EPOR. When restored to ETV6-deficient B-ALL cells, ETV6 directly binds to GGAA repeat enhancers, represses their acetylation, downregulates adjacent genes, and inhibits B-ALL growth. 1030 out of 1133 enhancer-like GGAA repeat elements in genome-wide analysis were associated with ETV6bound GGAA repeats (p<0.05). Thus, without intact ETV6 genes, E-R genes are activated in E-R+ B-ALL by the unopposed GGAA repeats. In ETV6-deficient B-ALL cells, we find that the ETS transcription factor ERG directly binds to GGAA microsatellite enhancers and is required for sustained activation of repeat enhancer-activated genes. CRISPRi-mediated ERG knockdown resulted in significantly decreased transcript levels for 36 of 40 genes in the ETV6-repression signature by RNA-Seq, showing its role in B-ALL. Discussion/Conclusion: Together, our findings reveal an epigenetic gatekeeper function of the ETV6 tumor suppressor gene and establish microsatellite enhancers as a key mechanism underlying the unique gene expression program of ETV6-RUNX1+/-like B-ALL.

#### In vitro analysis on master transcriptional regulators identifies tissue factor pathway inhibitor 2 as a novel biomarker for ulcerative colitis non-responders

Ms. Helen Huang<sup>1</sup>, Mr. Luke Grant<sup>2</sup>, Mrs. Ololade Lawal<sup>2</sup>, Dr. Dr Sudipto Das<sup>2</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Epigenetics and Gastrointestinal Diseases Research Group (EpiGastroDRG), School of Pharmacy and Biomolecular Sciences, Royal College of Surgeons in Ireland

Introduction: Effective patient management for ulcerative colitis (UC) is hampered by a lack of molecular biomarkers that can predict response to Infliximab. However, preliminary in silico results from our lab, for the first time, identified master transcriptional regulators (MTRs) that regulate gene expression underpinning response to Infliximab. The aim of this study was to examine the expression levels of these MTRs using in vitro models of UC to further identify biomarkers for Infliximab non-responders. Methods: Normal rectal epithelial cells were cultured and split into three replicates: vehicle (BSA 1.0%), cells only (CO), and cells treated with TNFa (20 ng for 24 hrs) to develop a pro-inflammatory phenotype recapitulating UC. mRNA levels of up-regulated (TFPI2, CXCL8, SELE, FCGR3B) and down-regulated (FGFR2) MTRs previously identified were extracted. A quantitative real-time PCR (qRT-PCR) was carried out to assess levels of MTRs post-TNFa stimulation. Values from qRT-PCR experiments were recorded and fold expressions (R.Q.) were obtained by calculating mRNA expression of MTRs in CO and TNF compared to vehicle. The data was analysed in Microsoft Excel and graphed using PRISM. Results: Higher expressions of TFPI2 was statistically significant in cell lines treated with TNFa compared to cells without treatment (p=0.03). While CXCL8 expression was higher in TNFa treated cell lines, the gene did not reach statistical significance when comparing with vehicle treated cells (p=0.051). In comparison, SELE and FCGR3B expression was not statistically significant. Of the previously identified downregulated MRs, lower expressions of FGFR2 was statistically significant in cell lines treated with TNFa compared to cells without treatment (p=0.01). Discussion: Our study suggests, for the first time, that TFPI2 may act as a novel biomarker for IBD treatment response. Future studies should be performed to assess the impact of TFPI2 knock-down on proinflammatory cytokines central to UC development and elucidate its phenotype in non-responders.

#### Moving a suicide bereavement peer-support group online due to COVID-19: the experiences of group facilitators and attendees.

#### Mr. Niall Seymour<sup>1</sup>, Dr. Selena O' Connell<sup>2</sup>, Dr. Eimear Ruane-McAteer<sup>2</sup>, Dr. Eve Griffin<sup>2</sup>

<sup>1</sup>School of Medicine, University College Cork, Cork, Ireland, <sup>2</sup>School of Public Health, University College Cork, Cork, Ireland. National Suicide Research Foundation, Cork, Ireland

Background: Suicide is recognised worldwide as a major public health issue; with a lifetime prevalence of losing a close friend or relative to suicide in excess of 20%. Those bereaved due to suicide experience unique challenges – including being at a higher risk of suicidal ideation, depression, and post-traumatic stress disorder. People bereaved by suicide often turn to peer support groups, facilitated by people who have been similarly bereaved, in an effort to deal with their grief. This study aimed to assess the impact of moving such groups from an in-person to an online format during the COVID-19 pandemic. Methods: The study was carried out with HUGG, an organisation providing suicide bereavement peer-support in Ireland. A mixed methods approach was used. HUGG group attendees were invited to complete an online survey and an online semistructured focus group was held with HUGG group facilitators. Results: 74% (n=17/23) of survey respondents said they would prefer a blended (in-person and online) or online-only approach to future peer-support groups. Reported benefits of the online format included greater flexibility, not requiring childcare, not having to drive or use public transport after emotional meetings, and being able to leave meetings easily. Drawbacks of the online format included difficulties with providing appropriate support and follow up if a group member became distressed, lack of body language, meetings being more tiring/draining, and the lack of privacy in a home environment. Computer skills did not appear to be an issue, with 87% (n=20/23) of respondents being "extremely confident" at using the computer and internet. **Discussion:** Group members and facilitators were highly satisfied with participating in online suicide bereavement support groups. Going forward, this study highlights that the online format may continue being of value, particularly for people who are unable or would prefer not to attend in-person support groups.

#### Should we monitor cerebral oxygenation in patients undergoing thoracic surgeries?

**Mr. Kajetan Kiełbowski¹**, Dr. Anna Lesińska², Prof. Krzysztof Safranow³, Dr. Jarosław Pieróg⁴, Dr. Janusz Wójcik⁴, Dr. Norbert Wójcik⁴, Dr. Małgorzata Wojtyś⁴, Prof. Tomasz Grodzki⁴, Prof. Bartosz Kubisa⁴

<sup>1</sup>Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland, <sup>2</sup>Department of Invasive Cardiology, District Hospital, Szczecin, Poland, <sup>3</sup>Department of Biochemistry and Medical Chemistry Pomeranian Medical University, Szczecin, Poland, <sup>4</sup>Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland

Introduction: Near-Infrared Spectroscopy (NIRS) is a non-invasive method of regional tissue oxygenation measurement. Intraoperative monitoring of brain oxygenation (BO) can help in identifying cerebral desaturations. We aimed to examine if commonly used peripheral blood saturation monitoring (SvO2) sufficiently represents BO.Methods: SvO2 and BO were measured in a group of 100 patients undergoing standard thoracic surgeries. We have noted the observations every 15 minutes. Statistical analysis was performed using Wilcoxon and Mann-Whitney U tests. Correlations between measured parameters were performed with Spearman's rank correlation. **Results:** The duration of included surgeries varied from 30 to 200 minutes. A negative correlation between age and BO at the beginning of surgery was found. A positive correlation between SvO2 and BO between 15 and 90 minutes of surgery was observed. Subsequently, we found a negative correlation between these two methods. SvO2 returned to baseline values faster compared to BO. Nevertheless, both SvO2 and BO showed a negative correlation with overall duration of surgery. Minimum SvO2 values were higher in patients undergoing left-sided procedures. Moreover, significant BO differences were observed in patients undergoing different types of surgery. Wedge resections were associated with higher BO values compared to lobectomies. Discussion: Cerebral desaturation is associated with several risk factors, including one-lung ventilation, hypoxic pulmonary vasoconstriction, and lateral decubitus position. This study shows that SvO2 and BO are not identical. Normal SvO2 measurement does not exclude cerebral desaturation. Furthermore, changes in BO values are associated with patients' age, duration, and extent of surgery. Annotation: This study is a PhD dissertation of dr Anna Lesińska


Friday, February 10, 2023

Session A: 12:00pm-1:00pm Session B: 4:00pm-5:00pm



### ADAM-17 Serum Concentration in Alpha-1-antitrypsin Deficient Patients

Ms. Domonique Proceviat<sup>1</sup>, Dr. Mark Murphy<sup>2</sup>, Dr. Malcolm Herron<sup>2</sup>, Dr. Emma Leacy<sup>2</sup>, Prof. Noel G Mcelvaney<sup>3</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Respiratory Research Division, Department of Medicine, Royal College of Surgeons in Ireland, Education and Research Centre, Beaumont Hospital Dublin, Ireland, <sup>3</sup>Head Of School Of Medicine, Department of Medicine, Royal College of Surgeons in Ireland

Alpha-1-antitrypsin deficiency (AATD) is a syndrome that predisposes patients to pulmonary emphysema and liver complications. While alpha-1-antitrypsin is often investigated for its antiprotease activity, it also inhibits pro-inflammatory molecules, including ADAM-17. ADAM-17 cleaves cytokines, receptors, and has been implicated in many pulmonary pathologies. Here we measure the differences in ADAM-17 concentration in the serum of patients with different AATD phenotypes. Whole blood was collected from 28 patients of varying phenotypes and processed for serum. ADAM-17 was measured using an R&D DuoSet ELISA kit, and an ELISA was also done to measure IL-6 and sTNFR1 concentration. Clinical and biochemical data were retrieved from the Beaumont Hospital PIPE system. Data was analysed in GraphPad Prism (version 9.4.0). Kruskal-Wallis tests were used for inter-group comparisons, and cytokine levels were correlated with clinical readouts using Pearson Correlation. We found ADAM-17 concentration to be significantly higher levels in ZZ patients compared to MMs (p=0.0225). ADAM-17 was also correlated to IL-6 and sTNFR1 concentration in the serum (p<0.0001 for both). Correlating ADAM-17 with the available pulmonary function tests (PFTs) for the patient cohort, ADAM-17 concentration was positively correlated with DLCO (p=0.0192). With data gathered from the Beaumont Hospital PIPE system, ADAM-17 was found to be positively correlated to serum IgA concentration (p= 0.0028). IL-6 was positively correlated with FEV1 (p=0.0076), FEV1(%) (p=0.0230), FEV1/FVC (p=0.0292), and DLCO (p=0.0174). Due to the significantly higher concentration of ADAM-17 in ZZ patients, this data is suggestive that ADAM-17 may have a role in the pathogenesis of severe AATD. However, since the ADAM-17 concentration shows a paradoxical relationship to PFTs, an activity assay should be performed in addition to measuring how much of the serum ADAM-17 is proteolytically active. It is evident that ADAM-17 is a piece of the puzzle in AATD, and this poses an opportunity to investigate the exact mechanism.

# Arginase-2 induction is TLR4 specific in inflammatory macrophages

# Ms. Rachel Frankle<sup>1</sup>, Dr. Jennifer Dowling<sup>2</sup>, Dr. Remsha Afzal<sup>2</sup>

<sup>1</sup>School of Pharmacy and Biomolecular Sciences, Royal College of Surgeons in Ireland, <sup>2</sup>School of Pharmacy and Biomolecular Sciences, Royal College of Surgeons in Ireland

During infection, the toll-like receptor (TLR) family of proteins in macrophages detect unique pathogen- and damage-associated molecular patterns and initiate an immune response accordingly. This response is mediated by differential expression of inflammatory mediators e.g., TNF, IL-1, and IL-6 etc.1 Although macrophages upregulate acute inflammation, they can later switch their functional phenotype to produce antiinflammatory cytokines, such as IL-10, to resolve inflammation.2 Dysregulation of TLR signalling and macrophage polarisation states are implicated in a diverse range of pathologies, from chronic infection to immunodeficiency.1,3 The enzyme arginase-2 (Arg2) is required for IL-10-mediated polarisation of macrophages to an anti-inflammatory state via downregulation of the inflammatory cytokine IL-1 $\beta$ . Specifically, the IL-10/Arg2 pathway is induced in macrophages stimulated with lipopolysaccharide (LPS), a TLR4 agonist.4 We explore whether other TLR signalling pathways induce Arg2 in the presence of IL-10, and hence which TLRlinked pathologies might benefit from Arg2 activation. We stimulated macrophages for 24 hours with LPS or Pam3CSK4 (TLR1/2 agonist) with and without IL-10 in wild type (WT) and Arg2 knock-out (KO) mice. Gene and protein expression were analysed via RT-PCR and western blotting, respectively. We characterised changes in Arg2 expression, as well as the processing and secretion of IL-1β. Our results demonstrated that whilst IL-1β was upregulated by both TLR1/2 and TLR4, Arg2 was induced more selectively by TLR4, an effect observed at both the mRNA and protein level. Moreover, we confirmed that whilst Arg2 KO macrophages were unable to suppress LPS-induced IL-1 $\beta$  with IL-10 pre-treatment, they retained the ability to downregulate Pam3CSK4induced IL-1β levels. Collectively, this data shows Arg2 holds promise as a novel anti-inflammatory target specifically in TLR4-mediated signalling. Future work will examine the therapeutic role of Arg2 in models of TLR4-centric diseases, as well as the ability of other TLRs to activate the IL-10/Arg2 axis in macrophages.

### Brain macrostructure in neonates with hypoxic-ischemic encephalopathy

**Ms. Bhavya Kapoor¹**, Ms. Lilian Kebaya², Ms. Paula Camila Mayorga³, Ms. Paige Meyerink³, Mr. Talal Altamimi³, Ms. Emily S. Nichols⁴, Ms. Sandrine de Ribaupierre³, Mr. Soume Bhattacharya³, Mr. Leandro Tristao5, Mr. Michael T. Jurkiewicz⁵, Ms. Emma Duerden²

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Neuroscience, Western University, <sup>3</sup>Neonatal-Perinatal Medicine, Department of Paediatrics, London Health Sciences Centre, <sup>4</sup>Applied Psychology, Faculty of Education, <sup>5</sup>Western University, Department of Medical Imaging, London Health Sciences Centre

Background: Hypoxic ischemic encephalopathy (HIE) is a severe brain injury impacting term-born neonates and is associated with a myriad of adverse developmental outcomes suggesting the involvement of subcortical structures with extensive cortical connections. Aims: 1) To examine subcortical macrostructure in the first few days of life in neonates with HIE compared to age- and sex-matched healthy newborns. 2) To determine whether subcortical volumetric maturation is associated with HIE severity. Methods: A cohort of 28 newborns (19 males [67.9%], median gestational age [GA] =38.6 weeks) with HIE (mild = 4, moderate =21, severe =3 based on Sarnat staging) were scanned with MRI within the first four days of life (median postmenstrual age [PMA]=39.2). The control group included 28 healthy newborns matched for GA, birth weight and PMA at scan. Subcortical volumes (thalamus, basal ganglia, hippocampus, cerebellum) were automatically extracted from T1-weighted images and generalized linear models assessed between-group volumetric differences. Within-group analyses assessed the association amongst subcortical volumes, HIE severity and cooling status. Results: Newborns with HIE had significantly smaller bilateral thalamic, basal ganglia, cerebellar and right hippocampal volumes compared to healthy newborns (all, p<0.001). Newborns with HIE had significantly larger ventricular volumes (all, p<0.001) compared to controls. Greater HIE severity was associated with smaller volumes of the right putamen (p <0.001), left putamen (p<.001), right (p<0.001) and left pallidum (p=0.015) when adjusting for clinical and demographic factors. Conclusions: Newborns with HIE, scanned with MRI within the first days of life, had smaller subcortical volumes impacting sensory and motor regions compared to healthy newborns. HIE severity was associated with smaller volumes, particularly impacting the basal ganglia, suggesting heightened vulnerability of these structures to perinatal asphyxia.

# DESTIGMATIZING DIFFERENCES—ONE WORD AT A TIME: HEALTH PROFESSIONS STUDENTS' PERSPECTIVES ON STIGMATIZING LANGUAGE USE IN HEALTHCARE

Ms. Saakshi Daswani<sup>1</sup>, Ms. Elizabeth Gorecki<sup>1</sup>, Ms. Jacinta Burke<sup>2</sup>, Dr. Lisa Mellon<sup>3</sup>

<sup>1</sup>Graduate Entry Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Centre for Mastery: Personal, Professional & Academic Success, RCSI University of Medicine and Health Sciences, <sup>3</sup>Department of Health Psychology, School of Population Health, RCSI University of Medicine and Health Science

Background: The use of stigmatizing words and phrases such as "disorder," "defect," "substance-abuser," "demented," is not uncommon in healthcare. It influences the perceptions healthcare providers have of their patients and affects care delivery. In an inclusive healthcare environment, the use of person-first language is considered best practice. However, guidelines surrounding this are not formalized and ever-changing. Methods: This qualitative study examined medical students' perspectives on the use of stigmatizing language in teaching and clinical settings, and recommendations for improvement. 21 medical students at RCSI University of Medicine and Health Sciences participated in four semi-structured focus group interviews. The interviews were transcribed, and two independent reviewers coded the data using thematic analysis. A third reviewer helped resolve any disagreements. **Results:** Seven key themes (average Kappa coefficient of agreement = 44%) surrounding the use of stigmatizing language in medical education were identified: the prevalence of stigmatising language ("insidious"), its impact on students and patients ("it stops people getting the help they need"), the fineline between being sensitive vs. medically correct ("do you change scientific lexicon to accommodate trends"), how recommendations for language use is constantly evolving ("it's hard to keep up"), barriers to change practice ("we don't have the tools"), how power dynamics and cultural context can influence language use, how this is a broader societal issue ("this isn't a problem we can solve just in medicine"). Participants further provided recommendations for improvement, including more training, facilitating workshops, and sharing patients' stories. **Conclusion:** Study findings provide insight into health professions students' perspectives on stigmatizing language use in healthcare and recommendations for betterment. This is a continuously evolving topic with little guidance. Results from this study can inform the development of formalized direction to address stigmatizing language use in healthcare, particularly coming from and catering to future generation of healthcare professionals.

### Identification of cancer driver mutations in chromatin remodelling genes

### Ms. Dahye Shin<sup>1</sup>, Dr. Nicola Cosgrove<sup>2</sup>, Dr. Simon Furney<sup>2</sup>

<sup>1</sup>School of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland, <sup>2</sup>Genomic Oncology Research Group, Dept. of Physiology and Medical Physics, RCSI

Chromatin-remodelling genes are a group of genes coding proteins related to the chromatin rearrangement from a condensed state to a transcriptionally accessible state. These genes affect gene expression epigenetically by modifying histones or acting as transcription cofactors. These chromatin-remodelling gene mutations appear in many types of cancers. This research focused on the most frequently reported colorectal, lung and breast cancer and compared the rate and characteristics of chromatin remodelling gene mutations according to different cancer types. This study is a retrospective cohort study using bioinformatics, and I conducted this research through the R statistics package to analyse cancer cohorts presenting somatic mutations. This study focused on characterising chromatin-remodelling gene mutations among 271 colorectal adenocarcinoma data (COAD), 409 samples of lung adenocarcinoma and 365 samples of breast cancer data by The Cancer Genome Atlas (TCGA). Recurrent somatic mutations are identified in chromatin-remodelling genes in the Colon (COAD), Lung (LUAD) and Breast (BRCA) cancer cohort. The data shows different kinds of mutated chromatin-remodelling genes in each cohort. In COAD cases, KMT2D is the highly mutated gene, followed by KMT2C and KMT2B. PRDM9 and KMT2C are the most frequently mutated genes in LUAD and BRCA, respectively. Overall, KMT2C is one of the most frequently mutated chromatin-remodelling genes. In conclusion, our data indicate that there are common and frequently mutated chromatin remodelling genes and their affecting loci.

### Leukodystrophy-linked mutant claudin-11 sensitizes cells to endoplasmic reticulum stress-induced death

### Ms. Caroline Mccamus<sup>1</sup>, Prof. Mahmoud Pouladi<sup>1</sup>

<sup>1</sup>Department of Medical Genetics, Center for Molecular Medicine and Therapeutics, British Columbia Children's Hospital Research Institute, University of British Columbia

Introduction/Background: ER stress-induced cell death is a cellular process that is triggered under a variety of conditions in response to disturb protein folding in the ER. There are several diseases associated with ER-stress induced cell death, including Pelizaeus-Merzbacher disease (PMD). The mechanisms by which ER-stress-induced cell death leads to disease is still unclear. Stoploss mutations in CLDN11, the gene encoding the tight junction protein claudin-11, have recently been identified as a novel cause of PMD. How mutant claudin-11 causes PMD is unclear. In this project, we sought to test the hypothesis that the PMD-linked stoploss mutations induce ER stress as a result of mutant claudin-11 misfolding, sensitizing to ER stress-induced cell death. Methods: HEK293 cells with stable expression of wildtype (WT) or mutant (MT) claudin-11 were assessed by Western blot to examine the impact of the stoploss mutations on claudin-11 expression. The Claudin-11 HEK293 cells were also evaluated using assays of cell viability and death at baseline and following treatment with the ER stress induced Thapsigargin (Tg). **Results:** Western blot analyses showed that the stoploss mutation causes a shift in MT claudin-11 to a higher molecular weight species and appears to decrease its steady-state levels. Treatment with the ER stressor Tg (3 and 6µM) for 24-48 hrs resulted in lower cell viability and higher cell death in MT claudin-11 HEK293 cells compared with WT. Conclusions: Our results indicate that MT claudin-11 sensitizes cells to ER stress-induced cell death, and suggest that ER stress may contribute to CLDN11-induced leukodystrophy. More broadly, ectopic expression of transgenes in immortalized cells can allow the impact of different mutations to be further examined. This can help clarify the impact that specific mutations have on ER function and how ER stress can lead to cell death in cells harbouring mutant proteins.

### Prognostic and Goals-of-Care Communication in the Ped<sup>3</sup> tric Intensive Care Unit: A Systematic Review

**Ms. Sherlissa Ali-Thompson<sup>1</sup>**, Dr. Megan L McSherry<sup>2</sup>, Dr. Sapna Kudchadkar<sup>2</sup>, Dr. Lauren Rissman<sup>2</sup>, Ms. Riley Mitchell<sup>2</sup>, Dr. Vanessa Madrial<sup>3</sup>, Ms. Katie Lobner<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Johns Hopkins Hospital, <sup>3</sup>George Washington University

Background: Admission to the pediatric intensive care unit (PICU) may result in substantial short- and long-term morbidity for survivors and their families. Engaging caregivers in discussion of prognosis is challenging for PICU clinicians. We sought to summarize the literature on prognostic, goals-of-care conversations (PGOCCs) in the PICU in order to establish current evidence-based practice, highlight knowledge gaps, and identify future directions. Methods: PubMed(MEDLINE and PubMed Central), EMBASE, CINAHL, PsycINFO, and Scopus databases were searched. We reviewed published articles (2001-2022) that examined six themes within PGOCC contextualized to the PICU: 1)caregiver perspectives; 2)clinician perspectives; 3)documentation patterns; 4)communication skills training for clinicians; 5) family conferences; and 6) prospective interventions to improve caregiver- clinician communication. Two reviewers independently assessed eligibility using Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) methodology. Data Synthesis & Results: Of 1420 publications screened, 65 met criteria for inclusion with several key themes identified. Parent and clinician perspectives highlighted the need for clear, timely, and empathetic prognostic communication. Communication skills training programs are evaluated by a participant's self-perceived improvement. Caregiver and clinician views on quality of family meetings may be discordant. Documentation of PGOCCs is inconsistent and most likely to occur shortly before death. Only two prospective interventions to improve caregiver-clinician communication in the PICU have been reported. The currently available studies reflect an over-representation of bereaved white, English-speaking caregivers of children with known chronic conditions. Conclusions: Future research should identify evidence-based communication practices that enhance caregiver-clinician PGOCC in the PICU and address 1)caregiver and clinician perspectives of underserved and limited English proficiency(LEP) populations 2)inclusion of caregivers who are not physically present at the bedside; 3)standardized communication training programs with broader multidisciplinary staff inclusion; 4)improved design of patient and caregiver educational materials; 5) the development of pediatric decision aids; and 6) inclusion of long-term post-PICU outcomes as a measure for PGOCC interventions.

# Testing a novel JAM-A inhibitor derivative for application in targeted drug therapy in breast cancer: a pre-clinical pilot study

Ms. Sarah Chiodo<sup>1</sup>, Ms. Lorna Williams<sup>1</sup>, Mr. Lance Hudson<sup>2</sup>, Dr. Cathy Richards<sup>3</sup>, Dr. Ann M. Hopkins<sup>2</sup>

<sup>1</sup>Medical student, Royal College of Surgeons in Ireland, <sup>2</sup>Department of Surgery, RCSI University of Medicine and Health Sciences, RCSI Smurfit Building, Beaumont Hospital, Dublin 9, Ireland, <sup>3</sup>Department of Medicine, RCSI University of Medicine and Health Sciences, RCSI Smurfit Building, Beaumont Hospital, Dublin 9, Ireland

Introduction: Junctional Adhesion Molecule-A (JAM-A) is emerging as a target of interest in breast cancer due to its reported capacity to regulate HER2 and HER3 expression, and because its cleavage may be a biomarker of resistance to HER2-targeted therapies in patients. A novel antagonistic peptide (JBS2) was previously shown to exert antitumour effects in pre-clinical in vivo breast cancer models (1). As peptides are unstable drugs, we aimed to explore whether a stable D-amino acid derivative of JBS2 (JBS2-D) had superior bioefficacy. Methods: In vitro cell viability assays and in vivo chick embryo xenograft assays were performed in HER2+/JAM-A+ SK-BR-3 breast cancer cells overexpressing JAM-A (SK-J+) or empty vector (SK-EV) following treatment with JBS2 or JBS2-D. In vitro, 1,500 cells/well were seeded onto 96-well plates, treated for 3-6 days with JBS2 or JBS2-D (50-500µg/mL) versus vehicle (10 µL PBS), and subjected to MTT viability assays. In vivo, 2x106 cells were implanted onto the chorioallantoic membranes of fertilised hen eggs, and xenografts harvested following 4-day exposure to JBS2, JBS2-D (250µg/egg) or vehicle (PBS 25µL/egg). Results: JBS2 and JBS2-D exerted concentration- and time-dependent reductions in in vitro cell viability, with the greatest sensitivity to JBS2-D in SK-J+ cells. In the in vivo pilot study, four embryos with grossly-visible tumours survived (vehicle; JBS2; 2xJBS2-D). Discussion/Conclusion: Early indications support the hypothesis that JBS2-D exerts greater bioefficacy in breast cancer models. Results provide a compelling rationale for replicating this pilot study, correcting for design flaws and low sample size. Acknowledgements: We thank the Health Research Board for funding (grant SS-2022-024 to SC), and the RCSI Research Summer School.

# **Poster Sessions**

Friday, February 10, 2023 Session A: 10:00am-11:00am Session B: 2:00pm-3:00pm Saturday, February 11, 2023 Session C: 10:00am-11:00am Session D: 3:00pm-4:00pm



#### "Visual snow - systematic review on etiology and treatment."

Mrs. Wiktoria Stańska<sup>1</sup>, Mrs. Anna Torbus<sup>1</sup>, Mr. Przemysław Rusztyn<sup>1</sup>, Dr. Piotr Maciejewicz<sup>1</sup>

<sup>1</sup>Department of Ophthalmology, Medical University of Warsaw

**Introduction:** Visual snow (VS) is a rare clinical entity, described as the bilateral presence of dynamic, flickering dots affecting the visual field, often compared by patients to snow or pixelated television static. It can be a lifelong condition or have an acute onset. Moreover, it is a relatively new term in medicine, and the nature of the condition is subjective and elusive, lowering the quality of life. Unfortunately, little is known about VS. This systematic review aims to describe the updates in the etiology and treatment of visual snow. Materials & Methods: We searched for articles in English, presenting original data and published after December 2019. We also aim to increase awareness of visual snow because many healthcare professionals have difficulty diagnosing it quickly. Results: Different studies show inconsistent data. Neuroimaging found, among others, hypermetabolism of the lingual gyrus, changes in the occipital cortex, increased gray matter in different brain areas, and altered connectivity in visual pathways. However, these findings are not present in all patients. Interestingly, they often do not have abnormalities in the ophthalmic examination. According to the literature, among the most effective drugs are lamotrigine and topiramate. Unfortunately, they also carry a risk of worsening the symptoms. It's crucial to remember that visual snow can be worsened or induced by alcohol, recreational drugs, and particular medication like antidepressants. In terms of treatment, nonpharmacological approaches like color filters and repetitive Transcranial Magnetic Stimulation are also made. Discussion: Further studies are needed to fully understand VS's nature, as current data is based mainly on case reports. Nevertheless, expanding the knowledge about visual snow can impact patients' comfort. That is why hearing what the symptoms are is an immense relief for a patient. As well as a quick and proper diagnosis lets patients avoid stress and shortens the diagnostic path.

### "Visual snow: Pixelated vision without any abnormalities in ophthalmic examinations – case report"

Mrs. Wiktoria Stańska<sup>1</sup>, Mrs. Anna Torbus<sup>1</sup>, Mr. Przemysław Rusztyn<sup>1</sup>, Dr. Piotr Maciejewicz<sup>1</sup>

### <sup>1</sup>Department of Ophthalmology, Medical University of Warsaw

Introduction: Visual snow (VS) is a clinical entity from neuro-ophthalmology. It is described as dynamic, flickering dots affecting the whole visual field, compared to pixelated television static. Unfortunately, patients often face a lack of understanding from medical professionals as the nature of the condition is subjective and elusive. Case report: We present a case report of a 23-year-old woman presenting visual snow. The patient was admitted to the Ophthalmological Department of Clinical Hospital Dzieciątka Jezus in Warsaw. The main symptoms were bright, flickering dots seen with opened and closed eyes, particularly disturbing while looking at plain backgrounds and reading paper books. It was accompanied by severe photophobia, nyctalopia, and oscillopsia. She has had VS for as long as she can remember, but only two years ago, she realized that her visual symptoms were not physiological. Interestingly, the patient's identical twin also experiences VS. Our patient had been previously diagnosed with fibromyalgia, psoriasis, and Sjogren's syndrome, treated with methotrexate. In our department, we performed an extensive ophthalmological examination. All the results were correct except for low myopia, -0,75 diopters in both eyes. Magnetic resonance also did not reveal any abnormalities. According to the patient wearing eyeglasses with a filter of blue light improves her condition. In April 2021, she had COVID-19 and experienced a depressive episode simultaneously. After administering duloxetine, her VS worsened. Nevertheless, the patient continued taking the drug. Discussion: Visual snow can be a distressing condition for many patients, lowering the comfort of daily life. Moreover, it is often labeled as purely psychogenic, which is stigmatizing for patients. That is why even though the pathophysiology of VS remains unknown and there is no strong recommendation for effective treatment, we believe that by expanding the knowledge about it, we can have a real impact on the comfort of patients.

# A 14-year-old patient with multiple neoplasms - Constitutional Mismatch Repair Deficiency Syndrome - a case report.

# Ms. Dominika Galli<sup>1</sup>, Dr. Magdalena Samborska<sup>2</sup>

<sup>1</sup>Students' Research Group of Pediatric Oncology and Hematology Department of Pediatrics Oncology and HematologyPoznan University of Medical Sciences, <sup>2</sup>Poznan University of Medical Sciences

Background: Constitutional mismatch repair deficiency syndrome (CMMRD) is a genetic disorder resulting from a biallelic mutation in one of the genes: MLH1, MSH2, MSH6, or PMS2. Patients have a higher predisposition for various malignancies, especially hematological neoplasms, and brain and gastrointestinal tract tumors. Case report: A boy was diagnosed with B common lymphoblastic leukemia (ALL) at the age of 3. The patient completed treatment for the SR group in 2012. The first magnetic resonance imaging (MRI) of the head, revealed hamartoma and astrocytoma lesions in the central nervous system (CNS). In 2014, the patient was admitted to the hospital due to a mediastinal tumor - a diagnosis of precursor T cell lymphoblastic lymphoma, accompanied by vena cava syndrome, was established. The treatment of lymphoma was completed in 2016. Due to brain tumors, second hematological malignancy, and numerous skin "cafe au lait" lesions, a genetic test including Sanger's sequencing was performed and the CMMRD syndrome was diagnosed. Since that time, the patient had regular checkups: in the MRI of the head astrocytoma and hamartoma were described, and in colonoscopy, numerous polyps of the type of tubular adenomas were removed every year. At the age of 14, the diagnosis of isolated bone marrow relapse of ALL B-common was established. Due to the almost exceeded total dose of anthracyclines, one course of blinatumomab was administered after induction chemotherapy, and the patient was qualified for allogeneic hematopoietic cell transplantation. The patient remains in CR2 under the care of the transplant center. Summary: The second case of cancer in a pediatric patient requires a thorough analysis of all clinical data and a search for genetic causes of cancer predisposition. The diagnosis of CMMRD syndrome allowed for the extension of diagnostics and the prevention or detection of other neoplastic changes at an early stage.

# A novel prognostic scoring system combining the revised Tokuhashi Score and the New England Spinal Metastasis Score for preoperative evaluation of spinal metastases

# Ms. Dionisia Mavritsakis<sup>1</sup>, Dr. Louis-Philippe Amiot<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>The Department of Orthopedic Surgery-Spine, Hôpital Maisonneuve-Rosemont

Introduction: Numerous scoring systems have been developed in order to determine the prognosis of spinal metastases. Predicting as accurately as possible the life expectancy of patients with spinal metastatic disease is very important, as it is the decisive factor in selecting the most optimal treatment for the patient. The Revised Tokuhashi score (RTS) and the New England Spinal Metastasis score (NESMS) are popular scoring systems used to determine the optimal treatment modality. However, they sometimes provide conflicting results. We propose a novel prognostic scoring system, which combines the (RTS) and the (NESMS) to predict with greater accuracy the prognosis. Methods: We retrospectively reviewed the data of 64 patients with spinal metastasis enrolled between 2012 and 2021 in the Department of Orthopedic Surgery-Spine, Hôpital Maisonneuve-Rosemont, Montréal, Que. The new score per patient was then calculated as a combination of the RTS of each patient and the patient's corresponding NESMS score and then compared to the actual patient survival period in order to assess its adequacy in predicting the survival of patients with spinal metastases. The patients were divided into three groups: Low, Moderate or Good Prognosis. Results: In the Low Prognosis group, the reliability of predicting the prognosis was 55.6% in 27 patients. In the Moderate Prognosis group, the reliability of predicting the prognosis was 95.8% in 24 patients. In the Good Prognosis group, the reliability of predicting the prognosis was 100% in 13 patients. **Discussion:** This study demonstrates that a new prognostic scoring system, which would combine the RTS and the NESMS, is promising in providing an improved accuracy for predicting the actual patient survival especially for the moderate and good prognosis patients. An appropriate prospective investigation with a larger sample size should be conducted to further investigate the validity of this novel scoring system and its overall predictive value.

# A review of international approaches to HTA: how do mechanisms of stakeholder engagement and research dissemination differ?

### Mr. Abubakr El Sheikh Idris<sup>1</sup>, Dr. Dr Barbara Clyne<sup>2</sup>, Ms. Karen Jordan<sup>3</sup>, Dr. Máirín Ryan<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Department of General Practice RCSI University of Medicine and Health Sciences, <sup>3</sup>Health Information and Quality Authority, Dublin, Ireland

Introduction: Health technology assessment (HTA) is research process that supports policymakers in making evidencebased decisions on how best to allocate finite resources within a healthcare system. Previous studies have highlighted the importance of increasing the participation of stakeholders, including patients and the public, in health services research and HTA. However, differences in stakeholder needs often leads to variation in processes between countries. As such, the aim of this study was to outline the processes of international HTA organisations regarding stakeholder engagement and research dissemination. Methods: A mapping review was undertaken comprising a grey literature search of websites of a sample of 14 international HTA organisations. Organisations were selected based on relevance to the Irish context, similar activity and similar ranking on the human development index. Results: In terms of stakeholder engagement, half of the agencies assessed used full public consultations in the preparation of HTAs, whilst 57% (8/14) accepted public comments on a HTA. Five agencies (36%) reported conducting interviews and focus groups to collect input from stakeholders. Almost all agencies (13/14, 93%) involved advisory groups in the production of their HTAs. In all agencies the findings of assessments were made publicly available through a variety of means. Notably, whilst all 14 agencies included summaries within their reports and most (12/14, 86%) also published separate summary documents, only two agencies (14%) published infographics alongside reports. Conclusion: Of the sample of agencies examined, there was variation in the types of stakeholder engagement and modes of dissemination used. Differences of approach may reflect differences in processes and roles between agencies. Measuring the impact of these differences on the outcomes of HTAs is difficult as multiple factors can influence policy and decision-making. Further research is needed to understand the contribution of stakeholder engagement and research dissemination to the impact of HTA research.

### A screening tool for the morphometric analysis of bladder cancer

**Ms. Radhe Shantha Kumar<sup>1</sup>**, Mr. Kevin Yamauchi<sup>2</sup>, Mr. Steve Runser<sup>2</sup>, Ms. Franziska Lampart<sup>2</sup>, Mr. Roman Vetter<sup>2</sup>, Ms. Marie-Didiée Hussherr<sup>2</sup>, Mr. Gieri Camenisch<sup>2</sup>, Mr. Cyrill Rentsch<sup>3</sup> Ms. Clémentine LeMagnen<sup>3</sup>, Mr. Lukas Bubendorf<sup>3</sup>, Ms. Dagmar Iber<sup>2</sup>

<sup>1</sup>University of St Andrews, <sup>2</sup>ETH Zurich, <sup>3</sup>University Hospital Basel

Bladder cancer (BC) is one of the most common cancers, with an incidence rate of 9.6/100,000 among men and 2.4/100,000 among women worldwide. Based on their shape, the two most common forms of BC can be broadly categorized into: i) papillary tumors with finger-like protrusions that project into the bladder lumen and ii) flat carcinoma in situ (CSI) which are limited to the inner layer of bladder cells. Papillary tumors have a low risk of tumor progression whereas CIS are at higher risk of developing into muscle-invasive cancers. Computationally distinguishing flat and papillary tumors can enable studies on underlying mechanisms driving these two phenotypes. However, tools to achieve this are lacking in established BC mouse models. The aim of this project was to build and implement a machine learning algorithm which can automatically measure the thickness of the tumor epithelium and distinguish the two tumour phenotypes. 3D microscopy images of mouse bladders treated with the BC inducing drug N-butyl-N-(4-hydroxybutyl) nitrosamine (BBN) were segmented and processed to extract mesh surfaces of the epithelium-lumen and the epithelium-connective tissue interfaces. As part of the screening tool, two approaches were explored to measure thickness of epithelium i) Normal ray approach: involves shooting normal rays from the epithelium-lumen interface and measuring the thickness of rays that intersect with the epithelium-connective tissue interface, ii) Closest points approach: involves finding the closest points from a vertex on the epithelium-lumen to the epithelium-connective tissue interface. Additionally, mean curvature was used to categorize papillary vs flat tumors and statistical significance was indicated by z-scores. Our tool estimated mean epithelium thickness to be 42um higher in BC compared to control, and regions of increased thickness (i.e., tumor areas) were indicated by z-scores. Therefore, our preliminary data show automatic assessment of tumor epithelium thickness and phenotype detection in BC mice.

### A Systematic Review of Blood Donation in Insulin Dependent Diabetes Mellitus Patients

Mr. Shreyansh Shreyansh<sup>1</sup>, Mr. Shivam Pradipkumar Thaker<sup>1</sup>, Dr. Vidya Monappa<sup>2</sup>, Dr. Shivananda K Bhat<sup>2</sup>

<sup>1</sup>Kasturba Medical College, MAHE, Manipal, <sup>2</sup>Department of Pathology, Kasturba Medical College, MAHE, Manipal

Introduction: Diabetes is a disease that is studied in several fields of clinical practice. In this paper, we present studies of diabetes in relevance to the field of blood transfusion, specifically about donation from insulindependent diabetics. The objective of this paper is to interpret relevant information and data pertaining to guiding national healthcare policies that are currently excessively restrictive. Method: Literature for this paper was obtained from PubMed, Embase, and ClinicalKey. Data on Vasovagal reactions from Diabetic Donors were analyzed. Guidelines were obtained from the official websites of the countries included in the review. Data interpretation, analysis, and policies of relevance were assessed by 2 reviewers and entered into the result table. Result: In the search of the literture on this topic, only fifteen papers were found, the majority of which indicated the practice of insulin-dependent diabetics donating blood as being safe, however, our research identified that HbA1c values drop for upto 3 months after donating blood and thus may put such donor at risk of a false indication of glycemic control. Additionally, blood donation leads to reduction in serum iron levels, which in-turn reduces reactive oxygen groups and increased insulin sensitivity, though there is literature to prove otherwise, hence left inconclusive. A vasovagal reaction rate of 4.8% was observed, which was not a significant increase from reaction rate of normal donors. The current status of many national guidelines banning blood donation by insulin-dependent diabetics is unduly conservative. It may be attributed to impact of research on bovine-derived insulin in opposition to the modern rDNA insulin. Conclusion: As per the review of existing research and evidence, authors recommend that it is safe for insulin-dependent diabetics to donate blood as long as they are aware of the impact on their own serum HbA1c values as a result of the donation.

# A systematic review of international health policy guiding the identification, analysis, and management of genomic secondary findings

Ms. Safa Majeed<sup>1</sup>, Ms. Christine Johnston<sup>1</sup>, **Ms. Saumeh Saeedi**<sup>2</sup>, Ms. Chloe Mighton<sup>3</sup>, Ms. Vanessa Rokoszak<sup>3</sup>, Ms. Sonya Grewal<sup>3</sup>, Ms. Vernie Aguda<sup>3</sup>, Dr. David Malkin<sup>4</sup>, Dr. Yvonne Bombard<sup>3</sup>

<sup>1</sup>Temerty Faculty of Medicine, University of Toronto, Toronto, ON, Canada <sup>2</sup>Royal College of Surgeons in Ireland <sup>3</sup>Genomics Health Services Research Program, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Unity Health Toronto, Toronto, ON, Canada <sup>4</sup>Division of Hematology/Oncology, The Hospital for Sick Children, Toronto, ON, Canada

Introduction: An explosion in genomic sequencing for precision medicine has yielded an analogous abundance of genetic secondary findings (SFs). SFs can be defined as gene variants identified by genomic sequencing that have potential medical value, but were found incidentally, and are unrelated to the patient's primary reason for testing. These results have the potential to inform patients about their risk of developing a health condition and may result in early screening or preventative measures. Current SF identification, analysis, and management practices are inconsistent and sometimes contradictory, leading to inconsistent patient care and outcomes. As the frequency of genomic profiling rises, a synthesis of the international SF health policy landscape is imperative to understand needs and limitations. Methods: We carried out a systematic review to appraise guidance established internationally directing identification, analysis, and management of SFs for participants receiving genomic sequencing. A comprehensive search in MEDLINE, Embase, and Cochrane databases was conducted. Articles were reviewed using Covidence. Results: We identified 1,028 records and found 63 studies for inclusion producing guidance on SFs based on our eligibility criteria. Most policies focus on SF management (98%; n = 62), but fewer guide bioinformatic analyses (60%; n =38) or identification (48%; n=30). The most frequent topic mentioned was informed consent (56%; n =35) during pre-test management. Lab policies (11%; n =7) including guidance for avoiding SF discovery when requested (11%; n =7) were minimal. Low levels of quality were awarded for evidence used, stakeholder involvement, and applicability for most studies. Conclusions: Our results highlight gaps in policy for SF bioinformatic analysis and identification. Although some management processes are described, policy for medical care following results disclosure remain unknown. Lastly, many studies did not have sufficient evidence to base their guidance on. Future work should fill policy gaps and support evidence-based practice.

A Systematic Review of Tools to Assess Disaster Preparedness and Readiness among Healthcare Professionals

**Ms. Sara Elshami¹**, Dr. Banan Mukhalalati¹, Dr. Ola Yakti¹, Prof. Mohamed Izham¹, Prof. Ahmed Awaisu¹, Dr. Mohamed Sherbash²

<sup>1</sup>College of Pharmacy, QU Health, Qatar University, PO Box 2713 <sup>2</sup>College of Health Sciences, Public Health Department, QU Health, Qatar University, PO Box 2713

**Introduction:** COVID-19 pandemic has demonstrated that healthcare professionals (HCPs), including pharmacists, have important roles and responsibilities in supporting their society in times of emergencies, and in ensuring the maintenance of seamless healthcare services provision. Nevertheless, the pandemic has compelled all HCPs across the world to reconsider what preparedness for disasters entails. Aims and objectives: To identify tools used to assess the preparedness and readiness to practice among HCPs during disaster and emergency situations, to summarize their psychometric properties, and to identify the most validated, reliable, and comprehensive tool for assessing preparedness and readiness to practice during disaster and emergency situations that could be used among all HCPs. Methods: A systematic review search strategy was designed to identify the relevant original research articles using five concepts: disasters, health personnel, preparedness, management, and questionnaire. Three databases (PubMed, ProQuest Public Health, and CINAHL) were searched for research studies published in English. The identified tools were summarized according to their measurement scope/context, healthcare discipline, psychometric properties, and strengths and limitations. Results: Some of the most commonly used tools are the Disaster Preparedness Evaluation Tool (DPET), the Provider Response to Emergency Pandemic (PREP) tool, and the Disaster Nursing Preparedness Response Competency (DNPRC) Scale. A quite large proportion of the retrieved tools were developed primarily to assess educational interventions related to developing HCPs' knowledge and skills related to disaster management. Moreover, most of the retrieved tools have undergone minor psychometric evaluations (i.e., content validity and internal consistency reliability). Discussion: The findings of this review highlighted the sacristy of adequately developed and tested assessment tools that can be employed to examine disaster preparedness amongst HCPs from different healthcare disciplines and in different disaster situations, which calls for future collaborative research initiatives to ensure evaluating and consequently improving HCPs preparedness for disasters.

# Acute Abdomen Due to Choriocarcinoma: A Rare Case Report

**Ms. Fatimah Rajabally<sup>1</sup>, Ms. Rama Alkhaldi<sup>1</sup>,** Ms. Farah Elnakoury<sup>1</sup>, Ms. Julia Matwiejczuk<sup>1</sup>, Mr. Mohammad Alabdulrahman<sup>1</sup>, Mr. Michael O'Connor<sup>1</sup>, Mr. Zahir Rajabally<sup>2</sup>, Dr. Ehab Elnakoury<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland

<sup>2</sup>Department of Obstetrics and Gynaecology, Wellkin Hospital, Moka, Mauritius <sup>3</sup>Department of Oncology, Saudi German Hospital, Jeddah, Saudi Arabia

Choriocarcinoma is a fast-growing, malignant, and rare gestational trophoblastic tumour. Although the prognosis of this tumour is very good, serious complications can occur. In this case report, a 31-year-old female patient, who was diagnosed with choriocarcinoma, returned to the hospital with severe abdominal pain a few days after her first cycle of chemotherapy treatment. Upon further examination, the presence of free fluid in her abdomen and high  $\beta$ -hCG levels were identified. Consequently, an emergency laparotomy was performed discovering that the uterine tumour, which was adherent to the right colon and appendix, had ruptured. A total hysterectomy and right oophorectomy were performed, and the patient is now doing well. This case elucidates the need for improved diagnostic methods and classification systems along with swift management of gestational trophoblastic diseases.

#### Application of artificial intelligence to in vitro tumor modeling and characterization of the tumor microenvironment

**Ms. Verlyn Tan<sup>1</sup>**, Ms. Denise Goh<sup>2</sup>, Mr. Chan Way Ng<sup>3</sup>, Mr. Jeffrey Chun Tatt Lim<sup>2</sup>, Dr. Mai Chan Lau<sup>2</sup>, Prof. Joe Poh Sheng Yeong<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland <sup>2</sup>Institute of Molecular and Cell Biology (IMCB), Agency for Science, Technology and Research (A\*STAR), Singapore <sup>3</sup>Singapore Immunology Network (SIgN), Agency for Science, Technology and Research (A\*STAR), Singapore

In vitro tumor models have played a vital role in enhancing our understanding of the cellular and molecular composition of tumors, as well as their biochemical and biophysical characteristics. Advances in technology have enabled the evolution of tumor models from two-dimensional cell cultures to three-dimensional-printed tumor models with increased levels of complexity and diversified output parameters. With increased complexity, new generation models are able to replicate the architecture and heterogeneity of the tumor microenvironment more realistically. In recent years, artificial intelligence (AI) has been used extensively in healthcare and research, while AI-based tools have also been applied in the precise development of tumor models. The incorporation of AI facilitates the use of high-throughput systems for real-time monitoring of tumorigenesis and biophysical tumor properties, raising the possibility of using AI alongside tumor modeling for personalized medicine. Here, we review the integration of AI tools into tumor modeling, including microfluidic devices and cancer-on-chip models.

### Assessing the Impact of COVID-19 on Health Resource Utilisation by Paediatric Patients with Cerebral Palsy

**Ms. Natalie South¹**, Ms. Sophia Provenzano², Dr. Emily Schaeffer³, Ms. Stacey Miller⁴, Dr. Maria Juricic⁴, Dr. Kishore Mulpuri³

<sup>1</sup>Royal College of Surgeons in Ireland <sup>2</sup>University of British Columbia, Vancouver, British Columbia, Canada <sup>3</sup>Department of Orthopaedic Surgery, BC Children's Hospital, University of British Columbia, Vancouver, BC Canada <sup>4</sup>BC Children's Hospital, Department of Physical Therapy, University of British Columbia, Vancouver, BC, Canada

Introduction: Cerebral Palsy (CP) is the most common cause of motor impairment or disability in children. One in 400 individuals in Canada have CP and require the continuous support of healthcare professionals. Prior to the start of the COVID-19 pandemic the BC Children's Hospital Orthopaedic Clinic Cerebral Palsy team conducted a study on the accessibility of care for patients with CP and how it varies across the Gross Motor Function Classification System (GMFCS) levels. The purpose of this cross sectional study is to develop and administer a follow-up survey to assess how access and utilisation of healthcare services by paediatric patients with cerebral palsy has been impacted by the COVID-19 pandemic and to determine any required changes to service delivery. Methods: The original survey used in 2019 was adapted to collect new data on how access to care has changed for CP patients throughout the pandemic. This anonymous survey will be completed by consenting CP patients who attend the orthopaedic clinic at BC Children's Hospital. Results: Thirteen patients have completed the study to date with surveys still being administered. Based on results to date and anecdotal evidence, CP patients saw a decrease in the frequency of in-person healthcare visits during the pandemic, specifically rehabilitation services. Discussion: The pandemic has had long lasting effects on the delivery of healthcare and this survey allows us to see the direct impact this has had on patients with CP. The overall goal of the study is to identify the gaps in care sustained by patients with CP during the pandemic. This will allow identification of service area needs and adjustments required in resource delivery to accommodate patient needs in the event of future pandemics. This study will also give us insight into the evolving balance of virtual and in-person care.

### Assessing the Patient Perspective in a Neurovascular Clinic: A Quality Improvement Project

### Ms. Minatoullah Habaka<sup>1</sup>, Dr. Vitor Mendes Pereir<sup>2</sup>, Ms. Nicole Cancelliere<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Neurosurgical and Medical Imaging, St. Michael's Hospital, <sup>3</sup>RADIS Lab, Li Ka Shing Knowledge Institute

Introduction: In recent years, patient-cantered care has become a crucial consideration in the healthcare system. Understanding the patient perspectives allows providers to accurately assess healthcare quality delivery. Medical information has shifted towards developing patient-centred care to ensure high quality care. The two overarching measures under patient-centred care are patient satisfaction and patient experience. Patient satisfaction provides insight on a patient's perspective with the overall care, whereas patient experience is concerned with a patient's interactions with the healthcare facility, staff and waiting times. This study aims to identify points of dissatisfaction and ensure patients are receiving high quality care. Methods: Patient experience surveys were administered to all patients being followed up by physicians at the Neurovascular Clinic. The survey measured patient experiences with initial appointments, hospital stays (if applicable), and follow-up appointments. Satisfaction ratings were done on a Likert scale of 1-5 or 1-7, with the higher ends of the scale representing satisfaction, the middle being neutral, and the lower ends of the scale representing dissatisfaction. Surveys were administered to 202 patients over the span of 6 weeks. **Results:** 108 responses from patients were recorded. Of 108 patients, 73% were female, and 27% were male. A major area of dissatisfaction was waiting room times. Of 101 patients, 49% were satisfied, 32% unsatisfied, and 19% neutral. Major areas which patients expressed satisfaction included patient-healthcare team communication. Of 102 patients, 71% expressed satisfaction with patient-doctor communication, and 70% expressed satisfaction with patient-hospital staff communication. Of 90 patients, 73% expressed satisfaction with patient-nurse communication. Discussion: The patient experience surveys were beneficial in collecting patient feedback and identifying areas of satisfaction and dissatisfaction. Future directions include a phase 2 where applicable changes can be made in the Neurovascular Clinic to improve patient experience and further assessment of patient satisfaction.

### Assessment of miRNAs as a Novel Class of Therapeutics in Neuroblastoma: A Systematic Review

### Ms. Rama Alkhaldi<sup>1</sup>, Dr. Olga Piskareva<sup>2</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Cancer Bio-Engineering Group, Department of Anatomy and Regenerative Medicine, RCSI University of Medicine and Health Sciences, DO2 YN77, Dublin, Ireland.

Neuroblastoma is an aggressive paediatric cancer capable of regressing spontaneously and metastasizing to various regions of the body. Current treatment modalities remain insufficient to treat patients with metastatic spread resulting in the malignancy to account for approximately 15% of all paediatric cancer deaths. MiRNAs are endogenous small non-coding RNAs (20-22 nt) that play a role in the tumorigenesis of different cancers including neuroblastoma. They pose as a novel therapeutic agent due to their ability to regulate the expression of various genes of different pathways, causing reduction in tumour mass.

A systematic search of PubMed Database, Google Scholar, and Clinicaltrials.gov were carried out from time of inception until July 20, 2021 using Preferred Adopting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Keywords included in the search were "miRNA", "neuroblastoma", "therapeutics", "3D", "mouse", "in vivo", "mice," and "murine". Only free English full text articles, paid articles accessible for free through RCSI, peer-reviewed articles, clinical trials, in vivo, and 3D in vitro studies were included.

After careful evaluation, 42 studies were included in the qualitative synthesis. We identified a plethora of miRNAs that exert their oncogenic or tumour-suppressive role by targeting various genetic pathways. The inhibition of oncogenic miRNAs by antagomirs or the replacement of tumour suppressive miRNAs poses as a novel method of treating neuroblastoma. This study also assessed the therapeutic efficacy of certain miRNAs such as miR-34a and miR-542-3p via different modes of delivery such as through nanoparticles and viruses. These methods demonstrated promising tumour suppressive function.

Even though there is a myriad of research conducted about the role of miRNAs in neuroblastoma, very few have been validated in 3D in vitro and/or in vivo. Additional pre-clinical studies assessing the therapeutic efficacy of miRNAs in validated settings is mandatory to allow for clinical large-scale trials to be conducted.

### Biomarker signatures for biomarker-driven targeted therapies in Epilepsy – Progress and Challenges

### Ms. Siddiqah Shah<sup>1</sup>, Dr. Shona Pfeiffer<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Department of Physiology and Medical Physics, Royal College of surgeons in Ireland (RCSI), Dublin, Ireland

Epilepsy is a complex disorder characterized by recurrent seizures with altered brain function. It affects more than 50 million people worldwide and can be caused by genetic defects or acquired through brain insults. This can lead to a cascaded process called epileptogenesis, where studies are aimed at finding biomarkers that target and interrupt these processes. The aim of this systematic review is to determine from previous studies how identification of biomarkers has aided in the progress of epileptic treatment as well as some challenges faced in the process.

Using a comprehensive literature review search on sites such as Embase, MEDLINE(PubMed), Scopus, and Google Scholar, a systematic search was conducted. A MeSH search was formed using key words such as "epilepsy" AND "biomarkers" AND "targeted-therapies" which generated filtered previous studies containing the most recent randomized trials of the topic at hand between the years 2016-2022.

Recent studies have focused on biomarkers such as %REM sleep, DNA Methylation, MicroRNAs and EEG biomarkers. Their established link to epilepsy shows promise in the development of new ways of approach for targeted therapy. Nevertheless, there are challenges surrounding the lack of availability of diagnostic and prognostic biomarkers in the clinical setting due to: applicability and specificity of biomarker signatures to animal models used; heterogeneity of the epilepsies; accessibility of biomarkers; and identification of patterns in the analysis and management of complex data sets using computational modelling. Due to these challenges, treatment for epileptic patients is limited and a cure is still undiscovered.

In conclusion, despite all the current approaches in establishing targeted therapies in epilepsy, the best biomarker is still the first seizure. There is however increasing potential for the discovery of new biomarkers with technological advancements, for instance in using IPSCs (induced pluripotent stem cells) or developing computational models in the detection of biomarkers.

### Blunt chest injury with chylothorax and thoracic vertebral fracture - multidisciplinary management

### Ms. Aurelia Burduniuc<sup>1</sup>, Dr. Petr Habal<sup>1</sup>

### <sup>1</sup>Charles University, Faculty of Medicine in Hradec Králové

Introduction: Surgical treatment is not commonly used in the management of chylothorax. Case report: We describe a complicated algorithm that was used in treating a 70-year-old woman with Bechterew's disease. Admitted for healthcare after a fall, she suffered from a blunt chest injury with subsequent right-sided serial rib fracture with hemothorax and thoracic vertebral body fracture. The hyperextension of the ossified thoracic spine associated with Bechterew's disease caused the injury of the thoracic lymphatic duct. Simultaneous thoracic spine stabilization and surgical revision of the thoracic lymphatic duct from an anterior approach were indicated. Despite the urgency of thoracic spine stabilization, the procedure was postponed due to acute coronary syndrome, which was treated with drug-eluting stent insertion DES with a subsequent need for dual antiplatelet therapy. Thus the procedure was performed 16 days after stent insertion. **Discussion:** The diagnosis of chylothorax must be considered in case of thoracic injury with continuing drainage to the chest tube and detection of well-expanded pulmonary parenchyma. Traumatic chylothorax is not common and there is no unified opinion on the correct treatment procedure. From individual literature reports, the opinion emerges that the duration of conservative treatment should not be extended. The postponement of surgical treatment in our case was motivated by the necessity to allow at least partial endothelialization of the introduced stent into the right coronary artery. The short time of dual anti aggregation was a compromise due to the pressure from the surgeon, who was aware of the risks of surgery delay, and the neurosurgeon, who was aware of neurological complications in an unstable vertebral body fracture. This rare case showed the necessity of connecting specialists of different surgical fields in treatment. The good end result only confirmed the already wellfunctioning cooperation between thoracic surgeons and neurosurgeons.

# Can the uptake of Home Haemodialysis be improved with the utilization of a mobile device application (app) that contains a remote patient monitoring platform in the Irish public healthcare?

**Ms. Danya James<sup>1</sup>**, Ms. Sherlissa Ali-Thompson<sup>1</sup>, Ms. Imogene Mohammed<sup>1</sup>, Ms. Amyrathul Munyra MohamedHassan<sup>1</sup>, Ms. Shubhi Hamilton<sup>1</sup>, Mr. John Keaney<sup>1</sup>, Mr. Michael O'Connor<sup>1</sup>, Ms. Lina Adil<sup>1</sup>, Mr. Jay Hanoudi<sup>1</sup>, Mr. Noel Lum<sup>1</sup>, Dr. Vicki Sandys<sup>1</sup>, Ms. Nurul Jasmine Binti Abd. Shukor<sup>1</sup>

<sup>1</sup>Royal College of Surgeons in Ireland

Introduction: The prevalence of end stage renal disease (ESRD) in Ireland is rising, with over 500 new patients developing renal failure yearly. The current renal replacement therapy(RRT) options for ESRD include peritoneal dialysis, hemodialysis, kidney transplantation and conservative management. In-centre dialysis is time-consuming to patients and has significant transport and nursing costs. While there are many apps for patients undergoing peritoneal dialysis or transplant, there is a market for HHD apps in Ireland. Despite the advantages of HHD, uptake is minimal. Medical apps have been shown to increase patient confidence and education about home-based interventions. We sought to obtain the perspectives of CKD patients and clinicians on if the utilisation of a mobile application containing a remote patient monitoring platform would increase the uptake of home hemodialysis. Methods: We conducted semi-structured interviews with 10 patients on dialysis, 5 nurses at the Beaumont Hospital's Renal Dialysis Clinic. The responses were analysed using thematic analysis. **Results:** The findings were separated into (1)patient perspectives; (2)clinician perspectives; and (3)opinions on what app components would increase usage. Patients rated medication reminders, a hospital alert button and HHD troubleshooting videos as essential app components that would increase HHD uptake. Clinicians rated remote patient monitoring as essential. Both patients and clinicians stated that inperson interaction and disabilities would still be hindrances to HHD. Discussion: Patient and clinician responses highlighted that a mobile app would increase the uptake of HHD. Similar technology, utilising a remote patient monitoring platform has been successfully employed in home peritoneal dialysis. The success of an HHD app would precipitate reduced costs of in-centre programs and transport on the Irish Healthcare system. Further research can be conducted, and data collected can be used in the production of an app prototype.

# Case Report of Hirschsprung's Disease in a Neonate: Early Detection and Review of Management

**Ms. Fatimah Rajabally<sup>1</sup>, Ms. Rama Alkhaldi<sup>1</sup>**, Ms. Helen Huang<sup>1</sup>, Mr. Mohammad Said<sup>1</sup>, Ms. Farah Elnakoury<sup>1</sup>, Dr. Chaithanya Avanthika<sup>2</sup>, Dr. Fouad Abdool<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Medicine and Surgery, Karnataka Institute of Medical Sciences, Hubli, India, <sup>3</sup>Department of Pediatrics, Wellkin Hospital, Moka, Mauritius

Hirschsprung's disease is a rare disease characterised by the absence of some nerve cells in the colon. Although most cases are diagnosed before the age of one, a diagnosis made in the first few days of birth is infrequent. Here, we present a case of a newborn baby boy who initially developed a distended abdomen, began bilious vomiting, and was not feeding well. Blood mucoid stools were also observed. The diagnosis of Hirschsprung's disease was confirmed through a full-thickness frozen suction rectal biopsy, and the Duhamel procedure was performed as a course of treatment all within the first few days of birth. No complications were reported, and the baby was safely discharged after 7 days. This case demonstrates the importance of timely treatment due to the prompt recognition and diagnosis of the severe symptoms. Even though this disease is rare, paediatricians should be trained to recognise and treat the child to prevent further detrimental outcomes.

# Central Nervous System Alterations in Primary Sjögren's Sydrome: an MRI Study

**Dr. László Módis¹**, Dr. Zsófia Aradi², Dr. Sándor Csaba Aranyi³, Dr. Tamás Papp⁴, Prof. Miklós Emri³, Dr. Antónia Szántó², Prof. Antal Miklós Bugán¹

<sup>1</sup>University of Debrecen, Faculty of General Medicine, Department of Behavioural Sciences, <sup>2</sup>University of Debrecen, Faculty of General Medicine, Department of Internal Medicine, Division of Clinical Immunology, <sup>3</sup>University of Debrecen, Faculty of General Medicine, Department of Medical Imaging, Department of Nuclear Medicine and Translational Imaging, <sup>4</sup>University of Debrecen, Faculty of General Medicine, Department of Medical Imaging, Division of Radiology and Imaging Science

Introduction: Central Nervous System (CNS) alterations have been observed in magnetic resonance imaging (MRI) studies of primary Sjögren's syndrome (pSS), however, they are not characterized unequivocally. We examined pSS patients' cranial MRI to establish how the disease impacts the CNS. Methods: The examination happened through retrospective database-analysis, using the database of the Outpatient Clinic of the Building "C", Internal Medicine Clinic, Clinical Centre, University of Debrecen. The inclusion criteria were the alreadyperformed cranial MRI and the absence of systematic autoimmune disorders other than pSS. Out of 729 patients registered in the database, 22 patients fulfilled the criteria. A healthy control group was also established. Comparisons were performed between the pSS and the control groups and between patients with and without detectable disease activity. Morphometric analysis of each brain region and asymmetry indices of the nuclei were involved in the study alongside with the patients' immunological parameters. The statistical analysis happened through T-tests. **Results:** We summarize the significant results remaining after false discovery rate (FDR) correction. Regarding the morphometric analysis, the right straight gyrus differed significantly between the groups with and without detectable disease activity (p<0.05). There was a significant correlation between the serum level of complement C3 and the volume of the left insula (p=0.01). The asymmetry indices of each nucleus of the thalamus and the entire thalamus correlate with the serum level of complement C4 (p<0.05) and haemoglobin (p=0.01). Discussion: CNS alterations in pSS may be related to the immunopathology due to the aforesaid correlations. Hence, neurology and neuropsychology should have bigger role in the treatment of pSS patients.

# CHARACTERISTICS COMPARISON OF ENT DISORDERS IN PREGNANT AND NON-PREGNANT WOMEN INFECTED WITH COVID-19 AT MATARAM UNIVERSITY HOSPITAL: A STUDY IN RURAL AREAS

Ms. Belva Bhadranitya Buana<sup>1</sup>, Dr. Didit Yudhanto<sup>2</sup>, Dr. Eka Arie Yuliyani<sup>3</sup>, Dr. Hamsu Kadriyan<sup>2</sup>

<sup>1</sup>Medical Faculty University Mataram, <sup>2</sup>ENT Department, West Nusa Tenggara Public Hospital, <sup>3</sup>ENT Department, Mataram University Hospital

West Nusa Tenggara has an ANC visit rate below the national average (67.7%), this condition exacerbated by the pandemic and positive cases in pregnant women tend to rise. COVID-19 is associated with more severe infection-related complications in pregnant women, compared to non-pregnant women. Extrapulmonary symptoms of COVID-19 which manifest through various disorders of the ENT are being recognized gradually. Given the low awareness of ENT disorders during pregnancy in rural areas, this study aims to compare the characteristics of ENT disorders in pregnant and non-pregnant women positive for COVID-19 for early detection to prevent long-term effects in pregnant women.

This is a quantitative descriptive study with a cross sectional design, using total sampling. The research subjects were 79 medical record files from pregnant and non-pregnant RT-PCR positive COVID-19 female patients at Mataram University Hospital for the period May 2020-May 2021 according to the inclusion and exclusion criteria, with the primary outcome; Chemosensory symptoms, URTI, Auditory Disorder, Vestibular Disorder. There were 79 samples of positive RT-PCR women for COVID-19, 36 (45%) of whom were pregnant and 43 (53.1%) were not pregnant. The mean age of the non-pregnant group was  $46.67 \pm 2.34$  years (95% CI: 41.95-51.40; range: 20-75; p<0.709) while that of the pregnant group was  $28.06 \pm 1.05$  years (95% CI: 25.92-30.19; range: 19-44; p<0.768). The data is normally distributed, that age deviation can be ignored. There was no significant relationship (p=0.002) between pregnancy status and chemosensory symptoms (p>0.05). There was a significant relationship (p=0.002) between pregnancy status and symptoms of upper respiratory tract infection (p<0.05). There were no symptoms of auditory disturbances in the entire study population. Pregnancy has a significance (p=0.010) for vestibular disorders (p<0.05).

To conclude, pregnancy has statistical significance for several variables of ENT disorders.

Community-Based Participatory Research approach: a case study within 'The Smokeless Village Project' in Malawi.

Ms. Eunice Phillip<sup>1</sup>, **Ms. Farah Elnakoury<sup>2</sup>**, **Ms. Joella Simon<sup>1</sup>**, Dr. Aisling Walsh<sup>1</sup>, Dr. Sarah Jewitt<sup>3</sup>, Dr. Debbi Stanistreet<sup>1</sup>

<sup>1</sup>School of Population Health, RCSI, Dublin, <sup>2</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>3</sup>Faculty of Social Sciences, UoN, Nottingham, UK

The tenet of the Community Based Participatory Research (CBPR) approach is to allow the equitable collaboration between stakeholders, community members and researchers through co-creation of knowledge and mutual respect, to improve health outcomes [1, 2]. The aim is to reduce the power imbalance associated with research projects especially in low-resourced communities. Despite this, there is a dearth of information on the perspective of the community and research team on CBPR, as well as the impact of CBPR constructs on capacity building. The Smokeless Village Project (TSVP) aims to reduce household and ambient air pollution through multi-level interventions using a community-led approach.

To design the CBPR approach, within TSVP, a qualitative case study was undertaken. Fourteen key stakeholder semi-structured interviews were conducted with 5 community members, 2 policy makers and non-governmental organisations, and 7 field-based researchers. A deductive and inductive approach to framework analysis was used to evaluate the interviews. Matrixes of generated codes were done in NVivo 12 software. Six main themes were identified as essential to CBPR. These are co-creation of knowledge, community and research dynamics, conflicts, evaluation of participatory approach, mobilization of community resources, and participation. Findings were incorporated into the TSVP processes which resulted in improved communication, enhanced engagement, and total community buy-in of the project interventions.

The high value allotted by the community members to the processes of open dialogue, research team engagement in community activities, skill acquisition, and respect for culture , norms, and community members , highlighted the importance of community involvement in project success.

# Comparison of Regurgitant Volumes in Patients with Mitral Valve Insufficiency using 4D Flow MRI and Transthoracic Echocardiography

**Mr. Adarsh Aratikatla**<sup>1</sup>, Prof. Michael Markl<sup>1</sup>, Mr. Taimur Safder<sup>1</sup>, Ms. Gloria Ayuba<sup>1</sup>, Prof. James Thomas<sup>1</sup>, Prof. Jeesoo Lee<sup>1</sup>

### <sup>1</sup>Northwestern University

Background: Regurgitant volume (RVol) is a key metric used to determine mitral valvular regurgitation (MVR) severity [1]. Transthoracic echocardiography (TTE) and an indirect approach using cardiac MRI, are both traditional modalities used to quantify RVol but they comprise of limitations affecting its precision and reproducibility, along with error amplification when cardiac abnormalities present [1-3]. 4D-flow-eMRI is a promising technique for MVR flow quantification, since it retrospectively places a plane directly across the flow jet to quantify RVol. Methods: 4D-flow-MRI was performed on 22 patients diagnosed with MVR based on them also having received an Echo within 3 months prior to the MRI. Echo RVol was measured via the PISA method, whereas 4D flow RVol was measured at 7 equidistant planes, placed along the MVR jet [1]. Results: 4D flow MRI-RVol and Echo-RVol values were 21.5±17.0ml and 36.0±26.0ml (p<0.005), respectively. All correlation values between 4D flow MRI-RVol and Echo-RVol were >0.75 at every plane. Bias between 4D flow MRI and TTE reduced as the plane was moved downstream, but regardless of plane location (PL), limits of agreement tended to stay similar. TTE overestimated 4D flow MRI measurements at every plane. **Discussion:** As expected, a consistent increase in 4D flow RVol was observed as the plane moved downstream. However, regardless of where the PL was on 4D flow MRI, TTE still tends to consistently overestimate RVol. These results lead us to believe that patients are vulnerable to being diagnosed with a more severe case of MVR than they truly have; and since this severity guides clinicians to recommend surgery, patients may be undergoing premature or unnecessary interventions. Further studies are warranted to determine whether 4D flow MRI is underestimating, or TTE is overestimating, the true RVol. Subsequently, in vitro models can be used to compare both imaging modalities with the ground truth.

### Cortisol Secretion in Psychosis: A Systematic Review and Meta-analysis

### Ms. Henna Elahi<sup>1</sup>, Prof. Mary Cannon<sup>1</sup>, Dr. Darren Roddy<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>The School of Medicine, Trinity College Dublin, The University of Dublin

Introduction: One of the many roles of the hypothalamic-pituitary-adrenal axis (HPA) is to mediate the physiological response of the human body to stressful stimuli. The hormone end-product of this axis is cortisol. In recent literature, aberrant functioning of this axis and altered levels of cortisol have been theorised to be linked to the pathogenesis of psychotic disorders including schizophrenia. However, current evidence has not yet been able to prove a definite relationship between psychotic disorders and abnormal cortisol levels. Methods: Current studies of cortisol levels in patients with psychosis were collected by a literature search of Pubmed and Google Scholar. Data extraction was carried out on all relevant articles which evaluated cortisol levels throughout the day in patients with schizophrenia, schizoaffective disorder, and first-episode psychosis. Studies that reported morning cortisol values, such as the cortisol awakening response (CAR) were sorted for inclusion and analysis. Data, including the mean cortisol concentration, standard deviation, and p-value, was then stratified and analysed by the type of sample obtained including plasma, salivary, and cerebrospinal fluid (CSF) cortisol. Results: A total of 20 studies were included and analysed for the association between CAR and psychosis. These yielded a moderate effect size with a Cohen's d-value of +0.46. However, these studies also exhibited marked heterogeneity with an I2 value of 94%. Discussion: Though the included studies showed a positive association between awakening cortisol levels and psychosis, high heterogeneity between the studies limits the ability to establish a clear association. The marked heterogeneity may suggest a lack of association between altered cortisol levels and psychosis, however, further research - perhaps with larger samples - is required to confirm whether there is a true association.

# Critical shortage of capacity to deliver safe paediatric surgery in Sub-Saharan Africa: evidence from 67 hospitals in Malawi, Zambia, and Tanzania

Ms. Muskan Sardana<sup>1</sup>, Dr. Jakub Gajewski<sup>1</sup>, Dr. Chiara Pittalis<sup>1</sup>

### <sup>1</sup>Royal College of Surgeons in Ireland

Introduction: Paediatric disease is rife in Sub-Saharan Africa (SSA). Approximately 85% of children within SSA are expected to require surgical intervention by 15, yet barely a fraction receive adequate care. SSA is a young region with 42% of its inhabitants under 15 years of age. Hence, global efforts in upscaling paediatric surgical capacity to meet the continuously growing demand should be a priority. Methods: Data from 67 district-level hospitals in Malawi, Tanzania, and Zambia (MTZ) were collected and analysed using the PediPIPES survey. The five components of PediPIPES are personnel, infrastructure, procedures, equipment, and supplies. A PediPIPES Index was calculated for each country, and a 2-tailed variance test (ANOVA) analysis was used to explore crosscountry comparisons, using Jamovi v2.3.18.0. Results: Major personnel shortages observed; no paediatric/general surgeons and anaesthesiologists available in any of the hospitals. Infrastructural capacity not adequate; no hospitals in Malawi had uninterrupted access to external electricity. Paediatric-sized supplies (chest tubes and urinary catheters) not available in 87% of all hospitals. Common surgery, such as open treatment of fracture, least observed in Zambian hospitals (23%). Repair of spina bifida observed in no hospital. No significant difference found in paediatric surgical capacity between MTZ. Conclusions: The lack of specialist personnel available is fundamental to the shortcomings of paediatric surgery in SSA. Local training programs on common paediatric procedures and international medical partnerships must be implemented by ministries to combat shortages. Securing investment in basic healthcare infrastructure, paediatric equipment, and supplies is equally paramount to upscaling safe paediatric surgery in SSA.

# Cutting Carbs to Combat Conditions: The Effect of a Low-Carbohydrate Diet on Alzheimer's Disease & Parkinson's Disease: A Systematic Review

# Ms. Gina Rizq<sup>1</sup>, Mr. Samuel Gobraeil<sup>2</sup>, Dr. Jala Rizq<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>University of Guelph, <sup>3</sup>Western University

**Introduction:** Neurocognitive diseases (NCD) are neurological disorders that cause the deterioration of cognitive functions and ultimately, a significant determinant in one's quality of life. Numbers have been increasing at alarming rates. Researchers found that dementia patients are doubling every 20 years with cases expecting to reach up to 115 million worldwide by 2050. Likewise, the search for prevention and treatments for NCDs has correspondingly increased with the gravity of the situation. **Methods**: Using the databases PubMed and the Cochrane Library, a systematic search was conducted and results were narrowed to compiling (7) articles. A MeSH search was formulated with key words such as "Parkinson's disease & Alzheimer's disease" and "Ketogenic diet/low carb diet", and the results filtered to include randomized control trials between the years 2005-2022. **Results:** It was found that there is ample evidence suggesting that low-carbohydrate diets may have a positive impact on both the onset and progression of various neurological disorders. This includes the implementation of a ketogenic diet as a means of prevention and treatment of Alzheimer's Disease (AD). It was also found that dietary ketosis plays a role in memory enhancement and positively impacts cognitive impairment in Parkinson's Disease (PD). **Discussion:** Overall, low-carbohydrate diets are described as being a "non-pharmacological treatment" with regards to certain disorders, and have proven to play a significant role in major neurological diseases.

# Deeper phenotyping of TM6SF2 to characterize hepatic steatosis, lipid traits, and metabolic risk factors using a genome-first approach

Ms. Helen Huang<sup>1</sup>, Dr. Carolin Victoria Schneider<sup>2</sup>, Dr. Daniel J. Rader<sup>2</sup>

<sup>1</sup>School of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland <sup>2</sup>Division of Translational Medicine and Human Genetics, The Perelman School of Medicine, University of Pennsylvania

Introduction: Using a genome-first approach, we performed deeper phenotyping of steatosis-associated variants in TM6SF2 to better elucidate its prevalence in non-alcoholic fatty liver disease (NAFLD), non-alcoholic steatohepatitis (NASH), and hepatocellular cancer (HCC), while expanding its associations to metabolic and lipid phenotypes. Methods: We leveraged exome sequencing data from the Penn Medicine Biobank (PMBB) to associate carriage of TM6SF2 variants with electronic health records (EHR) in 44,296 unselected participants. Participants with a history of hepatitis B/C infection or alcohol-related disorders were excluded. Liver phenotypes were identified in participants using ICD-10 codes and imaging data, and non-carriers of a TM6SF2 variant were controls.Phenome-wide association studies were replicated in the UK Biobank and statistical analyses were done using R and PRISM. Results: Two non-synonymous variants, rs58542926 (E167K) and rs187429064 (L156P), and one rare stop-gain predicted-loss-of-function (pLOF) variant rs1272943322 (W35X) were significantly associated with physician-diagnosed NAFLD and NASH. Of these, an increased risk of HCC was pronounced in homozygotes of E167K and L156P. A PheWAS confirmed these associations to liver cancer in the UK Biobank. A BMI>30kg/m and carriage of PNPLA3 rs738409:G, attenuated the effects of liver disease, while type 2 diabetes (T2DM) was an insignificant risk factor. E167K and L156P carriers exhibited higher CT-derived hepatic fat scores in an allele-dose manner compared to non-carriers. ALT was increased in E167K heterozygotes, while cholesterol was significantly lower in both heterozygote carriers of E167K and L156P. Discussion: We identified a novel stop-gain pLOF variant in TM6SF2 associated with liver disease not previously reported, while E167K and L156P carriers had a higher risk of liver cancer and hepatic fat accumulation. Obesity was correlated with increased steatosis and HCC, while type 2 diabetes was not a significant risk factor amongst diseased-carriers. Further investigations on liver-related mortality in TM6SF2 carriers is crucial to improve risk-stratification amongst NAFLD patients.

# Diagnosing cellulitis of the penis with point-of-care ultrasonography in a resource-Limited Setting: a case report

Dr Yonathan Aliye Asfaw¹, Ms Helen Huang², Dr Ayush Anand³, Dr Muhammad Taimur⁴, Dr Sujan Poudel⁵, Dr Rajeswar Kumar⁶, **Mr Mhmod Kadom²**, Dr Sangam Shah⁵, Dr Gavrilo Lazovic⁻, Dr Ivan Rodriguez<sup>®</sup>

<sup>1</sup>Internal medicine, Addis Hiwot Hospital, Addis Ababa, Ethiopia, <sup>2</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>3</sup>BP Koirala Institute of Health Sciences, Dharan, Nepal, <sup>4</sup>Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan, <sup>5</sup>Department of Research & Academic Affairs, Larkin Community Hospital, South Miami, United States, <sup>6</sup>Rajah Muthiah Medical College, Chidambaram, India, <sup>7</sup>Department of Emergency, Larkin Community Hospital Palm Springs Campus, Hialeah, Florida, <sup>8</sup>Department of Family Medicine, Larkin Community Hospital South Miami Campus, Hialeah, Florida

Introduction: Cellulitis is a potentially serious bacterial skin infection. Penile cellulitis refers to the inflammation of the penile shaft and commonly occurs in uncircumcised, sexually-active young adults. In tertiary settings, advanced laboratory investigations to isolate specific strains of organisms causing cellulitis is not feasible. Case Study: We reported the case of a 25-year-old heterosexual circumcised male patient with two-day history of swelling and pain over the penile shaft. Local examination revealed a diffusely swollen penile shaft, erythematous, warm to touch, and tender. He reported always being in a monogamous relationship with his female partner, who did not report any active vaginal discharge or vulvar lesions that may suggest provisional findings of any sexually transmitted infection. Scant, non-bloody, purulent discharge from the external urethral orifice and on the exterior of the penile shaft was noted. The patient's urinalysis showed 20-30 WBCs/HPF, and his complete blood counts were normal. Venereal Disease Research Laboratory tests (VDRL), Rapid Plasma Reagin (RPR), wet mount, Human Immunodeficiency Virus (HIV), and rapid antibody tests were negative. The penile discharge culture revealed gram-positive cocci in chains, indicating Streptococcus species infection. Ultrasound of the penis (Figures 1 and 2) showed increased echogenicity of the left side of the penile shaft soft tissue with markedly increased doppler signal. Based on **Discussion:** This was one of the first cases reported in the literature to utilize POCUS as a supportive imaging modality in penile cellulitis. Our case highlights the applicability of point-of-care ultrasound in low-income settings and can significantly avoid additional costs associated with extensive laboratory investigations for our patient. POCUS has been a well-sought diagnostic tool for other forms of skin cellulitis and draws more attention to the primary care physician in the present medical era.

### DOPPLER-GUIDED TRANSANAL HEMORRHOIDAL DEARTERIALIZATION VIA MUCOPEXY IS EFFECTIVE, SAFE, AND IMPROVES QUALITY OF LIFE IN CANADIAN PATIENTS

**Mr Andrew Dorovenis**<sup>1</sup>, Mr Mihail Kancharla<sup>1</sup>, Dr Anish Engineer<sup>1</sup>, Mr Aneesh Kapoor<sup>1</sup>, **Ms Demetra Lalos**<sup>1</sup>, Dr Ashwin Maharaj<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>ProctoCAN

Aim: Haemorrhoidal disease is a common condition impacting Canadians. Surgical management of haemorrhoids includes 4 main approaches, all with differing clinical outcomes. This study evaluated post-operative results of the first Canadian patients who underwent Transanal Hemorrhoidal Dearterialization (THD) with mucopexy. Method: This cohort study included patients with grades 3/4 haemorrhoids attending the Thornhill Endoscopy Center (Toronto, Canada) that underwent THD with mucopexy from June 2018 to March 2020. Patients were contacted via phone between 6 months to 2 years post-op. We collected baseline characteristics, previous medical and surgical treatments for haemorrhoids, number of weeks missed from work, pre and postoperative quality of life scores, failure and relapse rate, and haemorrhoid symptom severity scale by Thaha et al (2009). This scale evaluated pruritus, pain, prolapse, bleeding, soiling, and incontinence to gas. Results: In total, 42 patients with a mean age 51.5 years and 21% female were used. Prior to surgery, 85.7% of patients experienced prolapse and 78.6% experienced bleeding. The average Thaha et. al score was 6.4 (out of 19). Half of patients noted that haemorrhoids impacted their quality of life in an unbearable way. Following the operation, 19% of patients experienced surgical failure, 14.3% of patients experienced recurrence, and 80% were able to return to work within four weeks post-op. THD with mucopexy improved quality of life in 78% of cases. Conclusion: Our study demonstrated that the doppler-guided haemorrhoidal artery ligation with mucopexy technique was successful in relieving pain, improving quality of life, and having a quicker return to work.

# Effect of Chronic Hyperglycemia on Human Induced Pluripotent Stem Cell (hiPSC) Derived Endothelial Cell Function

# Ms Hannah Berman<sup>1</sup>, Dr Shane Browne<sup>1</sup>

<sup>1</sup>Tissue Engineering Research Group (TERG), Dept. of Anatomy and Regenerative Medicine, RCSI, Dublin 2

Diabetic foot ulcer (DFU) is a major debilitating complication of diabetes, estimated to occur in up to 34% of diabetic patients during their lifetime. Diabetes and hyperglycaemia are associated with dysfunction in all stages of wound healing, particularly the vascularization stage. Vascularization depends on the migration and proliferation of endothelial cells (ECs) lining the blood vessels, making EC behaviour under hyperglycaemic conditions important to study. The aim of this project was to differentiate and isolate ECs from human induced pluripotent stem cells (hiPSCs) and to assess the effect of chronic hyperglycaemia on iPSC derived EC proliferation and migration. ECs were differentiated and purified from hiPSCs using established differentiation protocols and magnetic activated cell sorting based off the expression of the EC surface maker CD31. ECs derived from hiPSCs (iECS) were maintained in 3 conditions: (1) Euglycemia, (2) Chronic hyperglycaemia: 30 mM Glucose media for 7 days, (3) Acute hyperglycaemia: Euglycemia days 0-7, 30 mM Glucose from day 7 onward The effects of hyperglycaemia on cell migration, metabolic activity and cell proliferation were assessed using a scratch assay, AlamarBlue and PicoGreen assays, respectively. After 7 days iECs cultured in hyperglycemic conditions showed a trend of less migration but no significant difference. iECs in chronic hyperglycemia and euglycemia showed a modest but not statistically significant increase in metabolic activity and increased DNA content from day 2 to day 4. iECs in acute hyperglycemia conditions showed increased metabolic activity and decreased DNA content from day 2 to day 4. While the cell migration assay showed a parallel between what is seen in non-healing DFU and what was shown in the experiment, in future experiments cells may require more long-term culture to see a significant effect on the parameters measured.

# Effects of IL-8 stimulation on ERK phosphorylation in cellular model for Hereditary Hemorrhagic Telangiectasia

# Dr Qiuwang Zhang<sup>1</sup>, **Mr Adam Lang<sup>2</sup>**, Dr Michael Kutryk<sup>1</sup>

<sup>1</sup>University of Toronto, 2 School of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland

Endoglin is a key protein for endothelium regulation and mutations have been shown to lead to hereditary hemorrhagic telangiectasia (HHT). As HHT is characterized by vascular dysplasia and abnormal inflammation responses, we sought to investigate whether introduction of IL-8 would cause abnormal activation of cellular signalling proteins such as ERK and AKT. Using human umbilical vein endothelial cells (HUVEC) as our non-HHT model, and cells transfected with siRNA to knockdown endoglin acting as our HHT model cells, we compared the effects of IL-8 stimulation on protein expression and phosphorylation. Proteins of interest were extracted and separated via western blot before quantification by secondary fluorescent antibodies. We observed a reduction in the phosphorylation of AKT in HHT model cells treated with IL-8 compared to our non-HHT model which was also treated with IL-8. Additionally, the HHT model cells showed higher phosphorylation of ERK compared to the non-HHT model cells when both samples were treated with IL-8 as well as when neither sample was subjected to IL-8. This provides evidence that abnormal activation of ERK and AKT are part of the pathogenesis of HHT in individuals with endoglin mutations which may help us better understand this disease in the future.

# Effects of Prehabilitation on patients undergoing major abdominal surgeries for Gastrointestinal cancer treatment: A Systematic Review.

### Dr Samher Jassim<sup>1</sup>, Ms Kathryn McKnight<sup>2</sup>, Dr Michael Newell<sup>1</sup>

<sup>1</sup>Department of Surgery, University of Galway, Ireland, <sup>2</sup>School of Medicine, University of Limerick

Backgound: Gastrointestinal cancers are one of the leading causes of cancer-related deaths worldwide, with surgical interventions at the forefront of management. Aim(s): Present up-to-date evidence surrounding the effects of prehabilitation on patients undergoing abdominal surgery for GI cancer. **Objective(s):** Identify the effects of prehabilitation on postoperative outcomes, length of hospital stay, mortality, ICU admission and readmissions. We also hope to discuss prehabilitation-related compliance. Rationale: Optimising preoperative health is a well-established aspect of surgical care, but little evidence exists illustrating the specific effects that structured prehabilitation may have on GI cancer patients undergoing abdominal surgery. Methods: A systematic search of multiple electronic databases was performed using a search strategy comprising of relevant keywords and controlled vocabulary. Eight studies were selected for inclusion consisting of a total of 6,006 participants. Results: A lower incidence of postoperative complications along with shorter hospital stays was noted in prehabilitation participants, but higher rates of readmission. Compliance with prehabilitation was affected by factors such as the modality of prehabilitation and supervision. Discussion: Evidence supports that prehabilitation has the potential to benefit GI cancer patients undergoing abdominal surgery. However, our systematic review found a vast variation in the significance of these effects. Conclusion: Major abdominal surgery for cancer patients has a significant physical and mental toll. Future studies require congruence regarding participant selection criteria and intervention protocols to allow precise interpretation of the effects of prehabilitation among this patient cohort.

Keywords: 'preoperative exercise,' 'prehabilitation,' 'cancer surgery', 'abdominal surgery', 'gastrointestinal cancer', and 'randomised control trial'

### Endoscopic Procedures of the Nose and Sinuses - Is a Histopathological Evaluation Always Necessary?

Ms Maya Madhavan<sup>1</sup>, Ms Magdalena Ostrowska<sup>2</sup>, Prof Maciej Wrobel<sup>2</sup>

<sup>1</sup>ENT Scientific Club at the Department of Otolaryngology and Laryngological Oncology, Collegium Medicum, Bydgoszcz, Poland, <sup>2</sup>Department of Otolaryngology and Laryngological Oncology, Collegium Medicum Bydgoszcz

**Objectives:** The aim of the study is to analyse and diagnose histological specimens taken from patients during endoscopic surgery due to changes in the nose and paranasal sinuses and to verify the initial clinical diagnosis against the final histopathology. Methods: Retrospective analysis of medical files, documentation of all endoscopic procedures performed within 12 months was subjected to retrospective analysis. Analysed indications for surgery, preoperative diagnosis, intraoperative and postoperative diagnosis, as well as the result of the subject's histopathology were analysed. Three groups of patients with preoperative diagnosis were distinguished: A -chronic sinusitis without polyps 52.23 %, B -chronic sinusitis with polyps 42.28 %, C- nasal cavity and / or sinus tumors 5.47 % Results: In Group A, postoperative diagnosis of chronic sinusitis without polyps in all cases, confirmed the initial diagnosis, in group B, 2.35% of patients were diagnosed with a malignant neoplasm as a final result and a benign lesion in 2.35% of cases; in group C - neoplasm was confirmed in all cases of the primary tumor, while in the group suspected of recurrence, histological confirmation of the primary clinical diagnosis was obtained in all but one patients. Conclusion: Regardless of the clinical conditions and the original diagnosis in all cases of endoscopic surgery, the collected material should be routinely examined by histopathology. While in cases of lesions suspected of a proliferative process, it is an obvious procedure, in the group of patients with a clinical diagnosis of chronic sinusitis with polyps, the presence of coexisting neoplastic lesions should be taken into account.

# Evaluating patient engagement with community resources after participation in social prescribing during the COVID-19 pandemic: A mixed methods evaluation of the LinkMM randomised control trial

### Ms Natalie Mack<sup>1</sup>, Dr Bridget Kiely<sup>2</sup>, Prof Susan M Smith<sup>3</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>HRB Centre for Primary Care Research, Royal College of Surgeons in Ireland, <sup>3</sup>Discipline of Public Health and Primary Care, Trinity College, Dublin 2

Introduction: The evidence base for social prescribing in Ireland is building. Although social prescribing aims to get patients involved with community resources, the extent to which patients connect with the resources they are referred to remains largely unknown. This report presents an initial analysis of a wider process evaluation of the LinkMM trial. The objectives of this study were to:1)Summarise the available community resources in the areas in which the LinkMM intervention was implemented 2)Describe the most common resources participants were referred to 3)Assess if people engaged with these resources 4)Describe participant experiences with these community resources **Methods:** A total of 240 patients with multimorbidity participated in a randomised control trial of social prescribing link workers based in 13 general practices serving urban, deprived areas of Ireland between July 2020 and January 2021. Quantitative data on available community resources mapped by link workers, patient referrals to resources from a patient database, and patient engagement with resources from a one-year follow-up survey were analysed using descriptive statistics. Semi-structured interviews were conducted with 25 participants six to eight weeks after trial completion. Qualitative interview data on community resource use and experiences underwent thematic analysis with NVivo. Results: Link workers identified a range of available resources, but primarily referred participants to chronic disease-specific supports, mental health services, and social activities. One year post-intervention, participants were mostly engaging with health and fitness services as well as personal hobbies. Thematic analysis revealed that participant barriers to resource engagement included a lack of motivation, limited availability with personal schedules, and COVID-19 pandemic restrictions. Discussion: Patients engaged most with social prescribing recommendations centred around individual self-help. Lower community resource engagement may have been influenced by COVID-19 pandemic restrictions. Future studies should investigate patient engagement with resources over time to determine the long-term impact of social prescribing.

Evaluation of a novel outpatient project for Peripheral Arterial Disease (PAD) and diabetic foot disease at Sunnybrook Health Sciences Centre: Vascular Limb Preservation Program (VLPP). A Quality Improvement Study.

### Ms Elena Colussi-Pelaez<sup>1</sup>, Dr Giuseppe Papia<sup>2</sup>

### <sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>University of Toronto

Introduction: As part of a province-wide lower limb preservation program, the vascular surgeons at Sunnybrook Health Sciences Centre in Toronto, Ontario initiated a novel outpatient Vascular Limb Preservation Program (VLPP) to treat wounds and prevent lower limb amputations caused by peripheral arterial disease (PAD) and diabetes mellitus. The purpose of this quality improvement study is to describe the program and determine if it has achieved its primary outcomes of reducing referral times, reducing time to intervention and treatment, and determining proof of concept of this model of care. Methods: A medical record review of all patients who were referred to, and attended, the VLPP from April 1, 2021, until February 10, 2022, was conducted. The patient's medical records were accessed using SunnyCare, the electronical medical record system at Sunnybrook Health Sciences Centre and recorded. The variables recorded include basic patient information and demographics, referral information, admission data, results from PAD assessment with the nurse practitioner, investigations performed and visit decisions. Results: Data collection is ongoing, a total of 86 patients have been completed. Next set of data collection would include collecting and analysing the VascuQoL-6 questionnaires distributed to each patient at the clinic as well as the satisfaction questionnaire distributed to referring physicians regarding this new paradigm of care in this population of patients. The amputation rates will also be analysed in April 2022, which marks the 1-year point of the project commencement. Conclusion: Early results of this study suggest that the time to referral to specialised vascular care is satisfactory with the current guidelines. The prompt referral time along with the multidisciplinary approach of the VLPP will help in lowering non-traumatic lower limb amputation rates, reducing hospital admissions, and lowering healthcare costs.

### **Evaluation of Medical Journalism Elective Experience**

### Ms Riley Meade<sup>1</sup>, Dr Seema Marwaha<sup>2</sup>, Dr Brandon Tang<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Saint Michael's Hospital, Toronto

The COVID-19 pandemic highlighted the impact of non medical provider information available in current and emerging internet communication. Physicians and public health experts need to improve their use of such communication to improve patient acceptance of scientifically justified medical recommendations. The aim of this cross sectional study is to evaluate the impact of the University of Toronto's Medical Journalism Elective Experience on Residency's verbal and written communication skills and patent advocacy. The Journalism elective at University of Toronto has demonstrated a benefit to training physicians' to become improved public communicators and health advocates, the importance of a living lab to practice science communication and diverse representation on editorial team. Consideration to widening the ability of such courses to medical training curriculum may prove to be beneficial in this age of electronic patient accessed information.

### EXERCISE AND ENDOMETRIOSIS: IS THERE A PROMISING FUTURE?

Ms Kathryn McKnight<sup>1</sup>, Ms Oluwadamilola Omotosho<sup>1</sup>, Prof Amanda Cotter<sup>2</sup>

<sup>1</sup>School of Medicine, University of Limerick, <sup>2</sup>University Maternity Hospital Limerick (UMHL), Limerick, Ireland.

Background: Endometriosis is the leading cause of chronic pelvic pain in women of reproductive age with debilitating effects on quality of life, yet no cure exists. Exercise yields the potential in providing women with a non-invasive, non-pharmacological method of symptom control. Scientific literature has alluded to exercise being a favourable factor in the management of endometriosis-related symptoms. Moreover, current clinical guidelines for endometriosis fail to reflect the aforementioned benefits of exercise. Aim(s): Present up-todate knowledge regarding how exercise may contribute to the management of endometriosis-related symptoms. Objective(s): Discuss: 1) The pathophysiology surrounding exercise and endometriosis. 2) The role of exercise in endometriosis symptom control. Methods: A search strategy using the terms 'endometriosis', 'endometriomas', 'exercise', and 'physical activity' was devised. Pubmed, Medline, Cochrane reviews, and Embase were reviewed. Interventional studies, within-subjects studies, randomized-control trials, systematic reviews, meta-analysis, cohort-studies, and publication since 2000 were included. Non-English publications and non-human studies were excluded. Results: Numerous studies have suggested positive effects for endometriosis patients who performed exercise exclusively or in conjunction with other therapies. Improvements in pain levels, quality of life, anxiety, and depression were noted. **Conclusion:** Achieving symptom control in women with endometriosis is a continuing challenge. Evidence from interventional studies supports exercise as a potentially beneficial modality in management of endometriosis related symptoms as well as a synergy between exercise and hormonal therapies for management. A body of evidence regarding the processes mediating endometriosis exist and were summarised in this review to further support the manner by which exercise can produce its positive effects. The current paucity of highquality robust studies investigating these aspects of endometriosis management is an apparent obstacle to progression in this area. For clinicians to incorporate exercise in managing endometriosis, clear recommendations regarding advice and benefits are needed.

Keywords: physical activity; exercise; endometriosis; endometriosis symptom management; preventative medicine; lifestyle medicine

# Factors associated with in-hospital mortality in acute pulmonary embolism: a retrospective multicenter cohort study.

**Mr Grzegorz Procyk<sup>1</sup>**, Mr Paweł Kurzyna<sup>1</sup>, Mrs Karolina Jasińska-Gniadzik<sup>1</sup>, Mrs Dominika Rymaszewska<sup>1</sup>, Ms Julia Smyk<sup>1</sup>, Mr Piotr Szwed<sup>1</sup>, Mr Marcin Wasilewski<sup>1</sup>, Mr Rafał Wolański<sup>1</sup>, Dr Aleksandra Gąsecka<sup>1</sup>, Dr Arkadiusz Pietrasik<sup>1</sup>, Prof Marcin Kurzyna<sup>2</sup>

<sup>1</sup>1st Chair and Department of Cardiology, Medical University of Warsaw, <sup>2</sup>Department of Pulmonary Circulation, Thromboembolic Diseases and Cardiology, Centre of Postgraduate Medical Education, European Health Centre Otwock

Introduction: Pulmonary embolism (PE) is an acute cardiovascular condition associated with high mortality. Conditions related to increased PE mortality are insufficiently characterized. We report the results of a multicenter retrospective study characterizing factors affecting in-hospital mortality in PE patients. Methods: Patients diagnosed with PE between 09.2017-12.2021 in academic centers in Poland were included. Clinical and treatment data were obtained from medical records. Patients' outcomes were assessed until death or hospital discharge. Mann-Whitney U test was used for nonparametric continuous variables and Fisher's exact test was performed for categorical variables. **Results:** The study cohort included 580 patients (49.3% male). The PE risk assessed according to ESC Guidelines was low in 205 (35.3%), intermediate-low in 240 (41.4%), intermediate-high in 103 (17.8%), and high in 32 (5.5%) patients.Women were older than men (median 72.0 years, IQR 62.0-83.0 vs. 65.0 years, IQR 53.0-74.3; p<0.001). Gender had no impact on in-hospital mortality (male/female OR=0.70; 95%CI 0.40-1.21; p=0.212). Patients with active or previous COVID-19 infection presented with lower Pulmonary Embolism Severity Index than COVID-19 negative patients (84.5, IQR 58.25-105.3 vs. 92.0, IQR 71.0-120.0; p=0.015), which might be due to age differences (59.0, IQR 45.8-69.5 vs. 69.0, IQR 57.0-80.0; p<0.001). Nevertheless, COVID-19 status did not affect in-hospital mortality (OR=2.13; 95%CI 0.54-9.19; p=0.413). Neoplastic disease was not associated with increased in-hospital mortality (OR=1.57; 95%CI 0.87-2.92; p=0.180). However, lung cancer increased in-hospital mortality (OR=4.19; 95%CI 1.61-10.94; p=0.009). The following symptoms on admission increased in-hospital mortality: circulatory arrest (OR=109.1; 95%Cl 15.71-1212; p<0.001), tachypnoea (OR=5.33; 95% Cl 2.86-9.89; p<0.001), oxygen saturation<90% (OR=2.98; 95%CI 1.58-5.62; p<0.001), and syncope (OR=2.39; 95%CI 1.07-5.11; p=0.037). Discussion: Our results are consistent with the current knowledge regarding factors associated with in-hospital mortality in PE patients. Regarding novel findings, we found that lung cancer was associated with increased in-hospital mortality, while COVID-19 infection was not.

### First reported case of Robinsoniella peoriensis pyometra and bloodstream infection: A case report

# Ms Nada Shaltout<sup>1</sup>, Dr Javier Mejia Gomez<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Department of Obstetrics and Gynecology, University of Toronto, Canada

We report on a 47-year-old woman with jejunal adenocarcinoma and concurrent endometrial cancer, admitted with sepsis. Uterine fluid and blood cultures were positive for Robinsoniella peoriensis. This is the first ever case report of Robinsoniella peoriensis in Canada. We encourage clinicians to publish their experience treating gynecologic infections caused by Robinsoniella peoriensis. Failure to recognize this rare pathogen as causative for pyometra, a pus accumulation in the uterine cavity, may result in insufficient antimicrobial treatment, and death.

### General Practice in the COVID-19 Era: A Qualitative Interview Study

### Ms Jennifer McKinlay<sup>1</sup>, Prof Colin Bradley<sup>2</sup>

<sup>1</sup>University College Cork, <sup>2</sup>University College Cork Department of General Practice

Introduction: The COVID-19 pandemic greatly impacted the delivery of healthcare, particularly in general practice. It is important to ascertain how practices in Ireland have adapted to the pandemic and the consequences that have ensued. This study aimed to elucidate what adaptations were made by general practitioners (GPs) to the operations of their practices as well as the perceived advantages or disadvantages of those changes and their implications for the future of general practice. Methods: Qualitative semistructured interviews were conducted with GPs who practiced both before and during the COVID-19 pandemic. GPs were purposefully sampled based on gender, location (urban vs. rural), and duration in practice. The sample size was determined using Francis et al.'s "ten plus three" approach to identify data saturation. Interviews were conducted via Zoom, transcribed verbatim and analyzed using a descriptive interpretive qualitative approach. Results: 8 GPs were interviewed. Major changes included the use of telemedicine, electronic prescribing and telephone triage systems. Other changes included increased infection control measures and the elimination of walk-in appointments. Perspectives on the advantages and disadvantages of these changes were mixed. All GPs endorsed electronic prescribing and improved infection control measures. More recently qualified GPs found telemedicine to be efficient while experienced GPs generally reported that it increased their workload. Most GPs intend to continue with their adapted practices in the future. The need for greater locum support for GPs and improved timely access to secondary care was also expressed. **Discussion:** This study describes how GPs have adapted to the COVID-19 pandemic in Ireland. Some changes in practice have been beneficial for patient care delivery while others have increased the workload and may contribute to physician burnout. These results highlight the need for further work in determining how GPs may be best supported in a post-pandemic world.

### Glucocorticoid taper success after 1 and 2 years of treatment in the Imperial Takayasu Arteritis Cohort

**Ms Ritu Alapat<sup>1</sup>**, Dr Andrew Porter<sup>2</sup>, Dr Charis Pericleous<sup>2</sup>, Dr Taryn Youngstein<sup>2</sup>, Dr Rob Maughan<sup>2</sup>, Prof Justin Mason<sup>2</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>National Heart and Lung Institute and Imperial College London

Introduction: Takayasu Arteritis (TA) is a granulomatous large vessel vasculitis that is treated with high-dose glucocorticoids (GC) and often a Disease Modifying Anti-Rheumatic Drug (DMARD) to induce remission. Subsequently, GC doses are tapered to reduce side-effects. Although current guidelines recommend GC dose be <10mg/day after 1 year, data describing GC tapering in clinical practice is limited. In this study, GC taper success is described, and associated parameters are explored. Methodology: Data from the Imperial College TA Cohort was reviewed; 158 patients followed for 8.4 [5-13.6] yrs. Patients with sufficient data and typical treatment initiation pattern were analysed; commencing either GC monotherapy or GC + DMARD without prior immunosuppression. Primary outcome: <10mg/day GC dose after 1- and 2-years treatment. Secondary outcome: patients achieving same without intensification (second DMARD or biologic agent). Taper-failure and -success groups were compared for baseline parameters and treatment at 5 years. Comparisons are nonparametric, data median [IQR]. Results: Of 129 TA cases requiring treatment, 80 (62%) satisfied analysis criteria. Overall, 46 (57.5%) and 59 (73.7%) patients met the primary outcome at year-1 and -2 respectively. Of these, 43 (93.5%) and 46 (78%) did so without treatment intensification. 94% of year-1 taper-success cases maintained this at year-2. In most cases (90.5%), year-2 taper failure was due to inadequate treatment response. Baseline parameters were similar between groups except ESR which was significantly lower in tapersuccess cases. As expected, initial treatment with GC monotherapy tended to be lower in the taper-success group. At year 5, taper-failure cases had higher GC doses and biologic usage suggesting a more refractory disease course. **Discussion:** The >10mg/day GC taper target was achieved in 57.5% of patients, increasing to 73.7% by 2 years. Clinical implementation of this target is practical, and will aid in reducing cumulative GC exposure and identifying patients who require treatment intensification.

### Glycemic control in Gestational Diabetes Mellitus during COVID-19 pandemic

Dr Howard Berger<sup>1</sup>, Dr Alexandra Berezowsky<sup>1</sup>, Ms Negar Bagheri<sup>1</sup>, Ms Elena Colussi-Pelaez<sup>2</sup>

<sup>1</sup>Saint Michael's Hospital, Toronto, <sup>2</sup>Royal College of Surgeons in Ireland

Introduction: About 7-10% of the pregnancies in northern America are complicated by diabetes and 90% of those cases are represented by Gestational diabetes mellitus (GDM). Both maternal and neonatal adverse outcomes of GDM are well established. Maternal adverse outcomes include prolonged labour, operative delivery, perineal injury, and future overt type-2 diabetes. Neonatal adverse outcomes include excessive fetal growth (large for gestational age - LGA), NICU admission, shoulder dystocia, hypoglycemia, respiratory distress syndrome, and electrolyte disturbances. Many of these adverse outcomes are associated with the adequacy of maternal glycemic control. We aimed to evaluate the adequacy of glycemic control in modified virtual GDM management compared with traditional follow up. A secondary aim is to assess the impact of modified virtual GDM management on select perinatal outcomes. Methods: The primary analysis will compare LGA between two groups using a binary logistic regression model. In a secondary analysis we will focus on study group patients and examine whether % of virtual visits is associated with LGA. All statistical analysis will be performed using SPSS software (version 27) with a level of significance 0.05 (p-values < 0.05 will be reported as statistically significant). Results: A total of 706 women were included in the analysis, 172 (24.3%) in the study group and 534 (75.6%) in the control group. The women in the study group had more perineal lacerations and their newborns had more cases of hypoglycemia and birth injury compared to the control group. Discussion: The results indicate that in-person GDM visits are more advantageous and are associated with less cases of perineal lacerations. It is particularly important for women to have in-person visits to follow-up with clinicians and prevent adverse neonatal outcomes from occurring.

# Happy hypoxia in Covid -19 and it's Predictive factors : A retrospective study

### Ms STABY BABY<sup>1</sup>, Dr ASWATHY LLOYDS<sup>2</sup>

<sup>1</sup>Third year Mbbs, Dr. SMCSI medical college, kerala, india, <sup>2</sup>Associate professor, Dr. SMCSI Medical College, kerala, india

Introduction: Happy or silent hypoxia is a condition found in COVID-19 patients, it is characterized by the presence of hypoxia without dyspnea. The non linear chaotic nature of pandemic make challenge to predicting the condition like happy hypoxia, however the epidemiological studies will help in analyzing the trend and risk factor associated with it . Our study suggested the hypothesis that hypoxia is the strongest predictor of mortality in COVID-19 patient. Methods: It was a retrospective study conducted at Covid-19 Tertiary care center in Kerala, India. The study population comprised of patients age > 18 years age and blood oxygen saturation < 94%. statistical analysis was performed with SPSS version 21 software, a value of p < 0.05 was considered the threshold of significance. Results: A total of 1655 Covid-19 patients included in the study. There were among 998 (60.3%) patients were present with hypoxia, 628 (62.9%) patients had hypoxia with dyspnea and 370(37.07%) patient had silent or Happy hypoxia. A total of 127 death under hypoxia with or with out dyspnea was confirmed during the study period, the result confirmed mortality to Covid 19 by happy hypoxia was 2.83%. In co-morbidities Diabetes mellitus is the major co-morbidity in happy hypoxic with 45.9% and in dyspneic hypoxia it was 54.3% (P = 0.863). Dexamethasone 6Mg is highest administrated drug in happy hypoxia with (41.98%) Conclusion: This study find co-morbidities include diabetes and hypertension leads mortality among hypoxic group. Finally the use of pulse oxy-meter is paramount important in general public to monitor the respiratory status, this helps to reduce delay in early medical care. Discussion: The present study will contribute to fill the research gap in the epidemiology of dyspneic hypoxia and happy hypoxia in Covid-19 and help the student researchers to do better investigation work in future.

### Healthcare Worker Pay - Investigating the Causes of Canada's Healthcare Worker Shortage

### Mr Lorcan Cooke<sup>1</sup>, Dr Sahil Gupta<sup>2</sup>, Dr Seema Marwaha<sup>3</sup>, Mr Jack Romanelli<sup>4</sup>

<sup>1</sup>RCSI, <sup>2</sup>Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada, <sup>3</sup>Healthy Debate, Saint Michael's Hospital, Toronto, <sup>4</sup>Healthy Debate, Li Ka Shing Knowledge Institute, Toronto

Introduction: Canada is currently suffering from the greatest healthcare worker (HCW) shortage in its history - 152,000 unfilled positions as of August 2022. These factors have resulted in record-breaking wait times in emergency rooms (ER) of 20.7 hours and many ER closures. HCW unions have tried to negotiate for higher pay, but since 2019 Bill 124 has capped pay increases of some HCW to 1% while Canada currently has 6.9% inflation, effectively slashing their real wages. This research aims to answer what role HCW pay and living expenses plays in this HCW shortage crisis. Methods: The pay and living expenses for 10 HCW jobs were researched for the provinces of Ontario, Alberta and Quebec.Sources, such as government, job search and union websites, were averaged to deduce their pay. By using the "Living Wage" - "the hourly wage a worker needs to earn to cover their basic expenses and participate in their community[SM1] "4 and comparing to pay it was calculated if HCW roles are financially sustainable. Several semi-structured interviews were conducted with subject matter experts that gave insight on the relative importance of pay to the staff shortage. **Results:** Poor pay likely deters potential HCW from the field and is instrumental in explaining staff leaving or changing jobs. Poor compensation may also demoralize current staff when working alongside colleagues being paid more for similar work as with nursing agencies. Poor pay affects some health professions more than others. **Discussion:** HCW pay and living expenses play a moderate role in the staff shortage by limiting the number of new HCW, and incentivizing switching to fields with higher compensation. This study will help inform politicians of the factors causing the staff shortage and suggest remediation strategies. Ultimately, this research may help to solve the staff shortage and prevent unnecessary harm.

# How one bite of mosquito leads to multi-organ failure - a case of complicated malaria with a clinical picture of severe sepsis.

### Ms Weronika Skoczek<sup>1</sup>, Ms Julia Janecka<sup>1</sup>, Dr Malgorzata Paul<sup>1</sup>

### <sup>1</sup>Poznan University of Medical Science

**Investigation:** Malaria is an acute parasitic infection caused by a Plasmodium spp. protozoan transmitted by a female Anopheles mosquito. It constitutes a risk for almost two billion people and 125 million travelers in 90 endemic countries. Nearly 90% of fatal cases due to malaria occur in Africa. Case report: A 47-year-old female patient was referred to the ER with a high fever, headache, and fatigue. Her symptoms seemed not lifethreatening, and she was discharged home with antipyretics. Soon, her condition worsened, and she was admitted to another hospital. Laboratory analysis revealed severe thrombocytopenia, leucopenia, anemia, elevated inflammatory markers, and renal dysfunction. The epidemiological interview disclosed her recent travels to India, Senegal, and Gambia, which are malaria-hyperendemic areas. She presented signs of brain hypoxia with reduced contact, indicating severe cerebral malaria. Moreover, she showed early signs of septic shock, DIC, metabolic acidosis, liver failure, and renal insufficiency with oliguria and hemoglobinuria (blackwater fever). The light microscopy identified an infection of Plasmodium falciparum with a parasitemia of 1.5% with additional hemozoin deposits in neutrophils, indicating a poor clinical prognosis. She received intensive therapy for malaria based on artemether and symptomatic treatment for multi-organ injury. Three days later, she achieved negative results for blood parasitemia, and her condition started to improve. After a week, she was discharged home in good clinical status without signs of chronic impairments due to the infection. Discussion: Malaria chemoprophylaxis is recommended for individuals traveling to endangered areas. It has to be selected individually according to a destination, climatic or environmental conditions, duration and purpose of travel, and regularly administrated according to suggestions of a specialist. Our patient discontinued the antimalarial prophylaxis when she returned home and then developed severe complicated malaria with a high risk of fatal course, which shows the importance of following the medical guidance thoroughly.

### Impact of Diabetes Duration on Left Ventricular Mass Regression with Empagliflozin

**Mr Michael Moroney**<sup>1</sup>, Mr Raj Verma<sup>1</sup>, Dr Makoto Hibino<sup>2</sup>, Dr C. David Mazer<sup>3</sup>, Dr Kim A. Connelly<sup>4</sup>,Dr Andrew T. Yan<sup>4</sup>, Mr Adrian Quan<sup>5</sup>, Dr Hwee Teoh<sup>6</sup>, Dr Subodh Verma<sup>5</sup>, Mr Pankaj Puar<sup>7</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Division of Cardiothoracic Surgery, Emory University School of Medicine, Atlanta, GA, USA, <sup>3</sup>Department of Anesthesia, St. Michael's Hospital of Unity Health Toronto, Toronto, Ontario, Canada, <sup>4</sup>Division of Cardiology, St. Michael's Hospital of Unity Health Toronto, Toronto, Ontario, Canada, <sup>5</sup>Division of Cardiac Surgery, St. Michael's Hospital of Unity Health Toronto, Toronto, Ontario, Canada, <sup>6</sup>Division of Endocrinology and Metabolism, St. Michael's Hospital of Unity Health Toronto, Toronto, Ontario, Canada, <sup>6</sup>Division of Endocrinology and Metabolism, St. Michael's Hospital of Unity Health Toronto, Toronto, Ontario, Canada, <sup>7</sup>Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada

Background: The duration of type 2 diabetes mellitus (T2DM) is an important determinant of diabetes severity. The EMPA-HEART CardioLink-6 trial reported significant left ventricular (LV) mass indexed to body surface area (LVMi) regression in patients treated with the sodium-glucose cotransporter 2 inhibitor empagliflozin for 6 months. This exploratory sub-analysis investigated the association between T2DM duration and LVMi regression. Methods: Ninety-seven individuals with T2DM and coronary artery disease (CAD) were randomly assigned to receive empagliflozin 10 mg daily or placebo. LVMi was measured at the baseline and 6-month visit using cardiac magnetic resonance imaging. The study population was divided into T2DM duration <10 years (n=40) or ≥10 years (n=57). ANCOVA was used to assess the treatment effect of 6month change in LVMi, LV end systolic volume indexed to body surface area, LV end diastolic volume indexed to body surface area and LV ejection fraction. Results: Median duration of T2DM in the <10 years groups was 4 years (IQR: 2.0 years to 7.0 years). The T2DM duration  $\geq$ 10 years group had a median duration of 15 years (IQR: 12 years to 20 years). There was no significant difference in baseline LVMi according to T2DM duration (median 62g/m2 [IQR: 53.1g/m2 to 70.0g/m2] for T2DM duration <10 years; median 57.5g/m2 [IQR: 52.1g/m2 to 66.2g/m2] for T2DM duration ≥10 years; P = 0.11). Empagliflozin was associated with reductions in LVMi irrespective of duration of T2DM above and below 10 years (T2DM duration <10 years group, adjusted difference -2.90g/m2 [95% CI: -6.64g/m2 to 0.84g/m2]; T2DM duration ≥10 years group, adjusted difference -3.69g/m2 [95% CI: -0.14g/m2 to -7.24g/m2]; Pinteraction = 0.07). Conclusion: In the EMPA-HEART CardioLink-6 trial, empagliflozin treatment was associated with reductions in LVMi in people with T2DM and CAD irrespective of the duration of diabetes assessed categorically above and below 10 years.

# Impact of pre-pregnancy BMI on delivery complications in VBAC patients

# Ms Alyssa Chow<sup>1</sup>, Dr Ayisha Buckley<sup>2</sup>, Dr Teresa Janevi<sup>2</sup>, Dr Angela Bianco<sup>2</sup>, Dr Leslee Shaw<sup>2</sup>, Dr Luciana Vieira<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Icahn School of Medicine at Mount Sinai

Rates of caesarean sections (CS) have increased the US, with rates increasing from 5 to 30-32% in the past 10 years (1). Despite their necessity in select cases, they are associated with complications; such as maternal death, postpartum haemorrhage, infection and can lead to higher rates of ectopic pregnancy, abnormal placenta and uterine rupture in subsequent pregnancies (2). With the aim of reducing these risks, more patients are being counselled for a trial of labour after caesarean section (TOLAC). A successful TOLAC, known as a vaginal birth after caesarean (VBAC) is associated with lower rates of complications. However, a failed VBAC has the risk of uterine dehiscence or rupture which leads to severe maternal morbidity. This study aims to determine the impact of pre-pregnancy BMI on delivery complications during VBAC, dividing BMI into obese, overweight an normal BMI cohorts. This retrospective cohort study reviewed all patients undergoing TOLAC from January 2016 to December 2019 at Mount Sinai Hospital (New York, NY), performing a univariable and multivariable analysis. A total of 1314 patients were included. The analysis showed that delivery complications were highest in the obese cohort, for which the biggest risk factor was induction. In the overweight and normal BMI cohorts no variables were found to impact delivery complication rates. These results will help guide clinicians in counselling patients on their delivery complication risk; understanding the increased risk induction poses for obese VBAC patients. Further research should be conducted to include all patients counselled for VBAC, not just those electing VBAC, as well as including pre-existing maternal conditions in the analysis to confirm these results.

# Internet-based cognitive behavioural therapy for psychiatric problems in cancer survivors: a systematic review and meta-analysis of randomised controlled trials

**Ms Valerie Josephine Dirjayanto<sup>1</sup>,** Ms Tazkiya Purwati Ariviani<sup>1</sup>, Mr Nathaniel Gilbert Dyson<sup>2</sup>, Ms Priscilla Geraldine<sup>2</sup>, Mr Muhammad Athallah Arsyaf<sup>1</sup>, Mr Febriyan Satria<sup>1</sup>, Ms Jasmine Virginia Anjani<sup>1</sup>, Ms Raisa Zalfa Meutia Abubakar<sup>1</sup>, Ms Cut Aqilla Rhania<sup>1</sup>

<sup>1</sup>Newcastle University and Universitas Indonesia, <sup>2</sup>Universitas Indonesia

**Background**: As one of the leading causes of death, cancer contributes to increased prevalence of psychiatric problems in survivors. Cognitive behavioral therapy (CBT) is the current gold standard, but challenges exist due to limited access. Internet-based cognitive behavioral therapy (iCBT) could be more beneficial in overcoming these barriers. Aim: To review the effectiveness of iCBT for psychiatric problems in cancer survivors. Methods: Following PRISMA and registered to PROSPERO, literature search was performed in PubMed, Scopus, CINAHL, and Cochrane, searching for studies implementing iCBT for cancer. Quality of studies were evaluated using the Cochrane Risk of Bias 2.0 tool and converted to AHRQ standards. After qualitative extraction, quantitative analysis of mean differences was performed using Review Manager 5.4 in inverse variance, random-effects model, and whenever appropriate, subgroup and sensitivity analyses were performed. Results: There were 11 studies included with a total of 1,961 participants. Internet-based cognitive behavioral therapy demonstrated promising efficacy in reducing adverse psychosocial conditions in cancer survivors, including anxiety (pooledMD: -1.20[95%CI: -4.60--0.77], p=0.01; I2=59%) and depression (pooledMD: -0.99[95%CI: -1.80--0.19], p=0.02; I2=34%). Lower anxiety inclined towards the subgroup implementing >10 weeks of iCBT (pooledMD: -1.90[95%CI: -4.20-0.40], p=0.11; I2=84%), although shorter intervention yielded more significance (pooledMD: -0.79[95%CI:-1.68-0.10], p=0.08; I2=29%). Similarly, more marked reduction was found towards the >10 weeks iCBT subgroup for depression (pooledMD: -1.95[95%CI:-4.01-0.12], p=0.06; I2=74%). Post-intervention, quality of life also significantly increased (pooled MD: 7.45 [ 95%CI: 1.30-13.60], p=0.02; I2=67%). In addition, indicators of sleep quality, fatigue, physical activity, and healthy dietary habits also improved. Conclusion: Internet-based CBT is a promising solution for improving psychosocial conditions in cancer survivors. We recommend scaling up studies to strengthen the evidence for the future possibility of wide-scope clinical application.

# Inter-rater reliability of patient and proxy-reports for outcome assessments in stroke: An update of a systematic review

Ms Raseel Althawadi1, Ms Claire Reimer<sup>1</sup>, Ms Sherlissa Ali-Thompson<sup>2</sup>, Dr Catherine Moran<sup>3</sup>, Dr Anne Hickey<sup>3</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>Royal College of Surgeons in Ireland, <sup>3</sup>Dept. Health Psychology, RCSI University of Medicine & Health Sciences, Dublin, Ireland

Introduction: To facilitate the rising global burden and disease-related impairment in stroke, as well as the move towards patient-centered healthcare, PROMs are increasingly used to incorporate the patient perspective and facilitate healthcare decision-making. (1) Many stroke patients with cognitive, motor, or language difficulties are unable to participate in PROMs so surrogate or proxy respondents may respond on their behalf; the reliability of which remains unclear. (2) Therefore, the aim of the present study is to update a 2010 systematic review to investigate the inter-rater reliability of proxy respondents answering PROMs on behalf of stroke patients. (3) Methods: A systematic review of the literature was performed. Studies related to the reliability of proxy respondents in stroke were searched for in CINAHL, Embase, APApsych, and Web of Science between 2008-2022. Duplicate studies were removed using EndNote and data extraction was completed in Covidence. In each study, reliability was assessed using ICCs or k-statistics. The ICC and kstatistic were categorized into poor (≤0 0.40), moderate (0.41-0.60), substantial (0.61-0.80), or excellent (>0.80). Furthermore, the Crowe Critical Appraisal Tool v1.4 (CCAT) was used to appraise the quality of the evidence from the included studies and examine the potential risk of bias. **Results:** For physical domain measures, the reliability of proxy respondents was moderate to excellent (0.41->0.8). For measures of cognition, memory and thinking, scores ranged from moderate to substantial (0.40-0.80). The reliability of proxies for measures of communication was poor to substantial and social roles and participation scores were poor to substantial (<0.4-0.80). The reliability of the response of proxies for psychological measures were poor to moderate (<0.40-0.60). Discussion: Proxy respondents are reliable sources for patient-reported outcome measures, however, caution should be used when interpreting more subjective measures like anxiety or depression. Furthermore, the results of the CCATs showed no significant risk of bias.

# Investigating the concentration of ADAM17, sTNF $\alpha$ r and IL-6 in bronchoalveolar lavage fluid of patients with alpha-1 antitrypsin deficiency

Ms Anoushka Sharma<sup>1</sup>, Dr Mark Murphy<sup>2</sup>, Dr Malcolm Herron<sup>2</sup>, Dr Emma Leacy<sup>2</sup>, Prof Noel G McElvaney<sup>1</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Respiratory Research Division, Department of Medicine, Royal College of Surgeons in Ireland, Education and Research Centre, Beaumont Hospital Dublin, Ireland.

Alpha-1-antitrypsin (A1AT) is an anti-protease against elastase synthesised in the liver. It protects the lungs from infection and irritants. Deficiency can cause emphysema, liver cirrhosis and panniculitis. A1AT deficiency (A1ATD) is a genetic condition caused by decreased A1AT in blood. Phenotypes of A1ATD include; PiZZ (most severe), PiMZ and PiSZ (moderate), and PiMM (wild-type). A disintegrin and metalloproteinase 17 (ADAM17) regulates cell phenotype via cell adhesion, migration, proteolysis and signalling. Cell surface ADAM17 release indicates a pro-inflammatory state. As A1AT is an anti-inflammatory protein, it was hypothesised that deficiency increases production of pro-inflammatory proteins (i.e. ADAM17), thereby causing increased TNF $\alpha$  and IL-6 shedding. Further, the more severe the phenotype, the greater the concentration of ADAM17 in bronchoalveolar lavage fluid (BALF) samples of A1ATD patients. ELISA measured cytokine concentrations, and BCA assay measured total protein. Additionally, correlations between concentrations of cytokines and phenotypes of A1ATD, age, sex, smoking history, lung function tests, emphysema/bronchiectasis status and blood test results were explored. Twelve patients participated, including three PiMM, three PiMZ, five PiZZ and one PiSZ patient. All concentration values were corrected using the volume of BALF return. A Kruskal-Wallis test compared the relationship between phenotype and each cytokine. ADAM17 concentration was higher in PiZZ patients than PiMM patients and lower in PiMM patients compared to PiMZ patients, but these results did not reach significance. Results trended towards a slightly higher concentration of IL-6 in BALF of PiZZ compared to PiMM patients (P=0.072). Soluble TNFa receptor (sTNFaR) concentration was similar for PiMM and PiMZ patients but was slightly lower for PiZZ patients. There appears to be a relationship between phenotype and concentration of cytokines, especially ADAM17 in BALF. However, future research should further evaluate this relationship with a larger sample size, as ADAM17 range could be a potential biomarker of phenotype in A1ATD patients.

# Less known and common side effects of surgery. Total laparoscopic transhiatal gastrectomy with esophagojejunal anastomosis for esophageal adenocarcinoma Siewert<sup>3</sup>

**Ms Sonia Dziugiel<sup>1</sup>**,Dr Irene Marziali<sup>2</sup>, Dr Elisa Sebastiani<sup>2</sup>, Dr Alberto Buonanno<sup>2</sup>, Dr Davide Pellegrini<sup>2</sup>, Dr Luca Cardinali<sup>2</sup>, Prof Salomone Di Saverio<sup>2</sup>

<sup>1</sup>Faculty of Medicine, Opole University, <sup>2</sup>General Surgery Department, San Benedetto del Tronto Hospital

Background: Esophageal adenocarcinoma Siewert 3 is the type of esophageal adenocarcinoma connected with poor prognosis. The treatment and surgery of patients with this type of cancer are extremely difficult, in particular the minimally invasive laparoscopy. Aim of the study: The aim of this case report is to show the importance of knowledge of surgical techniques and awareness of the possible changes in postoperative diagnostic imaging. Case presentation: A 72-year-old man was admitted to the Surgery Department due to esophageal adenocarcinoma Siewert 3. The patient underwent a minimally invasive laparoscopic surgery of transhiatal total gastrectomy and distal esophagectomy with D2 lymphadenectomy. The esophageal resection was performed with a linear stapler after intraoperative endoscopic identification of an adequate macroscopic lesion margin. The terminolateral esophagojejunal anastomosis was prepared on a transmesocolic Roux loop with the aid of a circular stapler and transoral insertion of the head performed by the anesthetist. The control X-ray taken on the fifth postoperative day showed images that might suggest an anastomotic leak. After analyzing the course of the operation, the chosen method of anastomosis, and clinical symptoms presented by the patient, the theory of anastomotic defect was rejected. Imaging examinations were repeated on the eleventh postoperative day and showed a reduction in the disturbing element of anastomosis seen in the previous X-ray. The patient was discharged in good condition on the fourteenth postoperative day. **Conclusions:** This case illustrates the importance of a holistic and vigilant approach to every patient and understanding the completely physiological effects of surgical procedures that sometimes can look like pathologies.

# Lock & Key of Recurrent BSEP Deficiency: Quantification and Epitope Identification of anti-BSEP autoantibodies

# Ms Alyssa Takahashi<sup>1</sup>, Dr Akihiro Asai <sup>2</sup>, Dr Chie Naito<sup>2</sup>, Mrs Eriko Kishimoto<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Cincinnati Children's Hospital Medical Center

Progressive familial intrahepatic cholestasis 2 (PFIC2) is a hereditary disorder due to mutations in the ABCB11 (BSEP) gene expressed in hepatocytes. BSEP regulates bile acid flow by exporting bile acids into the bile canaliculi; BSEP deficiency can lead to cholestasis and liver failure. The standard treatment for severe liver disease in patients with PFIC2 is a liver transplant; an estimated 8% of transplant recipients develop alloimmunity post-transplant. "Recurrent BSEP deficiency" and graft dysfunction are complications that arise after the transplant recipient develops BSEP autoantibodies in the new liver graft. The cause of these complications is established however the mechanism and detection method for these BSEP autoantibodies remains unknown. Our goal is to establish a reliable diagnostic method to detect anti-BSEP autoantibody presence and quantify it to minimise recurrent BSEP deficiency. As well as investigate the specific epitopes to which these autoantibodies react to.We developed a diagnostic method of ELISA to quantify BSEP autoantibodies present in patient's serum. This ELISA can be used to monitor titters of antibodies. Portion of BSEP amino acid sequence is coated on 96-well plate. With IRB approval and patient consent, two patients of recurrent BSEP deficiency's serum were analysed. Both patients had confirmed anti-BSEP autoantibodies in their serum from previously conducted western blotting. Using patient's serum, we quantified the concentration of autoantibodies to a specific portion (616-746aa) of the BSEP peptide. However, there was inconsistent pattern between the patient's serum. We found that there was a significant presence of autoantibodies in control serum suggesting these specific autoantibodies do not contribute to clinical manifestations. In conclusion, we developed a quantitative ELISA for detecting serum anti-BSEP autoantibodies that can be used for monitoring post liver transplant patients for "recurrent BSEP deficiency". However, further experimentation must be conducted to identify the causative epitope(s) of clinical manifestations.

# MEASURING PLATELET AGGREGATION USING DIFFERENTIAL CENTRIFUGAL SEDIMENTATION

Ms Zara Ahmed<sup>1</sup>, Prof Dr Ingmar Schoen<sup>2</sup>

<sup>1</sup>School of Medicine, Royal College of Surgeons in Ireland, <sup>2</sup>School of Pharmacy and Biomolecular Sciences, RCSI University of Medicine and Health Sciences, Dublin 2

The aggregation tendency of platelets is an important indicator for thrombotic risk and is measured by light transmission aggregometry (LTA). However, it does not provide information on aggregate sizes and their distributions. This project focuses on using differential centrifugal sedimentation (DCS) as a novel method to sensitively observe platelet aggregation tendencies. The aim of this project was to determine the feasibility of measuring platelets using a CPS machine and to determine changes in size distribution over time. Platelets were isolated using standard centrifugation technique. Platelets were then either subjected to hyper/hypoosmotic conditions or they were left to aggregate at intervals of 5 seconds using ADP at 20µM concentration. The disc speed of the CPS machine was set to 8000 rpm. A 2-8% iodixanol gradient was built by the sequential injection of 9x 1.6ml starting with 8% and ending at 2% iodixanol. Samples were injected into the centre of the CPS disk and the machine estimated a particle diameter depending on the sedimentation time. Results showed that the size distribution of resting platelets could be measured by DCS with high reproducibility with a standard error of  $\leq 0.01 \mu$ m. DCS also showed an ability to measure Mean Platelet Volume (MPV) with a weak correlation between MPV calculated by DCS versus a standard haematology cell counter. Finally, DCS revealed that platelet aggregates grew over time by fusing together as aggregates appeared heavier as time left to aggregate increased. In conclusion, our novel method of measuring platelets was very sensitive to the onset of aggregation and has the potential to investigate differences between the action of different platelet agonists and aid future platelet research techniques.We thank the Royal College of Surgeons in Ireland for their support and funding.

# Mechanical Vertebral Body Augmentation versus Conventional Augmentation Techniques for Osteoporotic Thoracolumbar Compression Fractures: A Systematic Review and Meta-Analysis of Outcomes

### Mr Matthew Macciacchera<sup>1</sup>, Dr Jake McDonnell<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>The Mater Misericordiae University Hospital

Background: Surgical management of osteoporotic compression fractures (OCF) has traditionally consisted of vertebroplasty or kyphoplasty procedures. Mechanical percutaneous vertebral body augmentation (MVPA) systems have recently been introduced as alternatives to traditional methods. However, the effectiveness of MVPA systems versus conventional augmentation techniques for OCFs remains unclear. This serves as the premise for our study. Methods: A systematic review and meta-analysis was conducted as per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Studies of interest included randomized controlled trials (RCTs) which directly compared patient outcomes following kyphoplasty or vertebroplasty to patients treated with an MVPA system. Clinical and radiological findings were collated and compared for significance between cohorts. Results: 7 RCTs were identified with 1296 patients total. The mean age was 72.5 years. 639 patients underwent kyphoplasty, 88 underwent vertebroplasty, and 569 underwent mechanical vertebral body augmentation using an MPVA system. MVPAs showed similar efficacy for restoration of vertebral body height (p=0.18), total complications (p=0.27), cement extravasation (p=0.31) and device-related complications (p=0.31). MVPAs also showed reduced rates of all new fractures (16.4% vs 22.2%; p=0.17) and adjacent fractures (13.3% vs 14.9%; p=0.23), with improved visual analogue scale (VAS) scores at 6-months (p=0.13). Conclusion: The results of this meta-analysis depict MPVA systems are an efficient alternative to traditional vertebroplasty and kyphoplasty for the treatment of OCFs. Nevertheless, further robust evidence with long-term follow-up data is needed to establish a true benefit over traditional methods, in addition to long-term cost benefit analyses. Keywords: spine surgery; osteoporosis; vertebral body augmentation; comparative; outcomes

# Meningoencephalomyelitis in a teenager caused by tick-borne encephalitis virus

Ms Tīna Luīze Čupāne<sup>1</sup>, Dr Mikus Diriks<sup>2</sup>

<sup>1</sup>University of Latvia, <sup>2</sup>Children's Clinical University Hospital

Introduction: Tick-borne encephalitis (TBE) is a viral infectious disease involving the central nervous system. It is a common cause of meningitis and encephalitis. The risk of acquiring this disease is present in many parts of Europe. Neurologic manifestations can range from mild meningitis to severe encephalitis, which may be accompanied by myelitis and acute flaccid paralysis. Prevention against TBE is vaccination. Methods: Case report **Results**: This case report demonstrates a fifteen-year-old boy with TBE. The patient had not received TBE immunisation, had no chronic illnesses, nor other health problems. The patient got admitted to the hospital. His main complains were febrile temperature, headache and back pain. Symptoms began one day prior. The patient had severe neck stiffness. MRI findings showed spinal cord hyperintensity from C2-Th7, oedema from C2-C7, broad acute myelitis and unclear hyperintensity changes at the dorsal part of pons, parietal lobe, and the left part of the basal ganglia. The patient was transferred to the intensive care unit (ICU). To provide feeding, a percutaneous enteral feeding tube was inserted, as well as a tracheostomy to provide ventilatory support. In total he spent 39 days in the ICU. A year later, due to the myelitis, the patient had secondary changes, including, respiratory failure, hypoventilation, scoliosis, etc. Due to the long hospitalisation, the patient now has learning difficulties that impact him daily. **Discussion**:We report a rare clinical manifestation of a TBE. Cases associated with myelitis are more likely to have a need for intensive care support. To be prepared for the respiratory complications, the infection should be identified early. The myelitis has caused important health problems that require further treatment. According to research, there is no specific antiviral therapy. It is relevant to remind patients that vaccination is the most efficient way to manage TBE.

### Modeling and Manufacturing a Hydrogel-based Regenerative Contact Lens Using Patient-specific Corneal Surface Data

### Dr Mert Egemen Caliskan<sup>1</sup>, Dr Semih Ceylan<sup>1</sup>, Dr Eray Atalay<sup>2</sup>

<sup>1</sup>Eskisehir Osmangazi University Medical School, <sup>2</sup>Eskisehir Osmangazi University Faculty of Medicine Department of Ophthalmology

Introduction: Current topical regenerative treatments such as topical autologous serum or platelet-richplasma (PRP) are rapidly cleared from the ocular surface resulting in limited interaction of their constituent growth factors with their respective receptors. Therefore, new approaches are necessary to deliver growth factors more efficiently to the ocular surface. Encapsulation of biological products with hydrogel biomaterials is a promising approach for sustained and controlled delivery of growth factors. The aim of this study is to present a methodology for manufacturing a patient-specific regenerative hydrogel lens using 3D corneal tomography data. Materials & Methods: A volunteer subject underwent Pentacam HR imaging and anterior corneal surface elevation data was exported in a CSV file format. The point cloud was imported into Matlab and quadratic curve-fitting was employed to generate data for missing points up to a 7mm radius. MeshLab was then used for surface reconstruction using the ball pivoting algorithm. Surface data was saved as an STL file and imported into Ansys Design Modeler to design the top and bottom contact lens master molds. Results: Master molds were printed using a 3D SLA Printer and were subsequently used to manufacture the negative PDMS molds. Pre-polymer GelMA 10% solution combined with 10% PRP was poured onto the PDMS mold and photopolymerized under visible light (450 – 550nm) for 8 minutes. Patientspecific contact lenses with varying central thicknesses were successfully manufactured. The manufactured hydrogel contact lenses had good durability and preserved its shape while handling. Discussion: Herein we propose a simple methodology to manufacture PRP-encapsulated hydrogel contact lenses using patientspecific clinical imaging data. Using our methodology, the thickness of the regenerative contact lens can easily be tailored to accommodate for the required time of degradation.

# Modified clinical and ethical construct for patients with acute alcoholic hepatitis undergoing liver transplantation at Yale

### Ms Kassandra Gressmann<sup>1</sup>, Dr Ramesh Batra<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Surgical director, liver transplantation, Yale New England Health, New England, Connecticut, United States of America

Background: Alcohol-related liver disease is the leading indication for liver transplantation in the United States. Most transplant centres' transplant listing eligibility criterion require patients meet at least 6 months of alcohol sobriety. However, this can be unrealistic and unfavourable for patients with severe acute alcoholic hepatitis. In October 2020, Yale-New Haven Organ Transplant Center implemented adjusted criteria to evaluate previously ineligible candidates for liver transplantation with goal of enabling patient survival, reducing transplant waiting-list mortality, and improving outcomes. Methods: Patients with alcoholic hepatitis and/or cirrhosis who failed medical therapy and were unlikely to improve without a liver transplantation underwent psychosocial evaluation. Candidacy was considered if they had adequate insight, strong social support, complied with care, and had no prior alcohol-related illness. The main exclusion criteria included poor insight, multiple prior alcohol relapses, active substance use, uncontrolled psychiatric illness, and previous non-compliance. Results: 18 patients were evaluated for liver transplant listing using the updated criteria between October 2020 and August 2022, aged 35 to 66 years, and 7 were female. 8 were declined due to psychosocial factors, 3 met eligibility criteria but died before listing, and 6 met criteria and were listed. Of those listed, 4 have received liver transplants, with an average waiting list time of 4.8 days. Prior to listing, patients were sober for 94.8 days. At time of writing, all had functional grafts with no alcohol relapse.Conclusions:Ethical complexity in organ transplant stems from the responsibility of the transplant centre to pair maximal recipient benefit with ethical utilisation to also reflect good organ stewardship on behalf of the community. The updated criteria reflect an attempt to balance the urgency, utility, and justice of organ transplantation. These criteria demonstrate how the outcomes for patients with alcohol-related liver disease can be optimised without ethical compromise to the donated livers.

# Mom, I am four years old; why are my bones only two? A case report of ten years old boy with hypochondroplasia treated with recombinant growth hormone.

### Ms Julia Janecka<sup>1</sup>, Ms Weronika Skoczek<sup>1</sup>, Dr Monika Obara-Moszyńska<sup>2</sup>

<sup>1</sup>Poznan University of Medical Sciences, <sup>2</sup>Department of Pediatric Endocrinology and Rheumatology Institute of Pediatrics Poznan University of Medical Sciences

**Background**: Hypochondroplasia (HCH) is a skeletal dysplasia characterized by short stature, abnormal body proportions, and a massive head with disproportionately short limbs. The leading cause is due to de novo mutation in the FGFR3 (Fibroblast growth factor receptor 3) gene. The growth-promoting therapy usually takes the form of orthopedic surgery. The recombinant growth hormone (rGH) treatment is not the standard in HCH, and its effectiveness is still being discussed. Management of short stature in hypochondroplasia is also influenced by parental expectations and concerns. **Case report**: We present a case of a 10-years-old boy with HCH. The patient's mother was diagnosed with HCH at the age of 12 years and was the first case in the family. Because of the disproportionate body build, the boy was referred to genetic counseling in the first year of his life. The heterozygous mutation c.1620C>A(p.N540K) in the exon 13 of the FGFR3 gene was identified, which confirmed the diagnosis. At the age of 2.5, growth hormone deficiency was diagnosed; max. the concentration of GH was 8.3 ng/ml after stimulation, and IGF-1 74ng/ml (ref value 79-432). MRI of the pituitary gland revealed a normal picture. The rGH therapy was started at the age of 3.5 years with a height of 88 cm (htSD -3,3) and a bone age of 2.5 years. During the first year of treatment, he grew up 7.5cm. Actually, at the age of 10 years, his height is 126cm (SD -2,3), and his bone age 10. He is still prepubertal. **Conclusion**: The treatment with the recombinant human growth hormone in our patient led to a satisfactory growth tempo during the pre-puberty time. The further effectiveness of rGH must be monitored, especially when bone age advancement is observed. The rGH administration may be an alternative therapy option for growth promotion in HCH.

# Natural products and their application in nano-based drug delivery and beyond – Pharmacognosy minireview

### Mr Pedram Pirghasemi<sup>1</sup>

<sup>1</sup>School of Pharmacy and Biomolecular Sciences, RCSI University of Medicine and Health Sciences, Dublin 2

A lot of medications used today are of plant origin. Aspirin, an NSAID, was derived initially from Salicin which was isolated from Willow Bark and it is by far one of the most successful drugs ever marketed. Firstgeneration statins such as Lovastatin were similarly isolated from the fungal species Aspergillus Tereus, Atropine, which is an anaesthetic medication used before the surgery to inhibit mucus secretion due to its anticholinergic activity was originally isolated from roots of Datura and belong to a special family of plants named Atropa Belladonna, just to name a few. This mini-view looks at the application of natural products in nano-based drug delivery and its potential use in tissue engineering. A wide search of various databases including PubMed, Scopus, and JACS was conducted focusing on keywords such as "use of Natural Products for drug delivery", and "Nano based drug delivery and natural products." The findings of this mini-review showed that approximately 50% of the approved New Chemical Entities (NCE) from Jan 81 - Sept 19 were either from natural products derivative, had natural product pharmacophore or it was unaltered natural product, while the rest were either synthetic, vaccines or biological macromolecules. It was also found that these natural products have a variety of applications in medicine and drug delivery including cardiovascular and neuroprotective, cancer, infectious diseases and even tissue engineering due to their biocompatibility characteristics. It is believed that a combination of nanotechnology and natural products would increase the effectiveness and ultimately bioavailability of these natural compounds and potentially prevent or treat different diseases. The scientific development of nanotechnology can revolutionize the development of formulations based on natural products.

# Neutrophil to lymphocyte ratio as a predictive marker in patients with advanced non-small-cell lung cancer treated with Immune checkpoint inhibitors.

Ms Ana Clement<sup>1</sup>, Mrs Alice Colescu<sup>1</sup>, Ms Paola Bonzanigo<sup>2</sup>, Prof Dana Clement<sup>3</sup>, Ms Iasmina Colescu<sup>1</sup>

<sup>1</sup>"Grigore T. Popa" University of Medicine and Pharmacy Iasi, <sup>2</sup>Humanitas University, <sup>3</sup>Regional Institute of Oncology Iasi

Introductions: Immune checkpoint inhibitors (ICI) have dramatically changed the therapeutic landscape for advanced non-small cell lung cancer (NSCLC). It is crucial to identify biomarkers to predict treatment response and to spare patients with resistant tumors from ICI-related toxicity. Biomarkers such as PD-L1 expression are potentially applicable in clinical practice but are modest predictive value. The detection of these biomarkers relied on the adequate tumor tissue. The ratio of neutrophils to lymphocytes (NLR) determined from peripheral blood is a marker of inflammation and has also shown promise as a predictive biomarker for response to immunotherapy. Methods: We conducted a retrospective cohort study of 95 patients with advanced NSCLC who had received immunotherapy as subsequent therapy at Regional Institute of Oncology Iasi, from 2018 to 2020. Data collected included patient demographics, baseline clinical features tumor histology, doses and duration of ICI, date of progression or last follow-up. The NLR was calculated from the most recent complete blood count before ICI initiation available in the medical record. Our study tries also to evaluate several variables as predictive factors for the effect of immunotherapy. Results: The univariate analysis revealed the female sex, age over 70, pretreatment LDH level were significantly associated with overall survival (OS). Our study showed that high pretreatment NLR was significantly associated with poorer OS compared with those with low pretreatment NLR. Subgroup analysis suggested that pretreatment NLR cutoff value of 3 was more reliable for OS. **Discussions**: Our findings suggest that NLR can be used as a reliable and easy to determine prognostic biomarker in clinical practice for NSCLC treated with ICI. There is a lack of uniform cutoff value among studies, with values ranging from 2.5 to 5.0 across various cancer types. However, specifically in NSCLC, pretreatment NLR of < 5 was associated with better outcomes with immunotherapy treatment across studies.

### Patient Attitudes Towards Same-day Thyroidectomy During the COVID-19 Pandemic

Ms Ravneet Dhillon<sup>1</sup>, Dr Albino Chiodo<sup>2</sup>, Dr Bradley Hubbard<sup>2</sup>, Dr Antoine Eskander<sup>3</sup>, Dr Justine Philteos<sup>4</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Michael Garron Hospital - Toronto East Health Network, <sup>3</sup>Department of Otolaryngology-Head and Neck Surgery, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada, <sup>4</sup>Toronto General Hospital

The COVID-19 pandemic has imposed constraints on many resources and services, including elective surgeries. Due to the pandemic, thyroidectomies, which traditionally are performed as inpatient procedures, have been cancelled and delayed, resulting in increased wait times and psychological distress for patients. Outpatient thyroidectomies may be a feasible and cost-effective alternative to inpatient procedures. Numerous reviews emphasize the potential of outpatient thyroidectomies as a safe and viable alternative in appropriately selected patients and high-volume hospitals. This study aims to determine patient attitudes towards same-day thyroidectomies during the COVID-19 pandemic, and to determine the proportion of thyroidectomy patients eligible for this procedure at Michael Garron Hospital in Toronto, Canada. 108 eligible participants that were selected and recruited through the Otolaryngology Electronic Medical Records were surveyed via phone interviews. Data collected was quantified using a five-point Likert scale and the Friedman test was used for statistical analysis. Analysis indicates that 65% of patient attitudes were favourable towards same-day thyroidectomies, and patients would avail of such an option if eligible. Although many participants fit the criteria for same-day thyroidectomies, 55% of participants were not knowledgeable about the risks of the procedure. Considering the feasibility and economical benefit of same-day thyroidectomies along with the favourable attitudes of the patient population, same-day thyroidectomies should be introduced. Attention to patient education and the use of standardised protocols will be necessary to ensure quality and patient safety.
#### Patients' Attitudes Toward Deprescribing and Treatment Burden: A Cross-Sectional Study

**Ms Sorcha Mooney¹**, Dr Frank Moriarty², Ms Aisling Croke³, Dr Karen Cardwell⁴, Prof. Susan M. Smith⁵, Dr. Dr Barbara Clyne³

<sup>1</sup>RCSI, <sup>2</sup>School of Pharmacy and Biomolecular Sciences, RCSI University of Medicine and Health Sciences, Dublin 2, <sup>3</sup>Department of General Practice, RCSI University of Medicine and Health Sciences, Dublin 2, <sup>4</sup>Health Information and Quality Authority, Dublin, Ireland, <sup>5</sup>Department of Public Health and Primary Care, Trinity College, Dublin 2

Background Treatment burden can be high in patients with multimorbidity and polypharmacy. Our objective was to investigate how treatment burden as measured using the Multimorbidity Treatment Burden Questionnaire (MTBQ) is associated with patients' attitude towards deprescribing, as measured by the revised Patients' Attitude Towards Deprescribing (rPATD). **Design**: Cross-sectional study utilising data from two studies investigating the integration of pharmacists into general practice in Ireland. Methods The MTBQ and rPATD were distributed to 156 patients aged ≥65 years and taking ≥10 regular medicines. A total MTBQ score was calculated, and scores were also grouped into four categories (no, low, medium, or high burden). An average score was calculated for each of the rPATD factors; medication Burden, Appropriateness, Concern about stopping, and Involvement. We used descriptive statistics to characterise patients. Multiple regression was used to explore potential associations between attitudes towards deprescribing (rPATD) and treatment burden (MTBQ). Results Of the 156 participants, 57% were female and the mean age was 77.5 years. A higher MTBQ score was significantly associated with higher rPATD scores in two factors (Burden (p<0.001) and Concern about stopping (p=0.003)) and a lower score for the belief in Appropriateness of medication factor (p<0.001) and satisfaction with medication question (p= 0.001)). MTBQ score was not significantly associated with willingness to stop one or more medications (-0.010 95% CI -0.024 to 0.005, p=0.182). Conclusion While our analysis did not find an association between an individual's treatment burden and willingness to stop one or more medications, we did find that higher treatment burden scores were related to patients attitudes towards deprescribing across several factors. This study demonstrates that measuring patients' treatment burden using the MTBQ can be used to further explore patient preparedness to deprescribe. Key Words: cross-sectional studies; general practice; multimorbidity; treatment burden; polypharmacy; deprescribing.

#### Patients' satisfaction with different types of craniofacial prostheses

**Ms Kassandra Gressmann<sup>1</sup>**,Dr Kevin Higgins<sup>2</sup>, Dr Antoine Eskander<sup>2</sup>, Dr Danny Enepekides<sup>2</sup>, Dr Nick Blanas<sup>3</sup>, Dr Susan Sutherland<sup>3</sup>, Dr Eszter Somogyi-Ganss<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Department of Otolaryngology-Head and Neck Surgery, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada, <sup>3</sup>Department of Dental and Maxillofacial Sciences, Sunnybrook Health Sciences Centre, University of Toronto, Ontario, Canada

**Background:** To communicate effectively and to express socially and emotionally, a face can play an essential role. A craniofacial prosthesis is an effective way to render craniofacial defects a positive aesthetic appearance with minimal surgical risks and a small number of post-surgical complications. To restore quality of life, a prosthesis can act as a feasible and reliable treatment for the reconstruction of facial defects. This cross-sectional study aims to assess patient overall satisfaction with their craniofacial prosthesis, and compare patient experiences associated with different prosthesis and retention types. Methods: We included 51 qualifying patients treated at the Sunnybrook Health Sciences Centre Craniofacial Prosthesis Unit (CPU) since 2015. Patients were treated according to a standardized protocol and answered a survey questionnaire package with sections covering the following: demographics, frequency of prosthesis use, and the Toronto Outcome Measure for Craniofacial Prosthetics (TOMCP-27) survey addressing patient satisfaction. **Results:**Our survey population was overall well satisfied with their craniofacial prostheses. In 77.8% of the TOMCP-27 questions, the largest group of patients chose the answer demonstrating the highest level of satisfaction. Auricular prosthesis patients experienced the highest rates of satisfaction, with the entire group having selected the highest rate of overall satisfaction. Orbital prosthesis patients were more likely to experience varying degrees of dissatisfaction, with 72% of the highest dissatisfaction levels reported in this implant type. For all prosthesis types surveyed, patients with osseointegrated implant retained prostheses reported higher levels of satisfaction compared to other methods of retention, with the bar clasp group outperforming the magnetic retention coupling method. Conclusions: Craniofacial prosthesis patients experience an excellent overall satisfaction during rehabilitation. Future development should focus on continued development of osseointegrated methods, improved magnetic coupling, and improved prosthesis technology, especially for orbital prosthesis patients.

### Patterns and Trends in First-line Anti-tuberculosis Drug Resistance in a Major Malaysian Tertiary Teaching Hospital Over a 4-year Period (2017-2020)

**Ms Liz Birdie Shi Yun Ong<sup>1</sup>**,Mr Gerald Tze Zhen Ser<sup>2</sup>,Mr Bryan Way Wern Lim<sup>3</sup>, Mr Charles Li Qi Gunn<sup>2</sup> ,Ms Harshini Mahendran<sup>2</sup>, Ms Jane Birdie Shi Qi Ong<sup>3</sup>, Mr Martin Tze Wah Kueh<sup>4</sup>, Dr Nadia Atiya<sup>2</sup>

<sup>1</sup>School of Medicine, Trinity College Dublin, <sup>2</sup>Faculty of Medicine, University of Malaya, <sup>3</sup>School of Medicine, University of Galway, <sup>4</sup>Royal College of Surgeons in Ireland & University College Dublin Malaysia Campus

**Intro**: Drug-resistant tuberculosis is a significant contributor to antimicrobial resistance globally. Despite tuberculosis (TB) being endemic in Malaysia, there is limited published data from Malaysia on anti-TB drug resistance. This study aims to determine the patterns and trends in first-line anti-TB drug resistance in a major Malaysian tertiary teaching hospital. Methods: A retrospective observational study was conducted on all patients who were diagnosed with culture-confirmed tuberculosis at the University of Malaya Medical Centre, Kuala Lumpur, Malaysia, between 1 January 2017–31 December 2020. Patients were identified from the microbiology laboratory database. The medical records of the patients were reviewed, and the following data were collected using a standardised data collection form: demographic data and first-line anti-TB drug resistance patterns. Findings: Over the 4-year study period, a total of 675 non-duplicate Mycobacterium tuberculosis isolates were identified from the clinical specimens of 675 patients, of whom the majority were men (64.3%) and between 18-40 years of age (39.9%). Only 8.3% of the isolates were resistant to at least one of the first-line anti-TB drugs tested. The most common form of first-line anti-TB drug resistance was resistance to streptomycin (4.0%), followed by resistance to isoniazid (3.6%), resistance to ethambutol (2.7%) and resistance to rifampicin (1.5%). Multidrug-resistant TB (MDR-TB) accounted for only 0.9% of the isolates. Between 2017 and 2020, there was an overall increase in the prevalence of resistance to at least one of the first-line anti-TB drugs (7.4% to 12.0%), rifampicin-resistant TB (RR-TB) (1.3% to 3.3%) and isoniazid-resistant TB (Hr-TB) (3.9% to 4.3%). However, there was no increase in the prevalence of MDR-TB (1.3%). Conclusion: The prevalence of MDR-TB in our study cohort remained low and stable over the 4-year study period. However, given the increase in RR-TB and Hr-TB rates, active and continuous surveillance of trends in anti-TB drug resistance is warranted.

### Physical activity and hypertension

Ms. Kathryn McKnight <sup>1</sup>, Dr. Andrew O'Regan<sup>2</sup>, Dr. Peter Hayes<sup>3</sup>, Ms. Aoife Keating<sup>4</sup>, Ms. Alexandra Ferrara<sup>5</sup>

University of Limerick<sup>1</sup>, University of Limerick<sup>2</sup>, University of Limerick<sup>3</sup>, University of Limerick<sup>4</sup>, University of Limerick<sup>5</sup>

**Background:** Hypertension and physical inactivity are leading causes of premature mortality. While both are modifiable risk factors for cardiovascular disease, their prevalence remains high. Aim(s): Present up to date knowledge from scientific studies that underpin the role of Physical Activity (PA) in hypertension management. **Objective(s): Discuss:** The epidemiology of PA and hypertension, the role of PA in hypertension and the pathophysiology surrounding PA and blood pressure. Rationale: Scientific advances have contributed to understanding of how PA improves blood pressure and the clinically relevant ambulatory blood pressure, but this is not reflected in hypertension guidelines for clinical management of hypertension. Search strategy: A search strategy using the terms 'hypertension', 'high blood pressure', 'exercise', 'physical activity', 'aerobic exercise', 'isometric exercise' was devised. Pubmed was reviewed yielding a large quantity of papers. Inclusion criteria: Interventional studies published in last 10 years. Exclusion criteria: Non-English publications, RCT protocols, non-randomised studies. Results: Longitudinal studies demonstrate a protective effect of higher PA levels as well as higher levels of cardiorespiratory fitness. Interventional studies report improvements in blood pressure because of aerobic and resistance training at different doses and intensities; the improvements in some studies were greatest among groups with established hypertensions; the effect was observed for groups with treatment-resistant hypertension also, a clinically important subgroup. **Discussion:** Current research provides evidence for the synergy between PA and pharmacotherapy for the treatment of hypertension, providing an opportunity for clinicians to promote PA as an adjunctive treatment as well as a preventative strategy. Conclusion: For clinicians to incorporate PA for hypertension prevention and treatment clear recommendations regarding advice and prescription are required.

## Pilot of a mobile web application to audit and improve hospital cleaning and its effect on bacterial surface contamination of the near-patient area in an intensive care unit.

#### Ms. Sara Charki<sup>1</sup>, Dr. Muireann Fallon<sup>2</sup>, Mrs. Aoife Kearney<sup>3</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Department of Clinical Microbiology, Royal College of Surgeons in Ireland, Beaumont Hospital, Dublin 9, Ireland<sup>2</sup>, Department of Clinical Microbiology, Royal College of Surgeons in Ireland, Beaumont Hospital, Dublin 9, Ireland<sup>3</sup>

Background: The hospital environment is known to contribute to the spread of pathogens causing healthcareassociated infections (HAI). It has been shown that in the hospital, near-patient surfaces are an important source of bacterial contamination, contributing to the spread of HAIs. As decontamination of near-patient surfaces is a crucial tool to decrease HAI, it is imperative to monitor and improve hospital cleaning. In this project, it was hypothesized that digital monitoring of daily cleaning could improve cleaning practices and decrease bacterial contamination of near-patient sites. Methods: A four-week sampling project in two Intensive Care Unit (ICU) wards of one Irish tertiary referral hospital was carried out. Total aerobic contamination (TAC) was assessed using Petrifilm (3M, Ireland). Surface contamination with selected Multi-Drug Resistant Organisms (MDRO) contamination (Methicillin-resistant Staphylococcus aureus, Vancomycin-resistant Enterococci, and Carbapenemase-producing Enterobacterales) was evaluated by swab sampling and culture methods. Cleaning monitoring was carried out for two weeks using a handheld tablet computer, through a digital form. **Results**: Surface samples were taken over a four-week period in ICU A with and without digital monitoring for a total of 250 and 248 samples respectively. Results show that no digital monitoring had a mean of 1.06 CFU/cm2, whereas the use of digital monitoring produced a mean of 0.52 CFU/cm2. The use of digital monitoring intervention resulted in a 50% reduction in surface contamination. Results also showed a 2.81-fold reduction in hygiene failure rate after introducing digital monitoring. Few MDRO were found during this study. Discussion: In a small-scale intervention study on two Irish critical care units, digital cleaning monitoring was shown to decrease TAC and hygiene failure rates. Larger studies over a longer period would be needed to show a greater, statistically significant decrease, and to draw conclusions on the effect of such an intervention on MDRO and HAI.

# Post-hoc analysis of the pivot trial to determine long-term re-detachment rates of pneumatic retinopexy and pars plana vitrectomy procedures for the management of primary hematogenous retinal detachment

Ms. Tugche Pehlivan<sup>1</sup>, Dr. Isabela Melos<sup>2</sup>, Dr. Rajeev Muni<sup>3</sup>, Dr. Roxane Hillier<sup>4</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Saint Michael's Hospital, Toronto<sup>2</sup>, Saint Michael's Hospital, Toronto<sup>3</sup>, Saint Michael's Hospital, Toronto<sup>4</sup>

**Introduction:** Pars plana vitrectomy (PPV) remains the globally popular surgical treatment of primary rhegmatogenous retinal detachment (RRD). However, the recent Pneumatic Retinopexy versus Vitrectomy for the Management of primary RDD Outcomes Randomized Trial (PIVOT) suggested that if PIVOT recruitment criteria was met, pneumatic retinopexy (PnR) should be considered the first-line treatment as it offered better visual outcomes and less morbidity than PPV. The purpose of our study was to determine the long-term success of both procedures by comparing long-term re-detachment rates. Methods: Post-hoc analysis of the PIVOT study. PIVOT participants were ineligible if re-intervention to re-attach the retina was performed within one year of the initial procedure. Redetachment was determined by chart review or telephone interview. The latter was the only accepted method for those with <2 years of follow-up (otherwise marked as unreachable and excluded). A two-tailed t-test was used for statistical significance. The mean follow-up duration was also calculated for each group. Results: There were 176 PIVOT participants with 88 in the PPV and PnR arms. There were 4 ineligible PPV participants (re-intervention) versus 8 PnR participants (7 re-intervention and 1 PIVOT dropout). Of the 84 eligible PPV participants, 22 were unreachable leaving 62 (73.81%) analyzed with 37 chart reviews and 25 phone calls (mean age: 69.10+/-7.93 years). Of the 80 eligible PnR participants, 15 were unreachable leaving 65 (81.25%) analyzed with 33 chart reviews and 32 phone calls (mean age: 70.22+/-10.05). Long term re-detachment rate was 0% and 1.54% (1/65) for PPV and PnR groups respectively (p= 0.33). The mean follow-up duration in years was 4.61+/-2.84 versus 4.48+/-2.66 for PPV and PnR groups respectively. **Discussion**: There was no statistically significant difference in long-term re-detachment rates for PnR vs PPV. Both procedures are durable treatment options for RRD over an extended period, rarely requiring additional intervention for re-detachment.

# Predicting the frequency of interventional percutaneous balloon angioplasties on arteriovenous fistulas in hemodialysis patients

### Ms. Jordan Loon<sup>1</sup>, Dr. Joel Woodley-Cook<sup>2</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Scarborough Health Network<sup>2</sup>

Introduction: Stenosed arteriovenous fistulas are a common cause of haemodialysis access failure that require frequent interventions in the form of percutaneous balloon angioplasty. The aim of this study is to assess the frequency at which we intervene on failing fistulas and what factors have an effect on overall patency, including the tip and line placement of central venous catheters. Methods: Patient medical and imaging records were retrospectively reviewed to include those who have undergone balloon angioplasty since 2015. ANOVA and t-tests were performed to determine the significance of various factors on the frequency of interventions on stenosed fistulas. **Results**: 299 patients were assessed on the time (mean days) between the creation of their fistula and their first balloon angioplasty. Diabetics required intervention before non-diabetics (694.09 days vs 917.08 days respectively; P=0.033). Patients with the catheter tip placed in the inferior vena cava underwent balloon angioplasty the earliest after fistula creation (130.23 days) compared to the superior vena cava, right atrium and cavoatrial junction, while those with the tip in the superior vena cava had fistulas that remained patent the longest (968.80 days; P= 0.007). The most optimal catheter line positioning for patency was the left internal jugular vein and the least optimal was the femoral vein (1132.80 days vs 142.50 days respectively; p=0.007). The frequency of interventions increased as the number of interventions a patient had received increased for the first 3 balloon angioplasties in those applicable (creation-1st intervention = 798.45 days, 1st-2nd intervention= 556.52 days, 2nd- 3rd intervention= 364.96 days; P=<0.001). Discussion: Factors such as central venous catheter tip and line placement, number of previous interventions, and diabetic status can be used to predict how frequently arteriovenous fistulas will require intervention by balloon angioplasty in haemodialysis patients.

# Primary lung diffuse large b-cell lymphoma (dlbcl) transformed from the marginal zone, mucosa-associated lymphoid tissue (malt) lymphoma – a case report

### Mr. Kajetan Kiełbowski<sup>1</sup>, Dr. Janusz Wójcik<sup>2</sup>, Prof. Konrad Ptaszyński<sup>3</sup>, Dr. Małgorzata Wojtyś<sup>4</sup>

Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland<sup>1</sup>,Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland<sup>2</sup>,Department of Pathology, Faculty of Medicine, Collegium Medicum, University of Warmia and Mazury in Olsztyn, Poland<sup>3</sup>, Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland<sup>4</sup>

Introduction: Primary lung lymphoma (PLL) is a rare disease representing 0,5% of primary pulmonary tumors and less than 1% of all lymphomas. Furthermore, PLL comprises only 3-4% of extranodal lymphomas. The marginal zone, mucosa-associated lymphoid tissue (MALT) lymphoma, is the most common subtype but transformation into diffuse large B-cell lymphoma (DLBCL) is extremely rare. Case report: We report a case of a 55-year-old male patient who was admitted to the hospital due to cough and fever and received treatment for bilateral pneumonia. Computed tomography showed consolidation of the lung tissue with an aerial bronchogram in the peripheral areas of both the lower and right middle lobes. Enlarged lymph nodes (11-12mm) of the hilum, mediastinum, and axilla were found. There was no improvement in the patient's condition and x-ray imaging after discharge. Therefore, the patient underwent partial resection of the right lower pulmonary lobe. Histopathological examination confirmed nodular lymphoid hyperplasia. One year later, pulmonary infiltrates were still present on the chest x-ray. The maximum standardized uptake value of the pulmonary lesions in positron emission tomography (PET) was 17. Therefore, in October 2018, the patient underwent a lingulectomy. Histology revealed MALT lymphoma with transformation into DLBCL. Neoplastic cells showed immunohistochemical expression of CD20 and CD79, and they were negative for CD5, CD10 and CD23. The proliferation index Ki-67 was 60%. In February 2022, pulmonary recurrence occurred. Consequently, the patient underwent resection of fragments of the right upper and lower lobes with the collection of lymph nodes from groups 4R and 7. Histopathological examination again confirmed MALT lymphoma. The patient remains in good condition 9 months after the last surgery. Discussion: Transformation of MALT lymphoma into DLBCL negatively impacts patients' prognosis, as DLBCL is a more aggressive subtype of lymphoma. It is considered that only 2-8% of MALT lymphomas transform into DLBCL.

### Pulmonary toxicity induced by carfilzomib. A case report.

### Ms. Aleksandra Zacny<sup>1</sup>, Dr. Mateusz Ziarkiewicz<sup>2</sup>

Department of Hematology, Transplantation and Internal Medicine, Medical University of Warsaw<sup>1,2</sup>

Carfilzomib is a second-generation proteasome inhibitor used in refractory or relapsed multiple myeloma (MM). Most adverse effects of this drug concern cardiovascular and gastrointestinal problems. The data on respiratory complications are insufficient. We present a case of significant pulmonary toxicity induced by carfilzomib in a patient with relapsed non-secreting MM.

A 56-year-old man was admitted with low-energy fracture of left clavicle to the Department of Hematology, Transplantation and Internal Medicine, Medical University of Warsaw. The patient denied smoking and chronic pulmonary diseases. A blood panel revealed hypercalcemia and elevated beta-2-microglobulin. Serum and urine immunofixation showed no monoclonal protein. Serum protein electrophoresis detected slight hypogammaglobulinemia. Bone marrow biopsy showed 90% plasma cells involvement. FISH examination of marrow cells confirmed the t(11;14) translocation. Based on the above, non-secreting MM was diagnosed. Bortezomib-based regimen was used as first-line treatment. Additionally, the patient underwent a stem cell transplantation. Complete response was achieved. Lenalidomide maintenance therapy was administered. After one year, disease relapse was diagnosed. This time, combined therapy with daratumumab, carfilzomib and dexamethasone was administered. After 3 courses of treatment, bone marrow response was confirmed. Beginning from the third cycle of carfilzomib, the patient reported elevated temperature and shortness of breath. After sixth cycle, the patient developed severe dyspnea, tachycardia, pyrexia, SaO2 dropped <90%. Thoracic CT and pulmonary function tests were abnormal. Pulmonary embolism and pneumonia were excluded. The symptoms occurred 12-24 hours after each carfilzomib administration, thus, they have been linked to the drug intake and the treatment was withheld. The patient's status improved. Noteworthy, readministration of carfilzomib caused the reappearance of symptoms, whereas daratumumab treatment was perfectly tolerated.Carfilzomib is an efficient second-line therapy for refractory MM. However, the cases of carfilzomib-associated pulmonary toxicity suggest paying more attention to patients' respiratory symptoms. Moreover, further investigation should be conducted to understand its pathogenesis.

# Recognizing rhabdo: an atypical presentation and progression of rhabdomyolysis and aki in a 31-year-old male: a case report

### Ms. Gina Rizq<sup>1</sup>, Dr. Heidix Lam<sup>2</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Michael Garron Hospital- Toronto East Health Network<sup>2</sup>

Rhabdomyolysis is the result of the breakdown products of skeletal muscle accumulating in the circulation. It is marked by disruption in myoglobin, creatine phosphokinase (CK) and lactate dehydrogenase (LDH) levels. Typical causes include direct and indirect trauma, electrolyte abnormalities, drugs and toxins. Diagnosis is normally confirmed when serum CK levels reach up to 5 times higher than normal standard (55-170 U/L). The objective of this clinical case is to highlight an atypical presentation of rhabdomyolysis. A 31-year-old male presented to the emergency department with severe bilateral flank pain and vomiting. He has no known renal history. The prior evening, he had a weightlifting session and felt normal before later reporting severe and sudden onset worsening back pain. He denied use of any pre-workout or supplements aside from a protein shake 24 hours prior to his intense workout as well as an Advil for back pain. He was found to have renal failure and was kept for further investigations to be started immediately on aggressive IV treatment. The patient initially presented with a CK of 1414 U/L and it continued to rise to reach an outstanding 9963 U/L unresponsive to IV fluids and rising serum creatinine. The CK and creatinine continued in an upward fashion over the course of 4 days despite the IV treatment before eventually deceasing. The presentation of this case coupled with the significantly and persistently elevated CK over the duration of the patients ER visit, displays the unusual manifestations that rhabdomyolysis can present with. As up to 50% of cases have the potential to progress to AKI, it is crucial that the adequate diagnosis and treatment is decided in a timely manner to reduce the risk of rhabdomyolysis associated mortality.

#### Refractory seminoma with bone marrow involvement treated with high dose chemotherapy - a case report

#### Ms. Estera Bakinowska<sup>1</sup>, Ms. Laura Szalewska<sup>2</sup>, Mr. Piotr Kulig<sup>3</sup>, Dr. Sławomir Milczarek<sup>4</sup>

Department of Hematology and Transplantology, Pomeranian Medical University, Szczecin, Poland<sup>1,2,3,4</sup>

Seminoma is the most common subtype of testicular cancer. It usually develops in patients in their 4th decade of life and accounts for 50% of germ-cell tumors. Radical inguinal orchidectomy is a routine treatment, even at advanced stages. Seminomas are highly sensitive to platinum based chemotherapy and radiotherapy. Unfortunately, some patients do not respond to the classical treatment. High dose chemotherapy (HDCT) represents an alternative for these patients. Case report: We present a case of 46-year-old male patient with refractory testicular seminoma not responding to recommended chemotherapy. The first line of treatment consisted of BEP (Bleomycin, etoposide, platinum) regimen with concomitant orchidectomy. Positron emission tomography (PET) scan revealed metastases to pelvic bones and bone marrow infiltration defining treatment failure. Subsequently, the patient was treated according to the TIP protocol (paclitaxel, ifosfamide and cisplatin). This regimen was also ineffective. PET scan confirmed neoplastic infiltration in lungs, mediastinal lymph nodes and pelvis. It was decided that HDCT should be introduced. He underwent chemotherapy according to GemOx protocol in order to mobilize stem cells. Subsequent stem cell separation was successful and the number of collected stem cells was enough for triple procedure. Thereafter, the patient underwent three cycles of HDCT CE (cyclophosphamide and etoposide) followed by autologous stem cell transplantation. Each procedure was complicated by neutropenic enterocolitis treated with broad spectrum antibiotics and total parenteral nutrition. PET revealed complete metabolic remission with the presence of slightly increased metabolic activity in pelvis region. Therefore, the patient was qualified for radiotherapy of involved area. Subsequently, levels of neoplastic markers have normalized. One year later, the patient remains in complete remission. Discussion: Seminomas are not typically treated with HDCT combined with autologous stem-cell transplantation. Nevertheless, it represents a valuable therapeutic options in patients with unfavorable response to the surgical treatment and initial chemotherapy.

### Relationship between the serotonin-bdnf duo and circadian clock genes in the patients with inflammatory bowel disease

**Mr. Szymon Turkiewicz¹**,Ms. Marta Ditmer², Mrs. Agata Binienda³, Dr. Agata Gabryelska⁴, Prof. Ewa Małecka⁵, Prof. Jakub Fichna⁶ ,Dr. Marcin Sochal<sup>7</sup>

Department of Sleep Medicine and Metabolic Disorders, Medical University of Lodz, Poland<sup>1,2,4,7</sup>, Department of Biochemistry, Medical University of Lodz, Poland<sup>3,6</sup>, Department of Digestive Tract Diseases, Medical University of Lodz, Poland<sup>5</sup>

Introduction: Inflammatory bowel disease (IBD) is a group of disorders including ulcerative colitis (UC) and Crohn's disease (CD). Studies investigate the role of the serotoninergic system, BDNF signaling, and the circadian clock in IBD development; however, there are no publications regarding their overlap. This could be important, in the context of comorbid psychiatric disorders in IBD. The study aims to investigate the molecular basis of sleep disturbances in IBD, including the above pathways. Methods: The study included 81 with IBD (divided using clinical conditions- exacerbation (EX) and remission (RE) phases; and subtypes of IBD - CD, UC) and 44 healthy controls (HC). The expression of BDNF, circadian clock genes (such as ARNTL, CLOCK, NPAS2, NR1D1), and SERT (serotonin transporter was determined by qRT-PCR, following RNA isolation and cDNA synthesis. BDNF, serotonin, and SERT serum concentration measurements were performed using ELISA. Funded by Polish Ministry of Education and Science (SKN/SP/536070/2022). Results: IBD group in comparison with HC showed a decreased expression of BDNF (p=0.008), CLOCK (p<0.001), NPAS2 (p=0.001), and NR1D1 (p<0.001) and elevated serotonin and SERT serum concentrations (p=0.026 and p=0.001, respectively). A strong negative correlation was found between ARNTL and BDNF expression in IBD, CD, and UC groups (R<-0.6 and p<0.001 for all), which was independent of the disease duration. In IBD, EX, and CD groups positive correlations were found between serotonin concentration and ARNTL expression (p<0.05), and between SERT and CLOCK expression[s1] (p<0.05). Conclusion: Disruption of the circadian clock is an essential part of IBD. Received outcomes emphasize the important role of serotoninergic and BDNF signaling pathways in the interaction with circadian rhythm in the IBD. The influence of serotonin is significant especially in CD patients and in exacerbation of the IBD. Further research on the molecular basis of comorbid sleep disturbances in IBD are needed.

### Repurposing auranofin for high-grade serous ovarian cancer therapy

### Ms. Estelle Tran<sup>1</sup>, Ms. Farah Abdalbari<sup>2</sup>, Dr. Alicia Goyeneche<sup>3</sup>, Dr. Carlos Telleria<sup>4</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, McGill<sup>2</sup>, <sup>3</sup>, <sup>4</sup>

Introduction: Ovarian cancer is considered as the deadliest of all gynecological malignancies. Amongst its many subtypes, high-grade serous ovarian cancer (HGSOC) remains the most prevalent in the clinical setting. Auranofin (AF) is an anti-rheumatic drug that has been explored for its potentiality as an anti-cancer agent in several types of malignancies including lung and gastric cancers. Its inhibition of the thioredoxin system in tumor cells has risen the possibility of its benefit as a consolidation therapy against HGSOC for chronic use following standard platinum-based chemotherapy. We hypothesize that Auranofin can induce DNA damage in HGSOC by inhibiting the thioredoxin system. Methods: Two different cells lines were tested on, PEO1 (platinum sensitive) and PEO4 (platinum resistant) cells. HGSOC cells were treated with AF, with and without N-acetyl cysteine (NAC), a powerful antioxidant scavenging for reactive oxygen species. Cytometry was performed to evaluate cell viability. If AF induces cell death in HGSOC cells by inhibiting the thioredoxin system, the addition of NAC should reverse AF's toxicity. To investigate if DNA damage is induced by AF in both cell lines, western blots were prepared and analyzed for the detection of H2AX, a DNA damage biomarker. Results: In samples treated with 4 mM of AF, with and without NAC, the observed difference in cell viabilities was statistically significant (p < 0.05). NAC was able to abrogate AF's toxicity.PEO4 cells expressed a lower amount of H2AX than PEO1 cells treated with AF. AF's induction of DNA damage in PEO1 cells seems to be dose related. Discussion: Auranofin can instigate DNA damage in HGSOC through inhibition of the antioxidant system thioredoxin. This offers a new perspective of Auranofin's use to treat this lethal disease and the possibility of a combination of cisplatin and Auranofin to potentiate the killing of both platinum sensitive and resistant HGSOC cells.

### Return to sport after surgical treatment for acromioclavicular joint dislocation – a systematic review

**Mr. Brian Cleary¹**, Dr. Eoghan T Hurley², Dr. Conor Kilkenny³, Dr. Sami Khan⁴, Dr. Martin S Davey⁵, Dr. Oke Anakwenze⁶, Dr. Christopher Klifto¹, Mr. Hannan Mullett<sup>®</sup>

Sports Surgery Clinic Santry<sup>1</sup>, Duke University Hospital<sup>2</sup>, Sports Surgery Clinic Santry<sup>3</sup>, Sports Surgery Clinic Santry<sup>4</sup>, Sports Surgery Clinic Santry<sup>5</sup>, Duke University Hospital<sup>6</sup>, Duke University Hospital<sup>7</sup>, Sports Surgery Clinic Santry<sup>8</sup>

Background: Acromioclavicular (AC) joint dislocation is a common clinical problem among young and athletic populations. Surgical management is widely used for high-grade dislocations (Rockwood III-VI), and in highdemand athletes at high risk of recurrence. Purpose: The purpose of this study is to systematically review the evidence in the literature to ascertain the rate and timing of return to play and the availability of specific criteria for safe return to play after surgical treatment for AC joint dislocation. Study Design: Systematic review, Level IV Methods: A systematic literature search was conducted based on PRISMA(Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, using the PubMed database. Eligible for inclusion were clinical studies reporting on return to play after surgical treatment for AC joint dislocation. Statistical analysis was performed by use of SPSS. **Results**: Our review found 120 studies including 4327 cases meeting our inclusion criteria. The majority of patients were male (80.2%), with a mean age of 37.2 years (range, 15-85 years) and a mean follow-up of 34.5 months. The overall rate of return to play was 91.5%, with 85.6% returning to the same level of play. Among collision athletes, the overall rate of return to play was 97.3%, with 97.2% returning to the same level of play. In overhead athletes, the overall rate of return to play was 97.1%, with 79.2% returning to the same level of play. The mean time to return to play was 5.7 months (range, 1.5-15 months). Specific return to play criteria were reported in the majority of the studies (83.3%); time to return to sport was the most commonly reported item (83.3%). Conclusion: The overall rate of return to play was reportedly high after surgical treatment for AC joint dislocation, with the majority returning to their pre-injury level of sport. However, there is a lack of criteria for allowing athletes return to play in the literature.

### Risk factors for the formation of reproductive potential disorders in teenage girls

Ms. Iryna Sokolnyk¹, Mr. Dmytro Koliesnik², Prof. Snizhana Sokolnyk³, Dr. Alla Korniakova⁴

Bukovinian State Medical University (BSMU)<sup>1</sup>, Bukovinian State Medical University (BSMU)<sup>2</sup>, Department of Pediatrics and Medical Genetics, Bukovinian State Medical University (BSMU)<sup>3</sup>, Regional Center for Reproductive Health of Youth, Chernivtsi Regional Children's Clinical Hospital<sup>4</sup>

Introduction: Reproductive health of a girl begins to form during puberty and depends on the combined influence of socio-biological, hereditary, economic and urban factors. Under inadequate conditions, the body's adaptive capabilities decrease and the risk of reproductive potential disorders increases. Aim: To assess the factors influencing the development of the reproductive function of girls and to identify prognostically significant risk factors for a decrease in reproductive potential. Methods: The groups of social, biological, genealogical anamnesis indicators of 86 girls aged 10-17 years (14.3 ± 2.1) were analysed by the conduct of an open prospective randomised "case-control" study, using social (questionnaire), genealogical (study of heredity in three generations of kinship with regard to gynaecological and somatic severity), mathematical - statistical methods (multifactorial analysis to evaluate the impact of adverse factors; to check the significance of the overall measure of communication - non-parametric Pearson test ( $\chi$ 2) and the odds ratio (OR); the reliability of connection at  $\chi^{2\geq3.84}$ , p<0.05, OR>1.0[95%CI]). **Results:** Prognostically significant anamnestic risk factors for the disorders formation of the reproductive potential of teenage girls were identified. Conditionally, they can be divided into two groups: modifying (inflammatory processes of the genital organs, OR=4.22[1.09-11.89], p<0.05; sexual "debut" before the age of 15, OR=3.14[1.02-9.29], p<0.05; stress, OR=2.37[1.05-6.91], p<0.05; extragenital pathology, OR=2.83[1.12-10.22], p<0.05; surgical interventions on ovaries, OR=7.02[3.43-14.52], p<0.05; bad habits, OR=3.47[1.17-9.67], p<0.05; disharmonious physical development, OR=3.31[1.33-8.12], p<0.05; unfavourable social history, OR=2.08[1.22-8.41], p<0.05; infections in childhood, OR=2.53[1.18-10.43], p<0.05) and non-modifying (age of menarche under 11 years, OR=2.69[1.01-9.93], p<0.05; burdened genealogical history for reproductive function on the maternal side, OR=3.04[1.21-11.23], p<0.05; burdened antenatal, OR=5.45[2.11-12.54], p<0.05, and postnatal, OR=3.91[1.09-9.88], p<0.05, periods). Conclusion: The obtained results will make it possible to develop individual preventive measures to improve the reproductive potential based on the identification of determining predictors.

# Role of endobronchial ultrasound in predicting sarcoidosis based on lymph node size: a retrospective cohort study

### Mr. Michael Roman<sup>1</sup>, Dr. Biniam Kidane<sup>2</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, University of Manitoba<sup>2</sup>

**Introduction/Background:** EBUS-TBNA has been shown to have a high diagnostic yield for sarcoidosis in patients presenting with mediastinal and/ or hilar lymphadenopathy. The goal of this study is to determine if the size of the lymph node being sampled with EBUS-TBNA is a reliable predictive factor for yielding a definitive diagnosis of sarcoidosis. **Methods:** We retrospectively reviewed patients at a tertiary Canadian center who underwent EBUS for suspected sarcoidosis and/ or were diagnosed with Sarcoidosis between 2013-2018. We extracted data on age, sex, radiological findings, lymph node size and station, number of passes, sedation, complications, and results. Next, we separated patients with a confirmed diagnosis of sarcoidosis and excluded patients who had a cytopathological confirmation of malignancy. **Results:** We identified 75 patients who had a confirmatory diagnosis of sarcoidosis and/ or underwent EBUS-TBNA for suspected sarcoidosis. The average long-axis diameter for the hilar lymph nodes the mean was 12.1mm. Data analysis has not yet been completed. **Conclusion:** No conclusions can be made yet regarding the lymph node sizes being a predictive factor in diagnosing patients with sarcoidosis using EBUS-TBNA, until data analysis is accomplished.

### Severe malnutrition impacts cd101 expression in neutrophils

Ms. Miriam Basta<sup>1</sup>, Ms. Mehak Thind<sup>2</sup>, Dr. Amber Farooqui<sup>3</sup>, Dr. Robert Bandsma<sup>1234</sup>

Research Student in Translational Medicine, Hospital for Sick Children, Toronto, Canada<sup>1</sup>, Department of Nutritional Sciences University of Toronto<sup>2</sup>, Translational Medicine Program, Hospital for Sick Children, Toronto, Canada<sup>3</sup>, Translational Medicine Program, Hospital for Sick Children, Toronto, Canada<sup>4</sup>

Introduction: Globally, severe malnutrition, specifically undernutrition, is directly and/or indirectly related to mortality in ~45% children under five years. Children with severe malnutrition are highly susceptible to lifethreatening infections and often present with hyperinflammation and uncontrolled bacterial infections. Innate immune cells, particularly neutrophils, are critical to control bacterial infections. Therefore, it is expected that dysregulations in the functionality of these cells leads to adverse outcomes. However, little research has been done to understand neutrophil biology in the setting of severe malnutrition. Methods: We fed weanling male mice a low-protein diet (LPD) for 13 days to study the effect of malnutrition on neutrophils. Control mice were fed a normal protein diet (NPD). Both groups were challenged with lipopolysaccharide (LPS) injected intraperitoneally to simulate an acute inflammation (n=6/group). Bone marrow neutrophils were isolated. Western blots were done for maturation markers CD101 (Cluster of Differentiation 101) and Lamin-B2 and granular protein LCN-2 (Lipocalin-2). One-way ANOVA was done to compare NPD control, NPD LPS treated, LPD control, and LPD LPS treated groups. Results: There was a significant difference in LCN-2 when comparing NPD and LPD LPS-treated mice (p<0.01) and CD101 was significant when comparing NPD LPS-treated and LPD (p<0.01). However, LaminB-2 was not significant when compared among any group, though downward trends were observed. Our study provides preliminary results, however further studies are required. Discussion: CD101 is a surface glycoprotein on neutrophils that is upregulated in mature neutrophils. LCN-2 is a secondary granular protein that has bacteriostatic properties. Our study demonstrates CD101 and LCN-2 expression are decreased in LPD and LPD LPS treated mice, suggesting a decrease in mature neutrophils in LPD mice. Impairment in neutrophil maturation can explain the increased susceptibility to uncontrolled infections in the setting of malnutrition and eluding the mechanism can prove to be useful developing novel treatments.

# Simultaneous bilateral thoracotomies in the prone position and an open window thoracostomy in the treatment of pulmonary echinococcosis – a case report

Ms. Estera Bakinowska¹, Mr. Kajetan Kiełbowski², Dr. Darko Gajić³, Dr. Janusz Wójcik⁴, Dr. Małgorzata Wojtyś⁵

Department of Thoracic Surgery and Transplantation, Pomeranian Medical University, Szczecin, Poland<sup>1,2,3,4,5</sup>

Introduction: Human echinococcosis is a zoonotic infection caused by the Echinococcus tapeworm. Liver is the most common primary lesion where the parasite forms cysts (hydatids). The worm may spread to other organs which can manifest as metastases. Hydatid disease is usually asymptomatic until the lesions obtain significant size. Case report: We report a case of 41-year-old male patient who was admitted to the hospital due to abdominal pain and shortness of breath. A computed tomography (CT) revealed heterogenous calcified lesion in the right hepatic lobe measuring 18x16 cm. In the chest, CT showed two lesions in the 6th segment of the right lung, measuring 4.6 and 1.4 cm. Another 1 cm lesion was in the 8th right segment. Subpleural tumor 4 cm in size was found in the 9th left segment. Therefore, in July 2021, the patient was admitted to the Department of Thoracic Surgery where simultaneous bilateral thoracotomies in the prone position were performed. According to the histopathological examination, numerous structures corresponding to echinococcosis were found in the necrotic tissue. One year later, CT revealed a break in the continuity of the hepatic cystic capsule. The right lower bronchus was filled with contents of the lesion in the liver. The image suggested the perforation of the hydatid cyst and formation of a broncho-peritoneal fistula. Subsequently, a percutaneous drainage of a liver abscess was started. In November 2022, the patient underwent surgical evacuation of the hydatid cyst. Fragments of IX and X right ribs were removed and open window thoracostomy was performed. The postoperative course was uneventful, and the patient was discharged home after more than 80 days of hospitalization. Discussion: Clinical symptoms of pulmonary echinococcosis may include dyspnea, chest pain, cough, and hemoptysis. In case of resectable intrathoracic hydatids, complete excision with maximum parenchyma preservation should be performed.

### Simultaneous floating thrombus in the ascending aorta and pulmonary embolism

### Ms. Paula-Virginia Lungociu<sup>1</sup>, Dr. Mariana Floria<sup>2</sup>

"Grigore T. Popa" University of Medicine and Pharmacy Iasi<sup>1,2</sup>

**Background**: A free floating thrombus in the ascending aorta is rare, and is almost exclusively encountered in patients with suspected or proven pulmonary embolism. It is commonly identified in hemodynamically unstable patients. Similarly, the association of arterial and venous thrombosis is very uncommon. Case description: An 83-year-old woman with a history of diabetes mellitus, was hospitalized for aggravating dyspnea associated with congestive heart failure, chronic kidney disease, paroxysmal atrial fibrillation and severe hypoglycemia, which was corrected in the emergency room. A floating thrombus of 22/37 mm in the ascending non-dilated aorta was incidentally discovered during computed tomography (CT) angiography on high suspicions of a pulmonary embolism presence. The thoracic CT scan also showed bilateral pulmonary embolism in the inferior pulmonary lobes. The Logistic EuroSCORE for cardiac intervention was 51.70%. After 24 hours of conservative treatment, the multidisciplinary heart team decided to continue with unfractionated heparin in the intensive care unit. After 2 weeks of optimizing the congestive heart failure treatment and heparin therapy, a new CT scan revealed an irregular aortic intimal surface. Furthermore, the floating thrombus in the ascending aorta was no longer detected. The presence of thrombophilia is yet to be confirmed by blood tests and neoplasia was not diagnosed. The latest research offer no consensus on how to treat a free floating thrombus in the ascending aorta. Therefore such cases, represents an opportunity to explore the challenge of managing the diagnosis and appropriate treatment. Conclusion: The severe dehydration associated with procoagulant status of chronic kidney disease and paroxysmal atrial fibrillation probably determined simultaneous arterial and venous thrombosis. In this case, the symptoms gradually decreased and the patient remained under observation.

### Sleep breathing disorders among adults with cystic fibrosis: a descriptive analysis

Ms. Asma Maqsood<sup>1</sup>, Dr. Nicholas Vozoris<sup>2</sup>, Dr. Anne Stephenson<sup>3</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada<sup>2</sup>,<sup>3</sup>

Cystic Fibrosis (CF) is a genetic, life-limiting disorder with primarily pulmonary effects, consisting of chronic infection and functional impairment, in addition to multi-system effects, including pancreatic insufficiency and infertility. While signs of sleep-breathing disorders, including sustained hypoxemia during sleep, have been repeatedly reported in the CF population, sleep breathing disorder in CF has received limited research attention. However, advances in CF management have increased life expectancy and body mass, propagating the development of important risk factors for obstructive sleep apnea (OSA), and possibly shifting the epidemiology of sleep breathing disorders in CF. We sought to describe the prevalence, severity, risk factors, and treatments used for sleep breathing disorders in the adult CF population. We retrospectively analyzed linked diagnostic polysomnography (PSG) reports and national CF registry data for CF patients that had undergone sleep studies at St. Michael's Hospital, Canada, between January 1991 and September 2020. Of the 42 patients included, 33% were women, the median age at time of PSG was 34.7 years, 45.2% were categorized as overweight, the median FEV1% predicted at time of PSG was 62.5 %, and 61.9% were growing pseudomonas. The total apnoea-hypopnea index (AHI) was increased (defined as ≥5 events/hour) in 69%, and nearly all these individuals had OSA. However, only 41% of individuals with an elevated total AHI were receiving some form of positive airway pressure (PAP) therapy. Sustained nocturnal hypoxemia occurred in 16.7%, and less than one-third of these individuals were receiving either PAP or supplemental oxygen. In conclusion, sleep breathing disorders, particularly OSA, more commonly occur in the adult CF population than previously thought, and there is evidence that these comorbidities are being under-treated. Our intention is for the results of this descriptive analysis to serve as a catalyst for future research into the clinical significance of sleep breathing disorders in CF.

### Smoking and degenerative spinal disease: a systematic review

Ms. Niharika Rajesh<sup>1</sup>, Dr. Jigishaa Moudgil-Joshi<sup>2</sup>, Dr. Chandrasekaran Kaliaperumal<sup>3</sup>

Royal College of Surgeons in Ireland<sup>1</sup>, Oxford University Hospitals NHS Foundation Trust<sup>2</sup>, Department of Clinical Neurosciences (DCN), Edinburgh<sup>3</sup>

Introduction: Smoking is a major cause of morbidity and mortality worldwide and is responsible for the death of more than 8 million people per year globally. Through a systematic literature review, we aim to review the harmful effects of tobacco smoking on degenerative spinal diseases (DSD). DSD is a debilitating disease and there is a need to identify if smoking can be an attributable contender for the occurrence of this disease, as it can open up avenues for therapeutic options. Methods: Sources such as PubMed and Embase were used to review literature, maintaining tobacco smoking and spinal diseases as inclusion factors, excluding any article that did not explore this relationship. Risk of bias was assessed using analysis of results, sample size and methods and limitations. **Results:** Upon review of the literature, tobacco smoking was found to be a major risk factor for the occurrence of DSDs, particularly lumbar spinal diseases. Smokers also experienced a greater need for surgery, greater postoperative wound healing complications, increased pain perception, delayed recovery and decreased satisfaction post-surgery (p<0.05). These effects were noted along the entire spine. Many mechanisms of action have been identified in the literature that provide plausible explanations to how nicotine can lead to spinal degeneration, including the effect on osteocytes, annulus fibrosus and nucleus pulposus. This opened up avenues for the exploration of possible primary targets to develop potential therapeutic agents. Discussion: More studies on cervical and thoracic spinal degeneration would be beneficial in identifying the effect of nicotine on these spinal levels. Some limitations included insufficient sample size, inconclusive evidence and lack of sufficient repeat studies. Conclusion: A causal relationship was identified between smoking and DSD onset and post-surgical complications, particularly pertaining to lumbar spinal pathology. Studying the pathophysiology of how nicotine affects the spine can yield possible therapeutic targets.

### Solar water disinfection (sodis): where it is and where it is going (a review)

### Ms. Dalia Chahien<sup>1</sup>, Prof. Kevin G McGuigan<sup>2</sup>

School of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland<sup>1</sup>, Department of Physiology and Medical Physics, Royal College of surgeons in Ireland (RCSI), Dublin, Ireland<sup>2</sup>

Solar water disinfection (SODIS) is a cost-effective and easily operated method of water disinfection. The number of publications on SODIS has steadily increased in the last 3 decades, with studies ranging from new technological advances to forecasting models to predict the time needed to achieve microbial inactivation. Today, over 2 million people rely on SODIS daily as a means of water disinfection. Its efficacy in reducing diarrhoeal morbidity and improving outcomes for children in underserved communities has driven research on interventions to enhance SODIS and increase its application. This review aims to evaluate the relevant literature on SODIS from the past 10 years including technological advancements, extended applications, forecasting models, and barriers to use.

# Study of the rhythms Beta and Alpha with EEG in the process of memorization with the usage of the spatial memory: the Loci method

**Ms. Valentina Barkhanskaya**<sup>1</sup>, Mr. Ruslan Tigay<sup>1</sup>, Ms. Prachi Pathak<sup>1</sup>, Dr. Danil Pshenichnyy<sup>1</sup>, Prof. Xeniya Mkhitaryan<sup>1</sup>

<sup>1</sup>Medical University of Karaganda

Introduction: Spatial memory is a certain part of the mind that is responsible for the accumulation of data about the location of cognitive psychology and neurobiology. Spatial memory is represented in working, short-term and long-term memory. Research shows that specific areas of the brain are associated with spatial memory. The purpose of our research is to study the activity of the cerebral cortex with ordinary memory and with the Loci method among students. This article presents the modification in the alpha rhythm activity of the cortex which depends on the method of memorization. Methods: There were 110 students from different years of study who participated in the research. Students memorized a number of words in a specific order. Then, the changes in the activity of the cerebral cortex were assessed on EEG. Differences between two methods of memorization were determined by the Wilcoxon test (p < 0.05). The calculation of statistical characteristics was carried out using the SPSS 7.0 software package. Results: An increase in frequency when memorizing by the Palace of Memory method is available in the following leads: FP3A1 (r = -1.084, p = 0.279), FP7A1 (r = -3.110 p = 0.002), FP8A2 (r = -2.760 p = 0.006), O1A1 (r = -2.970 p = 0.003). Discussion: According to the results of the study, an essential climb in the frequency of alpha and beta rhythms were revealed during memorization by Loci method in frontal, temporal and occipital lobes. This indicates the activation of the mental process with additional visualization. As for the left-sided arrangement of this activity in the subjects, it can be assumed that the left hemisphere is responsible for the processes of spatial memory, or about purely individual differences in the activity of the hemispheres.

# Surgical Treatment of Thoracolumbar Burst Fractures: A Systematic Review of Complication Rates with Best-Worst Case Analyses for Implant Failure Rates

### Ms. Grace Tan<sup>1</sup>, Dr. Dexter Seow<sup>2</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>National University Hospital Singapore

Objective: To evaluate complication rates following various surgical treatments of thoracolumbar burst fractures. The severity and neurological deficits of patients' burst fractures were assessed to determine the effectiveness of various surgical modalities and their specific indications. **Background:** Burst fractures are high-energy axial loading and flexion vertebrae compression injuries that lead to retropulsion of posterior vertebral bony elements into the spinal canal and dangerous neurological deficits. Indications for surgery include neurological deterioration and spinal canal compromise. There is no universal consensus on optimal surgical management due to the countless operative methods available. Methods: Two authors performed a systematic review of the PubMed and Embase databases according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines on August 31, 2021. 11 included studies were assessed in terms of the level and quality of evidence, and quality of literature. Data pertaining to complication rates and study characteristics were extracted, categorized, and analysed. Results: Posterior approach has fewer complications and better pulmonary function post-operatively than anterior/combined approaches. Comparing various posterior approaches, the paraspinal approach has fewer complications and instrumentation failure than conventional open approach and no significant difference compared with the percutaneous approach. There are statistically significant differences in complication rates between short and long-segment fixation in patients with Frankel grade A to C deficits; where long-segment fixation provided better radiological outcomes, therefore less complications and patient satisfaction especially with time progression. Fixation at the fractured level significantly maintains kyphotic angle correction in unstable bursts fractures, resulting in lower complication rates, especially in short-segment fixation. Conclusion: Posterior approach is favourable over anterior/combined approaches. Amongst other methods, minimally invasive paraspinal and percutaneous approaches seem to have the best complication rates. Long-segment is preferred over short-segment fixation, especially with time progression, but short-segment fixation at the injured level is worthy of clinical application.

#### Synthesis of extant oncology curricula for primary care providers: a scoping review with a global equity lens

**Ms. Vivien Jones<sup>1</sup>**, Ms. Leslie Oldfield<sup>2</sup>, Ms. Bhajan Gill<sup>2</sup>, Ms. Nardeen Kodous<sup>2</sup>, Ms. Rouhi Fazelzad<sup>2</sup>, Ms. Danielle Rodin<sup>3</sup>, Ms. Harminder Sandhu<sup>2</sup>, Mr. Ben Umakanthan<sup>2</sup>, Dr. Meredith Giuliani<sup>3</sup>, Dr. Janet Papadakos<sup>3</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Princess Margaret Cancer Center, University of Toronto, Toronto, Ontario, Canada, <sup>3</sup>Department of Radiation Oncology, Princess Margaret Cancer Center, University Health Network, University of Toronto, Toronto, Canada

**INTRODUCTION:** Global increases in cancer, coupled with a shortage of cancer specialists, has led to an increasing role for Primary Care Providers (PCP) in cancer care. This review aimed to examine all extant cancer curricula for PCPs and to analyze the motivations for curriculum development. METHODS: A comprehensive literature search was conducted from inception to October 13th, 2021, with no language restrictions. The initial search yielded 11,162 articles and 10,902 articles underwent title and abstract review. Following full-text review, 139 articles were included. Numeric and thematic analyses were conducted and education programs were evaluated using Bloom's Taxonomy. RESULTS: Most curricula were developed in high-income countries (HICs), with 58% in the United States. Cancer-specific curricula focused on HIC priority cancers, such as skin/melanoma, and did not represent the global cancer burden. Most (80%) curricula were developed for staff physicians and 73% focused on cancer screening. Over half (57%) of programs were delivered in person, with a shift towards online delivery over time. Less than half (46%) of programs were codeveloped with PCPs and 34% did not involve PCPs in the program design and development. Curricula were primarily developed to improve cancer knowledge, and 72 studies assessed multiple outcome measures. No studies included the top two levels of Bloom's Taxonomy of learning (evaluating;creating). DISCUSSION: This is the first review to assess the current state of cancer curricula for PCPs with a global focus. This review shows that extant curricula are primarily developed in HICs, do not represent the global cancer burden, and focus on cancer screening. This review lays a foundation to advance the co-creation of curricula that are aligned to the global cancer burden.

# Systematic review of gluteoplasty complication rates and complication stratification using Clavien-Dindo Classification

### Ms. Oleksandra Kaskun<sup>1</sup>, Dr. Abinaya Sivakumar<sup>2</sup>

<sup>1</sup>University College Cork, <sup>2</sup>Sri Ramachandra Institute of Higher Education and Research

Introduction: Gluteal augmentation is increasing in popularity, however complications and their severity vary by type of procedure performed. The aims of this study are to systematically evaluate complication rates of the most common gluteoplasty operations - implants, fat grafting, filler injections, and flaps. Then, to classify the complications by severity, which to our knowledge, has not been previously reported for gluteoplasty. Methods: PubMed, CINAHL, Medline, and Scopus databases were searched in October 2022, generating 1498 articles. After excluding articles without full text availability and removing duplicates, 169 articles remained. Further screening resulted in 53 articles. The Clavien-Dindo classification was used to classify complications. **Results:** A total of 6079 patients who underwent gluteal augmentation between 1986 and 2022 were identified. The overall complication rate was 6.6% and the most common complication was seroma (1.6%, 99 cases). Flaps had the highest complication rate (39.5%; 30/76 cases), although 90% of complications were minor (grade I/II). Implants had a complication rate of 31.4% (185/590 cases) with 2.2% of major complications (grade IV/V), including one mortality. Filler injections had a complication rate of 4.2% (72/1695 cases), with 11% of major complications including acute respiratory distress syndrome and retinopathy. Fat grafts had the lowest complication rate of 3.4% (125/3718 cases), with 9.6% of major complications including toxic shock syndrome, gangrene, septic shock, and pulmonary embolism. **Discussion:** Complication rates for different gluteal augmentation procedures vary significantly. The procedures that are most common (filler injections and fat grafts) have the lowest overall complication rates. However, they are also associated with the highest percent of major complications. This association should be emphasised to patients considering gluteoplasty.

#### Team and Leader Performance: A Mixed-Methods Analysis Using Interprofessional In Situ Simulation

**Ms. Vivien Jones¹**, Dr. Ashley Rider², Dr. Sarah R. Williams³, Mr. Daniel Rebagliatis⁴ , Dr. Kimberly Schertze⁵, Dr. Michael A. Gisondi⁵, Dr. Stefanie S. Sebok-Syer⁴

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Stanford University Department of Emergency Medicine, <sup>3</sup>Stanford University, Stanford University Department of Emergency Medicine

**INTRODUCTION:** Patient care in the emergency department (ED) is dependent on highly effective interprofessional teams. Determining optimal readiness of such teams has the potential to impact patient care, but the applicability of current performance assessment tools to ED teams is unclear. We aimed to assess team and leader performance during interprofessional in situ simulation using current tools, and further explore the simulation experience with interviews to elucidate characteristics of effective teams and leaders. **METHODS:** Eligible nurses, technicians, pharmacists, and PGY 2-4 emergency medicine residents at a tertiary ED participated in a 10-minute in situ simulation of a critically ill patient. Participants self-rated performance using the Team Performance Observation Tool (TPOT) 2.0 and completed a brief demographic form. Two raters independently reviewed simulation videos and rated performance using the TPOT 2.0, Team Emergency Assessment Measure (TEAM), and Ottawa Crisis Resource Management Global Rating Scale (Ottawa GRS). Following the simulations we conducted semi-structured interviews, which were coded by two coders and underwent thematic analysis. **RESULTS**: 23 simulations took place between January-April 2021. Raters' scores were on the high end for the TPOT 2.0 (R1 4.90, SD=.17; R2 4.53, SD=.27, IRR=.47), TEAM (R1 3.89, SD=.19; R2 3.58, SD=.39, IRR=.73), and Ottawa GRS (R1 6.6, SD=.56; R2 6.2, SD=.54, IRR=.68). Team leader attributes (residency year, age, gender) did not correlate with performance scores. We identified 6 themes: Leadership tone, interdependent energy, strategic staffing, optimal communication, simulation empowering team performance, and team entrustment. Participants acknowledged the effectiveness of in-situ simulation in promoting entrustment. **DISCUSSION:** The TPOT and TEAM were not discriminatory for high performing ED teams. Our qualitative analysis revealed that entrustability, interdependent energy, and team size are important for effective team dynamics but are not completely captured on current tools. ED-specific assessments of interprofessional entrustment may be useful in optimising readiness for the clinical setting.

## The Association between Non-Alcoholic Fatty Liver Disease and incidence of Arrhythmia and other Cardiovascular outcomes: A Systematic Review and Meta-analysis

Ms. Helen Huang<sup>1</sup>, Dr. Vikash Jaiswal<sup>2</sup>, Dr. Song Peng Ang<sup>3</sup>, Dr. Sidra Naz<sup>4</sup>

<sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Larkin Community Hospital, <sup>3</sup>Rutgers Health/Community Medical Center, <sup>4</sup>Harvard Medical School

Background: The association between non-alcoholic fatty liver disease (NAFLD) with cardiovascular and cerebrovascular outcomes, as well as their clinical impact, has yet to be established in the literature. We aim to evaluate the association between NAFLD patients and the risk of atrial fibrillation (AF), heart failure (HF), stroke, cardiovascular mortality (CVM), and peripheral revascularization. Method: We performed a systematic literature search using the PubMed, Embase, Scopus, and Cochrane libraries for relevant articles from inception until July 20th, 2022. Odds ratios (OR) were pooled using a random-effect model, and a p-value of <0.05 was considered statistically significant. Results: A total of 10 studies with 17886340 patients (2887214 NAFLD vs 14999126 non-NAFLD) were included in our analysis. The average age and percentage of males were comparable between groups, with a mean age of 55 years and 72.5% of males in the NAFLD group, whereas 52 years and 47.4% of males in the non-NAFLD cohort. The most common comorbidities among the NAFLD group included: hypertension (38% vs 24%), diabetes mellitus (14% vs 8%). The mean follow-up duration was 6.26 years. The likelihood of atrial fibrillation [OR, 1.42(95%CI: 1.18-1.70), P<0.001], heart failure [OR, 1.48(95%CI: 1.27-1.73), P<0.001], stroke (OR, 1.26(95%CI: 1.17-1.36), P<0.001], and peripheral revascularization (OR, 3.95(95%CI: 1.60-9.73), P=0.003] was significantly higher in NAFLD patients when compared with non-NAFLD patients. In contrast, cardiovascular mortality was comparable between both the groups of patients [OR, 3.11(95%CI: 0.32-30.03), P=0.33] respectively. Conclusion: Patients with NAFLD demonstrated an increased incidence of cardiovascular and/or cerebrovascular outcomes; heart failure, stroke, and arrhythmia. Patients with associated comorbidities were at higher risk of cardiovascular disease, implying a greater need for screening and adoption of cardio-protective measures amongst NAFLD patients.

### The attitudes of patients towards orthopaedic post-surgical scars

### Mr. Martin Ho<sup>1</sup>, Ms. Hannah Hughes<sup>2</sup>, Mr. Patrick Fleming<sup>2</sup>

### <sup>1</sup>University College Cork, <sup>2</sup>Cork University Hospital

**Introduction:** Post-surgical scars (PSS) are an expected consequence of surgical intervention. Several factors have been associated with an increased risk of lower PSS satisfaction, including younger patient age, longer scar length, and shorter time elapsed post-operative. Little data is available regarding patient attitudes towards orthopaedic PSS. Knowledge regarding same will allow physicians to administer pre and postoperative care to mitigate potential negative effects of PSS. Methods: All patients between 2-18 weeks postoperative attending orthopaedic outpatient fracture clinics in Cork University Hospital between February and August 2022 were included. Patients completed a questionnaire at the time of their outpatient visit and at six months post-operative. The Patient and Observer Scar Assessment Scale (POSAS) was used to assess patient PSS satisfaction. The European Quality of Life 5 Domain and multiple 6-point Likert Scales were used to quantify patient quality of life (QoL). Data pertaining to patient age, gender, race, smoking, diabetic status, scar location, closure method, presence of surgical complications, and time elapsed post-operation were collected. Results: In total, 100 patients were included. The mean POSAS score was 28.41 (p=0.028), indicating patients viewed their PSS in a favourable manner. Factors associated with decreased PSS satisfaction included younger patient age (p=0.045) and decreased time passed post-operatively (p=0.002). Patients reporting their PSS appearing worse than they expected were more likely to agree that their QoL had been adversely affected by it (p=0.001). Discussion: This study identifies several factors associated with poor PSS satisfaction that are consistent with established surgical literature. Knowledge of these factors can lead to the implementation of patient and surgeon-targeted interventions that may mitigate the harmful cosmetic and psychosocial effects of PSS. These include peri-operative patient expectation management, postoperative wound care education, patient reassurance, as well as emphasising the importance of adequate tissue handling and wound closure.

### The Childhood Obesity LANDSCAPE Project

**Mr. Mohammad Almulla1**, Ms. Niamh Arthurs1, Dr. Aisling Walsh1, Dr. Louise Tully1, Ms. Sara O'brien2, Prof. Grace O'Malley1

1Royal College of Surgeons in Ireland, 2Health Service Executive

Introduction: Approximately one in five children in Ireland has overweight or obesity(1). Obesity in childhood is associated with poorer health outcomes and significant complications in children's physical and mental health. Recent research in the field alongside clinical guidelines highlight the importance of early recognition and treatment in the management of childhood obesity(2-4). Aim: The aim of this study is to gain relevant insights into the current state of managing childhood obesity and its complications in health services across the Republic of Ireland. Identifying key challenges to management will support improvement of health delivery and health outcomes for children. Methods: Study Population: Healthcare professionals who see children and adolescents as part of their role were invited to participate in a focus group discussion on their experiences and challenges for delivering care to children with obesity. To date a total of 18 focus groups were conducted with N=85 participants from the following disciplines: dietitians, dental professionals, general practitioners, occupational therapists, nurses, paediatricians, physiotherapists, psychologists and surgeons. Additionally admin staff and clinical coordinators have participated in the focus groups. Ethical approval was granted by RCSI Ethics Committee. Analysis: Focus group data is currently being reviewed, coded and analysed by two independent researchers using the thematic analysis model outlined by Braun and Clarke(5). Input from two senior researchers with qualitative experience, is also being incorporated into the analysis. Discussion: Preliminary analysis of the generated data incorporates health professional perspectives related to the physical, psychological and social needs of children with obesity. Full analysis is being undertaken and findings will be used as part of the larger Childhood Obesity LANDSCAPE Project to inform recommendations on the delivery of childhood obesity care within the Irish health system. This project is funded by the Health Research Board of Ireland's Applied Partnership Award and the Health Service Executive(6).

### The discriminant ability of retinal optical coherence tomography angiography to detect dementia

Dr. Semih Ceylan<sup>1</sup>, Dr. Mert Egemen Caliskan<sup>1</sup>, Dr. Furkan Özdemir<sup>2</sup>, Prof. Nazlı Durmaz Çelik<sup>3</sup>, Dr. Eray Atalay<sup>2</sup>

<sup>1</sup>Eskisehir Osmangazi University Medical School, <sup>2</sup>Eskisehir Osmangazi University Faculty of Medicine Department of Ophthalmology, <sup>3</sup>Eskisehir Osmangazi University Faculty of Medicine Department of Neurology

Introduction: Dementia is the irreversible deterioration of acquired cognitive abilities and is reportedly the 7th leading cause of death. Its diagnosis involves various invasive and high-cost procedures such as magnetic resonance imaging, cerebrospinal fluid analysis and positron emission tomography. Owing to their shared embryological origins, evaluation of retinal microcirculation using optical coherence tomography angiography (OCT-A) may provide insight into the cerebral microcirculation and aid in the detection of dementia. This study aims to compare various OCT-A-derived retinal vascular parameters between dementia patients and healthy controls. Methods: Dementia patients aged 50 - 90 years were recruited from the neurology clinics of the Eskisehir Osmangazi University Hospital. Age-and-gender-matched healthy controls were recruited from the ophthalmology clinics of the same facility. Exclusion criteria were significant cataract, co-existing retinopathy and optic neuropathy, intraocular pressure >21mmHg, spherical equivalent ±4 D. Subjects underwent macular OCT-A imaging (Triton, Topcon Inc.). Exported left eye images were further evaluated using open-source software (OCTAVA) to determine vessel area density (VAD), vessel length density (VLD), total vessel length (TVL), mean and median vessel diameter (MVD and MedVD, respectively), branchpoint density (BD), fractal dimension (FD) and mean tortuosity (MT). Assessments were performed on 4 different layers; superficial and deep retinal capillaries, outer retina and choriocapillaris. Mann-Whitney U test was used and statistical significance was set at p<0.05. **Results:** A total of 16 patients (8 per group) with a mean age of 64.3 years were recruited. Among the parameters assessed, only MVD (65.8±8.8µm and 77.8±7.3µm respectively) and MedVD (66.5±9.4µm and 78.1±7.1µm respectively) were statistically significant at the outer retinal layers between dementia and healthy controls (p=0.028 and 0.015, respectively). Discussion: Subtle differences in mean outer retinal vascular diameter were noted between dementia and healthy controls. OCT-A may be a useful screening tool for identifying dementia.

### The first CMT type 1A patient in Latvia with PXT3003 treatment, case report

### Ms. Tīna Luīze Čupāne<sup>1</sup>, Dr. Madara Auzenbaha<sup>2</sup>

<sup>1</sup>University of Latvia, <sup>2</sup>Riga Stradins University

Introduction: Charcot-Marie-Tooth disease type 1 is peripheral neuropathy. It is caused by a duplication of the PMP22 gene. It leads to abnormal levels of PMP22 protein, which then leads to a failure in the production of normal myelin. As result, it affects the transmission of information between the central nervous system and the rest of the body. Usually, the disease is slowly progressive. Symptoms include distal muscle weakness and atrophy, sensory loss, and slow nerve conduction velocity. CMT1A is associated with pes cavus foot deformity and bilateral foot drop. PXT3003 is a novel fixed-dose synergistic combination of baclofen, naltrexone, and sorbitol formulated as an oral solution given daily. Data from various studies has shown to suppress PMP22 production and improve neuromuscular function. Methods: Case report Results: This case report presents the first CMT1A patient in Latvia using the PXT3003 treatment. The patient is a 12-year-old boy. He is wheelchair-dependent, and his motor functions are severely limited. The patient cannot write, walk, lift his hand above his head, etc. He has been using the PXT3003 for almost 2 years and has not reported any serious side effects. His motor function has not regressed since. Nonetheless, the patient lacks frequent physical rehabilitation, therefore – there are no major neuromuscular function improvements. Discussion: We report a severe case of CMT1A that is currently being treated with PXT3003 experimental therapy. The patient is wheelchair dependent and although the treatment aims to improve the neuromuscular function, there is a lack of enhancement. Optimal management for CMT patients is multidisciplinary, with care provided by neurologists, geneticists, nurses, physical therapists, physiatrists, etc. In most cases, and in ours, CMT is characterized by onset in the first or second decade of life. Generally, the disability increases with age, but complete loss of ambulation is uncommon.

### The Impact Of Doctor Consultation On Patient Hesitancy To Take The COVID-19 Vaccination

### Mr. Rafael Shehata<sup>1</sup>, Dr. Hazar Kobaya<sup>2</sup>

### <sup>1</sup>Royal College of Surgeons in Ireland, <sup>2</sup>Dandelion Allergy Centre

Introduction: Since the introduction of the COVID-19 vaccine, 51.7% of Canadians have shown hesitancy to take the COVID-19 vaccine due to fear of allergies or recurrences of an adverse reaction. In this study, we wanted to determine if allergy consultation would improve this observation. Methods: We have reviewed the charts of 265 patients referred to Dandelion Allergy Centre in Mississauga, Ontario, Canada for COVID-19 vaccination concerns between March 19, 2021, and May 30, 2022. Results: 179 (67.5%) patients were referred without receiving any dosage of the COVID-19 vaccine due to concerns about pre-existing allergies to various foods, medications, or other vaccinations. 86 (32%) patients were referred due to a suspected novel allergic reaction to any COVID-19 vaccine doses. After consulting with the allergist, vaccination was recommended for all patients. In total, 112 (62.5%) patients proceeded to get vaccinated. 50 (19%) patients did an intradermal allergy skin test containing the COVID-19 vaccine and 49 (18.5%) of those patients tested negative. 36 (13.5%) of those patients who tested negative were then vaccinated in the clinic. 13 (5%) patients refused to receive the COVID-19 vaccine after the skin test in the clinic; however, 10 (3.8%) of those patients later got vaccinated in the community. 3 (0.1%) of the 13 patients remained hesitant and unvaccinated to date. One patient tested positive but was successfully vaccinated under the allergist's supervision. Discussion: This study demonstrates that allergy consultation could improve the vaccination uptake rate in most patients with allergy-related concerns regarding the COVID-19 vaccine. Moreover, at this time with virtual consultation accessibility, allergists can play an integral part to improve public health and reduce vaccine hesitancy.

### The influence of psychological stress on the level of natural moisturizing factor in the student population

**Mr. Mislav Mokos¹**, Ms. Ivana Orešković², Ms. Dora Vlašić³, Ms. Maja Mikulec⁴, Prof. Ivone Jakaša², Prof. Branka Marinović⁵

<sup>1</sup>School of Medicine, University of Zagreb, <sup>2</sup>Faculty of Food Technology and Biotechnology, University of Zagreb, <sup>3</sup>School of Dental Medicine, University of Zagreb, <sup>4</sup>School of Medicine, Catholic University of Croatia, <sup>5</sup>School of Medicine, University of Zagreb, University Hospital Centre Zagreb

Introduction: This study aimed to examine the effect of psychological stress on the level of natural moisturizing factor (NMF) among third- and sixth-year medical students. Methods: 25 third-year students and 25 sixth-year students participated in the study. They completed the standard Perceived Stress Scale (PSS) questionnaire, and their samples of stratum corneum of the skin were taken during a period without exams (stress-free period) and during the exam period (stressful period). NMF was determined from stratum corneum using the tape stripping method. The NMF constituents were extracted from the adhesive tapes and determined using high-performance liquid chromatography. The NMF level was normalized for the amount of protein in the stratum corneum. Statistical analysis was done using Wilcoxon, Mann Whitney U, and Student's t-test. Results: The PSS results have shown that third-year students experienced higher stress than sixth-year students (p < 0.001) during the stress-free period. However, there was no significant difference between the two groups during the stressful period. Significantly higher stress levels during the stressful period compared to the stress-free period were present only among sixth-year students. The level of NMF in both groups did not differ significantly between the two periods. During both the stressful and stress-free periods, there was no difference in the level of NMF between the two groups, but there was a clear trend of increasing NMF levels among the third-year students. **Discussion**: Considering the results of PSS, the third-year students were exposed to longer-term stress. In contrast, among sixth-year students, stress was associated with the exam period, followed by a period of relaxation between exams. Namely, the change in stress levels between the stress-free and stressful periods was greater in sixth-year students than in third-year students. Furthermore, our study observed a trend of increasing NMF levels with increasing stress levels.

### The Medication and Non-Medication Related Reasons for Relapse in First Episode Psychosis

### Ms. Yamamh Jubori<sup>1</sup>, Ms. Al-Zahraa Al Maskari<sup>1</sup>, Dr. Hassan Mirza<sup>1</sup>

### <sup>1</sup>Sultan Qaboos University

Introduction: Patients who present with first-episode psychosis (FEP) show adequate response to treatment. However, they have a high tendency to relapse. The related reasons for relapse have been understudied especially in the middle east. The aim of this study is to answer the following question: What are the medication and non-medication-related reasons for relapse in FEP patients admitted to the department of behavioral medicine either in the inpatient or outpatient department at Sultan Qaboos University Hospital (SQUH)? Methods: This is a retrospective cohort study that involves 213 Omani FEP patients aged 12-55 years who were admitted to the inpatient and outpatient department of behavioral medicine at SQUH. Patients' medical records that have presented with FEP from June 2006 to December 2019 were thoroughly reviewed, identifying the relapse rate and the sociodemographic and clinical factors associated with relapse. **Results**: The average relapse rate for FEP patients was 14.28 months. Place of residence and leaving against medical advice were found to have a significant relationship with relapse rate. About half of the FEP patients were non-compliant with their medications and their relapse rate is 12 months which is significantly smaller than the compliant patient group (relapse rate of 17.22 months). Patients with regular follow-ups were significantly more compliant with their medications. **Discussion**: This study suggests that leaving against medical advice, place of residence (urban vs rural), and patients' follow-up appointments (Regular vs irregular) were the significant reasons associated with relapse. Future recommendations may include increasing the sample size and conducting prospective studies that include additional variables and overcoming general retrospective studies limitations.

### The new podophyllotoxin derivatives and their effects on human keratinocyte cells.

Mr. Karol Sadowski<sup>1</sup>, Dr. Izabella Młynarczuk-Biały<sup>2</sup>, Mr. Piotr Strus<sup>2</sup>, Ms. Julia Kostro<sup>1</sup>

<sup>1</sup>The Department of Histology and Embryology in the Medical University of Warsaw, Students Scientific Group HESA, <sup>2</sup>The Department of Histology and Embryology in the Medical University of Warsaw

Podophyllotoxin (PPT) is a plant-derived cell proliferation inhibitor used to treat anogenital warts. PPT stabilizes microtubules and stops the replication of cellular DNA. The high toxicity makes it impossible to administer PPT intravenously or orally, and it can be applied topically only. The drug under our study is a derivative of PPT, which turns out to be more effective in killing cancer cells in vitro and less toxic to nontumorogenic cells. We performed our research on the human keratinocyte line (HaCaT). We tested them with PPT (Sigma Aldrich), and KL-3 synthesized in cooperation with the Department of Chemistry at the University of Warsaw. We assessed the cell viability (PrestoBlue Assay) and apoptosis/necrosis (Annexin V assays) mechanisms in three different concentrations: 1µM, 5µM and 10µM. The changes in the structure of HaCaT cells were also described based on photos taken by electron microscopy. PPT causes a more potent cytotoxic effect on HaCaT cells than KL3 in the corresponding concentration in IC50 test. In Annexin V apoptosis and necrosis assay, KL-3 didn't induce either apoptosis or necrosis at lower concentrations, whereas PPT led to increased apoptosis and necrosis markers. After a 24-hour incubation, both compounds lead to mitochondrial swelling and stress of the endoplasmic reticulum. Still, in cells incubated with KL3, after 48 hours, cell adaptation started, the changes regressed, and autophagosomes were formed. We did not observe a similar regression effect in cells after incubation with PPT. Additionally, in PPT-incubated cells, the vacuolization of the cytoplasm and the loss of cell membrane continuity were observed. Based on that and our previous research, we know KL3 is more effective on cancer cells and less toxic on non-tumorogenic cells than PPT. It suggests that KL-3 could be a better alternative to PPT in anogenital warts and a potential systemic anticancer drug.

#### The State of Mental Health Situations of Students in Ukraine During the Ukrainian-Russian War Speculations.

#### Dr. David Ayodele Okunola<sup>1</sup>, Dr. Esther Ademeta<sup>2</sup>

<sup>1</sup>Ternopil National Medical University, Ukraine

#### <sup>2</sup>Sumy State University, Ukraine

Introduction: Mental Health disorder account for more than 16% of the global disease burden. In comparison to other countries but is a widely Known disease that is encapsulate or divide into Depression, schizophrenia, Anxiety, Addiction, psychotic disorders, Post Traumatic Stress disorder, Mental instability and so on. Aims: The purpose of this study is to determine and show how the Ukrainian-Russian war speculation has Affected or affected the mental health of the Ukrainians, Third Nationals (For Study, Work and Tourism Purposes) and how they were able to Manage through and maintain mental Stability before and After their escape from the war Zone. General Information will be addressed During the discussion session. Methods: We distributed a cross sectional online survey to University students throughout Ukraine, with an Estimated total of over 1211 students. The mental health of students was evaluated using the Generalized Anxiety Disorder(GAD-7), the Patient Health Questionnaire(PHQ-9), EQ-5D-5L to evaluate the quality of Mobility, Selfcare, usual activities, pain/discomfort and Anxiety/Depression. Also, we conducted an interview randomly among the university students in Ukraine. Results: GAD-7 shows that 63% were severe depression, 16% moderately severe, 21% mild. PHQ-9 and EQ-5D-5L shows 93% of students were severe Anxiety, 5% shows Moderate, 2% shows normal. Interview session shows that Most of Students and Citizens were Depressed and experienced PSTD but were able stabilize their mental state after Support and Acceptance of the majority of the European Countries eg Hungary, Poland, Ireland, Netherlands, Finland, Germany, Slovakia, Romania and so on. Conclusion: It clearly shows that the Ukrainian-Russian war speculations had a significant psychological impact on the Ukrainians and Her students.

### The strength of clinical guideline recommendations and the underlying certainty of the evidence: a cross-sectional analysis of a suite of national guidelines

**Ms. Ming Chuen Chong¹**, Dr. Melissa Sharp², Prof. Susan M. Smith³, Dr. Michelle O'Neill⁴, Dr. Máirín Ryan⁴, Dr. Rosarie Lynch⁵, Dr. Kamal R. Mahtani⁶, Dr. Dr Barbara Clyne²

<sup>1</sup>Department of General Practice, RCSI University of Medicine and Health Sciences, Dublin 2, <sup>2</sup>Department of General Practice, RCSI University of Medicine and Health Sciences, Dublin 2, <sup>3</sup>Department of Public Health and Primary Care, Trinity College, Dublin 2, <sup>4</sup>Health Information and Quality Authority, Dublin, Ireland, <sup>5</sup>Clinical Effectiveness and Antimicrobial Resistance Unit, National Patient Safety Office, Department of Health, <sup>6</sup>Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, England

Background: Clinical guidelines are systematically developed statements, based on a thorough evaluation of the evidence, to assist clinical decision-making. They generally include a rating of the quality of evidence and assign a strength to recommendations. Grading of Recommendations Assessment, Development and Evaluation (GRADE) guidance warns against making strong recommendations when the certainty of the evidence is low or very low, but has identified five situations where this may be justified. Aims and Objectives: We aimed to characterise the classification of the strength of recommendations and the certainty of the evidence in Irish National Clinical Guidelines that used the GRADE approach. Methods: All National Clinical Guidelines from the National Clinical Effectiveness Committee (NCEC) website were reviewed and those using the GRADE approach were analysed. All recommendations and their certainty of the evidence, strength of recommendations and justifications were extracted. Discordant recommendations, (strong recommendations with low certainty evidence) were classified into one of the five situations. Descriptive statistics of the proportion discordant recommendations were calculated. Results: Of the 29 NCEC Clinical Guidelines, 8 used GRADE. Out of 240 recommendations, 152 (63.3%) were strong, 72 (30%) were weak or conditional, and 16 (6.7%) did not use the GRADE approach. Of the 152 strong recommendations, 56 (37%) were supported by high or moderate certainty evidence and 96 (63.1%) by low or very low certainty. Of the 96 discordant recommendations, 55 (57.3%) were consistent with one of the five situations. However, none were specifically described as such within the guideline. **Discussion:** The proportion of discordant recommendations identified in this analysis was higher than previous international studies (30-50% discordant recommendations). The majority of discordant recommendations could be mapped to one of the five situations, but no guideline explicitly referenced this. Guideline developers should be more transparent in their reporting of the reasons for discordant recommendations.

#### Validation of circulating miRNAs as biomarkers in acute ischaemic stroke

Mr. Tejas Sawant<sup>1</sup>, Dr. Jorin Bejleri<sup>1</sup>, Ms. Diane de Bazelaire<sup>2</sup>, Dr. Shona Pfeiffer<sup>3</sup>

<sup>1</sup>School of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland, <sup>2</sup>École Supérieure d'Ingénieurs en Électrotechnique et Électronique, <sup>3</sup>Department of Physiology and Medical Physics, Royal College of surgeons in Ireland (RCSI), Dublin, Ireland

Introduction: Acute Ischaemic Stroke (AIS) occurs as a result of reduced blood supply to the brain. MicroRNAs (miRNAs) are a class of small non-coding RNA with central roles in gene regulation and are widely reported to be dysregulated in response to disease pathophysiology. We assessed the expression levels of four miRNAs of interest identified to be dysregulated in patients following AIS: hsa-miR-1-3p, hsa-miR-499a-5p, hsa-miR-143-3p and hsamiR-200b-3p using quantitative RT-qPCR. Methods: All approvals were finalised by local research ethics committees. Blood samples were collected from healthy controls and patients with AIS within ≤12 hours from onset of symptoms and prior to any reperfusion therapy. Following RNA isolation, cDNA synthesis and miRNA amplification, quantitative RT-PCR was performed to assess the expression levels of circulating serum miRNAs and normalised to synthetic spike-in internal control cel-miR-39. Plotting of graphs and unpaired t-tests were performed using GraphPad Prism9. Results: The expression values for the circulating miRNAs of interest were validated as follows (log2FC±SEM): hsa-miR-1-3p, -1.15×10-15 ± 0.86, n = 31 (control) and 1.44 ± 1.01, n = 15 (ischaemic), p = 0.32; hsa-miR-499a-5p, -2.76×10-16, n = 29 (control) and -0.63 ± 1.06, n = 12 (ischaemic), p = 0.75; hsa-miR-143-3p, -5.9×10-16 ± 0.55, n = 35 (control) and -0.2 ± 0.7, n = 18 (ischaemic), p = 0.71; hsa-miR-200b-3p, 1.08×10-16 ± 0.73, n = 33 (control) and -0.03 ± 1.29, n = 11 (ischaemic), p = 0.98. Discussion: Expression of circulating hsa-miR-1-3p, hsa-miR-499a-5p, hsa-miR-143-3p and hsa-miR-200b-3p were validated in patients with AIS. The lack of statistical significance can be attributed to small sample size, heterogeneity of AIS pathophysiology, heterogeneity of patient cohorts and associated lifestyle and risk factors. A larger scale study with additional clinical data, including stroke subtype and cardiac-related risk factors, can contribute to the development of a biomarker-based assay for early diagnosis of stroke.

## When a gluten-free diet is not enough. A rare case of type 2 refractoriness in a patient with a severe form of celiac disease.

Ms. Weronika Skoczek<sup>1</sup>, Mr. Poomrat Rasamikomen<sup>1</sup>, Prof. Piotr Eder<sup>1</sup>

<sup>1</sup>Poznan University of Medical Sciences

Investigation: A 40-year-old female was admitted to the hospital, presenting signs of acute abdominal pain, watery diarrhea, vomiting with subsequent peripheral edema, and massive ascites. An abdominal computed tomography scan showed inflammatory lesions throughout the entire small intestine. Case report: A full diagnostic work-up allowed to diagnose a severe form of celiac disease (CD) with the appearance of ulcerative jejunitis on magnetic resonance enterography (MRE). A gluten-free diet (GFD), budesonide, and parenteral nutrition were introduced. The general condition of the patient slightly improved, however, she developed steroid dependency. After 12 months, a diagnostic reassessment was done. A negative anti-tissue transglutaminase titer confirmed a full adherence to the GFD, but complete duodenal villi flattening shown microscopically was suggestive of refractory CD (RCD). Enteroscopy was performed with multiple small bowel biopsies - molecular, and the immunohistochemical assessment suggested type 2 RCD due to the characteristic T-cell receptor y/ $\delta$  gene rearrangements and loss of surface CD4 and CD8 on the intraepithelial lymphocytes. The patient continued with steroids and a strict GFD but refused to start immunosuppressive therapy. The patient's condition worsened, with several cases of ileus and significant weight loss. Control MRE, performed after two years, visualized a large obstructive small intestinal mass, which was resected surgically with a histopathological diagnosis of enteropathyassociated T-cell lymphoma (EATL). The patient received chemotherapy with no improvement and was qualified for a stem cell transplantation. Unfortunately, she died due to the dynamic progression of the disease. Discussion: Type 2 RCD is an extremely rare autoimmune disorder. A multistep diagnostics approach, including molecular methods, is needed to confirm the diagnosis. Commonly accepted therapeutic guidelines are not known. The prognosis for type 2 RCD is poor since more than half of patients develop EATL irrespectively of the treatment introduced.

# Why do some individuals with diabetes fail to attend diabetic retinal screening?: A systematic scoping review of the global literature.

Ms. Manvir K. Parmar<sup>1</sup>, Ms. Anvi Mistry<sup>1</sup>, Dr. Peter Hayes<sup>2</sup>

<sup>1</sup>School of Medicine, University of Limerick, <sup>2</sup>University of Limerick

Introduction: Diabetic retinopathy is one of the leading causes of vision loss and preventable blindness globally and affects one-third of diabetics. Regular diabetic retinopathy screening (DRS) can prevent blindness through early detection and timely referral for treatment. While annual screening programs are somewhat successful, non-attendance remains a major issue and is associated with poorer health outcomes. The aim of this scoping review is to examine the global scientific literature relating to DRS non-attendance. Methods: A search strategy was created using keywords/Boolean operators, and relevant articles were identified from multiple databases (Medline, PubMed Central, Embase, and Scopus). To include articles from low- and middle-income countries, where the burden of diabetes is accelerating, we also examined 'grey' literature. The Arksey O'Malley Framework for scoping reviews and the Preferred Reporting Items for Systematic reviews and Meta-analysis extension for Scoping reviews (PRISMA-ScR) checklist were both utilised. Results: Primarily 280 articles were initially identified, and after the removal of duplicates, there were 217 articles available to screen. In all, 180 articles were deemed irrelevant, leaving 37 articles to be assessed for full-text eligibility, and 26 articles from 9 different countries were selected for final review. Qualitative and observational studies dominated the literature. Identified factors associated with DRS non-attendance were fear and anxiety (8), forgetfulness of appointments (2), lack of motivation to attend (2), financial burden of attending (8), lack of knowledge (9), and health systems failures regarding DRS (4). Discussion: There are few randomised controlled trials (RCTs) examining interventions to improve attendance at DRS, but the factors associated with non-attendance are well described. It could be argued that well-powered RCTs are needed to help increase attendance rates at DRS and limit morbidity. The scientific literature on DRS is poorly evident in lower- and middle-income countries, where diabetic retinopathy is already an emergent global health phenomenon.

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### Delegates

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All the best, The ICHAMS 2023 Organizing Committe



