

SAAP Bulletin

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**VIRTUAL BIENNIAL SAAP VII
& PSI CONFERENCE – 2021**

March 23-25, 2021

Theme

“Physiological Sciences for betterment of Health”

Organized By

DEPARTMENT OF PHYSIOLOGY
HAMDARD INSTITUTE OF MEDICAL SCIENCES &
RESEARCH AND ASSOCIATED HAH CENTENARY HOSPITAL
HAMDARD NAGAR, NEW DELHI – 110062

2021 opened a new page
in the history of SAAP, with
the first virtual SAAP
Biennial conference

SAAP VII & PSI Conference 2021

At Hamdard Institute of
Medical Sciences & Research,
Jamia Hamdard
New Delhi, India



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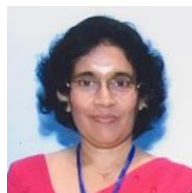
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From Editor's Desk



Professor Piyusha Atapattu

In March 2021 SAAP created history, by organizing the very first virtual SAAP conference. SAAP VII & PSI Conference 2021 organized by the department of Physiology, Hamdard Institute Of Medical Sciences & Research, Jamia, Hamdard, New Delhi, India.

At the inception of SAAP just 13 years ago, none would have dreamed that we would be so soon stepping in to the virtual world, and host a fully online SAAP conference! The COVID pandemic, while creating global chaos, also made the world aware how easily we could connect globally, promoting virtual conferences and bringing the SAAP family closer.

Much credit goes to the organizers of the SAAP conference, for planning a fantastic academic programme in such a short time, comprising pre congress workshops and a high quality scientific sessions contributed to by all SAAP member countries.

The SAAP programme is given later in this bulletin, and further details on SAAP VII & PSI Conference 2021 will be published in the next issue.

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Virtual Biennial SAAP VII & PSI Conference 2021

Theme: “Physiological Sciences for betterment of health”

ORGANISED BY
DEPARTMENT OF PHYSIOLOGY
HAMDARD INSTITUTE OF MEDICAL SCIENCES & RESEARCH, JAMIA HAMDARD
NEW DELHI

PROGRAM SCHEDULE

Day 1: 24 th March 2021				
S. No	Time	Event	Speaker	Title
<i>Inaugural Program</i>				
	9:00 am – 10:30 am (IST)	Welcome address (9:00-9:05AM) Condolence for Late Prof.Arif Siddiqui, President. SAAP Address By Dean , HIMSAR (9:05-9:15AM) Inaugural Speech by President SAAP (9:15-9:25AM) PSI-SAAP Report by President PSI (9:25-9:35AM) Guest of Honor (9:35-9:45AM) Guest of Honour (President, FAOS) (9:45-9:55 AM) Special Guest (VC, BLDE University, Bijapur) Chief Guest (President IUPS) (9:55-10:10 AM) Presidential Address (CEO, HIMSAR) (10:10- 10:25AM) Vote of Thanks, Secretary General (10:25AM- 10:30AM)	: Prof Iqbal Alam, Organizing Secretary, SAAP & PSI : Prof.Kusal K Das, Member Education Committee, IUPS : Prof. Mridu Dudeja (India) : Prof Md Aslam (Pakistan) : Prof A K. Chandra (India) : Prof Robert G Carroll (USA) : Chau Hun Leem, (South Korea) : Prof MS Biradar , (India) : Prof. Julie Chan (Taiwan) : Dr. G. N Qazi (India) : Prof. Savithri W. Wimalasekera (Sri Lanka)	

SESSION A		CHAIRPERSONS: 1. Prof M. Aslam, President, SAAP 2. Prof Kusal Das, Member, Education Committee, IUPS 3. Dr. Rokeya Begum, BPS Bangladesh 4. Prof. Sunil Kohli, HIMSR, New Delhi		
1	10:30 am- 11:00 am (IST)	Keynote Address 1	Prof. Julie Chan, President, IUPS	The good, the bad and the ugly of nitric oxide in cardiovascular regulation: Perspectives from a physiologist
2	11:00 am- 11:30 am (IST)	Plenary Lecture 1	Robert G. Carroll, Brody School of Medicine Greenville, NC, USA	Physiology benefits from the shift to competency-based education
3.	11:30 pm – 12:00 pm (IST)	Plenary Lecture 2	Dewan S. A. Majid Professir, Department of Physiology, Director, Hypertension & Renal Center of Excellence Tulane University School of Medicine New Orleans	The Physiological role of cytokines during high salt intake
SESSION B		CHAIRPERSONS: 1. Dr. Neelam Vaney, UCMS, New Delhi 2. Dr. Rita Khadka, President, Physiological Society Nepal 3. Prof. Sarwar Alam, Jamia Hamdard, New Delhi		
4	12:00 pm – 12:20 pm (IST)	Plenary Lecture 3	Dr. HR Ahmad Sindh Institute of Transplantation and Urology & Dept. of Biological and Biomedical Sciences, Aga Khan University, Karachi	Faculty Institution Relationship: Conception of Humanistic society
5	12:20 pm – 12:40 pm (IST)	Plenary Lecture 4	Dr. KK Deepak AIIMS, New Delhi	Physiologists role and participation in WHO global action plan for physical activity 2018-2030
6	12:40 pm – 1:00 pm (IST)	Plenary Lecture 5	Prof Somnath Gangopadhyay Department of Physiology	Health and safety in Indian SMEs during New Normal Situation.
1.00 pm-1.30 pm (IST)		LUNCH BREAK		

SESSION C		CHAIRPERSONS: 1. Prof. Savithri, Secretary General, SAAP 2. Prof. Yogesh Tripathy, SMSRH, New Delhi 3. Dr. V P Varshney, MAMC, New Delhi		
7	1:30 pm – 2:00 pm (IST)	Keynote Address 2	Prof. Sinerik Ayrapetyan UNESCO Chair, Life Science Yerevan, Armenia	The metabolic driving water efflux from the cell is a fundamental mechanism for metabolic control of semipermeable properties of cell membrane
8	2:00 pm – 2:20 pm (IST)	Plenary Lecture 6	Dr. Maulee Arambewela Faculty of Medicine, University of Sri Jayawardenepura, Nugegoda Sri Lanka	Exploring the Tsunami of Diabetes
9	2:20 pm – 2:40 pm (IST)	Plenary Lecture 7	Dr. Chandimani Udugodare Faculty of Medicine, University of Sri Jayawardenepura, Sri Lanka	Burden of Obesity on the Respiratory System
10	2:40 pm- 3:00pm (IST)	Plenary Lecture 8	Prof. Shelina Begum Bangobandhu Sheikh Mujib Medical University, Bangladesh	Relationship of cardiac autonomic dysfunction with iron status in metabolic syndrome patients
SESSION D		CHAIRPERSONS: 1. Prof. Amar Kumar Chandra, President, PSI 2. Prof. Ruhul Amin, Bangladesh 3. Dr Sujata Jetley, HIMSR, New Delhi		
12	3:00 pm – 3:20 pm (IST)	Plenary Lecture 9	Dr Muhammed Ayub President, PPS, Pakistan	Pakistan Physiological Society, Past present and future
13	3:20 pm – 3:40pm (IST)	Plenary Lecture 10	Dr. Md. Obaidullah Ibne Ali Rajshahi Medical College, Rajshahi	Study of lung function tests in chronic bronchial asthma with vitamin C supplementation
14	3:40 pm – 4:00pm (IST)	Plenary Lecture 11	Dr Rita Khadka Department of Basic and Clinical Physiology B. P. Koirala Institute of Health Sciences, Dharan, Nepal	Cardiovascular autonomic dysfunction in patients with hypo-and hyperthyroidism
15	4:00 pm – 4:20 pm (IST)	Plenary Lecture-12	Dr. Amit Bandyopadhyay University College of Science and Technology	Prediction of Cardiorespiratory Fitness in Sportspersons and Sedentary Individuals: An Indian Perspective
16	4:20pm – 5:00 pm (IST) 5:00- 6:00 pm (ist)	Keynote Address 3 ANNUAL GENERAL MEETING	Dr. Chandan Sen, ICRME, USA	Tissue Nanotransfection for In Vivo Tissue Reprogramming

Day 2: 25 th March 2021				
S. No	Time	Event	Speaker	Title
SESSION E			CHAIRPERSONS: 1. Dr. Charoo Hans, JH, New Delhi 2. Dr. Mahwish Arooj, VP Pakistan 3. Dr. Zahid Ashraf, JMI, New Delhi	
1	8:30 am-9:00 am (IST)	Plenary Lecture 13	Dr. Jasimuddin Ahamed OMRF, Okhlohama, USA	COVID-19 and Cardiovascular Disease
2	9:00 am- 9:20 am (IST)	Plenary Lecture 14	Dr. Sunil Dhungel, Department of Clinical Physiology, Nepal Army Institute of Health Sciences, Kathmandu, Nepal	Cross talk between Covid and Chemosensation
3	9:20 am - 9:40 am (IST)	Plenary Lecture 15	Dr. R. V.Kulkarni, BLDEA's College of Pharmacy, Vijayapur	Chronotherapeutic responsive drug delivery systems
4	9:40 am – 10:00am (IST)	Plenary Lecture 16	Prof. Deepthi De Silva Faculty of Medicine, University of Kelaniya ,Ragama, Sri Lanka	Role of connexins in inner ear function
5	10:00am- 10:20am (IST)	Plenary Lecture 17		
SESSION F			CHAIRPERSONS: 1.Prof. VP Varshney, MAMC, New Delhi 2.Prof. Sunita Monda, LHMC, New Delhi 3. Dr. Sandeep, HIMSR, New Delhi 4. Dr. Himani Ahluwalia, VMMC, New Delhi	
5	10:20 am – 10:40am (IST)	Plenary Lecture 18	Prof. Umar Ali Khan Pro-VC, Isra University, Islamabad	Translational physiology research, clinical practice and public health: A Continuum
6	10:40 am – 11:10am (IST)	Plenary Lecture 19	Dr. Gausal Azam Khan Fiji Medical College, Fiji	Stress induced sterile Inflammation and Insulin Resistance: Novel role of von Willebrand Factor
7	11:10 am – 11:30am (IST)	Plenary Lecture 20	Dr. Samina Malik UCM, Lahore, Pakistan	First Report of Novel PTEN variant in breast cancer from Pakistan: An extrapolative variable of diagnostic significance

SESSION G		CHAIRPERSONS: <i>Dr. Musharraf Hussain, HIMSR, New Delhi</i> <i>Dr. Manisha Jindal, SMSRH, New Delhi</i> <i>Dr. Zahid Hassan, SAAP, Bangladesh</i>		
8	11:30am - 11:50 am (IST)	Plenary Lecture 21	Prof. Akhtarun Nessa Mymensingh Medical College, Mymensingh	Evaluation of Changes of BMI and serum C-reactive Protein in post-menopausal women
9	11:50pm - 12:10 pm (IST)	Plenary Lecture 22	Dr Suvro Chatterjee	Microfluidics based investigation of vascular diseases process
10	12:10 pm - 12:30 pm (IST)	Plenary Lecture 23	Dr Amal Bera IIT, Chennai	Pannexin-P2X₇ receptor-Calcium: a nexus for cell survival and death
SESSION H <i>NO and Free radicals</i>		CHAIRPERSONS: <i>1. Prof. Somnath Gangopadhyay, University of Calcutta</i> <i>2. Dr. Ojaswe, VP SAAP, Nepal</i> <i>3. Dr. Manasi Bhattacharya, AIIMS, Guwahati</i>		
11	12:30 pm - 12:50 pm (IST)	Plenary Lecture 24	Prof. A. Ray, HIMSR, New Delhi	Nitric oxide (NO) regulates gender based differences in stress susceptibility and adaptation
12	12:50 pm - 1:10 pm (IST)	Plenary Lecture 25	Prof. M I Alam, HIMSR, New Delhi	Role of Nitric oxide and Decorin in Preeclampsia
13	1:10 pm - 1:30 pm (IST)	Plenary Lecture 26	Prof. Kavita Gulati, Patel Chest Institute, New Delhi	Newer insights into the neuromodulatory role of nitric oxide
1:30 pm-2:00pm (IST)		LUNCH		
SESSION I <i>Neurosciences</i>		CHAIRPERSONS: <i>1. Dr. Suman Jain, AIIMS, New Delhi</i> <i>2. Dr. Suhel Parvez, JH, New Delhi</i> <i>3. Dr. Meenakshi Chaswal, ABVIMS, New Delhi</i>		
14	2:00pm – 2:30pm (IST)	Keynote Address 4	Prof. Dr. Chae Hun Leem, FAOPS	Physiology into people's life
15	2:30 pm- 2:50 pm (IST)	Plenary Lecture 27	Dr. Eric Thelin Karolinska Institute, Stocholm, Sweden	Protein biomarkers of injury in traumatic brain injury management
16	2:50 pm – 3:10 pm (IST)	Plenary Lecture 28	Dr. Adel Helmi Department of Clinical Neuroscience Iniversity of Cambridge, UK	Clinical Studies of Neuroinflammation
4:00pm – 4:30 pm (IST)		Valedictory Session		

Pre-conference CME on Medical Education



Virtual Biennial SAAP VII and PSI Conference 2021 Pre-conference CME on Medical Education

Organised by
Department of Physiology
& Medical Education Unit
HIMSR, New Delhi-62

(March 17, 2021)

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Dr. Musharraf Husain
Coordinator MEU

Hamdard Institute of Medical Sciences and Research
Jamia Hamdard, New Delhi-110062, India

Venue: Online through Zoom

Date: March 17, 2021

Program

Time	Topic	Resource Faculty
Session I		
Chairpersons	Dr. M Aslam, President SAAP Dr. K.K. Deepak, AIIMS, New Delhi Dr.G.K.Pal, JIIPMER, Puducherry Dr. Rokeya Begum, President, BPS, Bangladesh	
8:30 am - 9:00 am	Inauguration and Welcome address	
9:00 am - 9:50 am	Aligning Assessment with CBME Objectives	Prof. Robert G Carroll, Greenville, USA
9:50 am - 10:30 am	Assessment Planning and quality assurance	Dr. Renuka Sharma New Delhi, India & Dr. Manasi Bhattacharjee AIIMS, Guwahati
10:30 am - 11:00 am	Student Assessment: fail or pass for teachers in the system of Assessment	Dr. Amaranath Karunanayake Sri Lanka
11:00 am-11:40 pm	Conducting Assessment for Undergraduates- Experience from southeast region	Prof.Md. Ruhul Amin Bangladesh
11:40 am-12 Noon	Tea Break	
Session II		
Chairpersons:	Dr. SavithriWimalasekera, Secretary General, SAAP Dr. Iqbal Alam, HIMSR, New Delhi Dr. Farah Khalique, UCMS, New Delhi Dr. PrasunPriyaNayak, AIIMS, Jodhpur	
12 Noon-12:40 pm	Assessment of Knowledge by constructing Quality MCQs	Prof. Samina Malik & Prof. MahwishArooj, Lahore, Pakistan
12:40 pm-01:20 pm	Assessment using long and short answer question: Advantages and Disadvantages	Prof. BishnuHariPaudel, Nepal
01:20 pm-2:00 pm	OSCE/OSPE in Resource poor setting	Prof. Musharraf Husain, New Delhi, India
2:00 pm – 2:30 pm	Lunch	
Session III		
Chairpersons:	Dr.YogeshTripathy, Sharda University, New Delhi Dr. Himani Ahluwalia, VMMC, New Delhi Dr.Ramanjan Sinha, AIIMS, Raipur Dr. Bharti Bhandari, GIMS, Greater Noida, UP	
2:30 pm-3:00 pm	Online Assessment- Relevance in current scenario	Dr. Sabina Khan New Delhi, India
3:00 pm-3:30 pm	Blueprinting in Assessment	Dr. Aqsa Shaikh New Delhi, India
4:00 pm	Vote of thanks	

Pre-conference workshop on Recent Advances in Physiological Techniques



VIRTUAL BIENNIAL SAAP VII & PSI CONFERENCE – 2021

Pre-Conference Workshop on Recent Advances in Physiological Techniques

Date: 23rd March 2021

Session 1: “Cardiovascular Autonomic Function Tests”

Time: 9:30 am to 12:30 pm

S. No	Title	Speaker	Chairpersons
1	Research ethics in Publication	Prof. Yogesh Tripathi India	Prof. Md. Aslam Pakistan
2	Introduction to Autonomic functions Tests: its relevance in basic research and clinical practice	Prof. Ashok Jaryal, India	Prof. A. K. Chandra India
3	Live demonstrations: <ul style="list-style-type: none"> • Lying to standing test • Deep Breathing Test • Valsalva manoeuvres • Cold Pressor test • Isometric exercise test • Heart rate variability 		Prof. K. K. Das India
4	Expert Comments and Interaction		

Equipment & Technical Support by Department of Physiology, HIMSR and AD Instruments India

Session 2: “Animal Experiments and its importance”

Time: 2:30 pm to 4:30 pm

S.no	Title	Speaker	Chairpersons
1	Importance of Animal experiments in Physiology	Dr. Bhawna Mattoo India	Prof. Arunabha Ray India
2	Live demonstrations: <ul style="list-style-type: none"> • Invasive Blood Pressure monitoring • Non-Invasive Blood Pressure monitoring • Blood flow measurement • Cardiac Output measurement 		Prof. Mangala Gunatillake Sri Lanka Prof. Ruhul Amin Bangladesh
3	Expert Comments and Interaction		

Equipment & Technical Support by Department of Physiology, HIMSR and AD Instruments India

Organised by

Department of Physiology
Hamadard Institute of Medical Sciences & Research, Jamia Hamdard, New Delhi - 62

Heart Rate Variability Indices & Their Implications in Health and Disease



Dr. Indu Nanayakkara
(MBBS, MPhil, PhD)

**Senior Lecturer in
Physiology
Faculty of Medicine
University of Peradeniya
Sri Lanka**

Autonomic nervous system (ANS) plays an important role in the regulation of the physiological processes of the human being during normal and pathological conditions (1). Among the techniques used in its evaluation, the heart rate variability (HRV) has emerged as a simple and non-invasive measure, representing one of the most promising quantitative markers of autonomic balance.

HRV comprises oscillations between consecutive R-R intervals – inter-beat intervals (IBIs) that reflect the changes in heart rate due to the summative action of the sympathetic and parasympathetic divisions of the autonomic nervous system on the heart.

The electrocardiogram, heart monitors and analog to digital converters are the main instruments used to obtain indices that allow the assessment of HRV, whose high variability indicates good physiological adaptation while its reduction has been identified as an important indicator of underlying pathological conditions.

Cardiac Autonomic Innervation:

Autonomic nervous system (ANS), provides efferent nerves to the heart, in the form of sympathetic nerve endings throughout the myocardium and parasympathetic nerve ends to the sinoatrial node, atrial myocardium and atrioventricular node (2)

The influence of the ANS on the heart is dependent on information from baroreceptors, chemoreceptors, atrial receptors, changes on the respiratory system, the renin-angiotensin-aldosterone system and the thermoregulatory system, among many others (3). From these afferent information, depending on stimulatory and inhibitory influences, the responses from sympathetic and parasympathetic impulses to the heart are sent. This way the ANS modify the HR, by adapting to the needs of each moment.

Changes in patterns of HRV provides a sensitive and early indicator of health impairments. High HRV is a sign of good adaptation, by characterizing a healthy individual with efficient autonomic mechanisms. Conversely, low HRV is often an indicator of abnormal and inadequate adaptation of the ANS, which may indicate the presence of some malfunction, needing further investigations.

Recording HRV:

The HRV indexes are obtained by analyzing the IBIs, which can be captured by instruments such as an electrocardiograph and a digital-to-analog converter from external sensors placed at specific points of the body.

One such digital-to-analog converter available is the Powerlab, an instrument used for bio signal monitoring, considered the gold standard for high-fidelity ECG measurement. The signals captured are transferred to a computer, saved and analyzed after filtering the ectopic and premature beats (4).

Heart Rate Variability Indices:

These indices could be obtained by linear methods and nonlinear methods. Linear methods could be classified as those obtained by time domain analysis and frequency domain analysis. Over the years there have been many Time-domain indices quantify the amount of HRV observed during monitoring periods that may range from ~2 min to 24 h. They are so named for expressing the results in unit time (milliseconds). Some of the indices calculated based on statistical methods (5) are SDNN, SDANN, SDNNi, RMSSD and pNN50 (table 1).

The SDNN, SDANN and SDNNi are obtained from 24 hour records and represent the combined effect of sympathetic and parasympathetic activity where as RMSSD and pNN50 indexes represent the parasympathetic activity.

Table 1: Time domain indices of HRV using statistical methods

Index	Description
SDNN	Standard deviation of all normal RR intervals recorded in a time interval (ms)
SDANN	Represents the standard deviation of the normal RR intervals means, every 5 minutes in a time interval (ms)
SDNNi	Mean of the standard deviation of normal RR intervals every 5 minutes (ms)
RMSSD	Root-mean square of differences between adjacent normal RR intervals in a time interval (ms)
pNN50	Represents the percentage of adjacent RR intervals with a difference of duration greater than 50ms
Triangular index	Integral of the density of the RR interval histogram divided by its height
TINN	Baseline width of the RR interval histogram (ms)

Another possible way to process RR intervals in time domain is from geometrical methods. Triangular index and Triangular interpolation of the NN histogram (TINN).The triangular index is calculated based on the construction of a density histogram of normal RR intervals. The x-axis shows the length of RR intervals and the y-axis, the frequency on which each interval occurred.

The width of the base of the triangle thus formed indicates the variability of the heart rate. The triangular index can be calculated by dividing the area by the height of the triangle. The TINN is the baseline width of a histogram displaying NN intervals. Like SDNN and RMSSD, contamination by only two artifacts within a 5-min segment can significantly distort its value (6)

Frequency-domain indices calculate the absolute or relative amount of signal energy within component bands. This analysis decomposes the HRV in fundamental oscillatory components depending on wavelength (Table 2). This is similar to a prism that refracts light into its component wavelengths. The Fast Fourier Transformation method is used to obtain an estimate of power spectral HRV during stationary studies.

Table 2: Frequency domain HRV indices and their frequencies:

Each of the bands can be expressed as absolute power [expressed in ms^2] and relative power [expressed in normal units (nu) or as a %]

Index	Frequency	Description
High Frequency (HF)	0.15 to 0.4 Hz	Corresponds to the respiratory modulation and is an indicator of the performance of the vagus nerve on the heart
Low Frequency (LF)	0.04 and 0.15 Hz	Due to the joint action of the vagal and sympathetic components on the heart, with a predominance of the sympathetic ones
Very Low Frequency (VLF)	0.01 – 0.04 Hz	Less used indices. Physiological explanation is not well established and seems to be related to the renin-angiotensin-aldosterone system, thermoregulation and the peripheral vasomotor tone
The LF/HF ratio		Reflects the absolute and relative changes between the sympathetic and parasympathetic components of the ANS, by characterizing the sympathetic- vagal balance on heart

Normalizing data of the spectral analysis can be used to minimize the effects of changes in the VLF band. This is determined by dividing the power of a given component (LF or HF) by the total power spectrum, minus the VLF component and multiplied by 100. For analysis of the HRV indexes using linear and multiple methods, software can be used (7) . High-frequency power is highly correlated with the pNN50 and RMSSD time-domain measures. HF band power may increase at night and decrease during the day. Lower HF power is correlated with stress, panic, anxiety, or worry. The modulation of vagal tone helps maintain the dynamic autonomic regulation important for cardiovascular health. Deficient vagal inhibition is implicated in increased morbidity (7)

Non-linear measurements quantify the unpredictability and complexity of a series of IBIs. The nonlinear behavior is predominant in human systems, which cannot be described properly by linear methods. The relationship between non-linear measurements and illness is complex. While stressors and disease lower some non-linear indices, in cases like myocardial infarction, higher non-linear HRV predicts a greater risk of mortality.

Among the nonlinear methods used for HRV analysis are detrended fluctuation analysis, correlation function, Hurst exponent, fractal dimension and Lyapunov exponent. Table 3 summarizes the non-linear measures frequently used.

The Poincaré plot is a geometric method for dynamic analysis of HRV. Each RR interval is correlated with the preceding interval and define a point in the plot. Quantitative analysis of these plots is done by adjusting the ellipse of the figure formed by the attractor to obtain SD1, SD2 and SD1/SD2 ratio.

Table 3: Commonly used non-linear HRV indices

Index	Description
S	Area of the ellipse which represent total HRV (ms)
SD1	Poincaré plot standard deviation perpendicular to the line of identity (ms)
SD2	Poincaré plot standard deviation along the line of identity (ms)
SD1/SD2	Ratio of SD1 to SD2 (%)

The records for analysis of HRV indexes by linear methods can be obtained in short periods (2, 5, 15 minutes) or long periods (24 hours), later being more common in clinical practice. For analysis of the indexes in the non-linear domain, a larger number (around 1000 consecutive RR intervals) of RR intervals is recommended. Circadian rhythms, body temperature, metabolism, the sleep cycle, and the renin–angiotensin system contribute to 24 h HRV recordings, which is considered the “gold standard” for clinical HRV assessment (8). These recordings achieve greater predictive power than short-term measurements.

Among the limitations of HRV are the factors such as the presence of ectopic beats and artifacts and other conditions such as heart transplants, presence of arrhythmias and pacemakers. These situations make HRV inappropriate because the factors that mainly control cardiac functions are not the autonomic. There is also the presence of atrioventricular block, where the impulse is not conducted properly to the ventricle, where analysis of RR intervals is not possible (9)

Clinical Applications of HRV:

So far the HRV indexes have been used to understand various conditions, such as coronary artery disease, arterial hypertension, cardiomyopathy, myocardial infarction, sudden death, chronic obstructive pulmonary disease, renal failure, heart failure, diabetes, stroke, Alzheimer’s disease, leukemia, obstructive sleep apnea, epilepsy, headache and many others.

A reduced HRV has been identified as a strong indicator of risk related to adverse events in healthy individuals and patients with a large number of disease. In diseases such as hypertension, acute myocardial infarction, coronary artery disease and atherosclerosis, HRV indexes are reduced. Studies that used HRV in cardiovascular disease are summarized in table 4.

The assessment of HRV has also been widely used in sports medicine, for example, is generally used to assess adaptations related to resistance training (11) and exercise (12). Both time domain and frequency domain parameters are higher in trained individuals compared to sedentary individuals. If an explanation is sought on a physiological basis, regular practice of physical activity has been reported as a factor in increased vagal tone due to physiological adaptations that have occurred by the increase in cardiac work, since there is a decreased sensitivity of beta receptors.

However, there are some studies which have shown no significant difference between trained and untrained individuals in the case of certain parameters. There is also the age and gender influences on exercise with regard to the HRV parameters. Aging process is known to causes a depletion of vagal tone and consequent increase in sympathetic activity, therefore older individuals have a lower HRV. It has also been observed that HRV variation is greater in women. Moreover, a study linking the effects of age and exercise has showed that exercise training can mitigate the effect of aging.

Table 4: Studies that have used HRV in different groups of patients and subjects with their conclusions

Author (year)	Disease studied	Indices assessed	Conclusions drawn
Reis et.al. (1998)	Acute myocardial infarction	Review	Low positive predictive value. Supports the use of other methods for post MI risk stratification
Carnethon et.al. (2002)	Coronary artery disease	SDNN, HF	HRV can be used to identify differences in cardiac autonomic balance in healthy adults
Paschoal et.al. (2002)	COPD	SDNN	The patients tend to have reduced HRV
Javorka et.al. (2002)	Recovery following exercise	SDNN, RMSSD, pNN50, LF, HF	The cardio-deceleration after exercise is related to the immediate recovery, confirming parasympathetic contribution at this stage
Catai et.al. (2002)	Aerobic training (young and middle aged men)	LF, HF, LF/HF	The vagal predominance seen during sleep is reduced with increasing age.
Novais et.al. (2004)	Arterial hypertension (AH)	RMSSD, VLF, LF, HF	No difference at rest between healthy and active individuals with AH
Menezes et.al. (2004)	Arterial hypertension (AH)	SDNN, RMSSD, pNN50, LF, HF, LF/HF	HRV is decreased in hypertensive patients compared to normotensives
Terathongkum et.al. (2004)	Arterial hypertension (AH)	Review	Decreased HRV is an independent predictor of arterial hypertension in the patients
Takahashi et.al. (2005)	Coronary artery disease (CAD)	RMSSD	There were no significant differences in HRV indices in healthy sedentary and active CAD men
Bittencourt et.al. (2005)	Hypertrophic cardiomyopathy	RMSSD, pNN50, HF	There was a significant increase in parasympathetic modulation during controlled breathing associated with the tilt test in patients
Weerapong et.al. (2005)	Effects of sports massage	Review	Evidences of an increased parasympathetic activity and HRV. There is an increase of relaxing substances such as endorphins
Mello et.al. (2005)	Age & physical activity	RMSSD, HF, LF, LF/HF	Aging reduces HRV. But, regular physical activity is likely to affect the vagal activity in the heart and consequently attenuates the effects of aging

Pecyna (2006)	Acute myocardial infarction	Time & frequency domain indices	HRV is decreased in post MI patients
Paschoal et.al. (2006)	Different age groups	RMSSD, pNN50, LF, HF, LF/HF	HRV analysis is an important tool for investigating cardiac autonomic functions related to increasing age
Carney et al. (2007)	Coronary artery disease	HF, LF, VLF	Moderate correlation was found between inflammatory factors and HRV in depressed coronary artery disease patients
Limongelli et.al (2007)	Hypertrophic cardiomyopathy (HC)	SDNN, pNN50, RMSSD, LF, HF, LF/HF	There is a predictive value of HRV in risk stratification of children and young patients with HC
Sin et.al. (2007)	COPD	SDNN, SDANN, RMSSD, TINN	Nocturnal application of noninvasive mechanical ventilation for three months may improve HRV in patients with stable COPD
Kudaiberdieva et.al. (2007)	Sudden death	Review article	The positive predictive value of HRV indices for sudden cardiac death remains low, requiring a combination of other markers
Neves et.al. (2007)	Postmenopausal women on oestrogen therapy	SDNN, RMSSD, LF, HF, LF/HF	Estrogen therapy seems to attenuate the process of HRV reduction with increasing age, promoting a reduction in sympathetic activity on the heart
Lopes et.al. (2007)	Age & resistance training	SDNN, pNN50, RMSSD	Aging causes changes in autonomic modulation on the sinus node, reducing HRV in middle-age individuals. The physical training studied did not change HRV
Karas et.al. (2008)	Arterial hypertension	LF, HF, LF/HF	There was a reduction of hemodynamic responses (SBP and DBP) and sympathetic (LF) of elderly hypertensive
Larosa et.al. (2008)	Acute myocardial infarction (AMI)	SDNN, Frequency domain indices	HRV is decreased in patients with AMI
Furuland et.al. (2008)	Renal failure	SDNN, LF	Chronic renal failure patients not undergoing dialysis showed reduced HRV

Indexes of HRV have also been used as a tool for prediction of mortality among patients with acute myocardial infarction and depressed left ventricular systolic function. It has also been used as an early marker of diabetic cardiac autonomic neuropathy in addition to characterization of a large number of morbid conditions suggesting that the HRV can be a possible marker of loss of homeostasis

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Disrespect for animals and snatching away their habitats could have caused Corona Pandemics



Professor HR Ahmad
Professor of Physiology

MD PhD Bochum FCPS
SIUT and AKU
Karachi Pakistan

Dear Khamy, you might appreciate the Q & A on COVID -19 Pandemic being elucidated by Jane Goodall.

- Q1** *Who is Jane Goodall?*
JG is best known for a trailblazing research on the true nature of chimpanzees in their natural habitat in Africa.
- Q2** *What caused Coronavirus Pandemics?*
JG Triggered by humanity's disregard for nature and disrespect for animals.
- Q3** *How could we reverse this Pandemic?*
JG We need to learn from past mistakes to prevent future disasters.
- Q4** *Could you explain the cause and effect of the COVID -19 Pandemics?*
JG we destroyed their residential places in the forest and caused them to flee like migrants carrying diseases from one animal to another. This in turn infected humans upon over consumption of their meat as food being sold in markets around the world.
- Q5** *When did we start such a business of killing animals?*
JG It was mainly during the Iron Age. We cut the forest into agricultural land and started animal breeding by artificial selection.
- Q6** *How did the viruses jump into this onslaught of animals by us?*
JG These conditions provided viruses to cross the species barrier to human.
- Q7** *Has any country taken any step to stop it?*
JG China has closed the live wild animal markets.
- Q8** *Will it be made permanent for all countries?*
JG It should be. The future will show our sanity.

- Q9** *What should be our relation between trees and animals?*
JG We have the same genetic code. We should behave like good cousins.
- Q10** *Is it possible for all countries to make friendship with animals?*
JG It may be difficult initially because of livelihood and religious rituals dependence using sacrificial animals and heavy meat consumption. But not impossible!
- Q11** *How this Corona Pandemics could enable us to reflect what we did in past and doing now? Could we build a new world of plants, animals and us for a peaceful coexistence?*
JG May be we should design a world after agreeing of the fact that we are part of the animal kingdom and natural world and depend on each other. This realization is important step to think forward.
- Q12** *What would be the effect on children if we continue with the same principles of killing our cousin animals and destroy their habitats?*
JG We would actually steal the future from our children.

Summary

Khamy, we need to beg pardons from all animals and plants for our misbehavior deliberately or religiously with a promise to design a new world of peaceful coexistence. We should start discussion on it in every home to perhaps come to a consensus through a new humane UNO to give back the habitats we have destroyed and stolen from our cousins.

Love, Rajoo

Karachi: 12 April 2020

The author is a professor of physiology at SIUT and AKU Karachi Pakistan who is sharing an email correspondence to his grandson Khayyam Shuja.



Can we prevent diabetes-related foot ulcers?

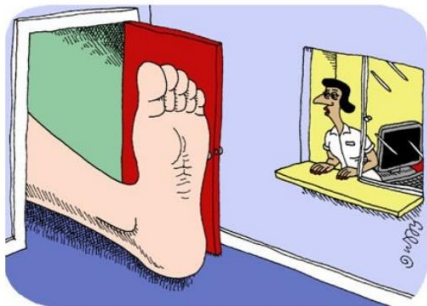


Dr C Alahakoon

Lecturer
Department of Physiology
Faculty of Medicine
University of Peradeniya
Sri Lanka.

“Foot care is essential to diabetes patients’ quality of life and wellbeing, yet is rarely given the attention it deserves”

Jeffcoate 2009



Background

Diabetes-related foot ulcers (DFU) are the commonest presentation of diabetes-related foot disease (DFD). It is a leading cause of hospitalisation resulting in disability and healthcare costs (1). Therefore, it is a current priority to identify and implement effective ways to reduce the occurrence of DFU (1). A number of past systematic reviews (2) and meta-analyses (3) have identified that the most widely investigated approaches to reduce the occurrence of DFUs are home foot temperature monitoring, patient education and offloading footwear (3).

Despite the previous publications in the field, there remain questions about the evidence to support home foot temperature monitoring, patient education and offloading footwear in reducing the occurrence of DFUs. The recent International Working Group on the Diabetic Foot (IWGDF)

guidelines, noted that the overall quality of evidence about the usage of the above interventions to prevent DFUs were low-to-moderate (4).

Therefore, our aim was to conduct an up to date and comprehensive meta-analysis to clarify the benefit of home foot temperature monitoring, patient education and offloading footwear from randomised controlled trials in preventing DFUs.

Methods

We conducted a systematic review according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement and registered in PROSPERO (Registration number: CRD42019135226) (5). A literature search was performed in MEDLINE, PubMed, CINAHL, Scopus and Cochrane databases to identify relevant original studies. These subject headings (MeSH terms) and key words were used: “Diabetic foot” OR “Diabetic Peripheral Neuropathy” AND “Nursing care” OR “Patient care” OR “Preventive health services” OR “Health education” OR “Primary prevention” OR “Secondary prevention”. No language or date restrictions were used. Meta-analyses were performed using intention-to-treat principals for worst (main analysis; it was assumed that all the patients who were lost to follow up developed an ulcer) and best (sub-analysis; all those who were lost to follow up did not develop an ulcer) case scenarios. Leave-one-out sensitivity analyses were also carried out to assess the consistency of findings.

The primary outcome was diabetes-related foot ulcer incidence. Secondary outcomes were minor, major and total amputations (minor and major amputations). Data on adherence to offloading footwear were also extracted.

Risk of bias of all included studies was assessed independently by three authors using the Cochrane Collaboration's tool for assessing risk of bias in randomised trials (6).

Results

Out of 7,575 unique records, seventeen RCTs involving 2729 participants were included. All trials included participants of diabetes foot risk category 2 or above in the IWGDF grading system (all these patients were having peripheral neuropathy, and some were having peripheral arterial disease and some had a past history of similar ulceration). We found that four trials tested home foot temperature monitoring (n=468), six examined patient education (n=823) and seven assessed offloading footwear (n=1438). Participants' who conducted home foot temperature monitoring (Odds ratio [OR] 0.51, 95% confidence interval [CI] 0.31 to 0.84, n=468) and those used offloading footwear (OR 0.48, 95% CI: 0.29 to 0.80, n=1438) were less likely to develop a diabetes-related foot ulcer. Education of patients did not significantly reduce diabetes-related foot ulcer incidence (OR 0.59, 95% CI: 0.29-1.20, n=823) (Figure 1). Sensitivity analyses suggested that offloading footwear findings were consistent, but home foot temperature findings were dependent on the inclusion of one trial. All RCTs had either high or unclear risk of bias.

Discussion

This meta-analysis suggests that offloading footwear is effective in reducing the incidence of diabetes-related foot ulcers. The main analysis we did also suggested that home foot temperature monitoring reduced the incidence of foot ulcers, however, the findings were not robust in all sensitivity analyses. The meta-analysis suggested that previously tested patient education programs are not effective in reducing the occurrence of diabetes-related foot ulcers but again findings were not robust in sensitivity analyses (7).

At a glance, the findings of this meta-analysis are similar to a recently published systematic review (3) but a number of differences should be noted. Firstly, the current meta-analysis employed a strict and clearly stated way of handling missing data in contrast to past systematic reviews. Intention to treat principle is an established cornerstone of analysis of data from RCTs (6). Missing data has an important impact on such analyses. In order to include all participants randomised we performed analyses to assess both the worst (where the participant with missing data was assumed to have developed an ulcer) and best (where the participant with missing data was assumed not to have developed an ulcer) case scenarios, as previously described (8). As a result of leave one out analyses it was evident that the findings for home foot temperature monitoring were not completely robust as they were dependent on the inclusion of a single trial (9). Similarly, the findings for the patient education programs also changed in one of the sensitivity analyses. In contrast, the findings for offloading footwear were consistent in all sensitivity analyses. Our interpretation of these findings is that there is robust evidence on the benefit of offloading footwear in preventing DFUs.

Conclusion

In conclusion, these meta analyses provides robust evidence that offloading footwear reduces the occurrence of DFUs in high risk people (4). The meta analyses also suggests that there may be benefit of home foot temperature monitoring, but further trials are needed (7). The value of patient education programs in preventing DFUs is currently unclear despite recommendations given by the IWGDF (4).

Disclosure:

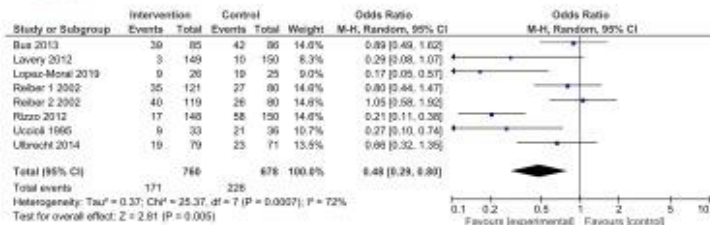
The contents discussed in this article has been already published in the journal "Diabetic Medicine" and is a part of the Doctoral thesis of the author. It has been cited in the Conclusion section for further reference.

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Prevention of diabetes-related foot ulcers
 People at high-risk of diabetes-related foot ulcers should be offered offloading footwear. Home foot temperature monitoring also appears efficacious in contrast to patient education.



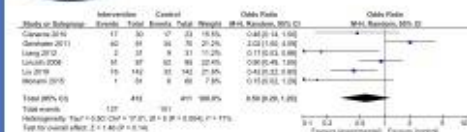
Offloading footwear



Home foot temperature monitoring



Patient education



Graphical abstract of the findings from the meta-analyses

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Covid-19 Vaccination and Bangladesh



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Dhaka Medical College
Bangladesh**

The world is in the midst of SARS-CoV-2 pandemic and working together in order to win the battle against this deadly virus. Vaccines are a critical new tool in the battle against COVID-19.

Vaccination is a simple, safe and effective way of protecting people against harmful diseases, before they come into contact with them. Vaccines save millions of lives each year. It uses our body's natural defenses to build resistance to specific infections and makes our immune system stronger. They work by exposing the human body to particles or molecules that trigger's the body's natural defense system thus protecting the subject from future infection.

It is a wonderful scientific milestone that COVID-19 vaccines have been developed within less than a year after the virus was first detected. Over the past few months, a number of COVID-19 vaccines became available, approved for general or emergency use and have shown different levels of efficacy.

There are four main type of vaccine against SARS-CoV-2. The key difference between the types is the method of exposure used. Here are the key differences.

1. Whole virus vaccine - Sinopharm, Sinovac
2. RNA or mRNA vaccine - Pfizer-BioNTech, Modern
3. Non-replicating viral vector - Oxford-AstraZeneca, Sputnik V
4. Protein subunit – Novavax

There is no single standard vaccine efficacy threshold that can be applied to all vaccines. The AstraZeneca vaccine seems to have lower efficacy than the Pfizer vaccine at preventing mild to moderate disease, but has proven 100% effective against severe disease. Bangladesh chooses to take AstraZeneca vaccine because it can be kept at normal refrigerator temperature meaning that it can be easily transported anywhere in the country. It is also cost effective.

More than 1.5 crore people have already been vaccinated globally. Bangladesh with a population of over 170 million joined the global vaccination campaign against the highly contagious virus that has already claimed 2.32 million lives across the globe. The country has officially reported 548,549 cases and 8,435 deaths till date. The daily rate of infections has eased sharply since a peak in July 2020.

A pilot program of Covid-19 vaccination began on 27th January 2021. The first batch of people received the first shot of the AstraZeneca-Oxford vaccine at Dhaka's Kurmitola General Hospital on that day. Then a nationwide vaccination campaign started on Feb 8, 2021 with plans to administer more than 30 million doses over the next few months. The south Asian country is seeking to vaccinate 80% of its population of around 170

million, with each person getting two doses administered eight weeks apart.

There was some doubt and confusion at the initial stage among people about taking the Covid-19 vaccine. Then the government has decided to increase awareness programs on the campaign to earn people's confidence and spread information about the merits and demerits of the vaccine. Now people gradually getting over their initial fear of the vaccine and going to the vaccine centers.

Getting vaccinated is one of many steps of stopping a pandemic. Safe and effective vaccines will be a gamechanger. Being vaccinated does not mean that we can throw caution and put ourselves and others at risk. Because it is still not clear that the degree to which the vaccines can protect not only against disease but also against infection and transmission. But for the foreseeable future we must continue wearing masks, physically distancing and avoiding crowds.



A young woman receiving Covid-19 vaccine on February 14, 2021 in BGB hospital, Dhaka.

News and Events

Unwrapping the body: Homeostasis inside

A successful talk by Prof Cheng Hwee Ming was organized by the University of Lahore

THE UNIVERSITY OF LAHORE
University College of Medicine & Dentistry

Physiology Talks
“Unwrapping the Body: Homeostasis inside”

13TH MARCH, 21
SATURDAY
11:00 AM PST
02:00 PM MST

Prof. Cheng Hwee Ming
University of Malaya
Kuala Lumpur, Malaysia

ZOOM LINK: <https://uoledupk.zoom.us/j/92667900569>
MEETING ID: 926 6790 0569

This lecture is available at the following link

<https://uoledupk.zoom.us/rec/share/IOSL8znO78kkAHJCjzTuedTgeFOk0mGpczcuHswJSildDeUtcMhdMMDafVPCHV0.vTV7OwiICR9AZVPX>

Passcode: M++hw+8.

‘Sodium Homeostasis: The Cat in the Balance’

Professor Hwee Ming Cheng, Honorary Professor, Dept. of Physiology, University of Malaya in Malaysia who initiated Inter Medical School Physiology Quiz (IMSPQ) in Kuala Lumpur, Malaysia has delivered the distinguished lecture entitled ‘Sodium Homeostasis: The Cat in the Balance’ on 26th March 2021 for the benefit of Sri Lankan students specially the students from Faculty of Medicine, University of Colombo (UOC) and Faculty of Medical Sciences, University of Sri Jayewardenepura (SJP) who have teamed up to contest at the International Physiology quiz organized by the University of Lahore, Pakistan.



Faculty of Medicine
University of Colombo

Guest Lecture (Online)
Title – ‘Sodium Homeostasis : The Cat in the Balance’
followed by a discussion on International Physiology Quiz



Distinguished Speaker
Honorary Professor HWEE MING CHENG
Dept. of Physiology,
Faculty of Medicine
University of Malaya,
Malaysia.

Date: 26th March 2021 (Friday)
Time: 2.30 – 4.00 pm

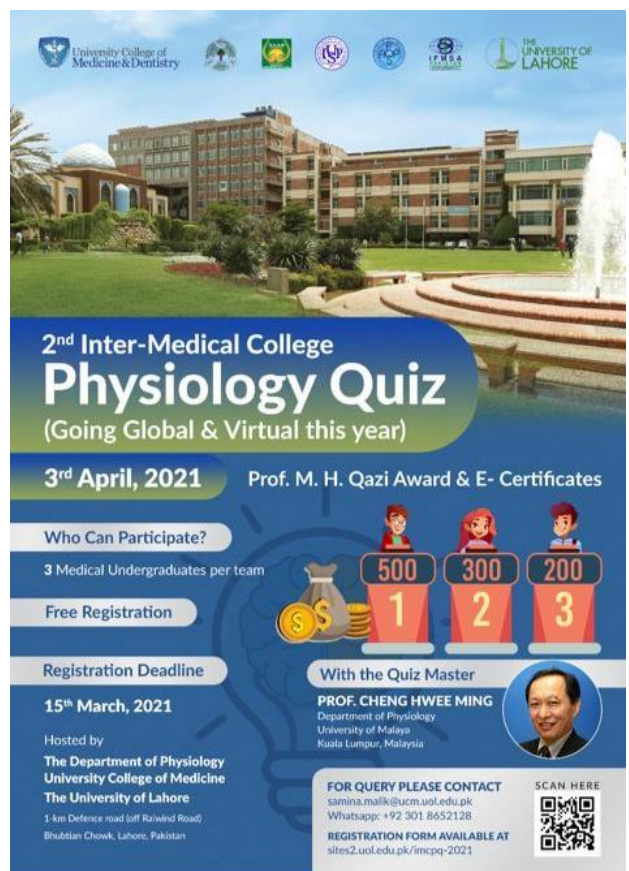
ZOOM link will be shared.

On the invitation of Professor Samina Malik, the Chairperson of the International Physiology quiz, nine student teams (5 teams from UOC and 4 teams from SJP) got registered for this international quiz to be conducted on a virtual platform on 3rd April 2021. Professor H M Cheng who is the quiz master in this international quiz has conducted a discussion after his distinguished lecture, to give an idea about the number and type of questions given, format of the quiz with the time allocation.

One hundred and thirty-three students from both universities joined this virtual lecture and discussion organized by the Department of Physiology, Faculty of Medicine, University of Colombo.

Further, a mock quiz will be organized by the quiz organizers in Pakistan on 1st April 2021.

Upcoming events and activities



University College of Medicine & Dentistry, IFMSA, THE UNIVERSITY OF LAHORE

2nd Inter-Medical College Physiology Quiz
(Going Global & Virtual this year)

3rd April, 2021 Prof. M. H. Qazi Award & E- Certificates

Who Can Participate?
3 Medical Undergraduates per team

Free Registration

Registration Deadline
15th March, 2021


Hosted by
The Department of Physiology
University College of Medicine
The University of Lahore
1-km Defence road (off Rawwind Road)
Bhuttian Chowk, Lahore, Pakistan

With the Quiz Master
PROF. CHENG HWEE MING
Department of Physiology
University of Malaya
Kuala Lumpur, Malaysia

FOR QUERY PLEASE CONTACT
samina.malik@ucm.uol.edu.pk
Whatsapp: +92 301 8652128

REGISTRATION FORM AVAILABLE AT
sites2.uol.edu.pk/imcpq-2021

SCAN HERE



Clinical Cardiovascular Autonomic Workshop

30/04/2021

Physiological Society of Sri Lanka

Time	Activity	Presenter
9.00am-9.30am	Introduction to the Autonomic Nervous system	Dr. Indu Nananayakkara Senior Lecturer, Department of Physiology University of Peradeniya, Sri Lanka
9.30am-10.00am	Heart rate variability assessment and its applications	Dr. Dinu Chandran Associate professor, Department of Physiology All India Institute of Medical Sciences, New Delhi
10.00am -10.15am	Q and A session while you grab a tea	Chaired by Prof. Niranga Devenarayana
10.15-11.15 am	Cardio vagal autonomic Function assessment at the Autonomic Unit, Queen Square London	Mr. Scott Johnstone Senior Clinical Scientist & Academic Programme Co-ordinator in Autonomic Neurology
11.15am-11.45am	Cardio vagal autonomic Function assessment available in Autonomic Units in Sri Lanka	Dr. Tania Warnakulasuriya Senior Lecturer, Department of Physiology University of Kelaniya, Sri Lanka
11.45am-12.00am	Q and A session	Chaired by Dr. Tania Warnakulasuriya
12.00 noon-12.30 pm	Diabetic Autonomic neuropathy and other autonomic neuropathies	Dr. Dulani Kottahachchi Senior Lecturer, Department of Physiology University of Kelaniya, Sri Lanka
12.30pm -1.00pm	Central Autonomic disorders	Dr. Ellen Merete Hagen Consultant Neurologist in Autonomic Medicine, National Hospital for Neurology and Neurosurgery, Queen Square, London, England
1.00pm -1.30pm	Orthostatic intolerance	Dr Valeria Iodice Clinical and Academic Lead, Autonomic Unit, University College London Hospital and Honorary Associate Professor , University College London, England
1.30pm-2.00pm	Some interesting presentations while you grab your lunch	Dr. Tania Warnakulasuriya/Dr. Valeria/Dr. Ellen Merete Hagen



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Compiled by Professor Piyusha Atapattu
Editor-in Chief, SAAP Bulletin