2019

College of Chemical Pathologists of Sri Lanka

4th Annual Academic Sessions

PROGRAMME & ABSTRACTS BOOK

"Optimize diagnosis for better care and cure"

21st 23rd of March 2019

Galle Face Hotel,Colombo- Grand Ballroom

COLLEGE OF CHEMICAL PATHOLOGISTS OF SRI LANKA

4TH ANNUAL ACADEMIC SESSIONS
&
WORKSHOP ON MEDICAL LABORATORY SCIENCE

"Optimize diagnosis for better care and cure"

PROGRAMME & ABSTRACTS BOOK

22nd – 23rd March 2019
Galle Face Hotel, Colombo, Sri Lanka

CONTENTS

MESSAGE FROM
THE PRESIDENT- DR GAYA KATULANDA
COLLEGE OF THE CHEMICAL PATHOLOGISTS OF SRI LANKA

On behalf of the college I am delighted to welcome you to our 4th Annual Academic sessions – the pinnacle of the year's academic calendar. It is a congregation for acquiring, enhancing, developing and sharing our knowledge.

Our theme this year is 'Optimizing the diagnosis for better care and cure'. As chemical pathologists, we deliver test results on bodily fluids to diagnose diseases and manage patients. Both the invention of accurate, timely, precise results and the meticulous use of tests and results would pave the way for better care and cure. This year's sessions have been planned and designed to reflect this.

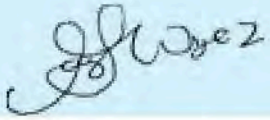
It spans two days and consists of 12 plenaries and 6 symposia. A mid-session workshop on automation is held where chemical pathology trainees would observe demonstrations with principles and new technologies of automation. In the breakfast symposia, our trainees can meet experts on method validation, statistical methods, molecular pathology and immunoassay. A poster presentation will be held to encourage young researchers.

We have identified the importance of training medical laboratory technologists. A two day parallel workshop on medical laboratory science is held to fulfil this. This is a wonderful way to express direction and unity.

The sessions owe to all invited speakers both international and local, chairpersons, workshop coordinators, experts, free paper presenters and judges. We thank all those registered for this great academic activity by the college.

We are extremely grateful to all our sponsors for their financial support as well as for adding colour to the industry exhibition.

I invite post graduate trainees and consultants in chemical pathology and those of other disciplines of medicine to join us for Sessions and medical laboratory technologists to join us at the workshop.



MESSAGE FROM

THE HONORARAY
JOINT SECRETARIES - DR KISALI HIRIMUTUGODA &
DR NANGAI KULARATNAM
COLLEGE OF CHEMICAL PATHOLOGISTS

It is our great pleasure to welcome you to the Annual Academic sessions of the College of Chemical Pathologists of Sri Lanka (CCPSL) on 21st, 22nd and 23rd of March 2019 at Galle Face Hotel Colombo under the auspicious of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and Asia Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB).

The year 2019 has been a very busy academic year for us. In order to update knowledge on current practices of chemical pathology of medical professionals and medical laboratory technologists, we have been conducting study days and regional workshops in collaboration with local clinical societies. The Annual Academic Session is one of the main activities and this year we will host our 4th annual academic session.

This year our theme "Optimization of diagnosis for better care and cure" is in line with the key role CCPSL is playing by coordinating between different clinical fields to optimize patient care.

We have organized a comprehensive scientific programme covering a wide variety of important topics in chemical pathology relevant to the day-to-day practice and the accompanying parallel two day workshop for Medical Laboratory Technologists will help them upgrade laboratory services and deliver reliable reports for better patient care.

We would like to extend our sincere gratitude to the president of CCPSL for providing leadership and the council for their continuous support in organizing this important event. We are honoured to have Dr Anil Jasinghe, Director General of Health Services as the Chief Guest to grace the occasion at the inauguration ceremony.

We are indeed privileged to have Professor R. Swaminathan as the Guest of Honour. We thank all overseas resource personnel for sharing their knowledge and experience with us. Our appreciation goes to all local experts who will share their expertise with us.

We express our sincere thanks to sponsors, event organizers, the hotel management, college assistant and all the well wishers for the support they lend to make this event a resounding success.

We hope that all the participants will have a fruitful learning experience.

MESSAGE FROM

THE CHIEF GUEST
DR ANIL JASINGE, DIRECTOR GENERAL OF HEALTH SERVICES
MINISTRY OF HEALTH, NUTRITION AND INDIGENOUS MEDICINE

It is with great pleasure I send this message to convey my best wishes for the 4th Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka and for the Induction of the new President

Chemical Pathologists are responsible for generating accurate and timely test results on specimens received in the laboratory. Many clinical decisions on diagnosis, monitoring, screening and prognostication of diseases are taken depending on chemical pathology test results.

The College of Chemical Pathologists is an active organization working for the upliftment of the specialty. A series of monthly study days have been carried out for junior doctors. Two regional workshops were conducted in Anuradhapura and Kurunegala in collaboration with respective clinical societies for doctors as well as medical laboratory technologists.

The college is liaising with the Ministry of Health in many activities. Development of primary health care, national laboratory quality assurance and development of laboratory manual, are a few of these.

I congratulate the college on this special occasion. There are nine overseas speakers from United Kingdom, Australia, Singapore and India to share their knowledge and experience. These two days will provide an invaluable opportunity for both doctors and medical laboratory technologists to enhance, replenish and develop their knowledge.

I convey my best wishes for a successful annual academic session and workshop on medical laboratory science.

MESSAGE *FROM*

THE GUEST of HONOUR
PROF. R SWAMINATHAN, CONSULTANT CHEMICAL PATHOLOGYST OF ST. THOMAS HOSPITAL, LONDON

It is a great privilege and honour to be invited for the fourth annual academic congress of the College of Chemical Pathologists of Sri Lanka (CCPSL) as guest of honour.

I learnt with great pleasure that CCPSL was established in 2015 with the aim of promoting the subject in Sri Lanka and thereby improve health delivery. Due to the foresight of people like Prof R.G. Panabokke, chemical pathology was introduced as a speciality on its own right in Sri Lanka and I was fortunate enough to be asked to be one of the early examiners for the MD examination in Chemical Pathology.

From those early days the specialty has grown and I believe that there are chemical pathologists in almost all the major hospitals in Sri Lanka. CCPSL is helping to train future chemical pathologists as well as making sure that all staff keep abreast of the subject. With this in mind CCPSL is organising the annual congress as well as the regional meetings.

I am confident of CCPSL's progress to excellence and it becoming an important organisation in shaping the clinical biochemistry practice in Sri Lanka. I wish them well and hope to see many more conferences in the future.

MESSAGE FROM

THE DEPUTY DIRECTOR GENERAL OF LABORATORY SERVICES
DR HEMANTHA BENERAGAMA

I am pleased to send this message to the College of Chemical Pathologists of Sri Lanka on the occasion of the inauguration of their 4th Annual Academic Sessions and Induction of the 4th President of the College.

I strongly feel that the contribution made by Chemical Pathologists is of utmost importance in the management of patients. Chemical pathology tests are crucial in the management of almost all communicable diseases, non – communicable diseases and other health related issues.
Hence the Chemical Pathologist have dual roles in the health setup. They manage the laboratory and release accurate test reports while supporting the fellow clinical colleagues in selection and interpretation of tests.

Given this background, I believe the theme selected for this year, "Optimize Diagnosis for better Care and Cure" is most appropriate.

Moreover the College of Chemical Pathologists liaises closely with the Ministry of Health in upgrading laboratory services. I take this opportunity to thank the College for their contribution made to strengthen the primary health care services and improvement of quality of the laboratories.

I believe, the two day annual academic sessions will contribute immensely to upgrade the knowledge of post graduate trainees and consultants in many disciplines. Also, the workshop on medical laboratory science will be a great venture for improving the knowledge of medical laboratory technologists.

I take this opportunity to convey my best wishes for the Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka and wish them great success in their future endeavors.

MESSAGE FROM
PRESIDENT INTERNATIONAL FEDERATION OF CLINICAL CHEMISTRY AND LABORATORY MEDICINE
DR HOWARD MORRIS

Dear Colleagues,

It is my great pleasure to welcome you to the 2019 Annual Academic Sessions of the College of Chemical Pathologists of Sri Lanka (CCPSL) and to bring greetings from the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

I congratulate the organizers on the theme for this conference "Optimize diagnosis for better care & cure" and to you, the delegates, for making the time and effort to attend. The IFCC is proud that this congress is being held under its auspices.

Healthcare systems face great challenges throughout the world, in resource-rich countries and also in resource-poor communities alike. We all face the challenges of increasing patient numbers, of increasing expectations of patients, governments and insurers.

Healthcare is a key component in bringing our communities together. Laboratory medicine is at the centre of healthcare delivery and as healthcare workers we have great responsibilities to provide optimal, cost-efficient services to our communities.

Perhaps never before have our professional organizations, such as CCPSL at the national level and IFCC at the international level, had such major responsibilities to inspire and train members to perform at their best in the day to day tasks of providing support for the optimal treatment of patients.

Thus it is of critical importance that conferences such as these are held on a regular basis. It is essential that we come together to discuss, debate and decide on the optimal practices for clinical laboratories to prepare us to go back to our clinical laboratories and successfully meet the challenges that we face in the coming months and years.

I wish all delegates an enjoyable and a productive congress in this historic and significant region of the world.

MESSAGE *FROM*

THE PRESIDENT ASIA-PACIFIC FEDERATION FOR CLINICAL BIOCHEMSITRY AND LABORATORY MEDICINE (APFCB)

DR SUNIL SETHI

The Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB) conveys its best wishes to the CCPSL on the occasion of the 4Th Annual Academic Session on 21-23 March 2019.

CCPSL has always been an active affiliate member society of the APFCB and the AAS have a reputation of being vibrant and well attended by members. The 2019 Annual Academic Session promises a wide-ranging coverage of the major topics in laboratory medicine.

I am particularly impressed with the quality of the world-class faculty. CCPSL AAS 2019 will no doubt be another extremely successful meeting. You have my very best wishes for a successful meeting.

I am sure all the speakers and participants will have a rewarding time of good science and enjoyable networking. On behalf of the Executive Board of the APFCB, allow me to convey my thanks and appreciation to the Organizing Committee of the Annual Academic Session 2019. Do have a richly rewarding time to learn and refresh yourselves at the meeting.

The college of Chemical Pathologists of Sri Lanka
Council 2019

President:
Dr Gaya Katulanda

President-elect:
Dr Manjula Dissanayake

Immediate Past President:
Dr BKTP Dayanath

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Dr.Neranjana Withanage
Dr. Ushani Jayawardane
Dr. HW Dilanthi

Honorary Advisor:
Dr. Saroja Siriwardena

The College of Chemical Pathologists of Sri Lanka
Council 2019

Seated: Dr Saman Pedruhewa, Dr Nangai Kularatnam, Dr Saroja Siriwardena, Dr B K T P Dayanath, Dr Gaya Katulanda, Dr Manjula Dissanayake, Dr S I Majitha, Dr Kisali Hirimutugoda, Dr Dilinika Perera

Standing: Dr Thamara Herath, Dr Dulani Jayawardena, Dr H W Dilanthi, Dr Sakunthala Jayasinghe, Dr Chandrika Meegama, Dr Thushara Hewageegana, Dr Ushani Jayawardena, Dr Rajitha Samarasinghe, Dr Deepani Siriwardena, Dr Neranjana Vithanage, Dr Eresha Jasinghe

SCHEDULE AND PROGRAM

ACADEMIC PROGRAM
Day 01 – March 22nd, 2019

7.30-8.00 am
Registration

8.00-8.30 am
Plenary 1
Vitamin D - Is it the panacea for all ill health?
Prof R Swaminathan

8.30-10.00am
Symposium 1 - BONE
Metabolic bone disease – Dr Brian Shine
Clinical uses of bone markers
Dr Roshitha De Silva
Teriparatide : anabolic therapy for severe osteoporosis
Dr Rajeev Srivastava

10.00-10.30 am
Plenary 2
Inborn errors of metabolism (basics for the endocrinologist/physician) – Dr Adrian Park

10.30-11.00 am
Tea

11.00-11.30 am
Plenary 3
Assay interferences and mitigating results – Dr Yeo Chin Pin

11.30-12.30 pm
Symposium 2 - ENDOCRINE
Principles of dynamic function tests
Dr Charles Antonypillai
Pitfalls in the measurement and interpretation of thyroid function tests – Dr Chandrika Meegama

12.30-1.00pm
Plenary 4
Acute porphyria – Prof Peter Stewart

1.00-1.30 pm
Plenary 5
Early detection of liver fibrosis
Dr Thamara Herath

1.30-2.30 pm
Lunch

2.30-3.30 pm
Symposium 3 - CARDIAC
Familial hypercholesterolemia
Dr Gayani Weerasinghe
Impact of analytical characteristics of troponin assays on clinical decisions
Dr Saman Peduruhewa

3.30-4.00 pm
Plenary 6
Molecular testing in the diagnosis of genetic disease – Dr Aaron Chapla

4.00 pm onwards
Tea

5.00 pm onwards
Automation Workshop

ACADEMIC PROGRAM
Day 02 – 23rd March , 2019

7.30-8.00 am
Registration

8.00-8.30 am
Plenary 7
Anti-mullerian hormone; trending
Dr Gautham Pranesh

8.30-10.00am
Symposium 4 - CANCER SCREENING
Myeloma; role of light chains
Dr Rajitha Samarasinghe
Clinicopathological aspects of neuroendocrine tumours – Dr Thushara Hewageegana
Screening for bowel cancer – Dr Brian Shine

10.00-10.30 am
Plenary 8
Interpretation of blood gases – Dr Rajeev Srivastava

10.30-11.00 am
Tea

11.00-12.30 pm

Symposium 5 - RENAL

Acute kidney injury - options for the future
Dr Dilinika Perera
Stone former investigations
Dr Sakunthala Jayasinghe
Current recommendations on GFR assessment
Prof R Swaminathan

12.30-1.00 pm

Plenary 9

Lead exposure
diagnosis, measurement and management – Prof Peter Stewart

1.00-1.30 pm

Plenary 10

Reference ranges – Dr Brian Shine

1.30-2.30 pm
Lunch

2.30-3.00 pm

Plenary 11

Inborn errors of metabolism: the role of basic biochemistry – Dr Eresha Jasinge

3.00-4.30 pm

Symposium 6 - DIABETES

Diabetes; clinicopathological correlations and role of the laboratory in management
Dr Prasad Katulanda
Guideline development in diabetes
Dr Amanda Adler
Obesity assessment and medical management
Dr Adrian Park

4.30–5.00 pm

Plenary 12

POCT governance & quality framework
Dr Yeo Chin Pin

5.00 pm onwards
Tea

MLS Workshop Program
Day 01 – 22nd March , 2019

7.30-8.30 am
Registration

8.30-9.10 am
Inauguration

9.10-9.35 am
Creatinine - what is best? -Dr B.K.T.P. Dayanath

9.35-10.00am
Introduction of new method
Dr Neranjana Vithanage

10.00-10.30 am
Tea

10.30-10.55 am
What is the future of lab testing? -Dr Peter Stewart

10.55-11.20 am
Reference ranges & decision limits - what you should know- Dr Gayani Weerasinghe

11.20-11.45 am
POCT - the way forward -Dr Majitha Ibrahim

11.45-12.10 pm
Pituitary disorders - dynamic function tests
Dr Ushani Jayawardena

12.10-1.10pm
Lunch

1.10-1.35 pm
Adrenal disorders - dynamic function tests
Dr Nangai Kularatnam

1.35-2.00 pm
Preanalytical variables – how to minimize their impact on laboratory test results -Dr Yeo Chin Pin

2.00-2.25 pm
Common electrolyte abnormalities
Dr Rajeev Srivastava

2.25-3.00 pm
Tea

3.00-3.25 pm
Accreditation on clinical biochemistry
Dr Deepani Siriwardena

3.25-3.50 pm
Stool markers- Dr Ganga Withanapathirana

3.50-4.15
Bone & vitamin D -Dr Homathy Sivakumar

MLS WORKSHOP PROGRAM Day 02 – 23rd March , 2019

8.30-9.10 am
Registration

9.10-9.35 am
Diabetes & laboratory- Dr Manjula Dissanayake

9.35-10.00am
Basics of molecular pathology -Dr Aaron Chapla

10.00-10.30 am
Tea

10.30-10.55 am
How to verify a new kit -Dr Gaya Katulanda

10.55-11.20 am
Investigating subfertility- Dr Gautham Pranesh

11.20-11.45 am
Thyroid: what we should know in the laboratory
Dr Kisali Hirimuthugoda

11.45-12.10 pm
Spectrophotometry; basics and common problems
Dr H.W. Dilanthi

12.10-1.10pm
Lunch

1.10-1.35 pm
Quality in the clinical biochemistry laboratory
Prof R Swaminathan

1.35-2.25 pm
Quiz
Dr Lanka Liyanage
Dr Thathsarani Vithanapathirana,
Dr Maduri Vidanapathirana

2.25-3.00 pm
Tea

3.00-3.25 pm
Case discussion - pre analytical errors
Dr Subadra Wanninayake

3.25-3.50 pm
Case discussion - analytical errors
Dr Aruni Wijesinghe

3.50 pm on wards
Awards and certificates

Mid-session Workshop on Automation
College of Chemical Pathologists
5.00 pm, 22nd March 2019
Grand Ballroom, Galle Face Hotel, Colombo

5.00pm - 5.05pm	*Welcome speech*
5.05pm - 5.25pm	*Art of Automation -Dr. Richard Rumnong*
5.25pm - 5.45pm	*Photometric advances in automation- Dr Anita Ittoop*
5.45pm - 6.05pm	*Management of information- Dr Dulani Jayawardana*
6.05pm - 6.25pm	*Principles of automation in urinalysis tests- Mr Andy Liu*
6.25pm - 6.45pm	*Advances in urinalysis solutions on identifying kidney disease Dr Tianting Zhang*
6.45pm – 7.05pm	*HbA1c Assay by CE technology and complete automation solution for all sizes of laboratories. - Mr Shawn CHEONG*
7.05pm – 8.35pm	*Interactive discussion at 5 separate stations*
8. 35pm – 8.40pm	*Vote of thank (and inviting participants for dinner)*

With Prior Registration

Breakfast Symposia
Annual Academic Sessions of the College of Chemical Pathologists
7.00 am, 23rd March 2019 , Jubilee Ballroom,
Galle Face Hotel, Colombo

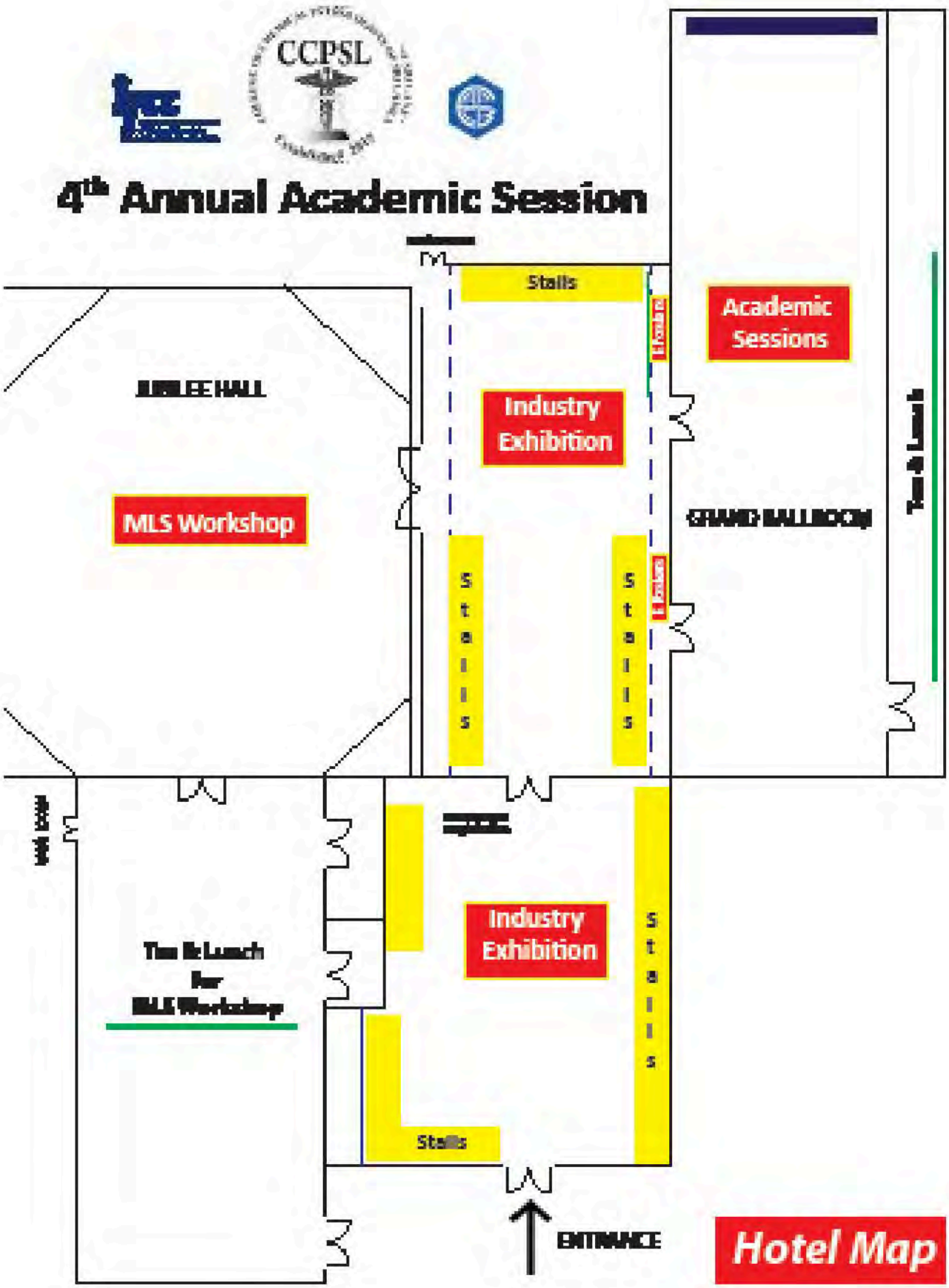
Diagnostic Molecular Pathology - Basic concepts and laboratory approach-Dr Aaron Chapla

Immunoassay -Dr Adrian Park

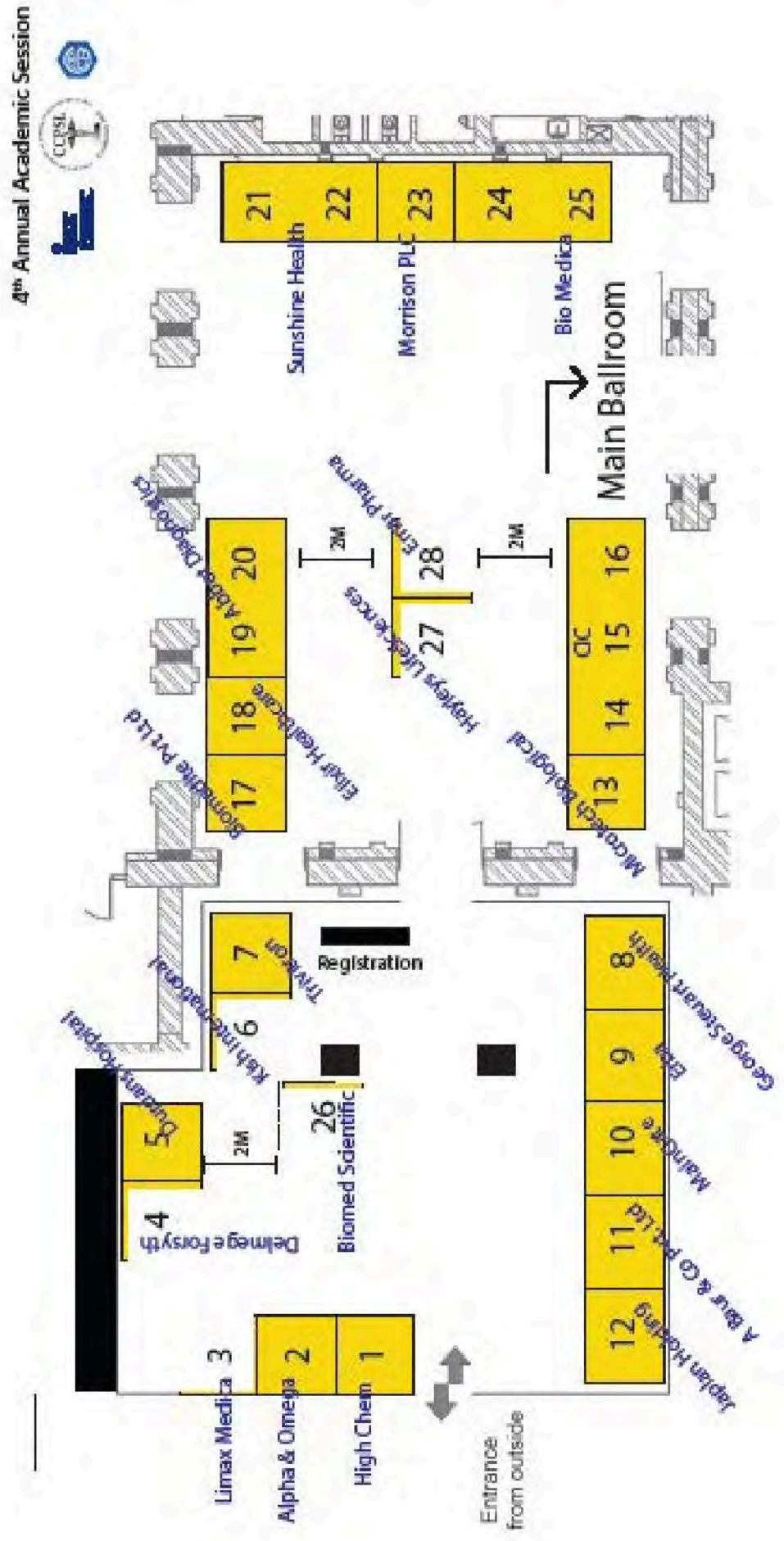
Statistical methods for chemical pathologists-Prof Swaminathan

Method validation-Dr Yeo Chin Pin

With Prior Registration


CCPSL
4th Annual Academic Session
Stalls
Academic Sessions
JUBILEE HALL
Industry Exhibition
MLS Workshop
Stalls
Stalls
Industry Exhibition
Stalls
ENTRANCE
Hotel Map

Stall Plan – Industry Exhibition



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5	Durdans Hospital
6	Kish International (Pvt) Ltd
7	Trivitron Nawakrama Medical Technologies (Pvt) Ltd
8	George Steuart Health (Pvt) Ltd
9	Erba
10	MainGate (Pvt) Limited
11	A. Baur & Co. (Pvt) Ltd
12	Japlan Holding (Pvt) Ltd
13	Microtech Biological (Pvt) Ltd
14	CIC Holdings PLC
15	
16	
17	Biomedite (Pvt) Limited
18	Elixir Healthcare (Pvt) Ltd
19	Abbot Diagnostics
20	
21	Sunshine Healthcare Lanka Ltd
22	
23	Morrison PLC
24	Bio Medica (Pvt) Ltd
25	
26	Biomed Scientific (Pvt) Ltd
27	Hayleys Lifesciences (Pvt) Ltd
28	Emar Pharma (Pvt) Ltd

FOREIGN FACULTY

Dr Amanda Adler

Dr. Amanda Adler is a Consultant Physician at Addenbrooke's Hospital, Cambridge and the standing Chair of the Technology Appraisal Committee at the National Institute for Health and Care Excellence (NICE) which addresses new treatment in all disease areas.

She has trained in economics, medicine, epidemiology, pharmacoepidemiology and pharmacovigilance. Her current clinical work includes diabetes and general medicine in the out-patient, in-patient and community settings.

She chaired the NICE Clinical Guidelines for Newer Agents for Type 2 Diabetes and the Quality Standard for Diabetes and currently advises the NICE 'CONNECT' project for diabetes.

She is a technical expert for the WHO on two projects: essential treatments for diabetes and diagnostic criteria for non-diabetic hyperglycaemia. Previously for Oxford University, she was the Clinical Epidemiologist for the UK Prospective Diabetes Study (UKPDS).

She has worked on projects that set priorities under universal health coverage in countries with low to medium resources in collaboration with NICE International, the World Bank, and the Gates Foundation.

She serves on the Cardiovascular, Diabetes, Renal, Respiratory and Allergy Expert Advisory Group for the UK Commission on Human Medicines and chaired the Expert Group on the Safety of Insulin for UK's Medicines and Health Products Regulatory Agency. Dr. Adler collaborates with the Medical Research Council (MRC) Clinical Trials Unit (London) testing metformin in prostate cancer.

Dr Aaron Chapla

As a basic science faculty in the Department of Endocrinology, Christian Medical College, Vellore, he leads the Molecular Endocrinology Laboratory (MEL). He joined CMC as a student in Medical Biochemistry in 2003 and has worked as tutor in biochemistry, in-charge of clinical biochemistry laboratory (CMC Ditchpally, AP) and as a research officer in the department of Haematology (CMC, Vellore).

With this experience, he joined Endocrinology in 2011 to set up the Molecular Endocrinology Laboratory including the NGS facility from its foundational aspects.

In CMC, along with Dr. Nihal he is responsible for all monogenic diabetes genetic testing and receives samples from across India and from neighbouring countries for both its research into monogenic diabetes and the translation of its research findings into diagnostic services.

MEL also provides a facility for integrated research and NGS based diagnostic genetic testing within the institute and also on a collaborative mode with various institutes across India.

His research interests, include monogenic diabetes, congenital hyperinsulinism, Lipodystrophy and Insulin resistance, and applying next generation sequencing technology for cost effective and improved diagnostic services.

Dr Yeo Chin Pin

Dr Yeo obtained her Bachelor of Medicine and Bachelor of Surgery degrees from the National University of Singapore in 1994. She received training in Chemical Pathology at Singapore General Hospital and obtained her postgraduate degree in Chemical Pathology from the Royal College of Pathologists of Australasia in 2001.

Dr Yeo was admitted as a fellow of the Academy of Medicine of Singapore in 2003. Dr Yeo is currently the Head of Department of Clinical Pathology in the Division of Pathology in Singapore General Hospital. The Department of Clinical Pathology hosts the Clinical Biochemistry Laboratory, Blood Bank Laboratory, Satellite Laboratories and the Client and Specimen Management Unit.

Dr Adrian Park

Dr Adrian Park qualified from the Imperial College of London in 1993. Dr Park subsequently trained in Chemical Pathology (Metabolic Medicine) at Imperial College, where he undertook PhD investigations on the effects of gut hormones on appetite regulation. In 2009, Dr Park was appointed as Consultant in Chemical Pathology (Metabolic Medicine) in Adden Brooke's Hospital, Cambridge. In addition to his work in Clinical Biochemistry, Dr Park is responsible for the regional Obesity Service and is a Diabetologist

Dr Gautham Pranesh

Dr. Gautham is the Sr. Vice President- Operations at Milann Fertility Center, Bangalore. He is an alumnus of Mahadevappa Rampure Medical College, Gulbarga. He has developed a solid tissue flow cytometry-based assay to assess NK cells in endometrium. He has developed cell depletion assays to support allogenic bone marrow transplantation procedures at Narayana Healthcare. He has done publications related to correlation of subendometrial-endometrial blood flow assessment by two dimensional power Doppler with pregnancy outcome in frozen thawed embryo transfer cells. He is a member of American Association of Clinical Chemistry.

Dr Brian Shine

Brian qualified in Medicine from the University of Zimbabwe. He trained in Chemical Pathology at St Bartholomew's Hospital, London where he completed an MD on C-reactive protein.

He holds an MSc in Applied Statistics and Operations Research from the University of London. He was a Senior Lecturer at the Institute of Ophthalmology and Moorfields Eye Hospital and Consultant at Stoke Mandeville Hospital.

Current appointments include Consultant Chemical Pathologist of the Department of Clinical Biochemistry in Oxford University Hospitals, Honorary Senior Clinical Lecturer in the Nuffield Department of Clinical Laboratory Sciences (Oxford University) and Vice Chair of NICE Technology Appraisal Committee A.

His clinical interests include thyroid disease, metabolic bone disorders, renal stone disease, renal tubular disorders and neuroendocrine tumours. Research interests include the use of routine laboratory data, modelling reference intervals, health economics and quality assurance.

Dr Rajeev Srivastava

Dr Rajeev Srivastava (MBBS, MS (orth), FRCS, FRCPath, EurClinChem) is a Consultant Chemical Pathologist at Queen Elizabeth University Hospital, Glasgow, UK.

He graduated from the Delhi University and completed his higher specialist training in Clinical Biochemistry at Ninewells Hospital in Dundee.

He has published various peer-reviewed papers in leading medical journals and is co-author of Clinical Biochemistry: AN ILLUSTRATED COLOUR TEXT and Case Studies in Clinical Biochemistry.

His special interests include osteoporosis and bone metabolism, diagnosis of inborn errors of metabolism and parenteral nutrition.

Prof Peter Stewart

Peter Stewart is a Chemical Pathologist and Physician practicing in NSW Health Pathology and is Clinical Director of Royal Prince Alfred and Liverpool Hospitals in Sydney.

He has an academic appointment as Associate Professor of Biochemistry and Medicine at University of Sydney.

He is currently a member of the Australian Government National Pathology Accreditation Advisory Council.

He is also the Chair of the Pathology Clinical Committee of the current Australian Medical Benefits Schedule Review.

He is a Past President of the Royal College of Pathologists of Australasia. He was Chairman of the RCPA Quality Assurance Company for 11 years.

He has been a lead Technical Assessor in the Australian Accreditation System for more than 20 years.

He has a particular long standing interest in the adoption of new technologies into laboratory practice.

Prof. R Swaminathan

Prof. R Swaminathan is a past Professor of Clinical Biochemistry at Kings College and Consultant Chemical Pathologist at St Thomas' Hospital London. He obtained his medical degree from the University of Ceylon, Sri Lanka.

He completed his PhD in the Department of Animal Physiology and Nutrition and MSc in Clinical Biochemistry in University of Leeds.

He obtained his MRCPath (Chemical Pathology) from the Royal College of Pathologists of UK. He also hold fellowships from the Royal College of Pathologists of Australasia (FRCPA) and Royal College of Pathologists (FRCPath) UK.

He has presented more than 250 papers in international journals and published several books and book chapters in famous text books. He has delivered many invited lectures in international congresses.

He holds the prestigious post of Referee for many high impact journals. He holds many positions in various respected committees and boards and is a member of many scientific societies such as Medical Research Society UK, Association of Clinical Biochemists, American Association for Clinical Chemistry, Hong Kong Pathology Society and Hong Kong Society of Endocrinology and Metabolism.

He was an External Examiner for MD Chemical Pathology in the University of Colombo, Sri Lanka.

Dr Gayani Weerasinghe

Dr Gayani Weerasinghe qualified in her Bachelor of Medicine and Bachelor of Surgery Degree from the University of Colombo, Sri Lanka in 2005.

She received training in Chemical Pathology at The National Hospital of Sri Lanka and obtained her Postgraduate Degree in Chemical Pathology (MD) in 2013. Following her overseas post MD training in Luton and Dunstable University Hospital and Oxford University Hospitals NHS Trusts, she qualified as a Consultant Chemical Pathologist in Sri Lanka.

She obtained her Fellowship of Royal College of Pathologists, UK in 2018. Dr Weerasinghe is currently working at the Department of Clinical Biochemistry, John Radcliffe Hospital, Oxford and holds an honorary post in the Buckinghamshire Healthcare NHS Trust.

She recently qualified as a Specialist in Chemical Pathology in the United Kingdom and is awaiting to apply for a substantive consultant post.

Her clinical interests are in lipid and metabolic bone disorders. Research interests include FGF-21 in diagnosing mitochondrial disease and reference interval study of FGF-21 and hepcidin in paediatric population.

She conducts the Laboratory Medicine Teaching Course for year 4 medical students of the University of Oxford. Dr Weerasinghe also contributes as Editor for Lab Test On-Line UK website.

LOCAL FACULTY

Dr Charles Antonypillai
MBBS, MD, MRCP (UK), MRCP (Diabetes & Endocrinology) (UK) FACE(USA), FRCP(London)
Consultant Endocrinologist
Teaching Hospital, Kandy

Dr B K T P Dayanath
MBBS, Dip Path, MD (Chemical Pathology), MAACB
Consultant Chemical Pathologist
Teaching Hospital, Ragama

Dr Roshitha de Silva
MBBS, Dip Path, MD (Chemical Pathology)
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SUMMARY OF PRESENTATIONS

Day 1

Vitamin D - Is it the panacea for all ill health?
Prof R Swaminathan

Vitamin D, the sunshine hormone, is essential for bone health. Recent studies suggest that vitamin D deficiency may contribute to the development of many diseases including cancer, diabetes mellitus, and cardiovascular disease.

There is also uncertainty about the optimal vitamin D levels for health. In this talk I will discuss the latest recommendation for optimal levels of vitamin D for health as well as explore why vitamin D deficiency is so common. The role of vitamin D in other diseases will be examined by reviewing the latest research on this area.

Metabolic bone disease
Dr Brian Shine

Bone is a complex, constantly renewing organ consisting of cells (osteoblasts, osteoclasts, osteocytes), a matrix (mostly collagen), and mineral (calcium and phosphate). Various factors, particularly hormones, influence the balance between the formation and breakdown of bone.

Bone also produces hormones, including FGF-23, which has a crucial role in phosphate metabolism. Metabolic bone diseases have major impacts on health. Osteoporosis is a disorder of the bone matrix and has some well understood risk factors, with some effective treatments.

Osteomalacia/rickets can be caused by vitamin D deficiency, but our understanding has been transformed by the discovery of FGF-23 and better understanding of its role in phosphate metabolism and interaction with other determinants of bone metabolism.

Clinical users of bone markers
Dr Roshitha De Silva

Bone is a metabolically active organ which undergoes continuous remodeling throughout life. After attaining peak bone mass, bone undergoes constant remodeling. This includes bone resorption and formation.

Various chemicals are released into the blood during bone resorption and formation, and they are called bone turnover markers.

Bone turnover markers are important tools for management metabolic bone diseases and are gaining acceptance in clinical practices worldwide.

The markers currently available for the evaluation of bone turnover include enzymes and non-enzymatic peptides derived from the cellular and non-cellular parts of bone. Bone formation markers are mainly products of active osteoblasts produced during osteoblast function and bone formation whereas resorption markers are formed during the bone resorption by osteoclastic activity released during bone resorption.

Bone formation marker testing can be subjected to various pre-analytical and analytical errors and need to interpret them carefully.

Anabolic therapy for severe osteoporosis
Dr Rajeev Srivastava

Osteoporosis is widely prevalent and severe spinal osteoporosis especially with multiple vertebral fractures is associated with significant morbidity. While anti-resorptives (e.g. alendronic acid, zoledronic acid or denosumab) remain the mainstay of osteoporosis treatment, teripartide (recombinant parathyroid hormone) has been demonstrated to have a significant beneficial effect on bone quality and reduce the risk of having vertebral fractures.

Inborn errors of metabolism (basic for the endocrinologist/ physician)
Dr Adrian Park

Whilst Inborn Errors of Metabolism are rare conditions, they are nevertheless important to consider as part of the differential diagnosis of a number of medical conditions. In this presentation, the principles of diagnosis and management of such conditions will be discussed.

Assay Interferences and Mitigating Strategies
Dr Yeo Chin Pin

Laboratory assays are subject to interferences, both endogenous and exogenous. Laboratory test results thus produced may be spuriously high or low, leading to inappropriate further tests, incorrect diagnosis and treatment and potentially unfavourable outcomes for the patients.
Interference may arise from haemolysed, lipaemic or icteric matrices, the patients' disease states such as hyperproteinemia or covert causes like autoantibodies, ingested dietary vitamins or herbs, IV fluids or sample collection tube additives.
Laboratory professionals and clinical colleagues should work closely to investigate laboratory test results that are discrepant with a patient's clinical presentations.

Principles of Dynamic Function tests
Dr Charles Antonypillai

The human body consists of trillions of cells. There are three systems, which are concerned with the communication among these cells. These are the nervous system, immune system and endocrine system. The pathologies associated with the endocrine system could be two fold, namely functional and structural. Functional pathology refers to either hypo or hyper functioning of the endocrine gland. Structural problem refers to a neoplasm associated with the endocrine gland. These neoplasms may have a neutral effect on the functioning of the gland or may alter the functioning of the gland.

Chemical pathology plays a big role in the assessment of the functioning the endocrine gland. Measuring the basal hormone levels would be enough to interpret thyroid disease. On the other hand this method may not be appropriate when the relevant hormone is secreted in an episodic manner and has a short half-life. This is when dynamic tests play a part.

Dynamic tests are based on the physiological control mechanisms of the endocrine system. This provides insight to the hormone physiology and pathophysiology. When hypo function is suspected the gland is stimulated to assess the reserve capacity of it. When hyper function is suspected the test designed to determine whether the feedback loop is intact.

Insulin Tolerance Test is an example where we stimulate the adrenal gland when we suspect adrenal insufficiency. Overnight Dexamethesone Suppression Test is an example where we determine whether the adrenal gland could be suppressed using the feed back mechanism in patients with suspected Cushing syndrome.

Pitfalls in the measurement and interpretation of thyroid function tests
Dr Chandrika Meegama

Thyroid function tests are now readily available and widely used by medical practitioners. However, proper interpretation of the results of such tests requires an understanding of the physiological processes being evaluated.

Although thyroid disease in its most florid forms is easily recognized, minor perturbations of thyroid status can be more difficult to diagnose clinically, manifesting symptoms and/or signs that are non-specific.

Confirmation or exclusion of an underlying thyroid disorder therefore requires a high clinical index of suspicion, coupled with accurate measurement and interpretation of thyroid hormone (TH) and thyrotropin (TSH) concentrations.

In the majority of cases, the results of thyroid function tests (TFTs) are straightforward. However, in a small, but significant subgroup of patients, the interpretation of TFTs is more challenging, either because the results appear discordant with the clinical picture or because different measurements appear to contradict each other. In most instances, careful clinical reassessment of thyroid status, together with considering possible confounding factors readily identifies the cause of apparently anomalous/discordant TFTs.

Where this is not the case, interference in one or other of TH or TSH assays should be systematically screened for, and may require specialist laboratory work up. Thereafter, rare genetic and acquired disorders of hypothalamic–pituitary–thyroid axis function should be considered.

Porphyria-Biochemical and Clinical Correlates
Peter Stewart

The Porphyrias are disorders relating to the Haem biosynthetic pathway. The clinical features can be related to overproduction of porphyrin intermediates (skin photosensitivity) and /or precursors, ALA and PBG (acute attacks).

The inherited porphyrias are uncommon but need to be considered in the differential diagnosis of photosensitivity, unexplained abdominal pain, peripheral neuropathy, organic brain syndromes.

The laboratory tests that aid in the diagnosis will be reviewed and advances in the genetics and treatment will be reviewed.

Early detection of liver fibrosis
Dr Thamara Herath

Hepaticbrosis is a common pathway leading to liver cirrhosis, which is the end result of any injury to the liver. The presence and degree of hepatic fibrosis is crucial in order to make therapeutic decisions and predict clinical outcomes.

The place of liver biopsy as the standard of reference for assessing liver fibrosis has been challenged by the increasing awareness of a number of drawbacks related to its use. Recent evidence suggests that liverbrosis may be modied by treatment

Accurate, reproducible and easily applied methods are therefore required and noninvasive methods ranging from serum assays to imaging techniques have been developed in recent years.

Fibrotest and Aspartate transaminase to platelet ratio index (APRI) are recommended as the preferred noninvasive tests to assess the presence of cirrhosis, and APRI is preferred in resource limited settings.

Transient elastography is an established technique and is recommended as the initial assessment for signifcant liver brosis and cirrhosis. However, circulating serum biomarkers of liver brosis can give moderate estimates in the diagnosis or exclusion of signifcant brosis and liver cirrhosis and may be used either stepwise or in combination with other non-invasive tests such as imaging or elastography to improve the accuracy of liver brosis.

Familial Hypercholesterolaemia
Dr Gayani Weerasinghe

Familial Hypercholesterolaemia (FH) is one of the most commonly occurring genetic conditions with an incidence of 1 in 250. This means there are approximately 260,000 affected individuals in the UK, however less than 15% of these patients have been diagnosed.

FH imparts a high risk of cardiovascular disease (CVD) so early diagnosis is critical in reducing morbidity and mortality. NICE CG71 published in November 2017 further highlights the need to identify FH individuals and cascade screening of family members.

Diagnosis arrives on the basis of the information gathered using Simon Broome criteria Scores but, genetic testing for FH is also undertaken in difficult occasions which will be available in NHS in the near future.

Statin therapy is the corner stone for management of FH in both primary and secondary CVD prevention. Administration of proprotein convertase subtilisin/kextin type 9 (PCSK9) has emerged as an efficient therapy during the past few years with promising effects.

It is a monoclonal antibody that stops low-density lipoprotein receptors in the liver from degrading and helping to lower levels of low-density lipoprotein cholesterol (LDL-C) in the blood.

PCSK9 is used in combination with a statin or other lipid lowering therapies or alone in patients unable to reach LDL-C goals with the maximum tolerated dose of a statin or for whom a statin is contraindicated.

Impact of analytical characteristics of troponin assays on clinical decisions
Dr Saman Peduruhewa

Development of high sensitive troponin (hs-troponin) assays have quickly gained a popularity displaying its potential benefits in the diagnosis of myocardial pathology resulting a flurry of literature on its characteristics and clinical applications. However, broadened knowledge on the assay has yet failed to complete certain areas and left controversies, particularly, on assay standardization and interpretation of results. Aim of my speech is to provide an overview on certain important differences between various hs-Troponin assays emphasizing the need for clinicians to work hand-in-hand with chemical pathologists for a better understanding and to use the assay more meaningfully in the clinical practice.

Molecular testing in the diagnosis of genetic disease
Dr Aaron Chapla

Investigations under diagnostic pathology would usually evaluate the morphological appearance of a tissue sample and the pattern of expression of a limited number of biomarkers along with associated clinically relevant data for diagnosis.

Recent advances in the sequencing technology known as next-generation sequencing (NGS) allows us to interrogate DNA and RNA from tissue samples in great detail. Utilizing these new sequencing technologies in a clinical setting has a potential to generate comprehensive data which can be used to support patient management.

However, to utilize this technology the pathologist must understand the utility and the limitations of NGS in a clinical setting. In this talk through our experience in the field of monogenic forms of diabetes screening, I would cover the principles behind NGS technologies and the advantages of NGS-derived molecular data in a clinical setting.

Day 2

Anti-Müllerian hormone; Trending
Dr Gautham Pranesh

Infertility is rising in India as a consequence of changes in the population demographics and lifestyle. It is estimated that there are 26-31 million couples affected with infertility in India. The clinical laboratory plays a major role in establishing diagnosis and guiding management of couples with infertility. Interpretation of laboratory results in the Indian setting often presents challenges as most of the available guidelines are based on Caucasian data. The Indian population differs from the Caucasian counterparts having a higher risk and earlier development of co-morbidities such as diabetes. Also, there is evidence to show that reproductive aging is faster in Indian women compared to Caucasians. We present data from our studies on the Indian population for evaluating ovarian reserve and findings a laboratory supporting specialized reproductive medicine practice. We look at the role of interferences and common diagnostic dilemmas through patient results where discrepancies provided valuable clinical insights. Finally, we review the newer applications of existing tests as well as recent advances in this domain that would impact our understanding of pathophysiology and laboratory medicine in the future.

Multiple Myeloma: Role of Free Light Chain Assay
Dr Rajitha Samarasinghe

Multiple myeloma is a malignant condition which belongs to a group of haematological disorders known as plasma cell neoplasm.

It consists of Intact Immunoglobulin Multiple Myeloma (IIMM), Light Chain Multiple Myeloma (LCMM), and Non Secretory Multiple Myeloma (NSMM).

Smoldering Multiple Myeloma (SMM) and Monoclonal Gammopathy of Undetermined Significance (MGUS) need follow up as they carry a risk of developing in to overt multiple myeloma.

Multiple myeloma is a disease of the elderly and is rarely seen in individuals less the 30 years of age. Free Light Chain (FLC) levels are useful in the diagnosis and follow up of patients with plasma cell neoplasm.

Its main use is in the diagnosis and a follow up of patients with LCMM in which routine serum protein electrophoresis and some immune fixation electrophoresis fail to show the monoclonal band. Serum FLC levels are recommended by the International Myeloma Working Group (IMWG) as a screening, diagnostic and follow up marker for multiple myeloma.

Clinicopathological aspects of neuroendocrine tumours
Dr Thushara Hewageegana

Neuroendocrine tumours (NETs) arise from neuroendocrine cells which resemble neurons but secrete hormones. NETs commonly arise from the GI Tract (GI NETs) ,lungs (Lung NETS) ,pancreas (pNETS).

Other NETs include medullary carcinoma of thyroid ,parathyroid tumours, thymic neuroendocrine tumoursphaeochromocytoma, paraganglioma pituitary gland tumours neuroendocrine tumours of the ovaries or testicles and Merkel cell tumour of the skin.

Clinical features and assay of the hormone that is produced by the tumour, imaging histopathology and immunohistochemistry aids diagnosis. Some of the NETs are small and selective venous sampling is required in localization of them.

Screening for bowel cancer
Dr Brian Shine

Colorectal bowel cancer is reported to be the 4th commonest cancer in males and the 6th in females in Sri Lanka.
Some countries, including the UK, have national screening programmes for asymptomatic adults, typically those aged more than 60 years. The UK National Institute for Health Care Excellence (NICE) recommends screening of adults by faecal testing for haemoglobin in people aged more than 50 years with weight loss, abdominal symptoms, iron deficiency, or change in bowel habit and additionally, in those aged more than 60 years with anaemia.
Most laboratories, including the UK national screening programme, are changing from using a guaiac-based test to a faecal immunochemical test (FIT), which is more specific for fresh haemoglobin and thus has a lower false-positive rate.
However, the present tests are imperfect, missing some cancers and with poor reproducibility, perhaps related to sampling variation or deterioration of haemoglobin if there is a delay in the specimen being placed in stabilizing fluid.

Interpretation of blood gases
Dr Rajeev Srivastava

Interpretation of blood gas results is an essential and vital skill for physicians, especially in the care of critically ill patients. However, it is often inadequately taught and therefore poorly understood.
In this talk I aim to outline and discuss the basic principles of interpreting blood gas results and illustrate the same with a selection of clinical scenarios.

Acute Kidney Injury: Options for the future
Dr Dilinika Perera

Acute kidney injury (AKI) is characterized by an acute decline in renal function. AKI is a significant independent risk factor for morbidity and mortality. Currently diagnostic approaches to AKI include careful history, physical examination and laboratory investigations.

Measurement of serum creatinine, serum electrolytes and urinalysis may be helpful in the diagnosis and for determination of underlying cause of AKI. Imaging tests, especially ultrasound, are important components of the evaluation for patients with AKI.

A standardized definition is important to enhance clinical care. The definition of AKI has evolved rapidly since 2004, with the introduction of the Risk, Injury, Failure, Loss and End-stage renal disease (RIFLE), AKI Network (AKIN) and Kidney Disease Improving Global Outcomes (KDIGO) classifications.

In the last decade a large number of publications have highlighted the limitations of traditional approaches to diagnose and monitoring renal AKI in the acute stage. This lead to the discovery and validation of new biomarkers aimed to detect AKI more accurately in early stages. However, biomarkers have not yet entered into the routine clinical practice and the definition of this syndrome has many areas of uncertainty.

Treatment of AKI is aimed at addressing the underlying causes of AKI and at limiting damage and preventing further progression. The key principles are: to treat the underlying disease, to optimize hemodynamics, to correct electrolyte imbalances and to withdraw or dose-adjust nephrotoxic drugs.

Investigation of a urinary stone former
Dr Sakunthala Jayasinghe

Urinary stones are solid structures that arise from disturbances of the physico-chemical balance and or the hydrodynamic system of urine and the urinary tract. Incidence of urolithiasis has increased over the years with a male preponderance. Majority of stones are composed of calcium oxalate and calcium phosphate.

A standard sequence of investigations are performed on a patient with suspected urolithiasis. Imaging procedures play a crucial role in identifying and localizing the stones while identification of metabolic risk factors such as hypercalciuria, hypocitraturia, hyperuricosuria, hyperoxluria and cystinuria are important to prevent recurrences.

Baseline laboratory investigations done in a single stone formerinclude, creatinine, urea, electrolytes, calcium, phosphate, magnesium, uric acid, +/- PTH in blood and Ca/creatinine ratio and pH in a spot urine sample.

Abnormalities detected in baseline investigations should be followed to establish the exact metabolic risk factors by means of 24 hr urine collections for volume,calcium, creatinine, citrate, sodium, oxalate, magnesium,phosphate and uric acid when the patient is on a normal diet, usually 6-8 weeks after the colic.

If special clinical clues exist, analyses of urine cysteine, pH, xanthine, oxalate, glycolate, L-glycerate are made. Stone analysis can be done on captured stones because certain types of stones immediately identify appropriate treatment Eg. Cystine stones.

Management of urinary stones includes removal of the stones, minimizing risk factors for stone formation and correcting metabolic abnormalities. Metabolic evaluation of regular 24-hour urine collections is important in the long-term follow up, to prevent recurrences.

Current recommendation on GFR assessment
Prof R Swaminathan

Chronic Kidney Disease has become a public health problem, imposing heath, social and human cost on societies worldwide.

Chronic Kidney Disease (CKD) remains asymptomatic till a late stage when intervention cannot stop the progression of the disease. Early detection of CKD is therefore important.

One of the current recommendations is to assess renal function by estimating glomerular filtration rate (eGFR) using serum markers. Over 70 equations to calculate eGFR have been published.

The plethora of equations suggests that there is no ideal equation for estimating GFR. I will discuss the limitations of the current equations used in practice and highlight the difficulties in finding an ideal equation to assess GFR.

Lead Exposure-Sources and Consequences
Prof. Peter Stewart

There remains considerable interest in the effects of Lead (Pb) on human health. Humans have been exposed to Pb over many centuries. The metal has the property of a relatively low melting point and resistance to corrosion and being malleable that resulted in its use as in water transport

It has been suggested that Emperor Nero may have had lead poisoning. More recently humans have been exposed to Pb in petrol, paint and industry. Severe Pb poisoning is now less common but lower levels of exposure is now recognized to affect the growing brain of children.

This presentation will discuss the clinical effects of Pb toxicity, sources of exposure, the favorable results of efforts to remove Pb from the environment.

Reference Ranges
Dr Brian Shine

Reference intervals (RIs) are important in defining the expected values for an analyte in a healthy population and thus what may be regarded as abnormal. The components of variability of an analyte define the RI and include between and within person variation and analytical variability.

For many analytes, the RI will also vary with age, sex, time of day, season, or during the menstrual cycle in females. Ideally, the RI should be determined in a local reference population by a laboratory for each analyte.

In the absence of such data, we can use results of studies in other populations, for instance the NHANES and CALIPER datasets and verifying the applicability of the data to local populations using at least 20 specimens.

It is also possible to use large datasets accumulated by routine laboratory measurements to define RIs, as long as certain criteria for exclusion are observed. Defining RIs is easiest if the data have, or can be transformed to produce, a normal distribution. Decisions about separate reference intervals by age and sex can also be based upon statistical tests.

Inborn Errors of Metabolism: The Role of Basic Biochemistry
Dr. Eresha Jasinge

In an era where emerging untargeted metabolomic techniques have the potential to replace commonly used targeted laboratory techniques, one might wonder why highlight the importance of performing routine laboratory investigations as screening tools in detecting inborn errors of metabolism (IEM).

Most countries employ newborn screening programs where mandatory testing of each newborn for metabolic diseases are carried out by the analysis of dry blood spots. The scope of these programs is limited by a multitude of factors.

In Sri Lanka, newborn screening is performed for congenital hypothyroidism. Thus, in the local setting, investigations for IEM is initiated when a patient presents with symptoms and signs or of a significant family history.

Most of the diagnostic investigations used are expensive, have limited availability and require clinical and technical expertise on interpretation.

However, the performance of basic biochemical and hematological investigations in blood and urine could provide an initial clue in unraveling the disordered pathway.

I will be describing a few patients where performing basic investigations paved the way for the diagnosis of IEM.

Diabetes -
Clinicopathological correlations and role of laboratory in management

Dr Prasad Katulanda

Diabetes mellitus is a condition characterized by chronic hyperglycaemia. Chronic hyperglycaemia leads to damage and dysfunction of vital organs such as the kidneys, eyes and the nerves and ultimately leading to failure of such.

In addition, diabetes accelerates atherosclerosis leading to premature and more aggressive vascular disease in diabetic patients compared to non-diabetic subjects. When hyperglycaemia is acute and more severe especially in a background of insulinopenia diabetic patients can get severe metabolic complications such as the diabetic keto-acidosis and hyperosmolar status.

Though hyperglycaemia is the universal phenomenon in diabetes the aetiology can be heterogenous. In type1 diabetes (T1DM) the hallmark is absolute insulin deficiency in a background of autoimmune destruction of islets in the pancreas.

In contrast in type 2 diabetes (T2DM) beta cell dysfunction is not absolute but progressive and happens in a background of insulin resistance. In some forms of specific subtypes such as maturity onset diabetes of the young (MODY) the clinical phenotype is much different where insulin resistance is much less compared to T2DM and beta cell insulin secretion can be maintained with sulfonylureas for a longer period. There are certain subtypes such as latent autoimmune diabetes of adults (LADA) the disease has an intermediate phenotype between T1DM and T2DM.

Understanding the etiology helps to design a management plan from the outset of disease diagnosis. For example, in T1DM its strategies are to provide a very efficient insulin therapy form beginning with lifestyle measures such as carb counting.

In contrast in T2DM its done to mainly address preservation of beta cell function by reversal of insulin resistance by weight reduction and more emphasis on physical activity. Studies have shown that new onset T2DM can be reversed by aggressive weight reduction and physical exercise or by bariatric surgery in the very obese.
Aetiological diagnosis of the specific subtype involves checking for beta cell function by testing C-peptide level, insulin resistance by HOMA- IR or high sensitivity CRP as well as autoantibodies to beta cells.

Several autoantibodies viz Islet Cell Antibodies (ICA) , against cytoplasmic proteins in the beta cell), antibodies to Glutamic Acid Decarboxylase (GAD-65), Insulin Autoantibodies (IAA), and IA-2A, to protein tyrosine phosphatase have been described. In addition, exact molecular diagnosis of MODY requires genetic tests.

The hallmarks of diabetes management of any subtype involve good glycaemic control, screening for cardiovascular risk and markers of early organ damage or complications and other related co-morbidities such as non-alcoholic fatty liver disease (NAFLD) especially in T2DM.

A chemical pathology lab has a crucial role to play in this regard. Glucose tests for diagnosis, glycosylated haemoglobin (HBA1C) for both diagnosis and as a marker of long-term complications are known to everyone. The lab plays an important role in making a sub-type diagnosis as mentioned above.

Checking for lipids has become a universal procedure to determine the CVD risk. In addition the role of novel lipid tests such as apo lipoproteins and small dense LDL is being evaluated. Markers of organ damage include assessment of increased excretion of urinary protein, glomerular function, cardiac markers of myocardial damage or dysfunction.

Overall the laboratory especially the chemical pathology lab has become an indispensable facility in the management of patients with diabetes.

Guideline development in diabetes
Dr. Amanda Adler

Clinicians and patients depend on guidelines on diabetes to help them together choose the best treatment Guidelines should be based on the best-available research evidence, the consensus of clinical experts and should take into account value for money.
Using guidelines should improve care and list metrics to prove this. Clear and documented methods, minimizing conflicts of interest and providing an opportunity for 'consultation' must drive guidelines, yet not all 'guidelines' in diabetes include these.
In this talk I will use examples from NICE (National Institute of Health and Care Excellence) to highlight the challenges associated with developing guidelines in diabetes and in deciding whether to fund new drugs and devices. Lastly, I will discuss how the experiences at NICE can help in disseminating information about diabetic care in Sri Lanka.

Obesity - assessment and medical management
Dr Adrian Park

Obesity is a common condition worldwide and is a major driver for the increased prevalence of type 2 diabetes mellitus worldwide.
In this presentation, I will outline the assessment and management of such patients, with the emphasis on the patients requiring more intensive medical interventions.

POCT Governance and Quality Framework
Dr Yeo Chin Pin

Point-of-Care Testing (POCT), with the advantages of immediate test results performed on easy-to-use tests devices or kits with minimal sample volumes, present an attractive alternative to central laboratory testing. However, POCT has re-introduced errors that have, over the last decades, been significantly reduced in the central laboratory due to advances in quality measures and analytical and information technology. Some errors are also related to suboptimal quality procedures and operator competence. A well-structured governance and quality framework administered by a multidisciplinary team and backed by senior level support is essential for POCT to realize its potential as a reliable source of clinical information.

FELLOWSHIPS

Prof R Swaminathan

I consider it a great honor to read the citation of Professor Ramasamyiyer Swaminathan a retired eminent chemical pathologist of UK and one who is held in the highest esteem as a dedicated academic and researcher, health care reader, popular mentor and as a selfless social worker.

Professor Ramasamyiyer Swaminathan was born in 1944 in Jaffna, SL. He qualified in Medicine from the University of Ceylon, Peradeniya in 1967. He completed his internship appointment at General Hospital Badulla and served as a lecturer in the Department of Anatomy at the University for two more years.

In 1970 he proceeded for his PhD, to the Department of Animal physiology and Nutrition at the University of Leeds, UK. Following his PhD in 1974, he joined the Chemical Pathology training scheme as a registrar and during this time obtained the MSc in Clinical biochemistry in 1976. Later he became a Lecturer in Chemical Pathology, honorary Senior Registrar and then honorary Consultant in the Department of Chemical Pathology at the University of Leeds. In 1979 he obtained his MRCPath (Chemical Pathology) from the Royal College of Pathologists of UK.

He left the UK in 1983and proceeded to the Chinese University of Hong Kong as Reader and Chairman of the Department of Chemical Pathology where he pioneered in developing a new curriculum in Chemical Pathology and set up a new laboratory at the Prince of Wales Hospital, Hong Kong. He was instrumental in establishing the first ever training programme in Clinical Biochemistry for medical graduates and clinical biochemists. He obtained his FRCPA and FRCPath (UK) in 1985 and 1991 respectively.

In April 1991, he cameto Sri Lanka as the External examiner for the first MD Chemical Pathology examination held by the Postgraduate Institute of Medicinein Sri Lanka.

The same month,he returned to the UK as Professor of Clinical Biochemistry and honorary Consultant in Chemical Pathology at Guy's hospital. With the merger of hospitals and the medical schools he became the Professor of Clinical Biochemistry at King's College and Consultant in Chemical Pathology, at St Thomas' Hospital, London. He worked there until his retirement in August 2014.

He held varied positions in numerous committees and boards including Member of the Regional Committee on Chemical Pathology in 1991, Organizer of Regional Scientific Meetings in 1993, 1997 and 1998, Member of the Specialist Advisory Committee of the College of Pathologists 1997- 2000, Vice Chairman of the Regional Training Committee 1998, Coordinator of the Regional Training Programme 1999, Advisor to Regional WHO (SE Asia division) on Clinical Laboratory Standards 1998-2000, Expert advisor to the Chinese Conference on Clinical Chemistry and Laboratory Medicine 2000, Scientific Committee Chairman of the National Meeting of Association of Clinical Biochemists 2001, Member of the Scientific Committee of the Association of Clinical Biochemists which decides on grants and other scientific matters, Chairman of the Organizing Committee of the 4th Asian Pacific Congress in Clinical Biochemistry and Chairman of the Organizing committee of the 5th International Conference on Circulating Nucleic Acids in Plasma and

Serum (CNAPS).

He is a member of many professional bodies including The Medical Research Society UK, Association of Clinical Biochemists, American Association for Clinical Chemistry, National Academy of Clinical Biochemistry, Nutrition Society, New York Academy of Science, Association of Clinical Pathologists, Hong Kong Society of Clinical Chemistry, Hong Kong Pathology Society and Hong Kong Society of Endocrinology and Metabolism.

His research interests consist of nutrition and bone metabolism, sodium intake and sodium transport inhibitors and use of plasma nucleic acids in diagnosis. He has published more than 250 papers in refereed journals and published several books and book chapters in text books. He has delivered several invited talks in international forums on markers of bone turn over, monitoring diabetes, endocrinology in critical illness, acid-base disorders and analysis of cells.

He is a referee for many high-impact journals such as Annals of Clinical Biochemistry, British Journal of Nutrition, Clinical Chemistry, Clinical Chemistry and Laboratory Medicine, Clinical science, Nutrition, Journal of Nutrition and Diabetic Research and Clinical Practice in addition to being on the Editorial Board of a few of the most prestigious ones.

He served as External Examiner for MPath in Malaysia, BSc in Biochemistry at the University of Brunei, MD Chinese University of Hong Kong. He is an examiner for MRCPath, UK and for MSc in Clinical Biochemistry in University of London, University of Leeds and University of Surrey.

We in Sri Lanka know him best because he was a much sought-after external examiner for the MD in Chemical Pathology conducted by the Postgraduate Institute of Medicine. He has participated five times from the beginning, the maximum number of invitations offered to an individual examiner by the PGIM. A true friend of Sri Lanka, he made himself readily available at difficult times in those early days when we as a handful of professionals were literally isolated from the rest of the world, with Colombo considered a security risk. A seasoned examiner, he set the standard and posed challenges that would uplift our candidates to reach international heights. In addition, he offered placements in UK for successful candidates to complete their foreign training, sometimes taking them under his own wing.

Apart from his professional pursuits, he is known to be a keen sports enthusiast very much interested in badminton, cycling and hiking. He climbed Africa's highest 19,340 feet Kilamanjaro Mountain in 2012, India's second highest 29,029 feet Mount Kailash in Himalayas in 2013. He cycled across Britain for 1000 miles in 2014 from Auckland to Wellington in New Zeeland and back for 1000 miles in 2015. Last year he cycled across USA for 4200 miles.

A great philanthropist, he raises money through these activities for a charity named "ORU PAANAI". He is Chairman of Trustees of this Charity helping to feed the hungry, help in digging wells, lend support for extra tuition for students in deprived areas and help with hearing tests and provide hearing aids to a deaf school. These selfless community commitments display his nobility and great love for his countrymen and motherland. A devoted Hindu greatly bonded to his culture; he allowed some of us a glimpse of his son performing Bharatha Natyam at his Arangethram held in Colombo many years ago. All his activities are supported by his devoted wife.

Learning is an endless journey and he proved it by enrolling at the Open University after his retirement for a degree in mathematics with statistics and completed it in 2017.

Citation read by Dr Majitha Ibrahim

Dr Chandrika Meegama

Dr Ramyamala Chandrika Meegama was born in 1958. She had her primary education in beautiful up country, at St Ursula's Convent, Badulla and the secondary education at Ananda Balika Vidyalaya, Colombo. Apart from studies in school she was a very active person in extra curricular activities: she was an athlete, a girl guide, was in school netball team, her passion for music kept her engaged in both English and Sinhalese choir in school and also she did Trinity College of piano music exams, London up to Grade 5.

After successful completion of AL she was awarded a fully paid scholarship by the Higher Education Ministry of Sri Lanka to study Medicine in Vinnitsa Medical College, Ukraine. She graduated in 1986.

She commenced the Postgraduate training in Pathology at Teaching Hospital Peradeniya under the supervision of Prof Neelakanthi Ratnatunge. She was successful in Diploma in Pathology in 1997 when she was at TH Karapitiya under the supervision of Dr Neetha Dahanayake and took up Chemical Pathology as the sub specialty for MD.
After 2 years' spell as a registrar at NHSL under the supervision of Dr Saroja Siriwardena and Prof. Eric Karunanayake, Head of Department of Biochemistry at the Faculty of Medicine, Colombo. In November 1999, she sat for the MD Chemical Pathology examination conducted by the PGIM, where Dr. Alan Clague from Royal Brisbane Hospital, Australia functioned as the foreign examiner, and was successful. She was successful.
She continued at the National Hospital as Senior Registrar in Chemical Pathology and proceeded to Adelaide, Australia in 2002 on a PGIM scholarship for compulsory overseas training. She trained under the supervision of Dr. Allan Need, Consultant Chemical Pathologist of Royal Adelaide Hospital, supplementing gaps in her local training with the advanced technology and wide test menu offered there.
On returning to Sri Lanka in 2003, she was Board certified as a Consultant from year 2000, and was appointed to the Colombo South Teaching hospital as its first Consultant Chemical Pathologist, a position she held until 2015. As a pioneer, she had to work hard to give order and quality to the Biochemistry section and upgrade it as the Department of Chemical Pathology. During her 13-year tenure at the Colombo South Teaching hospital, she commenced and maintained its quality assurance programme, introduced new tests, revised the reference ranges, improved the validation and interpretation of test results, supervised the purchase of analyzers, validated new equipment and educated the staff, high-lighting on cost-effectiveness in a set-up of limited resources.

She was appointed to Board of study in pathology in 2007. A postgraduate trainer for one and a half decades, she has spent valuable time on the Chemical Pathology and Pathology trainees in the form of a postgraduate trainer, lecturer, chief examiner and examiner for all levels of exams starting from screening upto MD level. Her forte is in Lipidology and Cardiac biomarkers which has driven her to participate at the Annual Scientific sessions of the American College of Cardiologists. Hence she has particularly taken the responsibility of training and examining in her areas of interest and her vision was to elevate the standard

of our postgraduate trainees to that of international level. Dr Meegama was the official Course coordinator in Chemical Pathology at the PGIM from 2012 to 2016.

Dr Meegama was the 2nd President in College of Chemical pathologist in 2016 -2017.She was awarded a fellowship by the American Association of Clinical Chemistry (AACC) at the 70th AACC Annual Scientific meeting and clinical Lab Expo in Chicago in 2018. She is a regular resource person at the Annual Academic sessions of the College of Chemical Pathologists. She participated as a guest speaker at the international conference of Association of Clinical Biochemists (ACBICON) in Mangalore, India in December 2016. Dr Meegama was a council member in the Sri Lanka Endocrine Society since 2016 -2018.She was also a council member in the National Laboratory Quality Assurance Board in Ministry of Health.
She has contributed for undergraduate training and in 2016 she was appointed as a honorary lecturer by the faculty of medicine, university of Colombo in recognition of her services in training undergraduate students. She was also a visiting lecturer in Pathology and an external examiner in Faculty of Medical Sciences in University of Sri Jayawardenapura.

Dr. Chandrika Meegama's name is particularly recognized in activities related to Laboratory Accreditation. She participated in the initial training course organized by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) with the standard ISO/IEC 17025 and ISO 15189. In 2008 she was appointed as a technical assessor for laboratory accreditation by the Sri Lanka Accreditation Board.She been a member of the expert committee in Clinical Biochemistry and the Technical Evaluation Committee of SLAB. Two private laboratories where she worked as a visiting consultant benefitted immensely from her input, in their quest for Accreditation.

In April 2015, due to untimely demise of Dr Meliyanthi Gunatilake, as the next senior person she volunteered to cover up duty of the Chemical Pathologist at NHSL in addition to the duty at CSTH and later in 2015 she took up the permanent post as the Chemical Pathologist at NHSL.She worked towards extending, strengthening and further improving the quality of the Chemical Pathology services offered by the National Hospital.In 2018 April she retired from the Ministry of Health after 31 years of service and joined the faculty of Medicine, Sir john Kotelawala University as a senior lecturer in Pathology in May 2018.
Currently she works as a senior lecturer in Pathology in FOM, KDU and also as the Chemical Pathologist at University Hospital Kotelawala University. (UHKDU),Werahera. She pioneered the establishment of Chemical Pathology department at the Laboratory complex of UHKDU, where she had to work hard to commission the department of chemical pathology in UHKDU as a fully functioning laboratory within six months of her commencing work at KDU.
The dept. of Chemical Pathology is situated in the main laboratory complex of UHKDU and it consists of two laboratories namely Clinical Biochemistry and Immunoassay laboratories.
At present Chemical Pathology laboratory at KDU provides comprehensive laboratory services to the patients over 24hrs, 7 days a week. The laboratory provides services to surgical wards, medical wards, and to other sub specialties and for the out patients' department and intensive care units.
Dr Meegama is a believer in Quality, the foundation on which resides any laboratory's reputation and she is committed to creating a better tomorrow by zealous efforts at educating the next generation and preparing them to take on the reins.
She is married to Dr Stanley Amarasekera, consultant Cardiologist and their only child Sachini has completed MBBS and awaits internship in Sri Lanka.
Out of her busy schedules she never forgets to spend time with the family to play badminton, listen to music and to sing.

Ladies and Gentlemen, on behalf of the President and council of the college of Chemical Pathologists of Sri Lanka, I would respectfully invite Dr Chandrika Meegama to the podium, to accept the Fellowship conferred upon Dr Chandrika Meegama by the College of Chemical pathologists of Sri Lanka, in recognition of her valuable contribution to the field of Chemical pathology in our country.

POSTER PRESENTATIONS
CASE REPORTS

CR 1Autoimmune Hypothyroidism in a Young Girl with Digeorge Syndrome

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Introduction
Endocrinopathies are common in patients with 22q11.2 deletion syndrome (DiGeorge syndrome: DGS). Thyroid dysfunction has been reported in about 20% of patients and Hashimoto's thyroiditis and Graves's disease have also been observed.

Case presentation
An 8-year-old girl who was diagnosed with DiGeorge syndrome presented to community paediatrics with tiredness, lethargy and sleepiness of 1 month duration. There were no associated weight gain, headache or other acute illnesses.
On examination, there were no pallor, lymphadenopathy or thyroid enlargement. Weight and height were within age related centiles.
Serum thyroid function tests (TFT) showed profound hypothyroidism with TSH >500 mIU/L (0.35-4.94) and FT4 <5.15pmol/L (9.01-19.05). Anti-thyroid peroxidase antibodies were strongly positive(>1000 IU/L). Bone profile and vitamin D were normal. Haemoglobin was 115 g/L, ferritin was slightly low at 18 ng/mL and the blood film was unremarkable. The 9 am cortisol was 94 nmol/L but short synacthen test showed a good response with a 30 - minute cortisol reaching to 533 nmol/L (>430). In retrospect, the new-born screening at birth had excluded congenital hypothyroidism. There were no subsequent TFTs performed until this presentation.
Based on the TFT, a diagnosis of autoimmune hypothyroidism was made. L-thyroxine 50 microgram daily was commenced and she was followed up regularly. Currently the patient is biochemically euthyroid with TSH value of 1.76 mIU/L.

Discussion
The prevalence and natural history of thyroid dysfunction in DGS are not well characterized. However, annual monitoring of thyroid function is recommended due to the possibility of developing autoimmune or acquired thyroid diseases.

Key words: DiGeorge Syndrome, autoimmune hypothyroidism

CR 2 Early Loss of Primary Dentition in an 18-Month-Old Girl

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Introduction
Hypophosphatasia (HPP) is a rare inherited metabolic bone disease that manifests in different ways across the life span. It is caused by loss-of-function genetic mutation in tissue non-specific alkaline phosphatase leading to defective bone and tooth mineralization.

Case presentation
An 18-month-old female was presented to the dentist with a complaint of non-traumatic premature fall of one primary lower incisor. Patient was one of non-identical twin born to non-consanguineous parents.

There was no personal or family history of dental or skeletal diseases. There was no history of febrile episodes. Development was age appropriate.
On examination, no skeletal deformities were seen. Oral cavity examination revealed no localized pathology. Musculoskeletal system examination was unremarkable.
Plasma ALP activity was low at 93 IU/L (152-767) with normal liver and bone profile including vitamin D. Repeated ALP after a month was persistently low at 83 IU/L. There were no biochemical abnormalities suggestive of suggesting nutritional deficiencies. Serum vitamin B6 (by High-Performance Liquid Chromatography) was raised at 517 nmol/L(40-100 nmol/L). Urinary phosphoethanolamine (by Ion-Exchange Chromatography) was elevated favouring diagnosis of HPP. X-ray skull showed loss of one lower incisor with remainder of dentition being normal. Currently, patient is being monitored by paediatric team and awaits genetic investigations.

Discussion
Unexplained premature loss of primary teeth in children always causes anxiety to the concerned parents. Out of several causes for this phenomenon, odontohypophosphatasia should be suspected with biochemical correlation. It is the mildest and most prevalent form of HPP affecting both children and adults. Mutation detection is not deemed necessary but provides inheritance patterns to support genetic counseling.

Key words: Low alkaline phosphatase, Odontohypophosphatasia

CR 3 Primary Hyperparathyroidism with Brown Tumour

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Introduction
Primary hyperparathyroidism (PHPT), an enlargement of one or more parathyroid glands, causes over production of Parathyroid Hormone (PTH), result in hypercalcaemia.
Parathyroid cancer is a rare disorder leading to (cancerous) overgrowth of cells in one parathyroid gland. This accounts for less than 1% of all cases of primary hyperparathyroidism.
Brown tumor of long bone is an infrequent presentation of primary hyperparathyroidism. We report a case of a young woman with primary hyperparathyroidism due to a parathyroid cancer, presented with a brown tumor of left distal femur.

Case presentation
A 34-year-old woman presented to orthopedic ward with left lower thigh pain and progressive difficulty in walking for one year. Her biochemical investigations revealed high serum total calcium 8.5 mmol/L, ionized calcium1.59 mmol/L, low serum phosphate 0.6 mmol/L, increased ALP 269 U/L and high plasma PTH 1356.8 pg/mL. Her skeletal survey showed a well-defined lytic area in L/lower femur. Histology of the bone biopsy was compatible with brown tumor.
Contrast Enhanced Computed Tomography (CECT) neck, chest and abdomen showed a malignant lesion in L/parathyroid with liver metastasis.
L/S parathyroidectomy was performed. Parathyroid carcinoma was histologically confirmed and was managed with chemotherapy.

Discussion
PHPT can present as an incidental finding of hypercalcemia during screening or on evaluating patients with nephrolithiasis, osteoporosis or pathological fracture. Presentation and radiological features may mimic metastatic involvement of bone or plasma cell myeloma. Therefore, basic biochemical investigations help

to differentiate them. Reaching the correct diagnosis requires a combination of clinical, biochemical, radiological examination and histology findings.

Key words: PTH, Parathyroid carcinoma, Brown tum

CR 4 Two Siblings with Mucopolysaccharidosis Type IIIB

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Introduction
Mucopolysaccaridosis type IIIB (MPSIIIB) or Sanfilippo B syndrome is a rare group of inherited lysosomal storage disorders caused by deficiency of N-acetyl-alpha-D-glycosaminidase (NAGLU). As a result, progressive lysosomalaccumulation of the glycosaminoglycan (GAG) heparansulphate interferes with the functions of other proteins inside the lysosomes and disrupt the normal function of cells. It primarily affects the central nervous system.

Case presentation
We discuss about two siblings, who were born to a second degree consanguineous parents. The baby boy presented at 18 months of age with fever and cough, was found to have mild coarse facies, short forehead, prominent eye brows, hypertrichosis, moderate hepatomegaly and mild splenomegaly. His 9-year-old sister in addition to the above features had speech delay, intellectual disability and seizures after normal early childhood development. She had hyperactive behavior and was referred to psychiatric clinic at 6years. Their diagnosis was autistic spectrum disorder with mental retardation. Their basic biochemical and hematological findings were normal.
As clinical features were suggestive of MPS III, his and his sister's blood were analyzed for lysosomalenzymes, both had low NAGLU levels, 0.16 and 0.09 nmol/hr/ml respectively. Sequencing analysis of NAGLU gene showed homozygous variant c.1004A>G p. (Tyr335Cys), which is a previously known mutation and confirmed the diagnosis of MPSIIIB.

Discussion
MPSIII should be strongly considered in the differential diagnosis of a child with early behavioral disorders, psychiatric symptoms and speech delay. Early detection, family counselling and appropriate management through a multidisciplinary approach is recommended to improve the quality of life.

Key word: MPS III B, Sanfilippo B, heparansulphate

CR 5 Type 2 Congenital GeneralisedLipodystrophy

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Introduction
Congenital generalisedlipodystrophy (CGL) is a rare, autosomal recessive disorder, characterised by generalised or near-absence of adipose tissue. Associated features include hepatomegaly secondary to hepatic steatosis, which can progress to cirrhosis, as well as splenomegaly.Thereare four distinct genetic subtypes of CGL. We report a Sri Lankan infant with genetically confirmed type 2 CGL.

Case presentation
A 5-month-old female infant born to consanguineous parents presented with failure to thrive despite having a voracious appetite. She was delivered by vaginal delivery at full-term with a birth weight of 1.9 kg. On examination, her weight was 3.72 kg (< -3SD), had amassive hepatomegaly with splenomegaly, and a lack of subcutaneous fat with prominent muscles and veins. A lipid profile revealed a triglyceride concentration of 13.5 mmol/L (0.62 - 3.12), HDL-cholesterol 0.21mmol/L (0.32 – 1.77) and total cholesterol 3.6 mmol/L (1.71 – 5.91). Her liver and muscle enzymes were mildly elevated with a normal amylase. Massively parallel sequencing of lipodystrophy genes, revealed a homozygous variant in BSCL2, c.630+3_630+6del. This variant is predicted to affect splicing and is supportive of a diagnosis of type 2 CGL. The child is breastfed and on low fat diet.

Discussion
The signs and symptoms of CGL are usually apparent from birth – affected individuals having the almost complete lack of fat and prominent musculature. Patients with type 2 CGL can have cardiometabolic complications including severe insulin resistance and hypertriglyceridaemia. The BSCL2 gene encodes seipin, a transmembrane protein important for lipid droplet assembly and adipocyte differentiation. Early diagnosis and a high-carbohydrate, low-fat diet can prevent and control comorbidities.

Key words: lipodystrophy, hypertriglyceridaemia, autosomal recessive

CR 6 A Female with Progressive Weakness, Weight Loss and Polyneuropathy

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Introduction
POEMS syndrome is a rare paraneoplastic disease of monoclonal plasma cells. POEMS is an acronym for Polyneuropathy, Organomegaly, Endocrinopathy, Monoclonal bands and Skin involvement.

Case presentation
A 38-year-old female presented with progressive weight loss, loss of appetite, generalized weakness with

bilateral lower limb numbness for 5 months duration.
Her BMI was 14 kg/m2. She was found to have fascial and limb muscles wasting, skin thickening with hyperpigmentation, nails clubbing with whitening, hepatosplenomegaly, generalised lymphadenopathy, bilateral ankle oedema and reduced power in all 4 limbs with glove and stocking type sensory loss.
Her FBC, blood picture, general biochemical investigations including serum LDH levels and endocrine investigations were within normal range. Serum albumin was 3.5 g/dl (3.8-5.5). Urine was negative for Bence Jones proteins. There was a small monoclonal band in serum protein electrophoresis. A monoclonal band of Ig A lambda was detected in serum immunofixation. ANA, dsDNA and serum cryoglobulin levels were normal. Abdominal CT detected paraaortic lymphatic infiltration. Lymph node biopsy was only reactive. No evidence of malignant infiltration in bone marrow biopsy. Nerve conduction studies revealed focal segmental demyelination with sensory and motor polyneuropathy.
She was diagnosed as POEMS syndrome and undergone autologous stem cell transplantation.

Discussion
Usually this disease is misleading which cause delay in diagnosis as the syndrome itself is rare and having complicating and varying clinical features. Delay in diagnosis causes serious complications like restrictive lung disease, pulmonary hypertension It took nearly two years to diagnose this patient. Serum albumin level is a prognostic marker. There for patients with low albumin levels need aggressive treatments early. Although elevated levels of serum Vascular Endothelial Growth Factor (VEGF) is a major diagnostic criterion in POEMS syndrome, could not perform due to non-availability.

Key words: POEMS, VEGF

CR 7 A Patient Presenting with Multiple Myeloma Complicated with Amyloidosis

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Introduction
Multiple Myeloma (MM) is a haematological malignancy of a single clone of plasma cells which is common in old age. Amyloidosis is one of the complication of light chain MM. The light chain amyloidosis is the most common form of systemic amyloidosis accounting about 10% of MM cases.

Case Presentation
A 50-year-old known patient with diabetes mellitus and hypertension, presented with gradual onset coarse facieses, macroglosia, thickening of skin, back pain associated with loss of weight and loss of appetite. She had generalized papular rash but no pulmonary oedema or hepatosplenomegaly.
Her diabetes mellitus was well controlled and had normal renal and liver functions. Skin biopsy revealed amyloidosis. Radiological investigations showed numerous lytic lesions in skull x-ray with pathological fractures in spine. 2D Echo showed left ventricular hypertrophy with high possibility of cardiac amyloidosis.
Her serum protein electrophoresis and immunofixation reports were normal. Her urine protein electrophoresis revealed monoclonal excretion of proteins in region. Her serum free light chain assay showed high kappa level of 330mg/L and normal lambda level of 14.90mg/L. The Kappa to Lambda ratio was distorted. Bone marrow aspiration and trephine biopsy showed abnormal plasma cell count of 15-18% with positive CD138 (40%).

Discussion
The diagnosis of symptomatic light chain MM with systemic amyloidosis was made and the patient was

managed with a combined chemotherapy regimen. Now she is on conservative management due to low ejection fraction which is a contraindication for chemotherapy.

Keywords: Multiple myeloma, light chain amyloidosis, free light chain assay

CR 8 High Amylase: A Clinical Dilemma

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Introduction
High serum amylase in a patient admitted to the emergency department could be a dilemma to his surgical team. A step-by-step approach by the laboratory may identify the root cause.

Case presentation
A 38-year-old male admitted to the emergency treatment unit with abdominal pain had a significantly elevated serum amylase level of 530 U/L (RR: 28 – 100) and a serum lipase level of 61 U/L (RR: 13 – 60). The pancreatic isoenzyme of amylase was 306 U/L (RR: 13 – 56). The abdominal pain was atypical for pancreatitis. A CT scan of abdomen revealed a normal pancreas. Hence the patient did not fulfill the Atlanta criteria for diagnosis of pancreatitis.
Serum amylase remained elevated 2 days later at 545 U/L with a spot urine amylase of 89 U/L. With a urine creatinine of 53 mg/dL and serum creatinine of 1.05 mg/dL, the fractional excretion of amylase worked out to be 0.3% (<1% macroamylasaemia; >5% pancreatitis)
The serum amylase in a post-convalescent sample collected one month later remained high at 536 U/L. The polyethylene-glycol (PEG) -precipitable enzyme activity was 89% (RR: 22 – 60), confirming macroamylasaemia.

Discussion
Macroamylasaemia is a benign (sometimes transient) condition, which needs to be distinguished from pancreatitis. Both pancreatic and salivary amylase could bind to circulating immunoglobulins to produce macromolecules which are not readily filtered by the kidneys, leading to their accumulation. They are measured in the serum amylase assay. About 2.5% of those with high serum amylase are attributed to macroamylase.

Key words: macroamylasaemia, macroamylase, high amylase

CR 9 A Patient with Severe Anaemia and Very High Erythropoietin

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Introduction
Investigation of anaemia is multi-faceted and the clinician needs to streamline the appropriate investigations to arrive at the root cause, while treating the anaemia simultaneously.

Case presentation
A previously healthy 59-year-old female became breathless on walking and was found to have severe anemia (blood haemoglobin 46 g/L). No evidence of blood loss or deficiency of nutrients.
Pre-transfusion PCV was 14.2% (RR: 36-48) and the RBC count was 1.7x106/µL (RR: 3.8-4.8). The blood picture showed a mixture of hypochromic microcytic and normochromic normocytic RBCs. Serum iron was elevated at 205 µg/dL (RR: 50-170), transferrin low at 147 mg/dL (RR: 202-364) and iron saturation 99% (RR: 15-60). The whole blood lead level was normal. Her bone marrow had a M:E ratio of 30:1 and erythropoiesis was virtually absent with occasional large erythroid precursors. Granulopoiesis and thrombopoiesis were active and normal. Perl's stain for iron was markedly increased. Impression was that of pure red cell aplasia (PRCA). Her serum erythropoietin level was >750 mIU/mL (RR: 4.3-29). It was evident that she was transfusion-dependent. MRI of the chest showed a large retrosternal circumscribed tumour which was removed. The histological diagnosis was malignant thymoma (type AB). She continues to be asymptomatic 2 years after surgery (Hb 136 g/L).

Discussion
The patient had iron overload and PRCA with very high erythropoietin. Causes for PRCA include autoimmune disease, viral infections and thymomas. T-lymphocytes produced by the thymoma act on the marrow to suppress erythropoiesis leading to transfusion-dependent anaemia and high erythropoietin.

Key words:thymoma, high erythropoietin

CR 10Elevated Ovarian Tumour Marker CA-125, In a Young Man

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Introduction
CA-125 is a marker for serous ovarian tumours, but when an asymptomatic young male is found to have a markedly high value, another cause has to be searched for.

Case Presentation
The serum CA-125 level of a 39-year-old male, who volunteered to verify its reference range on a Roche cobas e411, measured 132 U/mL (RR:<35). The other males had values of <17. He was clinically asymptomatic. His ESR was 52 mm in 1st hour and CRP was 16 mg/L (RR:<3). A USS abdomen revealed free fluid in Morison's pouch. FBC, serum -hCG, CEA and CA-19-9 were normal.
Soon he became symptomatic with low-grade evening pyrexia, body aches, loss of appetite and loss of

weight. The serum CA-125 rose to 367 U/mL and CRP to 72 mg/L with ESR static at 55 mm in 1st hour. His haemoglobin dropped to 124 g/L, from 136 g/L. Clinical ascites was confirmed by CT abdomen which showed omental thickening and minute lymph nodes. Mycobacterium tuberculosis was identified by PCR method on the tissue biopsy, supported by histopathology. Tissue culture for acid-fast bacilli was positive for M. tuberculosis. Following specific anti-tuberculous therapy, the CA-125 dropped to 6.7 U/mL and CRP to 1.2 mg/L.

Discussion
Serum CA-125 may be elevated in non-ovarian malignancies (lung, breast, pancreatic, colorectal) particularly those affecting the peritoneum or pleura, and in benign conditions (cirrhosis, hepatitis, ascites). Chronic inflammation of the omental serosa due to infection by Mycobacterium tuberculosis is the likely cause of the high CA-125 level in this patient.

Key words: CA-125, tumour marker, Mycobacterium Tuberculosis

CR 11 Abnormal Hb Variant Interfering with Hba1c Assay by HPLC and Capillary Electrophoresis

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Introduction
Although capillary electrophoresis is claimed to provide a reportable result for HbA1c in the presence of abnormal haemoglobin variants, compared to high performance liquid chromatography (HPLC), we report an abnormality which invalidated the HbA1c result on both platforms.

Case presentation
A routine HbA1c assay performed on BioRad D-10 analyser by HPLC on a 51-year-old female was found to be unacceptably high at 40.1% (Reference range 4.0 – 5.6%; Reportable range 3.8 – 18.5%). The pattern suggested an abnormal variant co-eluting with HbA1c.
Re-testing on a Sebia 2 capillary electrophoresis analyser on the HbA1c mode, failed to produce a result. The pattern showed an unidentified variant. A fresh sample run on the Sebia using the abnormal haemoglobin detection mode identified the variant as Hb Hope (44%), with approximately 52% HbA and 4% HbA2. A full blood count showed normal red cell indices and morphology.
An immuno-turbidometric method for HbA1c (Tina-quant 2nd generation assay) on Roche Cobas c311 analyser gave a value of 6.4%. It agreed with the approximate short-term glycaemic control expressed by her fructosamine level of 302µmol/L (RR: 208 – 285).

Discussion
Aspartic acid substituted by glycine at position 136 of the beta chain gives rise to Hb Hope, formulated as 2A 2136 gly-asp and runs anodal to HbA2. No red cell stigmata are noted in people with Hb Hope. Hb Hope interfered with the HbA1c assay in both HPLC and capillary electrophoresis systems, but it did not affect immuno-turbidimetry.

Key words:Hb Hope, Haemoglobin variant, HbA1c

CR 12 Pre-Operative Localization of an Occult Insulinoma

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Introduction
Insulinomas are rare pancreatic neuroendocrine tumours which are benign in majority (90-95%). They present with neuroglycopenic symptoms or the classic Whipple's triad of hypoglycaemia. Non-specific symptoms and small tumour size lead to diagnostic difficulties. Once identified and enucleated, prognosis is excellent.

Case presentation
A 39-year-old male was referred to the Endocrine clinic with a six months history of early morning confusion. The patient was found to have hypoglycaemic attacks with capillary glucose levels going down up to 1.7 mmol/L. His serum cortisol and pituitary function tests were normal. During a 72 hour supervised fast test (SFT), increased serum insulin and C-peptide levels with an insulin/C-peptide ratio <1 and negative urine ketone bodies were diagnostic of insulinoma. However, USS, spiral contrast CT abdomen and MRI pancreas were all negative. Biochemical diagnosis was confirmed with a repeat 72 hour SFT. Tumour was regionalised to the tail of pancreas by selective arterial calcium stimulation (SACS) test which showed a more than 2-fold step-up in hepatic vein insulin (pmol/L) upon proximal splenic (0s-212.75, 30s-237.02, 60s-2631.16) and distal splenic (0s-372.22, 30s-1126.22, 60s-2112.61) intra-arterial calcium injection. Intra-operative ultrasonography was used for accurate localization. Pancreatic tail insulinoma was enucleated and immunohistochemically confirmed by strong cytoplasmic positivity for neurone specific enolase. Patient remains asymptomatic at one year's follow-up.

Discussion
Diagnosis of insulinoma is challenging. Suspected cases are biochemically confirmed by the gold standard 72 hour SFT.SACS is obsolete as a routine investigation, but, is useful when imaging procedures fail. Pre-operative localization techniques allow for a successful surgical approach.

Key words
Insulinoma, occult, hypoglycaemia, supervised fast test, selective arterial calcium stimulation

CR 13 Beta-KetothiolaseDeficiency in a 4-Year-Old Boy with Metabolic

Ketoacidosis

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Introduction

Beta-ketothiolase deficiency (BKTD) is a rare autosomal recessive disorder of ketone utilization and isoleucine catabolism. Mutations in the ACAT1 gene are identified as causative of the disease.

Case presentation

A 4-year-old previously well boy, presented with a four days' history of vomiting and loose stools with low grade fever. On admission to the pediatric intensive care unit, he was afebrile, drowsy, unresponsive to painful stimuli, hypotonic, and had decreased reflexes and sluggish but equally reactive pupils. Acidotic breathing and circulatory collapse were noted. Initial investigations revealed severe high anion gap metabolic acidosis with positive urinary ketone bodies. Infectious workup with urinalysis, blood and urine culture yielded negative results. Radiographic imaging of the chest and abdomen were normal, and non-contrast CT brain showed multiple cerebral infarctions.The child required intubation, and was managed with intravenous fluids, bicarbonate, inotropes and broad spectrum antibiotics. Acute stage urine organic acid profile by gas chromatography/mass spectrometry revealed very high levels of 3-hydroxy-2-methyl-butyric acid and tiglylglycine. Analysis of ACAT1 NM_000019.3 gene on dried blood spots revealed homozygosity for the novel variant c.152C>T p.(Pro51Leu) confirming BKTD. A diet with mild protein restriction was initiated. The child was ventilator dependent and entered a continuous vegetative state.

Discussion

BKTD should be suspected in early childhood presenting with severe high anion gap metabolic ketoacidosis preceded by acute infection or fasting. The most promising predictor of severe metabolic phenotype is high urine tiglylglycine. This case highlights that timely diagnosis and judicious management can prevent serious consequences of an otherwise benign disorder.

Key words: Beta-ketothiolase deficiency, metabolic ketoacidosis, urine organic acid, gas chromatography/mass spectrometry, ACAT1

RESEARCH PAPERS

RP1 Utility of Hba1c as a Tool for Diagnosis of Gestational Diabetes Mellitus and to Study the Correlation between Hba1c and OGTT in a Tertiary Care Setting in Sri Lanka

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Introduction
Prevalence of gestational diabetes mellitus (GDM) in Sri lanka is 13.9% at present and it has been increasing gradually all over the world since 1998. As the early diagnosis is directly related to reduction of maternal and fetal morbidity and mortality, many studies were done on accurate and early identification of this disease. Currently a time consuming, labour intensive and cumbersome test, OGTT, is used for diagnosis. This study aimed at using HbA1c as an alternative to OGTT in diagnosis of GDM.

Method
Hospital based cross sectional study conducted among 154 GDM positive and negative pregnant women at POA of 24 – 28 weeks. Diagnosed Type 2 diabetes mellitus, multiple pregnancies, previous GDM, renal pathology, heamoglobinopathies, anemia (Hb< 10.5 g/dL) were excluded from the study. HbA1c of the sample was measured by Sebia 2 flex capillary electrophoresis analyser. Independent t test, correlation coefficient, Receiver operating characteristics (ROC) curve were done using SPSS 21.

Results
Mean HbA1c for GDM positive women was significantly higher than that of GDM negative women ($P < 0.05$). Pearson correlation between HbA1c and OGTT were 0.604, 0.683 and 0.66 at 0, 1 and 2 hour respectively. The area under the curve was 0.845 and at a cutoff value of 5.45%, sensitivity and specificity were 80% and 82% respectively.
Conclusion
HbA1c cannot replace OGTT for the diagnosis of GDM. Due to the limited population used, this study can be used as a pilot study to establish cutoff values of HbA1c for the diagnosis of GDM.

Key words :OGTT, HbA1c, GDM

RP 2 Prognostic Role of Pre-Operative Neutrophil-Lymphocyte Ratio (NLR) in Urothelial Carcinoma: Experience from Tertiary Centre

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Abstract:
Introduction: Neutrophil-Lymphocyte ratio (NLR) as an indicator of heightened systemic inflammatory response, predicts increased disease burden and poor oncological outcomes in urothelial carcinoma (UC). The study was undertaken with an aim to evaluate the association of NLR with clinicopathological variables and survival outcomes.
Material and methods: A total of 80 patients of UC were enrolled in the current retrospective study. Pre-operative NLR (within 1 month prior to the procedure), patient age, sex, tumour grade, pathological stage, re-

currence free survival (RFS), progression free survival (PFS) and cancer specific survival (CSS) were recorded. We chose a cut-off value 2.7 for NLR and patients were divide into two groups (NLR<2.7 and ≥2.7).
Results: NLR ≥2.7 was significantly associated with advanced tumour stage (p=0.001) but not with tumour grade (p=0.116). Progression (p=0.032) and death rates (p=0.026) were high in patients with NLR ≥2.7. Mean RFS (p=0.03), PFS (p=0.04) and CSS (p=0.04) were reduced in patients with NLR ≥2.7. On univariate analysis, NLR ≥2.7 predicted worse RFS (HR= 2.928, P=0.007), PFS (HR=3.180, P=0.006) and CSS (HR=3.109, p=0.016). However, it was not an independent predictor of outcomes on multivariate analysis.
Conclusion: Only tumour stage and grade are independent predictors of RFS, PFS and CSS. High NLR at a cut-off value ≥ 2.7 is associated with advanced pathological stage, but does not have an independent predictive value for RFS, PFS and CSS.

Key words:Urothelial carcinoma, Neutrophil-Lymphocyte ratio, Recurrence free survival, progression free survival, cancer specific survival

RP 3 A Descriptive Cross Sectional Study to Assess and Compare the Distribution of Hba1c and Lipid Parameters among Apparently Healthy Sri Lankan Adults and Diagnosed Diabetic Patients Attending Medical Clinics at a Tirtiary Care Hospital

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Introduction
Insulin resistance in type 2 Diabetes mellitus is known to elevate triglycerides (TG) and low density lipoprotein cholesterol levels (LDL-C) and lower the High Density Lipoprotein Cholesterol (HDL-C) levels in serum.

Methods
This descriptive cross sectional study consisted of a random sample of already diagnosed patients with diabetes attending medical clinics at National Hospital Sri Lanka (n = 351) and apparently healthy non pregnant volunteers over the age of 18 years, who were staff members of Lady Ridgeway Hospital, Medical Research Institute and National Hospital, and their friends and relatives (n = 433).
With informed written consent, a questionnaire was administered, followed by measurement of anthropometry. Blood samples were obtained after a 12-hour fast and tested for HbA1c levels and lipid profile including apolipoproteins (Apo A1 and Apo B) using fully automated assays. Data were evaluated using SPSS 23.

Results
Mean age of the apparently healthy group was 40.3 (SD=12.0) years and 56.1 (SD=11.8) years in the diabetic group. Both groups had higher female predominance (apparently healthy 63.9% and diabetic 70.9%)
The mean duration of diabetes in the diabetic group was 6.1 years.
There was a statistically significant (p=0.000) difference between mean HbA1c levels of diabetic (8.1%, SD =2.02) and apparently healthy (5.76%, SD=0.92) groups.
14.9% of the apparently healthy group and 79.7% of the diabetic group had HbA1c levels of 6.5% or more.
The diabetic group had significantly higher mean Triglyceride (TG) (p =0.04) levels and lower Apo B levels (p=0.000) than the apparently healthy group.

Diabetics with glycemic control (HbA1c < 6.5%) had significantly lower mean TC, LDL-C, Non High Density Lipoprotein Cholesterol (NHDL-C) and Apo B levels than the apparently healthy people with HbA1c < 6.5% (all p=0.000).

65.1% of the diabetic group were on statins and they had significantly lower mean HbA1c (p=0.04), LDL-C (p 0.02), TC/HDL-C ratio (p=0.003) than in diabetics not on statins and lower mean TC (p =0.000), TG (p=0.03), LDL-C (p=0.000), TC/HDL-C (p=0.000), NHDL-C (p=0.000), Apo B (p=0.000) than the apparently healthy group with normal HbA1c.

Conclusion
A significant percentage of the apparently healthy group had impaired HbA1c and lipid levels. TG levels were higher in the diabetic group, but those with proper glycemic control shows lower TC, LDL-C and Apo B levels than apparently healthy people with normal HbA1c. Statin therapy has effectively lowered atherogenic lipids in diabetics.

RP 4 Vitamin D Deficiency as a Risk Factor for Differentiated Thyroid Carcinoma: A Case Control Study

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Introduction
Thyroid cancer is the commonest endocrine malignancy.Papillary thyroid carcinoma (PTC) and follicular thyroid carcinoma (FTC) are the 2 subtypes of differentiated thyroid carcinoma (DTC). An association has already been documented for breast, colon, and prostate cancers with Vitamin D deficiency. However, the association for DTC is still undetermined.

Objectives
To determine the association between Vitamin D deficiency or insufficiency with DTC. To determine whether Vitamin D deficiency or insufficiency is a risk factor for DTC.

Methodology
An observational, non-interventional case control study was carried out at Department of Chemical Pathology, National Cancer Institute, Maharagama. We evaluated fasting serum samples for albumin corrected calcium, phosphorus, TSH, free T4 and 25 hydroxy vitamin D (25-OH-D) in histologically proven 66 DTC patients (53 PTC, 13 FTC) and 66 healthy controls. Patients and controls on vitamin D supplementations were excluded through interviewer administered questionnaire. One-way analysis of variance (ANOVA) analysis carried out and relative risk (RR) was calculated.

Results
Mean 25-OH-D in cases and controls were 17.68 ng/mL, 18.18ng/mL respectively. The level of Vitamin D was not significantly associated with DTC. ($F(1,130) = 0.186$, $MSE = 4.54$, $p = 0.66$). Odds ratio (OR) between case and control was 1.01 (95% CI; 0.026-2.193).
Conclusion
Levels of 25-OH-D were not different among cases and controls but it was deficient or insufficient in both groups. Low vitamin D level is not a significant risk factor for DTC according to our study.

Key words Differentiated Thyroid carcinoma, Vitamin D

RP 5 HDL-Cholesterol above 100 mg/dL; Are There Such Individuals?

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Introduction
High-density-lipoprotein cholesterol (HDL-C) is cardio-protective, resulting in theoretically less encounters with cardiologists for individuals with >100 mg/dL. Reporting of high HDL cholesterol has resulted in a negative feedback from local clinicians. We report our experience in a hospital laboratory.

Method
We measure HDL-C by homogeneous enzymatic colorimetry on Roche cobas and Dimension autoanalysers. From routine fasting lipid profiles performed from 2014-2018, those having HDL-cholesterol values >100 mg/dL were identified and statistically evaluated. Daily IQC and EQA for HDL-cholesterol were monitored for acceptability.

Results
After excluding 24 with total cholesterol >300 mg/dL, 445 individuals with HDL-C >100 mg/dL were evaluated. The highest HDL-C was 167 mg/dL (median 105). M:F ratio was 1:4. 11% were <40 years, 37% were 40 – 60 years and 52% were >60 years. 42% of the total group were females >60 years.
The different platforms in our lab agreed for a sample with 131 mg/dL (variability 1.5%) while sharing with other labs showed a bias of -13% and -25%. Our highest variability among results of 31 individuals with multiple lipid profiles on record, ranged from 1% – 20% (median 6%).

Discussion
The testing and reporting of HDL-cholesterol is largely uncontrolled in Sri Lanka with many labs not adhering to proper quality control procedures that would give the confidence to report high values. HDL-C is relatively stable with time. The majority of our subjects were older females, providing indirect evidence of the cardio-protectivity of HDL. Further studies and quality reporting of HDL-cholesterol are needed.

Key words: HDL-cholesterol, High HDL

RP 6 Relationship between Hyperglycemia and Obesity According to the Levels Of BMI and Central Obesity

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Introduction
Diabetes prevalence is in the rise in Sri Lanka with increase in body mass index(BMI). There has been an association of hyperglycemia with BMI and central obesity.
The aim of this study is to find the relationship between obesity, central obesity with newly diagnosed diabetes within the age group 40 to 70 years.

Method
The BMI cutoff for obesity based on South Asian guidelines were considered. Central obesity is identified using waist circumference according to the international diabetes federation guidelines for Asians (high risk male 90 cm and female 80 cm;)Hyperglycemia was classified using HbA1c (normal < 5.7%, pre-diabetes 5.7%-6.4%, diabetes >6.5%). A consecutive sample of 3494 adults (male 32.6%, mean age 53.22 ±8.9 years) was recruited from randomly selected GramaNiladhari divisions in the Colombo district.

Result
14.65% were diagnosed to have diabetes and 37.3% of them were obese. Among 27.50% obese participants, 19.9% had diabetes.
A positive correlations existed between HbA1c and BMI levels ($r = 0.125$,p-value<0.01) and between HbA1c and central obesity ($r = 0.152$,p-value<0.01).

Prevalence of very low risk for diabetes in central obesity according to waist circumference 32.57% male60.63% female18.59% and high risk is 67.42% male 39.37% female81.40% central obesity according to waist to hip ratio low risk of getting diabetes19.70% male 21.97% female 18.60% high risk 80.30% male 78.03% female 81.40%.

Conclusion
Overweight category has higher prevalence of diabetes and pre-diabetes than the underweight/normal category, while these statistics for obese category is even higher. Also risk is higher in increase central obesity for diabetes.

Key words : obesity, central obesity, Diabetes

RP 7 An Audit to Assess the Completeness of General Biochemistry Request Forms

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Introduction
Incomplete request forms can negatively impact laboratory processes which can increase the workload on laboratory staff and can lead to unnecessary delays and errors. With the aim of introducing a new request form, this audit assessed the quality of the request forms prior to the planned intervention.

Objective
To assess the completeness of general biochemistry request forms received by the department of biochemistry.

Method
This was a retrospective study and included all the request forms of general biochemistry samples received by the department of biochemistry during the time period from 1/9/2018 to 30/9/2018.

Results
A total number of 3189 request forms was included in the audit. Patient's name was clearly mentioned in 3165(99.2%), while in 24(0.8%) forms, the name was unclear. Bed head ticket (BHT) number was present in 3161(99.1%) forms while 28(0.9%) forms had unclear or absent BHT numbers. The requested test was clearly mentioned in 3184(99.8%) forms.

The age of the patient was not mentioned in 57.1% (n=1820) of the request forms, while the sex of the patient and the date were absent in 40.7% (n=1298) of the forms and 45.8%(n=1462) of the forms respectively.
The clinical unit was mentioned in 80.8% (n=2578) of the forms while the signature and the designation of the requesting officer was present 88.7% (n=2829) of the forms and 21.6% (n=689) of the forms respectively.

Conclusion
While the essential details were present to a satisfactory degree, age and sex were missing in about half of the request forms. A training session will be conducted and a new request form containing specific fields and checkboxes will be introduced later to rectify this issue.

Key words: Request forms, Completeness

RP 8 Internal Audit of Hba1c Request Forms Received During an Eleven Month Period

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Introduction
HbA1c is an important part of the diagnosis and monitoring of a diabetes mellitus patient. During result interpretation, a duly filled request form is a necessity.

Objective
To assess the completeness of HbA1c request forms received by the biochemistry department and to perform a descriptive study of HbA1c results.

Method
This was a retrospective study and included all the request forms of HbA1c samples received by the Biochemistry department during the time period of 3/7/2017 to 13/6/2018.

Results
A total number of 1029 HbA1c request forms were included in the audit. General information including patient name, age, index number etc... were complete in 93.39% (n= 961). Purpose of the assay was mentioned in 94.36% (n=971). History of Anaemia/Haemoglobinopathy was mentioned in 52.09%(n=536). Previous HbA1c values were mentioned in 39.26%(n=404). In cases where the purpose of requesting HbA1c was mentioned, 32.26%(n=332) were for the purpose of diagnosing diabetes mellitus. Out of this, 20.48% (n=68) were positive for diabetes mellitus with a HbA1c value of 7.5% or higher, while 19.27% (n=64) were at increased risk of developing diabetes with HbA1c values within 5.7-6.4%. There were 637 cases where the purpose of the assay was assessment of control and 23.7% (n=151) were found to have good glycaemic control. There were 2 cases of gestational diabetes mellitus.

Conclusion
Overall the completeness of the request forms was satisfactory with room for improvement in entering specific information.

Key words: HbA1c, Glycaemic control

RP 9 Effect of Hypomagnesaemia on Glycemic Control in Type 2 Diabetes Mellitus

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Introduction
Hypomagnesaemia impairs function of several enzymes in glucose metabolism. It can leads to insulin resistance in Type 2 Diabetes Mellitus. It has been reported that there is association between prevalence of hypomagnesaemia and glycemic control.
Objectives
To assess the prevalence of serum magnesium and to evaluate the effect of magnesium in glycemic control in newly diagnosed T2DM patients at Central Province of Sri Lanka.

Methods
A hospital based cross sectional study of six month period was performed in 212 newly diagnosed T2DM patients who were attending to the Diabetic clinic at Teaching Hospital, Kandy and Base Hospital, Matale. Participants were selected using systematic random sampling method and with their informed consent. Fasting blood sample was collected for serum Mg level and estimated using VITROS-250 dry chemistry analyzer. For HbA1C blood sample was collected in to the EDTA tube and measured in D-10 BIORAD analyzer using HPLC method. Mg level <0.7 mmol/L consider as hypomagnesaemia and HbA1C level >7.0% consider as poor glycemic control. Result on continuous measurements are presented as mean± SD and categorical measurements as proportions (%). Pearson correlation between study variables is presented at 5% level to find the relationship.

Results
The mean fasting Mg level was 0.76±0.09 mmol/L and mean HbA1C level was 8.34±1.97%. The prevalence of hypomagnesaemia among patients with T2DM was 21.50%. There was a significant negative correlation between serum Mg level and glycosylated hemoglobin level of the participant. 23.68% patients with poorly controlled glycaemia had hypomagnesaemia.
Conclusion
Hypomagnesaemia was common and showed significant prevalence in our population. The research revealed statistically significant negative correlation between serum Mg level and glycemic control which indicated by HbA1C level.

Keywords: Hypomagnesaemia, T2DM, Glycemic control, HbA1C.

RP 10 Prevalence of Preoperative Hypomagnesaemia and the Correlation Between Preoperative Hypomagnesaemia and Postoperative Hypocalcaemia after Total Thyroidectomy

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Introduction
Hypocalcaemia is a common complication after total thyroidectomy and produces potentially severe symptoms. Effects of magnesium on calcium metabolism are complex. Hence monitoring of serum calcium and magnesium is important and correction of those deficiencies facilitates the early recovery.

Method
A prospective, analytical cross sectional study was conducted including 63 patients who underwent total thyroidectomy, recruited from a surgical unit of a Base Hospital by using a random sampling method. Plasma iPTH, eGFR, serum albumin corrected total calcium (SACTC) and magnesium were analyzed on, the day before the surgery. SACTC was measured on post-operative (Postop) D1, and symptoms of hypocalcaemia were assessed on Postop D1. The descriptive and inferential statistics were used during the data analysis.

Results
The mean age was 48.25 years (SD=12.36) and 89% (n=56) were females and 13% (n=8) had malignancies.
Forty percent (n=25) of patients were hypomagnesaemic (< 0.7mmol/L) preoperatively and all of them got biochemical hypocalcaemia (BHC) on the post operative day 1(< 2.15mmol/L). Among them 80% (n=20) got symptomatic hypocalcaemia (< 1.88mmol/L) on Postop D1 but no one had malignancies. Out of normomagneseamic patients preoperatively (n=38), 76% (n=29) had BCH. However, no one got symptoms.
There was a statistically significant positive correlation between the preoperative serum magnesium level and SACTC on post operative day 1 with a Pearson correlation value of 0.818 and an adjusted R2 value of 66.45% (P < 0.001).

Conclusion
It is preferable to measure serum magnesium level preoperatively to exclude any deficiency which is a contributing factor for post operative hypocalcaemia.

Keywords
Hypocalcaemia, hypomagnesaemia, total thyroidectomy

RP 11 Features of Metabolic Syndrome among Sri Lankan Women with Polycystic Ovary Syndrome – A Preliminary Study

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Background
Polycystic ovary syndrome (PCOS) is one of the commonest endocrine disorders of women in reproductive age group. Though not included in the diagnostic criteria, features of metabolic syndrome (MS) and insulin resistance (IR) are important associations of PCOS.

Methods
Thirty five women fulfilling Rotterdam criteria were subjected to clinical, biochemical and ultrasound examination prior to initiation of any treatment to establish the diagnosis and assess IR (by HOMA-IR), hirsutism score (by FerrimanGallway scale), acanthosis score (scale by Burke et al; 1999), and presence of MS (criteria by AHA).

Results
Their mean BMI was 25.75 kg/m2 (SD=3.38) with 62.5% of them being overweight or obese. One third of the women (11) fulfilled diagnostic criteria for MS while all of them had at least one feature. MS score had a positive Pearson correlation with acanthosis score (p=0.008) and fasting insulin level (p=0.011) while women with MS had a significantly higher acanthosis score (p=0.002, t=1.526). Hirsutism score and serum testosterone level, plasma insulin level did not show any significant difference between women with and without MS (respective p values; 0.1, 0.7, 0.4). The mean IR among women with MS was >2.5 (2.55) but there was no significant difference between the 2 groups.

Conclusion
PCOS Women with MS had significant manifestations of insulin resistance like acanthosisnigricans though plasma insulin level was not significantly higher among them. HOMA-IR and Hyperandrogenism failed to show any statistically significant correlation to MS indicating a possible underlying genetic makeup for the manifestation of MS.

Key words:Polycystic ovary syndrome, Metabolic Syndrome

RP 12 Interventional Radiology Assisted Venous Sampling in the Diagnosis of Endocrine Disorders – A Single Center Experience From Sri Lanka

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Background:
Interventional radiology assisted venous sampling (VS) can be labelled as the gold standard for localizing abnormal hormone secretion in common endocrine tumours.

Methods:
Fourteen patients were subjected to VS of adrenal (n=8), pancreatic (n=4) and parathyroid (n=2). Adrenal (AVS), arterial stimulated pancreatic (ASVS), and parathyroid (PTVS) venous samplings were performed using standard procedures and sites. Selectivity (SI) and lateralization (LI) indexes were calculated for AVS and ≥2 taken as cut-off for both indices. In ASVS, ≥2 fold increase in insulin from basal within 60 seconds from calcium stimulation and in PTVS, ≥2 fold increase in PTH levels in the specific vein: peripheral vein were taken as a positive responses.

Results:
Four of eight patients who underwent AVS, had SI<2 on right side rendering results unable to be used for lateralization. The rest had a mean SI of 9.6 with a mean LI of 11.1, enabling diagnosis of unilateral adrenal tumours and managed surgically.
In three out of four patients who underwent ASVS, pancreatic lesions were localized (mean insulin increase 8.4 folds) and managed surgically. The remaining patient demonstrated similar increase in insulin secretion from 4 out of 6 arterial territories and managed as Nesidioblastosis.
Lesion was localized in both patients who underwent PTVS (mean highest PTHR 4.3 folds) and managed surgically.

Conclusion:
VS is a sensitive investigation to localize and assess tumour activity in common endocrine tumours. The difficulty in selective catheterization poses a technical difficulty in its utilization in the clinical practice which could be overcome with experience.

Key words:
Venous sampling, endocrine tumours

RP 13 Comparison of 25% Sulfosalicylic Acid Protein to Creatinine Ratio Vs Albumin to Creatinine Ratio in Urine of Patients with Chronic Kidney Disease

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Introduction:
Proteinuria is an important prognostic marker in diagnosis and management of Chronic Kidney Disease (CKD). Previously, 25% sulfosalicylic acid (SSA) method has been optimized as a cost-effective quantitative method to evaluate proteinuria in the lower range (0-50 mg/dL). This study was conducted to assess the clinical applicability by evaluating protein to creatinine ratio (PCR) and comparing it with pyrogallol red (PGR) PCR and the gold standard albumin to creatinine ratio (ACR).

Method:
A method comparison study was performed using 40 retained urine samples assessed for PGR PCR of patients likely to have CKD, based on estimated glomerular filtration rate (eGFR). Samples were evaluated using 25% SSA turbidimetry, Jaffe reaction and immunoturbidimetry for protein, creatinine and albumin respectively using manual spectrophtometric analysis at the Faculty of Allied Health Sciences, University of Ruhuna. In statistical analysis ROC curve and Spearman's correlation were applied.
Results: Method yielded a sensitivity of 91.6% and a specificity of 69.2% at cut-offs of 150 mg/g for PCR vs 30mg/g for ACR. In 25% SSA PCR median and interquartile range were 339 and 547 mg/g respectively. Area under the curve in ROC curve was 0.904 and 0.962 for 25% SSA and PGR PCRs respectively. Optimal cut-off for 25% SSA PCR was 166 mg/g. Spearman's correlation coefficient for 25% SSA PCR vs ACR, was r= 0.823 p<0.0001 and 25% SSA PCR vs PGR PCR was 0.913, p<0.0001.

Conclusion:
The 25% SSA PCR has a sensitivity of 92% against ACR, the current prognostic marker for proteinuria in patients with CKD. Test performs satisfactorily with a cut-off optimized at 166 mg/g of proteinuria. A strong correlation exists between 25% SSA PCR vs PGR PCR, the current gold standard for PCR.

Key words: Albumin to creatinine ratio, Chronic kidney disease, Protein to creatinine ratio, Proteinuria, Sulfosalicylic acid.

RP 14 Comparison of Urine Dipstick and Sulphosalicylic Acid (SSA) Methods with Pyrogallol Dye Binding Method for Detection of Urine Proteins

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Background:
The study was to evaluate the accuracy of urine proteins measurement, detected by five brands of dipstick methods and SSA method compared to dye binding method.

Method:
A cross sectional analytical study was carried out using urine samples which were referred to a Teaching Hospital, Sri Lanka, for Urine Full Report. Samples were analyzed (n=160) by using five brands of urine dipsticks (labeled as 1 to 5), Standard SSA (3%) method and dye binding (Pyrogallol) method. The sensitivity was calculated using crosstabs in SPSS version 16.
Results: Urine dipstick results of nil, trace,+1, +2 and +3 were referred to the results of dye binding method up to 10mg/dL, 11-30 mg/dL, 31-100 mg/dL, 101-300 mg/dL and > 300mg/dL. SSA results of nil, trace,+1, +2, +3 and +4 were referred to 0 mg/dL, up to 20 mg/dL, 21- 50 mg/dL,51- 200 mg/dL, 201-500 mg/dL and 501- 2500 mg/dL in dye binding method. All of the brands of urine dipstick method had low sensitivity to detect trace (< 55%), +1 (< 78%) and +3 (< 50%) urine proteins. The maximum sensitivity was observed in the range of +2 (94%-100%) by the dipstick method. The sensitivity of SSA method was from 71-78% in all levels (trace, +1, +2 and +3).

Conclusion:
The sensitivity of urine dipstick was vary in each brand. SSA method had a moderate sensitivity compared to the urine dipstick method in majority of urine protein levels, except +2 which had a high sensitivity.

Key words: Urinary proteins, Dipstick method, Sulphosalicylic acid (SSA), Sensitivity, Dye binding method

RP15 Prevalence of Hyperglycemia and Hyperlipidemia in Western Province and Correlation Between Hemoglobin A1c and Serum Lipid Profile

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2 Department of Pathology, The National Hospital of Sri Lanka

INTRODUCTION
Patients with type 2 diabetes (T2DM) have an increased prevalence of hyperlipidemia, which contributes to their high risk of cardiovascular diseases (CVDs). The aim of this study was to determine the correlation between HbA1c and serum lipid profile and to evaluate the importance of HbA1c as an indicator of dyslipidemia while exploring the prevalence of both Hyperglycemia and Hyperlipidemia in Western Province.

METHODS
A total of 458 adults which were undiagnosed, untreated as hyperlipidemia were selected. The whole blood and sera were analyzed for HbA1c, fasting blood sugar (FBS) and lipid profile. Dyslipidemia was defined according to the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) guidelines. Diabetes was defined as International Diabetes Federation criteria.
Significant differences between groups were assessed by one-way ANOVA and t-test. Pearson correlation was done and the r values were calculated at level of ($p<0.05$) significance. SPSS statistical package version 22.0 is used.

RESULT
The mean age ± SD of sample is 46.34 ± 15.51 years, male 42.4% (194) and female 57.6% (264).Population was diagnosed as Normal 45.0%, Pre-diabetes 29.5% and having Diabetes 20.3% based on HbA1c value and it was diagnosed as Normal 39.5%, Borderline high Cholesterol 34.5% and High Cholesterol 22.1% based on Total Cholesterol level. Results reveled that Normal, Pre-diabetic and Diabetic groups had significant different means of LDL-C ($p <0.05$), and TG ($p <0.05$). Furthermore means of TC ($p<0.05$) is significantly higher in Pre-diabetic than Non-diabetic. According to Pearson correlation there is a significant positive correlation between HbA1c and TG is a ($r = 0.121$, $p < 0.05$). Moreover, there was a statistically significant negative correlation between HbA1c and LDL-cholesterol ($r = -0.271$, $p <0.012$) which is contrary to common establishment.

CONCLUSION
It can be concluded that there is a tendency to develop hyperlipidemia in subjects when they are pre-diabetic or diabetic. Apart from a reliable glycemic index, HbA1c can also be used as a predictor of dyslipidemia and thus early diagnosis of dyslipidemia can be used as a preventive measure for the development of CVD within population.

Keywords: HbA1c, HDL-cholesterol, LDL-cholesterol, Triglyceride

ACKNOWLEDGMENTS

Special thanks to

Overseas and local faculty
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Judges of the poster presentations
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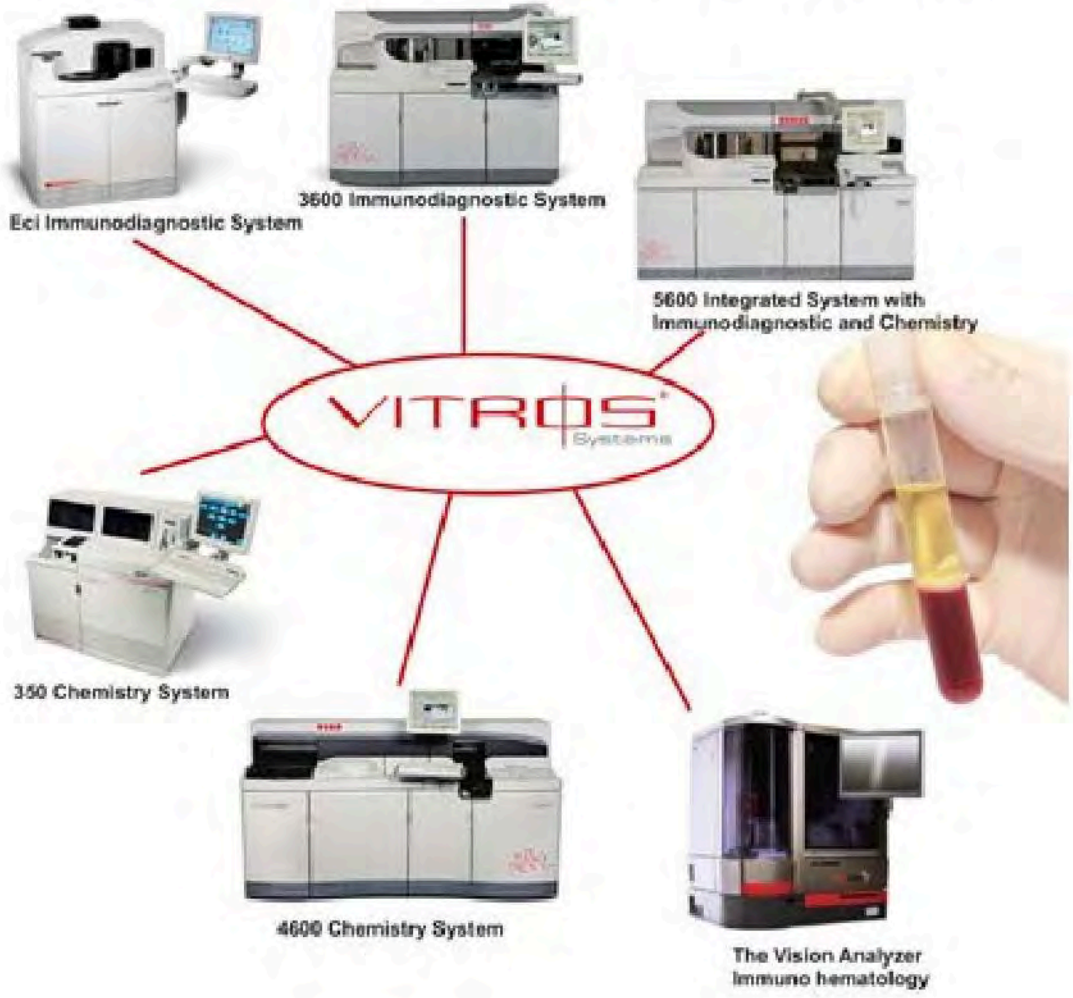

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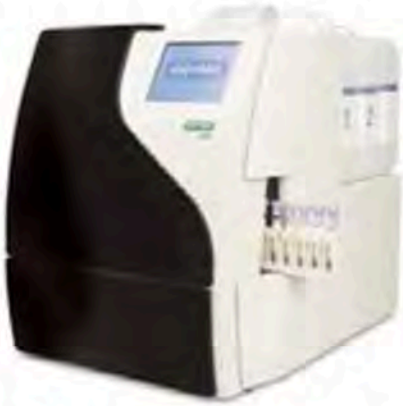

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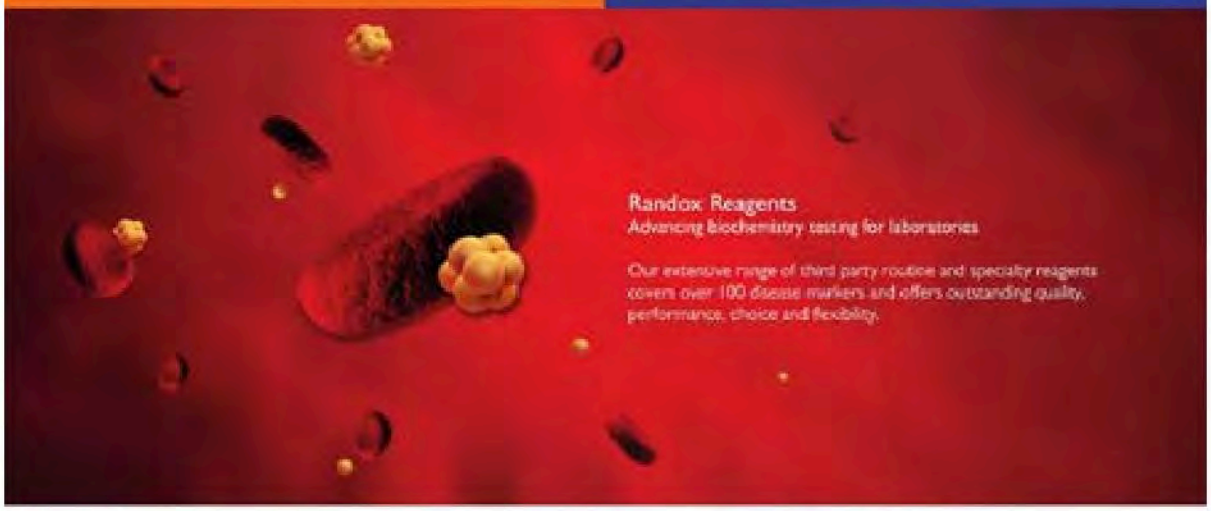

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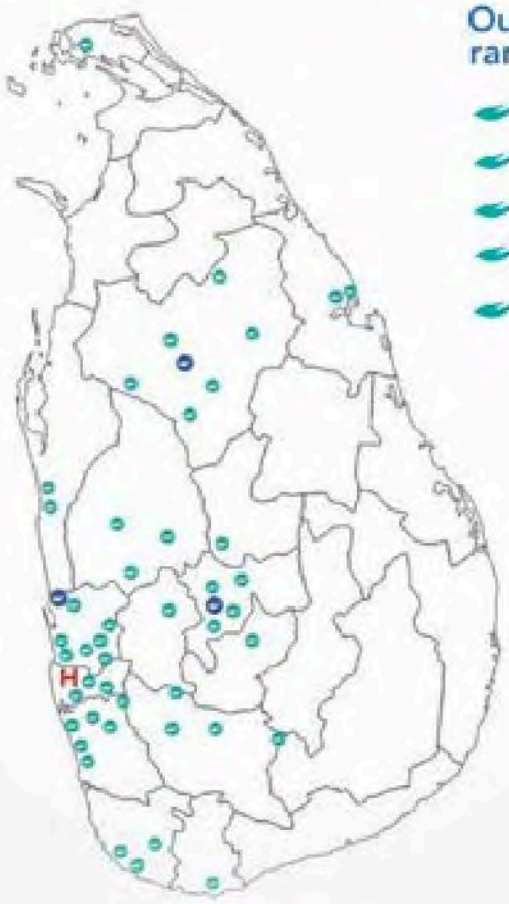

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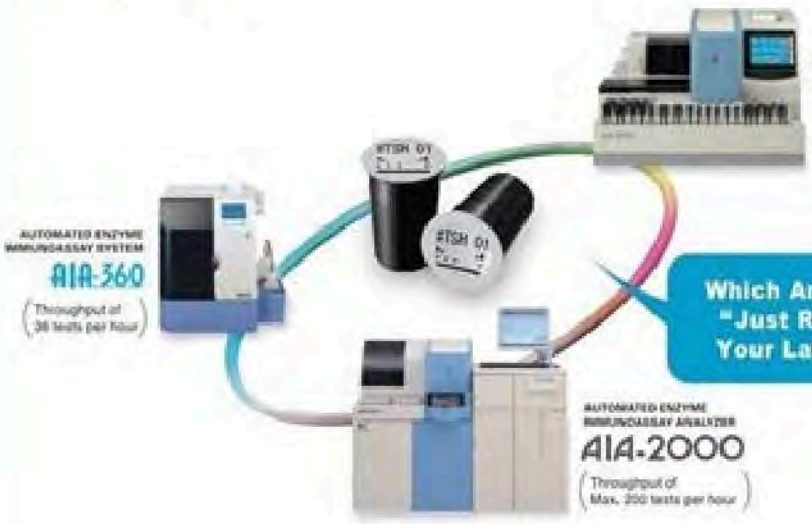

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