



IMRC  
2021 



# RESILIENCE IN HEALTHCARE RESEARCH

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**Abstract book**  
**December 18 - 19, 2021**

Phramongkutklo College of Medicine Bangkok, Thailand

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**IMRC**  
**2021**







## **International Medical Student Research Conference 2021**

**IMRC 2021**

***“Resilience in Healthcare Research”***

**December 18 - 19, 2021**

**Phramongkutklo College of Medicine  
Bangkok, Thailand**

## WELCOME MESSAGE



Dear all delegates,

On behalf of the organizing committee, it is my great pleasure and honor to welcome you to the International Medical Student Research Conference 2021 (IMRC 2021) which is held in Bangkok, Thailand. IMRC 2021 is organized by Phramongkutklao College of Medicine and the Consortium of Thai Medical Schools (COTMES), which offers a unique platform where worldwide medical students can share their self-initiated academic works and collaborate among the global network of medical students. Especially this year, we have provided pre-conference workshops, collaboration IMRC together with AMSA-Thailand and IFMSA-Thailand. In addition, innovation showcase is a new session to promote all medical students' capabilities. I ensure you that all delegates are given chances to actively participate, exchange experiences, and propose potential solutions toward research and health issues of their interested topics. Thus, building a generation of imminent medical doctors can make a major impact on the future of the healthcare system.

I wish you all the best and look forward to escorting all of you with our earnest hospitality during the conference. I assure that you will deliberate and make the best use of the time in this conference.

Sincerely,

A handwritten signature in black ink, appearing to be 'Surasak'.

**Maj.Gen. Surasak Tanudsintum, MD**  
Dean of Phramongkutklao College of Medicine  
Director of Phramongkutklao Hospital  
Chairman of IMRC 2021

## WELCOME MESSAGE



Dear Participants,

It is our great pleasure to welcome you to a hybrid conference, International Medical Student Research Conference 2021 (IMRC 2021). It is the second research forum in Thailand which is thoroughly organized by medical students, Phramongkutklao College of Medicine collaborated with the Consortium of Thai Medical Schools (COTMES). As the organizing chairperson, I am enthusiastic to operate this inventive colloquium for all medical students globally.

In this conference, the oral and poster presentations are held in parallel sessions, together with the pre-conference workshops from our amiable flagships: AMSA-Thailand and IFMSA-Thailand to level up your research and presentation skills. Especially this year, an innovation showcase which is the newly highlighted program, is also provided. In addition, honorably renowned keynote speakers are invited to each symposium. Apart from the academic program, visiting the Royal Phiyathai Palace and welcoming reception are programs which we can guarantee the momentous time in your participation. Not only to gain more academic experiences, but also to the lasting friendship among entrants.

Due to the SARS-CoV-2 pandemic, the second hybrid conference is performed again which all delegates can voluntarily choose their preferences. For on-site participation, our committee will ensure your safety with every standard measure possible. Our organizing committee is eagerly anticipating your engagement and successful accomplishment for all prospective purposes.

Sincerely,

A handwritten signature in black ink, appearing to read 'Naruporn'.

**Naruporn Krungkraipetch**

Organizing Chairperson

International Medical Student Research Conference 2021

Phramongkutklao College of Medicine, Class of 2023



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## ORGANIZING COMMITTEE

### International Medical Student Research Conference 2021

Maj.Gen. Surasak	Tanudsintum	<b>Chairman of the Organizing Committee</b>
Maj.Gen. Asst.Prof. Dusit	Staworn	<b>Dean of Phramongkutklo College of Medicine (PCM)</b>
Col. Prof. Mathirut	Munghthin	<b>Director of Academic Affairs Division, PCM</b>
Col. Prof. Ram	Rangsin	<b>Associate Dean for Administration, PCM</b>
Col. Asst.Prof. Thammanoon	Srisaarn	<b>Associate Dean for Academic Affairs, PCM</b>
Lt.Col. Assoc.Prof. Phunlerd	Piyaraj	<b>Associate Director of Academic Affairs Division, PCM</b>
Col. Asst.Prof. Panadda	Hatthachote	<b>Conference Secretary</b>
Col. Asst.Prof. Phunphen	Napradit	
Col. Asst.Prof. Pasra	Arnutti	
Col. Asst.Prof. Anusara	Vattanajun	
Col. Asst.Prof. Dangjai	Souvannakitti	
Col. Manop	Chaimati	
Col. Amnart	Chaiprasert	
Col. Pajaree	Thitthiwong	
Col. Kitiporn	Putthikhunt	
Col. Kasom	Bhanganada	
Col. Peetirat	Hiranrusme	
Col. Chanchai	Buawan	
Col. Pitipat	Jamnarnwej	
Lt.Col. Thanakrit	Vichasilp	
Lt.Col. Nutchol	Charoenpon	
Lt.Col. Kanista	Luenam	
Lt.Col. Waraporn	Wattanakij	
Lt.Col. Thidaporn	Phonchat	
Capt. Pisanupong	Buddhadecharad	
Lt. Jirapha	Sanit	
Lt. Surachai	Pangta	
Lt. Kawin	Wongthamarin	
Lt. Pongpisut	Thakhampaeng	
SubLt. Teeraboon	Lertwanichwattana	
SubLt. Sarut	Puengpreeda	
SubLt. Sakarn	Charoensakulchai	

## STUDENT COMMITTEE

International Medical Student Research Conference 2021

Ms. Naruporn	Krungkraipecth	<b>Organizing Chairperson</b>
Mr. Nachanok	Sutthiopad	<b>Executive Assistant</b>
Ms. Kanyakorn	Siraprapapong	<b>Vice Chairperson for Program Affairs</b>
Mr. Sirawich	Karuna	<b>Secretary of Vice Chairperson for Program Affairs</b>
Ms. Veeraya	Meeprasertsagool	<b>Vice Chairperson for Administrative Affairs</b>
Ms. Panissara	Amornjiraporn	<b>Secretary of Vice Chairperson for Administrative Affairs</b>
Ms. Patcharapa	Larbrangsirat	<b>Vice Chairperson for Support Affairs</b>
Ms. Jaedsupa	Thanakitcharu	<b>Secretary of Vice Chairperson for Support Affairs</b>
Mr. Panithi	Piyachon	<b>Vice Chairperson for Technology and Media Affairs</b>
Ms. Sirikorn	Pikulkaew	<b>Secretary of Vice Chairperson for Technology and Media Affairs</b>
Mr. Natthamongkol	Sanganate	<b>Director of Academic Program</b>
Ms. Nichanan	Chaisubunkanok	<b>Head of Academic Competition</b>
Ms. Suranuch	Marsook	<b>Head of Academic Reception</b>
Ms. Panissara	Amornjiraporn	<b>Head of Innovation Showcase</b>
Ms. Fasai	Amornchatchawankul	<b>Director of Non-academic Program</b>
Ms. Chanapat	Limprungpattanakit	<b>Head of Official Events</b>
Ms. Maneepatsorn	Sirisereewan	<b>Head of Master of Ceremony</b>
Ms. Patthira	Anusas-amornkul	<b>Head of Welcoming Reception</b>
Ms. Kulaya	Achakornlak	<b>Head of Palace Visit</b>
Ms. Punyada	Sakultaweewat	<b>Head of Virtual Program</b>
Mr. Nuttanun	Chantanakul	<b>Head of Broadcasting</b>
Mr. Netinunt	Poolthananunt	<b>Secretary for Internal Affairs</b>
Ms. Kavinthra	Teerakathiti	<b>Secretary for External Affairs</b>
Mr. Nattapong	Hongsimakul	<b>Director of Finance</b>
Mr. Pree	Pusayapaibul	<b>Head of Treasurer and Sponsorship</b>
Mr. Suwapach	Sukkrasanti	<b>Director of Human Resources</b>
Ms. Panrawee	Sertsuwankul	<b>Director of Food Logistics</b>
Ms. Bulporn	Lerdsakviman	<b>Director of Venue</b>
Mr. Dhorn	Tongsiri	<b>Director of Registration</b>
Mr. Supawit	Nakrit	<b>Head of Receptionist</b>
Ms. Sasipa	Arunrakthavorn	<b>Head of Group Moderator</b>
Mr. Gorawich	Witayanun	<b>Head of Evaluation and Development</b>
Ms. Nicharee	Detanan	<b>Director of Media</b>
Ms. Napatsorn	Sata	<b>Head of Photography and Videography</b>
Ms. Thawanporn	Chukiatchaturaporn	<b>Director of Promotion and Publication</b>
Ms. Pinyada	Kittisarapong	<b>Head of Publication</b>
Ms. Pornchanit	Sirisuknantadech	<b>Head of Public Relation</b>
Mr. Supakrit	Mahaisawariya	<b>Head of Art Officers</b>
Mr. Rujipart	Rattanapak	<b>Director of Website</b>
Mr. Passakorn	Khontharatkun	<b>Head of Database</b>

## CONFERENCE PROGRAM

International Medical Student Research Conference 2021

Venue: Phramongkutklao-Vejvitthaya Building, Princess Bejaratana Building

### Saturday, 18 December 2021

07:30 – 08:00	<b>Registration</b>
08:00 – 08:30	<b>Opening Ceremony</b> <ul style="list-style-type: none"> <li>▪ IMRC 2021 Video presentation</li> <li>▪ Opening remarks by <b>Prof. Dr. Sirirug Songsivilai, MD, PhD</b> <i>Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation, Thailand</i></li> <li>▪ Welcome remarks by <b>Maj.Gen. Surasak Tanudsintum, MD</b> <i>Dean of Phramongkutklao College of Medicine</i></li> <li>▪ Welcome remarks by <b>Ms. Naruporn Krungkraipetch,</b> <i>Student Chairperson of the Organizing Committee</i></li> <li>▪ Group Photo</li> </ul>
08:30 – 09:00	<b>2021 National Medical Teacher Award Presentation Ceremony</b> <ul style="list-style-type: none"> <li>▪ Announcement of 2021 National Medical Teacher Award under the Consortium of Thai Medical Schools</li> <li>▪ 2021 National Medical Teacher Award Video presentation</li> <li>▪ 2021 National Medical Teacher Award presentation</li> <li>▪ Remarks by the recipient of 2021 National Medical Teacher Award</li> <li>▪ Conclusion of Award Presentation Ceremony</li> </ul>
09:00 – 09:30	<b>Opening Keynote Session:</b> <b>Resilience in Healthcare Research</b> <b>LCDR William Davis, DrPH, MA</b> <i>Centers for Disease Control and Prevention (CDC), USA</i>
09:30 – 10:00	<b>Keynote Session:</b> <b>Real World Healthcare System and the Linkage to Policy</b> <b>Rapeepong Suphanchaimat, MD, PhD</b> <i>International Health Policy Program, Ministry of Public Health, Thailand</i>
10:00 – 10:15	Coffee Break
10:15 – 11:45	<b>Oral Presentation 1 (Mongkutvej Main Auditorium)</b> <ul style="list-style-type: none"> <li>▪ <b>Systematic Review and Meta-analysis research</b></li> </ul> <b>Poster Presentation 1 (Sodsri Room)</b> <ul style="list-style-type: none"> <li>▪ <b>Basic Science research</b></li> </ul>
11:45 – 12:00	Break

\* Oral Presentation: 10 mins/abstract; 7 mins presentation, 3 mins Q&A

Poster Presentation: 8 mins/abstract; 5 mins presentation, 3 mins Q&A



# CONFERENCE PROGRAM

International Medical Student Research Conference 2021

Venue: Phramongkutklao-Vejvitthaya Building, Princess Bejaratana Building

## Saturday, 18 December 2021

12:00 – 12:45	<p><b>Lunch Symposium:</b></p> <p><b>Use of Mathematical Modelling for Studying Infectious Disease Epidemiology and Control Strategies</b>  <i>Assoc.Prof. Wirichada Pan-Ngum, PhD</i>  <i>Faculty of Tropical Medicine, Mahidol University, Thailand</i></p>
12:45 – 13:30	<b>Innovation Showcase</b>
13:30 – 15:20	<p><b>Oral Presentation 2 (Mongkutvej Main Auditorium)</b></p> <ul style="list-style-type: none"> <li>▪ <i>Medical Education research</i></li> </ul> <p><b>Poster Presentation 2 (Sodsri Room)</b></p> <ul style="list-style-type: none"> <li>▪ <i>Systematic Review and Meta-analysis research</i></li> <li>▪ <i>Hospital-based research</i></li> </ul>
15:20 – 15:30	Break
15:30 – 17:00	<p><b>Oral Presentation 3 (Mongkutvej Main Auditorium)</b></p> <ul style="list-style-type: none"> <li>▪ <i>Basic Science research</i></li> </ul> <p><b>Oral Presentation 4 (Sodsri Room)</b></p> <ul style="list-style-type: none"> <li>▪ <i>Hospital-based research</i></li> </ul>
17:00 – 17:15	<b>Transfer to Royal Phyathai Palace</b>
17:15 – 18:00	<b>Visit Royal Phyathai Palace</b>
18:00 – 20:30	<p><b>Welcome Reception at Royal Phyathai Palace</b>  <i>(COTMES executives, Faculties, Student delegates)</i></p>

\* Oral Presentation: 10 mins/abstract; 7 mins presentation, 3 mins Q&A

Poster Presentation: 8 mins/abstract; 5 mins presentation, 3 mins Q&A

## CONFERENCE PROGRAM

International Medical Student Research Conference 2021

Venue: Phramongkutklao-Vejvitthaya Building, Princess Bejaratana Building

### Sunday, 19 December 2021

08:00 – 08:30	<b>Registration</b>
08:30 – 10:00	<b>Oral Presentation 5</b> ( <i>Mongkutvej Main Auditorium</i> ) <ul style="list-style-type: none"> <li>▪ <b>Community-based research</b></li> </ul> <b>Poster Presentation 3</b> ( <i>Sodsri Room</i> ) <ul style="list-style-type: none"> <li>▪ <b>Hospital-based research</b></li> </ul>
10:00 – 10:30	Coffee Break
10:30 – 12:00	<b>Oral Presentation 6</b> ( <i>Mongkutvej Main Auditorium</i> ) <ul style="list-style-type: none"> <li>▪ <b>Hospital-based research</b></li> </ul> <b>Poster Presentation 4</b> ( <i>Sodsri Room</i> ) <ul style="list-style-type: none"> <li>▪ <b>Community-based research</b></li> </ul>
12:00 – 12:15	<b>Candidate Announcement for Final Round Competition</b>
12:15 – 13:15	<b>Lunch Symposium:</b> <b>Medical Student Engagement in Conducting Research</b> <ul style="list-style-type: none"> <li>▪ <b>Mr. Chatdanai Chanthowong</b> <i>6<sup>th</sup> Year Medical Student, Phramongkutklao College of Medicine</i></li> <li>▪ <b>Mr. Nontapat Sukhonpanich</b> <i>6<sup>th</sup> Year Medical Student, Faculty of Medicine Siriraj Hospital, Mahidol University</i></li> <li>▪ <b>Mr. Pratchya Khamsaengdee</b> <i>5<sup>th</sup> Year Medical Student, Faculty of Medicine, Ramathibodi Hospital, Mahidol University</i></li> <li>▪ <b>Ms. Naruporn Krungkraipetch</b> (<i>Moderator</i>) <i>5<sup>th</sup> Year Medical Student, Phramongkutklao College of Medicine</i></li> </ul>
13:15 – 13:30	Coffee Break
13:30 – 14:30	<b>Oral Presentation: Final Round</b> <i>(Mongkutvej Main Auditorium)</i>
14:30 – 16:00	<b>IMRC 2021 Award Presentation and Closing Remarks by</b> <b>Maj.Gen. Surasak Tanudsintum, MD</b> <i>Dean of Phramongkutklao College of Medicine</i> <ul style="list-style-type: none"> <li>▪ Group Photo</li> </ul>

\* **Oral Presentation: 10 mins/abstract; 7 mins presentation, 3 mins Q&A**

**Poster Presentation: 8 mins/abstract; 5 mins presentation, 3 mins Q&A**

# CONFERENCE OVERVIEW

## International Medical Student Research Conference 2021

**Host:** Phramongkutklao College of Medicine and Consortium of Thai Medical Schools

**Theme:** Resilience in Healthcare Research

**Venue:** Phramongkutklao College of Medicine, Bangkok, Thailand

The International Medical Student Research Conference (IMRC) is an international conference for medical students organized by Phramongkutklao College of Medicine (PCM). The highlight of this conference is the medical student research competition. It constitutes a forum for undergraduate medical students to present their research, exchange ideas, and improve their communication skills while competing for the precious Her Royal Highness Princess Maha Chakri Sirindhorn's Trophy.

### Goals

- To provide medical students the opportunity to share their research ideas and results at IMRC in a special forum that provides visibility for their works
- To provide medical students the opportunity to meet and interact with IMRC attendees to interchange ideas, gain new insights, and understand possible practical applications
- To provide medical students the opportunity to sharpen their communication skills
- To provide valued feedback to students about their research and presentations, from a panel of distinguished judges from the Consortium of Thai Medical Schools (COTMES)
- To recognize and reward outstanding student research

### Research Competition

Abstract content is reviewed by the judge panels who evaluate the work based on its overall quality, originality, and relevance to the medical fields. Abstracts are not considered to be a prior publication of the work for the purposes of a journal publication. Abstract selection will be evaluated based on:

- Quality of work
- Novelty of approach
- Significance of the contribution to the medical field
- Clarity of written presentation
- Quality of visual and oral presentation

Confidentiality of submissions is maintained during the whole review process. All rejected submissions are kept confidential in perpetuity. All submitted materials for the accepted submissions are kept confidential until the start of the conference. The launch of the digital conference abstracts will be released on the website before the conference including only the title and author information. Submissions should not contain sensitive, private, or proprietary information that cannot be disclosed at publication time.

### Competition Overview

The two types of research competition in IMRC 2021, are **Oral Presentation** and **Poster Presentation**, which are divided in five tracks including:

1. Basic science research
2. Community-based research
3. Hospital-based research
4. Medical education research
5. Systematic review and meta-analysis research

### General Rules and Regulation

1. All submissions must be in English.
2. Documents with any form of plagiarism are immediately disqualified.
3. Deadline for submission is to be strictly followed. Any form of action which does not follow the deadline is disqualified.
4. All decisions made by judge panels are final.
5. Corresponding authors from multiple institutes are accepted. However, only one presenter can register under the conclusion among authors.
6. For group research, a presenting speaker shall be designated as a primary author for competition purposes.
7. The academic committee will recognize the latest submission before the deadline.

### Study Guidelines

1. Studies should present a significant new contribution in the biomedical, clinical, or public health fields.
2. Studies must not be previously published in a journal or currently be in the process of peer review.
3. The same protocol cannot be submitted for more than one competition.
4. Ethics approval of studies dealing with human data or animal subjects is required.
5. A systematic review and meta-analysis protocol must be prospectively registered in a publicly accessible database, including but not limited to, Open Science Framework (highly recommended), PROSPERO (recommended), or Cochrane Library, and Research Registry. For more information, please study the Declaration of Helsinki.

### Selection Process

1. Abstracts will be reviewed by three medical health professional reviewers.
2. For abstracts that are not accepted for oral presentation, reconsideration for poster presentation is conducted automatically.
3. Announcement of accepted abstracts are sent by registered email along with a confirmation link to the payment method.

### Abstract Submission

1. Submission deadline: October 31, 2021, GMT +7. No more changes are allowed to be made to the abstract after the closing submission.
2. Results announcement: November 7, 2021, GMT +7
3. Abstract format required for abstract submission is listed below:
  - a. Title
  - b. Authors and Institution/organization
  - c. Content
    - Background/Introduction
    - Objective
    - Method
    - Results
    - Discussion/Conclusion
    - Keywords (at least 3 words)
  - d. References (Vancouver style)
  - e. Word limit is 350 words
  - f. Language: English, all local words or phrases used should be provided with English translation

### Oral Presentation

1. Accepted participants have to submit their presentation material(s) on the website (before November 28, 2021, GMT+7).
2. Presentation file format: PowerPoint Presentation (.ppt or .pptx)
3. Presentation session will be assigned by category entry, time and presentation sequence are sent to registered email.
4. Presentation time: 10 minutes (7 minutes for presentation, 3 minutes for questions and answers)
5. Warning sound: 2 times (at the 5<sup>th</sup> and 7<sup>th</sup> minute)
6. Computer and LCD projector are available for onsite presenters.
7. For an online presentation, attending online preparation workshops and the readiness of online devices are compulsory.

### Final Round Competition

For the oral presentation competition, the winner of each track (Basic science, Community-based, Hospital-based, Medical education and Systematic review and meta-analysis) will be qualified to participate in the final round competition. The winner of the competition is awarded Her Royal Highness Princess Maha Chakri Sirindhorn's Trophy.

### Poster Presentation:

**Poster format:** Portrait or landscape poster, 90 x 120 cm

1. Participants have to submit their presentation material(s) on the website (before November 28, 2021, GMT+7).
2. Presentation file format: PDF/PNG
3. Presentation session will be assigned by category entry. The time and presentation sequence are sent to registered email.
4. Presentation time: 8 minutes (5 minutes for presentation, 3 minutes for questions and answers)
5. Warning sound: 1 time (at the 4<sup>th</sup> minute)
6. All posters will be displayed online or onsite for all registered participants.
7. For onsite display, please prepare mounted posters on December 18, from 07:00-10:00 (GMT+7). Thus, onsite presenters must bring their printed posters at the mentioned time. For online presenters, the presentation will be conducted on an LCD projector screen.
8. For an online presentation, attending online preparation workshops and the readiness of online devices are compulsory.

### Popular Vote Competition

As part of the popular vote competition, all the accepted posters can be independently included in this program. The posters are posted on the official Facebook page and are published to react or share by any Facebook users. Rules for popular vote competition are described below.

1. Each single Facebook like and all other emoticon's reactions in each posted poster is counted as 1 point.
2. Each single Facebook share in each posted poster is counted as 2 points.
3. A repeated Facebook share from the same Facebook account is forbidden.
4. Only accepted abstracts are eligible for the popular vote competition.
5. Participants need to submit their posters on the website before November 28, 2021, GMT+7.
6. The popular vote competition starts from December 1, at 12:00 to December 19, at 12:00, GMT+7.

### Innovation Showcase

The format required for abstract submission is listed below:

1. Project Title
2. Authors and Institution/Organization
3. Content: Introduction, Objective, Process, Result, Conclusion, Recommendation
4. Keywords (3-5 words)
5. References (Vancouver style)

### Showcase

1. The showcase is held at the 4<sup>th</sup> floor, Phramongkutklao-Vejvitthaya Building from December 18 to 19, 2021.
2. The presentation and Q&A session are December 18, from 12:45 to 13:30 (GMT+7).
3. Participants will be granted registration fee and be provided with transportation fee 1,000 THB/team and guest remuneration 1,000 THB/team.

### Guideline for prevention of COVID-19

Due to the Coronavirus (COVID-19) situation, the organizing committee of IMRC 2021 would like to ensure that health and safety is our priority. Accordingly, the hybrid conference is staged to ensure participants' well-being. For onsite participants, every standard precaution is stringent during the conference with a protocol including:

- All staff must have a negative ATK test 24 hours before initially being allowed on the conference
  - Vaccine certification
  - Face mask must be always worn
  - Alcohol rub
  - Thermoscan at every entrance
  - Rigorous social distancing
  - All meals are served in box set for individuals
  - Limited seat in each session room
  - Numbers of participants in each session are as the following:
    - Main hall                    250    people            (42% of maximum capacity)
    - Poster room                60    people            (60% of maximum capacity)
    - Welcome reception        200    people            (67% of maximum capacity)
    - Phyathai Palace visit      80    people            (54% of maximum capacity)
- [included separating to a small group visiting]

### Registration

The conference is held as a hybrid conference; Onsite and Online. Onsite registration will also receive access to the Online conference; hence, refunds are unavailable.

Registration fee		Price/Person
Onsite	Early bird registration Before November 21, 2021	2,500 THB (100 USD)
	Regular registration	3,000 THB (120 USD)
Online	Early bird registration Before November 21, 2021	1,000 THB (40 USD)
	Regular registration	1,500 THB (60 USD)

**Official website:** <https://pcm-imrc.com/>  
**Contact email:** [imrc@pcm.ac.th](mailto:imrc@pcm.ac.th)  
**Facebook page:** <https://www.facebook.com/PCMIMRC/>



## IMRC 2021 Video Presentation



## AWARDS

International Medical Student Research Conference 2021

Award for the best oral scientific presentation



**Her Royal Highness Princess Maha Chakri Sirindhorn's Trophy** and certificate of achievement is awarded for the best oral scientific presentation.

Award for each competition

	Oral presentation	Poster presentation
<b>Winner</b>	IMRC's Trophy Scholarship of 10,000 THB	IMRC's Trophy Scholarship of 7,000 THB
<b>1<sup>st</sup> runner-up</b>	Scholarship of 3,000 THB	Scholarship of 2,000 THB
<b>2<sup>nd</sup> runner-up</b>	Scholarship of 2,000 THB	Scholarship of 1,000 THB
<b>Popular vote</b>	-	IMRC's Trophy Scholarship of 5,000 THB

**Every academic work** will receive a certificate of achievement according to the score criteria listed below:

- Gold level     ≥ 80%
- Silver level   70 to 79%
- Bronze level   60 to 69%

## JUDGE PANELS

### International Medical Student Research Conference 2021

#### Abstract selection

1. Asst.Prof. Alisara Wongsuttitert, MD  
*Faculty of Medicine, Burapha University*
2. Col. Prof. Mathirut Mungthin, MD, PhD  
*Phramongkutklao College of Medicine*
3. Col. Asst.Prof. Panadda Hatthachote, PhD  
*Phramongkutklao College of Medicine*

#### Basic science research

1. Asst.Prof. Kanyanatt Kanokwiroon, PhD  
*Faculty of Medicine, Prince of Songkla University*
2. Titiwat Sungkaworn, MD, PhD  
*Faculty of Medicine Ramathibodi Hospital, Chakri Naruebodindra Medical Institute*
3. Kasiphak Kaikaew, MD, PhD  
*Faculty of Medicine, Chulalongkorn University*
4. Pundit Asavaritikrai, MD, PhD  
*Institute of Medicine, Suranaree University of Technology*
5. Col. Tanit Boonsiri, PhD  
*Phramongkutklao College of Medicine*
6. Lt.Col. Wittawat Chantkran, MD, PhD  
*Phramongkutklao College of Medicine*

#### Community-based research

1. Prof. Chutima Sirikulchayanonta, MD, PhD  
*College of Medicine, Rangsit University*
2. Asst.Prof. Suthee Rattanamongkolgul, MD, PhD  
*Faculty of Medicine, Srinakharinwirot University*
3. Asst.Prof. Ramorn Yampratoom, MD  
*Faculty of Medicine, Burapha University*
4. Jate Ratanachina, MD, PhD  
*Faculty of Medicine, Chulalongkorn University*
5. Wiwat Chiewsilp, MD  
*School of Medicine, Mae Fah Luang University*
6. Col. Prof. Ram Rangsin, MD, DrPH  
*Phramongkutklao College of Medicine*

## JUDGE PANELS

### International Medical Student Research Conference 2021

#### Hospital-based research

1. Prof. Sompol Permpongkosol MD, PhD  
*Faculty of Medicine Ramathibodi Hospital, Mahidol University*
2. Phawit Norchai, MD  
*College of Integrative Medicine, Dhurakij Pundit University*
3. Thana Thongsricome, MD  
*Faculty of Medicine, Chulalongkorn University*
4. Chavanant Sumanasrethakul, MD  
*Faculty of Medicine Vajira Hospital, Navamindradhiraj University*
5. Lt.Col. Asst.Prof. Picha Suwannahitatorn, MD, PhD  
*Phramongkutklao College of Medicine*

#### Medical education research

1. Asst.Prof. Yodying Dangprapai, MD, PhD  
*Faculty of Medicine Siriraj Hospital, Mahidol University*
2. Asst.Prof. Ittisak Subrungruang, MD, PhD  
*Faculty of Medicine Vajira Hospital, Navamindradhiraj University*
3. Asst.Prof. Danai Wangsaturaka, MD, PhD  
*Faculty of Medicine, Chulalongkorn University*
4. Fasinee Arunrodpanya, MD  
*Faculty of Medicine, Naresuan University*
5. Achara Wuttiprasittipol, MD  
*Panyanathaphikkhu Chonprathan Medical Center, Srinakharinwirot University*

#### Systematic review and meta-analysis research

1. Assoc.Prof. Wanruchada Katchamart, MD  
*Faculty of Medicine Siriraj Hospital, Mahidol University*
2. Asst.Prof. Pawin Numthavaj, MD, PhD  
*Faculty of Medicine Ramathibodi Hospital, Mahidol University*
3. Ronpichai Chokesuwattanaskul, MD  
*Faculty of Medicine, Chulalongkorn University*
4. Busaba Supawattanabodee, PhD  
*Faculty of Medicine Vajira Hospital, Navamindradhiraj University*
5. Win Techakehakij, MD  
*Lampang Medical Education Center, Faculty of Medicine, Chiang Mai University*
6. Lt.Col. Kanlaya Jongcherdchootrakul, MD, PhD  
*Phramongkutklao College of Medicine*

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Professor Sirirung Songsivilai, MD, PhD**  
**Permanent Secretary**

**Ministry of Higher Education, Science, Research and Innovation, Thailand**

Professor Sirirung Songsivilai was trained in clinical medicine with MD degree (First Class Honours with Gold Medal) from Mahidol University, and in molecular biology with PhD degree from University of Cambridge, U.K. He was postdoctoral fellow at University of Colorado Health Science Center, U.S.A. In management, he received postgraduate certificates in law and public administration from King Prajadipok Institute; in science, technology and innovation policy from Harvard University; and in national policy from the National Defense College.

Prof. Songsivilai is an Anandhamahidol Foundation Scholar awarded by H.M. the King of Thailand. After training and working in the U.K. and U.S.A., he returned to Mahidol University and became full Professor at Faculty of Medicine Siriraj Hospital in 2000. His main research interest is on molecular biology and genomics of infectious diseases, especially viral hepatitis and melioidosis; focusing on understanding clinical characteristics from the genomics variations. His laboratory works on cutting-edge technologies including manipulation of structure of antibody molecules, discovery of new biomolecular targets, and on nanobiosensor technology. He received several major international awards and honours, including Rockefeller Biotechnology Career Fellowship, Thailand Young Scientist Award, ASEAN Young Scientist and Technologist Award, and the National Outstanding Technologist Award. Prof. Songsivilai has been elected Associate Fellow of the Royal Society of Thailand.

Prior to becoming Permanent Secretary of MHESI, Prof. Songsivilai served as Secretary-General of the National Research Council of Thailand (NRCT), the main national funding agency for research and innovation on natural science, technology, social science, arts and humanities. He previously served as Executive Director of National Nanotechnology Center (NANOTEC), Thailand's flagship S&T center to conduct and support development and application of national nanotechnology strategic programs from 2008-2016. He is also the Founding President of Thailand Nanotechnology Association, President of Asia Nano Forum in 2015-2016 and currently Chairman of ASEAN Committee on Science, Technology and Innovation. Prof. Songsivilai plays active roles and represents Thailand in various international networks, such as ASEAN S&T communities and interactions with the United Nations bodies, OECD and the European Union.

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**William (Bill) Davis, DrPH, MA (LCDR, USPHS)**  
Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

### US Public Health Service (PHS) Assignment

- 2018-present **Senior Research Scientist (Epidemiologist)**,  
Influenza Division, International Epidemiology and Research Branch, CDC
- 2016-2018 **Epidemic Intelligence Service Officer**, National Center for Emerging and  
Infectious Diseases, Waterborne Disease Prevention Branch, CDC

### PRIOR TO WORKING AT CDC

- Independent consultant focused on health in conflict areas and program director for Physicians for Human Rights, Yangon, Myanmar
- Lecturer, Johns Hopkins University Krieger School of Arts and Sciences
- Logistician/Administrator, Medecins Sans Frontieres/ Doctors Without Borders (MSF), Rakhine State, Myanmar
- Technical Advisor 6-month contract with U.S. Peace Corps/ Crisis Corps, Bugiri Network of AIDS Service Organizations (BUNASO), Uganda
- Clinical Writer, Health Technology Assessment Group, ECRI Institute, Plymouth Meeting, PA
- Chemistry Teacher, U.S. Peace Corps, Mzumbe, Morogoro, Tanzania

### EDUCATION/TRAINING

- **Epidemic Intelligence Service fellowship**, CDC, 2016-2018
- **Postdoctoral researcher**, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, 2014-2016
- **DrPH**, Johns Hopkins Bloomberg School of Public Health, 2014, Dissertation title: *Health and Human Rights in Eastern Burma: Militarization, Risk and Community Responses*
- **MPH**, Johns Hopkins Bloomberg School of Public Health, 2008, Health and Human Rights
- **MA**, University of Colorado, Boulder, Molecular Biology
- **BA**, Franklin and Marshall College, Chemistry

### SPECIALTIES

DrPH epidemiologist with expertise in quantitative and qualitative research methods, data analysis, project management, advocacy, writing and teaching; seven years' work experience in rural and conflict-affected areas of Myanmar, including four years based in-country; six years' work experience in Africa; proficient in STATA, SAS and EpiInfo; conversant in Kiswahili, basic French and Burmese language skills

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Rapeepong Suphanchaimat, MD, PhD**  
Senior Medical Officer, Ministry of Public Health, Thailand

### WORK EXPERIENCE

2018-present	Field Epidemiology Training Programme, Bureau of Epidemiology, Ministry of Public Health
2011-present	International Health Policy Programme, Ministry of Public Health
2013-2018	Medical officer, Banphai Hospital
2009-2011	Medical officer, Umphang Hospital
2008-2009	Medical officer, Maesot Hospital

### EDUCATION

2014-2016	Doctoral degree in Public Health and Policy, London School of Hygiene and Tropical Medicine, University of London, UK
2003-2008	Faculty of Medicine, Siriraj Hospital, Mahidol University The Degree of Doctor of Medicine (First Class Honors with highest ranking of Internal Medicine throughout curriculum)

### SELECTED WORKS AND POLICY ADVOCACY

- Secretariat of the Asia Pacific Action Alliance on Human Resources for Health: 2011-2012
- Committee member of 'Umphang Hospital Foundation': 2011-2016
- Invited lecturer: Faculty of Medicine, Mahidol University, Ramathibodi Hospital, 2015-present
- Advisor: Medical and economic burden of healthcare services for immigrants in Phaholpolpayuhasena Hospital, Kanchanaburi - Faculty of Tropical Medicine, Mahidol University, 2016-2017
- Research advisory committee: Coordinating Country Strategy (CCS) on Migrant Health, Royal Thai Government-WHO collaboration, 2017-2021
- Secretariat of the working group for 'Social Determinants of Health (SDH)', National Health Commission Office of Thailand (NHCO), 2017-2018
- Working group under the Subcommittee of Human Resources for Health Reform, the Ministry of Public Health, Thailand, 2017-2018
- Advisor: Monitoring health systems responsiveness for migrants: evidence and experience from Tak Province, Thailand - University College of London and Naresuan University
- Advisor: PhD course of the College of Health Systems Management - Naresuan University
- Member of working group on the protection of health of people with citizenship problems, including non-Thai populations, under National Subcommittees for Health Financing and Health Insurance 2018

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Associate Professor Wirichada Pan-Ngum, PhD**  
**Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand**

### WORK EXPERIENCE

- 2020-present Associate Professor, Department of Tropical Hygiene,  
Faculty of Tropical Medicine, Mahidol University
- 2019-present Assistant Dean for Student Affairs, Faculty of Tropical Medicine, Mahidol University
- 2009-present Head of MAEMOD (Mathematical and Economic MODelling), Mahidol-Oxford  
Tropical Research Unit, Faculty of Tropical Medicine, Mahidol University
- 2016-present Honorary Visiting Research Fellow  
Nuffield Department of Medicine, University of Oxford, UK
- 2009-present University Research Lecturer in Biostatistics and clinical data management  
Department of Tropical Hygiene, Faculty of Tropical Medicine, Mahidol University
- 2018-present Lecturer and course coordinator in Mathematical modelling module  
MSc in International Health and Tropical Medicine, University of Oxford, UK

### EDUCATION

- 2002-2006 **PhD** Mathematical Modelling and Disease Epidemiology,  
University of Liverpool "Mathematical modelling of antimalarial drug resistance"
- 1998-1999 **MSc** Applied Statistics, University of Oxford  
"Deriving the principal factors associated with UK bodily injury claim settlement"
- 1995-1998 **BSc** Mathematics Operational Research, Statistics and Economics (MORSE)  
University of Warwick

### MEMBERSHIP OF COMMITTEES AND CONSORTIA

- 2019-present Administrative Board and Faculty Committee  
Faculty of Tropical Medicine, Mahidol University
- 2019-present Research Management Committee, Faculty of Tropical Medicine, Mahidol University
- 2018-present Committee of the Master of Science in International Health and  
Tropical Medicine University of Oxford, UK
- 2018-present Programme Chair of the Graduate Diploma in Biomedical and Health Informatics  
Faculty of Tropical Medicine, Mahidol University
- 2014-present Committee of the Doctor of Philosophy in Tropical Medicine  
Faculty of Tropical Medicine, Mahidol University
- 2015-present Tropical Diseases Modelling Network (TModNet), Leader
- 2013-present Academic committee, Leptospirosis Club, Department of Disease Control,  
Ministry of Public Health, Thailand

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Mr. Chatdanai Chanthowong**  
The Sixth Year Medical Student, Phramongkutklao College of Medicine

### EDUCATION

- 2012 English Program, Benchama Maharat School, Ubonratchathani, Thailand
- 2015 Excellent Educational Program, Benchama Maharat School, Ubonratchathani, Thailand
- 2022 MD, Phramongkutklao College of Medicine, Bangkok, Thailand (\* in progress)

### EXPERIENCE

- Nominated for Prince Mahidol Award Youth Program 2021 by Phramongkutklao College of Medicine in the project entitled "Safety, Immunogenicity, and Cell-mediated Immune Responses after Mixed- type COVID-19 Vaccine Regimen"
- Elected Rotational Chief Extern for the 6<sup>th</sup> year rotation, 2021
- Nominated for AMSA-International Lifetime-membership Award 2020, by AMSA-Thailand
- Organizing Chairperson, the 1<sup>st</sup> International Medical Student Research Conference 2020, Bangkok, Thailand
- Founder and Director of PCM Research and Innovation Club, Phramongkutklao Cadet Union, 2020
- Co-founder of Medical Student Research Collaboration Organization and Primary Investigator in a Medical student-led multi-centre research entitled "Proportion, Experiences, and Associated Factors of Conducting Medical Research among Medical Students in Thailand: a nationwide multicentre study"
- Phramongkutklao College of Medicine-National Defense Medical College Exchange program at National Defense Medical College, Saitama, Japan 2019
- Director of Official Events and Meetings, East Asian Medical Students' Conference 2018, Bangkok, Thailand

### MEMBERSHIPS

- President, Asian Medical Student Association- Thailand, 2018
- Regional Chairperson, Asian Medical Student Association- International, 2018
- Asian Medical Student Association Alumni, since 2018
- Membership of the International AIDs Society, since 2020

### INTERESTS

Infectious Disease and Immunology, Virology and Vaccinology, Pediatrics, Artificial Intelligent, Big Data Analysis, Biomedical Research



## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Mr. Nontapat Sukhonpanich**

**The Sixth Year Medical Student, Faculty of Medicine Siriraj Hospital, Mahidol University**

### EDUCATION

- 2013-2015 High school, Triam Udom Suksa school  
 2016-now MD, Faculty of Medicine Siriraj Hospital, Mahidol University

### EXPERIENCE

#### Academic Activities

- 2021 Candidate for Prince Mahidol Youth Award programme, Proposing project "Genetic Variation in Stroke – A Novel Approach for Precision Public Health in Thailand"  
 Currently conducting research "Proportion, Experiences, and Associated Factors of Conducting Medical Research among Medical Students in Thailand: a nationwide multicentre study"

#### Clinical Experience in Neurology

- 2021 Department of Neurology, Neurological Institute of Thailand  
 2019 Neurology division, Department of Internal Medicine,  
 Faculty of Medicine Siriraj Hospital, Mahidol University

### EXTRACURRICULAR ACTIVITIES

- 2020 Vice President of academic affair, Siriraj Medical Student Union  
 Co-creator, Siriraj Research Community  
 2019 Vice president of activity, Siriraj Medical Camp, 21<sup>st</sup>  
 2018 President of academic affair, SI127 Student Committee  
 Head of examination division, academic team, Siriraj International Medical Microbiology, Parasitology and Immunology Competition (SIMPIC)  
 2017 Head of creative activity, Siriraj International Medical Microbiology, Parasitology and Immunology Competition (SIMPIC)  
 2016 Vice-president, SI127 Student Committee

### AWARD

- 2019 Sukhum Pattarakom Award, *Highest overall score in medical microbiology and parasitology*

### INTERESTS

- Neuroscience, Neurogenetics, Design thinking, Music

## KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Mr. Pratchya Khamsaengdee**

**The Fifth Year Medical Student, Faculty of Medicine, Ramathibodi Hospital**

### EDUCATION

- 2016 Science-Mathematics program, Nakhonsawan School, Nakhonsawan, Thailand  
 2023 MD, Faculty of Medicine, Ramathibodi Hospital, Bangkok, Thailand (*\*in progress*)

### HONORS AND AWARDS

- **1<sup>st</sup> Runner up award, Economics Challenge**, BOT Challenge and Experience held by Bank of Thailand, 2015
- **Elected Vice-President, 1<sup>st</sup> year Medical Student**, Faculty of Medicine, Ramathibodi Hospital, 2017
- **Dean's leader practice award, Tonkla Ramathibodi project**, Faculty of Medicine, Ramathibodi Hospital, 2021
- **Elected Rotational Chief Medical student, 4<sup>th</sup>-5<sup>th</sup> year Medical Student** Faculty of Medicine, Ramathibodi Hospital, 2020-2021
- **Executive Committee of Tonkla Ramathibodi research scholarship**, Faculty of Medicine, Ramathibodi Hospital, 2021

### EXTRA-CURRICULUM ACTIVITY

- **Student Councils**, Nakhonsawan school, 2015
- **President of Ramathibodi research club**, Faculty of Medicine, Ramathibodi Hospital, 2020-2021
- **Vice-president of Ramapanitharn 23<sup>rd</sup> Camp**, Faculty of Medicine, Ramathibodi Hospital, 2017
- **Committee of Ramacracy Club**, Faculty of Medicine, Ramathibodi Hospital, 2020
- **Committee of Between the Line Club**, Faculty of Medicine, Ramathibodi Hospital, 2020
- **Board of Academic Affair, Ramathibodi Medical Student Councils** Faculty of Medicine, Ramathibodi Hospital, 2021

### INTERESTS

Neurology, Neuromuscular disease, Health System science and Medical Education

### COMMUNITY SERVICE

- Project chairman of "Dansai society for fighting childhood obesity" at Dansai District Loei, Thailand, Community Medicine project, 2020
- Volunteer in Rare disease Day activity at Ramathibodi Hospital, 2019
- Volunteer in Children's village school Moo Bann Dek, Kanchanaburi, Thailand 2017

# KEYNOTE AND PANELIST SPEAKERS

International Medical Student Research Conference 2021



**Ms. Naruporn Krungkraipetch**  
**The Fifth Year Medical Student, Phramongkutklao College of Medicine**

## EDUCATION

- 2013 Science and Mathematics Program, Piboonbumpen Demonstrative School, Chonburi, Thailand
- 2016 Gifted Science, Triamudomsuksa School, Bangkok, Thailand
- 2023 MD, Phramongkutklao College of Medicine, Bangkok, Thailand (*\* in progress*)

## HONORS AND AWARDS

- Organizing Chairperson of the International Medical Student Research Conference 2021
- Master of Ceremony for National Medical Teacher Award, the Consortium of Thai Medical Schools, 2020
- General Secretary of the International Medical Student Research Conference 2020
- President of the Asian Medical Students' Association - Thailand (AMSA-Thailand), 2019
- Regional Chairperson of the Asian Medical Students' Association - Thailand (AMSA-Thailand), 2019
- Executive Assistant for President of Asian Medical Students' Association - Thailand (AMSA-Thailand), 2018

## EXTRA-CURRICULUM ACTIVITY

- Vice-president of External Affairs, Phramongkutklao Cadet Union, 2021
- Vice-president of PCM Research and Innovation Club, Phramongkutklao Cadet Union, 2021
- Founder of the collaboration between Asian Medical Students' Association - Thailand and the Engineering Student Committee, Chulalongkorn University, 2020
- Secretary for Logistic Division, East Asian Medical Students' Conference 2018, Bangkok, Thailand
- General Secretary of the Asian Medical Students' Association - Thailand (AMSA-Thailand), 2017

## INTERESTS

Psychology, Child and Adolescent Psychology, Medical Education, Public Health, Biomedical Research

## COMMUNITY SERVICE

- Volunteered for Annual Training for Health Volunteer of Baan Na-Ngam, Chachoengsao, 2021
- President of "Stop HVP Stop Cancer Camp", 12<sup>th</sup> Community Service, Asian Medical Students' Association - Thailand, 2019
- "Stool Screening Program for Parasitic Infection" at Phythai Babies Home for Orphanage, 2019
- General Secretary of "Stop Teen Mom Camp", 11<sup>th</sup> Community Service, Asian Medical Students' Association - Thailand, 2017



**ABSTRACT: ORAL PRESENTATION**

Basic Science Research  
Community-based Research  
Hospital-based Research  
Medical Education Research  
Systemic Review and Meta-analysis Research

Abstract: OR-BS05

## HLA Allele Binding Affinity to SAR-CoV-2 Variants Antigens Influences SARS-CoV-2 Variant Selection

**Kuntapich Lertphasomsit**, Yanisa Pisalayon, Chatchanan Doungkamchan

*Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*

**Background:** Rapid and continuous mutations of SARS-CoV-2, which result in previously identified Variants of Concern (VOCs) - B.1.1.7, B.1.351, P.1, and B.1.617.2, have raised concerns for immune evasion. The key molecule in eliciting cytotoxic T-cell immunity is human leukocyte antigen (HLA) class I, which is polymorphic across populations.

**Objectives:** We hypothesize that mutations in the VOCs may alter HLA class I binding affinities and consequently result in immune evasion.

**Methods:** To investigate the effect of mutations on the number of epitopes, we used NetChop C term 3.0 to predict the CD8+ T-cell epitopes of Wuhan strain and the 4 VOCs. Next, to explore how mutations affect binding affinities, we used NetMHCpan 4.1 to predict binding affinities between representative HLA class I alleles, which have 99% population coverage, and total predicted VOC epitopes.

**Results:** In B.1.1.7, a premature stop codon in the ORF8 region resulted in the reduced number of peptides. Interestingly, we observed the same HLA alleles with the top ten highest numbers of strong and moderate binders, regardless of the strains. The majority of peptide-HLA pairs with diminished binding affinities were in Spike glycoprotein. Among these were the mutant peptides of the spike proteins in all 4 VOCs (A570D in B.1.1.7, D215G in B.1.351, T19R in B.1.617.2, and T20N/P26S in P.1) that exhibited increased binding affinities towards HLA-A\*26:02 more than 2 folds. On the other hand, peptide-HLA pairs with improved binding affinities were mostly found in ORF1b, due to the mutation P314L which was present in every VOC, except for the pairs from B.1.351, which were mostly identified in Spike glycoprotein.

**Conclusion:** Our findings showed that mutations in VOCs altered binding affinities between VOC epitopes and HLA class I. This provides a better understanding of the relationship of HLA allelic pressure on the mutational pattern of the virus and may benefit the development of variant-specific T-cell vaccines. Additionally, *in vivo* viral evolution courses under different HLA allelic pressure can be further explored to corroborate our findings.

**Keywords:** SARS-CoV-2, HLA class I, T cell



Abstract: OR-BS02

## Elucidating the Underlying Mechanisms of Migraine Models through Electrophysical Changes Traced by Patch-clamp Recording: an Experimental Study in Rats' Trigeminal Ganglion Neurons

**Sirikorn Vongseenin**, Naeemah Ha-ji-a-sa, Sekh Thanprasertsuk, Saknan Bongsbandhu-phubhakdi

*Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*

**Background:** Every minute, one in ten of the world population are suffering from the excruciating pain of migraine. Disability and impairment of migraineurs cause a significant decline in their quality of life. Cortical spreading depression (CSD) has long been postulated as one of the crucial factors that provoke pain and aura symptoms in migraine via the modulation of trigeminovascular system. In addition, with regard to the serotonin depletion, many migraine patients have been reported to have considerably low levels of serotonin in their brains.

**Objectives:** This study was conducted with the intention of elucidating migraine models concerning the effects of CSD and serotonin depletion on nociceptive small-to-medium (SM) size and non-nociceptive large (L) size primary order neurons in the electrophysical aspect.

**Methods:** The rats were divided into 3 groups which are CSD group, p-chlorophenylalanine (PCPA)-induced serotonin depletion group and control group. CSD in rats was induced by KCl placed on burr holes. After that, trigeminal ganglion (TG) neurons were primarily cultured and split into 2 groups, nociceptive SM neurons ( $\leq 29$  micron) and non-nociceptive L neurons ( $> 29$  micron). Electrophysical parameters of the neurons obtained including resting membrane potential (RMP), threshold and action potential duration were recorded using the patch-clamp recording, a gold standard method which provides detailed information regarding electrophysical properties of each neuron.

**Results:** In SM size TG neurons, RMP, threshold and gap between RMP and threshold were found to be significantly different between three groups, according to one way ANOVA ( $p = 0.001$ ,  $p = 0.016$ , and  $p = 0.016$ , respectively). Post-hoc analysis revealed that when compared to the control group, RMP and threshold in the CSD group were found to be remarkably more positive ( $p = 0.001$  and  $p = 0.017$ , respectively) with a narrower gap between RMP and threshold ( $p = 0.018$ ). Anywise, there was no substantial difference detected in L size groups.

**Conclusion:** Our results revealed that CSD has notable impacts on the nociceptive TG neurons' electrophysical features. In contrast, serotonin depletion does not have effects on the TG neurons. Thus, CSD plays an important role in the peripheral sensitization process of trigeminovascular pathways.

**Keywords:** Cortical spreading depression, Migraine, Patch-clamp recording, Serotonin depletion, Trigeminal ganglion

Abstract: OR-BS03

## Development of High-throughput Screening Assay for Identification of Mucus Production Inhibitors as Potential Therapy for Asthma

Chantapol Yimnual<sup>1</sup>, Nichakorn Worakajit<sup>2</sup>, Suchada Kaew-in<sup>3</sup>, Chatchai Muanprasat<sup>2</sup>

<sup>1</sup>Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

<sup>2</sup>Chakri Naruebodindra Medical Institute, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

<sup>3</sup>Faculty of Science, Mahidol University, Bangkok, Thailand

**Background:** Asthma is a chronic airway inflammatory disease characterized by airway inflammation, smooth muscle contraction, and mucus overproduction. The current treatments are focusing on the first two traits using corticosteroid and bronchodilators, respectively. However, almost half of patients are resistant to these treatments. In addition, little attention has been paid for mucus overproduction important for airway mucus plugging causing obstruction. Therefore, other therapeutic strategies are required to inhibit mucus overproduction.

**Objectives:** To develop cell-based assay for screening Thai natural compounds with inhibitory effect on mucus overproduction. To investigate *in vivo* efficacy of the active compound.

**Methods:** For cell-based assay, airway epithelial (16HBE) cells on 96-well plates were treated 48 h with lipopolysaccharide (LPS; 100 µg/mL) to induce mucus production with or without Dexamethasone (DEX; 10 µM) as a positive control. Then, the cells were fixed and stained with Periodic acid-Schiff (PAS) reagents. Magenta color as an indicator of mucus were quantified and normalized to area of the cells using ImageJ software. For animal model of asthma, BALB/c mice were induced by ovalbumin (OVA) to become asthma. To determine efficacy of active compound, the mice were treated with or without active compounds from cell-based assay with DEX (5 mg/kg) being a positive control.

**Results:** LPS caused 3-fold elevation of mucus compared to control with this effect being abolished by co-treatment with DEX, a positive control, as analyzed by PAS staining. The Z' factor was 0.65 suggesting excellent assay ready for compound screening. An initial screening of 8 Thai natural compounds at 1 µM identified XP1 as an inhibitor of mucus production. Using animal study, XP1 (20 mg/kg) inhibited mucus overproduction but not airway inflammation in OVA-induced mouse model of asthma.

**Conclusion:** This study developed novel compound screening method which might be beneficial for identifying compound for treatment of airway-centered diseases with mucus occlusion being main pathogenesis such as asthma, COPD, and airway infection. XP1 was identified by this assay as an inhibitor of mucus production effective both *in vitro* and *in vivo* studies.

**Keywords:** High-throughput screening, Asthma, Mucus, Airway, Drug discovery



Abstract: OR-BS04

## Anticancer Effect of *Licuala longecalyculata* Furtado Extract in Sirindhorn Peat Swamp Forest on Lung Cancer Cell line

Arisara Pratakkarn<sup>1</sup>, Saowanee Maungchanburee<sup>2</sup>, Aornrutai Promsong<sup>1</sup>

<sup>1</sup>Faculty of Medicine, Princess of Naradhiwas University, Narathiwat, Thailand

<sup>2</sup>Faculty of Medicine, Prince of Songkla University, Songkhla, Thailand

**Background:** Narathiwat has a unique natural resource, the Sirindhorn peat swamp forest, which is Thailand's largest peat swamp forest and has high biodiversity. In the surrounding area, *Licuala longecalyculata* Furtado is locally used as a traditional medicinal herb for cancer treatment. However, medical properties of *Licuala longecalyculata* Furtado have never been reported. According to the World Health Organization in 2020, the most common cause of cancer death was lung cancer.

**Objectives:** Therefore, the objective of this study was to investigate the anticancer effect of ethanol and aqueous extracts of *Licuala longecalyculata* Furtado on the human lung adenocarcinoma A549 cell line.

**Methods:** *Licuala longecalyculata* Furtado shoots were extracted with ethanol (LLE) and aqueous (LLA) using rotary evaporator and freeze dryer, respectively. Cytotoxicity of LLE and LLA extracts at concentrations ranging from 6.25 to 200 µg/mL on A549 cells was determined by MTT assay for 72 h.

**Results:** LLE extract strongly inhibited A549 cell proliferation in a dose-dependent manner with IC50 value of 12.59 µg/mL. LLA extract at 200 µg/mL showed significant inhibitory effect in A549 lung cells up to 68.61% ( $p < 0.01$ ). In addition to the morphological changes, an anticancer effect was observed in the LLE-and LLA-treated A549 cells.

**Conclusion:** These results indicate that in accordance with local wisdom, a *Licuala longecalyculata* Furtado crude extract can empirically inhibit lung cancer cell line. However, further study of *Licuala longecalyculata* Furtado is needed to identify phytochemical compounds and their mechanisms of anticancer action, in order to develop them as a new therapeutic agent for lung cancer management.

**Keywords:** *Licuala longecalyculata* Furtado, Lung cancer, Anticancer, Cytotoxicity

Abstract: OR-BS06

## Determination of Host-pathogen Interactions through Transcriptomics Analysis of Novel RNA Targets of Post-transcriptional Riboregulatory Protein RsmN in *Pseudomonas aeruginosa*

Natapong Thaneerat<sup>1</sup>, Stephan Heeb<sup>2</sup>

<sup>1</sup>Faculty of Medicine, Srinakharinwirot University, Nakhon Nayok, Thailand

<sup>2</sup>Faculty of Medicine, University of Nottingham, United Kingdom

**Background:** *Pseudomonas aeruginosa*, a commonly found nosocomial pathogen, relies on several virulence genes for infection. Although it has been established that the post-transcriptional riboregulatory protein of RsmN binds to RNA transcripts to modulate stability of the transcripts as well as translation in facilitating its pathogenicity, the molecular mechanisms have yet to be elucidated. Identification of RsmN-bound RNAs can thus provide a hint on its potential molecular functions.

**Objectives:** This study exploited the available RNAseq of *P. aeruginosa* RsmN-bound transcripts in response to different culture conditions, which were not fully analysed, to identify new insights into the RsmN control of RNAs' functions in *P. aeruginosa* virulence.

**Methods:** The transcriptomics sequence analysis software, Artemis, was used to identify candidate sense, antisense, and noncoding RNA targets of RsmN from the base pairs' position 3,138,236 to 6,276,470 in *P. aeruginosa* PAO1-L chromosome. RNA transcripts with number of reads above a threshold of 2.55 were defined as RsmN-bound RNAs and visualised side by side with the DNA sequences from which they originated.

**Results:** The findings presented 151 transcripts directly bound by RsmN, 73 of which were sense RNAs, encoding proteins with demonstrated functions including acute and chronic virulence traits. For example, RsmN may affect biofilm development via control of OprF and exopolysaccharide biosynthesis in chronic infections. The transcripts of 16 genes of interest (eight sense RNAs, six antisense RNAs, one both sense and antisense, and one non-coding RNA) provided insights into the intricacy of riboregulatory networks, with sense RNAs potentially regulating metabolic versatility, antimicrobial resistance, and envelope stress responses. Antisense RNAs, which silence their sense mRNA counterparts, may contribute to biofilm formation, defenses against host immunity, anaerobic respiration, and oxidative stress responses when interacted with RsmN. The newly identified small non-coding RNA CrcZ, involved in carbon catabolite repression, has differential binding of RsmN to specific CrcZ regions.

**Conclusion:** This study unravels the complexities regulating adaptive responses of *P. aeruginosa* through novel functions of RsmN, which is an attractive target for the development of antimicrobials against *P. aeruginosa*. However, future laboratory experimentations are needed to validate potential RsmN targets and test their effects on gene expression profiles of *P. aeruginosa*.

**Keywords:** *Pseudomonas aeruginosa*, Post-transcriptional regulation, Protein-binding RNAs, RsmN

Abstract: OR-BS07

## Identification of Recurrent Neoantigens in BRCA1-mutated Breast Cancer for Preventive Cancer Vaccine Development

**Nannapat Sutivijit**, Luksica Ruangapirom, Apiwat Mutirangura,  
Chatchanan Doungkamchan

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**Background:** Neoantigen-based cancer vaccine is used in cancer treatment to activate specific T-cells against tumors without targeting self-antigens or inducing tolerances. However, utilizing such technology for cancer prevention is still limited because neoantigens are highly individualized, thus restricting vaccine generalization for prevention. To circumvent this problem, we identified BRCA1-mutated carriers as the optimal target population for preventive cancer vaccine. Not only because their lifetime risks of developing breast cancer are high, but also the previous studies showed highly similar mutational signatures within the group, rendering finding recurrent generalizable mutations viable.

**Objectives:** We hypothesized that somatic mutations can be found recurrently among BRCA1-mutated samples to be utilized as generalized targets for the preventive cancer vaccine.

**Methods:** We first identified recurrent somatic mutations in BRCA1-mutated breast tissue samples by analyzing whole genome/exome sequencing or target sequencing data of 175 deleterious BRCA1-mutated breast samples from 3 open-access cancer genome databases; The cancer genome atlas program (TCGA), International Cancer Genome Consortium (ICGC) and Catalogue of somatic mutations in cancer (COSMIC). Subsequently, we identified the top 30 recurrent mutations with amino acid changes for antigenicity prediction which was performed by prediction of MHC class I binding affinity using NetMHCpan EL 4.1 and NetMHCpan BA 4.1.

**Results:** We found that PIK3CA H1047R was the top recurrent mutation in 9.90-19.23% of the samples from the three databases; NEUROD6 R321H in 5.26-7.69%; PIK3CA E542K in 5.26-6.30%; PIK3CA E545K in 4.50-5.26%. In terms of cumulative recurrence rate of mutation combinations in each database, PIK3CA H1047R and NEUROD6 R321H constitute a total of 23.08% of TCGA samples; PIK3CA H1047R, NEUROD6 R321H, PIK3CA E542K and PIK3CA E545K constitute a total of 28.95% of ICGC samples; PIK3CA H1047R, PIK3CA E542K and PIK3CA E545K constitute a total of 20.72% of COSMIC samples. We found that among 60 mutations evaluated by far, 45 exhibited antigenicity including PIK3CA H1047R, NEUROD6 R321H, PIK3CA E545K.

**Conclusion:** In summary, this study provides promising evidence of recurrent antigenic neoantigen presence in BRCA1-mutated breast tissue samples, which indicates the feasibility of preventive neoantigen-based cancer vaccine development.

**Keywords:** BRCA1, Neoantigen, Breast cancer, Preventive cancer vaccine

Abstract: OR-BS08

## Role, Diversity and Distribution of Agr quorum Sensing Systems in Pathogenic Clostridia

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**Background:** Quorum sensing (QS) is a bacterial cell-cell communication mechanism that involves the production, detection and response of extracellular signaling molecules called autoinducers to monitor cell density and collectively adjust gene expression. This allows bacteria to synchronize their behavior and regulate essential processes, which plays a role in how bacteria establish pathogenicity in a human body. This study focuses on a selected group of 15 pathogenic species in Clostridia, which uses a type of QS called Agr-like QS system.

**Objectives:** The aim is to use a bioinformatics approach to establish diversity and distribution of the autoinducer (*agrD*) genes, while considering interstrain variation.

**Methods:** *AgrD* homologs encoded in the genomes of the 15 clostridial pathogens were identified via PSI-BLAST searches in the NCBI database. Identified *AgrD* sequences were compared and grouped into classes, based on similarities, using sequence alignments generated from CLUSTAL OMEGA and phylogenetic trees from NGPhylogeny. A spreadsheet containing all the *AgrD* sequences present in the database and the respective strains that possess these variants was created. A phylogenetic tree comparing all the homologs in all species was also created.

**Results:** Results show unequal numbers of *AgrD* variants in each species, though all species except *C. tetani* presented at least one *AgrD* variant in the database. Sequence analysis identified: (1) *AgrD* sequences that vary in some parts but contain the same sequence in the mature autoinducer encoding region, (2) *AgrD* sequences in the same species that differ in the autoinducer encoding region, and (3) *AgrD* sequences that are shared between strains of the same/different species.

**Conclusion:** The divergence of QS systems is likely derived from mutations and horizontal gene transfer. Autoinducer-receptor specificity determines how QS systems cross-interact. Closely related strains seem to possess more similarly sequenced *AgrD*, notably certain strains of *C. botulinum* and *C. sporogenes* that have close phylogenetic relationships. Wider literature confirms QS role in toxin production and sporulation in several species.

**Keywords:** Quorum sensing, Clostridia, Autoinducers, *AgrD*, Bioinformatics

Abstract: OR-BS09

## Detecting Recurrent Mutations within and across Different Cancer Types Enables “Off-the-Shelf” Generalizable Strategy for Immunotherapy

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**Background:** Presently, utilization of individualized immunotherapy is increasing worldwide for the treatment of advanced stage cancers. Nevertheless, the extensive production time and its restricted application to one individual can be detrimental to the patient.

**Objectives:** In this study, we aimed to identify common mutations within the same and across different organs as a potential common target for “off-the-shelf” or “pre-made” or “ready-to-use” individualized immunotherapy which could also be beneficial as additional targets for off-label pathway inhibitors for these malignancies.

**Methods:** To identify common mutations, we analyzed the whole genome sequencing, whole exome sequencing and target sequencing data from two public cancer databases: International Cancer Genome Consortium (ICGC) and Genomic Data Commons (GDC). We initially examined mutations in all organs and tissue types within each database, then analyzed the results to identify common prominent mutations within the same and across different organs/tissues. Next, we calculated the cumulative coverage of mutation combinations within the same organs/tissues.

**Results:** The following mutations were found recurrently within the same organs/tissues (recurrent rates shown in percent from ICGC/GDC), some of which exhibited surprisingly high recurrent rates: pancreas (KRAS G12D; 31.03%/36.74%, KRAS G12V; 24.65%/25.24%), brain (IDH1 R132H; 22.56%/38.05%), skin (BRAF V600E; 38.72%/42.71%), thyroid (GDC) (BRAF V600E; 64.86%), head and neck (ICGC) (BRAF V600E; 29.91%), colon: cystic, mucinous and serous neoplasms (GDC) (BRAF V600E; 29.31%), eye and adnexa (GDC) (GNA11 Q209L; 42.50%, GNAQ Q209P; 33.75%). Then, we identified the following mutations as the ones found across different organs/tissues: KRAS G12D (ICGC: pancreas, colorectal, gallbladder; GDC: pancreas, rectum, colon), KRAS G12V (ICGC: pancreas, colorectal, lung; GDC: pancreas, rectum, rectosigmoid junction), BRAF V600E (ICGC: skin, head and neck; GDC: thyroid, skin). The cumulative coverage of mutation combinations for organs with a coverage over 50% are as follows: eye and adnexa (GNA11 Q209L/GNAQ Q209P/GNAQ Q209L; 88.75%), pancreas (KRAS G12D/KRAS G12V/KRAS G12R; 76.27%), thyroid (BRAF V600E/NRAS Q61R/HRAS Q61R; 75%), skin (BRAF V600E/NRAS Q61R/NRAS Q61K; 62.53%), colon (BRAF V600E/KRAS G12D/RNF43 G659Vfs\*41; 51.72%)

**Conclusion:** This study identified common mutations within the same and across different types of cancer, which may serve as beneficial potential targets for “off-the shelf” immunotherapy or “off-label” pathway inhibitors.

**Keywords:** Individualized immunotherapy, Recurrent mutations, Off-label pathway inhibitors, Cancer

Abstract: OR-BS01

## Biomechanical Study of Flamingo Lift and Bone Properties on Simple Femur Head Model using Finite Element Analysis

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**Background:** The “flamingo lift” has been debuted in Olympics 2020. This unusual technique in weightlifting is dangerous. Femoral neck mechanics in one-legged stance is necessary to understand for spontaneous hip fractures. Finite element method (FEM) is an engineering tool used to simulate real-world loading conditions in orthopedics and optimize medical devices. There are some parameters that the experimental study cannot directly measure such as internal stress and internal strain of bone. Furthermore, some conditions in orthopedics cannot be performed *in vivo* study due to a destructive experiment. Therefore, the *in silico* study using FEM is an alternative choice for the orthopedic study.

**Objectives:** This study compared the strain distribution during one legged-stance in a simplified model of femur between normal, osteopenic and osteoporotic patients by FE analysis.

**Methods:** Our simplified model imitated the dimensions of a population-based femoral neck. The 500 N force was applied to the femoral head and directed at 33.6° to the femoral neck axis. The distal end of the proximal femur was fully constrained. The Young's moduli were equal to 18,155, 10,752, and 7,972 MPa for normal, osteopenic, and osteoporotic femur, respectively. The bone properties were assumed isotropic and homogenous. Tetrahedron elements were assigned to the model. Finite element analyses were finally conducted via Abaqus program. The absolute maximum principal strain from three femora were compared visually and quantitatively.

**Results:** The most to least strained femora were osteoporotic (max. 400.1 microstrain), osteopenic (max. 296.7 microstrain), and normal (max. 175.7 microstrain), respectively. For all tested femora, the maximum tensile and compressive strains were on the upper and lower surfaces of the femoral neck respectively. The maximum absolute strain value on the lower surface of femoral neck is 49.7% higher than the upper surface for all tested femora.

**Conclusion:** FE analysis on the simplified models of the femoral neck provide better understanding of what happens in the femoral neck during one-legged stance related to bone properties. Osteoporosis and osteopenia can predispose to hip fractures due to increased strain on the femoral neck. Prevention of hip fractures should focus on decreasing strain on the subcapital region of femur.

**Keywords:** Finite element analysis, Weightlifting, Femur head, Osteoporosis, Osteopenia



Abstract: OR-CB04

## Prevalence and Associated Factors of Alcohol Consumption among Adolescents in a Rural Community, Thailand: a Mixed Methods Study

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**Background:** Alcohol consumption is one of the important causes of population health problems, globally. This problem affects physical and mental health of the individuals as well as their families and communities. There is an increase in the trend in alcohol consumption among Thai adolescents which may contribute the problems when they grow up to be adults. Therefore, the investigators aimed to determine the prevalence of alcohol consumption and its associated factors among adolescents in a rural community.

**Objectives:** To study prevalence and associate factors of alcohol consumption among adolescents in a rural community, Thailand.

**Methods:** A mix-methods study was conducted in Na-Yao rural community, Chachoengsao Province, Thailand in 2020. A cross-sectional survey using a standard questionnaire was performed among adolescent aged 13 to 18 years. Multivariable logistic regression analysis was used to determine the associated factors for alcohol consumption. Subsequently, qualitative method was conducted using focus groups discussion and in-depth interview. Potential stakeholders in the community were selected from the purposive sampling in order to participate the session to define the possible causes of alcohol consumption among adolescents.

**Results:** A total of 425 participants were enrolled in the quantitative study, in which 250 (60.4%) were female. The average age of participants was  $15.5 \pm 1.6$  years. The prevalence of current alcohol consumption in the last 12 months was 52.3%. After adjusting for potential confounders, the study found that female gender (AOR 1.94 CI 1.01-3.78), age (AOR: 1.42, 95% CI 1.18-1.71), relationship problems (AOR: 2.82, 95%CI 1.51-5.28), nights out (AOR: 3.47, 95% CI 1.89-6.38), active smoking (AOR: 4.39, 95%CI 1.62-11.88), and social media use 6 hours/day (AOR: 2.08, 95% CI 1.14-3.81) were associated with current alcohol used. The focus group discussion and in-depth interview found that the main factors for alcohol consumption were convenient stores, family, friends, having financial problems, knowledge, and personal judgement, as well as social and environment.

**Conclusion:** Alcohol consumption was an essential health issues among adolescents residing in a rural community. Social and behavioral risk factors played a major role for this issue. Therefore, the essential interventions, such as empower health literacy and awareness, should be implemented order to attenuate modifiable risk factors.

**Keywords:** Alcohol consumption, Adolescent, Mixed-methods study, Community, Rural Thailand

Abstract: OR-CB02

## Effectiveness of Daily Self-weighing Combined with Hypocaloric Diet and Community Personalized-dietary Counseling for Weight Loss among Adults with Obesity in a Rural Community, Thailand: a Community-based Randomized Controlled Trial

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**Background:** A trend in significant increase was found regarding the prevalence of obesity and average body mass index (BMI) in Thai rural community over 6 years. Obesity is one principal risk factor increasing the risk of noncommunicable diseases. Therefore, effective public health interventions should be implemented to prohibit increased BMI.

**Objectives:** This study aimed to evaluate effectiveness of daily self-weighing combined with hypocaloric diet and community personalized-dietary counseling for weight reduction.

**Methods:** A randomized controlled trial was conducted in Thakradan rural community, Thailand. People aged 18-60 years with BMI  $\geq 27.5$  kg/m<sup>2</sup> were invited in the study. A total of 107 individuals were randomly allocated to 70 participants and 30 participants for control group and intervention group, respectively. The health education of hypocaloric diet and how to lose weight were provided to all participants. Additionally, intervention group received digital weight machines and weight-recording calendar to weigh twice daily. The well-trained village health volunteer visited the intervention group weekly in order to emphasize on health education for weight loss, personalized-dietary counseling calculated approximately daily intake -500 kilocalories from personal basal metabolic rate, psychological encouragement, and adverse effect records. The interventions were conducted for 20 weeks.

**Results:** From a total of 107 participants, there were 93.50% females. The average age of participants was  $44.0 \pm 10.0$  years. The average BMI at baseline was  $32.45 \pm 3.45$  kg/m<sup>2</sup> and  $32.17 \pm 4.23$  kg/m<sup>2</sup>, among intervention and control groups, respectively ( $p = 0.744$ ). In intervention group, there were significant differences between average BMI at baseline and average BMI at 8<sup>th</sup> week ( $-0.48$  kg/m<sup>2</sup>,  $p = 0.0496$ ), at 12<sup>th</sup> week ( $-0.46$  kg/m<sup>2</sup>,  $p < 0.01$ ), at 16<sup>th</sup> ( $-0.42$  kg/m<sup>2</sup>,  $p < 0.01$ ) and the end of trial at 20<sup>th</sup> week ( $-0.51$  kg/m<sup>2</sup>,  $p < 0.01$ ). While there was an increase in the average BMI compared to their baseline in the control group. Besides, there was a significant decrease in average systolic blood pressure (BP) and diastolic BP from baseline to 4<sup>th</sup> weeks and 8<sup>th</sup> weeks in intervention group. The adverse events were not detected.

**Conclusion:** This study demonstrated that daily self-weighing combined with hypocaloric diet and community personalized-dietary counseling played an essential role in reducing weight and BP levels among individuals with obesity.

**Keywords:** Obesity, Self-weighing, Community counseling



Abstract: OR-CB05

## Leave the Door Open for Safe Sex: Sex Education as an Intervention for Safe Sex among Thai Teenagers and Young Adults

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**Background:** During the past decade, sexually transmitted diseases (STDs) which included chlamydia, gonorrhea, trichomoniasis and syphilis have sprouted continuously globally. In Thailand, incidence of STDs among Thai aged 15 to 24 years has doubled from 54.2 per 100,000 people in 2014 to 104.7 per 100,000 people within 4 years, especially in the northern region. As such, proper sex education is crucially needed for safe sex. Safe sex is not only about physical safety, but also mental and emotional story so sexual consent is essential.

**Objectives:** The project "Leave the Door Open for Safe Sex" was established to assess the perspectives and knowledges of Thai teenagers and young adults regarding safe sex (accessibility, understanding, communication, decision) prior to and after participating the project.

**Methods:** This cross-sectional study aimed at Thai people aged 15-24 years old. Social medias (Facebook page, Instagram, Line Open Chat and Twitter) were created to promote attention, awareness, conversation and talks with experts. Two-episode podcasts about STDs were streamed via YouTube, Spotify and Anchor. Three workshops - 1) knowledge about STDs/contraception, 2) assessing skills, and 3) communication skills/decision skills- were performed. General characteristics and perspectives regarding skills, knowledge and communication/decision skills were evaluated using 5-Likert scales both before and after the workshops. Comparison was done using dependent T-test. Significant differences were counted at  $p \leq 0.05$  at 95% confidential interval.

**Results:** A total of 39 participants enrolled. Most (75.9%) were from high school. People who used dating applications shared almost equal portion to those who did not (51.3% and 48.7%). Only 10.3% had sex via dating applications. Overall mean score after the workshop was higher than prior to workshop ( $p < 0.001$ , 95%CI: 0.83-1.99). All three workshops had higher score post-workshop compared to prior to workshops ( $p < 0.001$ , 0.004 and 0.001, respectively).

**Conclusion:** Proper sex education can enhance Thai youths' knowledge and perspectives about sex education, skills about safe sex, mainly contraceptives along with sexual consent and awareness in many aspects among societies.

**Keywords:** Sex education, Safe sex, Youth

Abstract: OR-CB03

## Knowledge and Attitude toward Influenza Vaccination among Pregnant Women in Bangkok, Thailand: a Cross-Sectional Survey

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**Background:** Pregnant women are at increased risk for influenza-related complications. Vaccination is regarded as the most effective influenza preventive strategy. World Health Organization (WHO) has identified pregnant women as the highest priority group for influenza vaccination. However, little is known about knowledge and attitude toward influenza vaccination among pregnant women in Bangkok, Thailand.

**Objectives:** To assess the knowledge, attitudes, and beliefs with the uptake of the influenza (flu) vaccination in women during their pregnancy period in Phramongkutklao Hospital, Bangkok, Thailand.

**Methods:** A cross-sectional survey was conducted on pregnant women at the antenatal clinic over a period of 2 weeks with the provision of influenza vaccination. The questionnaire collected demographic and other data; it included 17 questions on their general knowledge and assessed their attitude toward influenza vaccination, and their awareness of vaccine risk and the potential benefits during pregnancy. The data was analyzed quantitatively.

**Results:** In total, 100 pregnant women participated and provided information through a self-administered questionnaire. 74% of the studied group were not vaccinated against seasonal influenza during their pregnancy and only 21.43% had previously been recommended by someone to receive the flu vaccine during their pregnancy. In addition, 71.29% were feeling susceptible to influenza virus. While 90.1% understand that influenza infection during pregnancy leads to severe complication and 79.8% noticed the benefits of influenza vaccine, 12.87% had correct concept of the vaccine in perception. The best way to induce vaccination uptake is some advice from health care provider (94.95%). However, advice given from friends tend to have lower impact on inducing vaccine uptake (25.51%). Among all participants, 58.59% agree that they have had self-efficacy.

**Conclusion:** Overall, knowledge regarding influenza, implications during pregnancy and influenza vaccine was high among Thai pregnant women, but the incidence persist. While health care recommendation seems to be the best way to encourage vaccination uptake, intervention to raise patient self-efficacy can also be useful. These results suggest that in order to increase influenza vaccine acceptance, it is necessary to improve pregnant women's recommendation from health care provider and intervention of self-efficacy about influenza vaccine uptake.

**Keywords:** Influenza vaccination, Vaccine, Pregnancy

Abstract: OR-CB01

## A Cross-sectional Study Exploring the Justification of Opportunistic Breast Cancer Screening in Thailand

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**Background:** Breast cancer is currently the most common malignant disease in Thailand. The American Cancer Society 2015 guideline for breast cancer recommends regular screening mammography at age 45 years in an average risk woman. However, in women of Asian descent, a concern has been raised about accuracy of breast cancer detection as a result of high breast density as opposed to Western women. In the status quo, guidelines and research publications within East Asian countries have suggested contradictory action. There is currently no research conducted in Thailand or other Southeast Asian nations that investigates the difference between breast cancer detected by mammography alone versus mammography with ultrasonography. We identified the discordance between current breast cancer screening practice in Thailand and the lack of evidence supporting such practice.

**Objectives:** The present study aims to evaluate the most beneficial method of breast cancer screening in different breast densities by analyzing the benefits of screening mammography with additional breast ultrasonography classified by breast density.

**Methods:** 49 middle-aged and elderly Bangkokian women who had undergone both mammography and ultrasonography were picked at random for analysis. BI-RADS scores were assigned based on mammography results alone and based on combined mammography and ultrasonography results. Concordance/discordance rates between the 2 radiographic techniques were compared in women stratified based on their breast densities.

**Results:** All of our participants were given a score between BI-RADS 1 and 3, while over 40% of participants are in the BI-RADS 2 category. 60% of subjects with extremely dense breasts benefit from screening mammography with additional breast ultrasonography, while only 50% of samples with heterogeneous density and 34.21% samples with heterogeneous fibroglandular breasts benefit from the extra intervention.

**Conclusion:** Our study concludes that women with higher breast density are more likely to benefit from screening using ultrasonography in addition to mammography as opposed to mammography screening alone. We recommend both mammography and ultrasonography for initial breast cancer screening. For follow-up visits, we suggest the screening method in accordance with breast density, using ultrasonography alone for women with high breast densities and mammography for women with heterogeneously dense breasts.

**Keywords:** Opportunistic screening, Breast cancer, Mammography, Ultrasonography, BI-RADS

Abstract: OR-HB05

## TMPRSS6 Polymorphisms and a Risk of Iron Deficiency Anemia in School-aged Children

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**Background:** Iron deficiency anemia (IDA) is one of the common causes of anemia worldwide. In Thailand, the prevalence of IDA in children is around 10-16%. Inadequate iron intake is the most common etiology. Other than that, TMPRSS6 gene polymorphisms including rs855791 (c.2207C>T, p.V736A) and rs2235324 (c.757A>G, p.K253E), are associated with lower iron status. The TMPRSS6 gene regulates hepcidin expression which, thereby, maintains iron homeostasis. Previous studies showed an increased risk of developing IDA for p.V736A (Odds Ratio, OR = 1.5). However, the study of their association with IDA in Thai children is limited.

**Objectives:** To determine the prevalence of p.V736A and p.K253E variants and their association with iron status.

**Methods:** Subjects, aged < 18 years, who were investigated for iron status (including hemoglobin, ferritin, serum iron, total iron binding capacity, and serum hepcidin) were enrolled. They were classified into IDA, iron depletion (ID), and normal controls (NC) according to the criteria by Camaschella C. DNA from peripheral blood was amplified by Polymerase Chain Reaction (PCR). Restriction Fragment Length Polymorphism (RFLP) technique was performed to determine p.V736A and p.K253E variants. 10% of sample was sent for sequencing for confirmation. ANOVA and Chi square tests were used to determine the difference in iron status with respect to genotypes and ORs for IDA/ID, respectively.

**Results:** A total of 456 subjects were enrolled. The mean  $\pm$  S.D. of age and Hb for each group were 13.2  $\pm$  2.1 years, 11.2  $\pm$  0.9 g/dL (IDA); 11.5  $\pm$  1.8 years, 13.1  $\pm$  0.8 g/dL (ID); and 11.7  $\pm$  1.6 years, 13.0  $\pm$  1.2 g/dL (NC), respectively. The T allele (c.2207C>T) and A allele (c.757A>G) frequency did not significantly differ between groups [IDA (62.1% and 68.8%), ID (61.4% vs 71.5%), and NC (56.5% vs 62.1%)]. However, the proportion of the combined c.2207TT/c.757AA genotype was significantly higher in ID (25.9%) when compared to NC (14.1%). The ORs of developing IDA/ID for c.757AA alone and combined c.2207TT/c.757AA were 1.67 (95% CI 1.1-2.5) and 1.97 (95% CI 1.2-3.4), respectively ( $p$ -value < 0.01).

**Conclusion:** The c.757AA and combined c.2207TT/c.757AA genotypes were associated with increased risks for IDA/ID in our population. Therefore, investigation for these polymorphisms is encouraged in children who are refractory to iron supplement.

**Keywords:** TMPRSS6, V736A, K253E, Iron deficiency anemia

Abstract: OR-HB02

## Prevalence and Associated Factors of Cerebrovascular Accident (CVA) among Patients with Type 2 Diabetes Mellitus: a Nationwide, Cross-sectional Study

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**Background:** Cerebrovascular accident (CVA) is defined as acute onset of focal neurological deficiency from vascular compromise with other underlying cerebrovascular diseases. CVA is also well-known in the term of acute stroke. It is an emergency situation, which requires early recognition, diagnosis, and management to encourage the convalescent outcome. Type 2 diabetes mellitus (T2DM) poses about four times more considerable risk for stroke. Otherwise, these health concerns become the major health burden in Thailand and the leading causes of death and long-term disability in both men and women.

**Objectives:** The objectives of this study were to determine the prevalence of CVA among patients with DM and to determine factors associated with CVA in a nation-wide survey.

**Methods:** A cross-sectional study was conducted in 2018 to assess national outcomes among patients with diabetes who visited 987 hospitals under the Ministry of Public Health in Thailand. Data were gathered from medical records of those hospitals. The records were collected by DAMUS campaign. Permission to utilize data was submitted and accepted by the Institutional Review Board, Royal Thai Army Medical Department.

**Results:** 38,568 diabetic patients participated in this study. The prevalence in 2018 of CVA in DM patients was 3.2% (95% CI 3.0–3.4). As we conducted a multivariate analysis, the associated factors were being male (aOR 1.51,  $p$ -value < 0.001), and smoking (aOR 1.30,  $p$ -value = 0.002). Moreover, atrial fibrillation (aOR 2.67,  $p$ -value < 0.001), hypertension (aOR 2.16,  $p$ -value < 0.001), coronary artery disease (aOR 2.06,  $p$ -value < 0.001), peripheral neuropathy (aOR 1.90,  $p$ -value = 0.001), renal insufficiency (aOR 1.53,  $p$ -value < 0.001), diabetic retinopathy (aOR 1.36,  $p$ -value = 0.005) and gout (aOR 1.26,  $p$ -value = 0.027) were associated with stroke in type 2 diabetes mellitus.

**Conclusion:** This study emphasized CVA was a problem among patients with diabetes, as it illustrates the associated factors and other diabetic patient comorbidities. Therefore, patients with T2DM should be regularly assessed for risk of CVA and factors related to CVA. However, time-course relationship between these factors in T2DM patients and CVA is encouraged for better understanding of its association.

**Keywords:** Cerebrovascular accident, Type 2 diabetes mellitus, Nation-wide study

Abstract: OR-HB11

## Artificial Intelligence Assistance using Classification Model in Radiographic Classification between Early and Obvious Degrees of Knee Osteoarthritis: a Cross-sectional Diagnostic Study

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**Background:** In sport medicine, early knee osteoarthritis is a problematic issue in the athlete, especially in middle-aged athlete, while early knee osteoarthritis (OA) represented up to 15% that might be missed in the routine practice. The present study was to assess the performance of an artificial intelligence (AI) system using classification model that designed to assist in the classification of knee osteoarthritis from doubtful to obvious degrees in accordance with the Kellgren and Lawrence (KL) classification system.

**Objectives:** Using convolutional neural network method as the mean of training the AI to help detect the early stage of Knee osteoarthritis in the radiographic image. Reduce the rate of the undetected of early knee osteoarthritis in the routine practice.

**Methods:** A total of 1,803 (trained) and 521 (test) knee radiographs (anteroposterior [AP] view) had been collected from public resources as The Osteoarthritis Initiative (OAI). Regarding KL classification, grade 1 (doubtful) was used to represent 'early' stage of OA and grade 3 (moderate) was used to represent 'obvious' stage of OA. The AI system was trained and tested on these radiographs. The assistance of software highlighting boxes around AI- detected osteoarthritic change(s) was shown in each image during the analysis. The confusion matrix was used to statistically analyze the data.

**Results:** From 521 test images, the overall accuracy was shown as 94.63% to differentiate diagnosis between 'early' knee OA and 'obvious' knee OA on knee radiographs in accordance with the KL classification. Regarding this AI classification model, its precision and recall (sensitivity) levels were excellent as 94-95% and 94-95%, respectively.

**Conclusion:** The AI assistance with classification model provided the excellent levels of accuracy, precision, and recall for the classification between early and obvious degree of arthritic changes of knee osteoarthritis on AP radiographs. This technology is recommended to help interpret the knee radiographs for the sport medicine orthopedists or general orthopedist to diagnose the early knee osteoarthritis and consider for early treatments.

**Keywords:** Convolutional neural network, Knee osteoarthritis, Classification model



Abstract: OR-HB01

## Long-term Cerebrovascular Accident Outcome among Diabetic Patients in Thailand; a Nationwide, Retrospective Cohort Study

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**Background:** Cerebrovascular Accidents (CVA) or Stroke is a major health problem in Thailand. For the past 5 years, the mortality rate of stroke has been increasing despite of the fact that the healthcare system had improved. It has become one of the leading etiologies of disability and death of both males and females alike. Diabetes is one of the crucial risk factors that contribute to stroke morbidity in Thailand. In spite of the fact that the incidence of stroke in Thailand is now being studied in a large population-based cohort study, information regarding cerebrovascular incidence among the major population at risk like diabetic patients is still lacking.

**Methods:** A retrospective cohort study was conducted using data from electronic health records obtained from the DAMUS database of diabetic patients treated at public hospitals in Thailand who were stroke-free at enrolment in 1998 and regularly came for follow-up for 20 years. We calculated crude incidence rates for stroke and identified factors associated with stroke occurrence using multivariate Cox Proportional Hazards regression models.

**Results:** 33,716 eligible patients with 282,380 person-years of follow-up were studied. There were 819 identified new cases of stroke. During 20 years period from 1998-2018, the incidence rate of stroke was 269.85 events per 100,000 person-years [95% CI: 251.35-289.70]. Male diabetic patients tend to have higher incidence rate than female as 378.83 events per 100,000 person-years [95% CI: 340.20-421.86] and 220.80 events per 100,000 person-years [95% CI: 200.89-242.69], respectively. Being a male, positive history of smoking, having hypertension, and having dyslipidaemia were identified as being risk factors associated with stroke occurrence with the adjusted hazards ratios (95% CI) of 1.56 (1.32-1.85), 1.36 (1.10-1.67), 1.9 (1.50-20.41), and 1.2 (1.01-1.43), respectively.

**Conclusion:** Incident of cerebrovascular accidents among Thai diabetic patients is high, while those who ever smoke, being male, having hypertension, or having dyslipidaemia as comorbidities possess a higher risk of stroke occurrence than those without. Thus, diabetic patients who possess those risks should be recommended to engage in a smoking cessation program, stricter control of blood pressure and lipid level in order to reduce the risk of strokes.

**Keywords:** Cardiovascular accidents, Diabetes, Long-term outcomes, Nationwide

Abstract: OR-HB08

## Predicting Breast Feeding Jaundice from Percentage Body Weight Loss at 24 and 48 hours Postpartum in Normal Delivery and Cesarean Section Newborns

**Pongsapak Liamwattanasutha**, Sutharat Yoorod

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**Background:** Breast feeding jaundice is a common problem in newborns that can be a cause of kernicterus. Changing of neonatal bodyweight after delivered can use to predict this condition. Although the changing of neonatal bodyweight is different between newborns who delivered by normal delivery and cesarean section which there is no study about percentage body weight loss for predict breast feeding jaundice separately for each group.

**Objectives:** To study percentage bodyweight loss at 24 and 48 hours for predict breast feeding jaundice in normal delivery and cesarean section infants.

**Methods:** Studying term newborn who was born at Uttaradit hospital since October 1<sup>st</sup>, 2019 to September 30<sup>th</sup>, 2020 and collecting general information, birthweight, body weight after birth and microbilirubin at 48 hours postpartum to analyze cut point of percentage body weight loss for predict breast feeding jaundice.

**Results:** Total of 53 (15.3%) normal delivery newborn and 45 (8%) cesarean section newborn presented with breast feeding jaundice and appropriate cut point of percentage body weight loss 24 and 48 hours postpartum in normal delivery newborns for predicting breast feeding are  $\geq 3\%$  (sensitivity 50.9%, specificity 68.7%, accuracy 62.7%) and  $\geq 4.6\%$  (sensitivity 73.6%, specificity 52.0%, accuracy 64.6%), in cesarean section newborns are  $\geq 3.4\%$  (sensitivity 60.0%, specificity 59.0%, accuracy 62.3%) and  $\geq 6.0\%$  (sensitivity 44.4%, specificity 73.5%, accuracy 59.5%).

**Conclusion:** Body weight loss of newborn at 24 and 48 hours after birth may lead to breast feeding jaundice which should be found the cause and considered adequate milk and fluid supply especially in normal delivery newborns that have more incident.

**Keywords:** Body weight loss, Breast feeding jaundice, Normal delivery, Cesarean section, Newborns



Abstract: OR-HB04

## Does Intraoperative Frozen Section Analysis of Sentinel Lymph Nodes Change Intraoperative Management in Clinically Lymph Node Negative Breast Cancer?: a Thai Retrospective Study

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**Background:** Clinical application of the ACOSOG Z0011 trial results allows clinically node-negative breast cancer patients who meet criteria to avoid axillary dissection even when 1-2 sentinel lymph nodes (SLNs) are positive for metastatic disease. Most surgeons at a major academic hospital in Thailand still perform intraoperative frozen section analyses of SLN on a routine basis. Intraoperative frozen section analyses of SLN were thought to reduce re-operation rates despite a non-100% detection rate and possibility of a false negative result.

**Objectives:** This study evaluated the rate of re-operations prevented by frozen section analysis of SLN biopsies in a tertiary care hospital in Bangkok, Thailand within the span of 2 years.

**Methods:** From April 2019 to April 2021, 462 sentinel lymph node biopsy (SLNB) procedures were performed at King Chulalongkorn Memorial Hospital. Of these, 107 cases were breast-conserving surgery in accordance with the ACOSOG criteria with concomitant usage of frozen sections. Clinicopathological features of these cases were collected and analyzed. Re-operation rates prevented by the additional intervention were reported. Factors associated with sentinel node positivity were also summarized.

**Results:** Only 2 additional operations were prevented with the usage of 107 frozen section analyses. The discordance rate between frozen and permanent sections in terms of presence of metastatic disease and number of total lymph nodes was over 23%. Usage of frozen section analyses also created unnecessary hesitancy in some surgeons. Tumor and nodal status, lymphovascular invasion and estrogen receptor status were found to be significant in predicting SLN metastases.

**Conclusion:** Intraoperative frozen sections result in a very low prevention rate for additional operations and is associated with a high discordance rate compared to permanent sections. We encourage a nationwide omission of frozen section usage in clinically node-negative breast cancer patients. With such practice, nationwide cost and operative time can be reduced without reduction in the quality of care.

**Keywords:** Breast cancer, Sentinel lymph node biopsy, Intraoperative frozen section analysis, ACOSOG Z0011

Abstract: OR-HB09

## Period Prevalence and Risk Factors for Rapid Decline Kidney Function among Renal Preserved Hypertensive Patients in Sanam Chai Khet Hospital, Sanam Chai Khet District, Chachoengsao Province, Thailand

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**Background:** Hypertension is the important leading cause of premature morbidity and mortality worldwide. It is also an important risk factor for chronic kidney disease in the long run. Many medical reports found that the prevalence of hypertensive patients and the incidence of rapid decline kidney function in hypertensive patients increased year by year and tends to increase steadily. More importantly, since rapid decline eGFR is associated with increased morbidity and mortality, it is important to identify associated factors and prevent further decline eGFR.

**Objectives:** This study aimed to find the period prevalence and identify the associated risk factors for rapid decline kidney function among hypertensive patients with preserved kidney function (eGFR above 60 mL/min/1.73 m<sup>2</sup>) from years 2011 through 2021 at Sanam Chai Khet Hospital, Chachoengsao Province, Thailand.

**Methods:** Participants aged 18 years old and older diagnosed with hypertension with preserved kidney function of greater than 60 mL/min/1.73 m<sup>2</sup> having more than two creatinine values taken more than a year apart at Sanam Chai Khet Hospital from years 2011 through 2021. Cases with diagnosis of pregnancy, or meeting criteria for AKI by KDIGO are excluded. We use SPSS ver. 22.0 to calculate the prevalence of rapid decline eGFR more than 5 mL/min/1.73 m<sup>2</sup> per year and use logistic regression to identify associated risk factors that may contribute to having rapid decline eGFR.

**Results:** The period prevalence of rapid decline eGFR in renal preserved patients is 21.75%. From univariate analysis, having comorbidities such as diabetes mellitus, dyslipidemia, and fasting blood sugar greater than 180 mg/dL is risk for development of rapid decline eGFR. From multivariate analysis, there is statistical significance in groups with fasting blood sugar 140-180 mg/dL to be a protective factor.

**Conclusion:** One fifth of the hypertensive with preserved kidney function develop rapid decline eGFR. Programmes and add-ons in hospital databases for detection of rapid decline eGFR might be useful for early detection. Moreover, aggressive intervention regarding hypertensive patients with comorbidity might reduce the period prevalence of rapid decline eGFR. Since, having rapid decline eGFR has shown to be associated with increased morbidity and mortality.

**Keywords:** Hypertension, Rapid decline eGFR, Estimate glomerular filtration rate, Risk factors, Period prevalence

Abstract: OR-HB17

## Predicting ARDS in Influenza Pneumonia Patients using Delta Mean Platelet Volume

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**Background:** Patients with influenza pneumonia are at high risk of rapid progression to acute respiratory distress syndrome (ARDS). Mean platelet volume (MPV), which reflects platelet size, is considered to be a crucial inflammatory marker.

**Objectives:** The study aim was to investigate the role of delta mean platelet volume (delta MPV) in predicting mortality in patients with influenza pneumonia.

**Methods:** This retrospective study was conducted in a tertiary care centre in southern Thailand. Adult patients diagnosed with influenza pneumonia were enrolled from January 2015 to December 2020. Demographic data, laboratory investigations including delta MPV (MPV on day 2 minus MPV on day 1), management records, and clinical outcomes were collected for analysis. The study population was divided into two groups according to the development of ARDS.

**Results:** During the study, 1,240 patients with laboratory-confirmed influenza were screened and 212 pneumonia patients were enrolled. Fifty-six patients (26.4%) met the diagnostic criteria for ARDS during hospitalization. Delta MPV was significantly higher in the ARDS group compared to that in the non-ARDS group (1.0 fL vs 0.2 fL,  $p < 0.001$ ). Multivariable logistic regression revealed that delta MPV is an independent predictor of ARDS (OR 17.37; 95% CI 6.5–46.4;  $p < 0.001$ ). Receiver operating characteristic curve analysis indicated a cut-off value of 0.7 fL for delta MPV (sensitivity 80.36%, specificity 80.77%) to predict ARDS in patients with influenza pneumonia.

**Conclusion:** Delta MPV strongly predicts ARDS in influenza pneumonia patients. Implementation of delta MPV may be useful in identifying at-risk patients who will require intensive care and ARDS prevention.

**Keywords:** Influenza, Pneumonia, ARDS, Mean platelet volume

Abstract: OR-HB14

## Prevalence of Opioid Use and Outcome at End of Life in Palliative Care Service Patient

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**Background:** Opioids are the crucial analgesia to relieve pain and dyspnea symptoms especially in palliative patients. However, physicians might be reluctant to use opioids even with palliative care consultation. The misconception that the use of opioids may hasten death is one of the most common barriers.

**Objectives:** The aim of this study was to investigate the prevalence of opioids usage, associated factors for use of the opioids and survival time regarding the use of opioid at end-of-life care.

**Methods:** Data of patients in palliative care service at Bhumibol Adulyadej Hospital from July to December 2020 were collected from electronic health records retrospectively. Patients' characteristics, managements, and survival time at last admission of life were included. Association of opioid use and clinical factors were analyzed.

**Results:** 245 out of 299 patients (82%) who had palliative care consultation received opioid at end of life. Intubation and the use of vasopressor were significantly higher in patients who did not receive opioids (64.8% vs 34%;  $p < .001$  and 33.3% vs 14.4%;  $p = 0.001$  respectively). Patients with opioid usage have significantly higher diagnosis of malignancy, admission at the palliative care unit, death at the palliative care unit, presence of dyspnea and median palliative performance scale (40% vs 14.8%;  $p < 0.001$ , 22.9% vs 0%;  $p < 0.001$ , 48.6% vs 7.4%;  $p < 0.001$ , 77.9% vs 47.2%;  $p < 0.001$  and 30 vs 20;  $p = 0.002$  respectively). No significant difference of median survival time from admission to death between opioid user and non-opioid user (9 vs 7 days,  $p = 0.777$ ). Among opioid users with available time from opioid use to death ( $n = 232$ ), the use of dose greater than 24 mg/day of intravenous morphine equivalence has longer survival compared to 24mg/day or less. (103 vs 52 hours,  $p < 0.001$ ).

**Conclusion:** About one-fifth of palliative care patients did not receive opioid at end of life. Patients with diagnosis of malignancy, admission and death at the palliative care unit, dyspnea and higher palliative performance scale were associated with higher opioid use rate. Opioid use was not associated with shorter survival time.

**Keywords:** Opioids, End of life, Palliative, Survival time, Morphine

Abstract: OR-HB06

## Risk Factors of Severe Postpartum Hemorrhage Compared to Postpartum Hemorrhage in the First 24 Hours after Delivery in Uttaradit Hospital

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**Background:** Severe postpartum hemorrhage is a leading cause of maternal death. We performed this study in order to identify risk factors related to severe postpartum hemorrhage in patients in Uttaradit Hospital for screening, surveillance and immediate proper management.

**Objectives:** To study the correlation of risk factors and severe postpartum hemorrhage.

**Methods:** A retrospective 10-year case-control study of 313 postpartum hemorrhage patients in Uttaradit Hospital between January 2010 and November 2020 was obtained from medical records according to the ICD-10 system. Patients were divided into two groups; 80 patients were severe postpartum hemorrhage, and 233 patients were postpartum hemorrhage. Data were analyzed by using descriptive statistics and analytical statistics by a computer program.

**Results:** Postpartum patients with history of abortion were 2.34 times (95%CI 1.21-4.53,  $p = 0.012$ ) likely to develop severe postpartum hemorrhage and patients with antepartum hemorrhage were 2.49 times (95%CI 1.16-5.32,  $p = 0.019$ ) likely of developing severe postpartum hemorrhage.

**Conclusion:** Patients with history of abortion or antepartum hemorrhage have significant risk for developing severe postpartum hemorrhage in the first 24 hours after delivery. Thus, severe postpartum hemorrhage should have appropriated screening, surveillance, and immediate treatment to reduce risk of progression of postpartum hemorrhage to severe postpartum hemorrhage.

**Keywords:** Severe postpartum hemorrhage, Postpartum hemorrhage, Risk factors

Abstract: OR-HB07

## Prevalence of Recurrent Ischemic Stroke and Association of Risk Factors in KCMH

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**Background:** Stroke is the leading cause of death among non-communicable diseases (11.1% in men, 14.6% in women) and carries the second rank for disease burden in Thailand. About one-half of patients who survive on the ischemic stroke are at increased risk of recurrent stroke. Functional outcomes and post-stroke complications are worse in the recurrence. Thus, the importance of recurrent stroke risk factors and prevention should be studied.

**Objectives:** The purpose of this study is to investigate the prevalence of recurrent stroke cases (the second episode) in a one-year-period follow up at the stroke unit, King Chulalongkorn Memorial Hospital (KCMH) and to study on the risk factors associated with the recurrence.

**Methods:** This retrospective cohort study conducted at the Stroke Center, KCMH included all patients older than 18 years and admitted with the first episode of ischemic stroke confirmed by neurologists and imaging between January 1, 2019, and December 31, 2019. Patients who were diagnosed with transient ischemic attack (TIA) or presented with the recurrence in KCMH were excluded from the study. Patients who met inclusion criteria were followed up until the recurrence (second episode) occurred within 1 year. Associations of risk factors and the recurrence were determined by Cox-proportional hazard ratio.

**Results:** There were 736 patients with acute ischemic stroke admitted in KCMH during 2019. We included 418 patients who developed the first episode, ischemic stroke recurrence occurred in 26 patients. The prevalence of the recurrence was 6.2%, with an incidence rate of 0.079 person-year and 61.61 person-day as mean recurrence duration. Patients who developed recurrent stroke had a mean recurrence duration of around 2 months. From 52 patients who had atrial fibrillation as an underlying disease, none developed recurrent stroke. The Cox-proportional hazard ratio elicited that treatment of dyslipidemia was considered as a protective factor of recurrent ischemic stroke with HR 0.37 [95% confidence interval [CI] = 0.15 - 0.88,  $p = 0.025$ ].

**Conclusion:** The prevalence of the recurrence was 6.2%. Our study indicates that well-treated dyslipidemia has an association with recurrent ischemic stroke.

**Keywords:** Recurrence, Ischemic stroke, Prevalence, Risk factors

Abstract: OR-HB15

## Smart Blood Transport Device: Using Mobile Application to Monitor Blood Bag Temperature

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**Background:** Transporting Red Blood Cell (RBC) to patients requires a specific standard temperature range (1-10 °C) to maintain quality and viability of RBC. This is to prevent hemolysis and bacterial growth. However, current blood bag temperature monitoring devices are not effective enough to monitor and record the temperatures. Our novel smart blood transport device with the temperature-sensitive warning light signal is an innovative option for keeping blood transportation practical and able to record the changing temperature by mobile application.

**Objectives:** To study the accuracy and precision of smart blood transport devices to monitor the temperature of blood bags.

**Methods:** We monitor the temperatures of Leukocyte Poor packed Red Cells (LPRC) unit with 4 different volumes (160, 240.50, 256.77, and 308.41 mL) stored in the smart blood transport devices which are measured by mobile application, and we compare them to the measured temperatures from the probe thermometers as a reference and the blood bag temperature indicator. For each LPRC unit, we repeated the experiments 3 times. The accuracy of blood transport devices' light signals is also being measured simultaneously.

**Results:** The mean temperature, measured from probe thermometers, that yellow light signals (8 °C -warning) and red light signals (10 °C -warning) started to appear are 8.30 °C (SD = 0.37,  $p = 0.019$ ) and 10.42 °C (SD = 0.28,  $p < 0.01$ ). The correlation coefficient between measured temperature from the probe thermometers and the devices at range 8-10°C is 0.93-0.99. The mean temperature that the blood bag temperature indicators start changing their colour is 10.08°C but the range is more varied (SD = 1.56) compared to our devices. Furthermore, the Mann-Whitney U test shows no significant difference between using blood bag temperature indicators and red light signals to detect temperature exceeding 10 °C ( $p = 0.26$ ).

**Conclusion:** Our results determine the efficacy of our devices and how they are likely to monitor blood temperature. Our devices have a very high correlation with the probe thermometers. Although the light signals are more precise than blood bag temperature indicators, more accuracy improvement is required as using our smart blood transport devices are more user-friendly and could reduce the cost of the single-use indicators.

**Keywords:** Blood cold chain, Blood transport device, Blood bag temperature, Mobile application, Transfusion medicine



Abstract: OR-HB12

## Prevalence and Associated Factors of Chronic Kidney Disease in Diabetes Patient at Tha Luang Hospital, Lopburi Province

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**Background:** Chronic kidney disease is disease that slowly and continuously progress from both external and internal factors that result in abnormality of multiorgan system for example, diabetes mellitus affects cardiovascular system, immunological system and metabolic. Moreover, lifestyle of diabetes patient promotes the incidence of chronic kidney disease such as intake of hyperglycemic food, inadequate fresh water drinking and insufficient exercise activity.

**Objectives:** 1. For evaluation prevalence of chronic kidney disease in uncontrolled diabetes patient at Tha Luang Hospital, 2. For evaluation risk factors of chronic kidney disease in uncontrolled diabetes patient at Tha Luang Hospital.

**Methods:** We conducted a Cross-sectional study in order to quantitatively measure the prevalence of chronic kidney disease (CKD) in the patients at Tha Luang Hospital located in Lopburi Province, Thailand.

**Results:** From the study, we found prevalence of chronic kidney disease in patient with uncontrolled diabetes is 17.92 percent. there are factors associated that are Ages equal and more than 60, Female, Fasting blood sugar level of more than 180 mL/dL, hypertension and history of ischemic heart disease. These factors are associated with chronic kidney disease significantly from multivariate analysis.

**Conclusion:** We found multiple associated factors of chronic kidney disease such as, Ages equal or more than 60, this cause by progression of disease which take times and physiology of renal function which decline by ages. Female, this can explain by anatomical structure that male tend to have larger and large in numbers of nephron results in toleration to effect of hyperglycemic stage or other stimulation. Fasting blood glucose more or equal than 180 mg/dL, this can explain by multiple process that effect structural changes in nephron and tubular lead to decline of renal function. Hypertension, as similar mechanism involving microvascular and macrovascular damage. History of ischemic heart disease, this cause by impaired function of heart may result in renal function by various mechanism described as cardiorenal syndrome for example decrease of cardiac output result in vascular resistance and renal blood flow affect in long term disease progression.

**Keywords:** Chronic kidney disease, Uncontrolled diabetic patients



Abstract: OR-HB13

## **Incidence and Associated Factors of Cardiovascular Disease in Hypertension Patients in Tha Wung Hospital, Tha Wung District, Lopburi Province, 2015-2020**

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**Background:** Hypertension is one of serious medical condition and cause of premature death worldwide. Cardiovascular disease (CVD) is one of the important complications of hypertension. Factors affecting CVD are age, gender, heredity, hypertension, smoking, type 2 diabetes mellitus, dyslipidemia, obesity, and physical inactivity. Screening of these diseases through health care policies can lead to the effective prevention of the development of CVD in the Thai population and around the world.

**Objectives:** To determine the incidence and associated factors of cardiovascular disease in hypertensive patients in Tha Wung Hospital, Tha Wung District, Lopburi Province, 2015-2020.

**Methods:** We collected demographic data, physical examination, laboratory results and diagnosis from recorded computer data during last 6 years in Tha Wung Hospital for 3,050 patients, who has hypertension and free from cardiovascular disease before entering the study. The retrospective cohort study was conducted until the cardiovascular disease occurred at the end of the study individually. Descriptive statistics was used to analyze demographic data. Poisson regression was used to determine associated factors of cardiovascular disease.

**Results:** The incidence of cardiovascular disease among hypertensive patients is 344.21/100,000 person-years and the risk factors from multivariate analysis are age group greater than or equal to 60 years old and total cholesterol levels lesser than 150 during 2015 to 2020.

**Conclusion:** Male, age group greater than or equal to 60 years old, self-payment and smoking are significant risk factors. So, Public health interventions, primary prevention policies and healthcare coverage promotion could reduce the incidence.

**Keywords:** Hypertension, Cardiovascular disease, Myocardial infarction, Stroke, Primary care unit

Abstract: OR-HB10

## Association between Overweight and Obesity and COVID-19 in Tha Wung Hospital, Thailand

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**Background:** Obesity is one of serious medical condition and ranked as the fifth foremost reason for death worldwide. Obesity is abnormal or excessive fat accumulation that can negative impact on health and leading to other non-communicable diseases. COVID-19 is a new pandemic infectious disease in the world. Factors affecting severity of COVID-19 conditions are hypertension, diabetes mellitus, dyslipidemia, obesity and cardiovascular disease.

**Objectives:** The aim of this study is to define the prevalence and the relationship between obesity and severity condition of disease in COVID-19 patients in Tha Wung Hospital, Tha Wung District, Lopburi Province, Thailand.

**Methods:** Demographic data and possible risk factors were collected from hospital databases of Tha Wung Hospital, who visited out-patient clinic and received the test for COVID-19 infection in Tha Wung Hospital. A cross-sectional study was conducted. Data was analyzed using chi-square test. Multivariate logistic regression was done to determine the relationship between obesity and another risk factor with severity condition of disease of COVID-19.

**Results:** From a total of 1,420 patients who were enrolled into the study, 849 of them are female. The average age was  $43.82 \pm 16.41$ . The prevalence of COVID-19 infection among patient who was tested at the OPD was 71.84%. Multivariate logistic regression analysis found that overweight (95%CI: 1.22-2.75) and obesity (95%CI: 1.14-2.02) correlation with COVID-19 disease as risk factor were significantly accounted for COVID-19 infection and also found that female (95%CI: 0.47-0.77), age of 60 years and older (95%CI: 0.44-0.89), diabetes mellitus (95%CI: 0.24-0.67), hypertension (95%CI: 0.24-0.57) and cardiovascular disease (95%CI: 0.09-0.69) correlation with COVID-19 disease as protective factor were significantly accounted for COVID-19 infection. As for the severity of COVID-19 infection, we found that severe COVID-19 patients who had been treated with Favipiravir (98.67%). Severe COVID-19 patient also had been treated by using Dexamethasone (4.18%), had film chest x-ray for more investigation (0.61%) and had been treat with oxygen cannular (1.73%) which is slightly lower that it should be.

**Conclusion:** The prevalence of COVID-19 infection in this study is 71.84%. Associated factors with COVID-19 infection are overweight and obesity were statistically significant as risk factor and female, age of 60 years and older, diabetes mellitus, hypertension and cardiovascular disease were statistically significant as protective factor.

**Keywords:** Obesity, COVID-19, Community hospital

Abstract: OR-ME06

## Learning Behavior and Perspective Disruption during COVID-19 Pandemic: an Observational Study in Thai Medical Students

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**Background:** At the time of COVID-19 pandemics, medical students in Thailand were forced to adapt into an online curriculum. This study found that some of students' behavior and perspective have changed significantly from this abrupt switch. Better understanding about these aspects could improve online classes to be more suitable with students and improve their academic performances.

**Objectives:** To compare students' behavior in four aspects: attendance, formative tests preparation, perspective towards attendance record and its influence on becoming good doctors in before and after COVID-19 pandemics. To investigate whether these factors associated with their academic performance.

**Methods:** 222 medical students completed self-evaluating questionnaires to compare the four aspects mentioned above towards traditional onsite class during first year and online class during second year in COVID-19 pandemics. Total examination scores from both classes were collected and blinded to represent students' academic performance.

**Results:** Students are more responsible in attending and preparing for formative tests in online class than onsite class significantly ( $p = 0.001$  and  $p < 0.001$ , respectively). Moreover, they are more concur with the attendance score system and its influence on becoming good doctors during online classes ( $p = 0.001$  and  $p = 0.001$ , respectively). Interestingly, students' attendance was not associated with better academic performance in onsite class but was significantly associated in online class ( $p < 0.001$ ). Meanwhile, formative test preparation is associated with better academic performance in both traditional onsite class and online class ( $p = 0.047$  and  $p = 0.002$ , respectively). Students in online class agree with the attendance score and its benefit more than they did in onsite class ( $p = 0.001$ ). Nevertheless, students' perspective toward attendance score did not associate with their academic performance in both onsite and online class.

**Conclusion:** Difficulty can turn into opportunity in COVID-19 pandemics. This study showed that students attended and prepared for formative tests more in online class. Academic performance is reflected through actions more than attitude. Therefore, strategies to promote students' attendance and preparation for their formative should be implemented in online class.

**Keywords:** Attendance, Formative test, Online learning, COVID-19, Medical students

Abstract: OR-ME02

## Systems Thinking Approach to Understand Mental Model of Public Humiliation in Medical Education

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**Background:** Mistreatment in medical school is a wicked or complex problem demonstrating inter-relatedness and dynamicity of factors that affect students. Many studies have outlined the causes, perceptions, and negative consequences of mistreatment, however, a comprehensive mental model of public humiliation, the most common type of mistreatment, is still incomplete.

**Objectives:** This study aims to provide insight into the reasons why public humiliation in medical school continues to be a problem despite existing for decades, and to propose a shift in paradigm that will improve these incidents.

**Methods:** A systems thinking approach is used to conceptualize related components of public humiliation and student behavior. Through extensive literature review and problem structuring, we synthesize a mental model of humiliation displayed by a Causal Loop Diagram (CLD).

**Results:** From findings described in the CLD, students' performance is recognized as a key contributing factor leading to public humiliation. The mental model proposes two major systems underlying the consequences, the balancing loop illustrating the "No Pain, No Gain" mindset and the reinforcing loops of "Stress Overload" and "The Delayed Side Effect".

**Conclusion:** Systems thinking provides a comprehensive mental model of public humiliation to raise awareness among medical educators about the negative consequences of this kind of mistreatment. The paradigm shift to overcome the 'fix that fail' archetype is recommended to lessen abuse in medical school by referring to 3C's: Continuity of student supervision, Constructive questioning and Combining adult learning theory to medical curriculum.

**Keywords:** Mistreatment, Public humiliation, Mental model, Systems thinking, Medical education

Abstract: OR-ME07

## Attitude to Extracurricular Activities among Pre-medical Students at Phramongkutklo College of Medicine, Thailand

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**Background:** Activities in medical students can be categorized into curricular and extracurricular activities (EAs). Most of the pre-medical students at Phramongkutklo College of Medicine participated EAs as well.

**Objectives:** Hence, the objective is to critically explore students' attitudes to factors influencing EAs among pre-medical students.

**Methods:** A cross-sectional study was conducted on 96 recruits. Their attitudes were collected by electronic standardized questionnaires in a 5-point Likert scale. There were four types of attitudes including personal perspective, communication, barrier, and time-related. An independent t-test was used to compare means between each group. An exploratory factor analysis (EFA) was used to explore the loading factor of each factor.

**Results:** The Cronbach's alpha was calculated that this questionnaire was generally reliable. There were significant differences in all groups ( $p < 0.001$ ). The Bonferroni test was undertaken for multiple comparisons. To describe in each factor, personal perspective differed from communication ( $p < 0.001$ ) and barrier ( $p < 0.001$ ), communication differed from time-related ( $p < 0.001$ ) and barrier ( $p < 0.001$ ), and time-related differed from the barrier ( $p < 0.001$ ) with statistical significance. Moreover, supporting their needs ( $\lambda = 0.804$ ) and improving curriculum vitae ( $\lambda = 0.563$ ) had highest and lowest impact over personal perspective respectively. Improving communication skill ( $\lambda = 0.793$ ) and improving network ( $\lambda = 0.504$ ) had highest and lowest impact over communication respectively. While burden ( $\lambda = 0.819$ ) and not necessary ( $\lambda = 0.547$ ) had highest and lowest impact over barrier respectively.

**Conclusion:** In conclusion, there was a good optimistic attitude in this population. Thus, we need to remain this perspective more perpetually by implementing some promotion or making them role models.

**Keywords:** Extracurricular activities, Attitudes

Abstract: OR-ME01

## Knowledge and Perspective of Telemedicine among Medical Students in Phramongkutklao College of Medicine

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**Background:** Telemedicine is a term of distance healthcare service to exchange valid information for the accurate diagnosis, treatment, and effective prevention of diseases and injuries between healthcare providers across different geographical areas. It can be a solution to improve the accessibility of medical services in distant rural communities.

**Objectives:** To explore knowledge and perspective of telemedicine among medical students in Thailand.

**Methods:** A cross-sectional study was conducted in medical students of Phramongkutklao College of Medicine, 2019. The potential participants included 600 medical cadets including half in pre-clinical year and another in clinic year. Data were collected by using a five-point Likert-scale in an electronic standardized questionnaire edited in Google platform. The content validity of the questionnaire was checked, and the reliability was calculated by using Cronbach's alpha coefficient in pilot group ( $\alpha = 0.9169$ ). Data were analyzed using STATA version 15.

**Results:** A total of 267 medical students has completed the questionnaire, with the response rate of 44.5 percent. From the study, we found that majority of medical students had low level. We also found that there a dose-response relationship between knowledge and amount of online medical resource accesses. Advantages perceived by medical students were in moderate level. Most of medical students had moderate perception of disadvantages of telemedicine. Necessity perceived by medical students was in moderate level with answer length from 1 to 5. The need of security for telemedicine was perceived on high level.

**Conclusion:** Medical Students in Phramongkutklao College of Medicine has moderate knowledge level of telemedicine. Relationship between knowledge, perception and the use of telemedicine were observed. Finding also suggest factors that could have positive relationship with the knowledge of telemedicine, such as access to teleinformation, age, and being in a clinical year. These data help suggest some possible tool which could encourage implementation of telemedicine to medical students.

**Keywords:** Knowledge, Perspectives, Telemedicine, Medical student

Abstract: OR-ME08

## Facilitators and Barriers of Extra-curriculum Research among Undergraduate Medical Students in Thailand: the Student Perspective for Medical Education

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**Background:** In the COVID era, research training can be considered as an important thing to show off and promote medical students towards the newer advances and research training in a current undergraduate medical curriculum. Their thought process, point of view and talent are expressed regarding research. These research training offers opportunities for medical students to learn the value of work, individual responsibility, and patience. The students are certainly very motivated and intentional to do research; however, they are interrupted by some barriers.

**Objectives:** To evaluate the attitude of medical students towards doing extra-curriculum research, and analyzing the facilitators and barriers faced by them is the purpose of present study.

**Methods:** This cross-sectional study was conducted among 1<sup>st</sup> - 6<sup>th</sup> year's medical students at Phramongkutklao College of Medicine. An anonymous online survey was designed to assess demographic data, perceptions, facilitators, and barriers towards extra-curriculum research activity. Data were analyzed using STATA version 14.

**Results:** Of 602 students enrolled in the study, 480 (79.7%) responded the online survey. Of these, 15.0% had done extra-curriculum research while 60% expressed their interest in participating in research during studying in the medical school. However, a considerable proportion of students were not fully aware of the benefits of engaging in research. The student perspective was as followed; curriculum overload (51.4%), time constrain (47.1%), inadequate training/opportunities in research (46.1%), lack of interest in research experience (40.3%), lack of mentor guidance and cooperation (29.4%) and lack of motivation (27.4%). According to the students, perceived facilitators/motivation to undertake research included focus on pursuing higher degrees (52.9%), improving their potential in research skills (28.8%) and having mentor guidance/role model (27.2%).

**Conclusion:** A considerable interest in research with most of the students planning to perform the extracurricular research activities during studying in the medical school and having excitement to be included in research throughout their medical careers was shown in Thai medical students. Significant concern has addressed by the students e.g., decreasing overload of curriculum, more practicing workshops on research procedure, integration of research procedure into undergraduate curriculum as well as more research adviser and assistance.

**Keywords:** Extra-curricular research, Facilitator, Barrier



Abstract: OR-ME03

## An Analytical Cross-Sectional Study on the Relationship of Perceived Social Connectedness and Burnout Symptoms in Medical Students from a Private Tertiary Institution in Metro Manila Enrolled in an Online Curricula for the Academic Year 2020-2021

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**Background:** The COVID-19 pandemic has brought about the need for social distancing and severely limited social interaction, thus putting online learning at the forefront for the safe continuation of education today.

**Objectives:** This study determined the association of the level of social connectedness and symptoms suggestive of burnout in the setting of pure online academic curriculum.

**Methods:** Using an analytical cross-sectional design, an online survey of the perceived social connectedness and symptoms of burnout of medical students duly enrolled in a private tertiary institution in the National Capital Region was conducted. Perceived social connectedness and symptoms of burnout were objectively measured, using previously validated questionnaires, namely the Social Connectedness Scale - Revised (SCS-R) and the Copenhagen Burnout Inventory (CBI), respectively. Results were interpreted by computing for the prevalence risk ratio (PRR) with a confidence interval of 95%, using a 2 by 2 Contingency Chi square as statistical analysis to determine the association between social connectedness and burnout among the participants.

**Results:** A total of 119 respondents were included in the study. 72.3% reported reduced levels of social connectedness while 85.7% experienced symptoms of burnout. The PRR of 1.247 (1.001, 1.553) implied that among those with reduced levels of social connectedness, there was a 1.247 higher risk of having symptoms suggestive of burnout, and this was statistically significant.

**Conclusion:** Amid the COVID-19 pandemic and the implementation of a purely online curriculum, medical students with reduced social connectedness have an increased risk of experiencing symptoms of burnout.

**Keywords:** Social connectedness, Burnout symptoms, Online medical curriculum



Abstract: OR-ME10

## Learning-style Preferences, Academic Performance and Active Learning of Phramongkutklao College of Medicine, Thailand, 2014-2021

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**Background:** Understanding of learning styles can enhance teaching and learning effectiveness by identifying students' preferences for comprehending and utilizing information presented in classes. Up until 2014, No study examining the learning styles of medical cadets has been conducted. A deeper understanding of learning styles can help educators recognize and respond to diverse learning styles.

**Objectives:** Various learning styles are implemented among medical students. The goal of this study is to evaluate and comprehend learning styles preferred by medical students, so the educators can best adapt according to them.

**Methods:** A retrospective study was performed among second year medical student academic year 2014-2021. Demographic data, learning styles and academic performance were obtained using electronic standardized questionnaire. We used the Franklynn Chernin of learning styles, which has four dimensions (Visual, Visual reading, Auditory, and Kinesthetic) comprising 10 discrete-choice questions. Data were analyzed using STATA version 14.

**Results:** 694 students were enrolled. Of those 70.3% of them never fail any class and 76.3% preferred active learning. Their self-assessment learning styles were kinesthetic (43.5%), visual (28.8%), visual reading (17.1%) and auditory (9.9%). Learning styles was associated with preference of active learning; visual reading (OR = 1.55); visual (OR = 2.51) and kinesthetic (OR = 3.61).

**Conclusion:** Knowledge of learning styles of students at educational institutes, is valuable and helps solve learning problems among students, and allows students to become better learners. Moreover, it can help provide learning situations tailored to the student's individual preference, overcome the predisposition to treat all students in a similar way. Appreciation of different learning styles as well as increase understanding of their own preferences in this regard may help students relate to their supervisors' learning and coaching styles, enabling better adaptation and more expeditious resolution of differences in the service of getting the most out of medical college.

**Keywords:** Learning styles, Achievement, Instructional strategies

Abstract: OR-ME09

## Optimizing the Potential of Social Media in Undergraduate Curriculum in COVID-19

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**Background:** Social networks are websites application which people used for communicating, posting, working or relaxing which included numerous utility functions which can be used for augmenting our lives. Telecommunication (e.g., Twitter, Facebook), educational (e.g., Wikipedia) and other purposes of using social media rendered us inseparable from these platforms in daily life. Social media has become a part of our lives obviously in COVID-19 pandemic, one of which was educational purpose.

**Objectives:** The objective was to monitor usage of social media in Phramongkutklao College of Medicine throughout 4<sup>th</sup> wave of COVID-19 (early 2021) pandemic in order to determining 2 variables; time spending and applications used.

**Methods:** A cross-sectional study was designed. The databases were collected for educational purposes from the 2<sup>nd</sup> and 3<sup>rd</sup> year students from June to October 2021. Hours spending on three social media platforms, demographic data, academic performances, satisfaction, and attitude toward applications were collected and reported as percentage. Outcome was to criterion which programs was likely to be the most satisfaction and suitable for learning. STATA version 14 was used for data analysis.

**Results:** Out of 182 students, 50% mostly used LINE and 25% used Facebook. Mean time used per individual was 5.3 hours per day. It was found that 73% LINE was the most used application for communicating between students and teacher. Facebook and YouTube were used for self-studying the most. The findings also demonstrated that Facebook was the easiest application to organize, and store works such as folders and grouping. On the other hand, LINE was the best for chatting with fastest response.

**Conclusion:** Medical students choose different media for different purposes. LINE was free to use and suitable for faster information sharing and group work assignments while Facebook has more organized ability and files transfer as well as multiple conversation at same time.

**Keywords:** Curriculum, Social media, Network, Advantages, Students

Abstract: OR-SR01

## An Extended Literature Review: the Roles of Bacterial ABC Transporters in Human Infections and their Therapeutic and Vaccine Potential

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**Background:** Bacteria need to adapt to low availability of nutrients and exposure to hostile conditions to thrive in the host environment. One of the strategies is via ATP-binding cassette (ABC) transporters that invests in ATP to initiate movement of substrates across the cell membrane. ABC transporters is one of the transporter superfamilies that participate in the import and export of various molecules such as nutritional factors, virulent factors and antibiotics.

**Objectives:** This review aims to investigate the roles of bacterial ABC transporters in the pathogenesis and virulence during host infection based on current research; and to suggest potential drug targets and vaccine antigens.

**Methods:** The PRISMA statement method was implemented to select studies. Two electronic databases were used, EMBASE and PubMed, which yielded 1,968 and 1,567 papers, respectively. After duplicates were removed and screened, each paper was assessed for eligibility using a constructed criterion, and data was extracted for synthesis.

**Results:** A total of 34 papers (23 on ABC importers and 11 on ABC exporters) studied on different kinds of substrates suggested different roles of the associated ABC transporters. Generally, ABC transporter genes were mutated to see the effects on transport and other phenotypes on bacterial growth, colonization, and invasion *in vitro* and *in vivo*. In some circumstances, there were contradicting results that could be attributed to alternative transport systems.

**Conclusion:** Collectively, ABC transporters manifest similar roles in nutrient acquisition, maintenance of cell wall, and antibiotic resistance as part of bacterial pathogenesis and virulence. Moreover, exploitation of ABC transporters reveals its substrate-binding protein site as a promising vaccine antigen. Meanwhile, prokaryotic cellular processes can also be targeted with nanoparticles to develop novel drugs. While more research is needed to elucidate their exact mechanisms, this review highlighted current insights into bacterial ABC transporters that can provoke further investigations and initiatives in the pharmaceutical industry.

**Keywords:** ATP-binding cassette transporter, Bacterial pathogenesis, Virulence, SBP-vaccine antigens

Abstract: OR-SR04

## Systematic Review of Tropomyosin-1 and Troponin Mutations in Cardiomyopathy

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**Background:** Cardiac muscle contractions are controlled by a number of regulatory proteins such as tropomyosin-1 and troponin C, -I, and -T. Genetic mutations in the genes encoding these essential proteins (TPM1, TNNC1, TNNI3, TNNT2) result in altered protein structures that are found to be associated with hypertrophic cardiomyopathy (HCM), dilated cardiomyopathy (DCM), restrictive cardiomyopathy (RCM), and left ventricular noncompaction (LVNC).

**Objectives:** This systematic review aims to review the literature of all cardiomyopathy-causing mutations reported in TPM1, TNNC1, TNNI3, and TNNT2. The genotype-phenotype correlations could then be investigated to dissect the etiology of functional anomalies, and the distribution of mutations that will show the presence of mutational hotspots. In addition, this systematic review also aims to provide a complete and updated database of all missense and silent cardiomyopathy-causing mutations in the four genes.

**Methods:** An online literature search was performed on PubMed and Embase to obtain mutations in each gene found associated with cardiomyopathy. Included studies must be conducted in humans, in English, available in full-text, and contained at least one mutation. The documented mutations were mapped to updated gene sequences and analyzed for distribution of mutations and phenotypes.

**Results:** From 150 included studies, 218 mutations in TPM1, TNNC1, TNNI3, and TNNT2 were obtained of which, 186 missense and silent mutations were included in the mutation database. Analyses of the distribution across the exons and protein domains showed that mutations were not equally spread, suggesting the presence of mutational hotspots. Phenotypic distributions showed the proportion of phenotypes expressed in each gene and protein domain. In TPM1 for instance, exon 5 was identified as a hotspot, corresponding to the actin-binding domain, where HCM was the most prevalent phenotype.

**Conclusion:** Analyses of the distribution of mutations revealed that sites suggestive of hotspots often corresponded to important domains serving the proteins' critical functions. The structural alterations resulting from mutations in crucial regions could therefore explain the etiology of phenotypes. Because each distinct mutation lies in a functional domain, the phenotypes expressed are dependent on the protein domain affected.

**Keywords:** Cardiomyopathy, Tropomyosin, Troponin, Gene mutation

Abstract: OR-SR06

## The Efficacy of Botulinum Toxin Type A in the Treatment of Depression

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**Background:** In an attempt to combat depression, Botulinum Toxin type A (BTA) injected into the glabellar region has been introduced as an alternative treatment for those who do not respond to conventional ones. Through the ideas surrounding the facial feedback hypothesis (FFH), BTA's role in mitigating negative facial expressions may lessen the emotional impact experienced during negative life events, thus alleviating the symptoms of depression.

**Objectives:** To assess the use of BTA in treatment-resistant depression and elucidate the mechanisms involved in the efficacy of this treatment by compiling and presenting the results of all trials conducted and summarising proposed mechanisms surrounding BTA's effect on emotion.

**Methods:** A systematic literature search through NUSearch, Cochrane Library, PubMed, Medline and Embase using the following term: (botulism AND depression) from inception to October 2021 was conducted to identify relevant literature.

**Results:** From the literature search, 35 studies (n = 477) were included in the final review. 8 of the 35 were trials directly testing BTA's use in depression, and all showed positive results. Each study at least partially attributed the efficacy of BTA in depression to the FFH and aimed to delineate its neurobiological mechanisms further through various study designs. In more recent reviews, new hypotheses have been proposed in order to expound upon BTA's role in the management of depression, namely the Social Feedback Hypothesis, Monoamine Theory and Insular Cortex Modification, all of which are promising and warrant further investigation.

**Conclusion:** As a multidimensional disorder debilitating to many, depression calls for treatment with a wholesome and holistic approach. BTA does not merely treat the symptoms of depression. It influences the cognitive appraisals of patients while bettering their social life, allowing them to integrate back into society. Although the exact mechanism that surrounds BTA's efficacy has yet to be established, BTA has been shown to be effective and will continue to represent and inspire novel therapeutic interventions for depression.

**Keywords:** Botulinum toxin type A, Depression, Facial feedback theory

Abstract: OR-SR07

## Efficacy of Erythromycin on Esophagogastroduodenoscopy - An Updated Meta-analysis of Mucosal Visibility in case of Upper Gastrointestinal Hemorrhage

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**Background:** Upper gastrointestinal bleeding (UGIB) is a life-threatening condition. Hemorrhagic clots formed around mucosal lesions can obstruct the view of Esophagogastroduodenoscopy (EGD), preventing diagnostic and emergency intervention. Erythromycin has a potent pro-kinetic effect apart from its anti-microbial capability and thus infusion prior to EGD is prospectively to increase mucosal visibility by accelerating gastric emptying. Nevertheless, this particular application of erythromycin is still controversial. Many Asian countries including Thailand have not yet adopted the practice in their guidelines.

**Objectives:** This meta-analysis aims to update evidence on the efficacy of pre-procedure erythromycin infusion in assisting mucosal visibility during EGD.

**Methods:** Two comprehensive database searches were done on Medline and SCOPUS. Randomized controlled trials comparing the administration of erythromycin versus no-medication were included in the study; ten articles passed the inclusion criteria. Pooled estimates analysis including mucosal visibility score, hospitalization, procedure time, and repeated (second-look) endoscopy were performed. PROSPERO registration number: CRD42021281688

**Results:** Here we show that of the ten studies (n = 701) included, Erythromycin treatment improved mucosal visualization (Odds ratio (OR) 4.54; 95% CI: 2.42-8.50,  $p < 0.01$ ), while lowering the need for a second-look endoscopy (OR 0.51; 95% CI: 0.33-0.78,  $p = 0.01$ ) and hospitalization (Mean Difference (MD) -1.75; 95% CI: -2.43 to -1.06,  $p = 0.01$ ). There was no significant change in procedure time and surprisingly, the sum of mucosal visibility score.

**Conclusion:** Patients with UGIB could benefit from erythromycin administration before EGD. Gastrointestinal mucosa visibility was significantly improved in the erythromycin group. This correlates well with reduction of required second-look endoscopy and hospitalization.

**Keywords:** Upper gastrointestinal bleeding, Esophagogastroduodenoscopy, Erythromycin, Mucosal visibility

Abstract: OR-SR03

## Efficacy of Internet-based Cognitive Behavioral Therapy for Psychiatric Problems in Cancer Survivors: a Systematic Review and Meta-analysis of Randomized Controlled Trials

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**Background:** Cancer is one of the leading causes of death globally. Its impact on mortality, disability, lifestyle, and economic burden is significant and could potentially cause emotional distress in patients. Such emotional burdens contribute to the increased prevalence of psychiatric problems in cancer survivors, namely depression, anxiety, fear of cancer recurrence, and impaired quality of life. Cognitive behavioral therapy (CBT) is the current gold standard for psychological treatment, but amidst the ongoing COVID-19 pandemic, mobility restrictions have made it much less effective and efficient. Internet-based CBT can potentially improve the challenges of traditional CBT for more resilient healthcare services in the future.

**Objectives:** This systematic review and meta-analysis aimed to evaluate the efficacy of internet-based CBT to alleviate psychiatric symptoms in cancer survivors.

**Methods:** A literature search was performed in multiple databases including PubMed, Scopus, CINAHL, and Cochrane, searching for studies implementing internet-based CBT for cancer survivors from inception up to August 30<sup>th</sup>, 2021. The quality of studies was 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 possible, sensitivity analyses were performed.

**Results:** There are 11 studies included in this review with a total of 1,961 participants. Internet-based CBT demonstrates promising efficacy in reducing adverse psychosocial conditions in cancer survivors including anxiety (pooled MD: -1.20 [95%CI: -4.60--0.77];  $p = 0.01$ ) and depression (pooled MD: -0.99 [95%CI: -1.80--0.19];  $p = 0.02$ ). Post-intervention, quality of life also significantly improved in cancer survivors (pooled MD: 7.45 [95%CI: 1.30-13.60];  $p = 0.02$ ). In addition, indicators of sleep quality, fatigue, physical activity, and healthy dietary habits also improved post-intervention. Subsequently, the risk of bias assessment revealed an overall good quality of studies included in our review with only two out of nine studies need some concerns.

**Conclusion:** In conclusion, internet-based CBT presents a superior efficacy for improvements of psychosocial conditions in cancer survivors with high satisfaction results and better patient compliance. We recommend further studies to strengthen the evidence for the future possibility of wide-scope clinical application.

**Keywords:** Cancer survivor, Anxiety, Depression, Internet-based, Cognitive behavioral therapy



Abstract: OR-SR05

## Prospect of Mesenchymal Stem Cells and Exosomes as Immunomodulator Agents in the Treatment of Severe COVID-19: a Systematic Review and Meta-analysis

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**Background:** Mortality of patients with severe COVID-19 were often caused by acute respiratory distress syndrome (ARDS) due to systemic hyperinflammation. Based on laboratory and clinical studies, mesenchymal stem cells (MSC) and exosomes are found can regulate inflammation by their regenerative and immunomodulatory effect. Therefore, MSC and exosomes can be promising therapies agents for patients with severe COVID-19.

**Objectives:** This review aimed to summarize the currently available literature that evaluate the immunomodulatory effects and clinical outcomes of MSC and exosomes therapy for patients with severe COVID-19.

**Methods:** This meta-analysis followed PRISMA guideline. Studies evaluating MSC or exosomes therapies in patients with severe COVID-19 were included. Meta-analysis was performed using Mantel-Haenszel fixed-effect model, standardized mean difference (SMD), and odd ratios (OR) with 95% CI. The protocol of this review has already recorded in the PROSPERO with the registry number CRD42021287623.

**Results:** There were statistically significant reduction in inflammation markers level [SMD=-0.84, 95% CI (-1.18, -0.50),  $p < 0.00001$ ] and increment in main lymphocyte level [SMD=0.64, 95% CI (0.35, 0.93),  $p < 0.0001$ ] after exosomes infusion was given. No significant difference between MSC group and control group in the laboratory findings such as C-reactive protein level [SMD = -0.17, 95% CI (-0.59, 0.24),  $p = 0.41$ ], procalcitonin level [SMD = -0.02, 95% CI (-0.44, 0.39),  $p = 0.92$ ], interleukin-6 level [SMD = -0.02, 95% CI (-0.34, 0.31),  $p = 0.92$ ], CD4+ count [SMD = 0.28, 95% CI (-0.13, 0.70),  $p = 0.18$ ], and CD8+ count [SMD = 0.25, 95% CI (-0.16, 0.66),  $p = 0.23$ ]. The recovery event was higher on MSC group than control group [OR=6.56, 95% CI (2.92, 14.71),  $p < 0.00001$ ]. However, there were lower events in MSC group than control group about the mortality [OR=0.28, 95% CI (0.13, 0.59),  $p = 0.0009$ ] and the adverse event [OR = 0.43, 95% CI (0.22, 0.84),  $p = 0.01$ ].

**Conclusion:** The results showed some reductions of inflammation markers and increment of main lymphocytes level, indicating the improvement of immune system function after exosomes therapy. There were no significant differences of inflammation markers and main lymphocytes level after MSC therapy even the trend showed an improvement as well as the exosomes therapy. However, MSC therapy is an effective and safe method in the treatment of severe COVID-19 since it showed high recovery event, less adverse event and less mortality.

**Keywords:** COVID-19, Exosomes, Immunomodulation, Mesenchymal stem cells, Meta-analysis

**ABSTRACT: POSTER PRESENTATION**

Basic Science Research  
Community-based Research  
Hospital-based Research  
Systematic review and Meta-analysis research

Abstract: PO-BS05

## Small Changes, Big Difference: Virulence Factors and *Yersinia* spp.

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**Background:** Although *Yersinia pestis* inherits 98% genetic homology during the evolution from its ancestor *Yersinia pseudotuberculosis*, these two pathogens manifest distinctive clinical features. *Y. pestis* is a causative agent of three plague pandemics with mortality rates approaching 100% without early treatments. In contrast, *Y. pseudotuberculosis* infections lead to self-limited enterocolitis with rare cases of death. It has been widely acknowledged that *Y. pestis* acquires two plasmids and underwent inactivation of specific genes as part of the evolution. However, the mechanism behind the increased virulence of *Y. pestis* relative to *Y. pseudotuberculosis* is poorly understood. This literature review provides fundamental insight into the virulence factors that shape the emergence of *Y. pestis*, which may be beneficial to the development of prevention strategies to avoid the re-emergence of plague.

**Objectives:** This review aims to assess the hypothesis that the small changes in genetic level underlie the big difference in clinical manifestations between *Y. pestis* and *Y. pseudotuberculosis* infections.

**Methods:** To achieve the objective, this review compares each potential virulence determinant of *Y. pestis* and *Y. pseudotuberculosis* and assesses their contributions to virulence and transmission.

**Results:** The findings indicate that *Y. pestis* acquisition of pFra/pMT1 and pPla/pPCP1 plasmids enhance the bacterial capacity to inhibit the host immune response, supplementing the immune-suppressive activities encoded by pYV/pCD1 plasmid which is common to all pathogenic *Yersinia* species. The addition of pFra and pPla plasmids also underlies the emergence of bubonic plague. Moreover, the inactivations of dispensable genes, such as *yadA* and *inv*, remove the redundant activities and promote bacterial dissemination, enhancing the virulence of *Y. pestis*.

**Conclusion:** This review concluded that the small changes in the genetic level enhance the virulence and diverge the transmission route of *Y. pestis*, resulting in a big difference in clinical manifestations.

**Keyword:** *Yersinia pestis*, *Yersinia pseudotuberculosis*, Virulence factor, Pathogen evolution

Abstract: PO-BS07

## Alterations of *Pseudomonas aeruginosa* Pathogenicity through Analysis of Post-transcriptional Sense and Antisense RNA Targeted by RsmN Regulatory Protein

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**Background:** *Pseudomonas aeruginosa* is an opportunistic human pathogen affecting immunocompromised patients leading to complications in healthcare due to high intrinsic antibiotic resistance and coordinated virulence factor production causing difficult-to-treat infections. This gram-negative bacterium can regulate its survival through a switch between two lifestyles: free-living and sessile lifestyles. Free-living induces acute infection and is predominantly cytotoxic, while a sessile lifestyle survives in biofilm-forming communities causing refractory chronic infections. The transition between free-living and sessile lifestyles is governed by the Gac/Rsm regulatory cascade. Alongside mechanisms expressed through sense RNAs, *P. aeruginosa* utilizes antisense small RNAs for effective post-transcriptional regulation allowing a rapid halt in gene translation in response to sudden environmental changes and to hide from host immune response maintaining persistent infection.

**Objectives:** Here, we examine the sense and antisense RNA targets of RsmN, which is involved in the posttranscriptional regulation of gene expression, list the genes identified and possibly reveal an overview of novel post-transcriptional regulation in *P. aeruginosa* pathogenicity.

**Methods:** Using the transcripts previously mapped by Romero et al, signals of RsmN target sense and antisense transcripts were visualized with Artemis. Significant signals (cut-off value of 2.55, corresponding to a 3.5-fold increase in abundance in RsmN-bound RNAs) were cataloged and their functions examined in more detail. This study is based on the first half of *P. aeruginosa*'s chromosome with reference to the second half conducted by another BMedSci graduate.

**Results:** From the genes bounded by RsmN, it can be inferred that RsmN regulates genes involved in quorum sensing, coordinating virulence factor production, catabolite repression system, biofilm formation, anaerobic respiration, cellular stress response, and antimicrobial resistance. RsmN and its associated sRNA govern virulence and control partial duplex inhibition of targeted gene translated by regulating trans-encoded antisense sRNA targeting a broad regulatory pathway.

**Conclusion:** The post-transcriptional regulation control of gene expression by RsmN provides an insight into the mechanisms *P. aeruginosa* uses to alter its pathology according to its surrounding environmental variations. It governs both competitive (e.g., Type VI secretion system, phenazine, virulence factor pyocyanin) and cooperative (siderophore and exopolysaccharide production) traits in *P. aeruginosa*.

**Keywords:** *Pseudomonas aeruginosa*, Antisense, RsmN, Gac/Rsm regulatory cascade, Post-transcriptional regulation

Abstract: PO-BS02

## Discovery of FOXP3 Modulating Drugs by Pharmacogenomics Connectivity Mapping

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**Background:** Regulatory T cells (Tregs) play dual roles in human health and diseases. Tregs maintain immune homeostasis to prevent immune-mediated disorders. In contrast, Tregs in tumor microenvironment suppress antitumor immunity and mitigate the efficacy of immunotherapy. FOXP3, the master transcription factor of Tregs, is recognized as the pharmacologic target for modulating Treg functions. Pharmacogenomic Connectivity Map (CMap) is a new approach to discover new drugs from transcriptomic signatures of genetic knockdowns and small molecules collected in iLINCS database. We propose that iLINCS CMap of FOXP3 knockdown could facilitate the discovery of small molecules with Treg immunomodulatory activity.

**Objectives:** To discover FOXP3 modulating compounds by iLINCS CMap for the experimental validation.

**Results:** Of 21,299 small molecules in the iLINCS database, nine compounds were identified as the top candidates. These included small molecule inhibitors targeting cyclin-dependent kinases (CDKs), the mechanistic target of rapamycin (mTOR), phosphatidylinositol-3-kinase (PI3K), DNA topoisomerase-2 alpha (TOP2A), and histone deacetylase (HDAC). Flow cytometry revealed that four out of nine candidates downregulated FOXP3 protein expression in CD4+T cells. In addition, these compounds at 100 nM significantly suppress the differentiation of human peripheral blood CD4+T cells to CD4+CD25+FOXP3+Tregs compared to the positive control using TGF-beta stimulation.

**Conclusion:** This study discovered four small molecule inhibitors with Treg suppressive effect. Further investigations at molecular and cellular levels are required to confirm this promising result.

**Keywords:** CMap, Drug discovery, FOXP3, iLINCS, Tregs

Abstract: PO-BS03

## Anti-biofilm Activity of *Streptomyces* Extracts Isolated from Soil against *S. epidermidis*

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**Background:** The ability to form biofilm is a major virulence factors for *Staphylococcus epidermidis* that makes it able to stay on the surface of objects and tissues mediating the medical device-related infections in human.

**Objectives:** The present study aimed to evaluate the anti-biofilm activity of ethyl acetate crude extracts derived from soil *Streptomyces* spp.

**Methods:** The competence of biofilm formation by seven *S. epidermidis* isolates was screened using the microtiter plate assay. The selected isolate was further tested for the biofilm inhibition by nine crude extracts with vancomycin as the control. The difference of biofilm inhibition among each crude extracts and vancomycin were analyzed by ANOVA and T-test. A  $p < 0.05$  was statistically significant.

**Results:** The results showed that six isolates (85.7%) were positive for biofilm formation. The isolates P27.4 and P18.4 were the highest and moderate biofilm former respectively; therefore, the isolate P24.7 was chosen for evaluation of the biofilm inhibition. The 7B1 extract markedly exhibited the highest inhibitory effect against biofilm at  $0.25 \times \text{MIC}$ .

**Conclusion:** Though, two biofilm-positive isolates (P18.4 and P27.4) with moderate and high biofilm producers were retrieved from food samples, they could be likely virulent as well as biofilm-positive clinical isolates. Gajewska et al., 2020 found that a higher number of coagulase-negative staphylococcal strains (85.7%) collected from raw cow milk was capable of forming a strong biofilm than *S. aureus* (58.3%) when tested by a microtiter plate method. The difference in biofilm-forming ability of various isolates could be the influences of the growth conditions used and different adherence mechanisms on polystyrene microtiter plates (Stepanovic et al., 2000). Regarding to vancomycin, it showed weaker anti-biofilm activities than the 7B1 extract. It is possibly due to vancomycin could not diffuse well through the membrane of attached biofilm; consequently, it is ineffective to inhibit the growth of *S. epidermidis* P27.4 within the biofilm (Kiamco et al., 2015). In summary, the effective 7B1 extract could be an alternative agent to apply for reducing the infection rates caused by biofilm-producing *S. epidermidis* in the near future.

**Keywords:** Anti-biofilm, Crude extracts, Soil *Streptomyces* spp., *Staphylococcus epidermidis*

Abstract: PO-BS04

## ***In Silico* Derivatization and Experimental Validation of a Novel Anti-cancer Peptide**

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**Background:** Cancer accounts for about 29.8% of premature deaths worldwide. In contrast, the efficacies of chemotherapy and targeted therapies are restricted due to increased cancer resistance via many mechanisms. Anti-cancer peptide (ACP) is rising as a new class of potential cancer therapeutics. Our group has recently identified a naturally occurred peptide from human breast milk, in which its synthetic form is named HMP-S7 (Chiangjong W, et al., *Biomedicines* 2021;9(8):981). This study aims to use HMP-S7 as the lead for *in silico* derivatization of novel ACPs to test anti-cancer activity. Adding, deleting, or substituting amino acid residues of the lead ACP would modify its cytotoxic activity against cancer cells.

**Objectives:** To *in silico* derivatize the lead HMP-S7 and examine their anti-cancer activities against cancer cell lines *in vitro*.

**Methods:** HMP-S7 served as the lead ACP for *in silico* peptide derivatization based on amino acid substitution. The *in silico* peptide derivatives were checked for their likelihood of being ACP using three machine learning (ML) models, including anti-CP, mACPPred, and ACPred-FL. Secondary peptide structure was predicted by the PEP-FOLD3 program. HMP-S7 derivatives, owning equally or more positive charges, maintaining alpha-helix form, and having greater predictive scores compared to the lead HMP-S7 were applied to further measure cancer cytotoxicity against five cancer types by MTT assay.

**Results:** The consensus ML scores of three peptide derivatives (B1, 0.8693; B2, 0.8296; B3, 0.9144) were improved over the lead peptide (HMP-S7, 0.6961). However, only B1 and B3 retain the alpha-helical structure after derivatization. The experimental validation showed that the B3 peptide had the highest cancer cytotoxicity among three peptide derivatives, consistent with the ML consensus scores. The B3 peptide (200 M) significantly suppressed the cell viability of A549 lung adenocarcinoma cells ( $1.2 \pm 0.3\%$  vs.  $99.3 \pm 0.6\%$ ;  $p < 0.001$ ) and MDA-MB-231 breast adenocarcinoma cells ( $3.6 \pm 1.7\%$  vs.  $97.5 \pm 2.2\%$ ,  $p < 0.001$ ) compared to the untreated control condition.

**Conclusion:** This study discovered the B3 peptide derivative of HMP-S7, showing potent anti-cancer activities. Further studies focusing on the mechanism of action are warranted.

**Keywords:** Anti-cancer peptide, Drug discovery, *In silico* design, *In vitro* cytotoxicity, Machine learning



Abstract: PO-BS06

## Alpha-lactalbumin Derived Anti-cancer Peptide Screening by Machine Learning Approach (AMMA study)

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**Background:** Cancer is the second leading cause of death globally. Current cancer treatments are facing challenges of drug resistance. Anti-cancer peptide (ACP) is rising as a new class of cancer therapeutics. However, the traditional laboratory screening to discover a novel ACP out of hundreds-to-thousands peptides has not cost- and time-effective. We propose that *in silico* ACP screening combined machine learning (ML) and experimental validation can address this issue.

**Objectives:** To discover a novel ACP by integrating *in silico* ACP screening and *in vitro* validation.

**Methods:** An R script was coded to generate all possible peptides (5-25 amino acids in length) from alpha-lactalbumin, a human milk protein previously reported to have anti-cancer properties. Peptides were then filtered for positively charged peptides and then scored for ACP probabilities by three ML models, including mACPred, ACPred-FL, and anti-CP2. The secondary structure of the peptide was predicted by the PEP-FOLD3 program. The candidate ACPs were identified depending on the consensus scores of 3 ML models, with 3+ charges and alpha-helical structure. The anti-cancer effects of candidate ACPs were validated against cancer cell lines *in vitro*. A *p*-value < 0.05 was considered statistically significant.

**Results:** A total of 2,688 unique peptides were generated from alpha-lactalbumin by our in-house R script. Of these, 25 peptides have 3+ charges, and 18 of them contain helical structures. *In silico* ACP screening by 3 ML models identified the top 3 candidate peptides, namely AMMA-1 to 3. The experimental validation revealed that AMMA-2 peptide (200 M), but not AMMA-1/3 peptides, significantly induced cell death of A549 lung adenocarcinoma cells ( $59.7 \pm 1.1\%$  vs.  $98.1 \pm 5.6\%$ ;  $p < 0.001$ ) and HT20 colon adenocarcinoma cells ( $55.3 \pm 2.7\%$  vs.  $101.2 \pm 4.3\%$ ;  $p < 0.001$ ) as compared to the control untreated condition.

**Conclusion:** This study established the integrated approach of *in silico* ACP screening and experimental validation and discovered AMMA-2 as a novel ACP deriving from alpha-lactalbumin. Future studies can apply this integrated approach to a more extensive peptide library for discovering more candidate ACPs. AMMA-2 could serve as the lead ACP for further developing the therapeutic peptide for lung and colon cancers.

**Keywords:** Alpha-lactalbumin, Anti-cancer peptide, Drug discovery, *In silico* screening, Machine learning

Abstract: PO-BS01

## Development of Extracellular Vesicle-based Liquid Biopsy for MYCN-amplified High-risk Neuroblastoma

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**Background:** MYCN amplification is an important marker for detecting high-risk neuroblastoma (NB), an aggressive neuroblastic tumor with a poor prognosis. Currently, high-risk NB diagnosis needs invasive procedures, e.g., bone marrow aspiration and tumor biopsies. Extracellular vesicles (EVs) are cell-derived particles that contain molecular signatures (e.g., DNA, RNA, proteins) of originate cells. NB tumor-derived EVs could be an invaluable source for detecting MYCN amplification as a less-invasive liquid biopsy of high-risk NB. Nevertheless, there is no such method described at this moment.

**Objectives:** This study aimed to establish a method for detecting MYCN amplification status in EVs deriving from MYCN-amplified NB cell lines.

**Methods:** Two EV subpopulations, i.e., microvesicles and exosomes, were isolated from cell culture supernatants of MYCN-amplified and MYCN-non-amplified NB cell lines using multi-step centrifugation, ultrafiltration, and size exclusion chromatography. The isolated EVs were characterized using Western immunoblotting, transmission electron microscopy, and nanoparticle tracking analysis for protein markers and particle evidence. MYCN amplification status was detected by MYCN mRNA overexpression in NB cell line-derived EVs using quantitative RT-PCR. The feasibility of this method was demonstrated by pulsing NB cell line-derived EVs into human serum before isolating EVs and detecting MYCN amplification status.

**Results:** Microvesicles and exosomes were successfully isolated and characterized by protein markers and particle evidence. MYCN amplification status could be detected in microvesicles, but not exosomes, of three different MYCN-amplified NB cell lines compared to those of MYCN-non-amplification. A validation study was performed by pulsing large EVs of MYCN-amplified NB into the human serum. As expected, MYCN amplification status was precisely detected in the isolated EVs out of human serum background.

**Conclusion:** This study established the microvesicle-based liquid biopsy method to detect MYCN amplification status of NB cell lines. Future studies are warranted to evaluate this method applicability for detecting MYCN amplification status in the relevant clinical specimens, aiming to serve as the less invasive liquid biopsy for the high-risk NB diagnosis.

**Keywords:** Extracellular vesicles, High-risk neuroblastoma, Liquid biopsy, Microvesicles, MYCN amplification

Abstract: PO-CB04

## Knowledge, Attitudes and Beliefs related to Preeclampsia among Pregnant Women in Bangkok, Thailand: a Cross-sectional Study

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**Background:** Preeclampsia is the most common complication in pregnancy, the majority of deaths related to preeclampsia could be avoided with effective care. However, limited information is available about knowledge and attitude toward pre-eclampsia among pregnant women in Bangkok, Thailand.

**Objectives:** This study aimed to explore knowledge, attitudes, and beliefs on preeclampsia among pregnant women during their pregnancy period in Phramongkutklao Hospital, Bangkok, Thailand.

**Methods:** A cross-sectional survey was conducted on pregnant women at the antenatal clinic over a period of 2 weeks. The questionnaire collected demographic and other data; it included 19 questions on their general knowledge and attitude toward preeclampsia including their awareness of the disease during pregnancy. The data was analyzed quantitatively. This research protocol was approved by the ethics committee of Institutional Review Board of the Royal Thai Army Medical Department and all participants had been given informed consent to participate in the research study.

**Results:** In total, 100 pregnant women participated and provided information through a self-administered questionnaire. From the analyzed data, it was found that 1.05% of the interviewed women, did not know anything about the subject. The rest was evaluated as they had some knowledge about the topic. From those, 48.42% have little knowledge on the topic and 50.53% gave the almost entirely correct definition. Moreover, 65.35% have positive attitude, while the rest tend to have negative attitude towards risk of preeclampsia.

**Conclusion:** Despite of the impact that preeclampsia represents on mother and baby's health, our results show that information in the studied group, is relatively high. The studied group has more access to information, showing us that access to information is a key to educate patient. Thought people have high knowledge of the disease, but the risks are overlooked. Thus, we believe that it is necessary to apply instruments that could redefine, in a greater way, the real information level to the female population in all levels of assistance. In an era that social nets had changed human behavior, why should not we use it as an efficient tool to promote life quality?

**Keywords:** Preeclampsia, Pregnancy, Knowledge

Abstract: PO-CB05

## Effectiveness and Safety of an Integrated Self-monitoring Strategy and Health Education for Hypertensive Patients in Rural Area, Thailand: a Pre-post Intervention Study

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**Background:** Hypertension has been a major concern of national health policy in both developed and developing countries for decades. Despite various health interventions, the proportion of well-controlled hypertension is still unsatisfied.

**Objectives:** To determine the effectiveness and safety of an integrated self-monitoring strategy and health education for hypertension control.

**Methods:** A triple-arm pre-post study was conducted. The three programs included only self-monitoring strategy, only health education, and self-monitoring strategy with health education. Three separated areas were randomly selected for each program, then participants were randomly allocated into it. For a self-monitoring strategy, participants were given pedometers and simultaneously recorded data into their daily personal logbook with local health volunteers to regularly visit to provide support. The health education group would be provided with monthly conferences related to hypertension for four consecutive months. Systolic blood pressure, diastolic blood pressure, body mass index, and over health score were collected pre/post sessions. Comparisons were performed using paired t-tests and ANOVA tests. The protocol of this study was reviewed and approved by the IRB of the Royal Thai Army Medical Department.

**Results:** A total of 61 participants was enrolled in the study. The demographic and the baseline characteristics were collected at the beginning of the study. The mean systolic blood pressure, diastolic blood pressure in the target population was  $131.2 \pm 16.0$ . The total daily walking steps were  $4,125.1 \pm 5,433.7$  which was low compared to published healthy daily steps studies. However, the study was unable to process to the follow-up session.

**Conclusion:** The integrated intervention generally has positive effect reducing blood pressure and cardiovascular disease risk. The limitation of this study included the lockdown during COVID-19 pandemics which rendered the completion of data collection in the final month unavailable. However, this combination can be very effective, promising, and safe for hypertensive people.

**Keywords:** Hypertension, Health education, Self-monitoring strategy, Pedometer

Abstract: PO-CB10

## Willingness to Receive a COVID-19 Vaccine among Pregnant Women Residing in Thailand during the Delta Variant COVID-19 Pandemic

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**Background:** Though there is an increase in the number of effective COVID-19 vaccines, acceptance of these vaccines is a necessary component in fighting against the COVID-19 global pandemic. Pregnant women are especially susceptible towards symptomatic COVID-19 with an increased risk for severe illness more than non-pregnant people, and there have been studies conducted to estimate the acceptance of such vaccines among pregnant women, but such estimations within the Thai population are still undetermined.

**Objectives:** It is important to measure the level of vaccine acceptance in this group and investigate the predictors for their vaccine acceptance or reluctance in order to prepare for COVID-19 vaccination efforts.

**Methods:** In this study, we measured the level of currently available COVID-19 vaccine acceptance, attitude, and key predictors of COVID-19 vaccine acceptance among pregnant women through online and paper-based forms, distributed to all regions in Thailand between July and October 2021. Information on their attitude towards different forms of the COVID-19 vaccine and reasons for any hesitancy were collected.

**Results:** A total of 138 valid survey responses were obtained through convenience sampling. Fifty-nine percent of participants are willing to receive the Thai FDA-approved COVID-19 vaccines. In addition, participants were given information on composition, safety, and effectiveness, but not the commercial name and manufacturers, of the three currently available COVID-19 vaccines and were asked about their vaccine acceptance and concerns. An mRNA vaccine (BNT162b2) has the highest acceptance (59%) followed by an inactivated (CoronaVac) whole virion vaccine (30%) and AstraZeneca's ChAdOx1-S adenoviral-vectored vaccine (17%). Among those unwilling and unsure about the vaccines mentioned above, the greatest concern is the safety of the mother and fetus.

**Conclusion:** The degree of reliability of vaccine and COVID-19 information sources was highest in personal obstetricians and lowest in state media. Therefore, it is important for the government to build trust in the public to tackle this problem.

**Keywords:** Acceptance of COVID-19 vaccination, Pregnant women, Vaccine hesitancy

Abstract: PO-CB08

## Prevalence and Associated Factors of the Utilization of Traditional, Complementary and Alternative Medicine among Hypertensive Patients in a Rural Community, Thailand

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**Background:** The aim of this study was to determine the prevalence and associated factors of traditional, complementary and alternative medicine (TCAM) use among hypertensive patients in a rural community of Thailand.

**Objectives:** The objectives of this study were to determine the prevalence and associated factors of the utilization of traditional, complementary and alternative medicine among hypertensive patients in a rural community of Thailand.

**Methods:** a cross-sectional survey in with all hypertensive patients who live in Baan Na Yao, Baan Na Ngarm, Tung Heang, Tung Sor Hong Sar, Sanamchaikhet District, Chachoengsao Province, Thailand.

**Results:** A total of 207 participants diagnosed with hypertension. The majority of participants was Buddhism, primary school, uncontrolled blood pressure and had been married. Prevalence of TCAM use was 69.1%, herb was the most method used. Education level at high school, Buddhism, uncontrolled blood pressure, married and no antihypertensive drugs use was more likely use TCAM. Multivariate analysis found that TCAM use was significantly associated with to be married.

**Conclusion:** TCAM use among hypertensive patients in a rural community of Thailand was quietly high. Herb is the most popular method had been used especially Thai basil. To be married was associated to TCAM use. Better knowledge on the use of different TCAM modalities in this population may improve patient management. This study found that herb is mostly used same as the study of TCAM use among chronic disease in Vietnam and Cambodia, difference from study in Lao which physical therapy was the most method had been used. The study found that many factors was significant in univariate analysis but to be married was only factor significant in multivariate analysis, this may cause from too small sample size or inappropriate group of data.

**Keywords:** Traditional medicine, Complementary medicine, Alternative medicine, Rural community



Abstract: PO-CB09

## Correlation of Body Fat Percentage and 10-year Cardiovascular Risk Score in Thai Rural Population

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**Background:** Cardiovascular disease has been a major cause of death in Thai population. Risk factors of this disease can be classified as non-modifiable and modifiable cause. Male, having hypertension, diabetes and dyslipidemia were seen to be strongly associated. Thai CV risk score is one of the tools that calculate these risk factors to estimate 10-year risk for cardiovascular disease. Another tool that can collect data about body composition is to use a device with bioelectrical impedance analysis (BIA). The main purpose of this study was to explore the correlation between body fat percentage and 10-year cardiovascular risk score in Thai rural population.

**Objectives:** To study the correlation of body fat percentage and 10-year cardiovascular risk score in Thai rural population. To advise about primary prevention cardiovascular disease.

**Methods:** A total of 101 participants (43 men and 58 women), 35 to 70 years old, living in Na-Yao, Chachoengsao, Thailand participated in this study. Data were collected by using online questionnaire and BIA device, including further calculation of Thai CV risk score.

**Results:** A total of 101 adults in Na-Yao community were included in the study. The prevalence of high 10-year cardiovascular risk was 27.7%. The high 10-year cardiovascular risk was associated with higher age group (55-64 years old OR 7.15; 95%CI 1.43-35.67, 65-70 years old OR 30.25; 95%CI 4.78-191.47), grade I hypertension (OR 3.64; 95%CI 1.17-11.34), diabetes mellitus (OR 12.00; 95%CI 1.28-112.66), and higher body fat percentage (OR 1.375; 95%CI 1.17-1.62).

**Conclusion:** The present information indicates that body fat percentage can effectively increase risk to develop cardiovascular diseases. The high 10-year cardiovascular risk was also found related to the prevalence of diabetes mellitus, grade I hypertension, and higher age group at 55-70 years old. Effective health intervention should be provided to the community to reduce excessive body fat to prevent the progression of cardiovascular diseases and their complications.

**Keywords:** Body fat percentage, CV risk score, Cardiovascular disease, Rural community



Abstract: PO-CB07

## Behavioral Modification Package for Reduction of Uncooked Fish Consumption to Control Liver Fluke Infection in Thai Rural Community

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**Background:** Consumption of a traditional dish, "Koi Pla" or uncooked white scale fish, is a risk factor for *Opisthorchis viverrini* infection. From the community survey in the northeastern part of Thailand, opisthorchiasis is still prevalent.

**Objectives:** The main objective of this research is aimed to reduce the infection by encouraging behavioral modification through self-report and peer observation strategy.

**Methods:** This research was a community-based intervention trial conducted in Na Yao Village, Chachoengsao Province. Research participants were divided into study and control groups. Both groups received standard health education for good food hygiene and sanitation. For intervention groups, consumption of Koi Pla was recorded by themselves or family members to contribute negative reinforcement which would eventually change their eating habits. Stool examination was later performed to assess and compare the burden of infection.

**Results:** For the results, the study group of 364 individuals received the intervention. Preliminary analysis showed no statistical difference in Koi Pla consumption behaviors between groups.

**Conclusion:** The primary outcome cannot be conclusively assessed as the results of the stool examination are still in process.

**Keywords:** *Opisthorchis viverrini*, Behavioral modification package, Liver fluke infection, Uncooked fish consumption

Abstract: PO-CB01

## Knowledge, Attitudes, and Practices among Health Personnel towards COVID-19 Outbreak in Sanam Chai Khet Hospital, Chachoengsao Province, Thailand

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**Background:** Currently, the COVID-19 pandemic situation affects many countries, including Thailand. Medical and public health personnel is the key person in patient care, disease control and prevention.

**Objectives:** To identify relationship between knowledge, attitudes, and practices of health personnel towards COVID-19 outbreak in Sanam Chai Khet Hospital, Chachoengsao Province, Thailand.

**Methods:** A cross-sectional descriptive study was conducted at Sanam Chai Khet hospital, Chachoengsao Province, from 7 June to 4 July 2021. Data collection using Google Form, online questionnaires (reliability coefficient = 0.71) was done. Data analysis, using SPSS for window as descriptive statistics, t-test, and one-way ANOVA were utilized. The relationship between knowledge, attitudes, and practices was measured using Pearson correlation coefficient.

**Results:** A total of 176 participants enrolled in the study, 13.6% were male, and consisted of health professionals 67.0%, paramedics 20.5% and other 12.5%. It was revealed that they had good knowledge and practices, moderate level of attitudes towards COVID-19. 35.8% of them lacked confidence in Thai public health care system and 42.0% were still afraid of individuals infected with coronavirus. They were all wearing masks and frequent washing their hands, and 96% practicing social distancing and staying at home. However, 25.6% of them had improper care while coughing or sneezing. Their knowledge was significantly associated with gender, income, fields of work, and levels of education whereas their attitudes were associated with years' experience, fields of work, and levels of education. However, there was no statistical correlation between knowledge, attitudes, and practices.

**Conclusion:** The majority of health personnel have good knowledge and practices during the COVID-19 situation. However, some of them still lacked of knowledge, had negative attitudes and improper practices. Therefore, it is recommended to create awareness among health personnel by providing knowledge, information, proper attitudes, and practice guidelines to strengthen the effort of the COVID-19 prevention and control.

**Keywords:** Knowledge, Attitudes, Practices, Health personnel, COVID-19

Abstract: PO-CB02

## Risk Factors Related to Type II Diabetes in Primary Hypertension Patients, Phanom Sarakham Hospital, Chachoengsao, Thailand

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**Background:** Noncommunicable diseases are major public health problems worldwide including Thailand. Hypertension (HT) associated with diabetes mellitus (DM) will increase the risk of premature deaths in patients.

**Objectives:** To study the risk factors related to type II DM in primary HT patients of Phanom Sara Kham Hospital, Chachoengsao, Thailand.

**Methods:** A case-control study was conducted. Data were acquired from HOSxP electronic medical records of primary HT patients at HT clinic, Phanom Sarakham Hospital during 1<sup>st</sup> January 2020 - 31<sup>st</sup> December 2020. Statistical analysis for descriptive and qualitative statistics, using Pearson's Chi-square test and Independent samples T-test, were performed via SPSS version 16.

**Results:** A total of 724 primary HT cases (515 female) were reviewed and divided into 2 groups: 362 cases with type II DM were classified as the study group whereas those without type II DM were the control. It was reported that there were statistical relationships between type II DM and poor blood pressure control (OR = 1.52, 95%CI = 1.10-2.08, *p*-value = 0.011) and age of 50 or more (OR = 1.09, 95% CI = 1.35-4.00, *p*-value = 0.002). Gender, smoking, and drinking behaviors showed no relationship with type II DM in this study.

**Conclusion:** Poor blood pressure control is one of the risk factors related to type II DM in primary HT patients. Therefore, it is recommended to educate these patients to take medications regularly, weight management with diet, and exercise, including periodic screening for DM.

**Keywords:** Risk factors, Type II diabetes, Primary hypertension, Case-control study

Abstract: PO-CB03

## A Comparison of the Incidence of Acute Coronary Syndrome in Tha Luang Hospital, Tha Luang District, Lopburi province, Thailand during COVID-19 Pandemic and Non-COVID-19 Pandemic

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**Background:** The evidence of ACS incidence during COVID-19 pandemic in community hospital in Thailand was limited.

**Objectives:** The objectives of present study were aimed to determine the incidence of ACS among patients with NCDs during COVID-19 pandemic period as well as comparing to that during non-COVID-19 pandemic period. Furthermore, the investigator determined the risk factors for ACS among patients with NCDs.

**Methods:** A retrospective cohort study was conducted in Tha Luang community hospital, Lop Buri Province in Thailand. The eligible criteria for participants were patients with NCDs aged  $\geq 35$  years visiting in Tha Luang Hospital during February 1, 2019 - February 29, 2020 (during non-COVID-19 pandemic period) and Mar 1, 2020 - Mar 1, 2021 (during the COVID-19 pandemic period). The Patients with NCDs including type 2 diabetes (T2D), hypertension (HT), and dyslipidemia (DLP) were defined by according to the International Classification of Diseases, Tenth Revision codes (ICD-10) which presented in medical record. ACS data was determined by the ICD-10; I20-24. Multivariable cox proportional hazard regression analysis was used to determine the risk factors for ACS and the magnitude of association was presented as adjusted hazard ratio (aHR) with 95% confidence interval (95%CI).

**Results:** A total of 4,962 patients were enrolled in the study. In all, there was 3,049 females (61.45%). The average age of participants at baseline was  $62.28 \pm 12.16$  years. The cumulative incidences of ACS among patients with NCDs were 0.48% and 0.50% during non-COVID-19 pandemic and COVID-19 pandemic periods, respectively ( $p$ -value = 0.999). The incidence rate of ACS was 4.7 cases/1,000 person-years. The risk factors of ACS included age  $\geq 62$  years (aHR 2.09, 95% CI: 1.06-4.12), DLP (aHR 6.42, 95% CI: 3.39-12.17), having systolic blood pressure (BP)  $\geq 149$  mm Hg or diastolic BP  $\geq 90$  mm Hg (aHR 3.86, 95% CI: 1.93-7.71), pulse pressure  $< 56$  mm Hg (aHR 2.33, 95% CI: 1.14-4.78).

**Conclusion:** The incidences of ACS among patients with NCDs visiting in community hospital between COVID-19 pandemic and non-COVID-19 pandemic periods were not different. The ACS among patients with older age should be closed monitored. The modifiable risk factors including high BP and high cholesterol should be attenuated.

**Keywords:** Acute coronary syndrome, COVID-19, Risk factors, Tha Luang Hospital

Abstract: PO-CB06

## The Study of Mental Health and Associated Factors in Recovered COVID-19 Patients in Narathiwat Province

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**Background:** The severe acute respiratory syndrome coronavirus (COVID-19) pandemic could induce psychopathology, and psychiatric sequelae were observed after previous coronavirus outbreaks.

**Objectives:** The aim of this descriptive study was to evaluate the association between mental health and the factors found in patients recovering from COVID-19.

**Methods:** The 29 volunteers derived from Narathiwat Province selected with the specific criteria. The data was collected by the questionnaire comprised of 12 general mental health questions, 2 depression screening questions and 9 depression assessment questions. The analysis was performed by descriptive statistics with Fisher's exact test.

**Results:** The result showed that 10.34% of COVID-19 recovered patients (3 of 29) in Narathiwat province displayed the risk of mental health problems while 17.24% of patients (5 of 29) demonstrated the low level of depression. Moreover, the number of the income of the patient was found to be associated with both mental health and depression symptoms ( $p = 0.05$  and  $0.017$ , respectively).

**Conclusion:** This study included 29 participants who recovered from COVID-19 disease in Narathiwat Province, Thailand. After data analysis, 10.34% of COVID-19 recovered patients (3 of 29) in Narathiwat province displayed the risk of mental health problems while 17.24% of patients (5 of 29) demonstrated the low level of depression. However, this result needs more data from other investigation for comparative study.

**Keywords:** Mental health, Depression, COVID-19 recovered patients, COVID-19, Low income

Abstract: PO-HB10

## Comparison RIPASA Score and Alvarado Score to Help Management in Suspected Acute Appendicitis Case Presented with Abdominal Pain in Primary Care Unit

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**Background:** Acute appendicitis is the most common causes of acute abdomen. The incidence worldwide is approximately 100 per 100,000 people. Despite the widely used of Alvarado score system, there are limitations for application in Asian populations. Therefore, a new assessment called RIPASA score has been invented which is claimed to have higher accuracy than Alvarado score.

**Objectives:** To compare the RIPASA score and Alvarado score to help manage cases suspected acute appendicitis showing abdominal pain in Sanamchaiket Hospital.

**Methods:** A cross-sectional study was conducted to compare Alvarado score and RIPASA score in suspected cases of acute appendicitis in Sanamchaiket Hospital. By collecting patient data from past medical records.

**Results:** From the study, it was found that the prevalence of acute appendicitis was 54.0%. The data were used to calculate the Alvarado score and the RIPASA score and present it as the ROC curve. The Alvarado score at the 4-cut-off point had the sensitivity at 92.6%, the specificity at 46.5%, the positive predictive value at 63.8% and the negative predictive value at 86.2%. Using the 7-point intersection, the sensitivity, the specificity, the positive predictive value, and the negative predictive value was 57.8%, 88.2%, 83.0%, and 67.6%, respectively. While RIPASA score at the intersection 5.5 points showed the sensitivity at 97.0%, the specificity at 21.5%, the positive predictive value at 55.2% and the negative predictive value at 87.7%. At the intersection of 7.5 points, the sensitivity, the specificity, the positive predictive value, and the negative predictive value was 83.0%, 63.2%, 69.2%, and 78.8%, respectively.

**Conclusion:** A total of 450 participants were enrolled, 243 were diagnosed with acute appendicitis, with a prevalence of 54.0%, and Alvarado and RIPASA scores were not different in the diagnosis of acute appendicitis.

**Keywords:** Appendicitis, RIPASA, Alvarado

Abstract: PO-HB01

## Is Sentinel Lymph Node Biopsy without Frozen Section in Early-stage Breast Cancer Sufficient in accordance with ACOSOG-Z0011

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**Background:** In 2021, there is increased usage of permanent sections (PS) without intraoperative frozen sections (FS) for sentinel lymph node biopsies (SLNBs) worldwide. The ACOSOG Z0011 criteria revealed that re-operating for axillary lymph node dissection (ALND) was not necessary in patients with 1 or 2 nodal metastases. Surgeons globally began to cease implementation of FS. PS alone was thought to be sufficient for sentinel lymph node (SLN) diagnosis.

**Objectives:** This pilot study conducted in Thailand aims to determine the re-operation rate in SLNB cases without usage of FS.

**Methods:** We retrospectively reviewed 86 cases of SLNB without FS at King Chulalongkorn Memorial Hospital from April 2019 to April 2021. These patients were diagnosed with primary invasive breast cancer with clinically negative nodes, as determined from physical examinations, breast ultrasonography and mammogram. The need for re-operation was determined by the number of positive SLNs; patients with 3 or more SLN metastases were subjected to a second ALND surgical procedure.

**Results:** Between April 2019 and April 2021, 86 patients underwent SLNBs in accordance with the ACOSOG Z0011 criteria with the usage of PS alone. A single case was converted to ALND due to SLN identification failure and thus was excluded from the analysis. A total of 338 SLNs were removed from the remaining 85 patients, with an average of 3.98 nodes per patient. Nine out of 85 patients (10.6%) had metastatic disease in 1 node while the remaining 76 (89.4%) patients had no nodal metastasis. None of the patients were subjected to second surgical procedure.

**Conclusion:** With a re-operation rate of 0%, we suggest that implementation of SLNB with PS alone in patients who satisfy the ACOSOG Z0011 criteria is no different from care offered by additional FS analysis. Cessation of routine intraoperative FS could decrease operative cost, operative time, and anesthetic side effects.

**Keywords:** Permanent section, Intraoperative frozen section, Breast cancer, ACOSOG Z0011, Sentinel lymph node biopsy



Abstract: PO-HB02

## Risk Factors Associated with Successful Suicide in Patients in Plangyao Hospital, Chachoengsao Province, Thailand

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**Background:** Suicide has been a major problem in Thai society which affects individuals, their family, and even the community. Recently, statistical data reported that death rates from suicide in Plangyao Hospital, Chachoengsao Province has been on the rise.

**Objectives:** To determine associated risk factors in patients who had successful suicide, admitted to Plangyao Hospital, Chachoengsao Province, Thailand.

**Methods:** A retrospective cohort study was conducted at Plangyao Hospital, from 2018-2021. Data collection using medical records via hospital information system was done. Data analysis, using SPSS version 16.0 for Window as descriptive statistics, Chi square, odds ratio, and 95% confidence interval was done. Binary logistic regression was used to analyze the significant risks.

**Results:** A total of 112 cases, 48 (42.9 %) were male. There were 36 cases had successful suicide whereas 58.3% were male. It was revealed that associated risk factors with successful suicide were male gender (OR = 1.55, 95% CI = 1.02-2.36), age > 60 years (OR = 3.33, 95% CI = 1.06-10.48), and alcohol & drug abuse (OR = 2.68, 95% CI = 1.16-6.19). Regarding suicidal methods, hanging was the most successful method of suicide (OR = 4.43, CI = 1.85-10.61). According to chronic illness, only chronic physical illnesses showed significant association with suicide (OR = 2.63, 95% CI = 1.06-6.54). The most common trigger factor for successful suicide was family and individual relationship problems (83.8%).

**Conclusion:** This study highlights the importance of having a more effective method in identifying those who were at risk of suicide as well as providing them with holistic care. Involvement of several sectors ranging from the hospital to the community and the local services for suicide prevention are recommended.

**Keywords:** Successful suicide, Suicidal attempt, Risk factors

Abstract: PO-HB05

## Resilience Stress and Associated with Glycemic Control among People with Type 2 Diabetes Mellitus, Tha Luang Hospital

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**Background:** Diabetes is a major health problem globally and nationally. In addition to biological causes, stress is also considered as a risk factor. Stress in the time of COVID-19 crisis could potentially affect quality of life including diabetes care and treatment.

**Objectives:** To study the prevalence and associated factors of stress, resilience, health literacy and health-related behavior of diabetic patients.

**Methods:** In October 2021, the cross-sectional study was conducted in diabetic patients who received treatment at Tha Luang Hospital in Central Thailand using standardized questionnaires to assess health literacy and health behaviors. Stress and resilience were evaluated using Mental Health and ST5 Questionnaire from Department of Mental Health, Thailand.

**Results:** There were 47 participants in the study, respond rate were 28% (47/163) of the diabetic patients who attended for services during October 5-16, 2021. Major characteristics were female (68.1%), age over 60 years old (44.7%), non-smokers (83.0%) and most of participants had educational level at primary school (80.9%). Health conditions included 1<sup>st</sup>-stage obesity (42.6%), hypertension (76.6%) and dyslipidemia (74.5 %). From the assessment, 66.0% of participants had good health literacy (66.0%), poor health-related behaviors (93.6%), unable to control sugar level (74.5%). Most of stress level was low level (55.3%) with high resilience (59.6%). This study did not find a relationship between stress, resilience, health-related behavior, and health literature and diabetes. From the interview, the major issue of stress is financial problem. Farmer's lifestyle and limited choices of healthy diets may be the causes of poor health behavior.

**Conclusion:** Despite good health literacy, high resilience and low in stress, the diabetic participants in this study still have poor health-related behaviors. Further studies should be conducted to address the root cause of health behaviors in order to establish health promotion strategies.

**Keywords:** Stress, Resilience, Diabetes mellitus, Health literacy, Behavior

Abstract: PO-HB06

## Predictive Readmission Rate using MELD-Na, PALBI, CiMM and Associated Factors of Decompensated Cirrhosis in Primary Health Care Center Phatthananihom Hospital, Lopburi, Thailand

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**Background:** Cirrhosis is a disease that occurs in the late stages of many chronic liver diseases and can lead to deaths worldwide. In Thailand in 2010, it was discovered that cirrhotic patients who were hospitalized had a mortality rate of 10.7%, compared with the overall hospital mortality rate. Patients with cirrhosis who were hospitalized had a death rate ranging from 3.3% to 40%, depending on complications and co-morbidities. If there are complications, the mortality rate will rise and if a cirrhotic patient with a complication is admitted to the hospital once, the rate of re-hospitalization with the same or other complications will be higher.

**Objectives:** The aim of this research was to use MELD-Na, PALBI, CiMM score and associated factors for predicting readmission rate of decompensated cirrhosis as a tool that appropriate for primary health care center.

**Methods:** Retrospective cohort study collecting data from database over the 10-year study period (January 2011 to December 2020) at Phatthananihom Hospital, 235 patient diagnoses as cirrhosis were considered. Included 606 admissions from 133 patient who develop acute decompensation of liver cirrhosis at the time of admission and laboratory test such as Electrolyte, Coagulogram, Complete Blood Count, Liver Function Test, BUN, Creatinine was obtained to calculate MELD, MELD-Na, ALBI, PALBI, and CiMM score.

**Results:** In the multivariate logistic regression, the factors significantly associated with readmission of patient who presented with decompensated cirrhosis e.g., Ascites, SBP, Hepatic encephalopathy etc. within 1, 3, and 6 months were CiMM year 1 (Odds ratio 1.064, 95%CI 1.029-1.101  $p$ -value < 0.001), (OR 1.041, 95%CI 1.041-1.074  $p$ -value = 0.012), and (OR 1.04, 95%CI 1.01-1.072  $p$ -value = 0.01), respectively. Within 1 year, the only factor independently associated with readmission were ALBI Grade 2 (OR 4.641, 95%CI 1.092-19.727  $p$ -value = 0.038) and ALBI Grade 3 (OR 4.222, 95%CI 1.017-17.529  $p$ -value = 0.047) when compared with ALBI Grade 1.

**Conclusion:** CiMM score might be a better indicator for predict readmission of patients who has history of acute decompensated cirrhosis in primary health care within 1, 3, and 6 months compare to MELD, MELD-Na, ALBI and PALBI score.

**Keywords:** Complication of cirrhosis, Readmission, MELD-Na, PALBI, CiMM

Abstract: PO-HB04

## Long-term Hypertensive Disease Outcomes and Risk Factors among HIV Seropositive Adult in Thailand

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**Background:** Despite the introduction of a novel combination antiretroviral therapy (cART), leading into the era of Highly Active Antiretroviral Therapy (HAART), HIV/AIDS pandemic remains a global threat across the world, especially among low-middle income countries. Overall life expectancy for people living with HIV has been dramatically increased and mortality rate advances individual without HIV only if they could endure peripheral CD4+ T cell counts into normal range. However, treated patients do not have completely restored health, risk of several non-AIDS complication, associated with aging, has been increasing ominously, including other non-communicable diseases.

**Objectives:** To determine the incidence and risk factors of hypertension in HIV seropositive patients, Pattananiikom Hospital, Lopburi, Thailand.

**Methods:** A retrospective cohort study was conducted using data from electronic health records obtained from Pattananiikom Hospital's database of people living with HIV receiving care from this F2 facility in Lopburi Province, whom were NCD-free at enrolment. Data were anonymously obtained from the day of HIV diagnosis until last follow-up on January 1<sup>st</sup>, 2021 or until diagnosis of NCD of interest. We calculated crude incidence rates for NCD and identified factors associated with stroke occurrence using a multivariate Cox Proportional Hazards regression models.

**Results:** 82 eligible people living with HIV with 3,264 person-years of follow-up were being studied. There were 7 identified new cases of hypertension occurring within our studied population. Majority were adult aged below 65 years old with the average age at diagnosis  $37.33 \pm 12.04$  years. Due to the incompleteness of the database obtained, the outcome being studied in this paper was hypertension. The incidence rate of hypertension 120.27 cases per 1,000 person-year (95% CI: 46.05 - 327.02). No significant difference of incidence between gender was observed. Unfortunately, no risk factors can be presumed with statistical significance.

**Conclusion:** We observed a high incidence of hypertension in HIV-infected persons on ART in community hospital in Thailand. We did not find evidence for any strong independent association between risk factors and the risk of hypertension. Findings provide reassurance that screening policies and preventative measures for hypertension in people-living with HIV should follow algorithms used for the general population and should be integrated with HIV care.

**Keywords:** HIV seropositive, Hypertension, Incidence rate

Abstract: PO-HB09

## Does the COVID-19 Period Modify the Effect of Shift Work on Fasting Blood Sugar Over Time in Hospital Staff?: a Result from Multilevel Analysis

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**Background:** Previous studies have reported that shift work potentially affects circadian rhythm and hormone dysregulation that leads to a wide range of health effects from sleep disturbance to diabetes risk. Evidence showed that shift work is associated with increased fasting blood sugar (FBS) level, especially for prediabetics. During the COVID-19 period, health behavior, lifestyle, and work-life balance have changed. We hypothesized that this period may modify the effect of shift work on FBS levels.

**Objectives:** To examine the effect of shift work on FBS over 4 years compared to non-shift work and to investigate whether the COVID-19 period modifies the effect of this association.

**Methods:** We conducted a retrospective cohort study which included 86 hospital staff whose initial FBS level was between 100-125 mg/dL from January to December 2018 at Phrae Hospital. We defined term shift work as staff who have any work schedule that falls outside the hours of 8.00-16.00, and non-shift work (the reference) as those with work schedule of 8.00-16.00. FBS was measured repeatedly at 4 time points by consecutive years (2018-2021). Potential confounders from previous studies were set a priori. We performed a multilevel regression analysis to assess the exposure-outcome association and reported beta-coefficients ( $\beta$ ) and 95% confidence interval. We tested an interaction term of shift work and the COVID-19 period (cut by the year of 2019). AIC was used to compare the models.

**Results:** Shift work staff was about 56% ( $n = 49$ ), non-shift work about 44% ( $n = 37$ ). At baseline, sex, age, BMI, waist circumference, and biomarker profiles such as FBS and lipid were not different between the two groups. The fixed effect ( $\beta$ ) of shift work on FBS over time was 2.4 (95%CI: -4.3, 9.1) in crude analysis. After adjusted for all potential confounders, the adjusted effect changed in direction -1.1 (95%CI: -4.9, 2.6), but not statistically significant. The interaction term was also not statistically significant ( $\beta = -3.8$ , 95%CI: -8.7, 1.2).

**Conclusion:** There was no difference in FBS change over 4 years of observation between hospital staff with shift and non-shift work. In addition, the COVID-19 period did not modify the effect of this association.

**Keywords:** Shift work, Fasting blood sugar, Multilevel analysis

Abstract: PO-HB11

## Association between the Percentage of Lymphocytes at the First Diagnosis and Treatment Outcomes in Pulmonary Tuberculosis

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**Background:** Lymphopenia, especially the percentage of lymphocyte  $< 16$  and lymphocyte  $< 25^{\text{th}}$  percentile at the first diagnosis, is found to be associated with the higher rate of treatment failure in patients with pulmonary tuberculosis (PTB). The evidence, however, is still scarce due to limited sample size.

**Objectives:** To identify the association between the percentage of lymphocytes at the first diagnosis and sputum acid-fast bacillus (AFB) smear conversion failure after 2 months of initial treatment.

**Methods:** We conducted a retrospective cohort study in 809 PTB patients from January 2018 to May 2021 and grouped the patients into the high and low percentage of lymphocytes. Regarding the exposure, the primary outcome was sputum AFB conversion failure after 2 months of initial treatment and the secondary outcomes were all-cause mortality rates at 6 and 12 months.

**Results:** A total of 432 PTB patients were eligible for primary analysis; 247 had percentage of lymphocytes  $< 17$  and 176 did not. We found that the percentage of lymphocytes  $< 17$  was not associated with sputum AFB conversion failure at 2 months after initial treatment (adjusted relative risk, 1.15; 95% confidence interval [CI], 0.67 to 1.97). It was also found not to be associated with all-cause mortality rate in 6 and 12 months (adjusted hazard ratio, 1.11, 1.09; 95% CI, 1.05 to 1.16, 1.05 to 1.12, respectively).

**Conclusion:** The percentage of lymphocytes  $< 17$  was not associated with sputum AFB smear conversion failure rate at 2 months after initial treatment.

**Keywords:** Pulmonary tuberculosis, Lymphocyte, Treatment outcome

Abstract: PO-HB12

## Clinical Prediction Rules to Predict 1-Year Mortality in Newly Diagnosed Pulmonary Tuberculosis Patients: a Developmental Phase

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**Background:** Tuberculosis (TB) is one of the main ten causes of death by infection diseases in Thailand. In our TB clinic, newly diagnosed cases were found dead more than 15% during one year of follow-up. Therefore, to develop a prediction tool could help a physician to classify patients with different risk groups and to plan further management.

**Objectives:** To develop a clinical prediction rule (CPR) from prognostic factors to predict one-year mortality in newly cases of pulmonary tuberculosis.

**Methods:** We conducted a prognostic prediction research and used a retrospective cohort study as the design the data collection. A cohort of 791 newly diagnosed cases of pulmonary TB in Phrae Hospital, Thailand was formed between October 1<sup>st</sup>, 2013, to June 30<sup>th</sup>, 2020. The 11 candidate predictors were reviewed from previous studies and were collected from hospital database at the date of TB diagnosis such as age, body mass index (BMI), hospitalization, sputum test result, and co-morbidities such as HIV infection, chronic obstructive pulmonary disease, and cancer. We measured the outcome status (death or censored) at one-year follow up after diagnosis. The CPR was developed under the Cox proportional hazard model and the strength of association was reported by hazard ratio (HR) and 95% confidence interval. The C-statistic was performed as to assess discriminative ability of the final prediction model. The likelihood ratio positive (LR+) of each level of risk scores was reported.

**Results:** Five potential prognostic factors associated with one-year mortality included being hospitalized after first diagnosis (HR = 8.50, 95%CI: 5.16-14.03), having cancer (HR = 4.83, 95%CI: 2.12-10.98), age > 60 years old (HR = 2.77, 95%CI: 1.92-4.00), BMI < 18.5 kg/m<sup>2</sup> (HR = 2.11, 95%CI: 1.39-3.20), and positive sputum AFB (HR = 1.44, 95%CI: 0.98-2.10). The C-statistic of the final Cox model including these five predictors was 0.82. The risk scores ranged from 0 to 13 and classified into 3 levels: low risk (0-3), moderate risk (4-7), and high risk (8-13). The LR+ for each level were 1.00 (95% CI: 0.63-1.60), 2.22 (95%CI: 1.84-2.67), and 5.59 (95%CI: 4.30-7.28), respectively.

**Conclusion:** The clinical prediction rules including five predictors was developed. However, the validation of the prediction tool must be performed in further research.

**Keywords:** Tuberculosis, Mortality, Clinical prediction rules



Abstract: PO-HB13

## Prognostic Factors Associated with Intradialytic Hypotension in Patients with Acute Kidney Injury: an Exploratory Analysis

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**Background:** Intradialytic hypotension (IDH) is the most common complication in patients undergoing hemodialysis and increased risk of mortality. There was limited evidence on prognostic factors that were associated with IDH especially for acute kidney injury (AKI) patients. Identifying these prognostic factors could help a clinician to closely monitor patients before hemodialysis procedure. Ultimately, a set of these predictors may be used to develop a prediction tool to predict IDH during hemodialysis.

**Objectives:** To investigate the effect of pre-dialytic prognostic factors on IDH in patients with AKI who underwent the first hemodialysis.

**Methods:** We conducted a retrospective cohort study including 156 patients who were firstly diagnosed with AKI and underwent the first hemodialysis at Phrae Hospital, Thailand from January 2019 to August 2021. Candidate prognostic factors were reviewed from previous research. Patients' profiles, clinical signs and symptoms, co-morbidities, and biomarkers such as serum albumin, creatinine, sodium were collected from medical records and hospital database. The outcome was time-to-event data (time-to-IDH, in hours) during 3-hours observation period. We performed the multivariable Cox's proportional hazard regression model as an exploratory analysis to assess the effect of predictors on outcome. The strength of association was reported by hazard ratio (HR) and 95% confidence interval. We set a significance criterion for variable selection using Wald's  $p$ -value of  $< 0.15$ . This conservative level was chosen to be sure that no potential predictors were missed.

**Results:** In multivariable Cox regression analysis including 9 prognostic factors, there were two strong prognostic factors that were related to IDH which are: (i) having more than one antihypertensive drug used before hemodialysis (HR = 2.74, 95%CI: 1.11-6.76) and (ii) having an initial ultrafiltration rate  $> 250$  mL/hr (HR = 2.94, 95%CI: 1.07-8.07). Age  $\geq 60$  years, having comorbid with diabetes, pre-systolic blood pressure  $\geq 140$  mm Hg, and pre-diastolic blood pressure  $\geq 90$  mm Hg were also associated with increased hazards, but there were not statistically significant.

**Conclusion:** Concern and special attention should be made on AKI patients receiving antihypertensive drug before the first hemodialysis. Moreover, setting initial ultrafiltration rate for dialysis less than 250 mL/hr would help to prevent IDH.

**Keywords:** Intradialytic hypotension, Acute kidney injury, Prognostic factors

Abstract: PO-HB14

## Risk of Hip Fracture and Type 2 Diabetes Mellitus in the Elderly: a Case-control Study

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**Background:** Diabetes incidence remains high in Thai population. With an aging society, diabetes even becomes more important since it is evidently associated with a wide range of long-term complications including hip fracture which potentially causes disabilities in the elderly and give burdens to care givers. Previous research has shown conflicting results of the association between diabetes and risk of hip fracture and the mechanism remains unclear.

**Objectives:** To examine the association of diabetes and the risk of hip fracture in the elderly

**Methods:** We conducted a retrospective case-control study in which included elderly people between October 1<sup>st</sup> 2019, and September 30<sup>th</sup> 2020 at Phrae Hospital, Thailand. The elderly aged > 60 years and being hospitalized due to falling were enrolled to the study. Cases (n = 76) refer to the elderly who were diagnosed with hip fracture and were confirmed by radiographic imaging. Controls (n = 304) refer to those without hip fracture. We used calendar timing or density sampling to match the controls with the cases. The data on the exposure variable (presence of diabetes type 2) and covariates such as comorbidities, alcohol drinking and smoking were collected from hospital registry at 2 years prior to case definition. The ratio of cases-to-controls was 1:4. Multivariable logistic regression was used to explain the effect of diabetes on the risk of hip fracture and adjusted odds ratio (ORs) with 95% confidence intervals were reported.

**Results:** Cases were more female (n = 63, 82.9%) than controls (n = 175, 57.6%). Mean age of cases and controls were 77.8 years (SD = 7.5) and 73.9 years (SD = 7.2) respectively ( $p < 0.001$ ). Body mass index (BMI), smoking, alcohol drinking and other comorbidities were not different between cases and controls. Diabetes was more frequent in cases (n = 22, 28.9%) than in control (n = 59, 19.4%). After adjustment for age and sex, the adjusted ORs of the association of diabetes and the risk of hip fracture was 1.78 (95%CI: 0.97-3.24). In the fully adjusted multivariable logistic model after additional adjustment for BMI and comorbidities, the adjusted OR was 1.91 (95%CI: 0.88-4.08).

**Conclusion:** There was no evidence from our study that diabetes increased risk of hip fracture from falling in the elderly.

**Keywords:** Diabetes, Falling, Hip fracture

Abstract: PO-HB15

## Prevalence and Associated Factors of Anemia among Patients with Chronic Kidney Disease in Bang Khla Hospital, Chachoengsao, Thailand

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**Background:** Chronic kidney disease (CKD) is a global public health problem including Thailand. According to the study of The Nephrology of Thailand in 2009, the study of glomerular filtration rate (GFR) in 3,459 volunteers who are greater than or equal to 18 years old showed that the prevalence of CKD stage I-V was 17.5 percent, and it increased with age. There are complications of CKD such as anemia, osteoporosis, cardiovascular complications, and anemia is the most common one. Nowadays, there are not enough studies of the prevalence of anemia in any stages of CKD in Thailand. The objectives of this study were to study the prevalence and associated factors of anemia, such as age, sex, hypertension, diabetes mellitus, in patients with any stages of CKD.

**Objectives:** To study the prevalence and associated factors of anemia among patients with chronic kidney disease in Bang Khla Hospital, Chachoengsao Province, Thailand

**Methods:** Quantitative research takes cross-sectional study to investigate the prevalence of anemia in patients with chronic kidney disease by collecting information from the patient database of Bang Khla Hospital, Chachoengsao Province during January 1, 2018 - October 31, 2021, and to find relationships with other factors.

**Results:** The study showed that the prevalence of anemia in patients with CKD stages 3a-5 was 79 percent, and it increased with severity of CKD. The prevalence of anemia in CKD stages 3a, 3b, 4, 5 were 60, 93, 92, 88 percent respectively. Patients with CKD stage 3b, 4, 5 were likely to have anemia 10.43 (95%CI 2.786-39.037), 8.562 (95%CI 1.66-44.157), 5.901(95%CI 1.666-20.895) times compared with patients with CKD stage 3a. And from statistical analysis to find the association of various factors with anemia in patients with CKD, it showed that sex, underlying diseases such as diabetes mellitus, hypertension, and patients with hemodialysis were not associated factors of anemia in patients with CKD.

**Conclusion:** Among 176 participants, the prevalence of anemia in patients with CKD stage 3a-5 was 79 percent. And the associated factor which was statistically significant was the severity of CKD.

**Keywords:** Anemia, Chronic kidney disease

Abstract: PO-HB16

## The Association of Body Mass Index and Pneumonia in Confirmed Cases of COVID-19: a Retrospective Cohort Study

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**Background:** The coronavirus disease 2019 (COVID-19) pandemic is a global crisis that affects every life globally. More than 1.4 million COVID-19 confirmed cases have been reported in Thailand. Phrae Province has reported 1,491 cases recently. The complication of COVID-19 involves several systems including pneumonia. Previous studies have shown the association of high body mass index (BMI) and increased risk of pneumonia in confirmed COVID-19 patients. However, not many studies have examined the effect of BMI on hazard rate of pneumonia in these patients.

**Objectives:** To assess the effect of low and high BMI levels on hazard rate of pneumonia in patients with confirmed COVID-19 compared to that of normal BMI.

**Methods:** We conducted a retrospective cohort study and included 357 confirmed COVID-19 patients aged 18 to 80 years, and being hospitalized in Phrae Hospital, Thailand during January 1<sup>st</sup>, 2020, and September 1<sup>st</sup>, 2021. The data was collected from medical record. BMI was classified into 3 categories (i) < 18.5 kg/m<sup>2</sup> (underweight), (ii) 18.5-23.0 kg/m<sup>2</sup> (the reference), and (iii) > 23.0 kg/m<sup>2</sup> (overweight/obesity). We measured time-to-pneumonia (in days) for all patients under 14 days of observation. The binary outcome variable was the presence of pneumonia and censored. The confounders were reviewed and set at priori, for example gender, age, diabetes, hypertension, dyslipidemia, and signs/symptoms (e.g., fever, cough) of COVID-19. We performed the Cox's Proportional Hazard regression to quantify the effect of exposure-outcome association which was presented by hazard ratio (HR) and 95% confidence interval (CI).

**Results:** Mean age of underweight group (34.2 years, SD = 10.8) was statistically lower than normal (42.1 years, SD = 13.9) and overweight/obesity group (41.6 years, SD = 12.0). There were statistically differences in gender, serum LDH, and the presence of signs/symptoms between BMI groups ( $p < 0.001$ ). After adjustment for confounders, the hazard of pneumonia was 2.10 times higher in overweight/obesity group (95%CI: 1.42-3.12), compared to the reference. The hazard was increased by 13% in underweight group, but the effect was not statistically significant.

**Conclusion:** COVID-19 patients with high body mass index are more likely to develop pneumonia. These patients should be closely monitored after hospitalization.

**Keywords:** Body mass index, Pneumonia, Hazard

Abstract: PO-HB17

## Factors Associated with the Development of Pneumonia in COVID-19 Patients

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**Background:** Amid the ongoing COVID-19 pandemic, Thailand has witnessed a massive surge in COVID-19 cases. Patients with COVID-19 infection can experience a range of clinical manifestations, from asymptomatic to critical illness. Pneumonia is one of the most common complications of COVID-19.

**Objectives:** To examine factors associated with the development of pneumonia in COVID-19 hospitalized patients in Phanomsarakham Hospital, Chachoengsao Province, Thailand.

**Methods:** A case-control study was carried out between January 1, 2021, and July 31, 2021. Three-hundreds of COVID-19 patients were enrolled and divided into 2 groups, a group of 150 patients with pneumonia was labelled as a case and 150 without pneumonia as a control. Data collection was obtained from medical records and hospital databases. Statistical analysis for associated risk factors of pneumonia by inferential statistics using Pearson's Chi-square test and expressed as Odds ratio with 95% confidence interval were performed via SPSS version 16. The significance level of 0.05 was assigned.

**Results:** The study revealed that the factors associated with the development of pneumonia in COVID-19 patients were hypertension (HT) (OR = 3.70, 95%CI = 1.88-7.27,  $p$ -value = 0.001), age  $\geq$  65 years (OR = 3.49, 95%CI = 1.55-7.59,  $p$ -value = 0.001), no or incomplete of COVID-19 vaccination (OR = 3.27, 95%CI = 1.26-8.49,  $p$ -value = 0.011), age  $\geq$  60 years (OR = 2.96, 95%CI = 1.52-5.76,  $p$ -value = 0.001), diabetes mellitus (DM) (OR = 2.89, 95% CI = 1.24-6.75,  $p$ -value = 0.009), BMI  $\geq$  25 kg/m<sup>2</sup> (OR = 2.16, 95% CI = 1.35-3.44,  $p$ -value = 0.001), respectively.

**Conclusion:** Elderly patients and those with HT, DM, and obesity should be encouraged to get complete COVID-19 vaccination including intensive care in these infected COVID-19 patients to reduce serious complications were suggested.

**Keywords:** Factors, COVID-19, Pneumonia

Abstract: PO-SR04

## A Systemic Review: Mindfulness-based Cognitive Therapy (MBCT) as an Alternative Therapy to Depression

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**Background:** Major Depressive Disorder (MDD), or depression, is one of the most notable medical disorders positioned as a type of mood disorder. MDD has an 85% recurrence rate and a 50% increased risk of having another depressive episode after first episode. Mindfulness-based Cognitive Therapy (MBCT) is a non-pharmacological treatment developed to prevent a relapse in MDD patients. The current evidence has reviewed MBCT as adjunctive therapy to treatment as usual (TAU) or comparator to TAU.

**Objectives:** The aim of this systematic review is to highlight the benefits of MBCT in relapse prophylaxis, depressive symptomatology reduction, enhancing mediation on depressive factors and improving one's wellbeing.

**Methods:** This systematic review was carried on all recent research pertaining to MBCT intervention in depressive prophylaxis and depression reduction in patients with depression via the PRISMA statement method. There are 1,171 results from an electronic search performed using seven different databases: Cochrane Central Register of Controlled Trials (CENTRAL), Embase, MEDLINE, PsycINFO, PubMed, Scopus, and Web of Science from inception dates up to October 9<sup>th</sup>, 2020, with new alerts up to November 30<sup>th</sup>, 2020. After duplicates were removed, titles and abstracts were screened; this systematic review is then left with 20 studies included for qualitative analysis. The author has undertaken the risk of bias assessment on 20 RCTs independently.

**Results:** The studies included indicated 37% of the RCTs that examined relapse prophylaxis reported MBCT as efficacious in preventing relapse. The studies included also observed depression reduction on time interaction at pre-and-post MBCT intervention; 100% of the RCTs studied depression symptomatic relief reported positive outcomes. Moreover, MBCT may impact mediators to depression and patients' wellbeing. To elaborate, the mediators are rumination, cognitive reactivity, self-compassion, and positive affect.

**Conclusion:** Since the reported outcomes interaction of studies included were not consistent, more investigations are required for precise conclusion and beneficial application on depression.

**Keywords:** Mindfulness-based cognitive therapy, Major depressive disorder, Depression

Abstract: PO-SR05

## Factors Affecting Medical Adherence in Patients with Metabolic Syndrome during the COVID-19 Pandemic: a Systematic Review

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**Background:** Metabolic syndrome (MetS) and its components: diabetes, hypertension, and obesity, contribute to severe clinical course and poorer prognosis of coronavirus disease 2019 (COVID-19). Adherence to prescribed medication and lifestyle modifications are core determinants for successful control and reversal of MetS. However, the COVID-19 pandemic poses increasing challenges for patient populations with chronic illnesses including MetS due to mandated lockdowns and disruptions in the delivery of care.

**Objectives:** This systematic review aims to identify the factors affecting medical adherence in patients with MetS during the COVID-19 pandemic. By doing so we hope to pinpoint factors that most impede upon medical adherence in order to reduce COVID and non-COVID disease burdens on healthcare systems.

**Methods:** A systematic search of the pertinent literature via PUBMED, EMBASE and Google Scholar databases was conducted. Grey literature investigating the factors with regards to medical adherence in patients with MetS and its components during the COVID-19 pandemic was navigated through as well.

**Results:** We identified 42 published results that fulfilled our inclusion and exclusion criteria. Factors were categorised into (1) patient centred, (2) disease and therapy centred, (3) healthcare system centred, (4) legislative and economically centred, and (5) other factors. The most common factors affecting medical adherence in patients include patient and healthcare system centred factors, with 52.4% of papers highlighting that both categories significantly contribute to medical nonadherence in MetS patients during the COVID-19 pandemic.

**Conclusion:** Increased nonadherence to MetS control and treatment during the COVID-19 pandemic is a complex issue that requires a holistic approach across multiple disciplines. Although our study highlights the most associative factors, additional prospective studies are needed to confirm the association and causality of our findings. We expect our study to help improve resource allocation and risk stratification in patients with increased risk for severe COVID-19, paving the way for a more resilient healthcare system that better targets the needs of those in the face of adversity.

**Keywords:** Metabolic syndrome, MetS, Medical adherence, COVID-19, SARS-CoV-2



Abstract: PO-SR17

## Association of Selective Serotonin Reuptake Inhibitor and Hepatocellular Carcinoma in Hepatitis C Virus Infected Population: Systematic Review and Meta-analysis

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**Background:** Hepatocellular carcinoma (HCC) is the fifth most common cancer in men worldwide and the seventh most common cancer in women and also has a high mortality rate. Hepatitis C virus (HCV) infection, hepatitis B virus (HBV) infection, and cirrhosis are known as common risk factors of HCC. Serotonin is one of the neurotransmitters which plays a role in a diverse range of emotions in the central nervous system. Selective serotonin reuptake inhibitors (SSRIs), functioned by blocking the process of reuptake serotonin, are antidepressants that are generally concurrently prescribed in a patient with HCV infection. Over the last decades, there have been increasing reports illustrating the association between many groups of antidepressants including SSRIs and incidence of HCC. However, the clear conclusive association of SSRIs and HCC in the HCV infected population is yet to be known.

**Objectives:** To conduct systematic review and meta-analysis to summarize whether the overall use of SSRIs and high dose exposure is associated with risk of HCC in HCV infected population.

**Methods:** We independently searched for published studies from MEDLINE, EMBASE, SCOPUS, WEB OF SCIENCE, and CLINICAL KEY databases from inception to July 2021. A total of three cohort studies with 248,635 participants met the eligible criteria and were included in the meta-analysis. All statistical analysis was performed using STATA, version 14 (StataCorp LP, College Station, TX, USA).

**Results:** The use of SSRIs in HCV infected patients showed no statistically significant incidence of developing HCC; relative risk 0.89 (95% CI 0.74–1.08),  $I^2 = 86.1\%$ ,  $p = 0.001$ . Also, subgroup analysis of high dose SSRIs prescription had no statistically significant increase or decreased risk of HCC with a relative risk of 0.67 (95% CI 0.1–1.24),  $I^2 = 93.1\%$ ,  $p = 0$ .

**Conclusion:** The exposure of SSRIs in HCV infected patients—both overall SSRIs use and high dose use groups—compared with no or low dose SSRIs exposure had no statistically significance in increasing annual incidence of HCC. These findings oppose the negative observational data regarding effects of SSRIs with HCC in HCV infected population.

**Keywords:** Hepatitis C Virus, Hepatocellular carcinoma, HCC, Selective serotonin Reuptake inhibitors, SSRI

Abstract: PO-SR02

## The Association Factor and Effective Therapy for Young Adult Postpartum Depression

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**Background:** Postpartum depression is a complex psychiatric illness composting of physical, emotional, and behavioral changes after delivery. Although there are many associated risks and different treatments for postpartum depression, the exact causes of depression and evidence-based therapy remain systematically unsummarized in young adult mothers.

**Objectives:** To conduct a systematic review of risk factors and potential treatments for postnatal depression in young adult mothers.

**Methods:** The research articles were searched in PubMed and Science direct data sources by using specific keywords including young adult mother, risk factor, treatment, postpartum, depression through September 2020 for English. Two groups independently screened title, abstract and full-text articles with assessment of Edinburgh Postnatal Depression Scale (EPDS). Strength of evidence for existing systematic reviews was evaluated and agreed upon by review-team consensus.

**Results:** Fourteen studies were met all eligibility criteria. The risk factors could be divided into 3 domains, including biological factors (i.e., age, methods of delivery and implantation of hormonal contraceptives), psychological factors (i.e., body shape satisfaction and self-esteem) and socioeconomic factors (i.e., education, employment, and numbers of children). The effective treatment alleviating depressive symptom in young adult mothers were divided in to 2 groups, including pharmacological therapies (i.e., SSRIs and vitamin D3) and non- pharmacological therapies (i.e., home visit psychotherapy and telephone-cognitive behavioral therapy).

**Conclusion:** This systematic review provides the associated risk factors and evidence-based treatment options for postnatal depression in young adult mothers.

**Keywords:** Depression, ESPD, Postpartum, Risk factor, Intervention

Abstract: PO-SR03

## The Impact of Covid 19 Epidemic on Depression, Anxiety, and Stress in Healthy Medical Science Students

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**Background:** The COVID-19 outbreak significantly impacts on the lives of medical science students who are fully aware of the difficulties and stressful before becoming the medical personnel in worldwide. Although many studies focused on the effect of the pandemic on the mental health of students, medical science students still lack of systematically summarizing evidence.

**Objectives:** To conduct a systematic review of prevalence of depression, anxiety, and stress in medical science students.

**Methods:** PubMed and Science direct English databases were searched for the review with keywords including stress, anxiety, depression, COVID-19, SARS-CoV-2, behavior, and student. The research articles assessed the mental health status in healthy medical science students using Depression Anxiety Stress Scale-21 (DASS21) and published between January 2020 and September 2021 were included.

**Results:** Five studies were met all inclusion criteria. The prevalence of depression ranged from 36 to 100% with a mean score of  $2.34 \pm 3.13$  to  $29.36 \pm 4.42$ , the prevalence of anxiety ranged from 36.96 to 100 % with a mean score of  $2.30 \pm 3.03$  to  $28.56 \pm 4.67$ , and the prevalence of stress ranged from 27.5 to 100% with a mean score of  $2.78 \pm 3.59$  to  $28.99 \pm 4.53$ .

**Conclusion:** Almost medical science students in Asia, the mean prevalence of depression was 67.99%, the mean prevalence of anxiety was 63.75% and the mean prevalence of stress was 58.64%, respectively. The indicators of depression, anxiety, and stress included biological-, and social- related factors in COVID-19 epidemic.

**Keywords:** Anxiety, COVID-19, DASS21, Depression

Abstract: PO-SR06

## Meta-analysis of Enteral Lactoferrin Supplementation for Reducing the Risk of Preterm Infants Sepsis: a Perspective Review of the Preterm Infants Born to Mother with Severe COVID-19

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**Background:** Severe COVID-19 in pregnancy is strongly associated with preterm infant late-onset sepsis (LOS) which is known to be a major cause of infant morbidity and mortality followed by necrotizing enterocolitis (NEC). Recently, Lactoferrin, an iron-binding protein that significantly found in human colostrum, shows potential effect on reducing the risk of preterm infant LOS and mortality by its immunomodulatory properties.

**Objectives:** This review aimed to evaluate the effect of enteral lactoferrin supplementation for reducing the risk of preterm LOS, necrotizing enterocolitis (NEC), and mortality specifically in the perspective of preterm infants born to mothers with severe COVID-19.

**Methods:** This review followed the guidelines provided by PRISMA. A literature search was carried out with PubMed, Cochrane Library, Google Scholar, and ScienceDirect. The pooled effect of the incidence of LOS, NEC and mortality were presented as risk ratios (RR) with 95% confidence of interval (CI) using random-effects model (REM) or fixed-effects model (FEM) forest plot. The heterogeneity level was checked by I<sup>2</sup> and the *p*-value of the chi<sup>2</sup> test of heterogeneity. The protocol of this review has already registered in International Prospective Register of Systematic Reviews (PROSPERO) with the registration number CRD42021279189.

**Results:** Fifteen studies were included in qualitative and quantitative analysis. Incidence of LOS significantly higher in the control group than lactoferrin supplementation group [RR = 0.65, 95% CI (0.56, 0.77), *p* < 0.00001, I<sup>2</sup> = 56%]. However, there were no significant differences in terms of NEC incidence [RR = 0.80, 95% CI (0.63, 1.02), *p* = 0.10, I<sup>2</sup> = 39%] and mortality [RR = 0.94, 95% CI (0.77, 1.13), *p* = 0.49, I<sup>2</sup> = 39%] even though the trends are higher in the control group.

**Conclusion:** The previous research showed that neonates born from mothers severely infected by COVID-19 have high potential to develop extremely premature labor, sepsis, NEC, respiratory distress, thrombocytopenia, or abnormalities in liver function that end up death. Based on the results of this review, lactoferrin can favorably be used in terms of preterm or extremely preterm infants born to mother with severe COVID-19. This meta-analysis provided evidence that enteral lactoferrin supplementation was associated with a significant reduction in LOS, but not NEC stage II or III and all-cause mortality, in preterm infants born to mother with severe COVID-19.

**Keywords:** Lactoferrin, Premature birth, Neonatal sepsis, Systematic review, Meta-analysis

**ABSTRACT: INNOVATION SHOWCASE**

Abstract: IS-01

## Effectiveness of a Motion Sensor Device to Improve Hand Hygiene Compliance, an Innovation Invented by Medical Students

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**Background:** Hand hygiene is one of the most important means to prevent healthcare-associated infections. Global efforts have been made to improve hand hygiene in healthcare. However, hand hygiene compliance remains low.

**Objectives:** To assess the impacts of a motion sensor device in improving hand hygiene compliance.

**Methods:** A controlled before and after study was conducted during April-May 2018 in 2 medical ICUs of a tertiary care hospital in Bangkok, Thailand. One ICU was assigned to a motion sensor device intervention, another was assigned to a hand hygiene day intervention. Hand hygiene compliance was determined pre- and post-intervention through direct observation using surveillance cameras. Descriptive statistics and Student's t-test analysis was performed to identify significant differences between the two groups.

**Results:** A total of 2,692 opportunities of hand hygiene were observed. After the intervention, higher compliance rates were achieved. Hand hygiene compliance increased significantly from 15.9% to 29.1% in the motion sensor device intervention group, compared with a slight increment from 13.3% to 16.8% in the hand hygiene day intervention group.

**Conclusion:** The motion sensor device intervention improved hand hygiene compliance significantly, compared to hand hygiene day intervention. However, additional interventions are needed to enhance the results. Long-term evaluation and further work on interactive interventions to improve hand hygiene may prove valuable.

**Keywords:** Hand hygiene, Motion sensor device, Compliance

Abstract: IS-04

## 'Slim Seal' Mouth Patch for Oral Ulcer

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**Background:** Most common mouth ulcers in all age group is aphthous ulcers with the prevalence around 30 percent among adolescents. In addition, there are recurrence ulcers among a half of patients suffering from aphthous ulcer. Moreover, the ulcer could be extremely painful and brings about a limitation while eating and speaking. Hence, in Thailand, many treatments for oral ulcers are discovered for example ointment, spray, mouthwash, and mouth patch. However, the cost of which treatments mentioned is still expensive and out of reach to many people.

**Objective:** The developers aim to create a new solution for curing an aphthous ulcer with material and methods which are ready and available in Thailand. In the three main concepts including: edible, adhesive, and efficient.

**Method:** In the beginning, doing literature reviews how to make a mouth patch is conducted by reviewing in PubMed and other reliable sources. From previous studies, polysaccharide was the principal material which can dissolve in water and be dry to form a film-like material. In part of regimens for relieving ulcer, previous studies showed that Tahiti arrowroot, a Thai's renounce herb for cooking and healing superficial wounds, had been proven as an amylase resistance and antimicrobial. Moreover, the transforming technique to gels showed that solvent evaporation was a traditional method whereas electrospinning technique, the modern procedure, was more popular in medical professionals. There are many benefits of using electrospinning techniques for example more adhesion and enhancing drug release to buccal mucosa.

**Results:** The 'Slim seal' mouth patch was tested by experimentation in pig's oral cavity. This novel mouth patch was developed by different polysaccharides and mixing them with Tahiti arrowroot powder. Besides, the unconventional film, collaboration with Thailand Institute of Scientific and Technological Research, is generated with an electrospinning technique. Then, we found that a gel could formulate itself for up to 6 hours.

**Conclusion:** The results of this innovative formula were pretty good for the initiation. However, it was required to adjust for more effectiveness. Because the dryness from a sheet with the electrospinning techniques might lead to the uncomfortableness. Thus, we are going to explore more on other molding techniques. In addition, the modification for better film's property should be further investigated in terms of adding drug, smelling and its flavor. Apart from, additional treatments for mouth odor should also be scrutinized.

**Keywords:** Mouth patch, Oral ulcer



Abstract: IS-05

## Smart Blood Transport Device

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**Background:** Transporting Red Blood Cell (RBC) to patients requires a specific standard temperature range (1-10 °C) to maintain the quality and viability of RBC. This is to prevent hemolysis and bacterial growth. However, current blood bag temperature monitoring devices are not effective enough to monitor and record the temperatures. Our novel smart blood transport device with the temperature-sensitive warning light signal is an innovative option for keeping blood transportation practical and able to record the changing temperature by mobile application.

**Objective:** To study the accuracy and precision of smart blood transport devices to monitor the temperature of blood bags.

**Methods:** We monitor the temperatures of Leukocyte Poor packed Red Cells (LPRC) unit with 4 different volumes (160, 240.50, 256.77, and 308.41 mL) stored in the smart blood transport devices which are measured by mobile application, and we compare them to the measured temperatures from the probe thermometers as a reference and the blood bag temperature indicator. For each LPRC unit, we repeated the experiments 3 times. The accuracy of blood transport devices' light signals is also being measured simultaneously.

**Results:** The mean temperature, measured from probe thermometers, that yellow light signals (8 °C -warning) and red light signals (10 °C -warning) started to appear are 8.30 °C (SD = 0.37,  $p = 0.019$ ) and 10.42 °C (SD = 0.28,  $p < 0.01$ ). The correlation coefficient between measured temperature from the probe thermometers and the devices at range 8-10 °C is 0.93-0.99. The mean temperature that the blood bag temperature indicators start changing their colour is 10.08 °C but the range is more varied (SD = 1.56) compared to our devices. Furthermore, the Mann-Whitney U test shows no significant difference between using blood bag temperature indicators and red light signals to detect temperature exceeding 10 °C ( $p = 0.26$ ).

**Conclusion:** Our results determine the efficacy of our devices and how they are likely to monitor blood temperature. Our devices have a very high correlation with the probe thermometers. Although the light signals are more precise than blood bag temperature indicators, more accuracy improvement is required as using our smart blood transport devices are more user-friendly and could reduce the cost of the single-use indicators.

**Keywords:** Blood transport device, Blood cold chain, Transfusion medicine, Blood bag temperature

Abstract: IS-06

## Artificial Intelligence Assistance using Classification Model in Radiographic Classification between Early and Obvious Degrees of Knee Osteoarthritis: a Cross-sectional Diagnostic Study

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**Introduction:** In sport medicine, early knee osteoarthritis is a problematic issue in the athlete, especially in middle-aged athlete, while early knee osteoarthritis (OA) represented up to 15% that might be missed in the routine practice. The present study was to assess the performance of an artificial intelligence (AI) system using classification model that designed to assist in the classification of knee osteoarthritis from doubtful to obvious degrees in accordance with the Kellgren and Lawrence (KL) classification system.

**Objective:** To train the artificial intelligence in detecting knee OA and detect early sign of knee OA in radiographic imaging.

**Methods:** A total of 1,803 (trained) and 521 (test) knee radiographs (anteroposterior [AP] view) had been collected from public resources as The Osteoarthritis Initiative (OAI). Regarding KL classification, grade 1 (doubtful) was used to represent 'early' stage of OA and grade 3 (moderate) was used to represent 'obvious' stage of OA. The AI system was trained and tested on these radiographs. The assistance of software highlighting boxes around AI detected osteoarthritic change (s) was shown in each image during the analysis. The confusion matrix was used to statistically analyze the data.

**Results:** From 521 test images, the overall accuracy was shown as 94.63% to differentiate diagnosis between 'early' knee OA and 'obvious' knee OA on knee radiographs in accordance with the KL classification. Regarding this AI classification model, its precision and recall (sensitivity) levels were excellent as 94-95% and 94-95%, respectively.

**Conclusion:** The AI assistance with classification model provided the excellent levels of accuracy, precision, and recall for the classification between early and obvious degree of arthritic changes of knee osteoarthritis on AP radiographs. This technology is recommended to help interpret the knee radiographs for the sport medicine orthopedist or general orthopedist to diagnose the early knee osteoarthritis and consider for early treatments.

**Keywords:** Artificial intelligence knee osteoarthritis, Convolutional neural network, Machine learning, Knee radiographic image

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