5th SINGAPORE REHABILITATION CONFERENCE

7 – 8 September 2017
Academia, Singapore General Hospital

Integrating Rehabilitation Care: From Hospital to the Community

Co-organisers

Singapore General Hospital
SingHealth

Tan Tock Seng Hospital
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WELCOME MESSAGE

WELCOME TO THE FIFTH SINGAPORE REHABILITATION CONFERENCE 2017

Dear Friends and Colleagues in the Rehabilitation Community,

The Fifth Singapore Rehabilitation Conference is held on 7 and 8 September 2017 at the Academia, Singapore General Hospital campus. The theme for this conference is “Integrating Rehabilitation Care: From Hospital to the Community”. We focus on the need for rehabilitation today to adapt and align to national priorities. These include moving rehabilitation care from hospital to community, providing both quality and value and shifting from merely providing healthcare to embracing health.

This is the only general Rehabilitation Conference held in Singapore and regionally on a regular basis. The demand for comprehensive, high-quality rehabilitation has increased exponentially over the last decade with an aging population and significant numbers of patients are surviving albeit with disability due to advances in medical care.

The programme is designed to be wide-ranging and comprehensive. We further emphasize rehabilitation themes currently important in Singapore and Asia. There is a strong shift towards rehabilitation in the community and Aging in Place and this conference will emphasize this. Themes highlighted include Aging and Disability, Geriatric Rehabilitation, Cancer Rehabilitation, Innovative Rehabilitation Care Systems and Technology. Also, cutting-edge research and relevant practical approaches are presented in established and new fields of rehabilitation including Neurological/Stroke, Musculoskeletal and Amputee, Intensive Care and Cardiopulmonary Rehabilitation. Important issues are further focused including Rehabilitation Nursing, Integrated Care Pathways, Return to Work, Telerehabilitation, Caregivers in Rehabilitation and Paediatric Rehabilitation.

The Conference is further designed to be interdisciplinary, emphasizing the team-approach to rehabilitation. All themes are fully integrated, and each track comprises a composite team of different rehabilitation professionals representing a diverse range of institutions in different rehabilitation settings. The well-known and established international and local faculty represents the diverse and inclusive field of rehabilitation across all professional roles in rehabilitation.

Both the faculty and participants include Rehabilitation, Specialist or Family Physicians, Allied Health (including: Physical, Occupational, Speech, and Music Therapists, Dieticians, Podiatrists, Psychologists, Exercise Physiologists, Social Work), Rehabilitation Nursing, Scientists, Engineers, Academics, Public Health and Policy Administrators and the Industry.

In this Conference, there is important cross-representation of the spectrum of rehabilitation services providers including Acute, Community and Rehabilitation Hospitals, Nursing Homes, Community and
Home Rehabilitation. This conference will bring together Engineering and Technology Scientist and the Industry that are firmly integrated in current rehabilitation practice as well.

The Committee has put together a stimulating scientific programme that features a combination of plenary lectures and scientific paper presentations. We have also planned for a set of focused pre-conference courses aimed to impart meaningful and practical skills for everyday rehabilitation practice and research. We are confident that this conference will pave the way for the interdisciplinary rehabilitation healthcare team to share their knowledge and skills, as we help patients optimize their function in an inclusive and holistic rehabilitation environment.

In addition to the comprehensive scientific programme, this conference is held within the Singapore General Hospital campus. This academic tertiary hospital has a rich history and is the oldest, largest and flagship hospital in Singapore. It is centrally located and a launch pad to explore one of the most vibrant cities in South East Asia - Singapore. Cosmopolitan, multicultural and easily accessible, you will be enthralled by the multitude of world class attractions, entertainment and leisure options available.

We look forward to welcoming you to the Singapore Rehabilitation Conference for an exciting and enriching program of education and scientific exchange in Comprehensive, Integrated and Quality Rehabilitation Care.
Day 1 - Thursday, 7 September 2017

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<td>0715 - 0745</td>
<td>Academia</td>
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<td>0800 - 0930</td>
<td>Auditorium</td>
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<td>0800 - 0930</td>
<td>Auditorium</td>
<td>Welcome Address</td>
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<td>Assoc Prof Ng Yee Sien, Organising Chairperson, 5th Singapore Rehabilitation Conference</td>
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<tr>
<td>0800 - 0930</td>
<td>Auditorium</td>
<td>Opening Address by Guest-of-Honour</td>
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<td>Dr Lam Pin Min, Senior Minister of State for Health and Transport</td>
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<tr>
<td>0930 - 1000</td>
<td>Academia, Level 1</td>
<td>Keynote Plenary 1: Towards an Inclusive Society - From Hospital to the Community</td>
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<td>President of SPD and Nominated Member of Parliament Ms Chia Yong Yong</td>
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<td>0930 - 1000</td>
<td>Academia, Level 1</td>
<td>Keynote Plenary 2: Multidisciplinary Approach to Rehabilitation Care</td>
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<td>Prof Henry Lew, Tenured Professor, University of Hawaii School of Medicine, USA</td>
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<td>Adjunct Professor, Virginia Commonwealth University School of Medicine, USA</td>
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<td>Honorary Chair Professor, Chung Shan Medical University, Taiwan</td>
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<tr>
<td>0930 - 1000</td>
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<td>BREAK</td>
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<td>1000 - 1200</td>
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<td>1000 - 1200</td>
<td>Auditorium</td>
<td>Chairperson: Prof Rob Newton, Associate Dean, Medical and Exercise Sciences</td>
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<td>Co-Director, Exercise Medicine Research Institute, School of Medical and Health Sciences, Edith Cowan University, Australia</td>
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<td>Exercise In Cancer Rehabilitation: Evidence and Practical Tips</td>
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<td>Prof Rob Newton, Associate Dean, Medical and Exercise Sciences, Co-Director, Exercise Medicine Research Institute, School of Medical and Health Sciences, Edith Cowan University, Australia</td>
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<td>Plenary Talk</td>
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<td>Early Oncology Rehabilitation for Lymphoma Patients: Functional Outcomes and Inpatient Pilot Program</td>
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<td>Dr Saw Hay Mar, Consultant, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore</td>
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<td>Eating Well through Head and Neck Cancer: It Takes a Team</td>
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<td>Ms Yee Kaisin, Speech and Language Therapist, Speech Therapy, Singapore General Hospital and</td>
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<td>Ms Peh Hui Yee, Dietitian, Dept of Dietetics, Singapore General Hospital, Singapore</td>
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|      |       | 3. The Singapore Cancer Society Rehab Program: How We Do It  
Dr Ong Yew Jin, Medical Director, Singapore Cancer Society and  
Ms Jeanette Chan, Art Therapist, Psychosocial Services Department,  
Singapore Cancer Society, Singapore |
|      |       | 4. Prehabilitation in Geriatric Patients Undergoing Colorectal Surgery  
Ms Kylie Siu, Senior Physiotherapist, Rehabilitation Services,  
Khoo Teck Puat Hospital, Singapore |
|      |       | 5. Post-chemotherapy Cognitive Impairment: The Singapore Experience  
Assoc Prof Alexandre Chan, Deputy Head and Associate Professor,  
NUS Pharmacy, Associate Professor, Duke-NUS Medical School,  
Specialist Pharmacist, National Cancer Centre Singapore, Singapore |
| Seminar Room | L1-S3 | TRACK 2: MUSCULOSKELETAL REHABILITATION: AMPUTEE AND HIP FRACTURES  
Chairperson: Dr Rajeswaran Deshan Kumar, Consultant,  
Department of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore |
|      |       | 1. Functional Rehabilitation of the Amputee  
Ms Rinki Devi, Physiotherapist, Dept of Physiotherapy,  
Singapore General Hospital, Singapore |
Mr Trevor Binedell, Assistant Head of Prosthetics & Orthotics Service,  
Principal Prosthetist / Orthotist, Tan Tock Seng Hospital, Singapore |
|      |       | 3. Amputee Sports and Classification  
Ms Kelly Fan, Executive Director, Singapore Disability Sports Council,  
Singapore |
|      |       | 4. Rehabilitation Challenges in the Multiple Limb Amputee  
Assoc Prof Tjan Soon Yin, Senior Consultant and Head,  
Dept of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore |
|      |       | 5. Hip Fracture Care Pathways in Community Hospital  
Dr Chong Tsung Wei, Senior Consultant, St Luke’s Hospital, Singapore |
|      |       | 6. Geriatric Rehabilitation in the Community and ILTC Setting  
Ms Yong Limin, Senior Principal Physiotherapist, Allied Health Services,  
NTUC Health, Singapore |
**Day 1 - Thursday, 7 September 2017**

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<td><strong>Botulinum Toxin A in Spasticity: An Update (Sponsored by Menarini)</strong></td>
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<td>Assoc Prof Kong Keng He, Senior Consultant, Dept of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore</td>
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<td>1330 - 1500</td>
<td>Auditorium</td>
<td>TRACK 3: CARDIOPULMONARY REHABILITATION</td>
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<td>Chairperson: Dr Effie Chew, Senior Consultant, Department of Rehabilitation Medicine, Division of Neurology, University Medicine Cluster, National University Hospital, Singapore</td>
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|            |                        | 1. Survivor Presentation: Living with Pulmonary Hypertension, COPD and Congenital Heart Disease  
|            |                        | Mr Mohd Amin bin Haji S. Mubaruk                                             |
|            |                        | 2. Pulmonary Rehabilitation in Singapore                                   |
|            |                        | Dr Noel Stanley Tay, Director of Service, Dept of Respiratory Medicine, Ng Teng Fong General Hospital, Singapore |
|            |                        | 3. Advances in Cardiac Rehabilitation                                        |
|            |                        | Assoc Prof Tan Swee Yaw, Senior Consultant, Dept of Cardiology, National Heart Centre Singapore, Singapore |
|            |                        | 4. Exercise Prescription Principles in Pulmonary Rehabilitation             |
|            |                        | Ms Jaclyn Chow, Senior Physiotherapist, Dept of Physiotherapy, Tan Tock Seng Hospital, Singapore |
|            |                        | 5. Cardiac Rehabilitation in the Community                                  |
|            |                        | Mr Tay Hung Yong, Principal Physiotherapist, Manager, SHF – Heart Wellness Centre, Singapore Heart Foundation, Singapore |
|            | Seminar Room L1-S3     | TRACK 4: MAXIMIZING CARE OF THE TETRAPLEGIC IN THE POST ACUTE SETTING       |
|            |                        | Chairperson: Ms Nancy Ang, Senior Principal Occupational Therapist, Dept of Occupational Therapy, Singapore General Hospital, Singapore |
|            |                        | 1. Overview of Issues in the High Tetraplegic                             |
|            |                        | Dr Adela Tow, Senior Consultant, TTSH Rehabilitation Centre, Tan Tock Seng Hospital, Singapore |
|            |                        | 2. The Spinal Support Group and Tetraplegia Workgroup - How They are Reaching Out to Tetraplegias in the Community |
|            |                        | Ms Tess Hng, Senior Medical Social Worker, Care and Counselling Dept, Tan Tock Seng Hospital, Singapore |
### TIME | VENUE | PROGRAMME
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1500 - 1530 | Academia, Level 1 | BREAK
1530 - 1730 | Auditorium | **TRACK 5: TECHNOLOGY AND IMAGING IN REHABILITATION**

**Chairperson:** Prof Henry Lew, Tenured Professor, University of Hawaii School of Medicine, USA, Adjunct Professor, Virginia Commonwealth University School of Medicine, USA Honorary Chair Professor, Chung Shan Medical University, Taiwan

1. **Musculoskeletal Ultrasound and Applications in Rehabilitation**  
   *Prof Henry Lew,*  
   Tenured Professor, University of Hawaii School of Medicine, USA Adjunct Professor, Virginia Commonwealth University School of Medicine, USA Honorary Chair Professor, Chung Shan Medical University, Taiwan

2. **A Clinical Perspective on Rehabilitation Robotics and Technology: Future Proofing Rehabilitation Practice**  
   *Dr Karen Chua,* Senior Consultant, Dept of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore

3. **Low Cost and Wearable Technologies for Assessment and Rehabilitation**  
   *Dr Ross Clark,* School of Health and Sports Sciences, University of the Sunshine Coast, Australia

   *Assoc Prof Peter Lim,* Senior Consultant, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore

5. **Brain Computer Interfaces and Applications in Rehabilitation**  
   *Prof Guan Cuntai,* Professor, School of Computer Science and Engineering, Nanyang Technological University, Singapore

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Day 1 - Thursday, 7 September 2017

**TIME** | **VENUE** | **PROGRAMME**
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Seminar Room L1-S3 | **ORAL PRESENTATIONS**

1. A Survey for Nurse’s Needs for Care Robots in Integrated Nursing Care Services (ABS028)
   Ms Lee Jai Yon, Dept of Rehabilitation Medicine, Seoul National University Bundang Hospital, South Korea

2. Outcomes of Gait Training Using a Mobile Robot with Body Weight Support (ABS036)
   Dr Tay San San, Dept of Rehabilitation Medicine, Changi General Hospital, Singapore

3. Ability of Occiput-Wall Distance to Discriminate Severity of Kyphosis as Determined Using the Cobb’s Method (ABS005)
   Ms Arpassanan Wiyanad, School of Physical Therapy, Faculty of Associated Medical Sciences, Khon Kaen University, Khon Kaen, Thailand

4. The Effect of Cognitive Therapy in Improving Cognitive Functions Using Neuropsychology and Diffusion Tensor Imaging Measurements Following Mild Traumatic Brain Injury (ABS032)
   Dr Norhamizan Hamzah, Dept of Rehabilitation Medicine, University Of Malaya, Malaysia

5. Attitudes towards Sexuality Among Allied Health Professionals in Singapore (ABS044)
   Ms Toh Jing En, Occupational Therapy, Faculty of Health Sciences, The University of Sydney, Australia

6. Using of Pilates Exercises for Anterior Cruciate Ligament Injury (ABS014)
   Ms Derya Celik, Faculty of Health Science, Division of Physiotherapy and Rehabilitation, Istanbul University, Turkey

7. Incidence of Shoulder Strength Asymmetry and Its Correlation to Grip Strength, Symptom Duration, Self-Reported Pain and Function in Lateral Epicondylalgia - A Pilot Study (ABS040)
   Ms Li Kun Man, Dept of Physiotherapy, Tan Tock Seng Hospital, Singapore

8. Examining Functional Recovery Among Older Adults with Surgically-Treated Hip Fracture (ABS066)
   Mr Lim Ka Keat, Health Services & Systems Research, Duke NUS Medical School, Singapore

1800 | Academia, Level 3 Atrium | Conference Welcome and Networking Dinner
   All VIPs, Faculty, Committee and Delegates are invited
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| 0830 - 1000 | Auditorium | **TRACK 6: DISABILITY AND REHABILITATION IN SINGAPORE: THE LANDSCAPE AND NATIONAL REHABILITATION INITIATIVE**  
Chairperson: Assoc Prof Gerald Koh, Associate Professor, Saw Swee Hock School of Public Health, National University Health System, Singapore  

**Plenary Talk**  
Disability Prevalence, Recovery Trajectories and Comparative Rehabilitation Outcomes in Singapore: What We Know, What We Don’t Know and What We Need to Bridge the Knowledge Gap  
Assoc Prof Gerald Koh, Associate Professor, Saw Swee Hock School of Public Health, National University of Singapore, Singapore  

1. Return-to-Work Coordination in Public Hospitals in Singapore  
Ms Heidi Tan, Senior Principal Occupational Therapist, Dept of Occupational Therapy, Tan Tock Seng Hospital, Singapore  

2. Rehabilitation Research Institute of Singapore – Vision, Mission and Work to Advance Standards of Rehabilitation Care  
Assoc Prof Ang Wei Tech, School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore  

3. Transition Programme for Employment (TPE): Community Based Framework  
Ms Pauline Koh, Senior Physiotherapist, Transition Programme for Employment, SPD, Singapore  

4. Singapore’s National Telerehabilitation Pilot Project and Its Evaluation  
Assoc Prof Gerald Koh, Associate Professor, and  
Dr Miho Asano, Assistant Professor, Saw Swee Hock School of Public Health, National University of Singapore, Singapore  

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| Seminar Room  
L1-S3 |           | **TRACK 7: ACQUIRED BRAIN INJURY REHABILITATION**  
Chairperson: Dr Bok Chek Wai, Senior Consultant and Head, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore  

1. Epidemiology, Definitions and Assessment of Patients with Disorders of Consciousness (DOC)  
Dr Bok Chek Wai, Senior Consultant and Head, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore  

2. DOC: Determinants of Outcomes: Clinical, Neuropsychological, Laboratory and Neuroimaging  
Dr Effie Chew, Senior Consultant, Dept of Rehabilitation Medicine, National University Hospital, Singapore |
### Day 2 - Friday, 8 September 2017

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| 1000 - 1030 | Academia, Level 1   | **3. Management of Long Term Sequelae of Patients with DOC**  
Dr Kinjal Doshi, Principal Clinical Psychologist, Dept of Neurology, Singapore General Hospital, Singapore  
**4. Nursing the Brain Injured Person: Lessons and Insights**  
Ms Grace Yeo, Senior Staff Nurse (Resident Nurse), Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore  
**5. Sensory Stimulation for Severe Disorders of Consciousness - The Evidence and Our Experience**  
Ms Gan Hui Hui, Principal Speech Therapist, Dept of Speech Therapy, Singapore General Hospital, Singapore |
| 1030 - 1200 | Auditorium      | **TRACK 8: GERIATRIC REHABILITATION**  
Chairperson: Assoc Prof Angelique Chan, Associate Professor / Executive Director, Centre for Ageing Research and Education, Duke-NUS Medical School, Singapore  
**Plenary Talk**  
Disability and Ageing: Trends and Implications  
Assoc Prof Angelique Chan, Associate Professor / Executive Director, Centre for Ageing Research and Education, Duke-NUS Medical School, Singapore  
**1. Strength, Balance and Flexibility - Getting Seniors to Move with HPB’s Fit+**  
Mr Han Kok Teng, Senior Manager, Health Screening and Management Department, Health Promotion Board, Singapore  
**2. Gym Tonic: Making Our Seniors Genki!**  
Mr Gabriel Lim, Programme Director, Lien Foundation, Singapore  
**3. Do Caregivers Affect Patient Recovery after Stroke?**  
Ms Ong Peck Hoon, PhD Candidate, Saw Swee Hock School of Public Health, National University of Singapore, Singapore  
**4. Music Therapy in Rehabilitation for Persons with Dementia**  
Ms Michelle Low, Music Therapist, Music and Creative Therapy Unit, Singapore General Hospital, Singapore and  
Ms Ng Wang Feng, Principal Music Therapist, Inpatient Therapy Services, St. Andrew’s Community Hospital, Singapore |
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<td>Seminar Room</td>
<td><strong>TRACK 9: REHABILITATION IN INTENSIVE CARE UNITS</strong></td>
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<td>L1-S3</td>
<td><em>Chairperson: Dr Geoffrey Samuel, Consultant, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore</em></td>
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|            |                   | 1. Intensivist’s Perspective of Rehabilitation in ICU: Rationale and Cultural Change  
                     Dr Amartya Mukhopadhyay, Senior Consultant, Division of Respiratory and Critical Care Medicine, National University Hospital, Singapore |
|            |                   | 2. Rehabilitation Approach to ICU Acquired Weakness                        
                     Dr Geoffrey Samuel, Dept of Rehabilitation Medicine, Singapore General Hospital, Singapore |
|            |                   | 3. The Nuts & Bolts of ICU Rehabilitation                                
                     Dr Ong Hwee Kuan, Senior Principal Physiotherapist, Singapore General Hospital, Assistant Professor, Singapore Institute of Technology, Singapore |
|            |                   | 4. Role of Occupational Therapy in Critical Care                         
                     Ms Cassandra Ng, Occupational Therapist, Dept of Occupational Therapy, Singapore General Hospital, Singapore |
|            |                   | 5. Functional Neuromuscular Stimulation in ICU                            
                     Dr Geetha Kayambu, Research Director, Senior Physiotherapist. Department of Rehabilitation, National University Hospital, Singapore |
| 1200 - 1300| Academia, Level 1 | **LUNCH AND TOUR OF EXHIBITION BOOTHS**                                   |
| 1300 - 1330| Auditorium        | **LUNCH SYMPOSIUM**                                                       |
|            |                   | *Intelligent Rehabilitation Solutions and its Clinical Application* (Sponsored by Hocoma)  
                     Ms Constanze Meier, Clinical Applications Manager of Hocoma Hub Asia-Pacific, Singapore |
| 1330 - 1500| Auditorium        | **TRACK 10: SYSTEMS OF CARE IN REHABILITATION**                           |
|            |                   | *Chairperson: Prof Michel Landry, Professor and Chief,*  
                     *Doctor of Physical Therapy Division, Dept of Orthopaedic Surgery, Duke University School of Medicine, Durham, North Carolina, USA* |
|            |                   | **Plenary Talk**                                                           |
|            |                   | *Rehabilitation in Austere Environments: Effective Leveraging of Human and Financial Resources*  
                     *Prof Michel Landry, Professor and Chief, Doctor of Physical Therapy Division, Dept of Orthopaedic Surgery, Duke University School of Medicine, Durham, North Carolina, USA* |
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|            |            | **1. Rehabilitation Nursing: The Quest for Excellence Through Research**<br>
|            |            | Dr Lim Su Fee, Assistant Director of Nursing (Advanced Practice Nurse), Speciality Nursing (Rehabilitation Medicine), Singapore General Hospital, Singapore |
|            |            | **2. Practice Guidelines for Prescribing Powered Mobility Aids**<br>
|            |            | Mr Mohamad Nizar Bin Zainal, Council Member, Quality and Standards Committee, Singapore Association of Occupational Therapists, Singapore      |
|            |            | **3. 24 hrs Transitional Rehabilitation Care System in PeaceHaven**<br>
|            |            | Mdm Low Mui Lang, Executive Director, The Salvation Army, Peacehaven Nursing Home, Singapore                                               |
|            |            | **4. Assistive Technology: Enhancing Independence and Quality of Life**<br>
|            |            | Mr Tan Chuan Hoh, Principal Occupational Therapist, Specialised Assistive Technology Centre, SPD, Singapore                                |
|            | Seminar Room | **TRACK 11: STROKE REHABILITATION**<br>
|            | L1-S3      | Chairperson: Mr Adon Chan, Principal Physiotherapist, Rehabilitation Services, Yishun Community Hospital, Singapore                       |
|            |            | **Plenary Talk**<br>Does Measuring Spasticity Early Lead to Changes in Patient Outcomes?<br>
|            |            | Prof Anand Pandyan, Professor of Rehabilitation Technology, School of Health & Rehabilitation, Research Institute for Science and Technology in Medicine, Keele University, UK |
|            |            | **1. Rehabilitation of Stroke with End Stage Renal Failure**<br>
|            |            | Dr Shrikant Pande, Senior Consultant, Neurorehabilitation Medicine Department, Changi General Hospital, Singapore                           |
|            |            | **2. Non-Invasive Brain Stimulation in Stroke Rehabilitation: Updates and Applications**<br>
|            |            | Assoc Prof Lydia Abdul Latif, Head, Dept of Rehabilitation Medicine, University of Malaya Medical Centre, Malaysia                           |
|            |            | **3. Aphasia Testing in Singapore: Singapore General Aphasia Test**<br>
|            |            | Ms Deirdre Tay, Senior Principal Speech Therapist, Dept of Speech Therapy, Singapore General Hospital, Singapore                           |
| 1500 - 1530| Break      | 1500 - 1530 Academia, Level 1                                                                                                                |
### TRACK 12: SPECTRUM OF NEUROLOGICAL REHABILITATION

**Chairperson:** Prof Anand Pandyan, Professor of Rehabilitation Technology, Keele University, UK

1. **Pediatric Neurorehabilitation: Current State and Vision**  
   *Dr Ng Zhi Min, Consultant, Paediatric Neurology, Dept of Paediatrics, KK Women’s and Children’s Hospital, Singapore*

2. **Surgery for Spasticity and Movement Disorders**  
   *Assoc Prof Aymeric Lim, Senior Consultant, Dept of Hand & Reconstructive Microsurgery, National University Hospital, Singapore*

3. **Emerging Infectious Disease and Rehabilitation: A Case Study of the Zika and Ebola Virus**  
   *Prof Michel Landry, Professor and Chief, Doctor of Physical Therapy Division, Dept of Orthopaedic Surgery, Duke University School of Medicine, Durham, North Carolina, USA*

4. **Effectiveness of Vestibular Rehabilitation in the Management of People with Concussion: A Systematic Review and Meta-Analysis**  
   *Dr Dawn Tan, Senior Principal Physiotherapist, Dept of Physiotherapy, Singapore General Hospital, Singapore*

5. **Cueing Effect of Gait Ability in Parkinson’s Disease**  
   *Prof Areerat Suputtitada, Physiatrist, Chulalongkorn University & King Chulalongkorn Memorial Hospital, Thailand*

### ORAL PRESENTATIONS

1. **Assessment of the Visual Status of Older Adults in a Sub-Acute Rehabilitation Ward (ABS018)**  
   *Ms Debbie Boey, Dept of Occupational Therapy, Tan Tock Seng Hospital, Singapore*

2. **Measuring Paediatric Dysphagia Outcomes Post-Acquired Brain Injury (ABS054)**  
   *Ms Anastasia Kate Fife, Speech Language Therapy Service, Rehabilitation Centre, KK Women’s and Children’s Hospital, Singapore*
### SCIENTIFIC PROGRAMME

**Day 2 - Friday, 8 September 2017**

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| 3. Nurse-Led Function Focused Care (FFC) Model: Engaging Nurses in Maximising Patient’s Mobility to Achieve Therapy Goals in Acute and Sub-Acute Ward Tan Tock Seng Hospital (ABS068)  
Mr Iqbal Saboor Rahman, Dept of Physiotherapy, Tan Tock Seng Hospital, Singapore. |
| 4. Effectiveness of High-Intensity Training on Improving Physical Outcomes in a Stroke Population: A Systematic Review and Meta-Analysis (ABS001)  
Ms Mah Shi Min, Dept of Physiotherapy, Sengkang Health, Singapore. |
| 5. Importance of Lower Limb Support Ability During Stepping in Ambulatory Patients with Spinal Cord Injury (ABS004)  
Mr Teerawat Nithiatthawanon, School of Physical Therapy, Faculty of Associated Medical Sciences, Khon Kaen University, Thailand. |
| 6. An Accelerometry and Observational Study to Understand the Upper Limb Activity of Patients During First Four Weeks Post-Stroke (ABS017)  
Ms Chin Lay Fong, Rehabilitation Centre, Tan Tock Seng Hospital, Singapore. |
| 7. Changes in Static and Dynamic Asymmetry Following Discharge from Inpatient Stroke Rehabilitation and Comparison with Balance And Mobility Outcomes (ABS039)  
Dr Kelly Bower, Health and Sport Sciences, University of the Sunshine Coast, Australia. |
| 8. Validating the Use of the Syringe Flow Test to Classify Thickened Fluids for Dysphagia Management (ABS034)  
Ms Lim Hui Zhen, Speech Therapy Dept, Singapore General Hospital, Singapore. |

**1730 Auditorium**  
**PRIZE PRESENTATION AND CLOSING CEREMONY**

**END**
FLOOR PLAN

A: Menarini
B: Össur Singapore
C: Tan Tock Seng Hospital (Handbook of Rehabilitation Medicine)
D: Abbott Laboratories (S) Pte Ltd
E: Edith Cowan University
F: Innomed Pte Ltd
G: United BMEC Pte Ltd
H: Medtronic International Ltd
I: Allergan Singapore Pte Ltd
J & K: Hocoma Pte Ltd
L: Indiba Asia Pte Ltd
M: IDS Medical Systems (Singapore) Pte Ltd
N: Jaga-Me Pte Ltd
O: Flinders University
P: BTL Singapore Pte Ltd
Q: BES Technology Pte Ltd
R: SingEX Exhibitions Pte Ltd
S: Singapore Institute of Technology
T: Nanyang Technological University
U: MedSci Research & Supply Pte Ltd
V: DNR Wheels Pte Ltd

Legend:
- Exhibitors
- Food Point

St. Singapore Rehabilitation Conference
Participant Institution List

- Abilities Beyond Limitations and Expectations (ABLE)
- Academy of Medicine, Chapter of Rehabilitation Physicians, Singapore
- Agency for Integrated Care (AIC)
- Alexandra Health
- All Saints Home
- Ang Mo Kio - Thye Hua Kwan Hospital
- Assisi Hospice
- Auckland District Health Board (New Zealand)
- AWWA
- Beijing United Family Rehabilitation Hospital (China)
- Bright Hill Evergreen Home
- Bright Vision Hospital
- Bundang Hospital (Korea)
- Changi General Hospital
- Chulalongkorn University (Thailand)
- Columbia Asia Hospital Seremban (Malaysia)
- Corbridge Group (Philippines)
- Disability Sports Council
- Dongtan Sacred Heart General Hospital (Korea)
- Duke University
- Duke-NUS Medical School
- Eastern Health Alliance
- Edith Cowan University
- Epworth Healthcare (Australia)
- Fudan University (China)
- Gateway Physiotherapy (Australia)
- Hallym University (Korea)
- Handicaps Welfare Association (HWA)
- Health Promotion Board, Singapore
- Home Nursing Foundation (HNF)
- Hong Kong Institute of Vocational Education (Kwai Chung) (Hong Kong)
- Huashan Hospital (China)
- JAI Physiotherapy Clinic
- Jurong Community Hospital
- Jurong Health Services
- Keele University
- Khon Kaen University
- Khoo Teck Puat Hospital
- King Chulalongkorn Memorial Hospital (Thailand)
- KK Women's and Children's Hospital
- Kowloon Hospital (Hong Kong)
- Kwong Wai Shiu Hospital
- Kyoto Gakuen University (Japan)
- Lee Foundation
- Lions Home for the Elders
- Mahidol University (Thailand)
- Mahsa University (Malaysia)
- Man Fut Tong Nursing Home
- Medicare International Fairview Hospital (Zambia)
- Melbourne Health (Australia)
- Metta Welfare Association
- MINDS
- Ministry of Health (Brunei Darussalam)
- Ministry of Health, Singapore
- Nanyang Polytechnic
- Nanyang Technological University (NTU)
- National Healthcare Group
- National Heart Centre Singapore
- National University Hospital
- National University Hospital Systems
- National University of Singapore
- Ng Teng Fong General Hospital
- NTUC Health
- Orange Valley Nursing Homes Pte Ltd
- Osborne Park Hospital (Australia)
- Peacehaven Nursing Home, The Salvation Army
- Pearl's Hill Nursing Home, Vanguard Healthcare
- Ramathibodi Hospital (Thailand)
- Rehabilitation Research Institute of Singapore
- Ren Ci Hospital
- Ruijin Hospital (China)
- Sarawak General Hospital (Malaysia)
- Sardjito Hospital, Jogjakarta (Indonesia)
- Saw Swee Hock School of Public Health, NUHS
- Sengkang Health
- Sengkang Hospital
- Seoul National University (Korea)
- SG Rehab
- Shanghai Jiao Tong University (China)
- Singapore Association of Occupational Therapists
- Singapore Cancer Society
- Singapore General Hospital (SGH)
- Singapore Institute of Technology
- Singapore Physiotherapy Association
- SingHealth
- Siriraj Hospital (Thailand)
- Society of Rehabilitation Medicine, Singapore
- SPD
- St Andrew's Community Hospital
- St Joseph's Home
- St Luke's Hospital
- St Theresa's Home
- Sunway Medical Centre (Malaysia)
- Tan Tock Seng Hospital
- Thomson Medical Centre
- Thye Hua Kwan Moral Charities
- Toa Payoh Polyclinic
- Tokyo General Hospital (Japan)
- Tuen Mun Hospital, Hospital Authority (Hong Kong)
- Tzu Chi Buddhist Compassion Relief Foundation
- United Medicare Pte Ltd, Elizabeth Drive
- University of Hawaii (United States)
- University of Malaya (Malaysia)
- University of the Sunshine Coast
- Wong Tai Sin Hospital - Hospital Authority (Hong Kong)
- Yishun Community Hospital
- Zhejiang Provincial People's Hospital (China)
- Zhengzhou University and Hospital (China)
### ORGANISING COMMITTEE

**Organising Chairperson**
Assoc Prof Ng Yee Sien

**Co-Chairperson**
Assoc Prof Kong Keng He
Mr Patrick Ker

**Education Track**
Chairperson
Dr Bok Chek Wai

**Scientific Track**
Chairperson
Dr Effie Chew

**Senior Advisor**
Assoc Prof Peter Lim

**Members**
Dr Chong Tsung Wei
Dr Lim Su Fee
Dr Rajeswaran Deshan Kumar
Dr Sherry Young
Dr Wong Seng Mun
Dr Joyce Lui Siew Kwaon
Mr Adon Chan
Ms Doreen Yeo
Ms Nancy Ang
Ms Shaminian Balakrishnan
Ms Wong Wai Min

**Abstracts and Judging Panel**
Dr Effie Chew
Dr Sherry Young
Dr Edwin Lim Choon Wyn

**Organising Secretariat**
SGH Postgraduate Medical Institute
PLENARY SPEAKER 1

Ms CHIA Yong Yong, PBM
President of SPD, Nominated Member of Parliament

Keynote Plenary 1
Towards an Inclusive Society - From Hospital to the Community
Date : Thursday, 7 September 2017
Time : 0830
Venue : Auditorium

PLENARY SPEAKER 2

Prof Henry L. LEW
Tenured Professor, University of Hawaii School of Medicine, USA
Adjunct Professor, Virginia Commonwealth University School of Medicine, USA
Honorary Chair Professor, Chung Shan Medical University, Taiwan

Keynote Plenary 2
Multidisciplinary Approach to Rehabilitation Care
Date : Thursday, 7 September 2017
Time : 0850
Venue : Auditorium

Track 5: Technology and Imaging in Rehabilitation
Musculoskeletal Ultrasound and Applications in Rehabilitation
Date : Thursday, 7 September 2017
Time : 1530
Venue : Auditorium

PLENARY SPEAKER 3

Prof Rob NEWTON
Associate Dean, Medical and Exercise Sciences
Co-Director, Exercise Medicine Research Institute
School of Medical and Health Sciences
Edith Cowan University, Australia

Track 1: Cancer Rehabilitation
Exercise in Cancer Rehabilitation: Evidence and Practical Tips
Date : Thursday, 7 September 2017
Time : 1000
Venue : Auditorium
PLENARY SPEAKER 4

Assoc Prof Gerald KOH
Associate Professor
Saw Swee Hock School of Public Health
National University Health System, Singapore

Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiatives
Disability Prevalence, Recovery Trajectories and Comparative Rehabilitation Outcomes in Singapore: What We Know, What We Don’t Know and What We Need to Bridge the Knowledge Gap
Singapore’s National Telerehabilitation Pilot Project and Its Evaluation

Date : Friday, 8 September 2017
Time : 0830
Venue : Auditorium

PLENARY SPEAKER 5

Assoc Prof Angelique CHAN
Associate Professor / Executive Director
Centre for Ageing Research and Education
Duke-NUS Medical School, Singapore

Track 8: Geriatric Rehabilitation
Disability and Ageing: Trends and Implications

Date : Friday, 8 September 2017
Time : 1030
Venue : Auditorium

PLENARY SPEAKER 6

Prof Michel D. LANDRY
Professor and Chief
Doctor of Physical Therapy Division
Department of Orthopaedic Surgery
Duke University School of Medicine, Durham, North Carolina, USA

Track 10: Systems of Care in Rehabilitation
Rehabilitation in Austere Environments: Effective Leveraging of Human and Financial Resources

Date : Friday, 8 September 2017
Time : 1330
Venue : Auditorium

Track 12: Spectrum of Neurological Rehabilitation
Emerging Infectious Disease and Rehabilitation: A Case Study of the Zika and Ebola Virus

Date : Friday, 8 September 2017
Time : 1530
Venue : Auditorium
PLENARY SPEAKER 7

Prof Anand D PANDYAN
Professor of Rehabilitation Technology
School of Health & Rehabilitation
Research Institute for Science and Technology in Medicine
Keele University, UK

Track 11: Stroke Rehabilitation
Plenary Talk: Does Measuring Spasticity Early Lead to Changes in Patient Outcomes?
Date: Friday, 8 September 2017
Time: 1330
Venue: L1-S3

LUNCH SYMPOSIUM

Assoc Prof KONG Keng He
Senior Consultant
Department of Rehabilitation Medicine
Tan Tock Seng Hospital, Singapore

Lunch Symposium
Botulinum Toxin A in Spasticity: An Update
Date: Thursday, 7 September 2017
Time: 1300
Venue: Auditorium

Ms Constanze MEIER
Clinical Applications Manager of Hocoma Hub Asia-Pacific, Singapore

Lunch Symposium
Intelligent Rehabilitation Solutions And Its Clinical Application
Date: Friday, 8 September 2017
Time: 1300
Venue: Auditorium
**Dr Ross CLARK**
School of Health and Sports Sciences  
University of the Sunshine Coast  
Australia  

*Track 5: Technology and Imaging in Rehabilitation*
*Low Cost and Wearable Technologies for Assessment and Rehabilitation*

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**Assoc Prof Lydia Abdul LATIF**
Senior Consultant  
Rehabilitation Physician  
Associate Professor  
University Malaya  
Malaysia  

*Track 11: Stroke Rehabilitation*
*Non-Invasive Brain Stimulation in Stroke Rehabilitation: Updates and Applications*

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**Prof Areerat SUPUTTITADA M.D.**
Physiatrist  
Chulaongkorn University & King Chulalongkorn Memorial Hospital  
Bangkok, Thailand  

*Track 12: Spectrum of Neurological Rehabilitation*
*Cueing Effect of Gait Ability in Parkinson’s Disease*

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</tbody>
</table>
Assoc Prof Aymeric LIM  
Senior Consultant  
Department of Hand & Reconstructive Microsurgery  
National University Hospital, Singapore

**Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting**  
Upper Limb Surgery in Spinal Cord Injury with Relevance to Rehabilitation  
Date : Thursday, 7 September 2017  
Time : 1330  
Venue : L1-53

Assoc Prof Peter LIM  
Senior Consultant  
Department of Rehabilitation Medicine  
Singapore General Hospital, Singapore

**Track 5: Technology and Imaging in Rehabilitation**  
Electrical Stimulation in Spinal Cord Injuries: Stimulators for Lung, Continence and Motor Function  
Date : Thursday, 7 September 2017  
Time : 1530  
Venue : Auditorium
Assoc Prof ANG Wei Tech  
School of Mechanical & Aerospace Engineering  
Nanyang Technological University, Singapore  

**Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiatives**  
Rehabilitation Research Institute of Singapore – Vision, Mission and Work to Advance Standards of Rehabilitation Care  
Date : Friday, 8 September 2017  
Time : 0830  
Venue : Auditorium

Mr Trevor BINEDELL  
Assistant Head of Prosthetics & Orthotics Service  
Principal Prosthetist / Orthotist  
Tan Tock Seng Hospital, Singapore  

**Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures**  
Revolutionizing Healthcare: How 3D Printing Will Transform Future Prosthetics & Orthotics Industry  
Date : Thursday, 7 September 2017  
Time : 1000  
Venue : L1-S3

Dr BOK Chek Wai  
Senior Consultant and Head  
Department of Rehabilitation Medicine  
Singapore General Hospital, Singapore  

**Track 7: Acquired Brain Injury Rehabilitation**  
Epidemiology, Definitions and Assessment of Patients with Disorders of Consciousness (DOC)  
Date : Friday, 8 September 2017  
Time : 0830  
Venue : L1-S3

Assoc Prof Alexandre CHAN  
Deputy Head and Associate Professor  
NUS Pharmacy  
Associate Professor, Duke-NUS Medical School  
Specialist Pharmacist, National Cancer Centre Singapore  

**Track 1: Cancer Rehabilitation**  
Post-chemotherapy Cognitive Impairment: The Singapore Experience  
Date : Thursday, 7 September 2017  
Time : 1000  
Venue : Auditorium
Ms Jeanette CHAN
Art Therapist
Psychosocial Services Department
Singapore Cancer Society, Singapore

**Track 1: Cancer Rehabilitation**
The Singapore Cancer Society Rehab Program: How We Do It
**Date**: Thursday, 7 September 2017  
**Time**: 1000  
**Venue**: Auditorium

Dr Effie CHEW
Senior Consultant
Department of Rehabilitation Medicine
National University Hospital, Singapore

**Track 7: Acquired Brain Injury Rehabilitation**
DOC: Determinants of Outcomes: Clinical, Neurophysiological, Laboratory and Neuroimaging
**Date**: Friday, 8 September 2017  
**Time**: 0830  
**Venue**: L1-S3

Dr CHONG Tsung Wei
Senior Consultant
St Luke's Hospital, Singapore

**Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures**
Hip Fracture Care Pathways in Community Hospital
**Date**: Thursday, 7 September 2017  
**Time**: 1000  
**Venue**: L1-S3

Ms Jaclyn CHOW
Senior Physiotherapist
Department of Physiotherapy
Tan Tock Seng Hospital, Singapore

**Track 3: Cardiopulmonary Rehabilitation**
Exercise Prescription Principles in Pulmonary Rehabilitation
**Date**: Thursday, 7 September 2017  
**Time**: 1330  
**Venue**: Auditorium
Dr Karen CHUA  
Senior Consultant,  
Department of Rehabilitation Medicine  
Tan Tock Seng Hospital, Singapore  
Track 5: Technology and Imaging in Rehabilitation  
A Clinical Perspective on Rehabilitation Robotics and Technology: Future proofing Rehabilitation Practice  
Date: Thursday, 7 September 2017  
Time: 1530  
Venue: Auditorium

Ms Rinku DEVI D/O Shukul Brendra Kumar  
Physiotherapist  
Department of Physiotherapy  
Singapore General Hospital, Singapore  
Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures  
Functional Rehabilitation of the Amputee  
Date: Thursday, 7 September 2017  
Time: 1000  
Venue: L1-S3

Dr Kinjal DOSHI  
Principal Clinical Psychologist  
Department of Neurology  
Singapore General Hospital, Singapore  
Track 7: Acquired Brain Injury Rehabilitation  
Management of Long Term Sequelae of Patients with DOC  
Date: Friday, 8 September 2017  
Time: 0830  
Venue: L1-S3

Ms Kelly FAN  
Executive Director  
Singapore Disability Sports Council, Singapore  
Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures  
Amputee Sports and Classification  
Date: Thursday, 7 September 2017  
Time: 1000  
Venue: L1-S3
Ms GAN Hui Hui  
Principal Speech Therapist  
Department of Speech Therapy  
Singapore General Hospital, Singapore  

**Track 7: Acquired Brain Injury Rehabilitation**  
Sensory Stimulation for Severe Disorders of Consciousness - The Evidence and Our Experience  
Date :  Friday, 8 September 2017  
Time :  0830  
Venue :  L1-S3

Ms GOH Cheng Jee  
Senior Speech Therapist  
Department of Rehab Therapy Services, Speech Therapy  
Tan Tock Seng Hospital, Singapore  

**Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting**  
Communication Needs in the High Tetraplegic  
Date :  Thursday, 7 September 2017  
Time :  1330  
Venue :  L1-S3

Prof GUAN Cuntai  
Professor  
School of Computer Science and Engineering  
Nanyang Technological University, Singapore  

**Track 5: Technology and Imaging in Rehabilitation**  
Brain Computer Interfaces and Applications in Rehabilitation  
Date :  Thursday, 7 September 2017  
Time :  1530  
Venue :  Auditorium

Mr HAN Kok Teng  
Senior Manager  
Health Screening and Management Department  
Health Promotion Board, Singapore  

**Track 8: Geriatric Rehabilitation**  
Strength, Balance and Flexibility - Getting Seniors to Move with HPB’s Fit+  
Date :  Friday, 8 September 2017  
Time :  1030  
Venue :  Auditorium
Ms Tess HNG
Senior Medical Social Worker
Care and Counselling Department
Tan Tock Seng Hospital, Singapore

Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting
The Spinal Support Group and Tetraplegia Workgroup - How They are Reaching Out to Tetraplegias in the Community
Date  :  Thursday, 7 September 2017
Time  :  1330
Venue  :  L1-S3

Dr Geetha KAYAMBU
Research Director
Senior Physiotherapist
Department of Rehabilitation
National University Hospital, Singapore

Track 9: Rehabilitation in Intensive Care Units
Functional Neuromuscular Stimulation in ICU
Date  :  Friday, 8 September 2017
Time  :  1030
Venue  :  L1-S3

Ms Pauline KOH
Senior Physiotherapist
Transition Programme for Employment (TPE)
SPD, Singapore

Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiatives
Transition Programme for Employment (TPE): Community Based Framework
Date  :  Friday, 8 September 2017
Time  :  0830
Venue  :  Auditorium

Mr Gabriel LIM
Programme Director
Lien Foundation, Singapore

Track 8: Geriatric Rehabilitation
Gym Tonic: Making Our Seniors Genki!
Date  :  Friday, 8 September 2017
Time  :  1030
Venue  :  Auditorium
Dr LIM Su Fee
Assistant Director of Nursing (Advanced Practice Nurse)
Speciality Nursing (Rehabilitation Medicine)
Singapore General Hospital, Singapore

**Track 10: Systems of Care in Rehabilitation**
Rehabilitation Nursing: The Quest for Excellence Through Research
Date: Friday, 8 September 2017
Time: 1330
Venue: Auditorium

Ms Michelle LOW
Music Therapist
Music and Creative Therapy Unit
Singapore General Hospital, Singapore

**Track 8: Geriatric Rehabilitation**
Music Therapy in Rehabilitation for Persons with Dementia
Date: Friday, 8 September 2017
Time: 1030
Venue: Auditorium

Mdm LOW Mui Lang
Executive Director
The Salvation Army, Peacehaven Nursing Home, Singapore

**Track 10: Systems of Care in Rehabilitation**
24 hrs Transitional Rehabilitation Care System in PeaceHaven
Date: Friday, 8 September 2017
Time: 1330
Venue: Auditorium

Mr MOHD Amin bin Haji S. S. Mubaruk

**Track 3: Cardiopulmonary Rehabilitation**
Survivor Presentation: Living with Pulmonary Hypertension, COPD and Congenital Heart Disease
Date: Thursday, 7 September 2017
Time: 1330
Venue: Auditorium
Dr Amartya Mukhopadhyay
Senior Consultant
Division of Respiratory and Critical Care Medicine
National University Hospital, Singapore

Track 9: Rehabilitation in Intensive Care Units
Intensivist's Perspective of Rehabilitation in ICU: Rationale and Cultural Change
Date: Friday, 8 September 2017
Time: 1030
Venue: L1-S3

Ms NG Wang Feng
Principal Music Therapist
Inpatient Therapy Services
St. Andrew’s Community Hospital, Singapore

Track 8: Geriatric Rehabilitation
Music Therapy in Rehabilitation for Persons with Dementia
Date: Friday, 8 September 2017
Time: 1030
Venue: Auditorium

Ms Cassandra NG
Occupational Therapist
Department of Occupational Therapy
Singapore General Hospital, Singapore

Track 9: Rehabilitation in Intensive Care Units
Role of Occupational Therapy in Critical Care
Date: Friday, 8 September 2017
Time: 1030
Venue: L1-S3

Dr NG Zhi Min
Consultant
Paediatric Neurology
Department of Paediatrics
KK Women's and Children's Hospital, Singapore

Track 12: Spectrum of Neurological Rehabilitation
Pediatric Neurorehabilitation: Current State and Vision
Date: Friday, 8 September 2017
Time: 1530
Venue: Auditorium
Dr ONG Hwee Kuan
Senior Principal Physiotherapist
Singapore General Hospital
Assistant Professor
Singapore Institute of Technology, Singapore

**Track 9: Rehabilitation in Intensive Care Units**
The Nuts & Bolts of ICU Rehabilitation
Date :  Friday, 8 September 2017
Time :  1030
Venue :  L1-S3

Dr ONG Yew Jin
Medical Director
Singapore Cancer Society, Singapore

**Track 1: Cancer Rehabilitation**
The Singapore Cancer Society Rehab Program: How We Do It
Date :  Thursday, 7 September 2017
Time :  1000
Venue :  Auditorium

Ms ONG Peck Hoon
PhD Candidate
Saw Swee Hock School of Public Health
National University of Singapore, Singapore

**Track 8: Geriatric Rehabilitation**
Do Caregivers Affect Patient Recovery after Stroke?
Date :  Friday, 8 September 2017
Time :  1030
Venue :  Auditorium

Dr Shrikant PANDE
Senior Consultant
Neurorehabilitation Medicine Department
Changi General Hospital, Singapore

**Track 11: Stroke Rehabilitation**
Rehabilitation of Stroke with End Stage Renal Failure
Date :  Friday, 8 September 2017
Time :  1330
Venue :  L1-S3
Ms PEH Hui Yee  
Dietitian  
Department of Dietetics  
Singapore General Hospital, Singapore  
**Track 1: Cancer Rehabilitation**  
*Eating Well through Head and Neck Cancer: It Takes a Team*  
Date : Thursday, 7 September 2017  
Time : 1000  
Venue : Auditorium

Dr Geoffrey SAMUEL  
Department of Rehabilitation Medicine  
Singapore General Hospital, Singapore  
**Track 9: Rehabilitation in Intensive Care Units**  
*Rehabilitation Approach to ICU Acquired Weakness*  
Date : Friday, 8 September 2017  
Time : 1030  
Venue : L1-S3

Dr SAW Hay Mar  
Consultant  
Department of Rehabilitation Medicine  
Singapore General Hospital, Singapore  
**Track 1: Cancer Rehabilitation**  
*Early Oncology Rehabilitation for Lymphoma Patients: Functional Outcomes and Inpatient Pilot Program*  
Date : Thursday, 7 September 2017  
Time : 1000  
Venue : Auditorium

Dr Sandeep Jacob SEBASTIN  
Consultant  
Department of Hand & Reconstructive Microsurgery  
National University Hospital, Singapore  
**Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting**  
*Upper Limb Surgery in Spinal Cord Injury with Relevance to Rehabilitation*  
Date : Thursday, 7 September 2017  
Time : 1330  
Venue : L1-S3
CONFERENCE FACULTY

Ms Kylie SIU
Senior Physiotherapist
Rehabilitation Services
Khoo Teck Puat Hospital, Singapore

**Track 1: Cancer Rehabilitation**

Prehabilitation in Geriatric Patients Undergoing Colorectal Surgery
Date : Thursday, 7 September 2017
Time : 1000
Venue : Auditorium

Dr Adrian TAN
Consultant Family Physician
Department of Continuing and Community Care
Tan Tock Seng Hospital, Singapore

**Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting**

Tracheostomy Care and Weaning in the High Tetraplegic in the Community
Date : Thursday, 7 September 2017
Time : 1330
Venue : L1-S3

Dr Dawn TAN
Senior Principal Physiotherapist
Department of Physiotherapy
Singapore General Hospital, Singapore

**Track 12: Spectrum of Neurological Rehabilitation**

Effectiveness of Vestibular Rehabilitation in the Management of People with Concussion: A Systematic Review and Meta-Analysis
Date : Friday, 8 September 2017
Time : 1530
Venue : Auditorium

Ms Heidi TAN Siew Khoon
Senior Principal Occupational Therapist
Department of Occupational Therapy
Tan Tock Seng Hospital, Singapore

**Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiatives**

Return-to-Work Coordination in Public Hospitals in Singapore
Date : Friday, 8 September 2017
Time : 0830
Venue : Auditorium
Mr TAN Chuan Hoh
Principal Occupational Therapist
Specialised Assistive Technology Centre
SPD, Singapore

**Track 10: Systems of Care in Rehabilitation**

**Assistive Technology: Enhancing Independence and Quality of Life**

- **Date:** Friday, 8 September 2017
- **Time:** 1330
- **Venue:** Auditorium

Assoc Prof TAN Swee Yaw
Senior Consultant
Department of Cardiology
National Heart Centre Singapore

**Track 3: Cardiopulmonary Rehabilitation**

**Advances in Cardiac Rehabilitation**

- **Date:** Thursday, 7 September 2017
- **Time:** 1330
- **Venue:** Auditorium

Dr Noel Stanley TAY
Director of Service
Department of Respiratory Medicine
Ng Teng Fong General Hospital, Singapore

**Track 3: Cardiopulmonary Rehabilitation**

**Pulmonary Rehabilitation in Singapore**

- **Date:** Thursday, 7 September 2017
- **Time:** 1330
- **Venue:** Auditorium

Mr TAY Hung Yong
Principal Physiotherapist
Manager, SHF – Heart Wellness Centre
Singapore Heart Foundation, Singapore

**Track 3: Cardiopulmonary Rehabilitation**

**Cardiac Rehabilitation in the Community**

- **Date:** Thursday, 7 September 2017
- **Time:** 1330
- **Venue:** Auditorium
Ms Deirdre TAY
Senior Principal Speech Therapist
Department of Speech Therapy
Singapore General Hospital, Singapore

**Track 11: Stroke Rehabilitation**
Aphasia Testing in Singapore: Singapore General Aphasia Test
Date: Friday, 8 September 2017
Time: 1330
Venue: L1-S3

Assoc Prof TJAN Soon Yin
Senior Consultant and Head
Department of Rehabilitation Medicine
Tan Tock Seng Hospital, Singapore

**Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures**
Rehabilitation Challenges in the Multiple Limb Amputee
Date: Thursday, 7 September 2017
Time: 1000
Venue: L1-S3

Dr Adela TOW
Senior Consultant
TTSH Rehabilitation Centre
Tan Tock Seng Hospital, Singapore

**Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting**
Overview of Issues in the High Tetraplegic
Date: Thursday, 7 September 2017
Time: 1330
Venue: L1-S3

Ms YEE Kaisin
Speech and Language Therapist
Speech Therapy
Singapore General Hospital, Singapore

**Track 1: Cancer Rehabilitation**
Eating Well through Head and Neck Cancer: It Takes a Team
Date: Thursday, 7 September 2017
Time: 1000
Venue: Auditorium
Ms Grace YEO  
Senior Staff Nurse (Resident Nurse)  
Department of Rehabilitation Medicine  
Singapore General Hospital, Singapore  
**Track 7: Acquired Brain Injury Rehabilitation**  
**Nursing the Brain Injured Person: Lessons and Insights**  
Date : Friday, 8 September 2017  
Time : 0830  
Venue : L1-S3  

Ms YONG Limin  
Senior Principal Physiotherapist  
Allied Health Services  
NTUC Health, Singapore  
**Track 2: Musculoskeletal Rehabilitation: Amputee and Hip Fractures**  
**Geriatric Rehabilitation in the Community and ILTC setting**  
Date : Thursday, 7 September 2017  
Time : 1000  
Venue : L1-S3  

Mr Mohamad NIZAR Bin Zainal  
Council Member  
Quality and Standards Committee  
Singapore Association of Occupational Therapists, Singapore  
**Track 10: Systems of Care in Rehabilitation**  
**Practice Guidelines for Prescribing Powered Mobility Aids**  
Date : Friday, 8 September 2017  
Time : 1330  
Venue : Auditorium  

Dr MIHO Asano  
Assistant Professor  
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**Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiatives**  
**Singapore’s National Telerehabilitation Pilot Project and Its Evaluation**  
Date : Friday, 8 September 2017  
Time : 0830  
Venue : Auditorium
ABSTRACTS BY DAY/TIME

**Opening Address**

Opening Address

**Day One, 0800 – 0930, Auditorium**

**Integrating Rehabilitation from Hospital to Community: Rehabilitation – The Final Frontier**

Assoc Prof Ng Yee Sien

More than a billion people worldwide face disability daily. Rehabilitation is the core intervention in comprehensive disability management. The WHO-International Classification of Functioning, Disability and Health provides the overarching construct to provide clinical care, education, research and guide healthcare policy. The impact of disease is classified into impairments of body structure and function, activity limitation and participation restrictions, and integrates environmental and personal contextual factors. Solutions can be aligned with principles of restoration or compensation with a wide array of medications, therapeutic tools and technology.

Rapid developments in cardiopulmonary, neurological and musculoskeletal rehabilitation correspond with significant increases in the use of more sophisticated imaging and interventional modalities. Cancer rehabilitation and Geriatric rehabilitation are the fastest growing fields of rehabilitation in this region with an ever increasing demand due to the Aging and better Medical Care.

Rehabilitation needs to rapidly adapt and align to national priorities including moving rehabilitation care from hospital to community, providing both quality and value and shift from merely providing healthcare to embracing Health. Interdisciplinary care is a key principle in optimizing rehabilitation outcomes. The strengthening of rehabilitation systems including integrated care pathways, both very early and community rehabilitation and participation interventions such as Return to Work programs and Assistive Technology need significant emphasis. Paediatric Rehabilitation, Rehabilitation Nursing and Rehabilitation Education also needs urgent further development.

The Rehabilitation Community has the important mission to Advocate for the Disabled by providing rehabilitation to improve function, quality of life and health.


Refer to Annex A

**Keynote Plenary 1**

Towards an Inclusive Society – From Hospital to the Community

Ms Chia Yong Yong

Everyone, regardless of abilities, is a part of the community. Singapore has signed and ratified the United Nations Convention on the Rights of Persons with Disabilities, a commitment to treat persons with disabilities equally with the rest of the community, with dignity and respect, and with equal access to opportunities.

Ms Chia will share her experiences in advocating for social change in her course of work as the President of SPD and a Nominated Member of Parliament. She will give an overview of how Singapore has progressed towards building an inclusive society and the important role that rehabilitation clinicians and professionals play in facilitating integration of persons with disabilities from the hospital to the community.
Keynote Plenary 2

Multidisciplinary Approach to Rehabilitation Care
Prof Henry Lew

With the changing health care system, rehabilitation professionals are taking care of increasing complex medical conditions that require coordinated, individualized, and comprehensive medical and psychosocial intervention throughout the continuum of care. For example, the VA health care system in the USA has been in the frontline of caring for patients with amputation, spinal cord injury, traumatic brain injury (TBI) and polytrauma. In this presentation, we will discuss persistent problems in patients with TBI, in an attempt to illustrate the importance of multidisciplinary approach to rehabilitation care.

Track 1: Cancer Rehabilitation

Plenary Talk
Exercise In Cancer Rehabilitation: Evidence and Practical Tips
Prof Rob Newton

Not Available at Time of Publication

Early Oncology Rehabilitation for Lymphoma Patients: Functional Outcomes and Inpatient Pilot Program
Dr Saw Hay Mar

National Cancer Centre Singapore (NCCS) is the largest cancer centre in Singapore, located within Singapore General Hospital (SGH) campus and it provides unique oncology service with a wide range of cancer care, including medical management and rehabilitation of complex cancer patients. In SGH, well established rehabilitation programs for stroke, hip fracture, spinal cord injury and amputation exist with clinical pathways facilitating workflow and early initiation of rehabilitation. However, there was no formal oncology rehabilitation pathway until mid-2015. Studies showed that reported rates of physical impairment and disability in cancer survivors are high as a result of their cancer and or its treatment resulting limitation in daily activities and reduction of quality of life. As rehabilitation interventions can ameliorate physical and cognitive impairments and optimize functional outcomes, many oncological patients require rehabilitation services to maintain their physical and psychological well beings. In this presentation, we will review how we conducted early rehabilitation pilot program for lymphoma patients, their demographic data and short term functional outcomes. We also intend to highlight the strengths and weaknesses of the pilot program and comment on the feasibility of early rehabilitation program under oncology team co-managed by rehabilitation physician led weekly MDM and workflow system.
Eating Well through Head and Neck Cancer: It Takes a Team
*Ms Yee Kaisin and Ms Peh Hui Yee*

Head and neck cancer patients face unique challenges in maintaining adequate nutrition. Both the disease and its treatment can significantly impact on upper aerodigestive tract anatomy and/or function, resulting in difficulty and pain during chewing and swallowing. This, in turn, affects the patients' ability to obtain adequate nutrition orally and results in weight loss and malnutrition. Insufficient or unsafe nutrition intake can have profound impact on wound healing, infection risks, treatment outcomes and quality of life. We will discuss swallowing and nutritional management throughout the head and neck cancer journey, and how the synergistic work of speech and language therapists and dietitians can help patients maximise their nutritional intake and optimise overall nutritional status.

The Singapore Cancer Society Rehab Program: How We Do It
*Dr Ong Yew Jin and Ms Jeanette Chan*

Cancer rehabilitation is a process that assists the person with cancer to obtain optimum physical, social, psychological, spiritual and vocational functioning to maximize his/her ability to carry on with life, within the limits created by the disease and its resulting treatment. Being a new and the first community-based cancer rehabilitation centre in Singapore, we built a model that involved hospital and community-based partners. We adopted a tri-modal model approach in providing physical, nutritional, psychosocial support to persons across the cancer care continuum - from preventive, restorative, supportive to palliative rehabilitation. It is a work in progress and we will be sharing what we have learnt and developed thus far.

Prehabilitation in Geriatric Patients Undergoing Colorectal Surgery
*Ms Kylie Siu*

Colorectal cancer is one of the leading causes of death in Singapore. As the aging population grows, the incidence of colorectal cancer will also rise and will become a significant health burden. Age is a risk factor for being frail which has been defined as a state of limited reserve to withstand stress such as a surgical intervention. In the short term, frail patients have greater risk on major postoperative complications while in the long term; frail patients are more likely to experience a poorer functional performance postoperatively resulting in institutionalization and loss of capacity to perform daily life activities. Surgery is the cornerstone of the treatment of colorectal cancer. Older patients, especially if frail are more prone to complications and require specific preoperative risk stratification. Prehabilitation, defined as the enhancement of the preoperative condition of a patient, is a possible strategy to improve the postoperative outcome of these patients. In this presentation, we will review current literature on prehabilitation on this population, a showcase of prehabilitation and associated outcomes in a native hospital, and a discussion on how this could be pragmatically coordinated and structured into a local setting.

Post-chemotherapy Cognitive Impairment: The Singapore Experience
*Assoc Prof Alexandre Chan*

There is substantial amount of evidence suggesting that a subset of cancer survivors suffer from neurocognitive impairment after chemotherapy. This phenomenon is also known as ‘chemobrain’ or ‘chemofog’ in the literature. Based in Singapore, my research team has pioneered a number of research studies evaluating the impact of ‘chemobrain’ within the Singaporean population. Its implications on the road of recovery in Asian cancer survivors will also be shared in this seminar.
Revolutionizing Healthcare: How 3D Printing Will Transform Future Prosthetics & Orthotics Industry

Mr Trevor Binedell

Additive manufacturing, also commonly known as 3D printing, has transformed many industries including healthcare. 3D printing can fabricate complex-shaped components with precise detail and in various applicable materials. Ability to 3D print medical devices such as prostheses and orthoses will revolutionize healthcare as conventionally manufactured devices has its limitations in customisation and optimisation. With the rising cost of healthcare from factors such as labour resources, the introduction of an alternative manufacturing process has the ability to not only provide a unique solution but also further enhancements in medical application.

The Prosthetics & Orthotics industry has been at the forefront of adopting new technology such as the use of bionics and artificial intelligence in various prosthetic componentry. With the availability of open source sites and the increasing affordability of 3D printers, many users can now experiment and 3D print products even within their own homes. We have read news of 3D printed hands and fingers for those who cannot afford expensive bionic hands. Such medical solutioning should be applauded. However, without proper bench-testing of the materials used and clinical trials of prototypes, the clinical outcome of such “print-to-use” is questionable. Proper manufacturing standards and guidelines to ensure durability and reliability of these products are required to ensure patient safety and good outcomes.

This presentation will showcase our journey in 3D printing an ankle foot orthosis. We will share the past and future challenges faced in introducing this new manufacturing solution. New ideas, their limitations and possible future direction of prosthetics & orthotics industry through the introduction of 3D printing will be discussed.

Amputee Sports and Classification

Ms Kelly Fan

Sports, like music, is a common language that bridges boundaries and differences. Often, a person who acquires a disability suffers a shock upon seeing and feeling the differences that has been inflicted, and goes into withdrawal and helplessness, thinking that the differences are irreversible. Through sports, however, one can slowly regain equal ground, not just physically, but socially.

The Singapore Disability Sports Council (SDSC) firmly believes that sports should be accessible to all persons with disability (PWD), to help them benefit this form of rehabilitative therapy. In addition, the SDSC seeks to enable PWD to live better through sport, where they can earn recognition for their capabilities to contribute to society, and not be cast as burdens. In this presentation, we will be sharing on sports suitable for amputees and how amputees in the local context have pursued sports, to rebuild their confidence, careers and lives. We will also share how medical personnel can go beyond the hospitals to help PWD in Singapore, Asia and globally, by furthering their knowledge and training in classification, a process of identifying activity limitations of PWD in various sports.
Rehabilitation Challenges in the Multiple Limb Amputee

Assoc Prof Tjan Soon Yin

Poly-amputation has been increasing in incidence in the last 5 years due to complications associated with disseminated sepsis and use of inotropes. These patients have been managed at Tan Tock Seng Hospital due to the presence of its Prosthetic workshop and multidisciplinary amputee rehab team. The talk presents the profile, functional outcomes, challenges and opportunities for rehabilitation and integration of polyamputees.

Hip Fracture Care Pathways in Community Hospital

Dr Chong Tsung Wei

Hip fracture rates in Singapore have risen rapidly over the past forty years. Singapore’s hip fracture rate is among the highest in Asia. Hip fractures are a significant cause of mortality, morbidity and functional dependence. The majority of hip fracture patients do not manage to attain pre-morbid function even with surgery. The burden of hip fracture care is bound to increase and increasing with it are the costs of care. There is thus an urgent need to optimise the management of hip fracture patients. Hip fracture care is complex and heterogeneous. Using care pathways in hip fracture is one way to reduce variation and to enhance care for patients. In this presentation, we will review the existing evidence about the effectiveness of care pathways in hip fracture care. We will also share our experience with care pathways in a community hospital setting.

Geriatric Rehabilitation in the Community and ILTC setting

Ms Yong Limin

Not Available at Time of Publication

Lunch Symposium

Day One, 1300 – 1330,

Botulinum Toxin A in Spasticity: An Update

Assoc Prof Kong Keng He

Botulinum toxin A is an effective treatment for spasticity and there is general consensus that it should be the treatment of choice in focal spasticity. This talk will cover the rationale for early use of Botulinum toxin A in post-stroke spasticity and Botulinum toxin dosing in spasticity treatment.

Track 3: Cardiopulmonary Rehabilitation

Day One, 1330 – 1500,

Survivor Presentation: Living with Pulmonary Hypertension, COPD and Congenital Heart Disease

Mr Mohd Amin bin Haji S. S. Mubar

Mr Mohd Amin experienced shortness of breath from a young age years ago. He also has multiple problems relating to respiratory & bone problems. He will now be sharing with us his experiences as a survivor living with Pulmonary Hypertension, COPD and Congenital Heart Disease.”
Pulmonary Rehabilitation in Singapore

Dr Noel Stanley Tay

Pulmonary Rehabilitation is recognised as an important component in the management of patient with chronic lung conditions such as COPD. The challenge is not in setting up a Pulmonary Rehabilitation Service, but to increase in participation rate amongst patients. The talk will focus on the experience in Ng Teng Fong Hospital in the recruitment of patients and outcomes of the program.

Advances in Cardiac Rehabilitation

Assoc Prof Tan Swee Yaw

Not Available at Time of Publication

Exercise Prescription Principles in Pulmonary Rehabilitation

Ms Jaclyn Chow

Pulmonary rehabilitation (PR) is a multi-disciplinary, evidence-based, comprehensive intervention which aims to reduce symptoms, maximise functional status, increase participation in daily life, and reduce healthcare utilisation through stabilizing or reversing systemic manifestations of the disease. Supervised, individualised exercise training is considered the cornerstone of PR. Prescribing exercise requires knowledge to interpret components of the assessment of exercise capacity and limb function, in order to plan a safe and individualised exercise program with clear goals and an appropriate progression to optimize benefits. In this presentation, we will review key principles of exercise prescription in patients with Chronic Obstructive Pulmonary Disease, taking into account respiratory and muscle limitations as well the indication and contraindications for exercise and using information from current evidence to develop an effective exercise programme.

Cardiac Rehabilitation in the Community

Mr Tay Hung Yong

The Singapore Heart Foundation (SHF) is the only community-based facility in Singapore that offers Phase 3 and 4 cardiac rehabilitation to the public at a subsidised rate. Cardiac rehabilitation promotes lifestyle habits of regular exercise, healthy eating, smoking cessation and stress management (both mental and physical), as is clinically proven to significantly improve one's quality of life and reduce the risk of disability and death from heart disease. This presentation aims to give the delegates an overview of the programmes run by SHF as well as a better picture of advantages and challenges in running a cardiac rehabilitation programme in the community.

Track 4: Maximizing Care of the Tetraplegic in the Post Acute Setting

Overview of Issues in the High Tetraplegic

Dr Adela Tow

Not Available at Time of Publication
The Spinal Support Group and Tetraplegia Workgroup - How They are Reaching Out to Tetraplegias in the Community

Ms Tess Hng

Spinal cord injuries bring about intense personal psycho-emotional consequences as well as costly socio-economical impact. However, the outcome of these spinal patients varies widely, from those who move on and adapt to life after SCI, to those who developed depression and anxiety and remain unadjusted in the community.

According to research, the level of injuries does not prognosticate adjustments and coping. It is the quality of coping skills and social support received that matters more. Hence, both Spinal Support Group (SSG) and Tetraplegia Workgroup (TWG) have been trying to help patients in these 2 areas.

In this presentation, we will hear insights on the psycho-social needs of the SSG and TWG members gathered during a focus group discussion, and how the support groups tried to meet those needs through a series of activities. As we journey into the 3rd year of the support group, the route ahead will be more active member engagement to outreach to new spinal injured persons.

Communication Needs in the High Tetraplegic

Ms Goh Cheng Jee

Communication is part and parcel of life of everyone's life and is often taken for granted. The difficulty in expressing oneself in any form of communication, verbal or nonverbal often reduces an individual's quality of life. In some cases of tetraplegia, the presence of a tracheostomy tube decreases the ability of the patient to communicate effectively as well. Speech therapist's intervention would be crucial in identifying the most appropriate tools/ ways for patients with tetraplegia to communicate effectively.

In this presentation, we will explore several communication method/ tools that could be used to ease communication between patient with tetraplegia and their communication partners to improve the quality of life.

Upper Limb Surgery in Spinal Cord Injury with Relevance to Rehabilitation

Dr Sandeep Jacob Sebastin and Assoc Prof Aymeric Lim

Not Available at Time of Publication

Tracheostomy Care and Weaning in the High Tetraplegic in the Community

Dr Adrian Tan

Tracheostomy maybe needed in patient with high tetraplegia for ventilation, secretion management, sometimes comorbidity of upper airway obstruction. Most patient can wean off tracheostomy but because of the impaired respiratory function, the weaning need to more prolong than the standard protocol. Post weaning the patient may still need long management of respiratory secretions. For those patients who cannot wean off the tracheostomy, we have to pay attention to the long term care of the tracheostomy and manage its complications.
Track 5: Technology and Imaging in Rehabilitation  
Musculoskeletal Ultrasound and Applications in Rehabilitation  
Prof Henry Lew

With recent advances in computer technology, equipment miniaturization, reduced cost, and ease of use, the clinical applications of ultrasound have spread across various medical specialties, including musculoskeletal medicine. In this presentation, we review the most common ultrasound applications in bedside diagnosis, ultrasound guided injections, as well as discuss the new developments and utility of elastography in rehabilitation settings.

A Clinical Perspective on Rehabilitation Robotics and Technology: Future proofing Rehabilitation Practice  
Dr Karen Chua

In this presentation, we will discuss robotic-assisted therapy as an emerging and significant field of clinical rehabilitation and its value proposition for transforming and innovating rehabilitation clinical practice. To date, the literature is indicative of a sizeable number and variety of robotic devices in the field, some are commercially available; yet large scale clinical outcomes are mixed and less positive than expected. In addition to reductions in motor impairment and functional gains, use-dependent neural plasticity harnessed through task specific and repetitive robotic exercise are potential biomarkers of recovery after robot aided therapy.

Uppermost in the minds of rehabilitationists are the salience and relevance of the growing body of evidence-based medicine to daily multidisciplinary practice. A confluence of roboticists’ and clinicians’ goals in the development of gait machines or upper limb robots may facilitate their deployment and clinical integration. Attempts to achieve integration amongst clinicians’ practices and robots in the real world often generate new challenges and solutions. Both perspectives from rehabilitation professionals and patients in regard to their experiences with robot-assisted therapies must also be considered in the struggle for acceptance and sustainability.

Low Cost and Wearable Technologies for Assessment and Rehabilitation  
Dr Ross Clark

The combination of miniaturisation and mass production has been a game-changer in terms of making available electronics and sensors that can be used to assess and treat your patients. In this presentation Dr Clark will discuss how low cost but high tech systems such as smartphones and video gaming equipment can be repurposed as physical function assessment tools, and how the sensors in these and other devices such as wearable activity monitors function and might evolve in the near future. He will also explain how some of the recent advances in technology such as the “internet of things” and “the cloud” have the potential to both help and hinder you as clinicians, and what to look for when considering the purchase of new equipment and software for clinical use. The talk will also delve into the weird and wonderful world of devices such as the Raspberry Pi (hint – you can’t eat it) and Latte Panda (hint - you shouldn’t drink it and it’s not very cute) which are changing the way we can interact with sensors in the real world. Finally, a brief exploration of “programming for everybody” systems that allow people with no computer coding experience to easily create their own smart phone apps that can access sensor data, record reaction time, send alerts and create custom surveys will be performed.
Electrical Stimulation in Spinal Cord Injuries: Stimulators for Lung, Continence and Motor Function
Assoc Prof Peter Lim

Functional Electrical Stimulation (FES) also known as Neuromuscular Electrical Stimulation (NMES) is an intervention that has been used from the beginnings of Rehabilitation Medicine. Electrical currents are applied either directly onto muscles or via intact peripheral nerves to activate contractions and move the paralysed muscles. This rehabilitation modality has evolved with distinct purposes and goals including therapeutic for exercise to maintain cardiovascular conditioning, avoid muscle atrophy, osteoporosis, and improve peripheral circulation. It may be used to produce or augment respiratory, bowel, bladder, upper and lower limb muscle contractions for functional activities. Exogenously applied weak electrical fields have also been studied for facilitating and encouraging regeneration of damaged neurological tissues. A review of the currently available commercial devices using electrical stimulation for functional purposes will be discussed.

Brain Computer Interfaces and Applications in Rehabilitation
Prof Guan Cuntai

Brain-Computer Interfaces (BCIs) connect human central nervous systems (CNS) with an external device (usually a computer), where the computer interprets the brain signals, translates them into actions, and feeds back to the CNS system so as to replace, restore, supplement, enhance and improve human motor and/or cognitive functions. In the last decade, we have witnessed the accelerations of applying BCIs in various medical applications, such as stroke rehabilitation, cognitive training in elderly, assistance to ALS patients, and even restoration of motor functions for people with spinal cord injury. In this talk, we will discuss the advance of BCI technologies and its medical applications, in particular, in motor rehabilitations. Stroke is the leading cause of severe disabilities in many countries. Upper limb weakness and loss of hand function are among the most devastating types of disabilities. We will present BCI based stroke rehabilitation systems and a series of clinical studies aiming at restoring the motor functions of the upper limb in stroke patients.

Track 6: Disability and Rehabilitation in Singapore: The Landscape and National Rehabilitation Initiative
Plenary Talk
Disability Prevalence, Recovery Trajectories and Comparative Rehabilitation Outcomes in Singapore: What We Know, What We Don’t Know and What We Need to Bridge the Knowledge Gap
Assoc Prof Gerald Koh

Singapore has limited data on (1) disability prevalence rates across age groups and over time, (2) rehabilitation outcomes across settings and by diseases, or (3) a registry of disabled persons. For the first time, in December 2016, the Enabling Masterplan Committee reported that the prevalence of disability in those aged 7-18 years was 2.1%, 2.4% for those aged 18-49 years and 13.3% for those aged 50 years and above. Trends in age-standardized prevalence rates of disability are required to project rehabilitation and support service needs, especially for Singapore’s rapidly ageing population. We also need to think beyond physical disability and consider mental disability as well. Trends in rehabilitation outcomes across settings and by diseases (controlled for baseline differences in function and known non-modifiable factors) across settings (e.g. inpatient vs. outpatient), stages of recovery and by diseases are also needed. Such data are increasingly important in today’s ecosystem of value-driven outcomes and care integration.
Australia and New Zealand have set up a national rehabilitation medicine clinical registry called the Australasian Rehabilitation Outcomes Centre to develop a national benchmarking system and systematically collect rehabilitation outcome information in both the inpatient and ambulatory settings. In the US, Model Systems Knowledge Transfer Centre pools rehabilitation outcome information and conducts research to improve long-term functional, vocational, cognitive, and quality-of-life outcomes in individuals with spinal cord, traumatic brain and burn injuries. For Singapore to adopt and realise the potential benefits of such data monitoring systems, we will need (1) inclusion of disability as a measure in national health surveys, (2) commonly agreed disability and rehabilitation outcome measures, (3) user-friendly electronic data entry and management systems accessible to all rehabilitation settings, (4) researchers dedicated to linking and analysing the longitudinal data regularly, and (5) engagement of all stakeholders to interpret and use the findings meaningfully.

**Return-to-Work Coordination in Public Hospitals in Singapore**  
*Ms Heidi Tan*

While case management in helping patients discharge from hospital is a common feature in many hospitals, case management in helping patients return to work is a relatively unknown in public hospitals. Return-To-Work coordination in an acute hospital setting allows the opportunity for early focus on rehabilitating patients to an important role many value — Work. The presenter will share a framework of how return-to-work coordination can happen in public hospitals and the role of healthcare professionals in facilitating the patients to return to work.

**Rehabilitation Research Institute of Singapore – Vision, Mission and Work to Advance Standards of Rehabilitation Care**  
*Assoc Prof Ang Wei Tech*

*Not Available at Time of Publication*

**Transition Programme for Employment (TPE): Community Based Framework**  
*Ms Pauline Koh*

In 2014, SPD started a pilot community-based return-to-work project — the Transition Programme for Employment (TPE). The TPE service is delivered by a multidisciplinary team comprising physiotherapists, occupational therapists, social workers, employment support specialists and a clinical psychologist. It aims to support young adults with acquired physical impairments, such as Stroke and Spinal Cord Injury, in their return to open employment and meaningful engagement.

TPE partners clients in addressing the various barriers and facilitators to their success in returning to gainful employment. The team adopts a case management approach in providing clients with holistic and person-centered care. The programme model encompasses: Physical Rehabilitation, Employment Support, Assistive Technology exploration, Psychosocial and Caregiver Support.

TPE admitted a total of 144 clients for the period June 2014 to June 2017. As of 30 June 2017, 93 clients had been discharged from the programme. Of these, 56% were successful in returning to sustained (3 months) open employment and 17% returned to meaningful activities including education, competitive sports and art.
Singapore’s National Telerehabilitation Pilot Project and Its Evaluation

Assoc Prof Gerald Koh and Dr Miho Asano

Local research shows that although participation in rehabilitation after hospital discharge results in significantly better functional recovery after stroke, only a third of stroke patients recommended to continue with rehabilitation post-discharge actually do so. The barriers preventing them from continuing with post-discharge rehabilitation are functional, social and financial. Home rehabilitation is a potential solution but it is three times more expensive than centre-based rehabilitation. Telerehabilitation obviates the need for therapists to visit patients at their homes, and patients and their caregivers to travel to rehabilitation centres. A telerehabilitation system which uses video-conferencing, sensors and training videos was developed by National University of Singapore and is believed to be the first of its kind in the world. It was evaluated in a randomised controlled trial on acute post-stroke patients where the intervention group (n=50) receiving tele-rehabilitation for three months will be compared to the control group (n=50) receiving usual care. Preliminary results suggests that functional recovery with telerehabilitation is as good as with usual care. A time motion study also found that therapists and patients saved time traveling with tele-rehabilitation compared to centre-based and home rehabilitation, and therapists spent less time on consultation per patient per week. Singapore’s Ministry of Health has identified tele-rehabilitation as one of the first tele-health initiatives to be piloted on a large scale to assess its suitability to be implemented as a mainstream programme. This proposed tele-rehabilitation pilot project is to determine if tele-rehabilitation is a viable cost-effective solution to substitute some centre-based and home rehabilitation sessions with telerehabilitation for a range of eight conditions. The pilot project will be implemented in about 7 sites and on at least 600 patients over the next 2 years. The proposed evaluation framework for the pilot project will be presented.

Track 7: Acquired Brain Injury Rehabilitation

Epidemiology, Definitions and Assessment of Patients with Disorders of Consciousness (DOC)

Dr Bok Chek Wai

Not Available at Time of Publication

DOC: Determinants of Outcomes: Clinical, Neurophysiological, Laboratory and Neuroimaging

Dr Effie Chew

Not Available at Time of Publication

Management of Long Term Sequelae of Patients with DOC

Dr Kinjal Doshi

Not Available at Time of Publication
Nursing the Brain Injured Person: Lessons and Insights  
Ms Grace Yeo

Caring for patients with brain injury can be challenging. Common behavioural problems associated with brain injury include agitation, cognitive deficits, disinhibition etc. Nursing care of the patient with brain injury involves providing the individual with a safe environment and managing any cognitive deficits and physical needs of the patient. Therefore, it is essential to equip rehabilitation nurses with knowledge on strategies on managing behavioural problems. In this presentation, I will share a case study, to sieve out the lessons learnt, and provide an insight to the nursing management for brain injured patients.

Sensory Stimulation for Severe Disorders of Consciousness - The Evidence and Our Experience  
Ms Gan Hui Hui

Not Available at Time of Publication

Track 8: Geriatric Rehabilitation  
Plenary Talk  
Disability and Ageing: Trends and Implications  
Assoc Prof Angelique Chan

As the Singapore population grows older we can expect the proportions of older persons with disability to increase. This is primarily a result of the 80+ being the fastest growing proportion of the Singapore population. Increasing the number of years free of disability and reducing the impact of disability among older people are key health and policy objectives, especially in rapidly ageing countries. In order to achieve these objectives, it is important first to assess the extent, predictors and outcomes of activity limitations among older persons. In this presentation, I will discuss the correlates of disability and mobility limitations in Singapore, and how disability and mobility limitations affect older persons lives. Next, I will focus on predictors of active life expectancy among older Singaporeans. Finally, I will discuss the effects of changing educational levels among older cohorts on future prevalence of disability. Overall the findings underline the importance of improving elderly services for sustained integration of disabled older persons within the community.

Strength, Balance and Flexibility - Getting Seniors to Move with HPB’s Fit+  
Mr Han Kok Teng

Not Available at Time of Publication
**Gym Tonic: Making Our Seniors Genki!**

*Mr Gabriel Lim*

Strength training is an effective way to improve, maintain and delay the functional decline of elderly as they age, or in the event of acute events such as falls and strokes. Leveraging on an IT backbone, automated pneumatic-powered gym machines, know-how transfer, peer exchange, and evidence-based assessment instruments, Gym Tonic presented an approach towards delivering systematic and targeted exercise for seniors.

The findings of 396 seniors who participated in the Gym Tonic programme will be presented. These seniors came from either residential (nursing homes) or community settings (Senior Care Centres, Senior Activity Centres) who have gone through the 12-weeks programme. The findings have shown that the programme helps reverse or prevent frailty.

Consistent with the literature and an earlier research, participants have shown improvements in muscle strength and overall functional performance. These patterns and magnitude apply across service settings, gender, and age.

As an ongoing and evolving programme with deployment in 21 sites, we will briefly discuss the implications of these findings in relation to Gym Tonic as a frailty intervention programme.

**Do Caregivers Affect Patient Recovery after Stroke?**

*Ms Ong Peck Hoon*

The process of recovery for stroke survivors can be long and complicated. Many will continue to have varying degrees of long-term disabilities, requiring physical care and support. Anecdotally, as healthcare professionals, we recognise the importance of caregiver support during our patients’ rehabilitation. However, little work has been done to understand whether and how caregivers affect patient recovery. This presentation will share on the potential effect of several caregiver factors on patient outcomes. As there is greater pressure for families to take on more responsibility for the care of their loved ones, and policies are being adapted to meet the growing health care demands, a better understanding of these relationships can help improve care delivery, and inform decision making as well as resource allocation.

**Music Therapy in Rehabilitation for Persons with Dementia**

*Ms Michelle Low and Ms Ng Wang Feng*

Music therapy is an emerging non-invasive, non-pharmacological treatment modality. It can be used effectively in rehabilitation to address functional needs and improve quality of life for patients with dementia. Music Therapy reaches an individual who has lost the ability to communicate, to retrieve memories of life experiences, and those who have lost a sense of self and others, in varied degrees.

Music therapy in Singapore in the acute medical setting was first established in 2005, and has since expanded to 3 acute hospitals and various intermediate and long term care settings. An overview of updated research in music therapy in rehabilitation and dementia will be presented. Local data from an acute hospital, and a community hospital will be shared. Implications of current care delivery, particularly as it applies to music therapy, will be discussed briefly.
With improved management in the Intensive Care Units (ICUs) more patients survive critical illness today than ever before. Mortality for different conditions like sepsis, acute respiratory distress syndrome, trauma, and pancreatitis has improved in recent times. As more patients leave ICU alive, post-ICU syndromes like physical deconditioning, muscle wasting, cognitive impairment and neuropsychiatric problems are seen frequently. ICU patients are very sick, on life support machines, sedated and often undergo multiple procedures including surgeries. Questions may arise if rehabilitation is at all possible under these circumstances and even if possible, is it going to be useful. In the current lecture, we discuss some of these issues and look at the possibilities of doing further research and collaboration.

Rehabilitation Approach to ICU Acquired Weakness

Dr Geoffrey Samuel

Not Available at Time of Publication

The Nuts & Bolts of ICU Rehabilitation

Dr Ong Hwee Kuan

The roles of physiotherapists in critical care setting have transformed tremendously with the growing number of research on ICU rehabilitation. While the short term benefits of ICU rehabilitation is clear, the actual implementation of early ICU rehab as part of routine clinical practice is met with multiple challenges. The feasibility and sustainability rest not just on the availability of rehabilitation equipment and technical capabilities of the therapists, but more importantly on the buy-in of the patients, their care givers and the multidisciplinary care team. Strong interdisciplinary team coordination and communication is paramount in ICU rehabilitation. In this presentation, we will share the key challenges encountered in our implementation of ICU rehabilitation. While we have many anecdotal stories of successful early ICU rehabilitation, it is a labour and time intensive therapy. We are yet to systematically establish the value-for-money, the long term outcomes and an effective care plan for those patients discharging from our ICU.
Role of Occupational Therapy in Critical Care
Ms Cassandra Ng

Early rehabilitation in the intensive care unit (ICU) is feasible and safe, with evidence supporting its benefits in minimising impact of disabilities, reducing the length of hospital stay, lower readmissions rate and post discharge mortality. Individualised interventions that include physical reconditioning, increasing activity endurance through activities of daily living training, sensory and cognitive stimulation, prevention of contracture through splinting, can reduce physical and cognitive complications frequently occurring in survivors of critical illness.

The establishment of a successful early rehabilitation program that addresses the unique needs of patients in the intensive care unit requires a collaborative interdisciplinary team effort and occupational therapists play a distinct and valuable role in this interdisciplinary team. Occupational therapists’ in-depth knowledge and understanding of the interplay between patients’ needs, abilities, and the environment can optimise patients’ overall functioning and support their successful transition to the home, community, or next level of care.

In this presentation, we will examine the emerging role of occupational therapy in the area of critical care, understand the need and importance of comprehensive assessment in the intensive care unit, how the use of various occupational therapy interventions and engagement in meaningful therapeutic activities can enhance patients’ motivation to participate in their overall care plan.

Functional Neuromuscular Stimulation in ICU
Dr Geetha Kayambu

Not Available at Time of Publication

Lunch Symposium
Intelligent Rehabilitation Solutions and its Clinical Application
Ms Constanze Meier

Day Two, 1300 – 1330, Auditorium

Over the past decade, rehabilitation has undergone significant changes due to new evidence on conventional treatment forms. On the one hand, health insurers are asking for more quantifiable data to monitor the patients recovery and base their decision on this data for further financial support. On the other hand, therapists are required to guarantee the same recovery outcome for patients within a shorter admission time. Taking the upcoming demographic change into consideration, the rehabilitation market is facing additional challenges in the near future.

The presentation “Intelligent Rehabilitation Solutions and Its Clinical Applications” summarizes the current literature on robotics in rehabilitation and gives an insight into the different technological approaches. Hospitals have begun to incorporate robotics technologies into the daily treatment schedule of many patients. During the talk, international integration examples are shared.
Rehabilitation in Austere Environments: Effective Leveraging of Human and Financial Resources

Prof Michel Landry

The relative number of global sudden-onset disasters are rising at an alarming rate; there was a 3-fold increase in disasters between 2000 and 2009. In recent years, images of disaster landscapes hide the reality that survival rates after disasters are improving. Technical advances in field medicine have meant that greater lifesaving interventions can be achieved in the field, and relatively easy access to antibiotics has meant that post-injury infections can often be controlled. Due to effectiveness of many of these lifesaving interventions the likelihood of survival is improving, however “survival” rarely translates to a return to pre-earthquake health status due to the development of impairments and lifelong disabilities, all of whom add to the pre-disasters number of people with disabilities (PWDs). There are important disability-related outcomes that have risen to the forefront in deploying a coordinated disaster response, and as a result, the World Health Organization (WHO) released in 2016 a document entitled ‘Minimal Technical Standards (MTS) and Recommendation for Rehabilitation’. In this session, we review the overall prevalence and epidemiology of disasters, explain the relevance of WHO’s newly established technical standards as a way to develop a greater understanding of human and financial rehabilitation resource allocation in austere environments.

Rehabilitation Nursing: The Quest for Excellence Through Research

Dr Lim Su Fee

Rehabilitation nursing practice is based on the evolving body of knowledge of rehabilitation nursing. It is therefore important to identify a broad range of issues in rehabilitation practice that could be examined to advance the scientific knowledge base. This session will discuss the research priorities driving rehabilitation nursing research.

Practice Guidelines for Prescribing Powered Mobility Aids

Mr Mohamad Nizar Bin Zainal

The development of the intermediate and long-term care (ILTC) sectors have led to a renewed focus on aging in place and fostering an inclusive community. Resources and funding are now readily available to achieve these goals. For example, the Seniors’ Mobility and Enabling Fund (SMF) was launched by the Agency for Integrated Care (AIC) to support older adults to live more independently in the community. As such, there is now greater awareness of the availability of assistive technology and devices, particularly powered mobility aids, among service recipients. Occupational therapists play a vital role in recommending suitable assistive devices to ensure that individuals can achieve optimal function in their everyday lives. Powered mobility aids are among the most commonly prescribed devices. These devices can help individuals access their immediate environments and the community-at-large, thus allowing individuals to participate in their valued social roles and occupations, and enhance their quality of life.

With the advent of the Active Mobility Bill in 2017, it is imperative to develop standards of practice to structure the training and education of users of powered mobility aids. The Singapore Association of Occupational Therapists has taken the initiative to compile a set of practice guidelines based on a review of current evidence and consensus-building with local occupational therapists who are experienced in prescribing powered mobility aids to patients. This presentation will share the second draft of the practice guidelines, and help other clinicians consider their roles in prescribing powered mobility aids to future patients.
24 hrs Transitional Rehabilitation Care System in PeaceHaven

*Mdm Low Mui Lang*

As medical technology advances, patients are recovering from Cerebral Vascular Accident, traumatic brain injury, the older person from fractures, however, the question raised would be where should they receive rehabilitation and what about wellness?

Key to success of transition from service to service, to returning home lies within the critical integration and partnership among service providers.

Transitional Convalescent Facility (TCF) birth in December 2011, partnership between a Regional hospital and a Voluntary Welfare Organisation (VWO) to provide rehabilitation and wellness programme had saved 255 or 75% of clients from moving into nursing home, reducing disabilities and supporting family in caring for their member in the community. The 24 hours rehabilitation of care that encompasses every discipline of staff to motivate client to have a high sense of independence is one of the key to success in a home environment.

Upon reaching maximum potential, building muscle strength becomes the next important key to success to maintain their mobility including emphasis in building and maintaining muscle strength. Gym Tonic, an exercise programme funded by the Lien Foundation in Singapore had proven some standing result that healthcare staff should start to re-think in promoting health and wellness. The benefit to prevent another fracture, to reduce complication would reduce hospitalisation re-admission thereby reduce health care cost as population ages. It will improve quality of life and reduce dependency for caregiving.

For those who are unable to live in the community due to mental disability and social situation, their last resort is living in residential care. Residential facilities should empower them to live a normal way of life to maintain their sense of well-being. Earn & Spent programme was introduced in 2016, to motivate and encourage independent living empowering residents to live a life that they are used to within a supporting environment.

**Assistive Technology: Enhancing Independence and Quality of Life**

*Mr Tan Chuan Hoh*

Traditionally, persons with disabilities in Singapore receive rehabilitation services at Rehabilitation Centres or Community Hospitals. They would be prescribed activities of daily living aids and mobility aids to improve their independence in their daily activities. Assistive Technology (AT) devices were not considered as a part of rehabilitation as therapists lacked knowledge and resources in prescribing appropriate technological solutions to their clients. The services of the Specialised Assistive Technology Centre (ATC) at SPD have changed this perspective and greatly improved service provision and awareness. This presentation highlights the provision of AT to enable and integrate persons with disabilities back into the community and enhance their quality of life.
Does Measuring Spasticity Early Lead to Changes in Patient Outcomes?

Prof Anand Pandyan

Spasticity and contractures are a significant problem in patients with acquired neurological conditions. There is evidence that the presence of spasticity is not necessarily a barrier to return of active function. Furthermore, there is some evidence, that in patients with no return of active function, spasticity can contribute to contractures. However, existing clinical scales are not sensitive enough to identify early signs of spasticity. We, therefore, asked the question as to whether, by measuring spasticity, immediately following a stroke objectively at the bedside, we will be able to prevent or slow down the rate of contractures in acute stroke patients. This presentation will discuss the rationale for our double blind randomised control trial testing whether the early use of Botulinum toxin in severely disable stroke patients will prevent contractures. Our results demonstrate that early measurement have the potential to improve outcome, i.e. reduce contractures without affecting function, in these patients.

Rehabilitation of Stroke with End Stage Renal Failure

Dr Shrikant Pande

End stage renal failure (ESRF) is a potent risk factor for stroke. Patients on dialysis have a 10-fold increased risk of stroke with very high mortality. Rehabilitation of these patients comes with different challenges. Limited research is available on this subject.

We analysed consecutive 35 patients with stroke with dialysis. Average age was 61.5 years (36 -87), with male to female ratio of 17:18.

Eight patients had hypertension and 27 had combination of hypertension and diabetes as underlying cause of ESRF. Average recurrent admissions were 8(1-36), length of stay: 78.32 days (3-291)

Mortality was 45% with average survival since stroke of 31 months.

Common rehabilitation challenges observed were: uncontrolled hypertension, postural hypotension, hypoglycaemia and fluctuating sugar levels, infections including but not limited to MRSA, VRE, and CDT.

Patient’s inability to tolerate therapy due to these issues increases duration of hospital stay and risk of hospital acquired infections.

Literature shows benefit of intra-dialysis therapy, quadriceps and core strengthening exercises, which can be done during dialysis or non-dialysis days.

ESRF patients with stroke have complex needs; their medical issues take priority over the rehab process. The main goal for therapy is focussed on sitting balance, so as to tolerate dialysis session. Despite prolonged rehabilitation, recurrent admissions take place due to fluid overload, infections, recurrent surgical interventions for dysvascularity and fistula blockages. The overall physical improvement in terms of FIM scores as compared to other stroke patients is limited. Length of stay as compared to other stroke patients (17) days is much higher.

Community programmes and home therapy may help reduce recurrent admissions and decrease morbidity.
Non-Invasive Brain Stimulation in Stroke Rehabilitation: Updates and Applications  
*Assoc Prof Lydia Abdul Latif*

*Not Available at Time of Publication*

Aphasia Testing in Singapore: Singapore General Aphasia Test  
*Ms Deirdre Tay*

Stroke is a significant cause of disability in Singapore and aphasia contributes to the disability burden. Reliable aphasia assessment is important for accurate diagnosis of language impairment for all languages spoken by adults with aphasia. There has been no locally-normed aphasia test in Singapore and Speech-Language Therapists (SLTs) conduct assessments with roughly-translated versions of established aphasia tests. The Singapore General Aphasia Test (SGAT) was developed in response to this need.

The psychometric properties, and the validity and reliability of the SGAT - English and Mandarin versions, will be presented. Seventy-three English-speaking and 56 Mandarin-speaking adults with aphasia (AWA) and language normal adults (LNA) participated in the study. All participants underwent language testing in both English and Mandarin. The results demonstrated that the SGAT English and Mandarin were psychometrically sound, and were able to accurately and reliably differentiate AWA from LNA. The SGAT (English and Mandarin versions) can be used to assess language impairment in English and Mandarin speakers following stroke.

In addition, the picture description rating scale developed for use with the SGAT will be discussed. There is preliminary reliability and validity data for the scale, whose scoring criteria reflect the diversity of language use in the Singaporean population that speaks more than one language.

**Track 12: Spectrum of Neurological Rehabilitation**  
**Day Two, 1530 – 1730, Auditorium**

Pediatric Neurorehabilitation: Current State and Vision  
*Dr Ng Zhi Min*

Pediatric neurorehabilitation involves combination and coordination of medical, social, educational and vocational measures to maximize a child with neurodisability to his highest possible level of function. It is child-focused and family-oriented. It provides continuum of care for children with neurodisability, through the critical points of transition in growth and development. In this presentation, we will take a look at the current model of pediatric neurorehabilitation done in KK Women’s and Children's Hospital and review the future plans for development.

Surgery for Spasticity and Movement Disorders  
*Assoc Prof Aymeric Lim*

*Not Available at Time of Publication*
**Emerging Infectious Disease and Rehabilitation: A Case Study of the Zika and Ebola Virus**  
*Prof Michel Landry*

Although Zika (ZIKV) was identified close to 60 years ago, the mosquito-born virus was relatively unknown until 2015 when an outbreak was reported in Brazil. Following multiple global reports of ZIKV, the World Health Organization sounded the public health ‘alarm bell’ by declaring the outbreak to be an emergency of international concern. The underlying anxiety for the ZIKV outbreak was not a deadly infectious disease (ID) outbreak; rather, the concern surrounds the spike in morbidity and disability among approximately 20% of infected persons who developed neurological outcomes. Similarly, the 2014 Ebola outbreak occurred in West Africa which was much more deadly and virulent, but it was similar to the ZIKV outbreak that it created important amounts of disability-related outcomes among the survivors. In this presentation, we ‘connect the dots’ between infectious diseases, public health, disability and the need for rehabilitation, and argue the need and responsibility of rehabilitation providers to weigh into this discourse as advocates and as mediators of the physical and social effects of disability among the populations affected by ID. The emergence of subsequent disability-related outcomes and the role that rehabilitation must play in mediating the physical and social effects of disability.

**Effectiveness of Vestibular Rehabilitation in the Management of People with Concussion: A Systematic Review and Meta-Analysis**  
*Dr Dawn Tan*

Mild traumatic brain injury or concussion is the second most common acquired neurologic disorder and a major public health concern, with rising global incidence. Dizziness and imbalance are common symptoms, and are difficult to manage. Vestibular rehabilitation appears to be a promising treatment given its established effectiveness in alleviating these symptoms in vestibular disorders. However, little is known of its efficacy in concussion.

This talk presents the results of a systematic review of the evidence supporting the efficacy of vestibular rehabilitation in patients post-concussion. Three out of 61 studies screened, comprising 149 participants, were included. The studies included one randomized controlled trial (RCT), retrospective cohort and case series. The quality score ranged from 12-15 (out of 16). The RCT demonstrated that a larger proportion of patients receiving combination of cervical and vestibular physiotherapy were more likely to be medically cleared to return to sport within 8 weeks than controls (73.3% vs 7.1%, \( \chi^2=50.12, \ p<0.001 \)). All studies reported improvement in dizziness severity (mean difference=19.3, 95%CI, 14.36-24.24) and balance (SMD=18.95, 95%CI,10.86-27.03) but not gait (SMD=1.54, 95%CI,2.18-5.26).

Vestibular rehabilitation appears to have positive outcomes on dizziness and balance but not gait in people post-concussion. However, results should be interpreted with caution due to the lack of large well-designed RCTs. This study highlighted the need for more research to determine the efficacy of vestibular rehabilitation in people post-concussion and factors which affect recovery.
Cueing Effect of Gait Ability in Parkinson’s Disease

Prof Areerat Suputtitada

Abnormal gait patterns are commonly found in patients with Parkinson’s disease (PD). These often consist of short shuffling steps, decreased walking speed, increased cadence and freezing of gait. External cues have been tested for improving gait ability in patients with PD. Advanced rehabilitation techniques have been evidenced over the years: these included treadmill walking, direct current stimulation, transcranial magnetic stimulation and ground training with cues. Traditionally, visual cues had been used in the form of a series of strips located on the floor in transverse lines for the patient to walk over and pole striding which has been shown to reduce gait variability. In addition, laser guided-walking cues have been proposed which can be in the form of goggles with a light emitting diode (LED), laser guided-walking cane, or a laser-assisted device (LAD). Auditory cues in the form of music beats or metronomes, have been shown to help PD patients’ gait. A number of studies have considered different kinds of rhythmic somatosensory cues such as an electrical stimulation, rhythmic vibration or an insole with a vibratory device. Cues are defined as external stimuli of different type, that is, instructional, auditory, visual, and sensory, and are applied to improve gait ability via the activation of different strategies of motor control. Auditory cues, for instance, are believed to provide an external rhythm that bypasses internal rhythm deficit and visual cues engage the visual cerebellar motor pathway to facilitate the generation of a better gait ability, whereas somatosensory cues enable the voluntary activation of the dorsolateral premotor control system, thus bypassing the failure of supplementary motor area in controlling automatic movement. Abnormal gait patterns often persist despite treating with optimal pharmacological or deep brain stimulation. Evidences of cueing for improve gait ability are beneficial for delay dependency and bed ridden in patients with PD. The most beneficial of cueing are effectiveness, highly safety, easy to use and low cost.
EFFECTIVENESS OF HIGH-INTENSITY TRAINING ON IMPROVING PHYSICAL OUTCOMES IN A STROKE POPULATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

MAH SM
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Aims: High-intensity training, defined as achieving a minimum of 60–84% of heart rate reserve (HRR), 77–93 % of maximal heart rate, or attaining a score of 14–16 on the rate of perceived exertion (RPE) Borg scale, can elicit physiological benefits and improvements in motor function and aerobic fitness in persons post-stroke. Hence, it should be considered for implementation in stroke rehabilitation to optimize function and outcomes. The aim of this review is to examine the effects of high-intensity exercise in the stroke population.

Methodology: Major electronic databases (AMED (Allied and Complementary Medicine), Clinical evidence (BMJ), The Cochrane Library, EMBASE, Physiotherapy Evidence Database (PEDro) and Web of Science) were searched to identify randomized controlled trials that examined the effects of high-intensity exercise in stroke patients (last search performed October 2016). Meta-analysis was performed on the selected outcome measures where at least 5 studies could be pooled.

Results: 12 trials fulfilled the selection criteria and were included in this review. Meta-analysis showed significant effects on peak oxygen consumption (MD= 2.62, p = 0.008, I2= 95%), walking endurance (MD= 39.09, p< 0.00001, I2= 44%), maximal gait speed (MD= 0.13, p= 0.03, I2= 90%) and balance (MD= 0.70, p= 0.03, I2= 34%) in favour of high-intensity exercise. It revealed no significant effects on self-selected gait speed (MD= 0.04, p = 0.12, I2= 71%). The incidence of adverse events associated with high intensity exercise is shown to be low. The most commonly adopted session duration and frequency are 20-40 minutes and 3 to 5 times a week respectively, with duration ranging from 4 weeks to 6 months.

Conclusion: There is overall weak evidence that high-intensity exercise, is beneficial for enhancing aerobic fitness and functional outcomes in subjects with mild to moderate stroke. Further research is required to validate the positive outcomes associated with high-intensity training in the stroke population.
IMPORTANCE OF LOWER LIMB SUPPORT ABILITY DURING STEPPING IN AMBULATORY PATIENTS WITH SPINAL CORD INJURY

NITIHATTHAWANON T1, AMATACHAYA S1, AMATACHAYA P2, THAWEEWANNAKIJ T1, MANIMMANAKORN N3, MATO L1

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3Department of Rehabilitation Medicine, Faculty of Medicine, Khon Kaen University, Thailand

Aims: Lower limb support ability (LLSA) during a single support period is an important indicator for steady walking. However, there is no clear evidence to confirm this problem and its importance in ambulatory patients with spinal cord injury (SCI) who suffer from asymmetrical and bilateral sensorimotor deteriorations, and encounter a high risk of fall. Thus, the study investigated the amount of LLSA on the less and more affected limbs during stepping and its correlation with dynamic balance ability in ambulatory patients with SCI.

Methodology: Fourteen participants were assessed for their demographics and SCI characteristics. Then they were evaluated for LLSA during stepping using a digital load cell and dynamic balance ability using the Timed up and go test (TUGT). The dependent samples t-test was used to compare the amount of LLSA between the less and more affected legs. The Pearson correlation coefficient was adopted to quantify the levels of correlation between LLSA and balance ability.

Results: The average levels of LLSA on the more- and less-affected leg of the participants were 85.39 ± 9.54% (range 76.83% to 90.19%) and 86.43 ± 11.45% (range 78.96% to 91.07%) of their body-weight (p>0.05), even their lower extremity motor scores were significantly different between the sides (p<0.002). The levels of LLSA of the participants, only for the less affected leg, were significantly correlated to balance ability (r = 0.54 - 0.74; p < 0.05).

Conclusion: Ambulatory participants with SCI had the amount of LLSA during a single leg support period clearly less than that normally required for walking. The significant correlation only for the less affected limb may reflect the greater contribution of this limb to compensate for asymmetrical motor deterioration to successfully carry out daily movements. Thus the findings may suggest the importance of rehabilitation strategies to promote LLSA for these patients.
ABILITY OF OCCIPUT-WALL DISTANCE TO DISCRIMINATE SEVERITY OF KYPHOSIS AS DETERMINED USING THE COBB’S METHOD

ABSTRACTS

ORAL PRESENTATION ABSTRACTS

ABS005

ABILITY OF OCCIPUT-WALL DISTANCE TO DISCRIMINATE SEVERITY OF KYPHOSIS AS DETERMINED USING THE COBB’S METHOD

WtVyanAD A1,4, AmAtachaya S1,4, AmAtachaya P2,4, WaTTanapan P3, ThaweeWannakj t1,4, Mato L1,4

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4Improvement of Physical Performance and Quality of Life (IPQ) research group, Khon Kaen University, Khon Kaen, Thailand

Aims: The occiput-wall distance (OWD) is a simple screening tool for kyphosis in many epidemiologic studies. However, different two cut-off points (more than 0 cm and 5 cm) have been used to indicate the risk of kyphosis without clear confirmation as compared to a gold standard. Thus, this study investigated an appropriate cut-off point of the OWD to indicate the risk of kyphosis, as compared to the data from a standard radiological Cobb’s method.

Methodology: Thirty subjects aged 10 years and above with different degrees of kyphosis were cross-sectionally recruited from several communities in Thailand. All of them were involved in the study for 2 days. On the first day, they were assessed for their severity of kyphosis using the OWD for 3 trials/subject and the average data were used for data analysis. Within 7 days later, subjects were at a hospital to complete a lateral spinal radiographic examination (Cobb’s method) for 1 trial. Then a radiologic image was calculated for the Cobb angles by a well-trained physical therapist using SurgimapSpine program. The receiver-operating characteristic (ROC) curves were utilized to determine appropriate cut-off point of OWD for the risk of kyphosis.

Results: The average age of subjects was 56.53±25.33 years, and the average OWD and Cobb angle were 6.41±3.21cm and 39.15±10.01degrees, respectively. The OWD at 6.5 cm and over had good diagnostic properties (sensitivity 92.31%, specificity 82.35% and area under the curve = 0.966) to determine the risk of kyphosis.

Conclusion: The findings offered a clear cut-off point to indicate the risk of kyphosis using a simple and practical tool. Thus, they may help to promote standardization and effectiveness of kyphosis screening and monitoring to early detect the abnormality and clearly indicate effectiveness of the treatments.
ORAL PRESENTATION ABSTRACTS

ABS014

USING OF PILATES EXERCISES FOR ANTERIOR CRUCIATE LIGAMENT INJURY

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²Faculty of Medicine, Dept of Orthopedics, Istanbul University, Turkey

Aims: This study explored the effects of Pilates on the muscle strength, function, and instability of patients with partial anterior cruciate ligament (ACL) injuries in situations in which a non-surgical treatment option is preferred.

Methodology: Fifty participants 20-45 years of age who were diagnosed with isolated ACL injuries were included in the study. The participants were randomly assigned to either the Pilates exercise group (n = 24) or the control group (n = 26). The subjects in the Pilates exercise group performed basic mat exercises that focused on the muscle strength and flexibility of the lower limbs and core muscles during each class session, which met three times per week for 12 weeks. The control group did not receive any treatment or home exercise programme. All patients were evaluated using the Lysholm Knee Scale, the Cincinnati Knee Rating System, and isokinetic quadriceps and hamstring strength. Patient satisfaction regarding improvement in knee stability was assessed using the Global Rating of Change scale.

Results: The Pilates group experienced significant improvement over the control group as measured by the difference in quadriceps strength at 12 weeks (p = 0.03). Both groups showed some clinical change over time, but the Pilates group improved for all outcome measurements at the 12-week follow-up, and the control group only improved for functional outcomes. Patient satisfaction with the level of knee stability based on the Global Rating of Change scale was higher in the Pilates group than in the control group.

Conclusion: The results suggest that Pilates is a superior management approach over a control treatment for increasing quadriceps strength in participants with partial ACL injury. Pilates may provide clinicians a novel option when choosing a treatment for a partial ACL injury. Further study is needed to determine whether certain subgroups of individuals might achieve an added benefit with this approach.
ORAL PRESENTATION ABSTRACTS

ABS017

AN ACCELEROMETRY AND OBSERVATIONAL STUDY TO UNDERSTAND THE UPPER LIMB ACTIVITY OF PATIENTS DURING FIRST FOUR WEEKS POST-STROKE

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3Department of Physiotherapy, Nanyang Polytechnics, Singapore

Aims: Affected upper limb (UL) activity has been found to be reduced after stroke. There is a lack of information on how people of different UL severity use their affected UL early post-stroke. The aims of this study are 1) to characterise and compare affected UL activity in people 4-weeks post-stroke across different UL severity and 2) to compare accelerometry and direct observation UL activity monitoring models.

Methodology: Twelve stroke inpatients of different UL severity were recruited from a rehabilitation hospital. Affected UL activity was measured using accelerometry (24 hours) and direct observation (12 hours). Accelerometry variables include duration of UL use, use ratio, magnitude ratio, bilateral magnitude and variation ratio. Direct observation recorded type of affected UL movement (e.g. functional versus non-functional, active versus passive).

Results: People with mild, moderate, severe UL paresis used their affected UL 59%, 45%, and 22% compared with unaffected UL across 24 hours of accelerometry monitoring respectively. From accelerometry recordings, people with severe UL paresis had the lowest duration of affected UL activity (median 1.49 hours/day), the lowest bilateral magnitude and variation ratio compared with people with mild and moderate UL paresis. Majority of affected UL movements of people with mild paresis were functional (97.2%) and active (100.0%) movements. In contrast, people with moderate UL paresis performed mainly non-functional (65.8%), but active (71.3%) movements. People with severe UL paresis performed mostly non-functional (96.6%) and passive (83.6%) movements. Intraclass Correlation Coefficients (ICC3,1) between accelerometry and observation reports of duration of affected UL activity were more than 0.8. Absolute Percentage Error (APE) between accelerometry and observation findings ranged from 34.6% to 42.7%.

Conclusion: Affected UL activity differs across UL severity within 4-weeks post-stroke. People with severe UL paresis used their affected UL the least, with movements mainly passive and non-functional. Accelerometry and observation findings of affected UL activity were well-correlated, but APE was moderately high.
ASSESSMENT OF THE VISUAL STATUS OF OLDER ADULTS IN A SUB-ACUTE REHABILITATION WARD

BOEY D
Department of Occupational Therapy, Tan Tock Seng Hospital, Singapore

**Aims:** Low vision is prevalent in older adults and predicts higher functional dependence at discharge. There is little information on the visual status of inpatient older adults and few receive Occupational Therapy (OT) low vision rehabilitation to optimize their function. This project aims to examine the visual status of older adults in a sub-acute ward and initiate early OT low vision rehabilitation.

**Methodology:** Sixty two older adults were recruited from the sub-acute ward. Eight inpatient OTs asked them about their visual problems, assessed their visual field with the confrontation test and visual acuity using a standardised chart. Patients who reported visual problems, had visual acuity worse than 6/18, which is the definition of low vision, and had visual field deficits were taught strategies for their daily activities. Suitable patients could be referred to the outpatient OTs with specialized low vision training after discharge. Descriptive statistics were collected and feedback obtained from the inpatient OTs.

**Results:** Fifty percent of the patients had subjective visual problems and visual acuity worse than 6/18, and 13% had visual field deficits. Thirty one percent who wore glasses did not bring them. Despite the high prevalence of visual impairment, less than 20% received inpatient low vision rehabilitation and none were referred for outpatient low vision rehabilitation. Inpatient OTs feedback that they did not have adequate knowledge to provide low vision rehabilitation and identify patients for outpatient rehabilitation.

**Conclusion:** Visual impairment is prevalent in inpatient older adults and should be routinely assessed by OTs in order to initiate early low vision rehabilitation and ensure continued outpatient low vision rehabilitation. It is recommended that inpatients are asked to bring their glasses which may improve their vision and functional performance. The knowledge gap in OTs should be addressed by incorporating training on low vision rehabilitation as part of the organisations’ continuing education practices.
ORAL PRESENTATION ABSTRACTS

ABS028

A SURVEY FOR NURSE’S NEEDS FOR CARE ROBOTS IN INTEGRATED NURSING CARE SERVICES

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²Department of Nursing, Seoul National University Bundang Hospital, South Korea
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Aims: In Korea, an ‘integrated nursing care services’ providing comprehensive care by professional nurses was introduced in several hospitals. To deliver it successfully, a care robot development project has been launched to make supportive robotics for nurses. The purpose of this study is to figure out nurse’s needs on care robots and to suggest the priority of robotic care in integrated nursing care services.

Methodology: A total of 302 registered nurses from 5 hospitals in Korea completed the survey. The questionnaire included items about the necessity for robots and their roles that would be the most helpful in nursing performances. Also, nurses’ degree of agreements about robotic care were evaluated for the following three items; the reduction in burden of workload, possibility of delegation of nursing performances, and improvement of care quality. Furthermore, the questions of quantifying the expected degree of reduction in burden of workload were evaluated.

Results: The necessity for care robots was 3.24(±0.98) on average out of 5 points. Respondents expected that ‘measuring and monitoring’ was the most helpful performance and ‘physical assist’ and ‘safety care’ were included in top 3. They rated with the highest score in the reduction in burden of workload among three items achieved by the robotics. Physical works among the burden of workload showed the highest expected degree of reduction when the care robots work with nurses in the hospital. Nurses were concerned about malfunction of devices and difficulty of rapport formation with patients.

Conclusion: Care robots were supposed to be helpful in measuring and monitoring. As a perspective of nurses’ workload, care robots should be focused on supporting physical work in efficient and convenient way. As the integrated services are implemented more in Korea, the demand and expectation for robotic care will increase. Concentrating on improving care robots that cooperate with nurses and medical environment could be a next step.
THE EFFECT OF COGNITIVE THERAPY IN IMPROVING COGNITIVE FUNCTIONS USING NEUROPSYCHOLOGY AND DIFFUSION TENSOR IMAGING MEASUREMENTS FOLLOWING MILD TRAUMATIC BRAIN INJURY

HAMZAH N1, TAN JH1, VEERAMUTHU V2, TAN LK3, CHUNG ZY3, NARAYANAN V4, RAMLI. N1, MAZLAN M1

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3Department of Medical Neuroimaging, University Of Malaya, Malaysia
4Department of Surgery, University Of Malaya, Malaysia

Aims: To quantify clinical and structural white matter tract changes over six months, in patients with mild traumatic brain injury (mTBI) following early structured cognitive therapy.

Methodology: This was a non-randomized quasi-experimental study design. All patients with mTBI received written information and education on symptom(s) management before being assigned to structured cognitive therapy or conventional cognitive therapy at two weeks post injury. Structured therapy was one hour per week session by using computer-based and metacognitive training for the first three months followed by one hour per month session for the remaining three months. Conventional therapy was patient focused symptom(s) management and coping strategies. Neuropsychological assessment and Diffusion Tensor Imaging (DTI) were performed at baseline and six months post injury.

Results: Each group consisted of four male participants (N=8). Mean cognitive therapy duration was 7 hours (SD ±1.8). There was no demographic, Glasgow Coma Scale, Post Traumatic Amnesia and loss of consciousness duration statistical difference between groups. Although all cognitive domains tested were not statistically significant, the scores for Attention, Memory, Language, and Executive Function domains were higher than conventional group at six months. We analysed nine white matter tracts. Almost all Fractional Anisotropy mean values were lower (Corpus Callosum genu: p=0.03; splenium:p=0.05) whereas Mean Diffusivity and Radial Diffusivity mean values were higher at six months.

Conclusion: We quantified deficits in various cognitive domains as early as two weeks following mTBI, with higher normal scores in the structured therapy group as compared to conventional group at six months. Abnormal values of DTI parameters may suggest chronic axonal damage of various white matter locations and bundles. We did not yield statistical significance in our analysis due to small sample size caused by high drop-out rate. However, we concluded that early structured cognitive therapy may improve cognitive deficits beyond spontaneous recovery, despite persistent microstructural brain damage.
ABSTRACTS

ORAL PRESENTATION ABSTRACTS

ABS034

VALIDATING THE USE OF THE SYRINGE FLOW TEST TO CLASSIFY THICKENED FLUIDS FOR DYSPHAGIA MANAGEMENT

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Aims: The International Dysphagia Diet Standardisation Initiative (IDDSI) Syringe Flow Test is one method of classifying fluid consistencies of varying thickness (Levels 1-4) in dysphagia management. This study aimed to validate the syringe flow test against current fluid consistencies of thin-nectar, nectar, honey and pudding used in clinical bedside evaluation and videofluoroscopic swallow studies in Singapore.

Methodology: Twenty speech therapists (STs) each thickened 12 cups of room temperature water using RESOURCE® ThickenUp® Clear (three cups each of thin-nectar, nectar, honey and pudding) and performed the syringe flow test. The same fluid consistencies were mixed with barium sulphate powder to 40% weight/volume concentration, and five STs each performed the test three times per consistency. Mean flow test results by each participant for each consistency were analysed.

Results: Both thickened water and thickened barium solutions fell within four discrete fluid categories in increasing thickness. Our mean flow test ranges were narrower than IDDSI’s recommended range, likely from the use of only one type of thickener. All mean flow test values for consistencies of thin-nectar, nectar and honey fell within ranges of IDDSI Levels 1 to 3 respectively. Honey-thickened barium was significantly thicker than honey-thickened water (p<0.001), but still within IDDSI’s Level 3 range. Mean flow test results for pudding-thickened water and barium did not correspond to IDDSI’s Level 4.

Conclusion: The IDDSI Syringe Flow Test can distinguish between fluid consistencies despite intra- and inter-subject differences. Home and clinical settings using the same thickener may refer to the narrower acceptable range for each fluid level based on mean±2SD (Level 1: 1.2-4.2ml, Level 2: 5.0-7.6ml, Level 3: 8.8-9.6ml, Level 4: 9.6-10.0ml). To differentiate between Levels 3 and 4, the Fork Test or Spoon Tilt test should complement the flow test. Clinically, we propose fluids that fall in between levels should be adjusted to meet the desired thickness level.
OUTCOMES OF GAIT TRAINING USING A MOBILE ROBOT WITH BODY WEIGHT SUPPORT
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**Aims:** To study the outcomes after gait training with a mobile robot that provides body weight support.

**Methodology:** Prospective interventional study. Consecutive patients admitted to an acute rehabilitation unit within a tertiary hospital with diagnosis of stroke, traumatic brain injury, spinal cord injury or deconditioning and who fulfil the selection criteria for safety and suitability of robotic gait training were recruited into the study. Of the stroke patients, they are of mild to moderate severity. They were given up to 10 sessions of gait training with the robotic device, Andago in addition to the conventional therapy that they receive. Each session lasts 30 minutes. Pre and post intervention scales such as Functional Independence Measure, Berg Balance, Motor strength, Modified Ashworth Scale, Functional Ambulation Classification, Modified Rankin Scale, NIHSS, MOCA were obtained. These are the routine scales that are administered to a rehabilitation patient. Other data collected from electronic medical records include demographics, diagnosis, length of stay, duration of conventional and robotic therapy as well as distance ambulated.

**Results:** 17 patients had complete data. 13 patients had stroke, 1 TBI, 1 deconditioning and 2 other diagnosis. The average number of sessions each patient had was 7. The FIM gain and FIM efficiency were 19.5 and 1.39 respectively. In the stroke cohort, the FIM gain and FIM efficiency were 22.85 and 1.63 respectively. There were statistically significant improvements in the FIM, Berg Balance, Modified Rankin Scale, Functional Ambulatory Classification score, MOCA and motor strength in lower limb muscle groups. Patients found the treatment to be good or excellent. The average distance ambulated per session was 453m. This is markedly higher than the distance ambulated during conventional therapy.

**Conclusion:** There is significantly increased efficiency in rehabilitation when gait training was conducted with Andago. Patients like it. It should be considered as an adjunct to conventional therapy.
CHANGES IN STATIC AND DYNAMIC ASYMMETRY FOLLOWING DISCHARGE FROM INPATIENT STROKE REHABILITATION AND COMPARISON WITH BALANCE AND MOBILITY OUTCOMES

**Aims:** This study aimed to evaluate the responsiveness of asymmetry variables obtained during gait, sit-to-stand and static standing using low-cost technologies.

**Methodology:** Seventy-five individuals with stroke were consecutively recruited from four inpatient rehabilitation facilities within Australia and Singapore. Testing sessions were conducted within a week prior to discharge and three months later. Asymmetry of step length during gait, peak force during sit-to-stand and body mass during static standing were collected using a Microsoft Kinect camera and Wii Balance Boards. Measures of mobility (6-metre walk speed) and balance (Step Test and postural sway) were also obtained. Paired t-tests and standardised response means (SRMs) were used to evaluate responsiveness.

**Results:** Participants were a mean±SD age 62±14 years, 55% male, and time since stroke 28±12 days. Absolute measures of asymmetry did not change significantly over time (P>0.05). However, when only those with greater than 53% body mass or peak force towards the less-affected side were analysed, this was significant for sit-to-stand (P=0.021; n=34), and close to significant (P=0.056; n=28) for static asymmetry, with small SRMs of 0.36 and 0.43 respectively. Conversely, 6-metre walk speed, Step Test and postural sway outcomes improved significantly, with moderate to large SRMs (0.52 to 0.86).

**Conclusion:** Compared with other gait and balance outcomes, static and dynamic measures of asymmetry following stroke showed lesser improvement over a 3-month period following discharge from inpatient stroke rehabilitation. Further research is needed to determine the importance of post-stroke asymmetry, as the small responsiveness may reflect a lack of physiological recovery or the use of compensatory patterns and therefore require specific emphasis in rehabilitation approaches.
**INCIDENCE OF SHOULDERTRENGTH ASYMMETRY AND ITS CORRELATION TO GRIP STRENGTH, SYMPTOM DURATION, SELF-REPORTED PAIN AND FUNCTION IN LATERAL EPICONDYLALGIA - A PILOT STUDY.**

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**Aims:** Upper limb motor deficits exist in lateral epicondylalgia (LE). Biomechanically, proximal impairments may predispose or exacerbate distal limb conditions. Literature recommends assessing rotator cuff and scapulothoracic strength in LE. It is unclear how shoulder weakness influences pain and dysfunction. The study aims to study the relationship between proximal strength with grip weakness, pain and functional impairment in LE.

**Methodology:** A prospective cohort sample study. 23 subjects (52.56± 9.68 years old) with LE, referred to outpatient physiotherapy, meeting inclusion criteria were recruited. Pain (numerical rating scale), upper limb function (Quick-Disability of Arm, Shoulder and Hand questionnaire) and isometric strength of scapulothoracic and rotator cuff muscles (handheld dynamometry) were recorded. Bilateral shoulder strength was compared using paired t-test. Shoulder strength of LE-affected and unaffected arms was expressed as a ratio. Spearman correlation analyzed relationship between shoulder strength ratio (SSR) with grip strength, symptom duration, pain and function.

**Results:** LE-affected arms had decreased shoulder strength (SSR less than 1) in all shoulder muscles. Asymmetry was greatest in lower trapezius (0.87± 0.22, p=0.02). Shoulder strength asymmetry was not significant for arm dominance. Middle trapezius SSR had negative, strong correlation with shoulder internal rotation (SSR -0.584, p=0.04). While age had a strong, negative correlation with functional (-0.526, p=0.01) and work-related (-0.525, p=0.01) impairments, shoulder strength symmetry did not correlate with grip strength, symptom duration and functional impairments in LE.

**Conclusion:** Findings from this pilot study supports that shoulder strength asymmetry occur in LE. Activity in the lower trapezius is most affected but causation cannot be inferred from this study. Shoulder asymmetry did not show significant correlation with subjective symptoms or function in this study. There may be deeper interactions between scapulothoracic and rotator cuff musculature that require further study.
ORAL PRESENTATION ABSTRACTS

ABS044

ATTITUDES TOWARDS SEXUALITY AMONG ALLIED HEALTH PROFESSIONALS IN SINGAPORE

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Aims: To measure knowledge, attitude and comfort towards addressing sexuality in the context of rehabilitation among occupational therapists and physiotherapists in Singapore.

Methodology: A cross sectional survey of registered occupational therapists (n=144) and physiotherapists (n=145) was used. Attitudes towards sexuality were measured using the Knowledge, Comfort, Attitudes and Approach to Sexuality Survey (KCAASS) and the Sexuality Attitudes and Beliefs Survey (SABS).

Results: The majority of occupational therapists (n = 93; 64%) and physiotherapists (n= 118; 82 %) had not received education relating to sexuality and disability during their pre-professional training. Both occupational therapists and physiotherapists reported average levels of knowledge regarding sexuality (OT Mean Score 27.18 SD 6.26; PT Mean Score 28.58 SD 7.33) but demonstrated low levels of comfort (OT Mean Score 48.21 SD12.75; PT Mean Score 49.54 SD 16.6), and limited willingness to approach topics regarding sexuality (OT Mean Score 48.21 SD 12.75; PT Mean Score 16.63 SD 3.04). Both groups also reported negative attitudes towards sexuality and disability (OT Mean Score 8.57 SD 1.92; PT Mean Score 9.32 SD 2.48). Furthermore scores for both groups of therapists on the SABS suggest that they perceive a high number of barriers to addressing sexuality during clinical practice (OT Mean Score 43.57 SD 6.76; PT Mean Score 37.09 SD 4.51).

Conclusion: Neither occupational therapists nor physiotherapists in Singapore feel confident in their ability to discuss sexuality in the context of rehabilitation. There is urgent need for both pre and post professional training to increase knowledge of sexuality and disability and to challenge negative attitudes towards sexuality and disability.
MEASURING PAEDIATRIC DYSPHAGIA OUTCOMES POST-ACQUIRED BRAIN INJURY
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Aims: Feeding difficulties and dysphagia impact on the quality of life of both children and their families. Speech therapists provide intensive feeding rehabilitation post-acquired brain injury (ABI) through direct therapy, and indirect caregiver counselling. The purpose of this study is to profile the swallowing presentation of paediatric ABI at initial assessment, and to assess clinical change in swallowing outcomes at discharge post-speech therapy intervention.

Methodology: The Royal Brisbane Hospital Outcome Measure for Swallowing (RBHOMS) is a 10-point scale that rates swallowing difficulty. RBHOMS ratings were collated retrospectively for referred patients between June - December 2016. Children presenting with initial onset of ABI including haemorrhages, neurological infections, post-operative tumours and traumatic brain injuries were included in the study. Analyses of initial and discharge RBHOMS scores, presence of change between scores, and distribution across the four RBHOMS stages were conducted.

Results: Data from 29 children ranging from 2 months to 16 years old (mean age 7 years) was reviewed. 14 children achieved initial RBHOMS scores equal to, or greater than 8, indicating optimal swallowing function. Feeding intervention was not provided for this population. Of the 15 children who presented with an initial RBHOMS score less than 8, 80% (12 children) required enteral supplementation of their oral feeding. These children and their families received targeted speech therapy input for feeding throughout their hospital admission. A Wilcoxon Signed-Rank Test showed significant improvements in swallowing outcomes (p=0.001) for this cohort. At discharge, 9 of these children were able to feed safely on a full oral diet without supplementation.

Conclusion: Speech therapy’s role in the assessment and management of feeding is a key factor in achieving positive outcomes towards oral intake post-ABI. The RBHOMS successfully captures changes in swallowing outcomes in the paediatric population, however sensitivity for unique considerations in the paediatric population remains uncaptured.
EXAMINING FUNCTIONAL RECOVERY AMONG OLDER ADULTS WITH SURGICALLY-TREATED HIP FRACTURE

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Aims: While it is known that most patients with hip fracture do not recover completely by one year, little is known about the recovery process. We examined the longitudinal changes in function for a cohort of older adults with hip fracture from a single institution in Singapore.

Methodology: Using data from Singapore General Hospital Hip Fracture Registry, we described the changes in three outcomes: self-reported physical functions (SF-36® Physical Component Summary, PCS), proportion of baseline function recovered and the most commonly used walking aids at 1.5-month, 3-month, 6-month and 12-month after surgery for 926 patients ≥60 years old who underwent hip fracture surgery between June 2011 and February 2016. We only included patients experiencing first hip fracture.

Results: On admission, the patients were 78.3±8.1 years old; majority females (70%), Chinese (87%) and had neck-of-femur fracture (62%). Follow-up rates were 82.9%, 78.5%, 75.7% and 67.2% at 1.5-month, 3-month, 6-month and 12-month respectively. Pre-fall PCS averaged at 45.9±10.5, deteriorated to 28.3±8.5 (64.7±24.8% baseline) at 1.5-month and rebounded to 33.5±10.4 (75.6±28.4% baseline), 37.6±11.0 (83.7±26.7% baseline) and 39.7±10.7 (88.1±27.2% baseline) at 3-month, 6-month and 12-month. Only 13.5% patients recovered >90% baseline function at 1.5-month that rose to 46.9% by one year. While most patients (53.5%) did not use any walking aids pre-fall, majority (91.0%) did at 1.5-month with most using walking frame (54.3%). Reliance on walking frame decreased over time with patients switching to crutches or walking sticks such that at 12-month, crutches or walking sticks (40.4%) were the most common walking aids, with 25.9% on walking frame, 4.8% on wheelchair / bedbound and the rest without any.

Conclusion: More functional recovery was observed within the first few months after surgery with some residual deficits by one year. It is uncertain whether prolonged rehabilitation may further reduce the deficit and hence, hip fractures are best prevented.
NURSE-LED FUNCTION FOCUSED CARE (FFC) MODEL: ENGAGING NURSES IN MAXIMISING PATIENT’S MOBILITY TO ACHIEVE THERAPY GOALS IN ACUTE AND SUB-ACUTE WARD TAN TOCK SENG HOSPITAL

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Aims: Functional deconditioning is a common result of prolonged bed rest in hospital. With literature widely supporting the benefits of increasing therapy time to improve functional recovery, nurses were involved in engaging patients in physiotherapy-recommended activities throughout the day during our project. The primary aim is to increase mobilisation dosage and measure impact on functional scores. Subsequently to measure sustenance in sub-acute wards and its feasibility in acute settings.

Methodology: A FFC Model designed from our clinical process improvement project using the Functional Resonance Analysis method (FRAM). Nurses were empowered to continue the care model by collecting functional scores on admission and discharge. The number of mobilisation episodes were recorded. The Modified Barthel Index (MBI) and Modified elderly mobility scale (MEMS) was used as the functional assessment scale in pilot project. MBI alone used in the continuum project.

Results: In pilot phase, 1091 mobility episodes were recorded for 38 patients during study period of 2 months, with 86.5% done by nurses. Both the MBI (p=0.0001) and MEMS (p=0.0008) scores improved significantly. Patient surveys reflected an overall improvement in their general health and overall confidence in performing their Activities of Daily Living and mobility. In continuum phase, 491 mobilisation episodes recorded from May to July 2016 for 24 sub-acute patients with 80.6% done by nurses. 363 mobilisation episodes recorded from September to December 2016 for 26 acute patients with 77.4% done by nurses. Both populations demonstrated significant clinical and statistical improvement in mean MBI score (p-value 0.038 and 0.0005 respectively).

Conclusion: Principles and methods adopted in our FFC model were easily applicable in sub acute and acute setting. Positive outcomes in both settings suggest that FFC model has potential to spread the practice across other institutions to better engage the available work force in optimizing functional mobility to improve patient outcomes with no additional cost.
ABSTRACTS

SELECTED POSTER ABSTRACTS

ABS012

SEXUAL HEALTH RECOVERY IN PROSTATE CANCER SURVIVORSHIP: THE STANDARD OPERATING ALGORITHM AT SINGAPORE CANCER SOCIETY REHABILITATION CENTRE

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Aims: Advances in early detection and management of prostate cancer (PCa) have effectively prolonged the survivorship lifespan. Thus it becomes imperative to provide measures for improving quality of life in general and sexual health in particular to facilitate a smooth transition to near-normalcy during the post-cancer journey. Through this study, we identified main themes of intervention needs for a conceptual care model under the comprehensive umbrella of penile health rehabilitation.

Methodology: A cross-sectional survey was conducted in 13 men (mean age: 67.54y; SD: 17.1) with a presenting history of prostate cancer; newly diagnosed were 30.8% (n=4) while the rest (15.4% with stage IV lesion) had completed treatment in the last 3 years. The majority underwent radical prostatectomy (77.7%); 22.3% had radio- and chemo- therapy and 44.4% were on hormone ablation. Baseline comorbidities and sexual life quality were assessed through semi-structured interviews and the presenting erectile disorder (ED) was estimated using the sexual health inventory for men (SHIM).

Results: Pre-operatively, 18.1% had erectile and/or relationship problems with a menopause history in 92.3% of partners. Overall, 76.9% were distressed with post-treatment impacts on physical intimacy. Severe ED was reported by 66.7%, together with loss of libido and performance anxiety in all. In spite of partners’ (88.9%) acceptance of changes in relational dynamics, a majority was concerned with sexual health loss and delayed functional recovery. Customized bio-psychosocial model of sex counselling and therapy addressed their intervention needs, with urological referrals when indicated.

Conclusion: Our findings confirm that ED is a distressing survivorship-care requirement. Given the inevitable impacts of PCa treatment, majority will benefit from realistic recommendations for reinitiating (erection-independent) forms of physical and emotional intimacy, with a wider sexual repertoire. Where possible, early penile rehabilitation using clinical interventions should be considered for an optimal restoration of structural integrity as well as functional capability.
RELATIONSHIP BETWEEN DISCOURSE ABILITY AND HEARING IN DEMENTIA
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Aims: Hearing loss in elderly has been reported to worsen cognitive functions such as memory, which could be one of the risk factors to worsen cognitive functions (Dupuis et al., 2014, Wingfield et al., 2005). Yoshimura et al (2016) also reported that delayed memory recalls in all of cognitive tasks significantly related to hearing by using screening hearing test in normal elderly. On the contrary, lexical retrieval in discourse would be an early indicator of Alzheimer’s disease better than other cognitive tests (Pekkala et al., 2013). Our aim is to consider the relationship between hearing and discourse ability in dementia. We hypothesized hearing and discourse ability would be related as is the case with other cognitive functions such as memory. Moreover, we seek to examine how to augment and alternate discourse ability in dementia with hearing loss from a perspective of rehabilitation.

Methodology: We studied twenty-two elderly persons with dementia, 15 males and 7 females, range in age from 65 to 91 years old, 19 as Alzheimer’s disease and 3 as others. Hearing thresholds were measured by an audiometer with pure-tones at standard octave frequencies from 250 to 8,000 Hz in each ear under headphones. Regarding discourse tasks, Cookie Theft Picture (Goodglass & Kaplan, 1983) and False Accusation Picture (Brain Function Test Committee, 1997) were conducted. Additionally, other neuropsychological tests for memory and language were administered.

Results: Pearson’s correlation coefficient revealed significant positive correlations between the hearing and lexical retrieval in discourse (p<.05). However, there were no significant correlations between hearing and other cognitive tasks.

Conclusion: We concluded that hearing loss might relate to the discourse breakdown in dementia. We discussed a background of this relationship and suggested an effective way of intervention to discourse of dementia in light of relationship between hearing and cognition.
SELECTED POSTER ABSTRACTS

ABS015

AN ALGORITHM FOR SAFE MOBILISATION WITH EXTERNAL VENTRICULAR DRAIN: CASE STUDY

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Aims: To implement safe mobilization of patients on External Ventricular Drain (EVD) using flow chart to guide the Physiotherapists to promote patient safety. To have an algorithm for the mobilization with EVD through case studies to help in the clinical decision making of the physiotherapists.

Methodology: The limited available research on the physiotherapeutic management of this patient group was examined. Articles pertaining to physiotherapy management of patients with EVD were identified from PUBMED and Google Scholar electronic databases. Development of an algorithm and workflow for safe mobilization with EVD was done through case studies and also based on the existing limited literature review. Three patients who were on EVD were chosen for the case study and various parameters like medical stability, vital signs, colour, amount of cerebrospinal fluid and level of EVD were documented before and after mobilisation. The term mobilization used in this case study was Sitting over edge of bed, sit out of bed, standing and ambulation.

Results: With the details obtained on the parameters from the case study, able to come up with algorithm and workflow which will help in the clinical decision making of the Physiotherapists when mobilizing patients with EVD. A new algorithm and flowchart was created to provide guidance to therapists in making evidence-based treatment decisions with greater ease.

Conclusion: Patient safety is paramount during therapy interventions for patients with EVD. Clear evidenced-based decision-making algorithm and flowchart may improve therapists’ confidence in providing safe and efficacious interventions that lead to improved patient outcomes. The use of the algorithm and flowchart will help therapists to make evidence based decisions regarding the assessment and appropriate treatment for patients undergoing treatment via EVD.
ABSTRACTS

SELECTED POSTER ABSTRACTS

ABS020

CAN PHYSIOTHERAPISTS IDENTIFY DEPRESSION IN PATIENTS CONSULTING WITH LOW BACK AND LEG PAIN?

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Aims: Physiotherapists are the primary contact health professional in the management of LBP. Depression is one of the most significant psychological factors associated with poor recovery from LBP, but there is no formal standardisation for the screening of depression during physiotherapy consultation. This study evaluates if physiotherapists are able to detect depressive symptoms in patients with low back and leg pain, using active enquiry and questions tailored to each patient.

Methodology: Prior to consultation with the physiotherapists, 608 patients in primary care with low back and leg pain completed the HADS, which was this study’s reference standard. The participating physiotherapists were unaware of the HADS scores and were instructed to enquire about depressive symptoms and record their clinical impression in terms of presence or absence of low mood/depression during consultation. The association between the physiotherapists’ clinical impression of low mood/depression and the HADS category and its accuracy were investigated. Cut-off points of 8 and 11 on the HADS were used and corresponding sensitivity and specificity values were calculated.

Results: 35.6% of participants were classified according to the HADS as having possible or probable depression, whilst 44.1% of the participants were thought to have depressive symptoms by the assessing physiotherapists. Against HADS, the sensitivity and specificity of the clinical impression of physiotherapists were 72% (95% CI [65%, 78%]) and 72% (CI [67%, 76%]), respectively, at cut-off score of 8, whilst sensitivity and specificity were 79.6% (CI [70%, 86.8%]) and 62.7% (CI [58.4%, 66.9%]), respectively, at cut-off score of 11.

Conclusion: Physiotherapists are able to accurately screen for depressive symptoms in patients with low back and leg pain, using active enquiry and questions tailored to the individual patient. This assessment of depressive symptoms during physiotherapy consultation, without using formal depression questionnaires, has the potential of enhancing the overall management of outcomes for patients.
CASE SERIES OF PHYSICALLY DISABLED ADOLESCENTS WITH ROBOTIC-ASSISTED TREADMILL THERAPY IN SINGAPORE

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Aims: Case series describing the clinical outcomes and adverse effects of physically disabled adolescents after robotic-assisted treadmill therapy in Singapore.

Methodology: 16 patients with walking difficulties, age ranging from 10–20 years (mean 14 years 5 months), including 11 with cerebral palsy (median GMFCS III), 3 with global developmental delay, 1 with stroke and 1 with ischemic spinal cord injury, underwent robotic-assisted treadmill therapy (RATT) using Lokomat® at TTSH between 1 July 2013 and 31 March 2016. Only adolescents, weight >25kg, were recruited due to safety considerations at the adult hospital. The patients underwent 1-5 rounds of RATT (6 patients completed 1 round while the rest completed multiple with a median of 2 rounds). One round of RATT consisted 12 sessions (60min/session) at a frequency of 1-5 sessions/week (median 3 sessions/week). Pre and post-round measures included the 10 metre (speed) and 6 minute (endurance) walk test, observational video gait analysis, GMFM dimensions D (standing) and E (walking), and Motricity score.

Results: After the first round of RATT, 50% (n=8) showed clinically significant improvement in their walking endurance (mean +37m) and 81% (n=13) showed improvements in their trunk posture, gait pattern and independence in walking. Thirty-one percent (n=5) improved their walking speed (mean +0.2 m/s). There were also improvements in Motricity index scores (mean +8.2), GMFM dimensions D (mean +2.31) and E (mean +1.38). All patients improved further in all measures with multiple rounds of RATT. There were only 2 incidents of mild foot blisters, out of 35 rounds of RATT, which resolved with simple wound care and rest.

Conclusion: Robotic-assisted treadmill therapy (Lokomat®) for adolescents with neurological walking difficulties is novel in Singapore. It is a safe and effective gait training device with clinically observable improvements in their walking endurance, trunk posture, gait pattern and independence in walking.
DIFFERENT IMPACT OF OBESITY DETERMINED BY BODY MASS INDEX OR PERCENT BODY FAT ON MOBILITY FUNCTION IN KOREAN POLIO SURVIVORS

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Aims: Mobility decline in polio survivors is attributed to poliomyelitis itself and late effects including obesity. Obesity determined by commonly used body mass index (BMI) doesn’t work on properly in their group due to muscle loss. We aimed to investigate obesity prevalence determined by BMI and percent body fat (PBF) in polio survivors, and to analyze the relationship between obesity and mobility function according to obesity criteria.

Methodology: Eighty-three patients (26 men, 57 women) participated in this study. Flaccid paralysis was found unilateral or bilateral. Anthropometry, questionnaire regarding late effects, knee strengths, and short physical performance battery (SPPB) were evaluated. Obesity was determined by BMI and PBF from body composition analysis by dual-energy X-ray absorptiometry. The obesity by BMI was defined as above 25kg/m2 in both men and women. The cut-values of PBF for obesity were 26.2% in men and 37.3% in women referring to Korean Health and Nutrition Examination Survey (KHANES) 2009-2010.

Results: According to BMI criteria, 32 of total patients (10 men, 22 women) (38.6%) were obese, and according to the PBF criteria, there were obesity 19 among 20 men, and obesity 32 among 44 women, and overall prevalence of obesity was 79.6%. There was no statistically significant difference in knee strengths and SPPB score between obesity and non-obese group by BMI criteria. Only in women, there was statistically significant difference between obese and non-obese group by PBF in mobility functions by SPPB. (p<0.05).

Conclusion: Obesity prevalence was 38.6% by BMI and 79.6% by PBF. Especially, most of men were obese based on PBF. In obese men, there was no significant decreased mobility functions, but in obese women, their mobility functions were more impaired than non-obese women based on PBF. Obesity by BMI is highly likely to be underestimated in terms of prevalence and association with mobility functions in polio survivors.
EVALUATING THE EFFECTIVENESS OF A THERAPY SUPPORT ASSOCIATE (TSA) IN PROVIDING REHABILITATION FOR PATIENTS WHO HAVE UNDERGONE TOTAL KNEE ARTHROPLASTY IN AN ACUTE SETTING: A PILOT STUDY

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Aims: The health workforce is experiencing increasing pressures to deliver health services to an evolving population. Increased use of an assistant level workforce with new models of care is one strategy to respond to this challenge. We hypothesize that a therapy support associate (TSA) who had undergone structured training, will be able to provide rehabilitation for selected groups of patients without compromising treatment outcomes. This study aim to investigate the effectiveness of a TSA in providing rehabilitation for patients who have undergone total knee arthroplasty in an acute hospital.

Methodology:
Study design: Randomized controlled trial.
Subjects: patients with total knee arthroplasty (TKA) done by four high volume orthopaedic surgeons in SGH were assessed and treated by a physiotherapist on post-operative day (POD)1. Those who are able to walk on POD1, medically stable after surgery, assessed to be non-complex, and able to follow the TKA protocol were recruited.
Protocol: Control group - received standard physiotherapy treatment according to protocol carried out by a physiotherapist and a therapy assistant.
Experimental group: received standard physiotherapy treatment according to protocol carried out by a TSA.
Outcome measures: knee flexion and extension range of motion, pain score, length of stay, patient satisfaction.
Analysis: Mann-Whitney U test for between group comparisons.

Results: 48 patients were randomized into an experimental (n=23) and a control group (n=25). The groups were comparable at baseline for their age and gender ratio. Patients in the experimental group has significantly higher range of knee flexion and better knee extension compared to the control group at POD1, POD2 and POD3. There is no significant difference between the experimental and control group in terms of pain score, length of stay and patient satisfaction.

Conclusion: The TSA was non-inferior, or as effective as a junior physiotherapist in providing rehabilitation for patients who have undergone TKA on POD2 and 3.
THE ASSOCIATION BETWEEN BODY COMPOSITION MEASUREMENTS AND BALANCE
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Aims: Obesity is a major public health problem in the world. It is hypothesized that obesity increases demand in postural control, which results in poorer balance. Body mass index (BMI), waist-hip ratio (WHR) and body fat percentage (BFP) are common body composition measurements, which indicate relative body mass, central obesity and relative fat mass, respectively. The aim of this study was to evaluate the association between body composition measurements and balance.

Methodology: 60 healthy volunteers (26 males; 34 females) with age 19.3 ± 1.02 (mean ± SD) years were recruited in this study. Age, gender, BMI, WHR and BFP (assessed by InBody® S10 Body Composition Analyzer) were recorded for each subject. Static and dynamic balance abilities of subjects were measured by Postural Stability Test (PST) and Limits Of Stability Test (LOS), respectively by using Biodex® Balance System. PST and LOS results were presented as PST score, LOS score and LOS time. Lower PST score, higher LOS score and shorter LOS time indicate better balance.

Results: Multivariate linear regressions showed that BMI had significant associations with LOS score (adjusted $\beta = -1.59; p < 0.0001$; adjusted $R^2 = 0.43$) and LOS time (adjusted $\beta = 3.40; p < 0.0001$; adjusted $R^2 = 0.28$) after adjusted for age, gender, WHR and BFP. No significant association was found between body composition measurements and PST score. WHR and BFP did not show significant associations with LOS results.

Conclusion: This study shows significant negative correlation between dynamic balances with BMI. Surprisingly, higher WHR and BFP are not associated with poorer dynamic balance, and all body composition measurements do not associate with static balance. The results indicate that BMI may be used as a fast tool for predicting dynamic balance in healthy individuals. However, further investigation is needed to explore its association in elderly and individuals with pre-existing balance problems.
THE DIFFERENCE BETWEEN THALAMIC HEMORRHAGE AND PUTAMINAL HEMORRHAGE
KITAJI Y, WATANABE S, HARASHIMA H, MIYANO S
Department of Rehabilitation medicine, Tokyo General Hospital, Japan

Aims: The purpose of this study was to investigate the difference between the outcomes of thalamic hemorrhage and putamen hemorrhage.

Methodology: Subjects were 48 intracranial hemorrhage patients who admitted to our hospital due to post stroke rehabilitation (male 28, female 20, mean age 67.5 years, mean hospital stay 94.5 days). The brain lesion volume and location were evaluated from CT and/or MRI images. Main outcome measures were motor deficit level (the Brunnstrom Stage [BS] of upper extremity, finger, and lower extremity at admission and discharge, respectively), motor recovery (the difference between admission and discharge of the BS), and post hospital disposition (home or others).

Results: Twenty three patients had thalamic hemorrhage, 25 had putamen. Compared with thalamic group, putamen group showed younger age (71.3 years for thalamic, 64.5 years for putamen), severe motor deficit level (except for lower extremity at discharge), and larger hemorrhagic volume (10.5mL for thalamic, 42.4 mL for putamen). In all subjects, larger hemorrhagic volume showed correlation with severe motor deficit level. In putamen group, hemorrhagic volume also correlated with motor deficit level (lower extremity at admission, upper extremity, finger, lower extremity at discharge). In thalamic group however, hemorrhagic volume wasn’t correlated with motor deficit level. Compared with thalamic and putamen groups, motor recovery and post hospital disposition showed no relation the volume, (about 70% of patients were discharge to home). The cutoff points of hemorrhagic volume for discharge to home showed that thalamic group was smaller than 8.5mL(AUC=0.703) and putamen group was smaller than 26.0mL,(AUC=0.662).

Conclusion: This study suggested that putamen hemorrhage volume was more relevant to motor deficit level than thalamic hemorrhage. Thalamic hemorrhage volume was smaller than putamen hemorrhage volume.
INTERVAL HYPOXIA-HYPEROXIA TRAINING IS EFFECTIVE IN IMPROVING CARDIOPULMONARY FITNESS AND METABOLIC PROFILE IN AGED NYHA FC II-III CAD PATIENTS

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Aims: It is widely accepted cardiorespiratory Fitness (CRF) is an independent predictor of cardiovascular health and it is inversely associated with cardiovascular mortality. In pilot studies interval hypoxia-hyperoxia training (IHHT) was found to be safe and effective in exercise tolerance potentiation and positive shifts in biochemical markers, parameters of chronic inflammation, ROS-antioxidative status etc.

The aim was to compare the efficacy of a program based on IHHT to a shortened standard cardiac rehabilitation program over 5 weeks for coronary artery disease (CAD) patients.

Methodology: 46 cardiac patients (63.6±6.8 years, BMI 29.0±3.4 kg/m, NYHA FC II-III) were randomly allocated to control (CTRL) or intervention (IHHT) groups. CTRL group completed the initial 5 weeks of a standard rehabilitation program and attended 15 sessions of a sham hypoxic training. IHHT group completed a 5-week IHHT delivering by ReOxy (AiMediq, Luxembourg): 3 sessions/week, each session consisting of 5-7 hypoxic periods (10–12% O2 ) of 4-6 min and 1-3-min hyperoxic (recovery 30–35% O2) 15 sessions in total. Pulse rate and oxygen saturation were monitored during each session. CRF was measured as VO2peak during an incremental cardiopulmonary test (Bruce and M-Bruce protocols). All participants were tested at baseline and after their respective rehab program.

Results: The IHHT group showed a pre-post significant (p=0.043) of CRF improvement (difference, +0.234±0.108 l O2/min), while there was no improvement in CTRL group. CRF potentiation in IHHT group was associated with metabolic improvements: significant decrease of total cholesterol, triglycerides, glucose, but without any stimulated shifts in hematological parameters.

Conclusion: Our results show that such 5-week IHH is more effective than the initial 5 week of standard exercise rehabilitation in improving CRF. Furthermore, being a non-invasive and non-pharmacological intervention, it could be delivered by physiotherapists as an additional component in a multidisciplinary team rehabilitation plan.
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Three stages of epidemiologic transitions have come and passed. The first age of pestilence and famine was characterised by high birth rates and mortality. The advent of antibiotics heralded the second age of pandemic recession with subsequent exponential population growth. The third age of chronic, degenerative and man-made diseases was marked by the development of modern medicine, low birth rates and mortality. We now arrive at this final age. Advances in modern medicine and increasing longevity result in disability, diminished quality of life and a tremendous societal burden. The World Health Organization (WHO) reports that more than a billion people in the world face disability every day. This number is more than any single disease. A fresh strategic paradigm is needed to face the enemy onslaught of disability.

Rehabilitation is the core weaponry in disability management. It enables the improvement, optimisation and maintenance of practical function across a wide range of diseases. Rehabilitation medicine is the medical specialty that prescribes rehabilitation as its integral therapeutic modality.

Overall operational plans have gradually emerged. The recently developed WHO-International Classification of Functioning, Disability and Health (WHO-ICF) model provides the guiding map in the battle quagmire (Fig.1). It categorises the impact of disease into impairments of body structure and function, activity limitation and participation restrictions, and recognises the critical influence of environmental and personal contextual factors including self-efficacy and motivation. The WHO-ICF also emphasises health and not merely the absence of disease or disability. It further emphasises the importance of community participation including mobility, work, leisure and interpersonal relationships to optimise function and quality of life.

Clinicians, researchers and administrators can now objectively assess outcomes and provide interventions in these domains while maintaining a clear focus of the overall rehabilitation thrust. Indeed, shifts in healthcare funding from pure diagnostic-related group (DRG) casemixes to incorporate functional-related group (FRG)-based subventions recognises the additional impact and costs of disability.

Fig. 1. The WHO-International Classification of Functioning, Disability and Health. The emphasis is on health and functioning in society, rather than impairments and disability.

ADL: Activities of Daily Living; CNS: Central nervous system; CVS: Cardiovascular system; GI: Gastrointestinal; GU: Genitourinary; MSK: Musculoskeletal;
Hippocrates’ precept on medical practice to “cure sometimes, relieve often and comfort always” further translates to another important rehabilitation principle of restoration and compensation. For each rehabilitation goal in the WHO-ICF domains, we aim to restitute where possible or apply compensatory strategies and provide environmental modifications when we cannot. For example, in a hemiparetic stroke, reaching tasks are achievable by strengthening the weak arm, compensating with the non-affected arm or modifying the environment by placing objects closer to the patient. The recent deployment of rehabilitation technology further illustrates this. There are training robots that aim to restore strength or walking, assistive technology (AT) such as wheelchairs and prosthetic limbs that substitute or compensate for motor impairments and public buses with automated wheelchair platforms that provide environmental modifications for community access.

There is rapid progress in the development of rehabilitation sciences with significant increases in both the absolute volume and quality of research publications in diverse rehabilitation fields. In the rehabilitation of neurological conditions, facilitating neuroplasticity through neuromodulation and sensorimotor learning has transformed contemporary practice. Developments in the use of modulatory medications, constraint-induced therapy, braincomputer interfaces, non-invasive brain stimulation, virtual reality and rehabilitation robotics improve a wide variety of outcomes. Musculoskeletal rehabilitation is characterised by the increasing use of objective imaging and advanced assessment tools such as ultrasound and biomechanics laboratories for rapid diagnosis and focused rehabilitation. Early comprehensive rehabilitation programmes after a major acute event have proven safe and effective in intensive care, cardiac and pulmonary rehabilitation with encouraging reductions in lengths of stay, readmissions and morbidity. Cancer rehabilitation is a fast growing field of rehabilitation as survival rates increase, demanding specific approaches to specific impairments such as weakness, fatigue and cancerrelated pain. Paediatric rehabilitation is a significant need and practitioners require a broad knowledge of genetic, congenital and childhood diseases and disability, and interventions accounting for ongoing physiological and social development. Geriatric rehabilitation has assumed national importance in developed countries with ageing populations and demonstrates yet another paradigm shift in rehabilitation. It emphasises community screening for the frail elderly and delivering pre-habilitation through a core exercise programme in otherwise healthy elders prior to the onset of disability.

Systems of rehabilitation care have also concurrently developed. These include the initiation of national rehabilitation databases to optimise limited resources and integrated pathways incorporating rehabilitation in common diseases. The early delivery of rehabilitation in intensive care units, early supported discharge programmes, regional health systems integrating acute and rehabilitation (community) hospitals, streamlining of outpatient rehabilitation and rehabilitation in nursing homes address increasing demands and raise rehabilitation standards. Community rehabilitation including return to work, psychosocial support programmes and innovations such as remote telerehabilitation are important and continue to be developed. An unfilled gap is the need for adolescent rehabilitation to manage yawning chasms in the transitions from childhood to young adulthood for congenital, developmental and acquired chronic disabilities. These need to be seamlessly and actively managed in order to allow the fulfillment of maximal functional and societal potentials where possible, and reduction of parental and sibling burdens.

The battle requires not individuals, but a cohesive fighting force. There is an urgent need to train not just more rehabilitation clinicians to meet increasing demand for rehabilitation services but also to teach principles of rehabilitation to all healthcare clinicians. Competent functional assessments should be in the armamentarium of all physicians and transdisciplinary care models the norm in integrated rehabilitation. High quality research is needed to identify promising interventions and to improve rehabilitation services delivery. Further, the army needs champions and rehabilitation medicine leaders are well poised to advocate for the frail and disabled in our society by prescribing rehabilitation to improve function, quality of life and health.
REFERENCES

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