

P1

**Chronic Disease Management in a Globalised World: Joining Forces in the Age of Social Networks**

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Nobody has the critical mass of people, funds or time to meet the challenges created by the tsunami of chronic diseases that threatens the viability of most societies.

Although there are many successful efforts to improve chronic disease management (CDM) in different regions of the world, few effective mechanisms exist to transfer, adapt and use knowledge generated within one setting to another. As a result, most innovations tend to have limited impact beyond the communities or regions within which they were developed, or take far too long to become widely embraced. Similarly, when projects fail, little is available to ensure that avoidable mistakes made in one part of the world are in fact avoided elsewhere.

Thanks to its rapid evolution and global penetration, the Internet is creating many opportunities to turn locally generated knowledge into lessons of global value, while enhancing our capacity to bring the best the world has to offer to local communities.

In this session, participants will:

- Become aware of existing and emerging Internet-based tools that can promote “global” activities on CDM, by enabling global collaboration and local adaptation of successful practices and innovations,
- Learn about the Global Observatory of Innovative Practices in CDM, an international effort designed to promote global innovation along the entire spectrum of CDM and across all levels of the health system, and
- Gain a better understanding of opportunities to contribute to global efforts, and to benefit from them, through the innovative use of Internet-based social networking tools

P2

**Managing People with Co-morbidities: Outcomes of a Disease Management Unit**

**MARCO BONOLLO**

*Disease Management Unit, Alfred Hospital, Australia*

The Disease Management Unit (DMU) at Bayside Health in Melbourne aims to reduce (i) readmission rates, (ii) emergency department (ED) presentations, (iii) average length of stay (ALOS) and (iv) improve QOL of patients with *multiple* medical problems who disproportionately utilise in-patient resources. Typically, 80% of patients have at least three major co-morbidities including IHD, CHF, COPD, CKD and diabetes, in addition to social problems.

Differing from specific disease-based programmes, the DMU utilises *general physicians* with sub-specialty expertise in respiratory medicine, nephrology, cardiology, aged care, rheumatology and clinical pharmacology working together to manage patients with *multiple* co-morbidities (according to evidence-based guidelines). Critically, full-time care coordinators assist patients to navigate the hospital system, provide patient education, refer to community services and facilitate communication with GPs both directly and through an electronic health record.

Innovative outpatient clinics located in both tertiary hospital and community health environment allow flexible patient review based on the number, complexity and status of co-morbidities. Additionally, allied health disciplines provide patients with self-management strategies, in particular, targeting anxiety and depression. A dedicated pharmacist conducts home medication reviews and clinic consultations to address polypharmacy issues.

There have been 1,250 patients enrolled in DMU from January 2001 to January 2005, with on average 550 “open” cases. For these patients, hospital readmissions were reduced by up to 51%, ED presentations were reduced by 60% and ALOS was reduced by 20%, 12 months after enrolment in the programme, representing a return on investment of 5.7:1. More recent data from 2006 will be presented.

This model of Disease Management, results in improved outcomes or patients with multiple medical problems who frequently present to tertiary hospital.

P3

**Disease Management: What is the Evidence? What are Realistic Expectations?**

**SOEREN MATTKE**

*RAND Corporation, Arlington, VA, United States*

**Aim:** Disease management is increasingly viewed as a potential solution to the twin problems of escalating cost and inadequate quality of care, in particular for chronic conditions. It is, however, not clear whether and to what degree the available evidence is supportive of such high expectations. We set out to answer the following questions:

- 1) What types of disease management programs in which population groups have been evaluated in the scientific literature?
- 2) For which chronic conditions has the effect of disease management been researched?
- 3) What does the evidence say about the effect of disease management on endpoints like quality of care and cost?
- 4) Is there sufficient evidence for the large-scale, vendor-based disease management programs that are currently of most interest to public and private purchasers?

**Methods:** We searched the available literature for meta-analyses and reviews that summarised evaluations of disease management programs. We identified 29 meta-analyses or reviews that covered 317 unique publications and conducted a structured review of those.

**Results:** The types of interventions included in reviews were very heterogeneous and frequently little detail about the intervention was provided. But the typical program was relatively small (about 30-500 patients), was operated by the providers at a single site, and targeted high-risk patients. The interventions typically combined patient education, care planning and follow-up delivered by a nurse or case manager either by telephone or in-person. There were no reviews or meta-analyses and only three studies of large-scale, population-based interventions.

Congestive heart failure (CHF) was the condition with most evidence (18 reviews/meta-analyses covering 118 individual studies), followed by coronary artery disease (CAD) (7/78), diabetes (9/64), asthma (4/37), chronic obstructive pulmonary disease (COPD) (5/25), and depression (4/24). Other conditions were not sufficiently well researched.

Across most conditions, there was consistent evidence that disease management can improve processes of care, disease control and patient experience. We found no consistent evidence that disease management improved long-term outcomes for any condition, at least not in the typical follow-up period of up to 12 months, nor that it influenced utilisation of care, except for a reduction in hospitalisation rates among CHF patients and for higher utilisation of outpatient care and prescription drugs for patients with depression. There was no conclusive evidence that disease management leads to a net reduction of direct medical cost, when the cost of the intervention is appropriately accounted.

**Conclusion:** Most of the evidence to date concerns small, high-intensity programs focusing on high-risk patients, rather than the large, population-based disease management programs that are currently of most interest to private and public purchasers. Moreover, while these programs show evidence for improved quality of care, the evidence for improved health outcomes and cost savings is inconclusive. Further research is clearly needed, especially on the effect on cost, quality, and health outcomes of the large-scale, population-based programs to inform the decisions of public and private purchasers and to identify the most successful programs.

## P4

### **The Evolving Role of the Nurse Specialists in Chronic Care: Evaluation on its Effectiveness and Quality of Care**

**HJM VRIJHOEF<sup>1,2</sup>**

*<sup>1</sup>Faculty of Health, Medicine & Life Sciences, Department of Health Care and Nursing Studies, University Maastricht, The Netherlands, <sup>2</sup>University Hospital Maastricht, Department of Integrated Care, The Netherlands*

**Aim:** Against the growing number of chronically ill patients, the suboptimal quality of chronic care, and the ageing of medical staff, it was hypothesised that substituting physicians for nurse specialists in the care of the chronically ill might solve (part) of this problematic situation.

**Methods:** In various locations in the Netherlands (Maastricht, Venlo, Alkmaar), settings (primary care, secondary care) and patients (with diabetes mellitus, asthma, COPD), nurse specialists were appointed as primary care givers for patients who formerly received treatment from physicians. Different designs were applied (RCT, quasi-experimental) and multiple outcome indicators were measured (clinical outcomes, knowledge, self-care behaviour, quality of life, satisfaction, medical consumption, costs) for periods of 6-12 months. Repeated measures analysis and Markov modelling were applied to analyse differences within and/or between groups.

**Results:** Substituting physicians for nurses in the care for groups of patients with diabetes, asthma, or COPD is justifiable in terms of quality of care, patient outcomes and costs. Depending on the patient group, outcomes improved or remained equal compared with usual care.

**Conclusion:** In managing the care for chronically ill, nurses have an important role as members of the multidisciplinary team. Nurses can take on the role as primary care giver for groups of patients. It is important for nurses to combine their competencies with some medical skills, but not neglect their nursing skills. Furthermore, not all nurses will be competent enough to substitute the physicians.

## P5

### **Global Perspectives in Healthcare Transformation – The Relevance of Primary Care**

**BARBARA STARFIELD**

*Department of Health Policy and Management, Johns Hopkins University, United States*

The purpose of this paper is to review the evidence for the benefits of primary care throughout the world. The presentation first defines primary care and primary healthcare in ways that facilitate efforts to measure them and assess their adequacy.

Evidence from international comparisons and from within-countries (both industrialised and developing countries) shows that both effectiveness (in terms of health levels) and equity (in terms of systematic differences across population subgroups) are improved at the same time as costs are reduced. A particular challenge to the further improvement of primary care is the need for reductions in unnecessary referrals to and use of secondary care ('specialists'), which increase costs of care without gain in health and with increased potential for harm.

## P6

### **People-centred Healthcare: Health for All by All**

#### **SHIGERU OMI**

*World Health Organization Regional Office for the Western Pacific*

In the Western Pacific Region, chronic non-communicable diseases (NCDs) are already responsible for the greatest proportion of the burden of disease, accounting for 7 out of every 10 deaths. Without an effective response, the burden is expected to increase dramatically; for example, people with diabetes are projected to double by 2030, from 35 to 71 million.

What compounds the problem is that the health systems of many low- and middle-income countries and areas in the region have limited capacity to address the challenge of NCDs, especially because NCDs require a model of care which is different from that based on the treatment of acute, episodic conditions which have traditionally driven health system design. If and when health systems are organised to provide chronic illness care, the patient's role in management is emphasised, follow-up is continuous, community services are harnessed, and prevention measures are adequately utilised, a small but optimal package of population-wide and high-risk interventions could go a long way towards achieving the global goal of 2% annual reduction in mortality from chronic diseases by 2015.

Thus, there is a pressing need to reorient health systems in the 21st century towards impacting behaviours and social norms, building in health promotion principles across the continuum of care – most importantly primary care, and providing safe and quality healthcare that is more holistic, responsive and people-centred.

The central, overriding goal is to establish – or re-establish – the core value of healthcare, which is the health and well-being of people. The discussion will focus on the transformation of health systems to ensure that individuals, families and communities are informed and empowered; that health practitioners are competent and responsive; that healthcare organisations are efficient and just; and that the health system itself is supportive and humanitarian – in intent, in design, and in practice. The important role of primary care in making the vision of **health for all, by all** a reality will also be highlighted.

## P7

### **Role of Patient Empowerment in Providing Quality Primary Healthcare**

#### **MICHAEL KIDD**

*Discipline of General Practice, University of Sydney, Australia*

Not available at time of print.

## P8

### **Healthcare Transformation in the Community – Bridging the Gaps**

#### **TRISHA GREENHALGH**

*Primary Care and Population Sciences, Faculty of Clinical Sciences, University College of London, United Kingdom*

**Aim:** To highlight innovative approaches to improving primary care services by focusing on one example from inner London.

**Key points:** The talk will cover five aspects of healthcare transformation: (a) understanding demand and need; (b) building capacity in essential services; (c) managing the system and performance; (d) training, development and support; and (e) monitoring and feedback. These steps will be illustrated using one particular service initiative (the high prevalence of chronic pain in an ethnic community).

**Conclusion:** Transforming healthcare in the community is not merely a matter of improving clinical services but of ascertaining the needs of the community and developing services that are acceptable, accessible, efficient and effective.

## P9

### **Where is the Person in Disease Management?**

#### **BARBARA STARFIELD**

*Department of Health Policy and Management, Johns Hopkins University, United States*

The concept of disease is largely artificial, created for the convenience of medical practitioners who need a framework for applying the current state of the art and science of medical care. Although it may serve certain purposes, it does not reflect the reality of patients' needs. What characterises the needs of patients is primarily in the realm of patterns and burdens of illness, which are not well represented by medically constructed diseases, whether they are 'chronic' or not. There is, however, a reality of need for chronic care, which has more to do with needs of patients over time and the extent of their morbidity burden. The major challenge of health services is to adequately recognise patients' needs, which may or may not be the same as the practitioner's perception of that need (usually expressed as a definitive or tentative diagnosis). When patients and practitioners agree on what the patient's need is, the patient is more likely to improve, regardless of whether it is the practitioner

or patient making the judgment on improvement. This long-term need for care, which characterises almost everyone regardless of their sociodemographic and socioeconomic characteristics, is the responsibility of good primary care, which encompasses the domains of first contact access and use; long-term person (not disease) focused care; comprehensiveness (in the sense of taking care of all health-related ailments except those too uncommon to maintain competence, and coordination (integration) of care when care has to be received outside the primary care setting.. Secondary care, in contrast, is disease-focused and usually of limited duration. To better recognise and meet patients' needs, there are imperatives to develop methods to:

- accurately capture the burden of morbidity in people and populations
- accurately capture the major contributions of primary care and specialty care to meeting patients' needs
- specify the appropriate division of effort between primary care (person-focus) and secondary care (disease-focus)
- develop systems of assessing the quality of health services by generic rather than disease-specific measures

## P10

### What has Literacy to do with Health Outcomes?

#### DEAN SCHILLINGER

*UCSF Center for Vulnerable Populations, San Francisco General Hospital, United States*

**Introduction:** While the relationship between education and health has been well described, there has been little work regarding explanatory mechanisms. In low-income countries, illiteracy is a well-known predictor of mortality. We present the results of over a decade of research in middle and high-income countries regarding the population distribution of literacy, the independent association between literacy levels and health outcomes, and the pathways by which literacy could lead to poor health.

**Methods:** Literature review and call-to-action

**Results:** While there is between-country variation in the population distribution of literacy, between 25% and 50% of individuals in middle and high-income countries have literacy skills that are inadequate to meet the demands of contemporary healthcare systems or to effectively advocate for healthy environments (limited "health literacy"). The burden of limited literacy is disproportionately shouldered by socio-economically vulnerable populations and the elderly. Research performed largely in the US reveals that limited literacy is an independent risk factor for poor self-rated health, higher rates of chronic diseases, hospitalisations and associated costs, patient safety, and even mortality. The effects of limited literacy have been best studied in the chronic disease context (e.g. diabetes) and

at least 4 pathways have been identified that explain these relationships, including effect modification at the health system level (e.g. poor quality of care) with respect to health communication.

**Conclusions:** Limited literacy is common and negatively impacts health status, healthcare experiences and health outcomes for a significant proportion of people in developed nations across a range of common conditions and contributes to social disparities in health. At the public policy and public health level, future work should focus on improving literacy and engaging populations with limited literacy skills; at the health policy level future work should focus on improving healthcare quality for those with limited literacy skills.

## P11

### Harnessing IT in Healthcare Transformation

#### MICHAEL BAINBRIDGE

*Clinical Architect, NHS Connecting for Health, NHS England, United Kingdom*

Healthcare across the world is about to face an urgent dual challenge. The first is the one of population demographics which brings into question the ability of all countries in the Western world, Australia, Japan etc. to deliver healthcare in an affordable way using current 'illness intervention' delivery models. The second is the burgeoning number of people with chronic illness needing care and the fact these people are no longer restricted to the elder population but also from an emerging 'epidemic' of younger obese populations with associated conditions such as diabetes, heart disease and musculoskeletal problems. Clearly a transformation in services is required if these challenges are going to be met in the future (estimated as between 10 and 20 years at most) within a resource envelope. This is especially challenging when we take into account a 21<sup>st</sup> century citizen's expectations of safe, effective, state-of-the-art and reproducible healthcare at a time and place convenient to them.

My assertion is that it is only by the rapid integration of informatics and informatic principles into medicine will we have any potential to address the need and expectation in the coming decade. This will require cooperation and collaboration on an unprecedented scale by the global communities of healthcare providers and vendors. Enough standards exist already to achieve these needs; however, to make them all 'fit for purpose' and become universally implemented will present a great challenge. This presentation will focus on initiatives in delivering the UK 'National Programme for IT' such as Innovative Hardware design, Common User Interface, SNOMED, HL7 v3, Logical Architectures and clinically relevant structures upon which to construct multidisciplinary records. I will also indicate opportunities for global collaboration

## P12

### Quality Innovation in Primary Healthcare Transformation

#### TRISHA GREENHALGH

*Primary Care and Population Sciences, Faculty of Clinical Sciences, University College of London, United Kingdom*

**Introduction:** Whilst there is a lot of work being done on promoting innovation and on encouraging organisations to adopt innovation, there is very little work being done on how innovations can be routinised and embedded in healthcare organisations.

**Aim:** To introduce the research literature on 'organisational routines' and 'routinisation' as these apply to healthcare.

**Key points:** An organisational routine is "a repetitive, recognisable pattern of interdependent actions, involving multiple actors" (Feldman). Routines are supported by structuring devices including time, place, artefacts (e.g. documents, technologies), and defined roles and responsibilities. They are enacted by people – on whose capability, mindfulness, identity and agency their success depends. Leaders and managers can facilitate the routinisation of an innovation by mapping and resourcing its 'organisational grammar' (e.g. when, where, by whom, and how the work is meant to happen); developing staff for collaborative roles; rewarding creativity and initiative in refining routines; using sense making to shape and deliver a shared vision; training teams as well as individuals; and feeding emerging data into the quality improvement cycle.

**Conclusion:** A focus on how organisational routines are structured can help embed innovation in healthcare organisations.

#### L1.1

##### ABI/PWV – A Novel Marker of Arteriosclerosis

#### AKIRA YAMASHINA<sup>1</sup>, HIROFUMI TOMIYAMA<sup>1</sup>

*<sup>1</sup>Department of Cardiology, Tokyo Medical University, Japan*

Recently, large arteries are recognised to be a complex and functional organ as conduit or distributor as well as buffer of systolic pulsation and the second pump for diastolic perfusion. Therefore, impairment of these "Windkessel" functions of large arteries may lead to cardiovascular complications.

Among several non-invasive techniques to assess the function of large arteries, which have been introduced for clinical use, pulse wave velocity (PWV) is the most widely used after the introduction of fully automatic device like Form PWV/ABI (Omron Healthcare). Form PWV/ABI is designed to measure PWV between brachium and ankle (baPWV) and ankle brachial systolic blood pressure index (ABI) simultaneously which are clinically relevant. Measurements of baPWV are reproducible and showed high correlation with aortic PWV measured by

direct catheter method. We have measured baPWV over 15,000 subjects both in clinical or health screening purposes. Our study demonstrated significant interactions between baPWV and cardiovascular risk factors, such as age, gender, hypertension, diabetes, heart rate, alcohol consumption, sleep apnea syndrome, metabolic syndrome, bone mineral density, pulmonary function, as well as inflammatory marker. Follow-up studies in a cohort of a company employee demonstrated that the progression of baPWV is significantly high in the group of metabolic syndrome or other atherosclerotic risk factors. Moreover, subjects with high baPWV group shows higher incidence to develop to be hypertensive in pre-hypertensive subjects. Thus, baPWV can be a novel marker of arterial stiffness to particularise patients with high cardiovascular risk.

#### L1.2

##### Central Blood Pressure and Augmentation Index for Better Management of Cardiovascular Disease

#### JUNICHIRO HASHIMOTO

*Tohoku University, Sendai, Japan*

In arterial tree, the pressure pulse generated by the heart propagates toward the periphery, and then is reflected back from the periphery to the central aorta. The actual pulse waveform comprises the combination of these incident and reflected waves. In most adult humans, the reflected wave returns in late systole and boosts central aortic blood pressure. Such pressure augmentation, as gauged by the augmentation index, depends on the stiffness, geometry, and tone of the entire arterial tree including large elastic arteries, muscular arteries, and arterioles. Arterial stiffening and tone elevation increase wave reflection, augment central systolic and pulse pressure, thereby lead to left ventricular overload, and cause microvascular damage in vasodilated organs such as the brain and kidney.

Arterial wave reflection and pulse amplification are responsible for substantial difference between peripheral brachial pressure and central aortic pressure. Central pressure cannot be evaluated by conventional cuff measurement, but can be estimated with recently developed noninvasive applanation tonometry and pulse wave analysis. Studies have shown that central pressure and augmentation index are associated with cardiovascular risk, and can predict cardiovascular prognosis better than brachial pressure. Moreover, different classes of antihypertensive drugs can have different effects on lowering central pressure despite a similar effect on brachial pressure, which might explain different effects on cardiovascular outcome. Central blood pressure and augmentation index can therefore provide a novel useful guide to treatment and prevention of cardiovascular disease above and beyond conventional cuff brachial pressure.

## L2

### Global Impact of Diabetes

#### **ANIL KAPUR**

*World Diabetes Foundation, Denmark*

Rapid technological strides and globalisation of the world is bringing about significant changes in the way we live and work. Societies and economies in rapid transition show these changes most visibly; here lifestyles and culture are quickly catching up with the changing landscapes and new economic realities.

This transition while beneficial in many respects is also bringing about significant changes in the disease burden. Traditionally infectious diseases contributed to the bulk of the morbidity and mortality statistics, of late chronic non-communicable diseases are overtaking communicable diseases

Diabetes has emerged as a major public health problem all over the world but is particularly impacting the developing world especially in urban areas. Better early life survival and increased longevity, coupled with rapid urbanisation and changes from traditional lifestyles are to blame for the epidemic of obesity and diabetes (aptly called diabesity).

According to the new data from the International Diabetes Federation, diabetes already afflicts 246 million people in the world. It is estimated that by 2025, this number is likely to exceed 380 million. Seven out of the top 10 countries with diabetes are in the developing world and 80% of people with diabetes in a few years will be living in poor and middle income countries. Every 10 seconds 1 person dies due to diabetes-related complications (3.7 million/year) and in the same 10 seconds 2 new people develop diabetes (7.0 million/year). Diabetes is a major cause of limb amputations, is becoming the leading cause of acquired blindness, in addition to the being the major cause for end stage renal disease, coronary heart disease, strokes etc.

The healthcare infrastructure and focus has however not changed, or, is only changing very slowly to meet the rapidly changing demands.

The need to prioritise distribution of limited health resources, results in a public healthcare system that tends to concentrate on the care of people with acute emergent illnesses. Given the limited funds and infrastructure for chronic non-communicable conditions like diabetes, the quality of care suffers: public hospitals and clinics providing subsidised or free care are crowded and ill-equipped. Insurance cover and cost-reimbursement for treatment in the private sector is marginal or non-existent; here too the infrastructure for chronic care is limited and the focus is on revenue generating tertiary care. There are either no or few programs for health promotion and prevention of chronic non-communicable diseases. Need for economic development and market economy often overrides health issues in policy planning.

Prevailing lack of awareness and health consciousness and education, coupled with the lack of facilities and financial

capacity indirectly worsens long-term prognosis and increasing cost. The excess cost is related directly to higher cost of treating late complications and indirectly to the economic loss due to lost man-days and economic opportunity. In the absence of health insurance and a significant or credible social security system to fall back on during illness or bad times, as is often the case in many developing countries, an illness affecting the earning or active member of the family, affects not only this individual but others in the family as well. It may force other normally non-working members to start work, often prematurely at lower wages, cut short children's education with its long-term financial consequence for them and the family and often worsens the poverty and leads to indebtedness.

In a number of well designed large studies, lifestyle interventions in the form of a healthy balanced diet, adequate physical exercise, alcohol moderation and smoking cessation have been shown to prevent diabetes.

Proper control can prevent, retard or arrest development of complications as well as reduce mortality both in type 1 and type 2 diabetes as shown by several large-scale studies.

Despite the evidence that prevention and control is feasible, effective and economically viable in the long run, no large-scale public health initiatives have been taken to tackle the problem of diabetes and its associated conditions. Because of its wide ramifications, targeting diabetes prevention and control is the best approach to developing a non-communicable disease care delivery system.

Without effective intervention, the diabetes epidemic will continue to grow. Effective intervention means prevention and prevention means primary prevention – life style changes, and secondary prevention – reducing the burden of complications by early diagnosis and proper care.

Good health is a prerequisite to successful human endeavour and therefore core to economic growth and activity. At any level of economic development, the indirect cost is always higher than cost of providing good primary and secondary care that will prevent diabetes and its long-term complications. Each of us involved in healthcare planning and policy making needs to be aware of what drives cost. Prevention and proper treatment of diabetes is not costly; failing to prevent, not diagnosing it early enough and not treating it properly is very costly both in terms of physical health and economic development.

## A1.1

### Women and Tobacco - The Singapore Experience

#### **CHOO LIN**

*Smoking Control Programme, Health Promotion Board*

Like other Asian nations, Singapore is experiencing an increase in smoking prevalence among young women. The smoking rate among young females aged 18 to 29 years has increased from 5.2% in 1998 to 6.6% in 2004.

If this trend is left unchecked, Singapore will experience a multi-fold increase in smoking-related diseases among females in the coming years. This is particularly alarming as female smokers suffer from additional smoking-related health risks, such as cervical and breast cancer, compared to their male counterparts.

Amidst the rising smoking rate among Singaporean women between 1998 and 2004, the Singapore Health Promotion Board introduced the Fresh Air For Women (FAFW) programme in 2004. Initially focused on closing the knowledge gap among women about the female-specific risks of smoking and benefits of quitting, the FAFW programme has gained momentum with new findings from the National Health Survey (NHS) 2004 and a series of focus group discussions in 2006 and 2007.

The NHS 2004 revealed that almost 1 in 2 (44.5%) Singaporean women aged 25 to 34 years smoked to deal with stress or cope with problems. Qualitative data from focus group discussions suggested that in addition to stress, other factors which reinforce women's smoking habits include image concerns and social influences.

These findings form the basis of a new approach embraced by the **STRONG** Campaign, designed to help women confront their psychological dependence on smoking and conquer their inner challenges to quit smoking successfully. The key focuses are on stress, image concerns and social influences, and to help women understand how these factors reinforce their smoking behaviour. Adopting a multi-touch-point strategy, women smokers are *inspired* to take action and *empowered* with life-skills and alternative coping strategies to overcome their dependence on smoking.

The FAFW has reached more than 80,000 young women, while calls to QuitLine from young females have doubled since the start of the programme. Awareness of key campaign messages reached 90%.

## A1.2

### **Living Well with a Chronic Condition Program – Calgary, Canada**

#### **SANDRA DELON**

*Chronic Disease Management, Calgary Health Region, Canada*

This is a three-part program consisting of supervised exercise, disease education and self-management and is available for people with a variety of chronic conditions such as diabetes, arthritis and obesity. The program is offered in community settings such as gyms and leisure centres. To enhance sustainability the program is jointly run by Calgary Health Region staff and staff from the community sites. Clients can self refer to the program but require physician's clearance for safety prior to exercise. Clients can take any one or all parts of the program. Evaluation indicates improved clinical outcomes and quality of life for patients following the program.

## A1.3

### **Prevention of Risk Behaviours in the Community**

#### **PAULO A. JR. CASTRO**<sup>1,2</sup>

*<sup>1</sup>Section of Orthopaedic Surgery, Department of Surgery, Pasig City General Hospital, Philippines, <sup>2</sup>Pasig City Council for Population and Development, Philippines*

Pasig City has a young population with a substantial percentage engaging in risk behaviours. Thirty thousand are sexually active and 75% of these do not practice safe sex. More than 15,000 use drugs, over 65,000 are smokers and more than 95,000 drink alcoholic beverages. These are the results of the Young Adult Fertility and Sexuality (YAFS) Survey of the University of the Philippines Population Institute. The City Government felt the need to address related problems and develop interventional programs in collaboration with a non-governmental organisation – the Pasig City Council for Population and Development (PCCPD) – which works on a PHE (Population, Health and Environment) framework with a thematic focus on family planning/reproductive health (FP/RH) and adolescent sexual and reproductive health (ASRH). Utilising the YAFS findings, a workshop on ASRH was held at a school from one of the “barangays” (villages) of Pasig City which was attended by the teachers, particularly those teaching Music, Arts, Physical Education, and Health where sexuality and reproductive health is being taught; members of the student council; and the Parent-Teachers Community Association. The collaboration of NGO's (PCCPD and the Foundation for Adolescent Development), the Department of Education, and the City Government paved the way for the creation of a Teen HealthQuarters (THQ) that would provide counselling, information education, values clarification, behaviour modelling and medical services relevant to sexuality and reproductive health and development needs. In an effort to replicate this in other schools in the barangays, consultative meetings of various stakeholders were held and consequently, a strategic planning to develop a citywide program addressing the affairs of the youth, both in school and out-of-school. This paved way to training of student-representatives in various schools as peer counsellors and eventual creation of a group of officers who participated in youth programs such as the anti-drug campaign. Out-of-school youth (OSY) were trained in leadership and ASRH who later became youth coordinators in the community. OSY who are musically inclined and members of bands in the community were trained in song writing with PHE as the theme. Their original compositions were presented as “Battle of the Bands” dubbed “Live Earth Concert” and collectively recorded in a DVD album used in the advocacy of curbing risk behaviours with the band members acting as propagandists through their songs. Other health promotion programs were undertaken in the community involving the adult sector and health providers who were working to manage health risks.

The City Government recognised through a resolution the establishment of PCCPD, defining its mission and function. Another resolution was later passed calling for consolidated efforts of the relevant agencies to formulate a comprehensive

city program on adolescent health and youth development with the PCCPD acting as a catalyst in carrying out these programs.

#### A1.4

##### **Population Renovation: Targeting Men's Health**

**KERRY HOLLIER<sup>1</sup>, MEGAN BUICK<sup>1</sup>**

*<sup>1</sup>Bayside General Practice Network, Australia*

**Aim:** Many Australian General Practice Divisions participate in community health promotion events such as Festivals and Show Days but few have targeted specific populations. Bayside General Practice Network (BGPN) organised a community health check event through the local outlet of a National hardware chain, Bunnings Warehouse, to coincide with the International Men's Health Week 2007. The Health promotion component of the event was specifically designed to highlight the growing health risks associated with inactivity and obesity in the local community. This capacity building activity aimed to build an opportunistic benefit for males who characteristically are difficult to engage with general practice.

**Methods:** Local general practitioners and practice nurses volunteered to provide blood pressure, waist measurement, blood cholesterol tests and healthy lifestyle advice and shoppers were invited to undertake this free health check. While waiting, the shopper was asked to complete a checklist aimed at identifying potential lifestyle and chronic disease risk factors. Any shopper identified as suitable (between 45 and 49 years) for a health check or presenting with a serious or potential risk factor was referred back to their general practitioner for further follow-up. Health information provided included information available through a number of the National Health Programs. The Network also provided healthy fruit snacks.

**Results:** Over 6 hours, 150 people were seen. Data on age, gender, last medical check up, smoking status, regular exercise, blood pressure, random cholesterol level, abdominal circumference and weight were collected. All participants were given a summary letter for their GP. The results represent a surprising commonality.

#### A2.1

##### **How Do We Evaluate and Define Success in Self Management Programs**

**SOEREN MATTKE**

*RAND Corporation, Arlington, VA, United States*

Programs that provide patient self-management support have been developed in recognition that treating chronic illness requires a new model of care. Many stakeholders are enthusiastic about this new model, but limited evidence base on what works best in these programs creates challenges for program design and implementation. A robust yet practical evaluation strategy is required to inform rational decisions content, scope and funding of such programs.

This breakout session will cover 2 key steps of an evaluation approach for self-management programs. The first is the selection of performance measures. The session will address the concept of a logic model to guide the choice of evaluation

domains and success criteria and discuss principles of measures selection to assess a program's impact on a given domain.

The second key step in program evaluation is the selection of the attribution strategy, because one has to attribute changes in the selected measures to the program itself rather than other factors, such as secular trends or changes in demographics. In an ideal world, this would be achieved through a randomised controlled trial that provides a fully equivalent comparison group. This, of course, is rarely possible in real-world situations so that other attribution approaches will have to be used.

The session will educate participants about considerations around the selection and implementation of an attribution strategy and cover the following areas:

- 1) What are common threats to validity in non-experimental evaluation designs?
- 2) What steps can be taken to remediate them?
- 3) What are the pros and cons of different attribution approaches and how can one balance scientific rigor and operational feasibility?
- 4) How will those considerations be factored into the decisions on an attribution strategy?

The discussion of fundamentals and principles is combined with examples to illustrate how theory translates into practice.

#### A2.2

##### **Measuring Success and Determining ROI in Chronic Care Program**

**HJM VRIJHOEF<sup>1,2</sup>**

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**Aim:** To achieve a positive business case in improving care for chronically ill the financial benefits of the strategy (i.e. chronic care programme) have to exceed the costs while maintaining or improving quality of care. At the minimum the strategy has to improve quality of care without a net cost increase. What do we know about the impact of chronic care programmes on quality, patient outcomes and ROI?

**Methods:** To answer this question an extensive analysis of literature reviews about the effectiveness of chronic care programmes and their ROI's was performed.

**Results:** Based on five recently published reviews it was found that chronic care programmes are highly heterogeneous; no single definition exists for very similar programmes; programmes can improve the quality of care outcomes, but evidence about superiority is lacking; evidence regarding the ROI of care programmes is lacking.

**Conclusion:** In order to successfully measure the impact of chronic care programmes on quality of care and their ROI it is necessary to gain a better understanding of the programmes (i.e. care coordination strategies) and to reach consensus on a set of elements (methods) to be used in evaluations and to be described in evaluative reports.

### A2.3

#### **A Chronic Disease Evaluation Process that Primarily Uses Administrative Data**

**DAVID BERLOWITZ<sup>1</sup>, MARNIE GRACO<sup>2</sup>**

*<sup>1</sup>Northern Clinical Research Centre, Northern Health, Australia, <sup>2</sup>Northern Clinical Research Centre, Northern Health, Australia*

The Northern Alliance Hospital Admission Risk Program - Chronic Disease Management (HARP-CDM) comprises 13 services delivering care to those with chronic disease and older people with complex health needs, who are frequent users of hospital or at risk of hospitalisation in the northern suburbs of Melbourne, Australia. This evaluation was developed to measure performance in terms of: client profile; access and entry; service delivery; service efficiency; client outcomes; satisfaction; and reduced hospital demand. All data are collected electronically and uniquely, more than 80% of the evaluation data are derived from existing, administrative datasets (health department, hospital admissions, financial), thus minimising staff and client burden. Additional data includes up to 5 service specific, client outcomes and the Assessment of Quality of Life instrument (AQoL), a generic, health-related quality of life measure. The AQoL has published population data and allows simple calculation of health utility scores, facilitating health economic analyses. The first, preliminary 6-month data suggest that clients have “fair” or “poor” self-reported health status (n = 395) and the average health utility scores are significantly ( $P < 0.05$ ) worse than age-matched, population control data. Further analyses will be performed as data accrues. Preliminary analyses reveal, for the first time, that the HARP-CDM program is effectively targeting the appropriate clients. This methodology will enable many prospective assessments to be performed including client outcome evaluation, service model comparisons, benchmarking and cost-utility analyses. This approach demonstrates the feasibility of “whole of system” evaluation for a large and diverse program, developed within existing resources.

### A2.4

#### **Using Evaluation to Enhance Targeting of Chronic Disease Management**

**MARNIE GRACO<sup>1</sup>, DAVID J BERLOWITZ<sup>1</sup>, ANDREA E JASPER<sup>1</sup>, A L BARKER<sup>1</sup>**

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Impact evaluation assesses changes in individuals that can be attributed to a program in order to assess program performance. Impact evaluations are frequently used in disease management programs to justify continuation, growth or re-allocation of program resources. They enable dissemination of findings and contribute to evidence-based practice. However, impact evaluations frequently lack the detail required to genuinely contribute to continuous quality improvement. Another ‘layer’ of analysis is required to answer questions about where the program may be ‘falling short’, despite performing well overall.

These secondary analyses may also generate research hypotheses, and contribute to a greater understanding of both the client population and models of care.

Using the example of two disease management services in the Northern Alliance Hospital Admission Risk Program in Melbourne, Australia, this presentation will illustrate how routinely collected data can be used to evaluate a program on two levels: 1. Overall; and 2. Sub-group impact. For example, evaluation of a comprehensive diabetes service demonstrated significant improvements in blood glucose control, with a mean reduction in HbA1c of 1.3% at 12 months ( $P < 0.05$ , n = 399). Despite this, over 20% were still not achieving target (HbA1c < 8%). Further analysis has identified patient factors associated with poorer outcome, enabling clinicians to better recognise patients at risk and tailor their management. This presentation will demonstrate how routinely collected data can be used to improve chronic disease services in an efficient and meaningful way.

### A3.1

#### **Practical Approaches to the Diagnosis and Management of Cardiovascular Risk**

**AKIRA YAMASHINA**

*Department of Cardiology, Tokyo Medical University, Japan*

Cardiovascular disease (CVD) remains major cause of morbidity and mortality in developed countries. However, it is not fully predicted by traditional risk factors such as hypertension, diabetes, dyslipidaemia, smoking, or others. Although there are several equations or charts to estimate individual risk upon the combination of risk factors, nothing is used in daily clinical setting. Thus, more specific, accurate, convenient, and cost-effective markers are expected. Arterial stiffness, one aspect of vascular damage, is a non-traditional risk factor in the development of CVD and is noticed as an important risk marker of CVD. Increased central arterial stiffness is thought to increase cardiovascular risk through several mechanisms such as increased cardiac afterload, cardiac diastolic dysfunction, impaired coronary blood supply and direct atherogenic action via disturbed endothelial shear stress.

Pulse wave velocity (PWV) is known to be an indicator of arterial stiffness, and has been recognized as a marker of vascular damages. Recent studies have demonstrated that PWV obtained by noninvasive automatic devices is not only a marker of vascular damages but also a predictor of the prognosis of cardiovascular disease. Therefore, PWV has a potential application for screening vascular damage in a large population. The European Society of Hypertension and the European Society of Cardiology (ESH/ESC) 2007 Guidelines for the Management of Arterial Hypertension proposes that PWV is one of markers of subclinical organ damage, and the threshold of carotid-femoral PWV (cfPWV) is >12 m/sec as a conservative estimate of significant alterations of aortic function. On the other hand, brachial-ankle PWV (baPWV) not cfPWV is more frequently measured in Japan. baPWV provides more convenient and reproducible measurement of arterial stiffness than cfPWV.

In this session, I introduce the usefulness of baPWV as a marker of cardiovascular risk in the management of CVD by showing large scale cross sectional and longitudinal observational studies in healthy and diseased subjects. Finally I propose the cut-off value baPWV to predict future cardiovascular events in various setting of CVD.

### A3.2

#### **Early Supported Discharge for Stroke Patients: A Pilot in Progress**

**BERNARD PL CHAN**

*Division of Neurology, National University Hospital, Singapore*

Stroke is the leading cause of long-term disability in Singapore. Early and intensive rehabilitation during the first 3 months after stroke is critical in minimising disability and improving outcome. Currently in Singapore, the availability of staff and facilities for in-patient rehabilitation is limited, whereas the level of expertise and intensity in rehabilitation provided in out-patient clinics may be suboptimal for stroke management. Furthermore, costs and the transport requirements result in under-utilisation of out-patient rehabilitation resources. An Early Supported Discharge Service (ESDS) can address the specific needs of stroke patients by providing intensive rehabilitation in the home environment and involvement of care-givers of patients via a mobile team of therapists during the early post-stroke period. Such a service for stroke patients in Europe, USA and Australia was previously reported to result in improvements in long-term outcome without any notable increase in the costs of stroke care.

With a donation from the Shaw Foundation, an ESDS for stroke patients was recently set up at the National University Hospital, Singapore. The service consists of a physiotherapist, an occupational therapist, a nurse clinician and a stroke neurologist, with support from medical social worker and speech therapist. Acute stroke patients who are medically stable, have care-givers at home, and who do not require further in-patient medical, nursing or rehabilitation care are eligible. A maximum of 4 home therapy sessions per week for up to 3 months are provided. We aim to evaluate the demand, acceptance, clinical outcome and cost effectiveness of such a programme in Singapore during a 2-year period. In this lecture, issues concerning the planning, funding, organisation and administration of this programme will be discussed; and the acceptance, satisfaction, patient characteristics and clinical outcome of the initial forty patients who participated in the programme will be presented.

### A3.3

#### **Setting Pharmacist-managed Anticoagulation Clinic (ACC) in Primary Care**

**MUI ENG LIM**

*National Healthcare Group Pharmacy, National Healthcare Group, Singapore*

The setting up of Pharmacist-Managed Anticoagulation Clinic in NHG Polyclinics is to assist physicians in managing patients who are on warfarin, with the aim to achieve the desired outcome of 1) improving patients' adherence to prescribed regimen through education and empowerment, 2) decreasing bleeding or thrombosis complications and 3) increasing

patients' satisfaction through improved quality of life.

Piloted at Clementi Polyclinic in April 2007, patients who are on oral anticoagulants are systematically referred to ACC pharmacist for comprehensive management. The ACC pharmacist reviews and interprets the INR; troubleshoots the cause of askew INR (if any); assesses patient for compliance with, and/or complications, to the therapy; recommends appropriate warfarin dose and provides health education.

ACC operates once weekly within the premise of the NHG Polyclinics, and the team – which comprises a senior family physician, an ACC-certified pharmacist and health assistant – looks after approximately 75% of the warfarin patient cohort. This has helped to maximise, with more effective utilisation of, resources. At present, we have managed to achieve international recommendation of reviewing warfarin patients every 8 weekly (instead of the previous 12 weekly doctor's visit) and the organisational goal of 95% of our recruited patient population within the desired therapeutic range.

### A3.4

#### **Effectiveness of a Telephone Coaching Disease Management Programme**

**JULIE ANDREWS**

*Health Services, Medibank Private, Australia*

In November 2005, Medibank Private launched a tailored disease and case management telephone based coaching service for chronically ill members. The programs being offered focus on congestive heart failure, chronic obstructive pulmonary disease, heart disease and diabetes. Over 5,000 members are currently enrolled.

To ensure rigour and validity in the evaluation of this program, a randomised controlled trial design has been developed. As specific disease streams of members (e.g., COPD, CHF patients) are targeted for the program, Medibank uses a random algorithm to divide the group into two; one subgroup is enrolled immediately into the program, while the other is simply monitored for a 12-month period before being enrolled. Eventually, all eligible members are offered access to the program, but the window of delay for a randomly-selected half provides an opportunity to measure the short-term benefits of the CDM program.

Randomised groups within each disease stream are evaluated on the bases of change in health status; quality of life; compliance with clinical protocols and self-management capacity; and healthcare utilisation and cost.

Early results show improvements in self management behaviours, an increase in members' sense of wellbeing and some changes in utilisation, e.g. in length of stay.

Lessons learnt from conduct of the program have led to a significant review of Medibank's future health management approach including whether a specific disease intervention model is the most effective for its members.

#### A4.1

##### **The Control of Type 2 Diabetes and its Complications in a Primary Care Centre in Malaysia**

**BOON HOW CHEW<sup>1</sup>, YOOK CHIN CHIA<sup>2</sup> AND EE MING KHOO<sup>2</sup>**

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**Introduction:** There are national and international guidelines to treat diabetes mellitus to the recommended targets so as to reduce complications. In spite of this, a large proportion of diabetic patients are still not controlled to these targets.

**Aim:** To determine the proportion of patients with Type 2 Diabetes (T2D) in an urban academic institution who meet treatment goals and who suffer from complications.

**Methods:** The 3 most recent Fasting Plasma Sugar (FPS) and HbA1c within the past 3 years were taken as measures of diabetic control. The most recent systolic blood pressures (SBP), diastolic blood pressures, year of onset of T2D, earliest single proteinuria and other complications were captured from records.

**Results:** 212 patients were included into the study. Two thirds were females. The mean age was 62.7 (SD ± 10.8) years and duration of T2D was 11.74 (SD ± 6.7) years. A quarter achieved HbA1c ≤ 7.0% (23.6%) and only 8.0% achieved FPS < 6.0 mmol/L. The most prevalent comorbid condition was hypertension (77.3%). 24.5% had blood pressure < 130/ 80 mmHg. 72.8% had no complication. 9.9% had had either coronary artery disease or proteinuria < 1 gm/L, these 2 were the most common complications. 14.6% had diabetic proteinuria; out of which 32.3% had more than 1 gm/L. 2.8% had proliferative diabetic retinopathy and 5.2% had a stroke.

**Conclusion:** Poor control of T2D and SBP was found to be highly prevalent in this study but with relatively low complication rate.

#### A4.2

##### **Improving Glycaemic Control in Poorly Controlled Diabetics**

**SABRINA WONG<sup>1</sup>, LAY SZE TEO<sup>1</sup>, SUAT LUI OO<sup>1</sup>, AJJIKUTTIRA UTHAIAH NIRAN<sup>1</sup>, SERENE FOO<sup>1</sup>, WEI CHEK FOR<sup>2</sup>**

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**Introduction:** Improvement of glycaemic control in poorly controlled diabetics has been associated with a significant reduction in micro and macrovascular complications as well as mortality. However, 32.4% of diabetic patients in our practice were found to have poorly controlled diabetes (HbA1C > 8%). This study was conducted to determine the causes for poor diabetic control and to implement interventions that targeted

those causes.

**Methods:** HbA1C level readings for all diabetic patients were obtained for the period of May to December 2007. Using a patient survey and review of patients' medications, it was found that the predominant problems faced by poorly controlled diabetics were that of dietary non-compliance, inconsistent treatment offer and insufficient adjustment of medications (oral drugs or insulin). Two main interventions were implemented: a senior doctor-led diabetes clinic was started catering specifically to poorly controlled diabetics. In addition, a care manager-led insulin titration program was initiated, incorporating home glucose monitoring and a simple protocol of insulin adjustment.

**Results:** After 8 months, the proportion of poorly controlled diabetics decreased from 32.4% to 18.5% ( $P < 0.001$ ).

**Conclusion:** The use of specialised clinics targeting high-risk patients resulted in significant improvement in clinical outcomes. The expansion of the role of the care manager has been found to be beneficial and should be further explored, especially in area of insulin therapy.

#### A4.3

##### **Feet for Life – A Programme on Diabetic Foot Screening**

**JC TAY<sup>1</sup>, A NG<sup>2</sup>, M TOH<sup>3</sup>, A A NATHER<sup>4</sup>**

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**Aim:** Clinical practice guidelines recommend annual foot examination for all diabetic patients. Traditionally, podiatrists conduct diabetes foot screening (DFS) but the rate remained low in National Healthcare Group (NHG) as there were insufficient podiatrists to service the number of patients. This screening program was initiated to improve foot screening in patients with diabetes mellitus.

**Methods:** The NHG DFS programme trained nurses and podiatry assistants (PA) to perform first-tier DFS and provide foot care education in hospitals. A 10-day multi-disciplinary training programme was organised for the nurses and podiatrist assistants. The lectures and practicals focused on assessment for vasculopathy, neuropathy, infections and counseling skills on foot care. Foot screening equipment was purchased and patient education materials were produced. The DFS service started in May 2006 with 4 nurses and PAs providing first-tier foot screening and foot care education at the NHG hospitals. Patients were classified according to the King's Risk Classification.

**Results:** From May 2006 to May 2007, DFS screened 2,728 patients. Half the patients were classified as "Low Risk" foot (Stage 1); 40% as "At Risk" (Stage 2) and 10% as "High Risk" with ulcers, cellulitis or early necrosis (Stages 3 to 5) requiring

referral to podiatrists, orthopaedic or vascular surgeons. Incidentally, the rate of major lower limb amputations had also decreased from 2004 to 2006, a fall of 26% in NHG.

**Conclusion:** The DFS programme trained nurses and PAs to perform first-tier DFS and foot care education for diabetic patients and complemented the podiatry service. Half the patients screened by these nurses and PAs had "high risk" foot requiring further intervention.

#### A4.4

##### **Depression and Diabetes: Detection, Barriers, and Interventions**

**PRASUNA REDDY<sup>1</sup>, JAMES A DUNBAR<sup>1</sup>, KELLY BUTTIGIEG<sup>1</sup>, BENJAMIN PHILPOT<sup>1</sup>, NATHALIE DAVIS-LAMELOISE<sup>1</sup>**

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**Aims:** Despite substantial evidence of its adverse effects on the presentation and course of type 2 diabetes mellitus (T2DM), depression is still under recognised and under diagnosed in primary care. The aims of the two studies presented here were to: (a) examine the prevalence of depression in patients with T2DM in primary care practices in Victoria, and (b) investigate the barriers that health professionals experience in identifying and managing co-morbid depression in T2DM.

**Methods:** Study 1: Seven general practices in metropolitan and rural Victoria were selected on 3 criteria: (1) sufficiently large numbers of patients with T2DM; (2) the diagnosis of T2DM could be verified by patient record, and (3) an on-site GP was able to follow-up patients. All patients with T2DM were screened for depression using 2 standard measures (HADS and PHQ-9). Study 2: Participants (n = 149) were health professionals working with T2DM patients who completed a self-report questionnaire assessing barriers to depression identification and management.

**Results:** Across all 7 practices, the proportion of patients with T2DM reporting moderate-severe depression ranged from 9% to 12%. A further 12% reported mild depression. Patients reporting mild levels of depression were found to have high levels of cholesterol and 97% had hypertension. Health professionals identified specific barriers at the patient, practitioner and system levels that impeded identification and management of co-morbid depression.

**Conclusion:** Our results show that prevalence rates of clinical depression are higher than those reported in the general population. Barriers need to be addressed at multiple levels. Health checks should include screening for depression and related risk factors. Implementation of effective prevention and treatment programs must become standard clinical practice. We discuss a program that has been trialled in Australia for

management of co-morbid depression in primary care and a training program for health professionals.

#### A5.1

##### **Improving In-hospital Care of Patients with Acute Decompensated Heart Failure in Tan Tock Seng Hospital**

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**Introduction:** Heart failure (HF) is ranked 6th in Singapore as the principal cause of hospitalisation and death. In 2007, Tan Tock Seng Hospital (TTSH) received a quarter of HF hospitalisations in Singapore. The main causes for readmissions are acute coronary syndromes, non-compliance/ignorance, arrhythmias, and infections. In September 2006, a Heart Failure subspecialty service (HFS) was created to improve the management of all HF patients. The HFS comprises case managers, pharmacists, and a HF cardiologist.

**Methods:** We compared the following JCAHO outcomes between patients managed by HFS, general cardiology (CVM) and non-cardiology units (non-CVM) from September 2006 to August 2007 using independent T-tests: unscheduled readmission within 30 days, average length of stay (ALOS), and percentage of patients without contraindications who were discharged with Angiotensin-Converting-Enzyme-Inhibitors (ACE-I)/Angiotensin-Receptor-Blocker (ARB) and Beta-Blockers (BB).

**Results:** No significant difference was observed between HFS and CVM in the outcomes of ACE-I/ARB ( $P = 0.901$ ; 95% CI, -0.039 to 0.044), BB ( $P = 0.729$ ; 95% CI, -0.094 to 0.066) and ALOS ( $P = 0.716$ ; 95% CI, -0.510 to 0.743). Significant differences were observed for unscheduled readmission <30 days between HFS (8.6%) and CVM (3.7%) ( $P = 0.001$ ; 95% CI, 0.049 to 0.194); and between HFS and non-CVM (4.6%) ( $P = 0.000$ ; 95% CI, 0.051 to 0.168). Comparing HFS and non-CVM, there was no significant difference for patients discharged with ACE-I/ARB ( $P = 0.609$ ; 95% CI, -0.070 to 0.041) and BB ( $P = 0.185$ ; 95% CI, -0.037 to 0.192); HFS achieved 98% and 81% compliance for ACE-I/ARB and BB respectively, compared to just 58% and 57% under non-CVM. In addition, ALOS for HFS patients was significantly lower at 5.6 days compared to non-CVM at 7.3 days ( $P = 0.000$ ; 95% CI, -1.945 to -0.697).

**Conclusion:** This is a preliminary study on the impact of the HFS on patient outcomes. This is a positive step towards better management of the HF patients by adopting a disease management approach.

## A5.2

### **A Modified Home Exercise Programme Reduces Hospital Utilisation in Patients with Chronic Obstructive Pulmonary Disease (COPD)**

**FL NG<sup>1</sup>, A NG<sup>2</sup>, C PNG<sup>3</sup>**

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**Aim:** To provide an alternative exercise programme for patients who refuse to participate in a pulmonary rehabilitation programme.

**Methods:** Patients who refuse to participate in a structured pulmonary rehabilitation programme will be referred for the modified home based exercise programme. While hospitalised, the physiotherapist will teach the patient the exercises. If the physiotherapist is not available, the case manager will use a video recording of the exercise programme to teach. The video is developed and produced by the COPD team. After discharge, patients will receive regular calls by the case manager to remind them to exercise and address any issues or concern.

Functional status and quality of life are tracked using the 6-minute walk test (6MWT), and St George Respiratory questionnaires (SGRQ). These are done before discharge and repeated in 4 to 6 weeks as outpatient.

**Results:** Twenty-seven patients completed the programme with a pre- and post-SGRQ. An improvement of 5 points score is observed, total score from 44.37 down to 39.3. (An improvement of 4 points in SGRQ score is considered significant). Sixteen patients completed the pre- and post-6MWT. An improvement of 81 m was observed, from 203 m to 284 m (An improvement of 54 m in 6MWT is considered significant). The hospitalisation rate in 6 months was reduced by 10% from 1.3 episodes (range, 1 to 7). The average length of stay was shortened by 7% from 3 days pre programme.

**Conclusion:** Patient's reluctance to participate in a structured exercise can be overcome by introducing a modified home exercise, which can be easily taught and learnt. Findings from this small study show that cheap simple exercise programme can improve the quality of life and reduce the hospitalisation rate.

## A5.3

### **Trends in Rehabilitation Efficiency and Effectiveness in a Community Hospital**

**GERALD KOH<sup>1</sup>, BOON YEOW TAN<sup>2</sup>, NGAN PHOON FONG<sup>2</sup>, KINMING CHAN<sup>3</sup>, EDWARD MENON<sup>4</sup>, CHYE HUA EE<sup>5</sup>, SENG KWING CHEONG<sup>1</sup>, TECK YEE WONG<sup>1</sup>, ANGELA CHEONG<sup>1</sup>, KEE SENG CHIA<sup>1</sup>, DAVID KOH<sup>1</sup>**

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Community Hospital, Singapore, <sup>5</sup>Bright Vision Hospital, Singapore

**Aim:** To study the annual trends in rehabilitation efficiency (REy) and effectiveness (REs) among patients in a community hospital.

**Methods:** We manually extracted data from medical records of all first admissions to a community hospital from 1998 to 2005 who received at least 2 weeks of rehabilitation (n = 2,279). We collected socio-demographic data, primary diagnosis for admission and medical co-morbidity data using the Charlson Co-Morbidity Index (CMI), and admission and discharge Shah modified Barthel Index (BI) scores, and REy and REs scores were calculated. We determined crude mean REy and REs scores for each year of admission. We also determined adjusted REy and REs scores after controlling for independent predictors of REy and REs identified by multiple linear regression.

**Results:** Crude mean REy score improved from 7.4% in 1998 to 18.8% in 2005 (beta coefficient = +0.29, *P* <0.001), and crude mean REs score improved from 35.5 in 1998 to 45.5 (units per 28 days) in 2005 (beta coefficient = +0.11, *P* <0.001). However, adjusted REy and REs scores remained unchanged through the years. Independent predictors of REy and REs that showed a decreasing trend from 1998 to 2005 were % of patients with dementia and previous stroke, admission total BI score and age. Independent predictors of REy and REs that showed an increasing trend were % with peripheral vascular disease and no caregiver.

**Conclusion:** Since 1998 to 2005, crude rehabilitation efficiency and effectiveness in a community hospital has increased, but adjusted rehabilitation efficiency and effectiveness has not.

## A5.4

### **Findings from In-depth Interviews of Patients with Poorly Controlled Type 2 Diabetes Mellitus**

**KHARGEK WENDY NG<sup>1</sup>, MOON LIANG ELIZABETH HO<sup>1</sup>, CHEE LING SHARON FOO<sup>1</sup>**

<sup>1</sup>Nursing, National Healthcare Group Polyclinics, Singapore

**Aim:** This study aims to explore the gap between knowledge and behaviour among Type 2 diabetes patients who have poor glycaemic control in Hougang polyclinic. The research question is "what is stopping my patients from engaging in healthy self care behaviours?" This issue will be explored in 3 main domains. They are emotional, motivational and contextual.

**Methods:** A qualitative approach is used in this study. Five subjects underwent an hour in-depth individual interview. The subjects were purposefully selected to meet the criteria of i) having an HbA1C% over 8% for a year and ii) able to articulate their experiences and feelings. The interviews were recorded in MP3 format. Transcriptions of the interview were done by 2 transcribers to ensure data reliability. Each subject's data were analysed as a case uniquely on its own. Data were

summarised and framed to tell the subject's experience in coping with diabetes mellitus from the subject's perspectives.

**Results:** Study has shown that each subject has different strong theme in the way they cope with diabetes. Themes identified include: self-defeating mind sets, beliefs, discrepancies of what they want and what they do, failure to consider the consequences etc.

**Conclusions:** The concept of behaviour change is complex. It is evidenced that patient education has to incorporate strategies such as reflection, reframing and amplifying discrepancies. As nurses providing only knowledge to patient with chronic conditions cannot effect the transmission of behaviour change.

### A5.5

#### **A Structured Patient Empowerment Programme to Manage Patients with Hypertension in Hougang Polyclinic**

**NOR SHAWIYAH HARON**

*Nursing, National Healthcare Group Polyclinics, Singapore*

**Introduction:** Hypertension is a major health problem globally. It is also a major risk factor for stroke, coronary heart diseases, renal failure and peripheral vascular disease. Uncontrolled blood pressure may increase the risk of having these complications. It is important to educate and empower patients to self-manage their conditions and maintain good blood pressure control.

**Aim:** The aim is to assess the implementation of a structured patient empowerment programme to improve self management in patients with hypertension.

**Methods:** Patient Empowerment Programme was implemented in March 2006. Patients who met the enrolment criteria and motivated to manage their condition were enrolled into the programme. In the programme, the nursing interventions include teaching of self-management skills, goals setting, building patients' confidence in changing health behaviours and telephonic follow-up calls. Patients' information were entered into a database. Data were extracted from case notes review and database for a cohort group of patients recruited from March to September 2006. Analysis was done using SPSS version 14.

**Results:** Preliminary results showed that 95% were Chinese. The mean age of the subjects was 60 years. 90% of the subjects knew how to manage their blood pressure using the Hypertension Management Plan. 95% of the subjects had their blood pressure maintained within target level. 100% of patients reported compliance to medication and 88% complied to the 3-month interim visit to the nurse.

**Conclusion:** The process outcomes showed in this study strongly supported the importance of a structured patient empowerment programme in self-managing of patients with hypertension.

### A5.6

#### **A Team-based Approach to Diabetes Management in a Primary Care Setting: Outcomes of Patients with Regular Follow-up**

**WOAN SHIN TAN<sup>1</sup>, LOO SEE YEO<sup>2</sup>, DORIS LIEW<sup>2</sup>, BEE HOON HENG<sup>1</sup>**

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**Aim:** To assess the impact of a team-based approach to manage diabetic patients with poor cardiovascular risk control. In addition to routine care provided by the doctors and dieticians, diabetic patients with poor cardiovascular risk control were referred to care managers to strengthen their ability to self-manage.

**Methods:** This is an observational study. Patient information is entered routinely into a database. Patients' haemoglobin A1c (HbA1c), body mass index (BMI), blood pressure (BP) and low-density lipoprotein cholesterol (LDL-c) levels were compared at baseline, 1 and 2 years.

**Results:** Data were available for 1826 patients who were followed up with regular hbA1c test at 6, 12, 18 and 24 months. Baseline HbA1C was  $9.0 \pm 1.5\%$  (mean  $\pm$  SD), which fell to  $8.4 \pm 1.2\%$  ( $P < 0.001$ ) at 1 year before rising to  $8.6 \pm 1.4\%$  at 2 years ( $P < 0.001$  from baseline). Sub-group analysis showed that the glycaemia levels of patients with baseline HbA1c  $\leq 8\%$  increased from  $7.4\% \pm 0.5\%$  to  $7.9 \pm 1.0\%$  at 2 years ( $P < 0.001$ ) whereas those with HbA1c  $> 9\%$  dropped from  $10.3 \pm 1.3\%$  to  $9.2 \pm 1.6\%$  ( $P < 0.001$ ). While LDL-c and BP of hyperlipid and hypertensive patients improved significantly over 2 years, their BMI remained unchanged.

**Conclusion:** Although the study suffered from the lack of control, it has shown that a team-based approach was associated with a persistent reduction in HbA1c, BP and LDL-c for high-risk diabetic patients who returned for regular appointments.

### A5.7

#### **Home Blood Glucose Monitoring Data Management System for Patients with Type 2 Diabetes on Insulin Therapy**

**SOH MUI NG**

*Nursing, National Healthcare Group Polyclinics, Singapore*

**Introduction:** Home Blood Glucose Monitoring (HBGM) is an important component of the treatment for patients with diabetes on insulin therapy to optimise their glycaemic control and prevent complications. However, the uptake rate of HBGM is generally low. In NHGP, we have initiated a programme to engage and empower patient to do HBGM.

**Aim:** The aim is to leverage on technology and a structured programme to engage and empower patients to take control of their condition.

**Methods:** Patients that have been prescribed to start on insulin therapy will be offered this programme. It was implemented in all 9 clinics in October 2007. A total of 46 patients have been enrolled. The care manager will teach patients on how to self administer insulin, perform HBGM, learn about lifestyle changes and do telephone follow-up. Patients do not need to record their blood glucose readings manually. Glucometers are loaned to the patients and readings are stored automatically. The HBGM data management system that is installed in the care manager's computer enables the trend of the glucose levels to be printed. The care manager will then teach patients how to interpret the glucose trends, spot possible problems and work with doctors to identify opportunities to fine-tune management. Outcomes measures such as episodes of hypoglycaemia, medication compliance, correct technique on insulin administration and HBGM will be evaluated for the effectiveness of the programme.

**Conclusion:** This HBGM data management system and structured programme have facilitated the uptake of HBGM and engaged patients in self-managing their condition.

#### A5.8

##### **Utility of a Chronic Disease Patient Education Folder among General Physicians**

**ANDY TAN<sup>1</sup>, RATNALA SUKANYA NAIDU<sup>2</sup>, HANDY AMIN<sup>1</sup>, SHIRIN WADIA<sup>1</sup>, SAROJINI THANARAJAH<sup>3</sup>, ANBUMALAR RAMIAH<sup>4</sup>**

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**Aim:** As part of the Chronic Disease Management Programme (CDMP), Health Promotion Board (HPB) distributed a patient education folder, "AIM Be In Charge of Your Health" in 2007. The folder comprised 3 booklets to: 1) educate patients on chronic disease management, 2) facilitate self-monitoring and, 3) inform on Medisave use for outpatient treatment. This study aims to evaluate the utility of the folder among general physicians (GPs).

**Methods:** Structured interviewer-administered survey among GPs in clinics enrolled in the Medisave for CDMP.

**Results:** Among eligible clinics, 518 interviews were completed (response rate=72%). 93.7% of GPs felt that the folder was useful. 73.7% of GPs distributed the folder to patients, of which less than half (44.0%) used it for patient education. The main reasons for not distributing the folder included low prevalence of chronic diseases in their patient pool (18.8%) and the lack of interest among patients (13.8%). The most frequent uses of the folder were to educate patients on lifestyle modifications (97.2%), potential complications of uncontrolled disease (91.5%), and foot care for diabetics (85.8%). The reasons for not using the folder were preference in educating patients verbally, use of other materials, and time constraint

with using the folder.

**Conclusion:** The majority of GPs found the package useful. However, a smaller proportion distributed the folder and used it for their patient education due to preferences and constraints in the clinic setting. To address these limitations, HPB will launch the Nurse Health Educator programme aimed at complementing patient education efforts by the GPs.

#### A5.9

##### **Planning for Community-based Health Promotion Programmes: Implications for Programme Planning**

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**Aim:** A survey was conducted to identify the perceptions of Singaporeans on community-based health promotional programmes and their perceived disease prevention needs. Insights into the perception and needs for health promotion is especially important in view of Singapore's growing ageing population and the need to promote good health amongst the elderly.

**Methods:** A health needs survey was administered to 120 participants from the general public through convenience sampling. Descriptive statistics were employed to identify trends.

**Results:** The majority of participants viewed health as being very important. 82.46% of the subjects thought that having regular exercise was one of the best ways in staying healthy. Fifty per cent of those above 60 years believed that having a good support system was essential to staying healthy, while 51.96% of those aged between 40 to 59 years considered emotional well being as being important. The top 3 health programmes that participants were interested to join were exercise/weight loss programmes, educational talks regarding healthy lifestyle and educational talks regarding medical conditions. However, 77.5% of the population indicated that they had not participated in any health promotional programmes before. The main barriers faced were time-related issues (70.0%), lack of awareness of such programmes (33.33%), transportation-related problems (25.83%) and financial difficulties (25.0%).

**Conclusion:** The results from the study found that although participants had identified that health was important to them and appeared interested in specific health promotional programmes, only a minority had attended such programmes. Nevertheless, these findings can provide insight into the planning of such health promotional programmes so that perceived barriers can be overcome and that the needs of the community are met.

## A5.10

### Predictors of Cardiovascular Health Screening among Healthy Singapore Residents

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<sup>1</sup>Health Services and Outcomes Research Department, National Healthcare Group, Singapore

**Aim:** To study the predictors of cardiovascular health screening among healthy middle-aged Singapore residents and identify the segment of the population for more intense health promotion.

**Methods:** A population-based survey on screening for hypertension, diabetes mellitus and hypercholesterolemia, involving Singapore residents aged 15 to 69 years was conducted from December 2004 to October 2005. Households were randomly selected by the Department of Statistics and interviews were carried out by trained surveyors using a standard questionnaire. The predictors of screening for healthy respondents aged 40 to 69 years was compared by univariate and forward stepwise logistic regression analyses using SPSS v15, where a  $P < 0.05$  was considered statistically significant.

**Results:** Demographic characteristics of 2,632 respondents correspond to the general population, of which 940 respondents aged 40 to 69 years were not known to have a chronic diseases; i.e. hypertension, diabetes mellitus, hypercholesterolaemia, heart disease or stroke. Screening rates for hypertension, diabetes mellitus and hypercholesterolaemia were 80.9%, 64.8% and 51.6% respectively. Factors independently associated with screening for hypertension were family history of hypertension and higher educational levels; for diabetes were those with family history of cardiovascular risk factors, higher educational levels and who exercise regularly; and for blood cholesterol were those with family history of hypertension or diabetes, higher educational levels, non-smokers and who exercise regularly.

**Conclusion:** The study identified gaps in screening for high blood pressure, diabetes mellitus and high cholesterol amongst middle-aged Singapore residents. We should identify and educate people with no or primary education on the importance of early detection of cardiovascular risk factors.

## B1.1

### Be Your Own Boss: Self-management Support for Youth

**STEPHANIE DONALDSON KELLY<sup>1</sup>, PEGGY CLARKE<sup>1</sup>, TANYA SNICER<sup>1</sup>, ANGELA ESTEY<sup>1</sup>**

<sup>1</sup>Chronic Disease Management, Capital Health, Canada

**Aim:** The Capital Health Live Better Every Day Program is based on the Stanford Chronic Disease Self-Management Program and has been offered by Capital Health since 2005. Although this is a well-supported approach for adults who want to improve the ability to self-manage their symptoms,

there is no corresponding programming for adolescents who are struggling with chronic disease management issues.

**Methods:** Capital Health has developed a modified workshop to serve older adolescents who have chronic conditions such as spina bifida, cancer, and diabetes. This modified workshop was developed by a multidisciplinary team including registered nurses, registered psychologists, and Stanford Master Trainers and leaders with the assistance of teen "champions". The development process included having a group of teen champions participate in the adult workshop and leader training, and eliciting their feedback about possible changes after each session. Modifications were made to program content and delivery method, including multimedia components and age-appropriate examples. The second component of the program includes a concurrent parent support group, which is designed to provide parents with complementary information and assist them in supporting the development of their child's independence.

**Results:** The rationale and empirical support for these workshops will be discussed. Preliminary summary results of feedback provided by teen champions and participants will be presented. Implications for further development of self-management support programming for other populations will be discussed.

**Conclusion:** Youth with chronic conditions benefit from self-management support as they transition to adulthood.

## B1.2

### Outcome of the Self-care Stress Management Program

**JEFFREY CHI-FUNG KWAN<sup>1</sup>, PAMELA LIN<sup>1</sup>, WAI-KUEN CHAN<sup>1</sup>, YUK-NGA TSE<sup>1</sup>**

<sup>1</sup>Occupational Therapy Department, Castle Peak Hospital, Hong Kong

**Introduction:** Stress is a dynamic process of interaction between a person and his life. The influence of stress on physical, mental and psychological is well documented. A Self-care Stress Management Program was developed and aimed at facilitating clients in coping deleterious effect of stress. A Triple-E model was adopted in this health promotion approach. It was utilised to address Early prevention, Early detection and Early intervention of stress-related disorders and promote positive mental health.

**Aim:** Project aimed to provide a standard occupational therapy program in an out-patient clinic for ensuring the service quality and a pilot investigation was conducted to identify its effectiveness.

**Methods:** Participants were recruited by purposive sampling from an out-patient clinic. Assessments were conducted before and after the 4 sessions of Self-care Stress Management Program. Clinical response was evaluated using the Social Readjustment Scale (SRS) and the Chinese Beck Depression Inventory-I (CBDI-I).

**Results:** Fourteen participants were recruited. The median of SRS at post-program (Mdn 86.5) was significantly lower than that at pre-program (Mdn 122.5) ( $z = -2.578, P < 0.05, r = 0.49$ ); while the median of CBDI-I was also significantly lower at post-program (Mdn 7) than pre-program (Mdn 14.5) ( $z = -2.942, P < 0.01, r = -0.56$ ).

**Conclusion:** The purpose of this program is to facilitate Early prevention, Early detection and Early intervention of stress-related mood problems through educational activities and onsite assessments. With the promising result of this pilot investigation, this program is beneficial to clients and could serve as a pioneer for future RCT studies to achieve more influential results.

### B1.3

#### Me Managing Me Self-Management for Children

**CAROL SPARGO<sup>1</sup>, JENNY BENNETT<sup>2</sup>**

<sup>1</sup>Australia, <sup>2</sup>Education Department, Arthritis Foundation of South Australia, Australia

Self-management skills provide a framework for people with chronic conditions within which they can plan, organise and manage their condition. Children with chronic conditions rely heavily on parents, doctors and health professionals for information and guidance on what they should and should not do. Me Managing Me was developed as a self-management course for all children based on the premise that good self-management benefits all children and that, when these skills are well developed, children can manage their life and deal effectively with challenges to their health and well being.

Me Managing Me is designed to be used on several levels, as a targeted program for years 2 to 8, as a resource to be intergrated into the existing school curriculum and as a program for use in hospitals, specifically for children with health issues.

Included is a supportive program for parents that develops their understanding of what self-management skills are and enables them to support their children to become good self managers.

Topics include setting goals through action plans, problem solving, relaxation, communication, good eating habits and exercise. Within each topic students focus on learning the what, how and why through activity, group work, brainstorming, problem solving and formal learning.

Additional modules can be used to teach children about specific chronic conditions and how to manage them.

### B1.4

#### A Population-based Framework for Patient Education and Empowerment

**SHYAMALA THILAGARATNAM**

Active Health Management, Health Promotion Board, Singapore

As Singapore's population ages and the prevalence of chronic diseases such as diabetes, hypertension and lipid disorders rises, it is important that health promotion efforts reach not just the healthy population but also the at-risk and unhealthy. Traditionally, health promotion in Singapore has mainly targeted the healthy with messages on healthy eating, regular exercise and smoking cessation, with the unhealthy being taken care of by healthcare providers. However, to achieve the goal of the 'informed, activated patient', as in Wagner's chronic care model, health promotion efforts need to reach the unhealthy. This presentation describes a population-based framework for patient education and empowerment in Singapore, as well as some of the programmes and initiatives that have been implemented, and that are in the pipeline. Key programmes include the community-based Nurse Educator programme, the Chronic Disease Management Programme and the National Health Portal initiative.

### B2.1

#### Designing a Healthcare Performance Framework

**M DEURENBERG-YAP<sup>1</sup>, EK LIM<sup>2</sup>**

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**Aim:** In recent years, many countries have been developing conceptual frameworks for monitoring, measuring, and managing the performance of their health systems to ensure effectiveness, equity, efficiency, and quality. Health systems are expected to achieve and manage results in line with established objectives and quality standards.

This trend is understandable as technological advances and rising consumer expectations continue to raise demand. There is also growing concern about rising healthcare costs, ageing populations, persistent quality gaps, variation in care provision, lack of accountability and inequalities. This paper describes the development of a healthcare performance framework for the local context, which arose as a result of the desire to have evidence-based health system performance assessment (HSPA), to guide policy decisions and provide suitable performance indicators for national and international benchmarking.

**Methods:** The following steps were undertaken in the development process:

1. Review of current healthcare performance frameworks internationally. Sources of information included official websites, electronic databases, country reports, key informants from various organisations/countries.
2. Develop a locally relevant framework integrating performance at national, institutional and speciality levels, covering different domains of care (preventive to palliative) and quality of care (effectiveness, access, safety, equity, patient-centredness, appropriateness), and recognising social determinants of health.
3. Selection of priority areas for indicator development. Criteria used for prioritisation included alignment with national goals, disease burden/costs, improvability, and known variation in quality.
4. Selection of indicators (processes and outcomes). Indicators were considered based on purpose (accountability, quality improvement), importance, scientific validity, feasibility/costs and availability of benchmarks.

For each of the steps, relevant key stakeholders were consulted. In addition, external (international) reviews were obtained for the entire process.

**Results:** The process led to the development of a healthcare performance framework, which is currently being implemented nationally, beginning with the public sector.

**Conclusion:** It is important to note that the healthcare performance framework does not replace actual performance, but fulfils the niche of creating a regulated performance environment and stimulating a culture of continuous improvement.

## B2.2

### Measuring Performance in Healthcare (Quality, Costs and Utilisation)

**SOEREN MATTKE**

*RAND Corporation, Arlington, VA, United States*

Evaluating healthcare performance requires thoughtful decisions about the key indicators that are being used to determine successes and failures and to learn from past experience. Those decisions require balancing scientific rigor and practical considerations and being cognizant of the respective context.

This breakout session will address the decision process in selecting performance measures and cover the following areas:

- 1) How does the intended purpose of the measures influence the selection?
- 2) Which are the main steps in the selection process?
- 3) Which criteria should be used to select measures? 4) What is a realistic approach to measures selection that is sensitive to constraints in data availability and resources?
- 4) How can measures be maintained in the long run?

The discussion of fundamentals and principles is combined with examples to illustrate how theory translates into practice.

## B2.3

### Use of Quality Indicators to Assess Diabetes Care at the Specialist Outpatient Clinics in Singapore

**MATTHIAS PAUL HAN SIM TOH<sup>1</sup>, GABRIEL ZHI-WEIJIANG<sup>1</sup>, BEEHOONHENG<sup>1</sup>, JASON TIANG SENG CHEAH<sup>2</sup>**

*<sup>1</sup>Health Services and Outcomes Research Department, National Healthcare Group, Singapore, <sup>2</sup>Clinical Project Management and Planning, National Healthcare Group, Singapore*

**Aim:** Use quality indicators to study variability of care delivery for diabetes patients at the National Healthcare Group (NHG) hospitals in Singapore.

**Methods:** Quarterly statistics of all patients with diabetes mellitus aged 16+ years on follow-up at 3 acute hospitals in NHG between January 2006 and December 2007 were obtained from the Chronic Disease Management System. Process indicators included the rates of glycosylated haemoglobin (HbA1c), LDL-cholesterol (LDL-c), nephropathy tests and eye examination; intermediate outcome indicators included the proportion of patients with poor HbA1c (>9%) and optimal LDL-c (<2.6 mmol/L) control. These were benchmarked against the Healthcare Effectiveness Data and Information Set (HEDIS) indicators for comprehensive diabetes care by the National Committee for Quality Assurance (NCQA) in USA.

**Results:** Over the 2-year period, rates of HbA1c testing (74%-96%) and eye examination (10%-32%) remained stable across the 3 hospitals. There was a gradual increase in the rate of LDL-c test from 73%-85% to 86%-89%, with a relative improvement of 3%-18%; and nephropathy test from 34%-71% to 52%-74%, with a relative gain of 4%-54%. There were fewer patients with poor HbA1c control, decrease from 17%-24% to 16%-18%, with a relative drop of 7%-25%; and more patients with optimal LDL-c control, increase from 47%-56% to 50%-62%, with a relative drop of 2%-11%. Rates of all 4 process and 2 intermediate outcome indicators were comparable with the HEDIS benchmarks in 2005.

**Conclusion:** There is variation across the hospitals for the rates of key process indicators for quality diabetes care and these can be further improved.

## B2.4

### Managing Diabetes: A Coordinated and Systematic Approach

**FORD DALE<sup>1</sup>, DAVID LYON<sup>2</sup>**

*<sup>1</sup>Improvement Foundation, Improvement Foundation, Australia, <sup>2</sup>Improvement Foundation, Improvement Foundation, United Kingdom*

Diabetes is a significant problem in the UK and Australia as it is internationally. Type 2 diabetes has become one of the leading threats to the health of all Australians and with the complications of heart attack, stroke; blindness and kidney

damage it needs a co-ordinated systematic, and measurable approach to prevention and management.

The National Primary Care Collaborative (the first of Improvement Foundation UK programs) is currently the world's largest health improvement program covering over 5,000 practices and over 32 million patients. It has produced rapid results, including remarkable outcomes in Diabetes management:

- 80% improvement in digital retinopathy screening for Diabetics.
- 28.7% increase in diabetic patients with cholesterol <5 mmol
- 24.8% increase in diabetic patients with BP <140/80
- 143% improvement in patients who have received spirometry to confirm diagnosis

The Australian Primary Care Collaboratives participants have also achieved outstanding clinical outcomes for the 600+ participating practices to date.

This presentation will concentrate on the Change Principles and Change Ideas and examples which have enabled practices to produce these improvements in patient outcomes. Examples will include the development of Practice protocols with recall and targeted interventions; the process of running GP led multidisciplinary Diabetes mini-clinics, and using the power of measurement to alter Practice systems of care.

### B3.1

#### The Anatomy of an Osteoporosis Disease Management Program

**TC LAU<sup>1</sup>, L AU<sup>2</sup>, C RAJASOORYA<sup>3</sup>, SB CHIOH<sup>4</sup>, K TSOU<sup>5</sup>, ET KOH<sup>1</sup>**

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**Aim:** This paper aims to explore the set up and implementation of a successful osteoporosis disease management program, with focus on evidence-based medicine and healthcare delivery, establishment of a disease management program, funding issues, logistic and contextual considerations and the importance of team work.

**Methods:** The HSDP program for osteoporosis was an evidenced-based chronic disease management program that was conducted by trained care co-ordinators who recruited patients who have prior fragility fractures. The patients were educated on healthy lifestyle advices to prevent further accelerated bone loss, repleted with calcium and vitamin D, given bisphosphonate therapy (Risedronate or Alendronate) and assessed for appropriate falls-risk reduction strategies. Patients were also monitored by telephonic or face-to-face interview every 3 to 6 months to improve adherence to therapy.

**Results:** Prior to the start of the program, an audit of 442 consecutive admitted patients with fragility hip fracture was done. Only 16.0% of patients were on appropriate osteoporosis treatment after their fractures and the proportion dropped to 3.8% after 2 years. A repeat audit of 1130 patients was conducted from January 2004 to January 2005 after the implementation of the program, of which 508 (44.9%) patients agreed to start on osteoporosis treatment. The therapy adherence rate up to 2 years later was 71.2%. Therefore there was an eight-fold increase in the number of patients who have received appropriate osteoporosis therapy with the implementation of the program. Twenty-four hip fractures, 42 vertebra fractures (7 were symptomatic), and 23 other non-vertebra fractures occurred in 1643 patient-years of follow up. Therefore the hip fracture rate of participants on this program was 1.46%, vertebra fracture rate was 2.56% (0.43% symptomatic) and other non-vertebra fracture rate was 1.39% a year. This compares favourably with the expected hip fracture rate of 1.9% per year, vertebra fracture rate of 4.26% (1.0% symptomatic) per year, and non-vertebra fracture rate of 3.39% a year for this cohort of participants. There was a reduction of hip fracture rate by 23.1%, vertebra fracture rate by 39.9%, symptomatic vertebra fracture rate by 57.0%, and other non-vertebra fracture rate by 59.0%. The overall reduction in fracture rate was 42.4%

**Conclusion:** The HSDP osteoporosis disease management program which enrolled patients who have recently suffered a fragility fracture is effective in improving acceptance and adherence rate of therapy, as well as reduce the recurrent rate of fractures. A team of competent and dedicated workgroup members, adequate funding, and creative solutions to overcome problems encountered during implementation are the essential ingredients to ensure the success of the program.

### B3.2

#### A Multi-prong Strategy to Parkinson's Disease, Frailty and Falls

**LINA MA**

*Lions Home for the Elders, Singapore*

Parkinson's disease is a chronic progressive neurological disorder with potentially devastating consequences for any residents in the nursing home. The symptoms are likely to increase over time, with progressive loss of independence. Residents with Parkinson's disease will eventually faced with the problem of postural instability and frequent falls leading to injuries, reduced mobility, lost of independence, social isolation, loneliness and depression. This has an enormous impact on the quality of life for the resident.

Falls are typically multi-factorial in nature, and these factors may differ in different people. The presenter would like to share how she and her colleagues had developed a comprehensive falls program for one of their 54-year-old

resident who suffers from Parkinson's disease, and how it was applied in their nursing practice. It was a multi-pronged strategy with human science approach. The program has medical and management support. The strategies included hip protector, helmet, environmental modifications, exercise, gait training and, most importantly, the nurse-resident relationship. The practice perspective is very much focused on meaning, relations, values, patterns, and theme in human-universe-health process.

### B3.3

#### **Triaxial Accelerometry Systems for Managing Falls Risk**

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A third of people aged 65 years or over who live in developed countries fall each year. Falls are one of the leading causes of hospitalisation in this age group. As a consequence, methods to provide automatic alarm functions in the case of falls in independent living environments are becoming increasingly relevant. Ambulatory accelerometry systems have shown substantial promise for monitoring the frail elderly and for providing automatic alarming functions in the case of falls and other emergencies. Triaxial accelerometers can also be used to identify adverse events, such as stumbles and near falls, that could indicate an increased risk of falling.

We describe a falls management system capable of real-time falls detection in an unsupervised living context and remote longitudinal tracking of falls risk parameters. The key monitoring device used to perform these functions is a single wireless, waist-mounted, triaxial accelerometer.

Falls risk indicators and the onset of deficits in functional ability are ascertained by way of a directed-routine (DR) methodology. The DR comprises four separate tests based around sets of movements that have been shown to be correlated with falls risk. The DR tasks can be performed periodically in either a supervised or free-living environment. Clinical parameters for each DR movement are extracted and appended to the longitudinal record for the respective subject. A web-interface allows clinicians to login and view their patients' record thus facilitating the early detection of changes in the patients falls risk parameters. Initial results from a cohort of 45 patients are presented.

### B3.4

#### **Predictors of Rehabilitation Efficiency and Effectiveness in a Community Hospital**

**GERALD CHKOH<sup>1</sup>, TANBOONYEOW<sup>2</sup>, FONG NGAN PHOON<sup>2</sup>, CHAN KIN MING<sup>3</sup>, EDWARD MENON<sup>4</sup>, EE CHYE HUA<sup>5</sup>, CHEONG SK<sup>1</sup>, WONG TY<sup>1</sup>, CHEONG A<sup>1</sup>, CHIA KEE SENG<sup>1</sup>, DAVID KOH<sup>1</sup>**

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**Aim:** To study the predictors of rehabilitation efficiency (REy) and effectiveness (REs) among patients in a community hospital.

**Methods:** We manually extracted data from medical records of all first admissions to a community hospital from 1998 to 2005 who received at least 2 weeks of rehabilitation (n = 2,279). We collected socio-demographic data, primary diagnosis for admission and medical co-morbidity data using the Charlson Co-Morbidity Index (CMI), and admission and discharge Shah modified Barthel Index (BI) scores. REy and REs scores were calculated. We performed bivariate analysis for REy and REs with possible predictors and entered those whose  $P \leq 0.15$  into a multiple linear regression model to identify independent predictors.

**Results:** Independent negative predictors of REy in decreasing magnitude of association were dementia and higher admission BI score. Independent negative predictors of REs in decreasing magnitude of association were peripheral vascular disease, dementia, lower admission BI score, previous stroke, age and greater number of caregiver available.

**Conclusion:** Dementia is a predictor of rehabilitation efficiency and effectiveness. Lower admission Barthel Index scores are negative predictors of rehabilitation effectiveness but positive predictors of rehabilitation efficiency.

### B4.1

#### **Partnering Nurses with Family Physicians in Calgary, Canada**

**SANDRA DELON**

*Chronic Disease Management, Calgary Health Region, Canada*

A key feature of Calgary Health Region's chronic disease management program is the partnering of disease management nurses with family physicians. The role of the nurses is to support physicians in the management of patients with chronic conditions. The nurses take a holistic approach to care

addressing both medical management and psychosocial issues. Nurses support family physicians at the ratio of 1 nurse:10 physicians. They receive additional training in the management of chronic conditions and have access to an interdisciplinary team of providers including social workers and dietitians. They have caseloads of approximately 400 clients. Evaluation indicates improved clinical outcomes and quality of life for patients following the program.

## B4.2

### Care Management Centre (CMC) – Role in Community Care of Chronic Diseases

#### MARINE CHIOH

*Care Management Centre, National Healthcare Group Polyclinics, Singapore*

**Introduction:** Started in October 2006, CMC is part of NHG's effort in engaging GPs to facilitate chronic disease management in the community. Situated in the heartlands, these centres provide comprehensive ancillary services by trained healthcare professionals which include Care Managers, Podiatrist and Dietitians.

The goal of CMC was to bridge the gap between tertiary institutions and community care providers, helping patients transition within the care continuum. Care management is effective when delivered in conjunction with structured disease management programmes. For diabetes, efforts focused on glycaemic control, screening for diabetic retinopathy, foot lesions and peripheral neuropathy with supportive interventions from general practitioners have been shown to result in better weight management and glucose control.

*Improving Chronic Disease Care in the Community:* In the past year, our patient numbers have been modest but increasing. In particular, our diabetic retinopathy and foot screening have proven to be popular with many GPs who recognise the need for such services in the management of chronic diseases. Such efforts have been beneficial in catching patients at risk of developing eye and foot complications, prompting early intervention to prevent further deterioration.

In terms of our direct impact on Chronic Disease Management, many patients felt that the self-care skills taught to them were useful in meeting their individual needs, resulting in improved control of their chronic diseases without the need for increasing or changing medication.

*Moving Forward: Engaging GPs in Research:* Evidence-based research is a powerful tool in showing that chronic disease management can be done effectively at the community level. To this end, CMC is looking forward to work with like-minded GPs in coming together and sharing results to be able to effectively track patients' disease conditions. This proposed

collaboration will be able to highlight the effectiveness of team-based disease management and to serve as a basis for informing the public.

*Disease Management in Nursing Home:* For this coming year, we have also recognised the need to work with other healthcare providers in the community such as the Nursing Homes. We have already initiated foot screening services with Ling Kwang Home and Econ Homes. We hope to embark on a more comprehensive Chronic Disease Programme with the Nursing Homes and in so doing improve the health of patients as well as reduce the need for referrals to tertiary hospitals for complications.

*The Future of CMC:* The ultimate goal of CMC is to improve patients' outcomes and in so doing, reduce healthcare costs by preventing complications. To gain widespread acceptance and recognition, CMC will continue to collaborate with other healthcare providers and strive to inform and involve patients in chronic disease management.

## B4.3

### Nurse-led Models of Chronic Condition Management in GP Setting in Australia

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This paper presents the preliminary results of a randomised controlled trial study commenced in Australia in 3 general practices (one metropolitan, one rural and one regional). The study aims to ascertain the acceptability (to patients, doctors, nurses and other practice staff), the feasibility and cost-effectiveness of a nurse-led model of care for patients with chronic conditions (diabetes type 11, ischemic heart disease, hypertension) in the primary care environment. The paper will outline the study itself and describe the protocols developed and education program provided to the nurse participants for the nurse-led care. It will outline the baseline data (SF12, EQ5D, clinical data) collected for both the intervention and control arms of this study on the participants in each practice. It will outline the participation rate and discuss how this model of care has already begun to influence current medical practice in each general practice.

#### B4.4

##### **Care Coordination for Children with Complex Needs - Appropriate Provision Care at the ED**

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Patients of the Royal Children's Hospital (Melbourne) with chronic and complex health conditions who frequently presented to the hospital Emergency Department, and who were primarily cared for in the home, were enrolled in a care co-ordination programme providing 24 h access, through a dedicated mobile phone number, to experienced paediatric nurses who, in conjunction with the patients' primary care teams, had developed a personalised care plan.

The patients had a broad range of medical conditions, many had numerous medical services involved in their care, 80% of patients had a technical device or implant. Enrollment increased from 125 patients in 2003 to 260 patients in 2007. Usage patterns were tracked over that period. Parental satisfaction and cost of the programme were assessed.

Calls to the programme increased from an initial average of 31/month (0.24/participant) to an average of 111/month (0.42/participant) in 2007, 60% of calls received were after hours.

The percentage of Emergency Dept reviews/phone call fell from an initial 74% in 2003 to 36% in 2007, similarly the percentage of hospital admissions/phone call fell from an initial 32% in 2003 to 19% in 2007.

Parental satisfaction with the service remained consistent at 8.3 on a 0-10 scale (0 poor, 10 excellent) from 2004- 2007.

Program cost (on the basis of 220 pts) was averaged at AUD\$750 per patient per year.

This data show that it is possible through a co-ordinated approach to improve enhance families' capacity to manage children with complex chronic medical conditions in the community setting.

#### C1.1

##### **Framework of Chronic Disease Management in Japan**

**SHINYA MATSUDA**

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According to the healthcare reform program in 2006, a nationwide health promotion program will be introduced from April 2008. As a main program of health promotion, specified health check-up, follow-up health guidance and intervention program will be introduced from 2008. All public health insurers have to organise health check-up and health promotion programs for the insured over 40 years old. The main target of

screening is the "Metabolic syndrome", which is regarded as a major risk factor for chronic diseases such as diabetes and hypertension.

A standardised computer program is being developed for the stratification of recipients. The insured will be categorised into one of three levels according to their risk levels; active support required, incentive required, only information required. If an insured is evaluated as active support required or incentive required, he/she must follow a standardised disease management program that is offered by the health support organisation contracted with the insurers.

#### C1.2

##### **Chronic Disease Management in Canada: Fad or Foundation**

**PETER SARGIOUS**

*Chronic Disease Management, Calgary Health Region, Canada*

Canadians, perhaps more than citizens of any other developed country, take great pride in their health care system. But Canada does not have single national health system, but rather a collection of provincial and territorial systems operating on similar, highly valued principles. As such, variation across the country related to the implementation of disease management strategies is wide, with some notable areas of excellence. Focused collaboration and benchmarking, both between provinces and territories and with other national health systems, constitute important elements of an emerging national approach to improving chronic disease prevention and management.

#### C1.3

##### **Disease and Health Management in Thailand: Chronic Diseases Situation and Need for Healthcare System Response**

**CHAISRI SUPORNILPCHAI**

*Department of Diseases Control, Ministry of Public Health, Thailand.*

For more than 2 decades, Thailand has been undergoing a huge epidemiological transitional period. Now, however, non-communicable diseases are forming the major proportion of deaths and are also becoming the burden of diseases (36.5% of total deaths in 2005; 64.6% of total burden of diseases in 2004). Over the years, there have been many governmental attempts and initiatives such as tobacco control, promotion of physical activity and a healthy diet, changing consumption patterns from animal oil to vegetable oil, raising awareness of hypertension to reduce salt and increase vegetable intake, raising awareness of diabetes and comprehensive cardiovascular risks including cervical cancer screening and some quality service improvement.

However at the last National Health Examination Survey (NHEXAMS) in 2004, there was a steep increase of all major risk factors, except for smoking and physical inactivity. Among Thais aged 15 years and above, there has been an increase of up to 25.9% in smokers; 9.3% more are consuming alcohol, which is harmful and hazardous; 22.5% more people who were physical inactivity; 22% more people not eating enough vegetables and fruits; an increase of up to 28.5% in those who were overweight and obese; 22% more suffered from hypertension, with only 8.6% under control; 6.8% suffered from diabetes, with only 12.2% under control; and an increase of 13% of pre-diabetes; an increase of 15.4% of those who suffered from high cholesterol and only 6.2% were under control; only 32.4% had undergone a Pap smear screening; and 22.7% had undergone a breast examination. Most of these trends have been confirmed by another survey – the Behavioral Risk Surveillance Survey (BRFSS 2004 and 2005)

From both the NHEXAM and BRFSS surveys, it was estimated that the Thai community and the healthcare system would need to have new approaches to cope with the huge costs and demands for these services. Most of these demands were related to the the major chronic non-communicable diseases: hypertension 7.4 million; diabetes 3.4 million, asthma and chronic obstructive lung diseases 1.6 million, stroke and ischaemic heart disease 0.9 million, depression 0.6 million, cancer 0.2 million etc. To combat these threatening situations, the Thailand Conceptual Framework for Chronic Disease Prevention and Management, currently under the process of development and testing, will be one of the new effective options.

#### C1.4

##### **Chronic Disease Management in Singapore – Making it Work!**

**CHIEN EARN LEE**

*Healthcare Performance Group, Ministry of Health, Singapore*

Chronic Disease Management (CDM) is a key priority area in Singapore's Ministry of Health's (MOH) strategic objectives, and will remain so in view of the ageing population and increasing prevalence of chronic illnesses. CDM essentially captures many of our key national healthcare policy initiatives such as care coordination and integration, exploiting the use of information technology to enhance patient care, patient empowerment, spreading the practice of evidenced-based clinical care, increasing transparency in the healthcare system, right siting of care, and managing end-of-life issues.

This presentation will discuss some of MOH's key initiatives to facilitate chronic disease management, empower patients to better self-manage and set in place incentives to right site patients across the public and private sectors such as GPs.

#### C2.1

##### **The Phenomenology of Dying: Stories from Hospice WHPOON<sup>1</sup>, O CONNORM<sup>2</sup>, YL CHOW<sup>3</sup>, KPREMA<sup>4</sup>**

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**Aim:** This study is to uncover the lived experience of older Singaporean Chinese patients with life threatening illness and receiving palliative care in an inpatient hospice, and to obtain an increased understanding of the meaning and interpretation of their experience.

**Methods:** Patients with life threatening staying in the inpatient hospice in Singapore provided the sample and context to search for the lived experience. Data were generated from in-depth interviews, field notes taken during the interviews, photographs and the researcher's journaling. Fourteen patients were interviewed. Data analysis was guided by the hermeneutic-phenomenological approaches of Max Van Manen.

**Results:** The preliminary results of this study were as follows: Life World: Being in the Hospice, Lived Space: Being Aware of the surrounding, Lived Body: Understanding of illness and dying, Lived Time: Living With the illness and dying, Lived Others: Purpose of Living.

**Conclusion:** These results provided evidence that a wider adoption of a palliative care approach from all disciplines in order to take on cases with greater needs and also to develop a more structured way for transforming healthcare delivery for older person with life threatening illness.

#### C2.2

##### **Providing Support When There is No Cure Available**

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With the progressive lengthening of life expectancy throughout the world, people living with chronic diseases, and their loved ones, face an increasing risk of unnecessary suffering resulting from unrelieved symptoms, or unmet informational, practical, emotional, spiritual and social needs. Most health systems, which continue to offer services that are modelled on the management of acute conditions, are ill prepared to provide the supportive services required by patients and loved ones, from the time of diagnosis to the end of life.

In this presentation, participants will:

- Learn about the emerging field of supportive care and the role it should play in a modern healthcare system
- Become aware of innovative approaches to identify and mitigate unnecessary suffering among people living with

chronic diseases and their caregivers, with an emphasis on strategies for self-management and peer-to-peer support

- Understand the challenges faced by clinicians, policy makers and managers interested in the provision of supportive care services within current care models, and opportunities to overcome them

### C2.3

#### **Omega Project: Changing Clinical Practices in End-of-life Care**

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<sup>2</sup>*Nursing Service, Tan Tock Seng Hospital, Singapore*

**Aims:** Project Omega aims to: (1) determine the factors contributing to poor quality of end of life (EOL) care in an acute hospital, (2) address the factors identified and (3) improve satisfaction in EOL care amongst healthcare workers and patients/families.

**Methods:** Phase 1 consisted of (a) focus group survey of representatives of various healthcare workers in the hospital on the reasons contributing to poor EOL care and (b) survey of nursing attitudes towards EOL care. Phase 2 consisted of introduction of change initiatives. Phase 3 consisted of development of audit tools to measure improvement.

**Results:** Phase 1. Focus group discussions showed that the main reasons that contributed to poor EOL care were poor communication, inadequate training and staff/manpower shortage. Further focus groups were held amongst junior doctors on the challenges in end of life care communication. These revealed that skills, the affect (emotional state) and knowledge of care plans were areas of concerns in communication. In the nursing survey, only 30.7% felt confident looking after the terminally ill. About 30% felt that the processes in caring for the terminally ill were inadequate. Phase 2. Based on these findings, the decision was to base changes on care processes, with a heavy emphasis on communication, patient identification and decision making. Processes in the hospital were reviewed including the use of an identification/documentation form for dangerously ill and Do-Not-Resuscitate patients and the nursing patient care record. Education was centred on the appropriate use of the forms, which have domains of patient identification, communication and care delivery. Phase 3. Standards of care were devised through a modified Delphi method used for chart audit. A mortality follow-back bereaved family interview was also adapted for satisfaction audit.

**Conclusion:** The process of introduction of changes can be slow and onerous. Anchoring changes to care processes and forms help to increase uptake. The results of chart audit and bereaved family satisfaction are pending.

### C3.1

#### **Telehealth Technologies and Services for the Management of Chronic Disease at Home and in the Community**

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Telehealth services for the management of chronic disease in the home and the community are now becoming almost commonplace in the US, the UK and parts of Europe. Home telecare technology, developed and clinically trialled at the University of NSW and commercialised through TeleMedcare Pty Ltd, is now being deployed very effectively both in Australia and the UK and is rapidly developing international markets.

In Australia, TeleMedCare is engaged in some major clinical trials in Victoria, NSW and WA, with a major community based, deployment currently underway in the rural and remote Loddon Mallee area on the banks of the Murray. In the UK, a business case based on the telehealth deployment in rural Norfolk by the local PCT is being developed as a template for application throughout the UK. These trials represent a significant evolution on established models by taking an “all of population” approach targeting chronic disease management in the home, in GP offices, in residential care and in community health centres.

In this talk, the presenter will review the outcomes of these studies, identify issues that have had to be resolved and discuss outstanding problems. Clinical models of care based on three key elements will be presented. These are to use telehealth assistive technology to (i) improve case management, (ii) improve self management and (iii) to improve clinical HR management.

The role of decision support to facilitate data analysis and support the care team in better managing their patients’ health status will also be reviewed.

### C3.2

#### **Empowering Community Mental Healthcare Team With CommCare@IMH**

**SIEW HONG CATHERINE CHUA<sup>1</sup>, EMILEEN CHIA<sup>2</sup>**

<sup>1</sup>*Community Psychiatry, Institute of Mental Health, Singapore,*

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Institute of Mental Health (IMH) provides comprehensive mental health services for both in-patient and outpatient care. One of the outpatient services provided is by the Community Mental Health Team (CMHT) under the Department of Community Psychiatry. This multidisciplinary team consists

nurses, medical social workers (MSWs), doctors, psychologist and occupational therapist (OT). The team provides crisis intervention, psychosocial rehabilitation/education and treatment in the homes of patients discharged from IMH. CMHT depends very much on paper-pen for recording the progress notes in the medical notes to as well as checking patients' information. Patient key information is penned in personal diaries, which are later transcribed into the patient's medical notes on their return to IMH.

CommCare@IMH proof-of-concept (POC) project was initiated in June 2007. It was a collaboration between a few partners working on an IT system that will improve the care delivery model. The key objective of the POC was to develop and pilot a mobile solution for the CMHT that can streamline the CMHT's paper-based tasks while increasing the overall operational efficiency and patient safety by empowering the CMHT with up-to-date key information related to the patients.

The solution was an application that extracts patient information from various IT systems and allows medical documentation. Patients' clinical assessments will also be captured real-time into the system thru either Ultra Mobile PCs (UMPCs). This reduces possible errors when CMHT tries to document the outcomes into the patient physical medical records when returns to IMH after several home visits.

After the POC, feedback was that size and battery life are the key concerns for hardware. As the CMHT needs to do numerous home visits to different locations, the device must be reasonably lightweight and the battery can last at least 3 to 5 hours.

The POC had also proved that by involving key users in the early phase of development of the application creates a sense of ownership, thus achieving better acceptance for the newly developed CommCare@IMH application. Eventually the total turnaround time for the CMHT in their case management improved.

This is the first of its kind being implemented in a tertiary psychiatric hospital and feedback has been positive from users. The success of the POC justified for CommCare@IMH application to continue into phase 2 in FY08 targeted to reach out to more users and include more features to improve on the workflow.

### C3.3

#### Supported Discharge Program for Stroke Patients

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**Introduction:** Upon discharge from hospitals, stroke patients and carers often encounter unexpected difficulties in transfer of skills acquired from hospital-based training and adapting to the home environment. This inevitably results in anxiety,

frustration, conflicts, functional decline and eventually community reintegration and quality of life. A multidisciplinary supported discharge program is developed to monitor the community resettlement of patients and provide timely support after discharge. Team members include Rehab Specialist (Team Leader), doctor, Occupational Therapist (Coordinator), Medical Social Worker, Physiotherapist, Nurse and Community Nurse.

**Aim:** The Supported Discharge Program aims to facilitate safe and smooth transition from hospital to community through monitoring and review of patients' conditions in home safety, functional independence, use of aids and home modifications, medical conditions and carers' stress. It also serves to provide timely and appropriate intervention for needs and problems arisen

**Methods:** Non-institutionalised stroke patients will be screened in the multidisciplinary case conference. Those who are likely to have community resettlement problems, for example, high risk of fall, caring problem, unstable medical conditions, etc. will be followed up (via phone and/or visits) at 1-week, 1-month and/or 3-month intervals. Functional status and carer stress will be reported in review meetings. Follow-up and/or referral to services will be arranged if necessary.

**Results:** From January 2006 to December 2007, 469 stroke patients (73% of 643 discharged to community) were recruited. The results were encouraging with >88% of patients able to maintain functions, monitored carers' stress and low ratio (1%) of fall incidents leading to AED admission.

### C3.4

#### Delivery On Target – A Community-based Disease Management Programme

ANGIE PENG HOON LEE

*Nursing, Diabetic Society of Singapore, Singapore*

**Introduction:** People with chronic disease are now better equipped to manage their conditions with the support of their General Practitioners (GPs), primary care giver in the community. A programme called the Delivering On Target (DOT) helps GPs better manage diabetic patients

**Aim:** To place a new model for cost effective, integrated community-based chronic care delivery using a multi-prong approach bench marked against evidence-based best clinical practices to help patients achieve Ministry of Health (Singapore) MOH recommended targets for diabetes, hypertension and hyperlipidaemia.

**Method:** A total of 28 GPs completed the minimum requirements for inclusion in the DOT programme, 242 patients were enrolled out of the 372 patients who were recruited in this programme. As part of the programme, GPs participated in modular sessions focusing on behaviour modification, medical nutrition therapy, management with medical therapy and managing complications and as well treating diabetics with

special needs. GPs patients (At least 5 patients )were enrolled in 3 individualised education by Diabetes Nurse Educators in Diabetic Society of Singapore (DSS).

**Results:** An analysis of 103 patients participating in the programme for more than 4 months showed that an averageHbA1c levels dropped by 0.83 per cent from baseline of 8.1 per cent to 7.27 % ( $P < 0.001$ )

**Conclusion:** Early and proactive management of chronic diseases at primary level by GPs will go a long way in saving lives and reducing health care costs. With comprehensive care and support by GPs and the DSS through this programme, people with diabetes can be more actively engaged and empowered to manage health conditions.

#### C4.1

##### **Looking Across the Globe: Making Comparisons of Primary Care**

###### **BARBARA STARFIELD**

*Department of Health Policy and Management, Johns Hopkins University, United States*

The purpose of this presentation is to establish methods for thinking about and measuring primary care. The presentation reviews various descriptors of health systems and measures of impact on health and shows how they reflect differences across countries. Needed future directions are identified and a specific validated instrument (PCAT-Primary Care Assessment Tool) that can be used to further knowledge about the primary care system and its improvement over time is presented.

#### C4.2

##### **Dialogue on Evolving Models of Primary Care – The UK Model**

###### **TRISHA GREENHALGH**

*Primary Care and Population Sciences, Faculty of Clinical Sciences, University College London, United Kingdom*

**Introduction:** The UK primary care model has evolved considerably in recent years with the introduction of a number of service-level innovations.

**Aim:** To discuss a recent innovation in UK primary care – the Quality and Outcomes Framework or QoF – a set of incentives and rewards oriented around of evidence-based clinical and management indicators.

**Key points:** The QoF was developed systematically by research teams and piloted extensively, and was then the subject of political negotiation with GPs' leaders before being introduced nationally. It is not without controversy. Some say that the apparent improvements in the process and outcome of care are

due merely to 'gaming', and that generous payments to GPs for achieving maximum QoF targets are a waste of public money (there are even jokes about "the new QoF Class Mercedes") and that there is an opportunity cost for the clinical and administrative effort diverted into 'target chasing'. However, others interpret the overall high performance on QoF as evidence that numerous aspects of care – including chronic disease management, screening for asymptomatic disease, information technology, and patient satisfaction – are now improving year on year in most GP practices.

**Conclusion:** There are arguments both for and against the claim that the QoF has transformed UK primary care for the better. This talk will discuss both sides.

#### C4.3

##### **Dialogue on Evolving Models of Primary Care – The Australian Model**

###### **MICHAEL KIDD**

*Discipline of General Practice, The University of Sydney, Australia*

General practice is the cornerstone of primary care delivery in nearly every Australian community. In 2007, there were over 100,000,000 consultations between Australians and their chosen general practitioners and over 85% of all Australians visited a general practitioner at least once last year, and well over 90% visited during the past 2 years. These figures demonstrate the enormous potential we have through general practice to promote health, to prevent illness, to manage acute problems and chronic disease, and to manage co-morbidities and mental health and aged care health concerns in partnership with our patients. Healthcare delivery is always changing. In Australia, strong integrated primary care is evolving and this presentation will focus on changes and challenges in the areas of workforce recruitment, retention and training, support for rural general practice and procedural general practice, strengthening of roles in mental health, Indigenous health, addressing other health inequalities, preventive care and health promotion, and the need to support general practice teams and new models of care to ensure that high quality primary care is available to all people in Australia.

#### C4.4

##### **Dialogue on Evolving Models of Primary Care – The Singapore Model**

###### **FONG SENG LIM**

*National Healthcare Group Polyclinics, Singapore*

Not available at time of print.

## D1.1

### **Integrating Chronic Disease Management in Victoria: A Partnership Approach**

**SYLVIA BARRY<sup>1</sup>, CHRIS W BROOK<sup>2</sup>**

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**Aim:** To provide a proactive and integrated human services system using the Wagner Chronic Care Model to improve outcomes for clients with chronic disease and to reduce avoidable acute service demand in Victoria.

**Methods:** Since 2000, the Victorian Department of Human Services has implemented a number of health sector reforms across the care continuum including the Primary Care Partnerships Strategy and the Early Intervention in Chronic Disease (EliCD) initiative. More than 800 agencies comprising health and community service providers joined voluntary alliances to form 31 Primary Care Partnerships (PCPs). Using a partnership approach for joint planning, PCPs facilitate coordinated responses to local priorities for clients and local health care and community service agencies. A key focus is the implementation of integrated chronic disease management strategies. Sustainable, proactive client focused service delivery requires substantial and sustained change management support at both intra- and inter-agency levels to effect significant work culture and operational changes.

**Results:** Independent evaluations show that the PCP Strategy is contributing to improving the experience, health and well being of people who use primary care services. PCPs play a key role in planning, support and communication to enable better targeting of EliCD services and more integrated responses from member agencies to the issues that directly impact on health outcomes. PCPs are now used by both state and national jurisdictions as the platform for delivery of national chronic disease management initiatives.

**Conclusions:** The partnership approach is resulting in successful implementation of reform in chronic disease management to improve consumers' experience and outcomes.

## D1.2

### **Blueprints for Putting Theory into Practice: A Large Health Region's Experience with Implementing the Chronic Care Model**

**ANGELA ESTEY<sup>1</sup>, RICHARD LEWANCZUK<sup>2</sup>**

<sup>1</sup>Health Services Planning and Information, Capital Health, Canada, <sup>2</sup>Chronic Disease Management, Capital Health, Canada

**Aim:** The Capital Health Region, in Edmonton, Canada, is an academic healthcare system serving 1.6 million people. The

region is undergoing system-wide re-engineering to reduce disease burden and improve the health of its population living with chronic disease. Using the Chronic Care Model, Capital Health has the blueprints for a revolutionary, integrated disease management system that strengthens the relationship between individuals and their primary care providers with support from community specialty partners. A practical overview of how to operationalise the model will be presented.

**Methods:** Capital Health took an incremental, systematic approach including:

- Current state of assessment of services for seven diseases; identification of best practice and future state requirements
- Re-organisation and standardisation of care
- Analysis, mapping, and re-design of workflows across multiple geographical programs
- Development of information system technology to support workflows
- Decision support tools and proactive follow-up protocols

**Results:** A system map was created with standardised business processes including:

- Central intake and triaging into specialty services
- Delivering a menu of self management programming
- Specialist linkages to support primary care teams
- Bringing evidence-based care algorithms to frontline providers
- Incorporating a comprehensive evaluation framework to guide decision making and assess effectiveness of change.

Early results suggest a more coordinated system for users with individuals being identified and treated more effectively. Consumers report having better access to a greater range of services and feeling more empowered to accept responsibility for their health.

**Conclusion:** A comprehensive blueprint guides implementation ensuring successful change across a system.

## D1.3

### **Innovations of the Maastricht Care Model in The Netherlands**

**HJM VRIJHOEF<sup>1,2</sup>, STEUTEN LMG<sup>1,3</sup>, DUIJEL I<sup>2,4</sup>**

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**Aim:** In order to improve the quality of chronic care within the Maastricht region, incremental changes have been implemented between 1996 and nowadays. Which elements have been implemented in which order, with which success, and which strategy was followed?

**Methods:** A descriptive analysis was conducted based on scientific evaluation papers of the Maastricht Care Model, policy papers and protocols, and additional information from principal investigators and project coordinators.

**Results:** The elements being implemented were defined by: (1) assessment of shortcomings in local organisation; (2) literature and; (3) innovative ideas of leaders. In order of implementation: decision support; multidisciplinary design of process across the continuum of care; medical information systems; and self-management support have been introduced. The implementation strategy followed can be described as incremental, applying the PDSA-cycle, initiated by providers under influence of changes in the national healthcare system (i.e. health insurance, regulated market and treatment based costing).

**Conclusion:** Within a period of over 10 years, the Maastricht Chronic Care Model has gotten shape and can be best compared to the Chronic Care Model. Main challenges for the future are to organise care more around patients, to assess and improve the quality of care, to scientifically evaluate its impact and ROI, and to strengthen preventive care.

#### D1.4

### **Disease and Health Management Update from Thailand: Developing the Capacity, Driving the Action and Improving the Outcome**

#### **NIPIT PIRAVEJ**

*Center for Healthcare Management Innovation Thailand and, Bangkok Chain Hospital, Thailand*

Thailand health policy has been led and driven dominantly by the Ministry of Public Health (MOPH), which also plays a major role in delivering public health services and personal medical care to the people. However, in general, these two lines of public services are organised under different agencies. Thus, actions tend to be carried out separately, despite being based more or less on the conventional approaches, from mass preventive, promotive programs on one hand to episodic acute curative care on the other.

Moreover, there are also other healthcare delivery systems that people can access in a rather informal manner especially when self-payment is used. These include outpatient and inpatient facilities operated by local city administrations, university teaching centres, private for-profit and non-profit sectors. These make the whole system even more complicated and fragmented.

With the demographic and epidemiological shifts towards the elderly population and chronic health conditions, the systems are much more at risk of being insufficient. The current concept of Disease Management was introduced to Thailand

around 2002, by a life insurance company active in healthcare business, as an initiative to enhance collaboration with its provider network to improve care for chronic diseases in its ageing insured population.

The initial assessment indicated that chronic diseases in the private sector were treated mostly in acute care setting, using an acute care approach with minimal supports for long term patient self-management. Good quality and up-to-date epidemiological data of key diseases were also lacking, making systematic planning difficult. As a result, clinical ineffectiveness, complications and high overall cost were common.

The early advocacy effort was focused primarily on the demand side of capacity development. A series of disease management conferences, seminars and workshops, organised both at the national, regional and organisational levels in the last few years, had succeeded in bringing up the attention of health policy makers, academia and leaders in both public and private sectors to the issues and challenges of chronic diseases and modern lifestyle health risks. With leaders from broader medical and healthcare fields involved in the development, the term Disease and Health Management (DHM) has been proposed for use to reflect the multidisciplinary interests and collaboration in the field.

Another important development happened in late 2005 when the National Health Security Office (NHSO), the major of the 3 public purchasers in Thailand's Universal health Coverage program (UC), decided to establish a new bureau specifically for planning and driving disease management initiatives. A number of pilot disease management programs launched since 2006 has created a clear incentive, though still relatively small, for medical providers participating in UC to develop their supply capacity in chronic care. Basically, these programs are funded by two public financing sources, namely (1) the UC preventive and promotive (P&P) budget, and (2) the NHSO special disease management program budget.

As a result, they are organised accordingly into health promotion plus disease prevention initiatives for the general population on one end, and the medical maintenance plus complication reduction initiatives for diagnosed cases on the other. In general, although the programs, teams, processes and delivery channels are mostly the refinement of their traditional predecessors, the outputs are much more controllable due to the more systematic planning, better execution as well as the use of evidence-based clinical guidelines and health protocols. More common programs involve management of obesity, hypertension, diabetes and dyslipidemia.

After the first wave of development established the necessary foundation, the new DHM trend is more innovative and driven by new groups of players and partners. While the reactivated Primary Health Care (PHC) concept and operating framework supported by WHO can play an important role as a platform in

launching DHM to broader rural communities across the country, the improvement of chronic disease statistics through the regular National Health Examination Survey as well as the application of various converging technologies and expertise, including mobile e-health, portable health record, geo-information system (GIS), customer relationship management (CRM) and consumer behavior modification, will help move DHM to the next level of achievement.

At the same time, the private sector has started to become more active in creating a viable DHM market, to be funded by private payers to balance the current dominant position of the public systems. In the longer term, Thailand's DHM development will continue to move ahead, driven by the main forces in public health and medical care fronts that will become more and more integrative across the health continuum.

## D2.1

### **Health Promotion for the Elderly in Japan**

#### **SHINYA MATSUDA**

*Department of Preventive Medicine and Community Health, School of Medicine, University of Occupational and Environmental Health*

In order to formulate the prevention program under the LTCI scheme, the authors conducted a cross-sectional study of frailty status among the elderly in a Japanese city.

The population studied was inhabitants of one city, Fukuoka prefecture. Three thousand inhabitants more than 65 years old were randomly selected from citizen registration by the city council.

From June to September 2002 and 2003, trained interviewers visited the chosen inhabitants and gathered information using a structured questionnaire comprising demographic data (sex, age, address, household's type), health status, ADL and IADL.

The present study clarified that most of the aged lived independently, even though they had some forms of chronic health problems, such as knee-joint disorder and hypertension. Furthermore, a person with only a slight difficulty in mobility and with depression showed more ADL degradation compared to an elderly without such symptoms.

This finding indicates the necessity for preventive program targeting at mobility and mental status of the aged.

## D2.2

### **Ageing, Disability and Health in Singapore and Japan**

#### **ANGELIQUE CHAN**

*Department of Sociology, National University of Singapore, Singapore*

Not available at time of print.

## D2.3

### **Dementia as a Chronic Condition - Moving from Disease to Person-centred Care**

#### **JENNYGOH**

*Medical Social Service, Alexandra Hospital, Singapore*

Dementia is commonly viewed as a brain disease, gradually robbing one's intellect and personality as the condition progresses. In a disease-centred medical model that attributes the symptoms of the condition solely to brain pathology, little can be offered for the patient short of a cure for the damaged brain. There is still no cure in the horizon for dementia.

A person-centred model is a more inclusive model which recognises that the manifestations of dementia are not only the result of brain pathology but much influenced by the personality and biography of the person with dementia, as well as the physical and social environment that surrounds him. As this model values the uniqueness of each individual, it advocates an individualised approach to care that takes into account the person's past and utilises this understanding to guide interventions that cares for his well-being.

Person-centred care also presupposes an unconditional positive regard for the person with dementia. As such, it is a necessary prerequisite to be able to see from the perspective of the person in order to understand why he acts and behaves the way he does, regardless of rationality and social appropriateness. It is only in empathising with the person that the carer can understand the pressures he faces.

This philosophy of care is the basis for the design of non-pharmacological interventions and care delivery models to care for the person with dementia as well as his carer. Finally, person-centred care is not applicable just to dementia but its principles can be harnessed to provide holistic care for other chronic diseases.

## D2.4

### **Preventing "Bad Manners in Aged Women": An Interventional Counselling Program with Families**

#### **SEYED HABIBOLLAH KAVARI**

*Health Management, Islamic Azad University- Darab Branch, Iran*

This presentation was conducted from 2005 to 2006 and its objective was to study the effect of a counsellor program with families so that "bad manners" in elderly women in Shiraz, Iran can be prevented. "Bad manners" are defined as neglect, psychology and violation of rights.

Thirty families were chosen for this study and the counselling program consisted of interviews, counselling supported with questionnaires and checklist. The families were subjected to the program and tested pre and post. Preliminary data showed that there is a significant meaning difference between average

of scores on signs of behaviour, indicators of neglect, psychology of “bad manners” and the violation of rights. Indeed, it shows promising results that the counsellor program has an effect in the prevention of “bad manners” with aged women.

### D3.1

#### Health Education Strategies in Improving Diabetes Awareness in North India

**SANJAY KALRA<sup>1</sup>, BHARTI KALRA<sup>2</sup>, AMIT SHARMA<sup>1</sup>**  
*<sup>1</sup>Endocrinology, Bharti Hospital, Karnal, India, <sup>2</sup>Gynaecology, Bharti Hospital, Karnal, India*

This exploratory, prospective, interventional study seeks to assess the relative efficacy of various health education strategies in improving diabetes awareness amongst subjects attending an endocrine OPD in north India.

All subjects attending the OPD were exposed, over a 3-month period, to posters, leaflets, hand-written charts, certain free investigations, television and newspaper advertisements, and one-to-one education, to encourage them to improve their investigation and treatment-seeking behaviour.

All subjects were asked to rate the efficacy of these interventions, along with their behaviour, on a 5 point Likert scale, at the beginning and end of the study period.

The most effective method of behaviour modification was one-to-one counselling (change in behaviour index:  $3.4 \pm 1.28$ ), followed by hand-written charts ( $2.5 \pm 1.2$ ). The least effective methods were newspaper ( $1.9 \pm 1.22$ ) and television advertisements ( $1.7 \pm 1.26$ ).

The difference in efficacy was significant for one-to-one counselling versus posters, pamphlets ( $P < 0.01$ ), television and newspaper advertisements ( $P = 0.05$ ). There was no difference in efficacy of hand-written posters and one-to-one counselling.

Maximum behaviour modification was noted in willingness to get urine ketone, HbA1c and biothesiometry ( $3.4 \pm 0.48$ ) checked and willingness to seek treatment for sexual complications ( $3.7 \pm 1.0$ ). Least change in behaviour was noted regarding willingness to undergo retina examination ( $1.2 \pm 0.4$ ).

This study demonstrates the efficacy of one-to-one counselling in achieving behaviour modification in persons with diabetes. It also reveals the differences encountered in changing various aspects of diabetes related behaviour in patients.

### D3.2

#### Pharmacist Health Ambassador: A Community Programme on Patient Empowerment

**CT NG<sup>1</sup>, ICY CHEW<sup>1</sup>, YT SEE<sup>1</sup>**  
*Pharmaceutical Society of Singapore, Singapore*

**Introduction:** Positioned strategically in the heartlands, community pharmacists play a key role in educating and assisting Singaporeans to make lifestyle and behavioural changes, as they are a highly accessible source of information and assistance on preventive health and chronic disease management. Patient empowerment is pivotal in implementing effective strategies to promote good health and reduce illnesses and complications among Singaporeans.

The Pharmaceutical Society of Singapore (PSS) partnered the Health Promotion Board (HPB) to launch the **Pharmacist Health Ambassador Programme**. A Memorandum of Understanding was signed on 21 October 2006.

**Aims:** The objectives of the Pharmacist Health Ambassador Programme are as follows:

- To equip pharmacists with holistic preventive health knowledge and skills to effectively merge preventive and curative care advice to achieve better health outcomes for the population;
- To increase the accessibility to the public and increase outreach to enhance the population’s knowledge and skill on adopting healthy lifestyle so as to prevent or delay the onset of chronic diseases.

**Methods:** Specially tailored training programmes were designed by PSS and HPB. In 2007, 2 training workshops were conducted for close to 250 community pharmacists in areas such as diabetes management, nutrition, physical activity, smoking cessation and mental health.

**Results:** Almost 2000 members of the public benefited from the advice provided by the community pharmacists from October 2007 to February 2008. This is an ongoing program covering various conditions.

**Conclusion:** Singaporeans need to have easy access to health information to empower them to better manage their health. Community pharmacists can have a role in promoting healthy lifestyles and work with other healthcare professionals to manage chronic diseases in a holistic approach. Further improvement to the programme is required to improve documentation and encourage more pharmacists to be proactive in delivering health advice.

### D3.3

#### Creating a Sweet Space of Support for Diabetics

**EMILY TAN<sup>1</sup>, SAN SAN NG<sup>1</sup>**  
*<sup>1</sup>Medical Social Service, Alexandra Hospital, Singapore*

Caring for patients with chronic diseases involves more than just the medical care and education about the symptoms and treatment regime. Chronic illnesses have a long-term economic and emotional impact on the individual and family, and this is especially true for diabetes mellitus.

Both research and clinical evidence suggest that family dynamics have a bearing on diabetes management. We can recommend, persuade, guide, encourage and coerce but it is

ultimately the patient actions and decisions that influences the degree of success or failure. The extent to which the patient follows the prescribed treatment depends on the degree of social support from their family.

The family is the social network from which the individual derives identity and develops strong psychological bonds. The way in which the family reacts and adapts to the illness, influence the patient's subsequent adjustment. The more involved and educated the family on diabetic management, the easier it will be for them to understand and support the patient in coping with lifestyle adjustment in his or her diabetes self care.

It takes time and effort to forge an effective therapeutic relationship with patient's family. We cannot assume family members automatically give the support whenever the patient needs it. It is therefore important to listen to the family's feelings about diabetes and address their concerns.

Considerations about the family's ethnic and cultural background are critical. In family with dysfunctional interaction patterns, creating a sweet space of support for diabetics can be very challenging. The key will be to individually define support for each patient, in each family system.

#### D3.4

##### **Physician Engagement: A Large Health Region's Experience with Implementing the Chronic Care Model**

**RICHARD LEWANCZUK<sup>1</sup>, ANGELA ESTEY<sup>2</sup>, STEPHANIE DONALDSON KELLY<sup>1</sup>**

<sup>1</sup>Chronic Disease Management, Capital Health, Canada, <sup>2</sup>Health Services Planning and Information, Capital Health, Canada

**Aim:** Capital Health, in Edmonton, Canada, is reorganising its health system to align with the Chronic Care Model requiring a shift from an acute-care, reactive, specialist-driven system to one that is based on proactive, team-based interventions largely focused in primary care. Such a change represents a radical departure from the way our 2,400 physicians practice and interact with each other, other health professionals, and the health system. This presentation will describe methods and learnings in physician engagement and change management.

**Methods:** Physician change management strategies were developed by multiple methods:

- Literature review
- External consultants
- Physician consultation
- Local experience
- Trial and error

**Results:** Six years of experience in CDM implementation has resulted in many learnings including:

- Physician change management is important
- Change management strategies must be planned proactively and resources allocated

- Physician champions are critical
- Physician must be involved in decision-making and need ownership and responsibility for reorganising their services
- 100% Physician consensus or agreement may not be possible
- Work with innovators and early adopters, the rest will follow, some may never
- Physician only meetings between Regional physician leaders and physician groups, or between family physicians and specialists are effective in facilitating change

**Conclusions:** Through multiple strategies, physicians can be engaged in implementing the Chronic Care Model. In Capital Health, it is estimated that the majority of family physicians who provide true continuing care are engaged in CDM implementation to various extents. Similarly, a majority of specialists function within the Regional CDM system.

#### D4.1

##### **Understanding the Development, Design and Implementation of a Chronic Disease Management Registry in Primary Care**

**STEPHANIE DONALDSON KELLY<sup>1</sup>, PAT READER<sup>2</sup>, RICHARD LEWANCZUK<sup>1</sup>, NEIL BELL<sup>4</sup>, SHERI FIELDING<sup>4</sup>, DEB WILSON<sup>4</sup>, JEFF LASKOSKI<sup>4</sup>, DAWN ESTEY<sup>1</sup>, MARK HELMAK<sup>5</sup>**

<sup>1</sup>Chronic Disease Management, Capital Health, Canada, <sup>2</sup>Continuum of Care, Calgary Health Region, Canada, <sup>3</sup>Chronic Disease Management, Capital Health, Canada, <sup>4</sup>Canada, <sup>5</sup>Information Systems, Capital Health, Canada

An essential component of chronic disease management programs is disease registries that are used to manage and provide information on specific conditions to support organised care management of patients. The development of a registry within an electronic health record allows for better care coordination across different levels of care. To illustrate how these technologies can help to provide care, this presentation will use the development, design and implementation of Alberta's electronic health record and chronic disease management solutions by primary care physicians and services teams in the Capital Health Region (CH) and Calgary Health Region (CHR) authorities.

Population-based clinical registries and dashboard reporting tools were established in both community and academic family practices which used either electronic or paper medical records. The registry and population dashboard are used by clinicians for the management of their diabetes/hypertension populations and were available to over 1500 primary care physicians and their teams and regional service providers to manage patient populations and achieve improved outcomes. Patients were identified through a regional laboratory repository and family practice records and then validated by clinicians in primary care.

It has shown that these initiatives have benefited the following:

- Communication and information sharing between primary care physicians and specialists;
- Clinician time in the retrieval of patient clinical information;
- System capacity's to match patients' needs with appropriate levels of providers and services;
- Compliance with evidence-based guidelines;
- Feedback and clinical quality indicator reporting

#### D4.2

##### **E- nutrition: The Way Forward**

###### **VERENA TAN**

*Tan Tock Seng Hospital, National Healthcare Group, Singapore*

Tan Tock Seng Hospital's Nutrition and Dietetics Department launched their online consultation service - "E-nutrition" on 16 October 2007 at Quality Day. This service is a first in Singapore and is targeted at patients who have difficulty coming for face-to-face consultations and prefer having online follow-up consultations.

Anyone with a doctor's referral, latest medical report (within past year) and health screening results can sign up with E-nutrition as members for a duration of 6 months with unlimited online-consultations, personalised advice as well as one initial and two optional face-to-face follow-ups. In addition, members can also sign up for supermarket tours, hawker trails, cooking demonstrations and focus groups at no additional charge.

In one study, self-management diabetes education coupled with Internet access and web-based care management resulted in significant improvements in HbA1c when compared with education and usual care (McMahon et al, 2005). In another study, adding e-mail counselling to a basic Internet weight loss intervention program has been shown to significantly improve weight loss in overweight and obese adults at risk of diabetes (Tate et al., 2003). These findings support a role for Internet-based management of patients with chronic illnesses and achieving clinical benefit.

Sharing her vision, Ms Ng Kok Mun, Manager of Nutrition and Dietetics department said, "We hope that despite being busy, members can continue to work towards their goals, since they can track their progress at their own convenience. This will also reduce the need of re-scheduling appointments and decrease waiting times at outpatient clinics. We also hope to promote this service to our overseas patients so that we can continue to communicate with them, improving our continuum of care."

#### D4.3

##### **A New Paradigm in Chronic Disease Management – Panel Management**

**WS AW YANG**<sup>1</sup>, **M SUNDARAMAN**<sup>1</sup>, **PS LIM**<sup>1</sup>

*<sup>1</sup>National Healthcare Group Polyclinics-Toa Payoh, National Healthcare Group, Singapore*

**Aim:** To evaluate the effectiveness of a team approach to panel management for well controlled hypertensive patients without co-morbidities.

**Methods:** Toa Payoh Polyclinic piloted the project in June 2007. The enrolment criteria were a) patient diagnosed with hypertension without co-morbidities, b) 3 consecutive blood pressure readings of  $\leq 140/90$ , c) patient wants to learn self-management and purchase a blood pressure monitoring set. Patients were taught to do home blood pressure monitoring and action plan by the care manager. The primary care doctor will review the patients' lab results, home blood pressure monitoring record, care plan and prescribe the next step of care. The program assistant will contact and convey the primary care doctor's orders to the patients. They will also monitor patients' condition via telephone call at 3 monthly intervals, coordinate the care, follow-up treatment, and outreach.

**Results:** A total of 54 patients have been recruited into the programme. 97.5% had their blood pressure maintained within target level and 87.5% reported reduction in doctor's clinic visit. The interim patient satisfaction survey reported that patients' confidence in self-managing their blood pressure at home had increased and patients were satisfied with the care.

**Conclusion:** Although, the programme is still piloting in Toa Payoh Polyclinic, the interim outcomes have shown favourable results and supportive of team approach to panel management.

#### D4.4

##### **Spatial Cluster Analysis and Cancer Mortality Hot Spots in Texas**

**F. BENJAMIN ZHAN**

*Department of Geography, Texas Center for Geographic Information Science, Texas State University, United States*

To improve cancer prevention and treatment practices that may reduce cancer mortality rate, it is important for public health officials to identify geographic areas or population groups with significantly higher rate of cancer mortality otherwise known as hot spots. The identification of these hot spots would help public health officials gain insights about the shortcomings in existing practices related to cancer prevention

and treatment. These insights, in turn, would help them make more informed decisions and allocate the necessary resources to these geographic areas or population groups to improve healthcare services related to cancer prevention, early detection of a cancer, and cancer treatments. Spatial cluster analysis is an effective method for identifying these hot spots. I conducted spatial cluster analysis of mortality data related to 16 different types of cancer from 1990 to 1997 in the State of Texas. This presentation reports the results of the spatial cluster analysis and the geographic distribution of the identified cancer mortality clusters. The results provide useful information to public officials for improving practices that may reduce cancer mortality rates in some areas of Texas where cancer mortality rates appeared significantly higher than the rest of the state from 1990 to 1997.

### **D5.1**

#### **Societal and Community Support in the Face of an Ageing Population**

**WS PANG**

*Geriatric Medicine, Alexandra Hospital, Singapore*

The ageing population is a heterogeneous group comprising relatively well and high functioning elderly, elderly with some impairment in function, elderly who are very dependent on care givers for self-care and elderly requiring end-of-life care. Such groups are not necessarily age-dependent as there are very well and active non-agenarians and also frail young olds. Functional abilities are not static and may decline with illness or improve with rehabilitation. A wide range of community services are therefore needed to meet the needs of an ageing population. These services may have different therapeutic goals for different groups. The well elderly need to remain active and independent. Community-based activity centres with exercise programmes that include strength, cardiovascular and balance training and educational programmes focusing on nutrition and social engagement are important. As function declines, the emphasis switches to rehabilitation, to restore mobility and self-care abilities to enable the elderly to remain in the community for as long as possible. More skilled healthcare workers are needed to design appropriate programs with targeted rehabilitation outcomes. These have to be supplemented with support services to modify environment to enhance function or services to provide direct care. With further decline, an end-of-life approach aimed at maintaining dignity and comfort is needed. Consideration needs to be given to funding, to designing a suitable environment for care and to supporting caregivers. Ageing is a journey and community services should be designed to assist the elderly achieve goals of care through each phase.

### **D5.2**

#### **The Role of Community Hospitals in the Face of an Ageing Population**

**BOON YEOW TAN**

*Medical Services, St. Luke's Hospital, Singapore*

The community hospital is a hospital that is sited in the community. It is an intermediate care facility that provide for "seamless" continuation of care between acute hospital services on the one hand and community and domiciliary services on the other, especially in the groups of patients whose recovery and rehabilitation depends upon effective multidisciplinary and interdisciplinary programmes of care.

Community hospital care was first introduced in Singapore slightly more than a decade ago with one community hospital each sited in the west, central and eastern parts of the island. In the initial years, inpatient rehabilitation of the older patient was the main emphasis. Over the years, it has slowly evolved to a facility which provides a range of in and out-patients services in addition to rehabilitation. These services include inpatient care comprising of sub-acute medical care, wound and palliative care. Some of the community hospitals also have outpatient services which includes clinics specialising in care of the older person as well as patients with chronic diseases. In addition, domiciliary services like home medical, home therapy and home nursing services are also provided by some community hospitals.

With the ageing population, the need for and role of community hospitals will be anticipated to grow. Its role maybe further expanded in the near future.

### **D5.3**

#### **"Sans Teeth and Mind" – What are the Priorities for the Care of the Aged Sick in the Population?**

**WAI CHONG NG**

*Hua Mei Seniors Clinic, Tsao Foundation, Singapore*

Not available at time of print.

### **D5.4**

#### **Providing Palliative Care- An Emerging Role for the Community Physicians?**

**JAAN YANG KOK**

*Dover Park Hospice, Singapore*

Not available at time of print.

## D5.5

### Transforming the Role of the Family Doctor

#### NORIDAH ABDULRASIP

*Hua Mei Seniors Clinic, Tsao Foundation, Singapore*

**Background:** Research in developed countries has shown that appropriate use of primary care promotes good health and reduces healthcare cost through decreased use of specialist care, hospitalisations and premature nursing home placement.

**Issues:** The traditional role of the family doctor is to holistically manage the problems that patients or their families may have; be it medical, social or psychological. This becomes more important especially in chronic disease management and older persons. However, because of certain challenges, family doctors or general practitioners are now unfortunately more skewed towards practising medicine which is episodic and fragmented in nature.

Drawing on experiences as both a family doctor in a public polyclinic and a primary care doctor in Hua Mei Seniors Clinic, which is a primary care clinic for mature adults aged 40 years and above, the speaker shares her views on the core family medicine practices that ultimately give the best patient-centred outcomes.

**Conclusion:** With the increasing numbers of older persons in the communities and their extended life expectancies, the traditional role of a family doctor has to be revitalised if we are to effectively manage and maintain older persons in the community and continue to let them age in place in their own homes. This may require a whole paradigm shift in the way family medicine is currently being practised.

## D6.1

### Marrying “Ying and Yang” with the Evidence-based Medicine – A Paradox or an Emerging Reality!

#### YONG PENG SWEE

*Primary Care Division, ParkwayHealth, Singapore*

The Traditional Chinese Medicine (TCM) theory has its basis in the “yin” and “yang”, loosely translated as being warm and cold. In the teaching of TCM, “yin” and “yang” are symptoms of the body and it is in the reflection of these symptoms that determines whether one is “yin” or “yang”. Integrating these into evidence-based medicine, it can be clearly reflected that some form of disease like hyperthyroid and premenopausal symptoms can also be attributed with “yin” and “yang” symptoms. Some hormones seem to be “yin” in nature and others seem to be of “yang”. On this premise, it seems possible that we can merge this “yin” and “yang” into science and explaining them may be a reality!

## D6.2

### Acupuncture and Western Medicine

#### KENG HE KONG

*Complementary Integrative Medicine, Tan Tock Seng Hospital, Singapore*

Acupuncture is an ancient Chinese treatment that has been in use for more than 2000 years. Its effectiveness has been substantiated in chronic pain conditions like low back pain and osteoarthritis of the knee. From a Traditional Chinese Medicine perspective, acupuncture works by regulating yin and yang and the flow of Qi (energy) through vital organs in the body. From a modern medicine perspective, much of the action of acupuncture can be explained by neurophysiological mechanisms, which are easily understood by Western physicians/healthcare professionals. These include the gate-theory of pain control, release of endogenous opiate-like substances and trigger point deactivation. The demystification of acupuncture allows it to be embraced and practised by Western physicians/healthcare professionals in a manner that is in keeping with their training.

## D6.3

### Regulating Traditional Chinese Medicine Practice - Singapore's Experience

#### C CHEAH<sup>1</sup>, KL WONG<sup>1</sup>, CH TAN<sup>2</sup>

*<sup>1</sup>Traditional and Complementary Medicine Department, Health Regulation Division, Ministry of Health, Singapore, <sup>2</sup>Health Regulation Division, Ministry of Health, Singapore*

**Aim:** This paper aims to present Singapore's experience in the statutory regulation of the practice of traditional Chinese medicine (TCM).

**Methods:** The TCM Practitioners Act was passed in Parliament in 2000 to enable the setting up of the TCM Practitioners Board to regulate the practice of TCM in phases, starting with the registration of acupuncturists in 2001, followed by TCM physicians in 2002. A transitional registration framework was established to register those who have been practising acupuncture and TCM at the time the Act came into effect. Various upgrading courses and appraisal tests were conducted to ensure smooth implementation of the registration process. A common registration examination was also established for the registration of TCM practitioners after the expiry of the transitional period.

**Results:** During the transitional registration period, 1595 applied for registration as acupuncturists and 1865 applied for registration as TCM physicians. Detailed breakdown of the registration results and the profile of registered TCM practitioners are presented in the paper.

**Conclusion:** The implementation of the statutory regulation of the practice of TCM was carried out smoothly. Singapore's experience in regulating the practice of TCM can be a reference for other countries seeking to regulate the practice of traditional medicine, including TCM.

#### D6.4

### **Complementary Integrative Medicine - Future Directions and Role in the Community**

**TAT LEANG LEE**

*Acupuncture Service, National University Hospital, Singapore*

Not available at time of print.

#### E1.1

### **Productive Interactions in Chronic Care: Cultivating a Framework for Health Communications to Overcome Literacy and Social Factors.**

**DEAN SCHILLINGER**

*UCSF Center for Vulnerable Populations, San Francisco General Hospital, United States*

**Introduction:** The Chronic Care Model highlights the importance of "productive interactions" between a prepared and proactive workforce and an informed, activated patient as a pathway to improving health. We present an analysis of how contemporary health systems (using the exemplar of US system) contribute to poor communication for those with limited literacy, and advance a conceptual framework that can inform interventions to reduce social disparities in chronic disease care.

**Methods:** Literature review and call-to-action

**Results:** Health communication in chronic disease care includes achieving clinician-patient concordance across 4 domains. The 1<sup>st</sup> involves *elicitation-type* communication, such as assessing (a) symptoms and disease state and (b) barriers to carrying out treatments or behaviors. The 2<sup>nd</sup> involves *explanatory-type* communication, such as conveying (a) diagnoses and (b) treatment and self-management plans. Ineffective communication can affect decision-making, adherence, and more distal health outcomes. Limited literacy not only affects written communication, but impairs decision-making, understanding of technical information and explanations of self-care. Extent of jargon, use of visual aids, and degree of interactivity appear to be determinants of communication. Limited literacy also impairs medication communication, jeopardizing safety. There are a number of characteristics of the US health system that exacerbate communication difficulties, including lack of interactivity;

clinician-population cultural mismatch; reliance on single modes of communication; high concentrations of vulnerable patients in under-resourced clinics; reactive vs. proactive models; and underdeveloped technology platforms. Our group has carried out successful health communication interventions by adapting or reversing system characteristics to better meet the needs of those with limited literacy.

**Conclusions:** Ineffective communication is one pathway by which limited literacy impairs chronic disease care, with numerous domains of communication being affected. The communication characteristics of the healthcare system contribute to sub-optimal care, particularly for those with limited literacy. Re-structuring the healthcare system can improve the reach and effectiveness of healthcare, thereby improving quality of life and clinical outcomes.

#### E1.2

### **Medicine Non-adherence in Diabetic Kidney Disease**

**ALLISON WILLIAMS<sup>1</sup>, ELIZABETH MANIAS<sup>2</sup>, R. WALKER<sup>2</sup>**

*<sup>1</sup>School of Nursing & Social Work, The University of Melbourne, Australia, <sup>2</sup>School of Nursing, The University of Melbourne, Australia*

The prevalence of diabetes is rapidly escalating and is now the leading cause of chronic kidney disease in developed countries. Consumers with diabetic kidney disease commonly have additional chronic conditions that require the consumer to take multiple prescribed medicines and have frequent consultations with various health professionals, raising quality use of medicine issues. This paper presents intentional and nonintentional nonadherence to prescribed medications as perceived by consumers with diabetic kidney disease and health professionals likely to care for this group. Individual interviews with 23 consumers and two focus groups with 16 health professionals were conducted to gain an understanding of nonadherence in this context. All transcripts were analysed individually using an thematic "framework" method of qualitative analysis applied to a medication adherence model. Consumers were less confident of the need, effectiveness and safety of their medications than health professionals. Accessing prescribed medications, defence mechanisms and feedback problems affecting continuity of care contributed to consumers' nonintentional medication nonadherence. Health professionals were aware of the difficulties that consumers faced taking multiple medications, but continued to rely on pharmacology, and their concern centred around the consumer taking the medication. Acknowledging the consumer as 'expert' and awareness of the barriers as perceived by consumers can facilitate effective communication, promote self-management, general wellbeing and contribute to medication safety.

### E1.3

#### **Application of Motivational Interviewing in Clinical Practice**

**ELIZABETH MOON LIANG HO**

*Nursing Services, National Healthcare Group Polyclinics, Singapore*

Motivational Interviewing was first developed to help people with addiction problems. The 5 basic principles behind Motivational Interviewing are:

- i) Expressing empathy
- ii) Developing discrepancy
- iii) Rolling with resistance and
- iv) Supporting self-efficacy.

In the area of chronic disease management, patient education has gone beyond the realm of just providing health information. The focus on health education is rapidly shifting to influencing change in health behaviour. Many studies have shown that having the knowledge on the disease or managing the disease does not necessarily equate engaging in positive health behaviours.

The human behaviour theory that underlies Motivational Interviewing is Prochaska and DiClementi's Transtheoretical Change model (TTM). The TTM describes a series of stages that people pass through as they change a behavior. These stages are Pre-contemplation, Contemplation, Preparation, Action and Maintenance. Motivational Interviewing believes that these stages of change are "fluid", not as "fixed" in time as TTM suggested. Thus, it is possible to influence a person's stage of change by creating awareness of the ambivalence.

Moving through these stages of change requires effort and energy for thinking, planning and doing. Motivation is believed to be the driving force from the patient to initiate positive health behaviours and sustain them. Adaptation of Motivational Interviewing or Brief MI preserves the principles of MI and only requires 15 to 20 minutes to execute. This can be used in an outpatient clinical consult session to move patient along the stages of readiness to change.

In this presentation, principles and applications of Motivational Interviewing to change health behaviours during clinical sessions will be discussed. We will also explore the challenges and barriers involved. Motivational Interviewing can be a useful communication strategy to transcend the current level of partnership between the patients and healthcare professionals in chronic disease management.

### E2.1

#### **Successes and Near Misses in Applying e-Health Tools for Chronic Disease Management**

**ANGELA ESTEY<sup>1</sup>, CHRIS HOBSON<sup>2</sup>**

*<sup>1</sup>Health Services Planning and Information, Capital Health, Canada, <sup>2</sup>Clinical, Orion Systems International, Canada*

**Purpose:** This session will share knowledge and insights gained from a large health system that successfully implemented an electronic chronic disease management application and supporting business processes to enable an integrated service delivery strategy for diabetes patients.

**Methods:** With clinician guidance, the health region took a systematic and planned approach to improving diabetes services including:

- Re-organisation and standardisation of care and business processes, including centralised patient intake and scheduling
- Analysis, mapping, and redesign of workflows across multiple sites
- Implementation of information technology to support redesigned workflows, evidence-based practice guidelines, decision support, and comprehensive follow-up
- Establishment of performance measures to track quality of care and improvement
- Comprehensive maintenance and system enhancement processes

**Results/Outcomes:** The following results were achieved:

- System capacity increased to handle almost triple the number of patients with improved patient access to services
- More efficient delivery of care including patient stratification according to risk and more streamlined business processes
- Better health outcomes for patients
- Important learnings for other chronic disease management implementations both inside and outside the organisation including earlier engagement of broad base of clinicians in process and system design

**Conclusion:** Information technology is an integral component of an effective chronic disease management program. Using information technology and improved business processes to integrate diabetes service delivery improves clinical outcomes, breaks down barriers between health system silos, and ultimately ensures that a standardised system of care is delivered across the continuum.

### E2.2

#### **Measuring the Business Value of Telehealth Technologies**

**BEN WILSON**

*Digital Health Group, Intel Corporation, United States*

From patient records to clinical reference materials, healthcare runs on information. But while healthcare IT adoption rates are rising, healthcare continues to lag other information-intensive industries in using IT to achieve strategic business objectives. There are many reasons, including cultural resistance, competing priorities and a perception that IT deployment is fraught with difficulties. Do healthcare IT investments improve the delivery of high-quality healthcare services and deliver financial benefits to hospitals and physicians?

Ben Wilson, *MBA, MPH* has lead an initiative in Intel's Digital Health Group to build models that will help healthcare executives understand the business value of their investments in healthcare IT. Intel first developed these models to understand its own investments in IT and then customised them for different industries including manufacturing and financial services?healthcare is the latest industry for which these models have been developed. Mr. Wilson and his team have applied the Intel Healthcare IT Value Model at no cost at hospitals around the world including Banner Health in the US, Salford Royal in the UK, Wuhan Hospital in the PRC, St. Vincent's in Australia and many others around the world.

Mr. Wilson and his team have recently completed a literature review of the business value of Telehealth technologies in disease management. In this presentation Mr. Wilson uses the case study method to illustrate how Telehealth technologies have made an impact to reduce costs and improve outcomes across multiple chronic diseases.

### **E2.3**

#### **Increasing the Impact of Disease Management by Using e-Health Systems**

**DENNIS TANNENBAUM**

*Sentiens, Sentiens Pty Ltd, Australia*

Disease management (DM) is being increasingly incorporated into medical practice for a range of long term conditions such as diabetes, congestive heart failure, asthma and obesity. Similarly, chronic mental illnesses such as bipolar disorder need to be treated following a DM model that enhances patient empowerment. The health service implications from international implementation projects of an Internet-facilitated DM system are discussed. The online DM system has delivered programmes tailored for depression in the Western Australian health system, monitored the mental health outcomes of hurricane survivors and the effect of a mass community intervention in a post Hurricane Katrina disaster recovery effort, and tested in a world first randomised control trial of online DM for bipolar disorder based on an international sample and conducted in collaboration with the University of New South Wales. These research and implementation projects highlight the capacity to customise web-based systems to meet disorder-specific requirements for individual chronic diseases and cater to the needs of targeted populations. The system enables health providers to deliver accessible, high volume and sustained best-practice medicine. Such systems can provide an interactive environment for urban, rural or mobile populations that are tailored to managing their chronic illness by teaching effective self management skills, improving monitoring and providing efficient communication with treating clinicians. Online DM systems appeal to clinicians and administrators alike, as they can improve the clinical management of populations, prevent unnecessary hospitalisation and reduce costs.

### **E2.4**

#### **Telecare Monitoring with Decision Support for Health Risk Stratification**

**JIM BASILAKIS<sup>1</sup>, NIGEL H LOVELL<sup>2</sup>, BRANKO G CELLER<sup>1</sup>, JANETTE GOGLER<sup>3</sup>, JULIE STEINKRUG<sup>3</sup>**

*<sup>1</sup>School of Electrical Engineering and Telecommunications, University of New South Wales, Australia, <sup>2</sup>Graduate School of Biomedical Engineering, University of New South Wales, Australia, <sup>3</sup>Remote Patient Monitoring, Austin Health, Australia*

Telecare is the provision of health services remotely - typically in a patient's home. While telecare shows great promise in reducing health expenditure and improving patient health outcomes, a critical issue is the stratification and identification of 'at-risk' individuals based on the clinical monitoring information. Similarly, one of the key challenges is developing an effective means to reduce the data overload that healthcare professionals face in managing the chronic and complex disease processes of those being monitored.

We outline a decision support framework that can be used to analyse clinical information generated from subjects at either home or residential care settings. The telecare information generated from these environments comprises clinical information in various forms including physiological measurements, questionnaire and medication data. An enterprise application server framework combined with a rules engine and statistical analysis tools is used to analyse these data, searching for trends and shifts in parameter values as well as identifying individual measurements and sequences of successive measurements that exceed predetermined or adaptive thresholds.

By means of Web and other IT services, the health carer can be alerted to any deterioration in the health status of a patient. The system also will automatically stratify subjects into high, medium and low risk groups. In this way, the system may ultimately influence changes in work flow by targeting scarce human resources to patients of most need.

Data from a pilot study of the system in 30 patients with chronic obstructive pulmonary disease and chronic heart failure will be reviewed.

### **E3.1**

#### **The ON TRACK Diabetes Management Programme**

**JULIE ANDREWS<sup>1</sup>, SUE BRADSHAW<sup>1</sup>**

*<sup>1</sup>Health Services, Medibank Private, Australia*

Management of diabetes and adherence to screening guidelines is less than optimal and treatment targets are not met in 50% of people. The "On Track" Program was a 12 month pilot for Medibank Private Members with diabetes aimed at increasing the participants' rate of complications screening and risk factor assessment, and the proportion of people meeting

treatment targets. The intervention comprised a mailed reminder of diabetes checks, a questionnaire at baseline, 6 and 12 months to collect medical exam results (HbA1c, BP, lipids, renal, eye and foot checks) and self reported health and lifestyle information. Participants were mailed a report with individualised feedback on the results and were advised to seek medical advice when results were outside the target range.

The intervention appears to have influenced treatment of diabetes and CVD risk factors. In the 295 participants who completed the program, there were statistically significant improvements in diabetes and CVD risk factor control and an increase in the number of participants meeting lipid treatment targets. Participants also reported increased physical activity, improved disease knowledge and more confidence in discussing their diabetes with their doctor.

Hospital admissions decreased 16% and healthcare costs 8% during the intervention period. This improvement in management and consequent reduction in the risk of long term diabetes complications has indicated the potential for this intervention to reduce hospitalisation rates and costs.

The program has continued post the pilot phase with over 500 members currently enrolled.

### E3.2

#### **Innovative Programme for Diabetes Screening, Prevention and Care**

##### **ANIL KAPUR**

*World Diabetes Foundation, Denmark*

Diabetes is already a major public health problem in the developing world and regarded as a major cause of premature mortality and morbidity. It is amongst the leading causes of blindness, renal failure, heart attacks, strokes and limb amputations. Poor and disadvantaged people tend to be diagnosed later, have less access to treatment and consequently suffer more acute and late complications, limiting productivity and increasing economic burden. Effective intervention reduces health and economic burden of diabetes and requires focusing on prevention – primary prevention – promoting healthy living, and secondary prevention – reducing the burden of complications by early diagnosis and proper care. This is particularly true for foot complications.

World Diabetes Foundation (WDF) aims to address and potentially limit the epidemic by bringing diabetes higher on the global healthcare agenda as well as fund sustainable projects in awareness, primary prevention, building healthcare capacity, and improving access to care in the poorest countries.

At present WDF supports 138 projects in over 75 developing countries. These projects will directly impact the lives of over 60 million people with diabetes in developing countries.

A few examples of WDF projects which illustrate that simple cost effective initiatives are possible and can make a huge

difference to care delivery are illustrated below.

#### **Making a difference In Tanzania**

It is estimated that only 30% of people with diabetes in Tanzania have access to care. In 2002, when the World Diabetes Foundation funding was initiated, Tanzania had only three diabetes clinics on the mainland and one clinic in Zanzibar. Today, the country has a network of 38 clinics established with the support of the Foundation, and several other clinics funded from other sources. What started as a small project to improve access to diabetes care has led to establishment of diabetes clinics now in 25 out of Tanzania's 26 regions, attracting additional co-funding and bringing diabetes and non-communicable diseases higher on the national health agenda.

In total, 35 teams consisting of one doctor, two nurses and one laboratory technician have been trained to run the clinics that – besides being responsible for basic care – also play a significant role in informing their local communities about diabetes through IEC (Information, Education and Counselling) activities. Standard guidelines and care protocols have been included as part of the Clinic Practice Training and Guidelines developed under another supported by the World Diabetes Foundation and the International Diabetes Federation (IDF), African Region, which helped create course curriculum and training material for the training of healthcare professionals, as well as guidelines for diabetes care on the African continent.

A new project aiming to strengthen diabetes care from the primary to tertiary level, and to raise public awareness of diabetes, its risk factors and possible preventative measures has been initiated in the Lake Zone comprising of four regions: Mwanza, Mara, Kagera and Shinyanga with substantial co funding from the Danish International Development Assistance (DANIDA).

The comprehensive care model being rolled out in Tanzania has the potential to form the basis of a national non-communicable disease programme because of the ownership and active involvement of the Tanzanian government along with TDA. The capacity-building is fully integrated into the public health system and builds on the structures.

The diabetes clinic model developed by the Tanzanian Diabetes Association is now being replicated by the Association of Private Health Facilities in Tanzania (APHFTA) in another project funded by the World Diabetes Foundation. The project involves 80 private health facilities and aims to improve access to diabetes care and prevention in the private health sector which caters to 45% healthcare in the country

#### **Saving feet, saving futures**

Amputations as a result of unattended injuries and resultant infections are sadly an all too common occurrence in many developing countries. Over one million amputations are performed on feet of people with diabetes. 80% of these are avoidable and needless; all that is required are simple interventions for prevention. In close collaboration with foot care experts from India and Tanzania, the World Diabetes

Foundation has facilitated a targeted effort in India and Tanzania by implementing specific programmes for screening, treatment and prevention of the diabetic foot.

The Step-by-Step model piloted in India and Tanzania from November 2003 has trained 115 teams consisting of a doctor and nurse to provide preventive care and education to reduce unnecessary amputations. The model systematically builds up the skills of the enrolled medical teams and has been developed with the purpose of establishing a sustainable, integrated and low-cost healthcare capacity both for the early recognition of high risk feet and for preventive care. Through the education of healthcare personnel and the cascading of information through the system, focus on diabetic foot problems gradually increases. Awareness and educational activities aimed at the general public at the same time empower people with diabetes to seek timely help. The project has helped set up about a 100 preventive foot care centres.

In yet another initiative funded by WDF, the Jain Institute of Vascular Sciences in Bangalore Karnataka has launched a project named "Padasamraksha" protecting the feet. The project provides training for paramedics. The course includes both didactic education and hands-on experience for one month. So far 44 people have been trained. In addition a total of 10 foot care centres have been established across the state of Karnataka in India. Furthermore a specially designed mobile foot care clinic equipped with state of the art diagnostic facilities provides foot care and education, including customised footwear, in remote areas within a radius of 150 kilometres of Bangalore, visiting approximately 20 outreach areas per month, attending to about 30 to 40 people per visit.

Presently more than 27,000 people with high risk feet have been provided with foot care, education and counselling. The project has received wide publicity and attention, and requests for the mobile unit to visit new areas are received constantly. Since 2002, the WDF has supported the training of 456 healthcare professionals in providing proper care for the diabetic foot. It is estimated that they have provided care for over 100,000 people with high risk feet. Over the next several years, these professionals are in a position to treat many more people with diabetes. By sharing information with their colleagues, they build even greater capacity.

The foot care projects in India and Tanzania have had a catalytic effect on several other partners of the World Diabetes Foundation thus inspiring similar projects in countries like Mali, Pakistan, The Democratic Republic of Congo, Burundi, Mauritius, Kenya and Uganda. More importantly these projects are raising awareness to one of the most devastating, costly and yet eminently preventable complication of diabetes.

### **Preventing blindness in rural India**

Diabetes is a leading cause of blindness worldwide. In India it is estimated that one in five people who have had diabetes for more than 10 years will develop diabetic retinopathy. To date retinopathy treatment has only been available at certain urban

hospitals. This means travelling 200-300 km to access such care, resulting in a huge barrier for poor people who live in rural and semi-urban areas. Now an innovative team from the southern Indian state of Karnataka has achieved impressive results after introducing a unique way to bring the treatment out to the patients.

With the objective of improving treatment for diabetic retinopathy in remote areas of Karnataka, a team from Vittala International Institute of Ophthalmology (VIIO) initiated a project with the support of the World Diabetes Foundation to develop and use a highly advanced, fully equipped mobile unit to diagnose and treat people with retinopathy in semi-urban and rural settings right at their door step.

The mobile unit makes a fixed journey each month, stopping at pre-arranged locations. Local ophthalmologists trained during the project from the selected small towns pre-screen and identify people requiring advanced investigations and laser therapy. The patients are asked to come on the day the van is scheduled to arrive in the area. Each participating ophthalmologist has been trained to use the equipment available in the van (retinal camera, fluorescence angiography, ophthalmic ultrasound, and laser) and takes care of his/her patients. If and when needed, expert guidance from a trained fellow accompanying the van is available. Close collaboration between the local ophthalmologists, general practitioners (GPs) and physicians in the area ensures that patients are screened and referred to the van. Care delivery by the local doctor in the patients' own familiar surroundings builds respect and trust as well as ensuring ownership and compliance.

Treatment is offered free of charge to patients with an income of less than USD 30 per month, the official poverty-line set by the Indian government. Of the money received from paying patients, 70% goes to the local ophthalmologist and 30% to a VIIO project account. The payment structure offers an incentive for local ophthalmologists to participate and to refer patients. The project is like a co-operative movement for advanced diabetes eye care. The participating ophthalmologists have a joint stake and ownership in the continuing success, and have each agreed to pay USD 35 per month for maintenance of the van once the co-operative was formed. They could not otherwise individually afford to invest in these advanced equipments; but owned, run and maintained in this way the return on the investment is highly justified and a corpus is being created for replacement when the equipment breaks down due to wear and tear.

The most advanced and state-of-the-art eye care is being delivered literally to the patient's doorstep in the remote rural areas of Karnataka. This is a level of care for which even people in the most developed countries would have to wait for months if not years. People do not have to travel long distances. This saves travel costs, time, and accompanying hassles resulting in a remarkably improved compliance. This is of great value in a country where poverty and illiteracy constitute a great barrier to access appropriate healthcare.

One of the biggest challenges in the project was to find a solution for transporting sensitive equipment safely on unreliable, poorly-metalled roads in rural and semi urban areas in India. The team from VIIO in consultation with Vortex Engineering and with the help from a group of students from the Indian Institute of Technology in Chennai came up with a solution allowing the mobile unit to transport the equipment in a vibration free system of springs and dampers that absorbs shocks from the van.

In this project 229 GPs have been trained in basic, intermediate and advanced diabetes management. More than 171 local health workers have been trained in the detection, motivation and counselling of people with diabetes. 19 surgeons and 83 ophthalmologists have been trained in state-of-the-art treatment methods.

The current number of patients receiving assessment and treatment through the van stands at over 16,500. A total of 2,012 (1,687 patients) laser photocoagulation treatments have been performed on site, of which half were free of charge or received concessions.

The compliance rate for three laser sittings over three months is 100%

A total of 259 sight restoring and sight-saving vitreo retinal surgeries have been performed of which 123 have been done totally free

Since 2002 through several projects funded for prevention of diabetes related blindness WDF has supported 2,429 screening and awareness camps, including diabetic retinopathy camps. The camps have been attended by 2,194,500 people, of which 1,833,407 have been screened for diabetes. A total of 122,116 cases of diabetic retinopathy detected and more than 7,700 people have received sight saving laser therapy.

For information on the World Diabetes Foundation and WDF funded projects please visit: [www.worlddiabetesfoundation.org](http://www.worlddiabetesfoundation.org)

### E3.3

#### **The Multipurpose Diabetes Workers - Developing the "Poly Provider" in India**

**SANJAY KALRA<sup>1</sup>, BHARTI KALRA<sup>2</sup>, AMIT SHARMA<sup>1</sup>**  
<sup>1</sup>Endocrinology, Bharti Hospital, Karnal, India, <sup>2</sup>Gynaecology, Bharti Hospital, Karnal, India

This paper describes the Multipurpose Diabetes Worker (MPDW) training programme at an Indian hospital.

The objectives were to train multipurpose diabetes workers (MPDWs), and to utilise their services in existing diabetes care centres in a cost-efficient manner.

Forty-three selected candidates, (high school graduates, with or without a paramedical diploma, and medical representatives), were invited for a 3-day intensive training session, in groups of 2 to 4, at Bharti Hospital, Karnal. Services of doctors and paramedical staff including dietician, physiotherapist, clinical

psychologist and podiatrist were utilised for training. The training schedule was spread over three 10-hour working days. Sixteen trainees were pharmaceutical representatives, while 18 were workers being trained for employment in existing diabetes centres. Twenty-five candidates were graduates (17) or postgraduates (8), while 18 were diploma-holders.

All 43 trainees completed the 3-day course at first attempt, and cleared an internal house oral/ written assessment satisfactorily.

Post-training evaluation has been carried out in 20 MPDW graduates. All have demonstrated a significant ability to counsel patients, and discuss diet, exercise, foot care, insulin technique and other problems with them. Thirty-five (81.39%) workers are still working in the field of diabetes.

The training programme has achieved improvement in provider-patient interaction, by reducing the "distance" between doctor and client, through the MPDW; an increase in diabetes awareness/advocacy amongst medical professionals and patients; and placement of a practical system of diabetes care delivery, suited for underprivileged areas.

### E3.4

#### **Using Teams to Support Diabetes Care in the Community**

**STEPHANIE DONALDSON KELLY<sup>1</sup>, DOROTHY SMOLEK<sup>1</sup>, KAREN KASTELIC<sup>1</sup>, PATTI GILMOUR<sup>1</sup>**  
<sup>1</sup>Chronic Disease Management, Capital Health, Canada

**Aim:** The Regional Diabetes Program assures healthcare providers in Primary Care have access to evidence-based diabetes information based on Clinical Practice Guidelines and telephone support through DIAL – the Diabetes Information and Advice Line.

**Methods:** The Diabetes Information and Advice Line was launched in 2005 to provide real time access to diabetes specialty team members and support for managing patients with diabetes. Staged education sessions were implemented in 2007 to support Primary Care Network (PCN) CDM nurses, and other community-based healthcare professionals, in the acquisition of knowledge and skills in diabetes management.

Level 1 is an introduction to diabetes management including lifestyle changes. It is similar in content to information clients receive in the community and provides basic information to help providers support their clients manage their diabetes.

Level 2 is an in-depth workshop focusing on specific skills in assessment and management of diabetes and the tools to support clients in managing their disease through its progressive stages. This class includes foot assessments and initiation and management of insulin therapy.

#### **Results:**

- 80% of PCN CDM nurses have attended Level 1 and Level 2.
- PCN nurses demonstrate an increased ability to initiate

insulin therapy and adjust.

- Healthcare provider calls to DIAL have increased by 40%.
- Patients with diabetes receive care in their community in accordance with basic CDM principles. Literature indicates this has a positive effect on health outcomes.

**Conclusion:** Staged education and support from specialty services provides Primary Care nurses the ability to manage and follow-up diabetes patients.

#### E4.1

##### **Heavy Utilisation of Primary Healthcare Services by Patients with Chronic Illnesses: Implications for Health Quality**

**SAAD ALGHANIM<sup>1</sup>, BADRAN AL- OMAR<sup>2</sup>**

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**Aim:** To determine factors associated with heavy use of healthcare facilities by patients with chronic illnesses in Saudi Arabia.

**Methods:** The study employed a self-administered questionnaire to collect data from patients aged 18 years or older in Riyadh City. The data were collected on a set of independent variables including predisposing, enabling and need variables which were thought to determine the heavy utilisation of health facilities. Bivariate and multivariate analyses were employed to determine which factors best predict heavy use of health facilities by patients with chronic illnesses.

**Results:** More than half of the patients with chronic illnesses have used different healthcare facilities during the past 3 months. Despite the importance of predisposing and enabling variables, need variables seem to be the principal determinants of the heavy use of health services by this group of people. The study showed that health facilities are limited in the provision of suitable healthcare quality for patients with chronic conditions.

**Conclusion:** Patients with chronic illnesses constitute a unique subset of health services users. This vulnerable group of patients tends to make heavy use of health resources which should prompt policy makers in Saudi Arabia to propose health plans to cope with such use. Further research should take into account the promotion of the health status of this "at risk" group of patients.

#### E4.2

##### **Avian Influenza and Healthcare Workers: A Comparative Study of Tertiary and Community Hospitals, Polyclinics and Private General Practitioners** **GERALD KOH<sup>1</sup>, JUDY SNG<sup>1</sup>, SENG KWING CHEONG<sup>1</sup>, TECK YEE WONG<sup>1</sup>, HEOW YONG LEE<sup>1</sup>, BOON YEOW TAN<sup>2</sup>, MEENA SUNDRAM<sup>3</sup>, KELVIN KOH<sup>4</sup>, KIN MING CHAN<sup>5</sup>, YUKE TIEN FONG<sup>6</sup>, SIN ENG CHIA<sup>1</sup>, DAVID KOH<sup>1</sup>**

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**Introduction:** Primary healthcare workers (HCW) are at the frontline during infectious disease outbreaks. Although private general practitioners (GP) provide 80% of primary healthcare services in Singapore, little is known about how prepared they are to face infectious disease outbreaks. This is an important consideration, in the light of a potential avian influenza (AI) pandemic.

**Methods:** We studied the attitudes, concerns, perceived impact, coping strategies, knowledge of AI and personnel protective measures, and preparedness at institution and personal levels of HCW in a tertiary hospital (TH), 2 community hospitals (CH), 18 government-based polyclinics (PC) and 200 private GP. A self-administered questionnaire was administered to 3045 HCW from the 4 institution groups.

**Results:** Across all institution groups, HCW had positive attitudes despite their concerns about the risk of being infected with AI at work. GP were less willing to look after AI patients and felt less confident that their employer would look after their medical needs if they were to fall ill with AI. GP would feel more stressed at work during an AI pandemic than other groups. The overall knowledge on AI and Personal Protection Equipment (PPE) were good, but GP were less informed about goggles and respirators. Institutional preparedness was highest for tertiary hospitals and lowest for GP. Participation in infection control activities was lowest for GP but they compensated by buying anti-viral influenza medications and masks for themselves.

**Conclusion:** Private GP lack institutional preparations and infection control training for an AI outbreak. There is a need to better empower them in pandemic preparedness.

#### E4.3

## **Evaluation of Quality in Delivery of Primary Care by Assessing Avoidable Hospitalisations in Taiwan**

**YING-CHUN LI<sup>1</sup>**

*<sup>1</sup>Institute of Health Care Management, National Sun Yat-Sen University, Taiwan*

**Aim:** To evaluate quality in delivery of primary care by assessing avoidable hospitalisations (AH) in Taiwan since implementation of the National Health Insurance (NHI) program in 1995.

**Methods:** Reduction in avoidable hospitalisations for 4 common ambulatory care conditions such as asthma, pneumonia, diabetes and hypertension; by provision of appropriate primary care, were evaluated as quality measurements. National data from 1997 to 2004 were analysed to investigate standardised rates of avoidable hospitalisations (AH). Multivariate logistic regression models estimated the probability of AH by controlling for individual factors and provider characteristics.

**Results:** Over time, AH rates were increased within the study period, except for hypertension. Multivariate logistic regression results indicated that gender and age were two key individual factors affecting the probability of AH ( $P < 0.01$ ). AH were more likely appear in private and non-profit hospitals than in public hospitals ( $P < 0.01$ ). The probability of avoidable hospitalisations (AH) increased significantly ( $P < 0.01$ ) in east areas, which has less healthcare resources.

**Conclusion:** NHI may increase access to care. Nevertheless, the empirical results of this study suggests that the trends of avoidable hospitalisations increased over time with some area variations, even under the NHI program. It is necessary for policymakers and healthcare professionals to continue to explore the key factors affecting AH, and to improve the delivery of primary care in more timely, appropriate and effective ways to residents. To amend the healthcare delivery system, AH may be applied as a proxy performance indicator of evaluating quality in delivery of primary care in Taiwan.

### **E4.4**

## **The International Success of Primary Care Collaboratives – Can One Size Fits All?**

**DAVID LYON<sup>1</sup>, FORD DALE<sup>2</sup>**

*<sup>1</sup>Improvement Foundation, United Kingdom, <sup>2</sup>Improvement Foundation, Australia*

Primary Care Collaborative programs have achieved significant improvements in the delivery of Primary Care to patients in England, Scotland, Canada and Australia. Presenters will introduce the Collaboratives Methodology and demonstrate how the Improvement Foundation (UK) Collaboratives Program has been responsible for impressive improvements in the management of Diabetes and CHD in the UK, Scotland, Australia and Canada.

The Collaboratives methodology is a specific method of quality improvement that can be applied to achieve incremental, rapid and locally relevant improvements across a broad range of clinical and practice business issues. Change Principles and Change Ideas are a key component of the methodology and the presenters will discuss how readily they can be transferred to achieve rapid quality improvement in Primary Care and Chronic disease management. In addition to this, they will share the improvements that have been achieved in improving patient access to Primary Care in each health system – the successes and lessons learned.

Participants will be given the opportunity to discuss and compare the improvements and how the lessons may apply to their respective organisations. This session will be of interest to those who advocate sharing expertise, continuous quality improvement, and capacity building in the primary care environment.

Primary Care Collaboratives programs have achieved significant results in multiple areas of disease management including, but not limited to: up to 80% improvement in digital retinopathy screening, up to 70% improvement in access to see GP, and up to a 4-fold reduction in mortality for CHD compared to non-participating practices.

### **E4.5**

## **Implementation of a Total Electronic Health System in the Remote Community Primary Healthcare Arena**

**WENDY MACKAY<sup>1</sup>, NOELENE SWANSON<sup>1</sup>, SCHATZ STEVEN<sup>2</sup>**

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**Aims:** The need for continuity of care has been identified as a long-standing issue in maintaining health for remote Indigenous population. This paper will illustrate the implementation processes of a complete electronic health record system via a wide area network throughout remote (predominantly Indigenous) communities spread across more than 1.35 million square kilometres of the Northern Territory of Australia.

The high level of mobility of this population group within these communities, adds to the complexity of providing continuous healthcare management to those who have a significantly higher level of co-morbidities and complications from chronic disease.

**Methods:** The Northern Territory Government is seen as forerunners in the development and implementation of a suitable electronic program that is acceptable to clinicians, providing enhanced primary care delivery, referrals and medication management capabilities. Consultation and acceptance of program development has occurred with a range

of health professionals over the past 4 years.

Quality processes have been implemented.

Consultation occurred with the security, legal and confidentiality divisions to ensure adherence to the appropriate Acts and Legislations.

**Results:** To date, 18 remote communities are completely paperless on the wide area network. About 350 clinicians are registered users of the system, allowing continuity of care to about 16,000 people. Continuity of care has improved from initial point of care, to secondary care, discharge with electronic pathology, scripts, Medicare claiming and referral letters all within the system.

**Conclusion:** Clinicians have embraced the electronic era and have adapted workflow practices accordingly. Continuity of care for the patient has become coordinated with better outcomes.

#### E4.6

##### **Implementation of EFQM Model in Healthcare Educational Organisation**

**FATEMEH HAGHDOOST OSKOUI<sup>1</sup>, LEILI BORIMNEJAD<sup>2</sup>, FOROOGH RAFII<sup>1</sup>, SHARAREH SAFAVI<sup>2</sup>**

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**Introduction:** Different quality improvement approaches are used in different organisations delivering healthcare education. The EFQM model is one such approach that has been adopted by higher education organisations for Quality Management. This article describes the background and progress relating to the use of the EFQM excellence model within the Nursing and Midwifery School of Iran University of Medical Sciences.

**Methods:** Initially, the training activities were focused on executive teams and middle managers in the organisation. Training included a practical, case-based approach, and practical experience in the self-assessment process. Throughout this training, many quality managers and technicians acquired knowledge and skills useful for the implementation of the EFQM model in our centre. The Organisational Excellence committee was created in 2005 and endowed with technical and human resources to promote and facilitate total quality management in the school. This committee has the responsibility of developing different tools to facilitate the implementation of the EFQM model.

**Results:** This model in our organisation has had a dramatic

impact on the improvement of inner organisational culture, customer focus and research amongst faculty members. Their partnership in improvement projects led to various achievements such as: establishing the first nursing care research centre in Iran, and achievement to the first Scientific research Nursing Journal that was accredited by Iran Ministry of Health and Medical Education.

**Conclusion:** This experience indicates the applicability of the EFQM excellence model for improvement research activity in a healthcare education institute.

#### E4.7

##### **Improving Compliance with Metered Dose Inhalers in Asthmatic Patients**

**MUTHIAH PAERARASI<sup>1</sup>, TING NEE LIM<sup>1</sup>, VIVIAN WING LING CHEE<sup>3</sup>**

*<sup>1</sup>Pharmacy, SingHealth Polyclinics, Singapore, <sup>2</sup>Pharmacy, SingHealth, Singapore*

**Aim:** To ensure all asthmatic patients on metered dose inhaler (MDI) therapy attending SHP Bukit Merah achieve efficient MDI techniques (or be on a spacer) in 6 months.

**Methods:** The CPIP team brainstormed on the causes of poor MDI techniques using cause-effect analysis and Pareto charting. The 4 main causes identified were poor coordination of inhaler technique; lack of awareness of the correct MDI technique; too many steps in inhaler technique; and doctors failing to identify and recommend counselling for patients with poor techniques. Based on these findings, 3 interventions were planned and they were: screening and counselling of patients with poor techniques by pharmacists; use of posters and counselling aids for patient education; and introduction of an MDI stamp to highlight to doctors patients identified to have poor techniques.

**Results:** After the introduction of interventions 1 and 2 at week 1 and 3 respectively, the percentage of patients with inadequate inhaler techniques fell from 46.4% to 12.5% by the middle of the project period (at week 10). Patients with efficient techniques rose from 14.3% to 37.5%. Two patients, who could not achieve adequate inhaler technique despite intensive counselling, were put on the spacer. With the introduction of intervention 3 at week 12, the percentage of patients with inadequate techniques fell further to 4.2% at the end of the project at week 24, while patients with efficient and adequate techniques rose to 95.6%. Patients with efficient techniques rose to 47.8%.

**Conclusion:** The interventions have been highly effective in helping asthmatic patients on MDIs to improve their MDI technique.

#### E4.8

## Access to After-hours Primary Care in Ontario, Canada

**GLENRANDALL<sup>1</sup>, MICHELLE HOWARD<sup>2</sup>**

<sup>1</sup>*DeGroote School of Business, McMaster University, Canada,*

<sup>2</sup>*Department of Family Medicine, McMaster University, Canada*

**Aim:** Since the early 2000s, most of Ontario's family physicians have joined reformed practice models for the delivery and funding of primary care that feature provision of patient access to care outside of regular business hours. The purpose of this study was to determine the options and prevalence of those options for after-hours care made available by family physicians.

**Methods:** The Canadian Medical Directory was used as the sampling frame and more than 1,600 physicians listed as family physicians in Ontario were selected (stratified by regions defined by Local Health Integration Networks). A random sample of 120 physicians was chosen from each of the 14 geographic regions. Physicians' offices were contacted after regular business hours between September and December 2007. Instructions provided to patients regarding how to obtain care after-hours were documented.

**Results:** A wide variety of options were made available to patients for after-hours primary care. These ranged from using Tele-Health Ontario, the province's telephone health advisory service (THAS), after-hours clinics, and a house-call service, to simply referring patients to hospital emergency departments. Not all family physicians provided their patients with instructions for access to after-hours care.

**Conclusion:** This study provides important data on instructions provided to the public to access after-hours care, and the degree to which various forms of primary care models with after-hours arrangements are being implemented in communities throughout Ontario.

### E4.9

## Knowledge, Attitudes and Practices of Primary Care Physicians Towards Depression

**WERN EE TANG<sup>1</sup>, MATTHIAS TOH<sup>2</sup>, COLIN TAN<sup>3</sup>**

<sup>1</sup>*Bukit Batok Polyclinic, National Healthcare Group Polyclinics, Singapore,* <sup>2</sup>*Health Services & Outcomes Research, National Healthcare Group, Singapore,* <sup>3</sup>*Ang Mo Kio Polyclinic, National Healthcare Group Polyclinics, Singapore*

**Aim:** Studies have reported that depression is often under-diagnosed and under-treated in primary care. This study aims to determine the self-reported knowledge, attitudes and practices of primary care physicians towards screening and management of depression.

**Methods:** A self-administered questionnaire was distributed to 138 physicians working in the 9 NHG Polyclinics during

December 2007. The questionnaire was answered anonymously. Areas covered by the questionnaire included post-graduate training, work experience, knowledge, attitude and practices regarding screening and treatment of depression. Data were analysed using SPSS.

**Results:** Response rate was 81.2%. The distribution of respondents with postgraduate family medicine training, prior work experience in a tertiary psychiatric institution and previous attendance of courses in psychiatry or psychotherapy was 41.4%, 26.8% and 15.2% respectively. About 17% had both postgraduate family medicine training and prior work experience in psychiatry; 7.1% had both postgraduate family medicine training and attended short course in psychiatry or psychotherapy. Primary care physicians who had received postgraduate family medicine training were more likely than those without to view as important the screening for depression in diabetic patients (OR 3.24; 95% CI, 1.45 to 7.25). Those with prior work experience in psychiatry were more likely to initiate antidepressant therapy compared to those without (OR 3.19; 95% CI, 1.4 to 7.35). There was no significant correlation between attending a short course in psychiatry or psychotherapy and physician attitude and practices towards depression.

**Conclusion:** Postgraduate family medicine training and work experience in a psychiatry unit improves the awareness and management of patients with depression.

### E5.1

## Patient Care Goes High Tech: Optimising IT to Deliver Quality Patient Care

**MICHAEL BAINBRIDGE**

*Clinical Architect, NHS Connecting for Health, NHS England, United Kingdom*

To meet the demands of healthcare in the 21<sup>st</sup> century, the NHS in England has embarked upon an IT transformation programme of an unprecedented scale. It touches all areas of clinical care from acute and emergency to primary care (doctor's offices), as well as extending out into the community and into the citizen and patient's home.

In order to achieve this integrated aim and truly deliver interoperability, it has been necessary to innovate at fundamental levels in areas such as:

- Basic Standards
- Record Structure and Record Keeping Standards
- Hardware Design
- User Interface Design

Taking these in turn, we have been proactive in promoting and developing HL7v3 messaging. We have also supported development in the foundation of the International Healthcare Standards organisation taking SNOMED CT forward as a globally relevant clinical nomenclature. Underpinning these is

an “enterprise-scale” network and infrastructure programme which forms the supporting substrate.

Turning to record structure, we have embarked upon a number of related projects involving both the healthcare professional and the informatics communities. Within these projects we are working on clinical content and with the caring professions to deliver data archetypes<sup>1</sup> and definitions.<sup>2</sup>

At the same time we have been addressing the hardware requirements for clinicians and citizens as we transform care delivery models and move care closer to home. This has led to the Mobile Clinical Assistant Specification (MCA [www.intel.com/healthcare/mca/](http://www.intel.com/healthcare/mca/)) and a global alliance of over 140 hardware suppliers; the Continua Alliance ([www.continuaalliance.org](http://www.continuaalliance.org))

A final piece of the jigsaw is the Common User Interface programme (<http://mscui.org>) and the usability programme surrounding it.

These “heavy lifting” pieces of work are not specific to English IT implementations and have, with obvious caveats such as “billing” and “organisations”, global applicability. The development and implementation of standards-based software is critical to the delivery of high quality care in the 21<sup>st</sup> century; the talk will demonstrate how thorough the optimisation of IT these aims can be achieved. An international forum to share experiences and learning will also be suggested.

<sup>1</sup> An example of an archetype might be a blood pressure which is ‘built’ from two numeric and coded readings (one always larger than the other). The reading is ‘usually’ in mm/Hg. It might have been taken sitting, lying down, standing up and with a large cuff etc..

<sup>2</sup> Simple concepts in medicine do not have ubiquitous implementation of computable definitions. Consider the examples of ‘Allergy’ and ‘Current medication’ and the patient safety issues which might ensue from misunderstanding of such terms.

## E5.2

### **Leveraging IT’s Potential in Enhancing Patient Care - Singapore’s Experience (a) Tele-radiology: The NHG Experience (b) eMR: The System in Development**

**JONATHAN PHANG**

*Health Informatics, National Healthcare Group Polyclinics, Singapore*

This presentation shares the NHG’s experience in harnessing IT in to provide better patient-centred primary care and online access to patient’s clinical information to provide better decision support for our healthcare team on the ground. The areas covered include: prescribing, laboratory investigation orders and results, radiology investigation orders and reporting, clinical notes and chronic disease management.

## E5.3

## **Economic Impact of Globalisation on Healthcare**

**KAIHONGPHUA**

*Lee Kuan Yew School of Public Policy, National University of Singapore, Singapore*

As the world undergoes rapid transition in the globalization of healthcare, population dynamics such as migration and travel, together with epidemiological disease patterns, would have great economic impact in the health sector. On the supply side, new medical and technological advances have revolutionized delivery of healthcare across the world. Global health policy issues are increasingly becoming more important as businesses, governments, civil society and international organizations respond to these challenges. There is a need in developing sound policies to meet such global health challenges due to the increasing economic demand and market competition for quality services, versus the implications in terms of social costs. This presentation will provide a macro policy framework for the analysis of important global health trends, with a focus on the economic impact in Asia. Critical policy issues for growth of the global healthcare industry and complexities involved will be discussed, covering the role of international bodies and governments in foreign policy, development assistance, international trade, medical tourism, and future of global health governance.

## E5.4

### **Challenges When Healthcare Transcends Borders**

**JASON YAP**

*Healthcare Services, Singapore Tourism Board, Singapore*

Not available at time of print.

## E5.5

### **Medico-legal Implications of IT and Globalisation on Healthcare**

**BOON THENG KUAH**

*Legal Clinic LLC, Singapore*

Not available at time of print.

## E6.1

### **Transforming Healthcare Preparedness in the Face of Emerging Infectious Diseases**

**JEFFERY CUTTER**

*Ministry of Health, Singapore*

Not available at time of print.

## E6.2

## **Pandemic Plan for Infectious Diseases - Sharing Singapore's Perspectives**

**YEE-SIN LEO**

*Communicable Disease Centre, Tan Tock Seng Hospital, Singapore*

Influenza A and B are two of the three types of influenza viruses associated with annual outbreaks and epidemic of influenza. Only influenza A can cause pandemic when a major change in the surface antigen components occurs. The three global pandemics reported in the last century were H1N1 Spanish flu (1918), H2N2 Asian flu (1957), H3N2 Hong Kong flu (1968). On 18 March 2008, World Health Organization reported an accumulative total of 373 human cases of H5N1 worldwide since 2003. Of these, 236 (63%) were fatal. Although there is no clear evidence of human-to-human transmission of H5N1, the rapid evolving nature of type A influenza has cast the possibility of a significant antigenic change that may lead to a pandemic.

Singapore's Ministry of Health in its influenza preparedness plan using FluAid software, estimated a half million outpatient visits, more than 10,000 hospital admissions, close to 2,000 deaths based on 25% clinical attack rate with 0.2% mortality. Most of the cases would present in the first 1 to 2 weeks of pandemic. The number clearly overwhelmed any healthcare system and demanded preparedness strategies.

Apart from putting in place healthcare measures to ameliorate the impact of pandemic, of equal importance are the concurrent measures to address international and community responses.

### **E6.3**

## **Vietnam's Experience of Combating Emerging Infectious Disease – Lessons Learnt and Challenges Ahead**

**AUTHORS**

Not available at time of print.

### **E6.4**

## **Primary Care and Infectious Diseases — Being at the Frontline and Maintaining the Ring of Defence**

**TIEN HUA WONG**

*Mutual Healthcare Pte Ltd, Singapore*

Not available at time of print.

### **F1**

## **Critical Thinking in Quality Innovation**

**TRISHA GREENHALGH**

*Primary Care and Population Sciences, Faculty of Clinical Sciences, University College London, United Kingdom*

**Introduction:** It is important to distinguish between “stories of quality improvement” and “quality improvement research”.

**Aim:** To introduce the principles of critical appraisal as applied to quality improvement research.

**Results:** In appraising a paper on quality improvement research, questions should be asked about the study design, sampling strategy, sample size, methods of data collection and analysis, nature of key findings, link between findings and conclusions, and transferability of findings to other settings. These and other dimensions of the critical appraisal checklist will be applied to a real-life example during the workshop.

**Conclusion:** Published papers that claim to describe quality improvement research should be considered using critical appraisal principles.

## F2

### Lean Management Workshop

#### **CHI HONG HWANG**

*Quality Management Office, National Healthcare Group Polyclinics, Singapore*

Of late, many healthcare organisations have much interest in LEAN as a means of improving care and safety to patients. LEAN embodies both a culture of quality improvement at in every staff of the organisation and the tools for problem analysis, innovation and solution implementation. Many books have been written on the extraordinary benefits both to organisations and customers that have successfully implemented LEAN. Currently, while there is an increasing amount of information of LEAN implementation in hospitals, there is little literature regarding LEAN implementation in primary care settings. National Healthcare Group Polyclinics (NHGP) began looking into LEAN as a concept in 2006. A decision was made in late 2007 for definite plans to implement LEAN in NHGP and the formation of a LEAN task force to drive this initiative. While NHGP has only begun on our LEAN journey, there are many worthwhile learning lessons in this enterprise wide change management endeavour. This is an honest account of the challenges and the successes faced in beginning to transform NHGP into a LEAN organisation.

## F3.1

### Promoting Health at the Workplace – Case Study: Treasure Your Mind

#### **YANG HUANG KOH**

*Adult Health Division, Health Promotion Board, Singapore*

**Aim:** This paper describes the national strategies Singapore has implemented to promote health at the workplace, and cites Treasure Your Mind as an example of an effective workplace health promotion (WHP) programme.

**Rationale for WHP:** Sixty-four per cent of Singaporeans aged 18 to 65 years work. Most work 8 to 10 hours daily, 5 days a week. The rapid ageing of our population and workforce potentially threatens the productivity and profitability of businesses. Chronic diseases such as cancer, heart disease, stroke and mental illness have become major causes of death and morbidity. The workplace is thus an excellent setting to promote the physical, social and mental health of our workers, resulting in a healthier and happier workforce, increase in productivity and a reduction in healthcare costs.

**Development of WHP:** WHP in Singapore started in 1984. It empowers workers with life skills to increase control over and improve their own health. It also works with employers to incorporate WHP as part of their organisational infrastructure, making healthier choices easier choices. Today, WHP embraces

a holistic and integrated concept involving all areas that influence working life. The number of private sector workplaces having a comprehensive WHP programme has grown from 32.6% in 1998 to 58.7% in 2006. This represents 75.0% of the total private sector workforce compared to 26.0% in 1998.

WHP strategies are aligned with the Ottawa's Charter of:

- *Building healthy public policy* — Workplace Health & Sports Grant, Singapore HEALTH Award
- *Creating supportive environment* — healthy canteen, exercise facilities, work life strategies, social support
- *Strengthening community action* — Tripartite WHP Committee, Club HEALTH, Employers' Alliance for Mental Health
- *Developing personal skills* — RESPECT, HealthPRO, Treasure Your Mind, Weight No More

**Programme evaluation:** The effectiveness of Singapore's WHP programme was evaluated against a set of key performance indicators (KPIs). These included prevalence (%) of Singaporeans aged 18 to 69 years who exercise regularly, eat healthily, smoke, are obese, have hypertension, have diabetes, have high total blood cholesterol, suffer from Minor Psychiatric Morbidity. These KPIs were tracked through the 6-yearly National Health Survey and National Health Surveillance Survey.

**Challenges:** The challenges to promoting health at the workplace include addressing the social stigma attached to diseases such as HIV/AIDS and mental illness, a rapidly ageing workforce and changes in the way work is being conducted. How can we persuade business leaders (especially of small- and medium-sized companies) to view WHP as an investment, a necessity rather than an option? Do we develop WHP programmes that differentiate between the needs of different target audiences? Are these gender and culturally specific? Are we prepared for a new generation of workers who telework from home or overseas workstations? These are but some of the challenges facing WHP in Singapore.

## F3.2

### RESPECT – A Multi-Pronged Approach to HIV Prevention Among Working Adults

#### **J TAYLOR**

*Communicable Disease Education Department, Adult & Elderly Health Division, Health Promotion Board, Singapore*

Over 80% of persons newly diagnosed with HIV in Singapore were gainfully employed at the point of diagnosis in 2007. In order to curb the HIV rates of infection among the most economically active in Singapore, Health Promotion Board launched a comprehensive workplace programme, RESPECT (**R**allying Employers to Support the **P**revention, **E**ducation

and Control of STIs/HIV/AIDS). Since such an intervention must take into consideration the reality at the workplace, the Health Promotion Board advises companies on how they can tackle workplace HIV education to suit their context and needs. The multi-pronged programme utilizes different modalities of health promotion from print materials to interactive workshops. The programme ultimately is designed to motivate employees to protect themselves from infection and be more accepting towards employees who are infected with HIV. A pre and post survey conducted in 2007 among the participants of two programme components, the workshop and talk, showed an increase in measures of knowledge and attitude change. The findings show that working adults exposed to an educational programme such as RESPECT would be equipped to prevent the spread of HIV and be more tolerant towards a co-worker with HIV. The next phase is to integrate the role of the healthcare provider to close the link between prevention and care.

### F3.3

#### **Empowering the Health Professional — Certification for Quit Smoking Consultants (CQSC) Programme**

##### **NORMAN CHONG**

*Smoking Control Programme, Adult Health Division, Health Promotion Board, Singapore*

**Aim:** This presentation describes the establishment of a certification programme for health professionals, with the aim of increasing the quality and efficacy of quit smoking services in Singapore.

**Rationale for CQSC:** Singapore has experienced favourable smoking trends in the last decade. Smoking prevalence has declined from 18.3% in 1992 to 12.6% in 2004. However, international tobacco control experts concur that countries with low prevalence rates face an uphill task to further reduce its smoking prevalence. This is due to the plateau effect, where current smokers are likely to have high psychological and physiological dependency rates and will require more intensive interventions to quit smoking.

Studies show that intensive quit smoking therapy and pharmacotherapy where appropriate, can produce quit rates of up to 20% per year. This is significantly higher than the 3% to 5% quit rate for smokers who quit on their own. Singapore needed to strengthen the quality of quit smoking services, to further reduce the smoking prevalence rate.

**Development of CQSC:** The provision of smoking cessation services (quit smoking services) remains an integral aspect of the national smoking control programme. The service frequency and therapy standards were determined by the service providers.

There was also no consistent training syllabus for quit smoking consultants. To strengthen the therapy standards of cessation interventions, the CQSC was developed to:

- set a benchmark in clinical practice standards for smoking cessation service providers;
- formalise a system to deliver the prescribed skill set and knowledge required to provide quality and effective cessation therapy;
- facilitate the adherence and continual practice of these skills;

**Value propositions for service providers:** The CQSC is positioned as the authority's (Health Promotion Board) endorsement of quit smoking consultants' technical competency and service standards in delivering quit smoking therapy. This endorsement offers quality assurance and confidence to members of the public, when choosing quit smoking services. The programme also provides quit smoking service providers with a standardised and established framework, to train and also to provide continuing education for their quit smoking consultants.

### F3.4

#### **Weight Management in National Healthcare Group Polyclinics: Programme in a Public Sector, Primary Healthcare Setting**

##### **WF SIEW**

*Health for Life, National Healthcare Group Polyclinics, Singapore*

The prevalence of obesity in Singapore has increased from 5.1% in 1992 to 6.9% in 2004. Obesity is associated with significant medical illness and consequences.

In the past, the management of overweight/obese patients at the National Healthcare Group Polyclinics (NHGP) was inconsistent. They were either given generic advice, referred to tertiary centres for further management or the issue might not have been addressed. Now, NHGP have systematised the care of these patients.

Overweight/obese patients are identified during health screenings (opportunistic, community and corporate health screenings) and during the usual consultations at the clinics. They are offered programmes which range from a 1-hour talk to a 6-month programme. These programmes are delivered by a multi-disciplinary team of doctors, nurses, dietitians, counsellors, psychologist and physiotherapist. Exercise sessions are conducted by external service providers.

The aim of the presentation is to share some of HGP's experiences in running this programme.

#### F4.1

##### **APN Degree Development**

###### **PREMARANI KANNUSAMY**

*Manpower Standards & Development Division, Ministry of Health, Singapore*

Not available at time of print.

#### F4.2

##### **Service Planning: Whose Needs are we Meeting?**

###### **CHING YEE TAN**

*Medical Social Service, Alexandra Hospital, Singapore*

The author demonstrates how health professionals could draw knowledge from the social work field of practice and concepts of quality improvements in the planning of services to meet the needs of the patient.

#### F4.3

##### **The Evolving Role of Dietitians in Primary Care**

###### **SARAH SINARAM**

*Clinical Services, National Healthcare Group Polyclinics, Singapore*

Prior to the employment of dietitians at National Healthcare Group Polyclinics, doctors and nurses provided patients with basic nutrition information. The Dietetics team has grown from 1 full-time dietitian in 2006 to 5 full-time dietitians in 2008. The current emphasis in polyclinics is team-based management, leading to progressive utilisation and recognition of dietetic services. Dietitians are involved in individual and group counselling, public and corporate weight management programmes (WOW) organised by Health For Life, community outreach i.e. talks, workshops, forums and development of education materials for health professionals as well as patients. Another pertinent component is the nutrition information training for doctors and nurses, both in-house and in the private sector. Student placements have been coordinated for independent studies projects and community placements after collaboration with overseas universities. Present challenges for the dietitian include differentiating the nutrition services provided by care managers, awareness of dietitians' role in primary care, communication and coordination with hospitals and other sectors e.g. government, non-government and volunteer organisations and a lack of research opportunities.

#### F4.4

##### **The Evolving Role of the Pharmacist in Primary Care**

###### **JOYCE YU-CHIA LEE**

*Department of Pharmacy, National University of Singapore & National Healthcare Group Polyclinics, Singapore*

The role of the pharmacist has been changing over the past three decades in many practice settings. With greater emphasis on clinical pharmacy education and training, more pharmacists are now stepping out from their traditional role behind pharmacy counter to offer services beyond drug dispensing and distribution. The role and responsibilities of the pharmacist have expanded to include direct patient care, drug monitoring, drug product education, and speciality disease management. In primary care settings, more pharmacists are working side-by-side with the healthcare professionals in optimising drug therapies for patients with chronic disease states. Pharmacist-run clinics dedicated to anticoagulation, diabetes mellitus, hypertension, hyperlipidaemia and chronic heart failure, just to name a few, have also reduced patient load for primary care physicians, and brought favourable outcomes for patients both clinically and economically. Together with other health and social service professionals, pharmacists today play a pivotal role in the primary healthcare team in providing qualitative care for the fast-growing ageing population with chronic disease states.

#### G1.1

##### **To Educate Teachers on Asthma: Optimising Community Resource to Improve Asthma Care**

###### **ING HUA TAY, NGIAP CHUAN TAN, AGNES NGOH**

*SingHealth Polyclinics–Tampines, Singapore Health Services Pte Ltd, Singapore*

**Aim:** Asthma school was a pilot project in a district in Singapore and consisted of a workshop to educate teachers on asthma management and self care. This one-afternoon workshop comprised lectures by primary healthcare professionals, role plays of case scenarios and hands-on demonstration on the use of asthma medications, devices and accessories. This survey aimed to evaluate the teachers' asthma knowledge and understanding prior to and after the asthma school.

**Methods:** A total of 32 teachers from childcare, kindergarten and primary schools attended the asthma school. The participants answered a questionnaire comprising 8 questions to test their understanding and knowledge of asthma. The same questionnaire was fielded after the workshop. Each individual was then scored accordingly.

**Results:** Out of the 32 teachers, 26 completed the questionnaires. The ethnic composition of the participants was 50% Chinese, 46% Malay and 4% Indian. 62% of them had higher scores after the workshop. 15% of the participants with pre-workshop score <50%, achieved a post-workshop score of ≥63%. 30% of them had full pre- and post-workshop scores. 58% considered the asthma school as effective in providing asthma education.

**Conclusion:** Asthma school can be developed into a community-based educational programme to empower teachers to manage their asthma students in schools.

## G1.2

### **Role of the Advanced Practice Nurse in Polyclinics' Chronic Disease Management: From Concept to Practice**

**ELIZABETH MOON LIANG HO**

*Nursing Services, National Healthcare Group Polyclinics, Singapore*

The ageing population in Singapore has made it necessary for a greater emphasis on chronic disease management in the polyclinics. At the National Healthcare Group Polyclinics (NHGP), chronic disease management has evolved from the solo effort of the individual physician, to a more holistic and team-based approach since the emergence of Care Management in year 2000. This team-based approach is required for the successful management of patients with chronic diseases, catering to different aspects of care. The Advanced Practice Nurse (APN), equipped with a hybrid of advanced nursing skills, plays an instrumental role in the team-based model of care delivery. Apart from the primary role of helping patients with chronic diseases, the APN also needs to tackle the presence of other health ailments during a consultation. This additional role requires advanced health history taking as well as physical examination skills. The APN is able to formulate probable diagnoses and differentials from the synthesis of clinical information. With sound clinical reasoning, the APN manages the patient with the most appropriate care. A structured APN internship programme has been designed to ensure that these essential skills are developed competently in NHGP. How should the concept of APN be translated to serve as the integral link to catapult the current chronic disease management to the next level of excellence?

## G1.3

### **Segmentation of Poorly-Controlled Asthma Patients in a Primary Care Centre in Singapore: Does it Lead to Better Outcome?**

**AGNES NGOH**

*SingHealth Polyclinics-Geylang, Singapore Health Services Pte Ltd, Singapore*

**Aim:** To determine the outcome of poorly-controlled paediatric and adult asthmatic patients managed in a 2<sup>nd</sup> tiered clinic at a primary care centre in Singapore.

**Methods:** A cohort of paediatric ( $\geq 3$  years of age) and adult moderate to severe asthmatic patients, (GINA 2002 classification), internally referred or decanted from hospitals, was recruited consecutively, for management in a 2<sup>nd</sup> tiered asthma clinic within a Singapore polyclinic. The outcome in

terms of their asthma control pre- and post-enrolment is defined as the frequency of day and night symptoms, nebulised bronchodilator therapy (as surrogate indicator for acute exacerbation), which were monitored over a 1-year period. Trained family physicians and nurses, asthma education, written asthma action plan (WAAP), subsidised asthma medication, and appointment and recall system for continuity of care were provided at the asthma clinic. Pre- and post-enrolment data were compared and analysed using paired t-test or Wilcoxon Signed Rank Test for continuous outcome and McNemar's Test for binary outcome.

**Results:** One hundred and nine patients of all 4 major races in Singapore, with male:female ratio of 1:1.5, were recruited consecutively for the study. Overall, there was significant decline in the frequency of day symptoms ( $-45.2$  days,  $P < 0.0001$ ), nocturnal symptoms ( $-29.2$  nights,  $P < 0.0001$ ) and days off work/school ( $-6.7$  days,  $P = 0.004$ ). For adults, nebulised rescue therapy decreased by 17.6% ( $P = 0.015$ ) but there was no significant decrease among the asthmatic children ( $P = 0.701$ ). Factors influencing asthma exacerbation in terms of the number of nebulised therapy sessions include the number of such therapy sessions before enrolment ( $P < 0.0001$ ), change of inhaled steroid to combination drug ( $P < 0.0001$ ) and WAAP (prescribed during nebulised therapy,  $P = 0.0003$ , or pre-existing WAAP,  $P < 0.0001$ ). Source of referral to asthma clinic was a significant determinant affecting the patient's number of day and night symptoms and the number of days off usual activities.

**Conclusion:** High-risk asthma patients can be segmented and managed adequately by family physicians, trained nurses, subsidised asthma medications and continuity of care.

## G1.4

### **Electronic Immunisation System – Leveraging on Information Technology to Improve Nursing Documentation**

**ROSNA SABANI**

*Nursing, National Healthcare Group Polyclinics, Singapore*

The quality of information available to healthcare professionals is paramount to ensure effective communication to support decision-making in the delivery of quality care during the care process. Redesigning the paper-based nursing documentation of childhood immunisation data to a structured electronic nursing record was the solution for National Health Group Polyclinics (NHGP). The primary aim of developing the Electronic Immunization System (EIS) is to leverage on information technology (IT) to enhance the efficiency in capturing and tracking childhood immunisation administered at all the 9 NHGP polyclinics. EIS enables the nurse to capture

screening details of every childhood immunisation, and to check and verify the vaccine to be administered. The latter system feature aims to reduce childhood immunisation errors in NHGP. EIS creates a seamless integrated database of childhood immunisation and developmental assessment information, enabling easy access by all authorised users. Using IT as an enabler frees up the healthcare provider's time by eliminating cumbersome and repetitive data entry. EIS was implemented on 7 January 2007 and by 7 March 2007, all NHGP had begun to utilise electronic nursing documentation of childhood immunisation and developmental assessment. Active engagement of the nursing team through participation in the user acceptance testing, user training and road shows resulted in a smooth transition from a paper-based to an electronic documentation system. The fruition of the electronic documentation system would not be realised without the cooperation and strong team spirit of the project team, nurse managers and nurses in the 9 polyclinics.

### G1.5

#### **Innovation in the Redesign of Care Delivery in SingHealth Polyclinics – A Nursing Perspective**

**JASMINE HENG, MS MUSRIFAH, K MALINI, BH OH, R LIM**

*SingHealth Polyclinics-Geylang, Singapore Health Service Pte Ltd, Singapore*

**Aim:** To redesign care delivery in polyclinics by incorporating automated blood pressure (BP) measurement and body mass index (BMI) at the Health Monitoring Station (HMS) for patients with chronic diseases.

**Methods:** HMS was initially piloted and manned by nurses. A survey revealed that non-nursing personnel such as Health Care Assistants (HCAs) could manage HMS. An in-house training programme to expand the role of HCAs and to empower them in managing the HMS was designed by the nursing team. Twenty-four HCAs with basic knowledge of English and good interpersonal skills were enrolled. The training programme consisted of theory on hypertension, practical skills in BP measurement and BMI, basic knowledge of information technology (IT) and role plays on service quality in managing patients. On-the-job training on IT transfers of BP measurement and BMI electronically was included. A multiple choice question (MCQ) test and a competency assessment were conducted at the end of the training.

**Results:** Post-training evaluation showed that majority of the HCAs felt that the expanded role was interesting, gave them an opportunity to learn something new and they acquired a better understanding of the patients' conditions. 87.5% of the HCAs scored above 80% for the MCQ test. All HCAs scored 100% in the competency assessment. Patients' satisfaction survey

conducted on 85 patients showed that 98.8% were happy with the availability of the HMS in the polyclinic; 97.6 % agreed that it had saved and made better use of their consultation time; 95.3% were comfortable with the electronic measurements and 100% felt that the HCAs manned the HMS effectively.

**Conclusion:** Job redesign had improved care delivery and maximised staff potential. The successful transfer of learning to the HCAs enabled the nurses to spend more time on counselling patients with chronic diseases.

### G1.6

#### **Recognising and Assessing a Patient with Respiratory Distress: Your Quick Action Saves Lives**

**JHH LIM, ST SEE, PS HO**

*Nursing Services, National Healthcare Group Polyclinics, Singapore*

**Aim:** To evaluate the effectiveness of the respiratory assessment form to expedite medical interventions in patients with respiratory distress.

**Methods:** The CPIP methodology was adopted for this project. This project was piloted in Hougang Polyclinic from April to July 2007. Patients who complained of respiratory distress at the pre-registration counter were directed to the treatment room for triage. The nurse assessed each patient's respiratory condition using the respiratory assessment form. This form was developed based on the Asthma Clinical Guidelines. Upon assessment, patients would be assigned either an emergency or priority queue number for consultation by doctor.

**Results:** A total of 134 patients were identified to have respiratory distress and directed to the triage room. All patients who presented with respiratory distress at pre-registration received prompt assessment and treatment. Patients assigned with priority number were seen by the doctor within 15 to 30 minutes and 5 to 10 minutes for emergency cases. Patient survey showed that patients were satisfied with the care rendered.

**Conclusion:** The respiratory assessment form is effective in assessing patients with respiratory distress and expedites medical intervention. It guides nurses in their assessment and clinical decision-making during triage for medical intervention.

### G2.1

#### **Introduction to MOH Allied Health Branch Manpower Standards and Development Division**

**HONG CHOON LAU**

*Manpower Standards & Development Division, Ministry of Health, Singapore*

Not available at time of print.

## G2.2

### **Post Graduate Allied Health Institute's Initiatives in Allied Health Services**

#### **CELIA TAN**

*Post Graduate Allied Health Institute, Singapore General Hospital, Singapore*

Not available at time of print.

## G2.3

### **Strategic Priorities and Transformation Tracks in Allied Health Services**

#### **DENNIE HSU**

*Clinical Support Services, National University of Singapore, Singapore*

Not available at time of print.

## G3.1

### **Rehabilitative Approach to Treatment of Osteoarthritis**

#### **SOON YIN TJAN**

*Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore*

Osteoarthritis is a common cause of pain and disability especially in an ageing population. Pharmacology treatments and surgical correction aim to reduce pain and restore anatomy, but optimal functional return and pain relief frequently require a planned rehabilitative approach.

This talk will cover common rehabilitative treatments used to help patients with osteoarthritis. Both the evidence and practice of the modalities will be discussed.

These include prescription of therapeutic exercises, choice of orthotic devices, adjustment of physical activities, use of physical modalities for pain relief, use of intra-articular and peri-articular injections, use of pharmacological supplements, and use of alternative medicines for pain relief.

Case scenarios will be used to illustrate the choice and use of some of these treatments.

## G3.2

### **Management of Low Back Pain in General Practice**

#### **ENG-CHING YAP**

*Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore*

Back pain is one of the most common musculoskeletal conditions seen in general practice. Most patients will improve with conservative treatment. Soft tissue and mechanical dysfunction are common causes. Nerve, disc, bone and joint pathologies may also generate pain, often with concomitant soft tissue and mechanical pain. The brain is also closely related to the musculoskeletal system, influencing muscle

tone, tension, fatigue and pain perception.

During history taking and physical examination, red flags for sinister causes and yellow flags for psychosocial overlays should be elicited. Basic biomechanics should be assessed and soft tissues examined for any sensitisation and dysfunction. Abnormal imaging, degeneration and spondylosis, disc bulge and prolapse, are seen frequently in asymptomatic individuals and may not be the source of pain. It is important to correlate history and examination with imaging to determine the likely pain generator.

Analgesics and adjuvant analgesics are prescribed for pain control. Heat and electrical modalities, massage and mobilisation may provide relief, often temporarily. Active participation of patients is essential to rebalance the muscles for better outcome. When a patient fails to improve, it is important to find out what therapies were prescribed at each phase of rehabilitation; and modification may be necessary. Besides medication, treatment includes appropriate physical modalities, orthotics and exercises, integrated with targeted needling and injection, to reduce the risk of recurrent pain.

## G3.3

### **Musculoskeletal Pain and the Workplace**

#### **KAY FEI CHAN**

*Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore*

Not available at time of print.

## G3.4

### **Soft Tissue Injections in General Practice – An Overview**

#### **ADELA PE TOW**

*Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore*

Musculoskeletal pain arising from soft tissue problems is extremely common, as the muscles and the tendinomuscular system make up a significant proportion of body mass and is subject to daily stresses. Chronic repetitive strain and trauma are common causes. Soft tissue conditions amenable to treatment with needling and injections include myofascial pain with trigger points, tendonitis, tenosynovitis and bursitis. After excluding red flags for pain, treatment would include removal of perpetuating factors, advice on posture and ergonomics, patient education, and exercises to prevent further deterioration and improve function.

Soft tissue injections have both diagnostic and therapeutic functions. When initial conservative management is ineffective, or immediate pain relief is required, or where there are time constraints, injections may be indicated. They can be briefly divided into dry needling techniques, usually with acupuncture needles, and those involving hypodermic needles. Dry needling techniques with acupuncture needles include needling trigger points and tender points, needling acupuncture points,

intramuscular stimulation and superficial dry needling. Needling and infiltration with hypodermic needles into myofascial trigger points, tendons, bursa and tendon sheath usually include injection of local anaesthetics and may include corticosteroids. The addition of somatic paraspinal block and peripheral nerve block with local anaesthetic may help to further reduce the nociceptive impulses and interrupt the pain cycle.

An overview of injection techniques, risks, benefits and precautions will be discussed.

### H1.1

#### **Wellness, Anti-ageing and Aesthetics – Has Consumerism Invaded Medicine Perspectives of a Practising Aesthetic Practitioner?**

##### **BENJAMIN YIM**

*Benjamin Yim Clinical Aesthetics & Laser Centre, Singapore*

Running a successful aesthetic practice is like navigating in a minefield. Several key points that are important in any aesthetic practice will be briefly touched on:

1. Protecting oneself against medico-legal suits.
2. Keeping patients happy.
3. Advertisement and publicity.
4. Maintaining a healthy/stress-free practice philosophy.
5. Dealing with an upset patient.
6. The future of aesthetic medicine.

### H1.2

#### **Ethical Considerations in the Realm of Consumer-Driven Medicine**

##### **T THIRUMOORTHY**

*Singapore General Hospital, Singapore*

Not available at time of print.

### H1.3

#### **Legal Safeguards for Patients and Healthcare Professionals in the Realm of Consumerism in Medicine**

##### **SIANG PHENG LEK**

*Rodyk & Davidson, Singapore*

Not available at time of print.

### H1.4

#### **Aesthetics in General Practice: Am I Covered?**

##### **LAWRENCE NG**

*Medical Protection Society, Singapore*

Not available at time of print.

### H1.5

#### **Is Mediation a Panacea When All Else Fails?**

##### **SO LOONG**

*Singapore Mediation Centre, Singapore*

Institutionalised mediation in Singapore began in the 1990s with the Subordinate Courts. In 1997 and 1998 respectively, the Singapore Mediation Centre and the Community Mediation Centres were established. Since then, the mediation movement has been steadily gaining momentum in Singapore. Mediation is often touted as a better way of resolving disputes compared to adjudicatory dispute resolution mechanisms such as litigation or arbitration. Some are even of the view that mediation is particularly suitable for medical-related disputes. Is this always the case? Is mediation the cure-all for any kind of dispute? Are there downsides to mediation? This talk will explore this and other commonly held views.

### H2.1

#### **Shaping the Primary Care Physician of Tomorrow**

##### **MICHAEL KIDD**

*Discipline of General Practice, The University of Sydney, Australia*

The world is facing many healthcare challenges. And the answer to the world's great healthcare challenges lies in primary healthcare. If we are going to have strong primary healthcare in our nations, then we need a strong primary medical care system. This presentation will outline ways to ensure the quality of our work as primary care physicians during a time of many changes and challenges. Sustainable quality in primary care requires a system that attracts "the brightest and the best" to join our clinical discipline, supports lifelong learning and encourages continuous improvement, provides excellent practices and infrastructure, enables ready access by our clinicians to the best available evidence, values the generalist traditional, and cultivates good morale and a yearning for excellence by all clinicians.

## H2.2

### Nurturing Critical Thinking Nurses

#### **PREMARANI KANNUSAMY**

*Manpower Standards & Development Division, Ministry of Health, Singapore*

Not available at time of print.

## H2.3

### Family Medicine Training in Singapore: Where are we Now and Where do we Go from Here?

#### **GERALD CH KOH**

*Community, Occupational and Family Medicine Department, Yong Loo Lin School of Medicine, National University of Singapore, Singapore*

Family medicine (FM) training in Singapore currently comprises: (1) a 1-month undergraduate FM posting, consisting of attachments to family physicians (FP) in private and public practice (2 weeks each), community hospitals, palliative and domiciliary services, cumulating in a written test which contributes towards the final professional exam, (2) Graduate Diploma in Family Medicine (GDFM), consisting of 8 quarterly distance learning modules and workshops (termed FM Modular Course) and 8 small group tutorials over 2 years, cumulating in a written (2 parts) and OSCE examination, (3) Masters of Medicine in Family Medicine (MMed FM), consisting of 20 small group tutorials, 10 clinical sessions or ward rounds and 10 FM seminars, in addition to the FM Modular Course, cumulating in written (3 parts), viva and clinical exams, (4) Fellowship of College of Family Physicians (FCFP), consisting of portfolio learning from case studies and topic reviews, teaching activities, skills courses and research, cumulating in an exit interview, and (5) continuing medical education (CME) programmes for all FP, offered by the College of Family Physicians of Singapore (CFPS) and other agencies. The future in local FM training lies in: (1) reorientation of the medical undergraduate curriculum away from hospital-centric models and towards ambulatory and community care, (2) sustainment of the message that FM is a professionally-satisfying career option among undergraduates, (3) correction of market distortions in chronic disease management between public and private primary care sectors so that local FM practice is more equitable and sustainable, (4) realisation of the Family Practice Register to increase recognition of FM training by the public and explore recertification, (5) further development of the current FM Modular Course to better prepare family physicians for the future (e.g. including principles of research and systems management to promote FM development and seamless transfer of care respectively), (6) refinement of pedagogy towards adult learning and outcome-based assessments in FM exams and CME, and (7) partnerships between CFPS and the Academy of Medicine of Singapore to offer conjoint courses that leverage on both academic institutions' strengths and minimise duplication.

## P1 – Asthma

### Analysis of Repeated Patient Appointment Defaults in an Asthma Clinic

#### **ARULEARNEST<sup>1</sup>, JOHN ABISHEGANADEN<sup>2</sup>, LATHY PRABHAKARAN<sup>3</sup>**

*<sup>1</sup>Clinical Research Unit, <sup>2</sup>Department of Respiratory Medicine, <sup>3</sup>Nursing Service, Tan Tock Seng Hospital, Singapore*

**Introduction:** Disease management models used to treat and care for patients with chronic disease often involve patients making multiple visits. Studies often fail to account for multiple visits from the same patient.

**Methods:** Data from the Asthma Fast Track Clinic (FTC) in Tan Tock Seng hospital was used. We sought to examine demographic and clinical factors associated with appointment defaults among the patients referred to FTC. Three different analytical strategies were compared. Firstly, we ignored any intra-person correlations, and analysed the data as if they were independent. Secondly, we analysed only the first visit of each patient. Finally, we used generalised estimating equation models to correctly account for within-person correlations.

**Results:** There were 155 visits from 145 patients from April to August 2006. There were changes in the magnitude of the odds ratios for some of the variables when we accounted for the intra-person correlations in the data. For instance, the odds ratio of default appointment for males was reduced from 1.10 to 1.01 when we compared the crude model versus the generalised estimating equation model. Consequently, the variable also became less significant. The effect was less pronounced for some variables like age. Simulation studies indicated that the effect was marked when the proportion of repeat patients increased.

**Conclusion:** Studies that analyse repeated admissions or visits from patients with chronic disease need to account for the intra-person correlation inherent in the data so as to provide correct inference.

## P2 – Asthma

### Knowledge, Attitudes and Practices on Metered-Dose Inhaler Technique

#### **FEI LING LO, HSU PENG ADELIN TAY, SHER FERN WONG, SIEW CHENG, SARAH TAY, CHIN CHIN GOH, YAN LIN TAN**

*Pharmacy, SingHealth Polyclinics, Singapore*

**Aim:** To determine the knowledge, attitudes and practices of asthmatic patients on their inhaler technique and their ability to use the metered-dose inhaler (MDI).

**Methods:** One hundred and three patients were recruited from 4 polyclinics. The patients' MDI techniques were assessed using an 11-item checklist and graded based on a set of predetermined criteria. Subjects were later guided through a

peer-validated knowledge, attitudes and practices (KAP) survey.

**Results:** Only 20% of the respondents were able to carry out the recommended MDI technique. On average, respondents scored 60% (3 out of 5) in the knowledge section. Only 47% of respondents knew of the need to clean their inhalers regularly. The respondents scored a good average attitude score of 80% (24 out of 30). In the Practice section., respondents scored 63% (5 out of 8). Only 50% of respondents used the reliever before the preventer where both were indicated. The proper timing between actuation and coordination is a critical step commonly carried out by respondents incorrectly (48%). There were secondary findings from the study. The mean MDI score for respondents who demonstrated suboptimal and poor techniques was 8 out of 11. Hence, the MDI score alone may not be a good indicator of individual MDI competence. No statistically significant relationship was found between the MDI scores and respondents' demographic variables ( $P > 0.05$ ). A positive correlation was found between MDI scores and KAP scores ( $P < 0.01$ ).

**Conclusion:** A holistic approach should be adopted to improve patient's MDI techniques. This study revealed weaknesses in patients' KAP of MDI techniques that can be improved on.

### P3 – Asthma

#### Improving Compliance with Metered Dose Inhalers in Asthmatic Patients

**MUTHIAHPAERARASI, TING NEE LIM, WING LING VIVIAN CHEE**

*Pharmacy, SingHealth Polyclinics, Singapore*

**Aim:** To ensure all asthmatic patients on metered dose inhaler (MDI) therapy attending SingHealth Polyclinic-Bukit Merah achieve efficient MDI techniques (or be on a spacer) in 6 months.

**Methods:** The CPIP team brainstormed on the causes of poor MDI techniques using cause-effect analysis and Pareto charting. The 4 main causes identified were poor coordination of inhaler technique, lack of awareness of the correct MDI technique, too many steps in inhaler technique, and doctors' failure to identify and recommend counselling for patients with poor techniques. Based on these findings, 3 interventions were derived and they were screening and counselling of patients with poor techniques by pharmacists, use of posters and counselling aid for patient education, and introduction of an MDI stamp to highlight to doctors patients identified to have poor techniques.

**Results:** After the introduction of interventions 1 and 2 at week 1 and 3 respectively, the percentage of patients with inadequate inhaler techniques fell from 46.4% to 12.5% by the middle of

the project period (at week 10). Patients with efficient techniques rose from 14.3% to 37.5%. Two patients, who could not achieve adequate inhaler technique despite intensive counselling, were put on the spacer. With the introduction of intervention 3 at week 12, the percentage of patients with inadequate techniques fell further to 4.2% at the end of the project at week 24, while patients with efficient and adequate techniques rose to 95.6%. Patients with efficient techniques rose to 47.8%.

**Conclusion:** The interventions have been highly effective in helping asthmatic patients on MDIs to improve their MDI techniques.

### P4 – Asthma

#### Predictors of Defaulters at a Fast Tract Asthma Clinic

**LATHY PRABHAKARAN<sup>1</sup>, ARUL EARNEST<sup>2</sup>, JOHN ABISHEGANADEN<sup>3</sup>**

*<sup>1</sup>Nursing Service, <sup>2</sup>Clinical Research, <sup>3</sup>Department of Respiratory Medicine, Tan Tock Seng Hospital, Singapore*

**Introduction:** Emergency department (ED) visits for asthma are increasing because it is commonly recognised as a major source of asthma care during an acute exacerbation. Many of these patients are given follow-up appointments within 14 days to a Fast Tract Clinic (FTC) to optimise asthma control, but the default rates are high. The purpose of this analysis was to identify the characteristics of these defaulters.

**Methods:** Patients who were given appointments from April to August 2007 to the Asthma Fast Track Clinic (FTC) in Tan Tock Seng Hospital were used in our analyses. There were 155 patient appointments during this period. Twenty patient appointments were excluded because of wrong referral to FTC.

**Results:** We used 135 patient appointments for the study analysis. The overall default rate was 57/135 (42%). We examined demographic factors i.e. age, sex and race, source of referral, old case and 3-month prior ED visits as factors associated with defaults. Race was the only factor significantly associated with default rate ( $P = 0.022$ ). Default rates were seen to be higher among the Indians and Other races. Twenty-eight patients had ED revisits within 3 months of the FTC appointment. The median cost for pre- and post-3-month ED visit was found to be \$354 (interquartile range [IQR] = 189 to 581) and \$229 (IQR = 142 to 484) respectively.

**Conclusion:** This study helps to identify specific target groups for intervention. Further interventions are required to find out patients' perception of illness and barriers to healthcare to reduce the high default rates.

## P5 – Asthma

### Was an Emergency Department Treatment Centre Effective in the Management of Acute Asthma?

**JOHN ABISHEGANADEN<sup>1</sup>, L PRABHAKARAN<sup>2</sup>, ARUL EARNEST<sup>3</sup>, GH LIM<sup>4</sup>, JANE C<sup>2</sup>, WL TAN<sup>4</sup>**

<sup>1</sup>Respiratory Medicine, <sup>2</sup>Nursing Service, <sup>3</sup>Clinical Research Unit, <sup>4</sup>Emergency Medicine, Tan Tock Seng Hospital, Singapore

**Aim:** To evaluate the effectiveness of an Emergency Department Treatment Centre (EDTC: 24 hours short stay ward) in the management of acute asthma.

**Methods:** This is a descriptive comparison of prospectively collected data of 758 asthmatics admitted to our hospital from January to December 2006. These patients were either admitted directly to a traditional inpatient ward (n = 510, 67.3%) or to EDTC (n = 248, 32.7%). The EDTC group was further stratified: transferred to inpatient ward from EDTC (n = 67, 27%), and discharged from EDTC (n = 181, 72.9%).

**Results:** There were significant differences in terms of race ( $P = 0.033$ ), mean age ( $P < 0.001$ ), re-attendance to ED 24 hours prior to admission ( $P < 0.001$ ), re-attendance to ED 40 days prior to admission ( $P < 0.001$ ), re-admission to hospital 40 days post discharge ( $P = 0.014$ ), median length of stay ( $P \leq 0.001$ ), median cost for hospitalisation ( $P < 0.001$ ), follow-up appointment to specialist outpatient clinic (SOC) ( $P < 0.001$ ) and show rates at SOC ( $P < 0.001$ ). We also found significantly lower co-morbidities (i.e.  $\leq 3$ ) in patients admitted to EDTC.

**Conclusion:** Demographics and previous ED visits were significantly associated with admission to hospital. We found the EDTC to be effective for a selected group of patients and this resulted in the safe discharge of 73% of patients admitted to EDTC, with lower re-admission rates and costs.

## P6 – Asthma

### Case Management at Emergency Department: A Pilot for Patients with Chronic Obstructive Pulmonary Disorder

**MIN TANG<sup>1</sup>, ANGELA NG<sup>2</sup>, AZMAN JOHAN<sup>3</sup>**

<sup>1</sup>Case Management, Alexandra Hospital, Singapore, <sup>2</sup>Disease Management, National Healthcare Group, Singapore, <sup>3</sup>RESP Medicine, Alexandra Hospital, Singapore

Frequent readmission is very common among patients with chronic obstructive pulmonary disease (COPD). However, unnecessary admissions result in over-utilisation of hospitalisation services and medical resources. Conventionally, COPD patients are managed by case manager upon their

hospitalisation. Case management includes patient education, reinforcement of inhaler techniques and smoking cessation. As majority of these patients are admitted via the emergency department (ED), we started implementing case management there. Through this approach, we hope to manage patients with mild acute exacerbation of COPD as outpatients instead of inpatients to reduce unnecessary admission.

This poster presents 2 typical cases of frequent flyer of COPD to ED and how this programme has reduced readmission, improved care and saved costs.

## P7 – Cardio

### Palliative Care Needed for End-Stage Heart Failure Patients in Singapore

**JASMINE QUEK<sup>1</sup>, JENNIFER WONG<sup>1</sup>, HUINAHTAN<sup>2</sup>, DANIEL YEO<sup>3</sup>**

<sup>1</sup>Casemix, Tan Tock Seng Hospital, Singapore, <sup>2</sup>Clinical Project Management and Planning, National Healthcare Group, Singapore, <sup>3</sup>Medical, Tan Tock Seng Hospital

**Introduction:** Palliative care for patients with end-stage heart failure (ESHF) has the potential to play a central role in relieving suffering and distress for both patients and carers. In Singapore, palliative care has been generally confined to the realm of oncology.

**Discussion:** The suffering that ESHF patients experience is comparable to that of patients with terminal cancer. Ms N was diagnosed with heart failure in 2002, progressing to ESHF in 2007. Treatment was principally fluid restriction and intravenous diuretics. During the last 3 admissions, Ms N presented with significant symptoms of NYHA Class IV, dyspnoea, pain, overwhelming fatigue, functional impairment, depression and anxiety. Ms N was referred for hospice care but rejected as it was not clear that she had a prognosis of less than 6 months. Traditional palliative care models require a prognosis of less than 6 months before admission to hospice. This is difficult in practice for ESHF due to the disease trajectory. Patients with acute decompensation of ESHF can and often do return to their prior functional status after a short period of intensive treatment. As such, many ESHF patients do not receive optimal palliation during their last stage of life. Current palliative care in Singapore is oncology-centric and priority is given to oncology patients. As a result, many ESHF patients would have had some months of unnecessary suffering.

**Conclusion:** With an increase prevalence in heart failure patients, there is an urgent need to develop hospice resources to ensure ESHF patients receive optimal palliative care in their last stage of life.

## P8 – Cardio

### National Healthcare Group Stroke Programme Planning: Estimating Patient Volume

**ANUSHA GOVINDA RAJ<sup>1</sup>, BEE HOON HENG<sup>2</sup>, N VENKETASUBRAMANIAN<sup>3</sup>, JSK PHANG<sup>4</sup>**

<sup>1</sup>Health Services and Outcomes Research Department/Disease Management, National Healthcare Group, Singapore, <sup>2</sup>Health Services and Outcomes Research, National Healthcare Group, Singapore, <sup>3</sup>National Neuroscience Institute, Singapore, <sup>4</sup>National Healthcare Group Polyclinics, Singapore

**Introduction:** National Healthcare Group (NHG) is initiating a new stroke management programme to provide coordinated care for patients post-discharge.

**Aim:** The purpose of this study was to estimate the patient volume in planning for the stroke management programme.

**Methods:** Administrative databases from the inpatient (January 2005 to December 2006) and specialist outpatient clinics (SOCs) of 3 acute care hospitals and NHG Polyclinics (NHGP) (January 2006 to December 2006) were used. Primary ICD codes 430.0 to 436.0 were used to identify stroke cases in the inpatient and NHGP databases.

**Results:** In 2006, there were 3,857, 5,013 and 10,571 stroke patients seen at the inpatient ward, SOC and NHGP respectively. Among the stroke inpatients, 80.7% attended either the SOC, NHGP or both. Specifically, 61.3% attended a SOC, 3.4% NHGP and another 16% attended both the SOC and NHGP. Approximately 41% of NHGP stroke patients also attended SOCs. Patient flow between the two levels of care was high, with 72% moving back and forth between NHGP and SOC. The remaining 28% were approximately divided between those being referred to SOC from NHGP and vice versa.

**Conclusion:** Patient load was high at both the SOC and NHGP. Despite the limitations of using administrative databases, the analysis indicated that there appeared to be a high proportion of stroke patients attending both SOC and NHGP concurrently. Reasons for this need to be further studied in the light of optimising care and streamlining processes to the appropriate level of care.

## P9 – Cardio

### Outcomes of Patients with First Stroke at the National Healthcare Group, Singapore

**MATTHIAS PAUL HAN SIM TOH<sup>1</sup>, GABRIEL ZHI-WEIJIANG<sup>1</sup>, ANN YIN<sup>2</sup>, N VENKETASUBRAMANIAN<sup>3</sup>, BEE HOON HENG<sup>1</sup>, JASON TIANG SENG CHEAH<sup>4</sup>**

<sup>1</sup>Health Services and Outcomes Research Department, National Healthcare Group, Singapore, <sup>2</sup>Disease Management, National Healthcare Group, Singapore, <sup>3</sup>Neurology, Singapore Health Services, Singapore, <sup>4</sup>Clinical Project Management and Planning, National Healthcare Group, Singapore

**Aim:** To determine the outcomes of patients admitted with first-time stroke at the National Healthcare Group in Singapore.

**Methods:** Patients discharged with a primary diagnosis of ischaemic stroke (IS), haemorrhagic stroke (HS) and transient ischaemic attack (TIA) were randomly selected from 3 acute care hospitals between April 2004 and March 2005. We analysed the patients with first-episode stroke, comparing their demographic characteristics, complication rate and length of hospital stay (LOS).

**Results:** Out of 608 stroke patients surveyed, 402 (62.7%) with first-episode stroke were analysed in this study. Majority of them had IS (55.7%), followed by HS (31.6%) and TIA (12.7%). There were more female patients with IS, more male patients with HS and equal distribution of male and female patients with TIA. Mean age for IS was higher than HS and TIA (70.5 years vis-a-vis 63.3 and 61.5 respectively). About 40.3% of the patients had at least 1 complication, mainly fever, pneumonia and urinary tract infection. Complication rate was highest among patients with HS (48%) and IS (41.5%) than TIA (15.7%). Mortality rate was highest among patients with HS (30.7%) compared to IS (10.7%). For patients who were discharged, the LOS was significantly longer for HS (21.6 days) and shortest for TIA (3.1 days) patients.

**Conclusion:** Complication rate, mortality and LOS were highest among first-time stroke patients with HS. Greater vigilance in care is needed to improve outcomes and reduce readmission.

## P10 - CM/BM

### Reach and Usability of a Chronic Disease Patient Education Folder among Patients

**ANDY TAN<sup>1</sup>, ERWIN TEO<sup>2</sup>, HANDY AMIN<sup>1</sup>, SHIRIN WADIA<sup>1</sup>, SAROJINI THANARAJAH<sup>3</sup>, ANBUMALAR RAMIAH<sup>4</sup>**

<sup>1</sup>Non-communicable Disease Education, <sup>2</sup>Research and Evaluation, <sup>3</sup>Resource Development, <sup>4</sup>Youth Health Programme, Health Promotion Board, Singapore

**Introduction:** As part of the chronic disease management programme (CDMP), the Health Promotion Board distributed a patient education folder entitled "AIM Be In Charge of Your Health" in January 2007. The folder included 3 booklets to educate patients on: (1) managing chronic disease conditions, (2) self-monitoring and, (3) Medisave usage for outpatient treatment. This study aimed to evaluate the reach and usability of the folder among patients.

**Methods:** We conducted focus group discussions (FGD) between April and June 2007 among patients with chronic diseases to evaluate the usability of the folder. In addition, a separate randomised household survey (Omnibus) was conducted to evaluate the reach of the folder in the general population between June and August 2007.

**Results:** Fifty-seven patients participated in the FGDs. Patients felt that the distribution of the folder was limited, the information did not cater to varied health literacy levels, and that encouragement to use the record book from their doctor was a strong motivator. Among the eligible residents, 909 interviews were completed (response rate = 72%). One hundred and eighty-nine respondents (20%) had at least 1 chronic disease (hypertension, diabetes mellitus, lipid disorders, or stroke). Nineteen of these respondents (10%) reported receiving the patient education folder and 8 of them (42%) used the folder to monitor their conditions.

**Conclusion:** Increased distribution channels, additional in-depth information, and encouragement from doctors may improve the usage of the folder. The reach and usage of the folder in the general population form the baseline for evaluating further patient education initiatives.

### P11 - CM/BM

#### **Role of Pharmacists in the Community to Improve Quality of Care for People with Diabetes: An Overview of Diabetes Workshop Conducted in Singapore**

**ANGIE PENG HOON LEE**

*Nursing, Diabetic Society of Singapore, Singapore*

**Introduction:** The role of a pharmacist in diabetes management is crucial as it consists of assessment, education, monitoring and referral. A half-day workshop over a period of 4 weeks was organised to augment the knowledge of the pharmacists so that they can offer effective over-the-counter advice to people with diabetes. One hundred and thirty-three pharmacists working in the retail pharmacies attended this workshop.

**Methods:** The latest diabetes management, complications and research studies were highlighted. Practical session and case studies on insulin administration and proper blood glucose monitoring tips were incorporated. An endocrinologist, a dietician and diabetes nurse educators conducted the sessions. Pre- and post-questionnaires were given to each pharmacist to gather information on knowledge of diabetes and confidence level in providing over-the-counter advice.

**Results:** Fifty-one per cent of the pharmacists got right answers before the workshop and 65% got the right answers after the workshop. The findings indicated significant improvements in the depth of knowledge and increased confidence level in dealing with people with diabetes. Positive evaluations were given in relation to the workshop.

**Conclusion:** This workshop helped pharmacists gained uniform and consistent knowledge in the care of people with diabetes. It also highlighted the importance of the role of pharmacist in the community and how their expertise can be a significant aid to people with diabetes.

### P12 – CM/BM

#### **Wrist Blood Pressure Monitor: A Comparison with Mercury Sphygmomanometer**

**LEE HIANG TAY**

*Diabetes Centre, Alexandra Hospital, Singapore*

**Introduction:** Self-measurement of blood pressure (SMBP) using various automatic devices has become an important value in the treatment of high blood pressure patients. These devices may enhance patients' involvement in their care and allay doctor's concern about "white-coat syndrome". However, SMBP requires reliability of instrument as well as good measuring technique by the patients.

**Aim:** This paper aimed to compare blood pressure readings using a wrist blood pressure instrument with a mercury sphygmomanometer.

**Methods:** Blood pressure (BP) readings were measured using both a wrist blood pressure instrument (Durocare BGP-100) and a mercury sphygmomanometer. A convenient sample of 77 diabetes patients from September to October 2007 was recruited in Alexandra Hospital, Diabetes Centre after obtaining patients' consent. Wrist blood pressure measurement was done according to specification in the product's manual. All subjects had rested 15 minutes prior to wrist blood pressure measurements, and readings were done in a sitting position, with wrist blood pressure cuff maintained at heart level. Comparative mercury sphygmomanometer BP measurements were obtained from the same arm.

**Results:** Overall analysis showed a stronger correlation for systolic blood pressure ( $r = 0.87$ ) than for diastolic blood pressure ( $r = 0.75$ ). Analysis using Bland Altman reviewed general consistency for both systolic and diastolic BP for the 2 devices.

**Conclusion:** The findings suggested that there is good correlation between wrist blood pressure and mercury sphygmomanometer BP. However, strict observations and careful explanations are required on the use of wrist blood pressure instrument as a home monitoring device.

### P13 - CM/BM

#### **An Audit of Process Compliance in Nursing Care Management**

**LS YEO, WS TAN, WF CHONG**

*Nursing Services, National Healthcare Group Polyclinics, Singapore*

**Introduction:** In the past, the nursing care management model relied on didactic education and authority to help patients to adopt health behaviour change. However, in February 2007, the nursing care management practice in National Healthcare Group Polyclinics (NHGP) was restructured to incorporate 4

essential elements: (1) assessment and collaborative definition of problems between patient and provider, (2) goal setting and planning, (3) self-management, and (4) active and sustained follow-up.

**Aim:** To evaluate the compliance of the revised nursing care management practices in NHGP.

**Methods:** A retrospective audit of care management notes was carried out in 8 polyclinics. Audit sample sizes were between 27 and 54 per clinic, which varied according to the extent to which the practices were adopted. The audit was carried out on the processes adopted for the most recent episode of patient care.

**Results:** A total of 350 case notes were reviewed to assess process compliance between May 2007 and January 2008. The results showed that patients verbalised their perceptions and experiences of their condition. Problems causing poor control were identified for 99.7% of patients. Short-term goals were developed for 93.0% of patients and care managers assessed 78.3% of patients' confidence level in achieving these goals.

**Conclusion:** During the audit, we found that the new practices were employed to varying degrees by different clinics. The compliance rates also differed across different process components, suggesting a need to explore the barriers that have impeded the adoption of these changes by care managers.

#### P14 – DM

##### **Chronic Pain: Sleep Disorder and Personal Characteristics**

**SIMIN TAAVONI<sup>1</sup>, AASHRAF VASEGHNIA<sup>2</sup>, FATEMEH GHOLIPOUR<sup>2</sup>, AHMAD REZA BAGHESTAN<sup>2</sup>, MAHSHID ARYANPUR<sup>2</sup>**

*<sup>1</sup>Midwifery Continuing Education Office, Iran University of Medical Sciences, Iran, <sup>2</sup>Member of Pain Research Group of ACECR, IUMS, Iran*

**Introduction:** A subset of chronic pain patients suffer from a primary sleep disorder, which require specialised management. The cause of sleep problem must be determined and may be referred to the multidisciplinary centre.

**Aim:** The aims of this study were to identify (1) prevalence of sleep disorders in patients with chronic pain, (2) personal characteristics of these patients, and (3) correlation between sleep disorders and gender and type of chronic pain.

**Methods:** In this retrospective study, we randomly selected 105 medical records of patients who had been referred to the multidisciplinary pain centre of ACECR of Iran University of Medical Sciences from 2000 to 2004. The descriptive and inferential statistics ( $X^2$ , Fisher's exact test) were used. The average age of patients was  $41.09 \pm 14.25$  years.

**Results:** Forty per cent of women and 46% of men had decreased sleep times. The largest group of patients under medication which have effect on their sleep was the patients with head and neck pain (92.3%) while the smallest group was

the patients with lumbar back pain (69.44%). The largest group of patients who experienced chronic pain was the patients with lumbar back pain (47.2%). There was no significant correlation between sleep disorder and chronic pain, between sleep disorder and type of chronic pain, and between sleep disorder and gender.

**Conclusion:** We found that patients had difficulty in falling and staying asleep, unpleasant effect of sleeping, fatigue and awakening unrefreshed. Although there was no correlation between gender and sleep disorders, we found that more men experienced chronic pain women. Further studies on controlling the reverse effect of sleep disorders on chronic pain are needed.

#### P15 – DM

##### **Patients' Knowledge, Attitudes and Practices of Insulin Usage and Delivery**

**SWEE KENG TAN, BOON KWANG GOH, FEI LING LO, SHER FERN WONG, TING NEE LIM, SHU YEN KHOO**

*Pharmacy, SingHealth Polyclinics, Singapore*

**Aim:** For optimal diabetes management, patients requiring insulin should be familiar with the various facets of insulin therapy. This study aimed to elucidate the knowledge, attitudes and practices of SingHealth Polyclinics patients on insulin therapy.

**Methods:** Two hundred patients were interviewed in person at 3 polyclinic locations at the pharmacy on a case-encounter basis, using a peer-reviewed questionnaire.

**Results:** From the study, it was observed that 23% of patients did not know the reason for using insulin and 75% were unclear of insulin's mechanism of action. Seventy per cent of patients were unable to identify hypoglycaemia as the main precaution when injecting short-acting insulin. Whilst all the patients identified abdomen as a possible site of administration, 39% did not know that arms and thighs were also possible sites. Eighty-one per cent were also unclear of site-dependent differences in absorption rates. In terms of attitude, 65% of patients generally felt positive about insulin's ability to control their diabetes. Of these, 58% reported that insulin therapy did not reduce their quality of life and 95% did not find their regimens complex. Over the years of insulin usage, patients' attitude score towards insulin therapy improved from 0.18 to 0.82 (maximum score is 2). However, patients' quality of life did not generally improve. On insulin injection practice, 16% did not disinfect the injection site or did it only occasionally. Thirty per cent of patients used the same injection needles more than twice and 24% used insulin beyond 4 to 6 weeks after first opening.

**Conclusion:** This study highlighted areas where continuous patient education and motivation are necessary to achieve optimal insulin therapy.

## P16 – DM

### Improving Diabetes Care at Yishun Polyclinic

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<sup>1</sup>Nursing, National Healthcare Group Polyclinics, Singapore,

<sup>2</sup>National Healthcare Group Polylinics, Singapore, <sup>3</sup>Medical, National Healthcare Group Polylinics, Singapore

**Aim:** To increase the percentage of patients with integrated nurse-directed glycated haemoglobin (HbA1c) check and counselling service in 1 month at Yishun Polyclinic, with the secondary aims of increasing diabetic retinal photography (DRP), diabetic foot screening (DFS) and counselling by care managers.

**Methods:** In April 2007, integrated nurse-directed HbA1c check and counselling service was started in Yishun Polyclinic for diabetic patients in the Family Physician Clinic. Since implementation, there was positive feedback received from both patients and physicians. The positive effects include reduced waiting time for patients and quality time spent with the nurses during counselling. Thus, a new set of expanded workflow involving all diabetic patients, including those in the general clinic, was adopted in October 2007.

At the registration counter, patients registering for HbA1c will be directed to the care managers to perform HbA1c, parameter measurements, counselling and screening for DRP and DFS, while waiting for doctor consultation.

**Results:** After the implementation of the new workflow, 79% of patients received nurse counselling compared to 65% before implementation. This system of nurse-directed HbA1c has minimised the waiting time for patients in the process. The data also showed that there was a tremendous increase in DRP and DFS uptake. Nineteen per cent of patients had DRP done compared to 4%, and 17% had DFS done compared to 5.3% before the new workflow.

**Conclusion:** This new workflow has yielded very promising results in enhancing collaboration between healthcare providers and patients to develop a shared care plan. It is simple, streamlined, time efficient and effective.

## P17 – DM

### Determinants of Non-attendance at Diabetes Education or Care Team Appointments

**STEPHANIE DONALDSON KELLY, RICHARD LEWANCZUK, ANGELA ESTEY, ARLENE CHARRON**  
*Chronic Disease Management, Capital Health, Canada*

**Aim:** The purpose of this study was to identify determinants of non-attendance at education or specialty team visits using a population-based approach.

**Methods:** All referrals for diabetes services are centralised in the Capital Health region of Edmonton, Canada. Based on all referrals, we analysed available demographics and conducted

a follow-up telephone survey for those patients who did not attend scheduled diabetes services from January to July 2004.

**Results:** A total of 5,537 patients were referred for diabetes services in the time period. The non-attendance rate overall was 23.6%. The highest non-attendance rate was during the summer months and was seen in those between the ages of 40 and 59 years (47.3% of the total). Men were slightly more likely not to attend compared to women (57% vs. 43%). Twenty-four per cent of patients who initially missed appointments rebooked, but almost half (43.3%) failed to show on the second occasion. Other demographic factors associated with non-attendance were previous diabetes education or duration of diabetes >5 years. Interestingly, the wait times for an appointment had no influence on attendance, nor were any referring physician factors identifiable. By telephone survey, the most common reasons given for non-attendance were: forgot appointment (19.8%), and employment obligations (9.3%).

**Conclusion:** A significant number of patients do not attend diabetes appointments. By identifying factors that determine or predict non-attendance, measures can be taken to reduce the non-attendance rate. For example, after institution of a telephone reminder system for appointments in response to this data, non-attendance has decreased substantially.

## P18 – DM

### Do Religiosity and Religions Affect the Control of Type 2 Diabetes Mellitus?

**BOON HOW CHEW<sup>1</sup>, EE MING KHOO<sup>2</sup>, YOOK CHIN CHIA<sup>2</sup>**

<sup>1</sup>Tapak Community Polyclinic, Perak, Ministry of Health, Malaysia, <sup>2</sup>Department of Primary Care Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

To explore the relationships between religiosity and religions and diabetic control. A descriptive cross-sectional study conducted at a primary care outpatient clinic in a teaching hospital. Patients with type 2 diabetes mellitus (T2D) aged 30 years and above who professed their religiosity for at least 3 years were invited to participate in the study. Religiosity was assessed using the beliefs and values scale (BV) with score ranging from 0 to 80. The mean value of the 3 recent readings of fasting plasma sugar (FPS) and HbA1c within the past 3 years were taken as diabetic control. Analysis was done using SPSS version 11.

Two hundred and twelve patients participated (response rate 79%). Two thirds of the participants were female. The mean age was 62.7 (SD 10.8) years and the mean duration of T2D was 11.74 (SD 6.7) years. There were 72 (34%) Moslem, 53 (25%) Hindu, 32 (15.1%) Buddhist, 29 (13.7%) Christian, 14 (6.6%) Roman Catholic, 11 (5.2%) did not observe a religion and 1 (0.5%) observed other religion. The mean BV score was 57.4 (SD 10.97, CI 55.9 to 59.0). Religiosity had a weak negative correlation with FPS ( $r = -0.15$ ,  $P = 0.041$ ) but there

was no significant association shown with HbA1c. Using Kruskal-Wallis test, Christians and the no-religion group had significantly lower mean rank HbA1c than other religions (Chi-square 11.54,  $df = 5$ ,  $P = 0.042$ ). FPS showed a similar trend of ranking but was not statistically significant.

Higher religiosity was associated with better FPS. Patients with church-going religions and the no-religion group had better diabetic control.

## P19 – DM

### Specialist Follow-up does not Determine Diabetes Outcomes

**RICHARD LEWANCZUK, STEPHANIE DONALDSON KELLY, ANGELA ESTEY**

*Chronic Disease Management, Capital Health, Canada*

**Aim:** We hypothesised that effective primary care follow-up of diabetic patients referred to diabetes specialists would be as effective as follow-up by the specialists.

**Methods:** Electronic medical records for over 5,000 sequential diabetic patients seen in the regional diabetes programme by specialists were analysed. Specifically, the number of follow-up visits, as well as the duration of follow-up was correlated with clinical outcome as measured by haemoglobin A1c (HbA1c) achieved 30 months after the initial visit.

**Results:** Overall, the average number of follow-up visits by the 24 regional specialists as a group was 1.5. However, the average number of follow-up visits per specialist ranged from 0.5 to 2.4 with a skewed distribution. Average overall duration of follow-up was 102 days, but the average follow-up per specialist ranged from 54 to 604 days. During the time the specialists followed patients, the HbA1c fell by an overall average of 1.14%, with a range of 0.49 to 1.53 per physician ( $P = NS$ ). There was no correlation between either the number of follow-up visits or the duration of follow-up on the HbA1c achieved after 30 months.

**Conclusion:** These results demonstrate that in a system with effective primary care, it is not necessary for diabetes specialists to follow up patients long-term or to have multiple visits. By reducing specialist follow-up visits, outcomes are not affected and the healthcare system is able to accommodate more new patients and shorten waiting times.

## P20 – DM

### Performance Assessment of a Nurse-led Diabetes Care Management Service: Does Risk-adjustment Matter?

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**Introduction:** Diabetic patients with poor cardiovascular risk control were referred to care managers to strengthen their ability to self-manage.

**Aim:** To illustrate changes in the performance assessment of a nurse-led diabetes care management service when adjusting for dissimilarities in characteristics between programme and non-programme patients.

**Methods:** We compared the haemoglobin A1c (HbA1c) at baseline, 1 and 2 years for 1895 and 12,192 patients receiving and not receiving care management services in the 9 National Healthcare Group Polyclinics. The control group consisted of non-programme patients who also met the referral criteria of HbA1c greater than 7% or low-density-lipoprotein cholesterol higher than 2.6 mmol/L. Patient information was extracted from administrative databases. A multiple linear regression model was used for risk-adjustment.

**Results:** The mean baseline HbA1c of programme and non-programme patients was  $9.0 \pm 1.5\%$  (mean  $\pm$  SD) and  $7.7 \pm 1.3\%$  respectively. In a non-risk adjusted analysis, we found that the HbA1c reduction for care-managed patients was 0.5%-points and 0.3%-points higher over 1- and 2-years. After adjusting for differences in baseline demographics and HbA1c profile, we found non-programme patients to have done better. Their HbA1c reductions were 0.2%-points ( $P < 0.001$ ) and 0.5%-points ( $P < 0.001$ ) higher over 1 and 2 years.

**Conclusion:** While this study was limited by the exclusion of unmeasured prognostic variables, we have illustrated that non-risk adjusted aggregated outcomes data could bias performance assessments. With new services being constantly applied for chronic disease care, responsible evaluation is vital to the development of effective strategies for improving the quality of care.

## P21 – DM

### Care of Patients Newly Diagnosed with Type 2 Diabetes in Primary Care

**STEPHANIE DONALDSON KELLY<sup>1</sup>, DOROTHY SMOLEK<sup>1</sup>, PATTI GILMOUR<sup>1</sup>, WANDA ZIMMERMAN<sup>1</sup>**

*<sup>1</sup>Chronic Disease Management, Capital Health, Canada*

**Aim:** Prior to 2007, all patients with Type 2 diabetes who had an A1c  $> 8.0\%$  were triaged to group education and an assessment from the specialty team including a physician, nurse and dietitian. Patients with a new diagnosis of Type 2 diabetes were attending the 1:1 appointments with marked glycaemic improvement which no longer required specialty services.

**Methods:** In January 2007 patients newly diagnosed with Type 2 diabetes were triaged to group education and medical management by their family physician based on the lack of need for this patient group to see the specialty team, the scarcity of specialty resources and the Chronic Disease

Management (CDM) principle of ensuring that patients see the right provider at the right time.

**Results:** Of the 315 patients tracked, greater than 80% of patients newly diagnosed with Type 2 diabetes achieved an A1c <8.0% within the first 6 months of diagnosis. Seventy-nine percent of patients requiring urgent attention achieved an A1c <8.0% within the first 6 months of diagnosis. Seventy specialty appointments per month were freed up to see patients who truly required specialty care.

**Conclusion:** Patients diagnosed with Type 2 diabetes achieve significant A1c reduction with primary care intervention supported by specialty teams.

## P22 – DM

### Public Awareness of Type 2 Diabetes Mellitus in Regards to Modifiable and Non-modifiable Risk Factors

**ANGIE PENG HOON LEE**

*Nursing, Diabetic Society of Singapore, Singapore*

**Introduction:** The National Health Survey 2004 revealed that the prevalence of diabetes among adults aged 18 to 69 years in 2004 was 8.2% , it came down from 9.0% in 1998. The disease is more common in males (8.9%) than females (7.6%). Indians (15.3%) had the highest prevalence followed by the Malays (11.0%) and Chinese (7.1%).

**Aim:** The purpose of this study was to gain an overall of the level of awareness public has on Type 2 diabetes. It is also to explore the level of public education targeted toward correcting any misconception that surface. The results of the survey could also allow improvements of the current programmes to address areas of knowledge deficiency and misconceptions of the modifiable and non modifiable risk factors, thus achieving maximum efficiencies with the finite resources devoted to public education.

**Methods:** A convenience sampling from researcher's contact. Selection of 100 subjects based on inclusion and exclusion criteria from researcher's contact. A point was awarded for each correct response and zero for wrong or unsure response.

**Results:** A total of 100 subjects were interviewed. The mean score obtained by the respondents is 5.52. Among those surveyed male score higher than female with 6.06 compare to 5.26. Those who had tertiary education scores higher than others (i.e. mean score of 5.6).The singles score higher than those who are married (i.e. mean score of 5.75). Those with higher incomes scored higher, a total of 5.62 than those from other income group.

## P23 – DM

### Survival of End Stage Renal Patients on Dialysis with Diabetic Nephropathy in Singapore (1999-2006)

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**Aim:** End stage renal disease (ESRD) burden has increased worldwide. This study looked at ESRD aetiology and compared the survival of ESRD patients on dialysis with diabetic nephropathy (DN) with survival of those having other primary aetiology (non-DN).

**Methods:** This was a retrospective cohort study using data collected by the Singapore Renal Registry from 1999 to 2006. All patients included were those on definitive dialysis (received dialysis for at least 90 days). Cox regression was used to model the hazard ratio (HR) between DN versus non-DN ESRD patients on dialysis.

**Results:** DN comprised of 53.8% (2693) of the ESRD patients' aetiology whereas 46.2% (2312) were non-DN. The incidence of DN increased over the period of study (3.4% average annual increase; 95% CI, 1.7 to 4.9). Amongst the DN patients, 68.4% were Chinese, 22.1% were Malay, 8.5% were Indian and 1.0% was of other ethnicities. Despite adjusting for age, ethnicity, types of dialysis modalities and co-morbidities (ischaemic heart disease, cerebrovascular disease, and peripheral vascular disease), the HR for ESRD patients with diabetic nephropathy was worse compared to those with non-diabetic aetiology (HR 1.88; 95% CI, 1.69 to 2.08). Of note, Malays compared to Chinese had poorer survival. (HR 1.17; 95% CI, 1.04 to 1.31).

**Conclusion:** DN was the most common cause of end stage renal failure and had increased in proportion over the study period. DN patients had poorer prognosis compared to non-DN patients. Efforts to identify and control the progression of diabetes are important in chronic disease management programmes.

## P24 – GP

### Survey of Private Primary Care Doctors on Chronic Disease Management

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**Aim:** General Practitioners (GPs) provide 80% of primary care in Singapore and play an important role in the management of patients with chronic diseases. This survey sought the perceptions and interests in chronic disease care among the GPs in Singapore.

**Methods:** A self-administered survey was mailed to all GPs who were members of the National Healthcare Group (NHG) GP-Partners in August 2007. Completed survey forms were returned within 2 months. The questionnaire collected information on demographic characteristics including postgraduate qualification in family medicine, awareness and interests in chronic disease care and preferred methods of continued medical learning.

**Results:** A total of 273 of 1594 (17.1%) GPs responded, 85% expressed interest in chronic disease care. A third of the GPs attained postgraduate qualifications in family medicine. The majority of GPs had fewer than 30% of patients with a chronic condition. There was lack of awareness of chronic disease programmes. Most GPs attended ad-hoc lectures or talks and engaged in self-learning to further their knowledge in chronic disease care. Some attended structured seminars, workshops (60%) and used e-learning (40%). GPs reported that managing chronic conditions was challenging (74%), time-consuming (66%) and there was a lack of accurate post-hospitalisation data (55%). GPs with postgraduate qualifications in family medicine, compared to those without, expressed greater interest in working with the hospital to care for patients discharged with acute medical problems and attended more structured seminars and workshops.

**Conclusion:** Many GPs lacked awareness of chronic disease management programmes and were interested to learn more despite its challenges.

## P25 – GP

### Examining Patients' and Carers' Views in Promoting Right Siting of Psychiatric Treatment with the General Practitioner Partnership Scheme

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**Introduction:** The General Practitioner (GP) partnership scheme was introduced to recruit family physicians to collaborate in patient care with the Institute of Mental Health/Woodbridge Hospital (IMH/WH) to

1. right site care
2. provide convenient and affordable services
3. de-stigmatise care

Between October and December 2007, case managers assisted with the scheme and made 103 referrals. However, some patients and carers refused the referral. This paper examines their reasons with the aim of improving the scheme.

**Methods:** A survey tool was developed to collect patients' and carers' response to the GP partnership scheme. Data were analysed with SPSS version 13.0

**Results:** The number of patients/carers who declined referral was 102 out of 205 (49.7%). There were 37 males and 65

females and their age range, 21 to >70 years. Racial distribution followed the country's population distribution. The main reasons cited were

1. increased cost of GP consultation (15)
2. increased cost of medication (81)
3. inconvenience of travel to new site (86)
4. reluctance to change doctors (52)
5. reluctance to accept any changes to their care (50)
6. increased cost of travel to new site (30)
7. financial problems and needing institutional social support (36)

**Conclusion:** The results provide insight into the difficulties patients and carers encountered with the scheme. This will allow for strategic plans to address these difficulties to achieve a win-win situation for both groups. Right-siting is a crucial step in healthcare. It needs coordinated provider efforts to ensure that not only is the care comparable and not compromised but also that the end-user is not inconvenienced by the change.

## P26 – HP

### Predictors of Fruit and Vegetable Intake and Physical Activity Among Singaporean Students

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**Aim:** Students' Health Survey was conducted in 2006/07 to assess the health practices of students and their social determinants.

**Methods:** 5975 students (response rate = 83%) from secondary schools and pre-universities participated in this self-administered cross-sectional survey. Separate logistic regression models were developed to determine the predictors associated with failure to meet the guidelines for fruit and vegetable intake and physical activity.

**Results:** Of the 25% of students who had consumed the recommended 2 + 2 fruits and vegetables per day, 66% reported being aware of the guidelines. After adjusting for demographic and educational levels in the model, knowledge of the 2 + 2 recommendation (OR, 3.8; 95% CI, 3.2 to 4.6) and consciousness about one's diet (OR, 1.5; 95% CI, 1.3 to 1.8) emerged as strong predictors of fruit and vegetable eating behaviour (change in deviance is  $X^2$  (df = 2) = 326.7,  $P < 0.001$ ). Eleven per cent met the physical activity guideline of exercising at moderate or vigorous intensity for at least 5 days a week for 60 minutes per day. After adjusting for demographic and educational levels in the model, self-efficacy in sports (OR, 2.2; 95% CI, 1.9 to 2.7), intention to exercise (OR, 1.2; 95% CI, 1.0 to 1.5) and peer influence (OR, 1.5; 95% CI, 1.3 to 1.8) emerged as strong predictors for engaging in recommended levels of physical activity (change in deviance is (df = 3) = 131.1,  $P < 0.001$ ).

**Conclusion:** Knowledge, peer influence and self-efficacy were significant modifiable explanatory variables over the non-modifiable demographic variables. Health Promotion Board implements health promotion programmes for youth within the school and community settings to address these factors as part of efforts to encourage youth to adopt healthy dietary practices and engage in regular physical activity.

#### P27 – HP

##### **The 2-Minute Weight/10 Diabetes Diet: A Practical Approach**

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**Aim:** There is a need for a simple, short method of explaining diet to patients in resource- challenged clinics where doctors and dieticians are unable to spend enough time with them.

This paper assesses the accuracy, efficiency, efficacy and acceptability of a simple diet prescription which can be shared within 2 minutes by a trained high school/paramedical graduate.

**Methods:** Two hundred consecutive persons with diabetes were given the following prescription by 5 multipurpose diabetes workers (MPDWs). The prescription (weight ÷ 10 = daily number. of cereal helpings = 5 equal helpings of dairy products, fruits, vegetables, salad and non-vegetarian/lentils; in 3 + 3 meal pattern; with 10% extra for underweight/children /pregnancy; with 10% less for obese) was delivered with a visual aid. Calorie content of this prescription was measured to assess accuracy. Time taken for consultation was measured to assess efficiency. Acceptability and efficacy were assessed through a questionnaire and a 24-hour dietary recall at 1 month follow up.

**Results:** The calorie content was 865 cal for 50 kg and 1730 cal for a 100-kg person, equal to 17.3 cal/kg/day, allowing for addition of snacks. The prescription was delivered in 3.15 ± 2.46 minutes (range, 1.0 to 7.5 ). Subjects scored the MPDWs 4.1 ± 0.7 on a Likert Scale for acceptability. Average calorie intake, checked by 24-hour recall, was 24.3 ± 4.51 cal/kg/day, in a random cohort of 40 patients, at 1 month follow up.

**Conclusion:** The weight/10 diet is an effective, efficient, acceptable and accurate method for resource-challenged clinics.

#### P28 – HP

##### **Survey and Analysis on the Eating Behaviour Among Students of a University in Wuhan**

**XIAODONG TAN**

*Occupational and Environmental Health, School of Public Health, Wuhan University, China*

**Aim:** To study the day-to-day eating habits and attitudes of the college students in Wuhan, and provide basic information on healthy eating.

**Methods:** In May 2007, the dietary structure of 276 college students from 4 different grades in a university was surveyed using a questionnaire. Statistical analysis was performed.

**Results:** Only 33.9% of university students could ensure 3 meals regularly, 39.9% of college students did not have breakfast regularly and 29.2% often snacked. The results from 2 different questionnaires showed that 49.5% to 56.7% of college students focused more on the taste of food rather than whether it was healthy.

**Conclusion:** The eating habits and attitudes of the students in a university in Wuhan are not conducive to a healthy lifestyle. The university and societies should give more advice and guidance to help the students change their eating habits. More attention should be given to promote healthy eating.

#### P29 – HP

##### **Survey on the Structure of Meals among Students of a University in Wuhan China in 2007**

**XIAODONG TAN**

*Occupational and Environmental Health, School of Public Health, Wuhan University, China*

**Aim:** To study the structure of meals among students in a typical week so as to access reasonable proposals to improving dietary nutrition.

**Methods:** The study of 276 college students from 4 different grades in a university in Wuhan was carried out in May 2007.

**Results:** Of the 276 students, 91.95% consumed coarse grains and 97.46% consumed a variety of potatoes less than once a week, 80.08% of them consumed meat products less than once daily, 93.22% of them consumed soy foods less than once daily and 76.27% consumed fresh fruit once.

**Conclusion:** Students of the university in Wuhan do not have a well-balanced diet. The promotion of healthy eating should start immediately.

### P30 – HP

#### **Anxiety in Mammography: A Survey of Clients in Singapore**

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**Aim:** Adapted from the 2003 study “Anxiety in Mammography: Mammographers’ and Clients’ Perspectives” that was conducted in Australia (Galletta et al), this study aims to identify the causes of anxiety experienced by women during screening mammography in the local context. Furthermore, strategies that may decrease the level of anxiety experienced are also investigated.

**Methods:** A survey with the aid of a questionnaire was used for data collection. Evaluation will aim 2000 women aged 40 and above as respondents who presented themselves at 8 National Healthcare Group Diagnostics (NHGD) Centres for screening mammogram over a period of 2 months.

**Results and Conclusion:** From our study, it can be concluded that pain is the highest cause of anxiety among the clients in Singapore. The results are similar to the one conducted in Australia by Galletta et al, 2003. This information will allow the mammographers to have better understanding of the clients’ anxiety and manage their concerns with sensitivity.

### P32 – Quality

#### **Use of the Modified Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Clinician and Group Survey as a Tool for Improving Quality of Care**

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Quality is the extent to which healthcare affects patient outcomes. Patient satisfaction is an important measure of quality, as it correlates with treatment outcome. It is an important outcome measure in chronic disease management programs. Consumer Assessment of Healthcare Providers and Systems (CAHPS®) is an internationally validated tool for assessing quality of care. It evaluates quality based on patient experience during an episode of care. This unique feature allows for actionable observations and avoids the “ceiling effect” of traditional perception-based surveys.

**Aim:** To describe experiences and results from field testing of a modified version of CAHPS® as administered to patients attending specialist outpatient clinics (SOC) of an acute hospital in the National Healthcare Group.

**Methods:** Contents of CAHPS® were reviewed and modified to contextualise it to the setting of the hospital and Singapore. Seven trained interviewers administered the tool to subjects waiting at the hospital lobby and pharmacy in June 2007. Respondents were eligible if they were at least 21 years old, understood English and consulted any doctor at the SOC.

**Results:** Questions were generally easy to understand, although first-time SOC patients had more difficulty answering. Issues related to care coordination, patient empowerment and patient centredness were uncovered by the tool. Specific areas for improvement such as waiting times for consultation, health personnel’s knowledge of vital patient information, patients’ involvement in decision making, and communication between the patient and healthcare provider were identified.

**Conclusion:** By focusing on patients’ experience of care, a contextualised version of CAHPS® can serve as an actionable quality improvement tool.

### P33 – Quality

#### **RIMS (Prescription Intervention Management System) – Improving the Management of Prescription Intervention by Pharmacy**

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**Aim:** To improve the management of prescription interventions by SingHealth Polyclinics (SHP) - Pharmacy Department.

**Methods:** In a survey of pharmacy staff (in 9 polyclinics) who was involved in the documentation of prescription interventions performed by pharmacy, 64% felt that the manual documentation process was time-consuming while 62% felt that the manual collation process was inefficient. A pharmacy team was formed to brainstorm for solutions, and eventually decided on using IT as an enabler to tackle the problem. The solution involves the development (by pharmacy) of an in-house database application called Prescription Intervention Management System (RIMS). The system was successfully piloted at 2 of the outpatient pharmacies, before rolling out to the remaining 7 pharmacies. Surveys were conducted pre- and post-implementation of RIMS to ascertain the improvement in the management of prescription interventions.

**Results:** Five months after the implementation of RIMS, the percentage of staff who spent 15 minutes or more to collate intervention data decreased from 64% to 30%. The percentage of staff who rated the collating process as ‘time consuming’ decreased from 54% to 0, while the percentage of staff who rated the documentation process as ‘time-consuming’ fell from 64% to 0. The percentage of staff who rated the overall documentation process as ‘inefficient’ also fell from 36% (manual) to 0 (using RIMS). In addition, RIMS enabled pharmacy management to view real-time intervention statistics, search, extract and/or generate (customisable) reports for analysis both at individual polyclinic level and across polyclinics.

**Conclusion:** The management of prescription interventions by SHP pharmacies was significantly improved following the implementation of RIMS.

### P34 – Quality

#### **Heavy Utilisation of Primary Healthcare Services by Patients with Chronic Illnesses: Implications for Health Quality**

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**Purpose:** To determine factors associated with heavy use of healthcare facilities in Saudi Arabia by patients with chronic illnesses.

**Methods:** The study employed a self-administered questionnaire to collect data from patients aged 18 years or older in Riyadh City. The data were collected on a set of independent variables including predisposing, enabling and need variables which were thought to determine the heavy utilisation of health facilities. Bivariate and multivariate analyses were employed to determine which factors best predict heavy use of health facilities by patients with chronic illnesses.

**Results:** More than half of patients with chronic illnesses have used different healthcare facilities during the past 3 months. Despite the importance of predisposing and enabling variables, need variables seem to be the principal determinants of the heavy use of health services by this group of people. The study showed that primary healthcare facilities are limited in the provision of suitable healthcare for patients with chronic conditions.

**Conclusion:** Patients with chronic illnesses constitute a unique subset of health services users. This vulnerable group of patients tends to make heavy use of health resources which should prompt policy makers in the Saudi Arabia to propose health plans to cope with such use. Further research should take into account the promotion of the health status of this at-risk group of patients.

### P35

#### **National Healthcare Group (NHG) Diagnostics Sonographers: How We Do It?**

**XENIA ADVERSALO**

*Radiology, National Healthcare Group Diagnostics, Singapore*

**Aim:** Introduction of Qualified Sonographers in National Healthcare Group Diagnostic (NHGD) Centre with remote supervision of a radiologist: A study of its effectiveness and reliability.

**Methods:** The ultrasound images obtained are sent through National Healthcare Group (NHG) network to remote workstations of the radiologist and images are stored at the National Healthcare Group Diagnostics Primary Data Centre (PDC). Request forms were scanned into the Radiology Information System together with the sonographer's preliminary

results and findings. A Skype communication was also established to enable direct communication if the radiologist has any queries. A meticulous workflow, standardised protocols and a comprehensive training plan are drawn up with regular scanning sessions with the radiologists conducted every 6 months. These sessions provide for continual competency assessment of the sonographer and at the same time build rapport between the radiologist and sonographer.

**Results/Conclusion:** The practice of off-site sonographers with remote supervision by radiologists is able to deliver required standards. Over a period of 6 months, 4613 scans were performed at the NHGD ultrasound centres by sonographers. Ten patients were recalled by the reporting radiologist for additional images to be performed at the corresponding centres. This is a recall rate of 0.35%. The reason given for the recalls is the technically difficult nature of the scans. No patients were recalled to the NHG institutions for repeat scans. This arrangement is significant in supporting the right siting of care initiative that has been effective in reducing the number of hospital visits by the patients who can now obtain ultrasound services at primary healthcare level.

### P36

#### **Bacteriologic Study of Diabetic Foot Ulcer**

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**Introduction:** Foot infections are the most common problems in patients with diabetes. These individuals are predisposed to foot infections because of a compromised vascular supply secondary to diabetes. Both aerobic and anaerobic bacteria are responsible for infections, with majority being resistant to antibiotics. The aim of this study was to assess the drug sensitivity of isolated bacteria in patients with diabetic foot infections.

**Methods:** In total, 116 hospitalised and outpatient diabetic patients with foot infections were investigated. Deep tissue biopsies were inoculated into freshly prepared Thioglycollate broth medium. Bacterial agents were identified by conventional bacteriologic methods. Sensitivity tests were performed according to standard disc diffusion method of Kirby & Bauer.

**Results:** Clinical grading and bacteriological study of 116 patients with diabetic foot lesions revealed polymicrobial aetiology in 63 (54.3%), single aetiology in 45 (38.8%) and 8 negative cultures. Aerobic gram-positive bacteria accounted for 42.25%. *Staphylococcus aureus* was the most frequent microorganism yielded (26.7%), and *Staphylococcus epidermidis* was regularly associated with these lesions (14.6%). Gram-negative rods accounted for 52.6%. *Escherichia coli* (*E. coli*) was the most predominant gram-negative organism (24.1%). No anaerobes were isolated from the ulcers. All the

microorganisms isolated showed high resistance to prescribed antibiotics. Among them, *Staphylococcus aureus* and *Pseudomonas aeruginosa* were the most resistant bacteria.

**Conclusion:** *Staphylococcus aureus* was the most common cause of infection either alone or with other microorganisms with high resistance to antimicrobial therapy (MRSA & VRSA) but sensitive to ciprofloxacin. *E. coli*, *Staphylococcus epidermidis* and *Proteus vulgaris* were the other common causes of diabetic foot infections in this present study. The rate of antibiotic resistance was 65% among the isolates. Due to polymicrobial infection and antibiotic resistance, surgical intervention with ciprofloxacin must be considered.

### P38

#### **Patients' Perception of the Link between their Mental and Physical Health**

**SOOK CHUEN KAREN ANG**

*Clinical Services, National Healthcare Group Polyclinics, Singapore*

**Aim:** Many medical disorders have been shown to have a strong psychological component. We sought to assess the perception of patients who seek treatment in primary care providers towards the link between their mental and physical health.

**Methods:** A randomised survey was conducted on a day in a community-based primary healthcare centre of the National Healthcare Group Polyclinics. A self-administered, descriptive questionnaire was used to obtain information on patients' perception towards mental health. There were 53 respondents.

**Results:** Fifty-seven per cent of the respondents perceive mental health as mental illness. For those who perceive mental health as not equivalent to mental illness, a few of them think that mental health means no emotional pressure, normal behaviour, psychological wellness, as well as being unsure. Most patients feel that the qualities of a mentally fit person include taking life easy, staying mentally alert and coherent, being joyful, having a healthy body and mind, as well as the ability to resume normal routine. Thirty-six percent of the respondents indicated that they have often been bothered by little interest or pleasure in doing things over the past 2 weeks, while 25% of them indicated that they feel down, depressed or hopeless.

**Conclusion:** Most patients perceive mental health as mental illness. The majority also agrees that there is a positive correlation between mental and physical well-being. This study serves as a useful reference for future studies to enhance patients' mindfulness about the link between mental and physical health, as well as to come up with appropriate screening tools and follow-up.

### P39

#### **Back to the Future: Maggot Debridement Therapy in 21st Century Healthcare**

**CARL BAPTISTA**

*Research and Development, ORIGIN Scientia Pte Ltd, Singapore*

Each year, thousands of patients in Singapore suffer from non-healing, slough/necrotic wounds. The continued rise in 'lifestyle' diseases such as diabetes, allied to the increasing threat posed by multi-resistant bacteria such as MRSA, has made the need for an effective, low cost wound treatment solution a priority.

Conventional mechanical debridement and wound care methods often fall short in one or more vital areas, be it speed, cost, or effectiveness in the face of complicating factors such as bacterial infection. Fortunately, the solution has been with us for hundreds of years. Maggot Debridement Therapy (MDT) is a process using specially reared, medical grade fly larvae to remove only necrotic tissue from wounds whilst improving the healing process. MDT has a number of inherent benefits over conventional wound care and debridement techniques, not least its ability to heal previously unresponsive MRSA infected wounds. ORIGIN Scientia Pte Ltd is the only company in Singapore providing sterile larvae for MDT use in hospitals and clinics. We will share our knowledge on the history of MDT, a treatment method that dates back hundreds of years, as well as show the procedure for correctly administering the treatment. We will reveal the impressive results obtained during clinical service and explain why MDT deserves to become a 'first choice' treatment method, a method whose time has come full circle, once more relevant in 21st century healthcare.

### P40

#### **Behavioural Modification for Obese Patients - A Personal Reflection**

**TIMOTHY CHUA**

*Clinical Services, National Healthcare Group Polyclinics, Singapore*

**Aim:** Obesity is an increasingly prevalent problem in modern society. A holistic approach is needed to empower our obese patients in managing their lifestyle (diet and physical activity) and emotion. The process of designing the training materials of behavioural modification in our weight management programme is discussed in this paper.

**Methods and Results:** National Healthcare Group Polyclinics (NHGP) formalised a 6-month obesity programme in 2006. The team comprised doctors, nurses, dietitians and medical social workers. We have successfully taken 4 batches of

patients through the programme. Each batch consisted 5 patients on average. Medical social workers were involved in conducting 1 group session per batch focusing on cognitive behavioural therapy for obesity. Topics include Group Motivational Interviewing and Group Cognitive Behavioural Therapy in the beginning. For the third and fourth batches, our materials were further refined to include more specific examples relating to the patients' management of their unhealthy diets and lifestyles.

**Conclusion:** In planning the teaching, we found that training materials should be made simpler so that the Asian population can grasp and apply the knowledge and skills taught. Trainers need to balance their roles as professional educators and be respectful of each patient's potential to self manage. To change the health behaviour of others, healthcare professional should be mindful of their own undesirable lifestyle and habits, and also empathise with difficulties patients face in changing some lifestyle habits. Thus while our programme activities are evidence-based, there is a room for individualised approaches as well. Having taught patients useful skills in weight management, the choice belongs to the patients in adopting these skills at different points of their lives.

#### P44

### **Promoting Health Workers' Skills for Developing Effective Community Health Education Programs Based on an Educational Model in the Isfahan Province, Iran**

**SEYYED M. MEHDI HAZAVEHEI**

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The purpose of this study was to determine the effect of an educational intervention programme on the level of Isfahan province health workers' knowledge, attitude, skill and ability related to applying appropriately, behavioural modification models as a conceptual framework for developing and implementing community health educational programmes.

The educational intervention programme was implemented for 209 health workers from 10 township health centres which were selected randomly from 20 township health centres of the province. One hundred and ninety-seven health workers from the other 10 township health centres participated as the control group in the study. The 2-day educational workshop intervention programme including 3 session follow-up counselling and guiding related to the Health Belief Model (HBM), Behavioural Intention Model (BIM), and PRECEDE Model was developed based on funding of phase 1 study. The instrument for data collection was acceptable, validated and re-labelled questionnaires about the effectiveness of intervention and the

level of health workers' learning and applying theories and model before intervention, after implementing the educational workshop, and after 6 months of intervention. One hundred and eighty-one health workers (86.6%) from 209 health worker participants in experimental group developed, implemented, and reported variety 97 variety of health education programmes based on HBM, BIM, or PRECEDE Model successfully. The educational workshop for health workers that having ability to create possible enabling factors for their skills is necessary for their effective community educational programmes.

#### P45

### **Workplace Health Promotion: An Investment In Our Healthcare Professionals**

**MALATHI KANAGASABAPATHY**

*Director's Office, Myran Ventures Pty Ltd, Australia*

**Aim:** To reduce the significant impact staff stress, staff workload, staff turnover, worker compensation claims, and work-related injuries has on the primary healthcare services. A comprehensive programme under the banner of Workplace Health Promotion (WHP), is currently being implemented to shape and sustain changes made to an Aboriginal Medical Service in South Australia.

**Methods:** A qualitative and quantitative approach initially was implemented to gather data, forming the baseline for the programme. A more proactive development of the second phase involved staff, senior management and the organisation's board members in the implementation phase. A WHP monitoring tool was designed and developed to enable continuous quality improvement through the programme. Staff were encouraged to report monthly through the tool, and feedback on progress was provided in a timely manner. The WHP monitoring tool accessed personal and professional goals, collated information on stress-related workloads, and performance management thus enabling senior staff and CEO to be more proactive in reducing possible staff related issues.

**Results:** The programme is currently operational and the poster presentation will provide results to date. Aboriginal Health Services in Australia are funded by the government to run various health-related programmes. Aboriginal Health Workers (AHW) are employed to provide a catalyst for relationship between an indigenous patient and the general practitioner.

**Conclusion:** Results from this programme are to assist the CEO/senior staff have a better understanding of the various demands placed on the AHWs in the organisation and the cost of stress-related worker compensation towards the organisation overall.

P46

### Improve Correct Identification of Patients at Toa Payoh Polyclinic

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**Aim:** To eliminate 80% of incidences of “near-miss” and actual misidentification of patients within 6 months.

**Background:** Toa Payoh Polyclinic (TPP) is a one-stop primary health centre serving approximately 600-650 patients daily. With such a high patient load came the great challenge to ensure correct identification of patients at all service stations, especially at the Registration, Medical Record Office and Consultation Area. “Near-miss” and actual misidentification of patients happened sporadically, impacting erroneous medical care and treatment.

**Methods:** From June to December 2006, we started the processes of data collection and analysis using the Clinical Practice Improvement Programme (CPIP) methods and tools. We began with the introduction of automatic non-blame self reporting using our own simplified self reporting form as well as continued monitoring of reporting through the existing institutional electronic significant events reporting system. Our team intervened by creating awareness of the severity of the misidentification and improving the verification checks in the Flow processes of the highly occurring misidentification areas. We also implemented customised compulsory 2-3 Right Checks for these stations. At the same juncture, we facilitated ease of visibility in tracing of case notes.

**Results:** After implementation, TPP reported a drop of 90% in misidentified cases with good compliance to the right method of verification of patients. This project was subsequently awarded the Healthcare Quality Improvement Funding from the Ministry of Health, Singapore.

**Conclusion:** The project aims to eliminate 60% of all incidences of “near-miss” and actual misidentification of patients due to operational processes within one and a half years at all National Healthcare Group polyclinics.

P48

### Contextualising the Evidence of the Efficacy of Self-monitoring of Blood Glucose in National Healthcare Group Primary Care

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Strict glycaemic control is associated with a lower risk of diabetic complications, as evidenced by the findings of the UK Prospective Diabetes Study (UKPDS) in Type 2 diabetes mellitus, where each 1% reduction in HbA1c was associated with a 37% decrease in risk for microvascular complications and a 21% decrease in risk for any end point or death related to diabetes.

Self-monitoring of blood glucose (SMBG) is one of many strategies currently implemented to improve glycaemic control in type 2 non-insulin treated diabetic patients. Evidence in support of self-monitoring for type 2 non-insulin treated diabetics is currently emerging. Recent systematic analyses and meta-analyses have demonstrated that SMBG can lead to statistically significant improvements in glycaemic control.

In the context of Singapore’s primary care setting, SMBG is not implemented in a standardised way or part of a large-scale disease management programme. Contextualising the evidence from systematic reviews, we project the potential benefits in terms of reduction in diabetic complications and costs savings, for diabetic patients currently being treated at polyclinics of the National Healthcare Group.

## P49

### **Increasing Uptake Rate of Diabetic Panel Test at Bukit Batok Polyclinic**

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**Objective:** To increase the percentage of diabetic patients with diabetic panel test done every 15 months, from 66.1% in January 2006 to 90% by December 2006 in Bukit Batok Polyclinic.

**Methods:** A patient workflow chart was drawn up. The group then discussed factors at various steps of the workflow that may cause patient non-compliance. This was organised into headings using the cause and effect diagram. A patient survey (32 patients) was done and the most common reasons were determined using the pareto chart. Interventions were implemented for these reasons and the uptake rate for the panel test was monitored. More interventions were introduced if the uptake rate was unsatisfactory.

**Results:** The most common reasons identified were 'not given blood test form' and 'lack of awareness'. After discussion, interventions were introduced such as reinforcement to doctors to send patients to care managers, and posters, pamphlets and My Management Guide booklet were given to patients. Clinic staff were reminded to encourage more diabetic patients to do their panel test. Patients were also advised on the importance of doing diabetic panel test. The diabetic panel test uptake rate was obtained from data sent monthly by NHGP headquarters to the polyclinics. The number of diabetic patients who did their panel tests increased from 66.1% in January 2006 to 100% in December 2006.

**Conclusion:** Patients' and staff's perception of problems are invaluable in planning and improving clinical processes. Patient care is managed not by doctors alone, thus multiple approaches are essential to improve the quality of care delivery.

## P50

### **Building Up Primary Care Capability to Manage Psychological Issues in Crisis**

**HENRY LEW**

*Clinical Services, National Healthcare Group Polyclinics, Singapore*

**Introduction:** With the development of a global community, Singaporeans have been more intricately linked to crises both locally and overseas. National Healthcare Group Polyclinics' (NHGP) setting within the community, positioned it to provide psychological first aid to victims, next-of-kins or staff members affected by national or civil emergencies.

**Methods:** NHGP staff attended the National CARE (Caring Actions in Response to Emergency) Course organised by the Ministry of Health to be trained as CARE Officers. Deployability is categorised into 3 tiers of readiness. To facilitate inter- and intra-institution coordination, there is a Head CARE, Deputy Head CARE and a CARE Coordinator

**Results:** To date 20 NHGP staff, comprising of Medical Social Workers, Social Work Assistants, Patient Service Associates and operations staff from across the 9 polyclinics and NHGP headquarters, are CARE trained and deployable. On-going CARE Awareness Seminars and mock simulation exercises are conducted to sharpen respective operational readiness and joint-capabilities in crisis management. The CARE system in NHGP is also well linked to the CARE system at the hospitals and national levels.

**Discussion:** Assessment and coping skills are critical to managing fluid crisis situations. Benefits from building crisis management capability include increased operational readiness and skills of staff. Staff confidence and morale in crises management are boosted. Trained staff are also able to apply interpersonal skills learnt when attending to patients in everyday work. Moving forward, there is a need to equip suitable CARE Officers with advance knowledge and skills to perform duties beyond basic supportive counselling.

## P51

### **Standards, Audit and Quality in Primary Care**

**KEN MENON**

*The Ongar Surgery, West Essex Primary Care Trust, United Kingdom*

Sustainable improvements in the quality of Primary Care can only arise from the bottom and work upwards. It is the individual practitioner in the work place who can provide the impetus to improvements in quality by instituting and maintaining a continuous cycle of change. Audit of performance, in its various forms, is the key driver for change, in both the practitioner and in the structure and the process of Primary Care. This study shows how the serial audits of chronic disease performed in a Practice could inform the latter about the standards of care provided. This in turn could drive change towards improvements and the maintenance of achieved high standards. A Primary Care Trust (PCT) is responsible for the performance and clinical governance of several Practices. Clinical audit at this level provides useful information about the comparative performance of the component Practices. Such data helps individual Practices and Practitioners to focus on their own respective performance in comparison to peers. Constructive feedback is known to be a useful means of effecting change. The collective performance of Practice units working towards set standards helps a community to achieve better care. Finally, information collected at a supra PCT level provides a means for individual PCTs to drive change in their constituencies.

## P52

### **Outcomes of a Second Tier Clinic for Patients with Poorly Controlled Diabetes Mellitus in Toa Payoh Polyclinic**

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<sup>1</sup>*Toa Payoh Polyclinic, National Healthcare Group Polyclinics, Singapore*

**Aim:** The aim of this study is to describe some of the outcomes of a second tier clinic set up to focus on patients with poorly controlled diabetes mellitus in Toa Payoh Polyclinic.

**Methods:** A cohort of 25 patients who have attended the clinic for at least 4 months were randomly selected.

**Results:** Twenty patients (80% of the cohort) had documented improvements in HbA1C. The average HbA1C when they started attending the clinic was 9.8% while the average HbA1C achieved at the latest consultation was 8.6%. The HbA1C improvements ranged from a modest 0.2% to 2.9%. Five patients were discharged from the clinic (when their HbA1C decreased to below 8.0%) while the other 20 are still on follow up at the clinic. Eight patients were newly initiated on insulin within the period they attended the second tier clinic. Ironically, 3 of these patients experienced worsening of HbA1C. 2 patients dropped insulin use subsequently due to their experiences with hypoglycaemia.

**Conclusion:** There were modest gains from the clinic, with an average 1.2% reduction of HbA1C amongst 80% of the cohort studied with improvement in HbA1C. Only a third of the patients newly initiated on insulin were successfully maintained on insulin with concurrent improvement in HbA1C reflecting the complexity of these cases. There were successes such as closer collaboration between the doctors, care managers and medical social workers as well as increase in usage of insulin pen devices.

## P53

### **Knowledge, Attitudes and Perceptions of Healthcare Providers and Patients Towards Obesity and Weight Management Programmes**

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<sup>1</sup>*Toa Payoh Polyclinic, National Healthcare Group Polyclinics, Singapore*

**Aim:** The aim of this study is to determine the knowledge, attitudes and perceptions of healthcare providers and patients towards obesity and weight management programmes.

**Methods:** Fifty participants, consisting of 22 doctors and nurses and 28 overweight patients were surveyed between November 2007 and January 2008.

**Results:** Almost all (96.4%) of the patients surveyed agreed

that they needed to lose weight and their primary motivation for losing weight is for health reasons. Most patients were aware of the associated co-morbidities of obesity but only 39% were aware that obesity is linked with cancer as well. Most patients (85.7%) were motivated to lose weight but only 53.6% were confident of losing weight on their own. Most patients (78.6%) cited cost as the reason for not joining a weight management programme whilst 57.1% cited a lack of time. 39.3% of the patients expressed ambivalence about the usefulness of weight management programmes.

95.5% of healthcare workers will dispense general advice alone to obese patients whilst only 13.6% will refer such patients to a weight management programme. 72.7% of the healthcare workers perceive that patients are usually not interested in weight management programmes.

**Conclusion:** More can be done to educate patients on the benefits of weight loss and weight management programmes and to encourage healthcare providers to refer patients to weight management programmes.

## P54

### **To Increase the Percentage of Diabetic Patients at Jurong Polyclinic with HbA1c of <7.0% from 35.9% (Dec 2005) to 50% by June 2006 and 60% by December 2006**

**TOMMY NG**

*Bukit Batok, National Healthcare Group Polyclinics, Singapore*

**Methods:** The team identified reasons for poor diabetic control using a pareto chart. In implementing changes in the workflow to facilitate and achieve the desired outcome, the more common causes were targeted for which a PDSA cycle is carried out.

**Interventions/Results:** Factors identified which contributed to poor diabetic control included non-compliance, complicated regimen, insufficient dosages, and doctors not reviewing the treatment or sending patients for counselling. The project involved 412 diabetic patients over 6 months and the interventions included tagging the case notes to identify patients to be directed to the care manager, more frequent nurse counselling with emphasis on diet control and empowerment, cases with poor control were traced and reviewed before the patient's visit, deliberate and increased efforts were made to boost insulin usage and simplify the therapy regimen. Meetings were conducted on a regular basis to update and remind doctors and nurses involved.

We have identified the reasons for patients who are more likely to have poorer diabetic control. There was no improvement in the percentage of patients achieving HbA1c <7% largely due to the large denominator of diabetic patients. HbA1c results improved but did not reach levels <7%. There are also side effects to overzealous control and hence it is not possible in

certain groups of patients i.e. the frail elderly.

**Conclusion:** The causes for poor control of diabetes are often multifactorial and require concerted efforts on the part of the patients, family members, doctors and nurses to work towards the common goal and achieve satisfactory outcomes.

## P55

### Evaluating User Satisfaction with an Electronic Prescription System in a Primary Care Group

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**Aim:** To examine users' satisfaction with an electronic prescription system in the National Healthcare Group Polyclinics Singapore where prescriptions are ordered and sent electronically to the pharmacy.

**Methods:** A questionnaire was administered in October 2007 to all physicians, pharmacists and pharmacy technicians working in the 9 National Healthcare Group Polyclinics. The questionnaire assessed their 1) computer background and experience; 2) ability to use the electronic prescription system; 3) satisfaction with the system functionalities and 4) perception of impact on quality of patient care. Returned surveys were analysed to obtain frequencies and descriptive statistics for each survey item.

**Results:** Respondents include 118 physicians and 61 pharmacy staff who had average to excellent computer and typing skills, had average to excellent ability to use the electronic prescription system, and had been healthcare practitioners for an average length of 5 years. The users were generally satisfied with the range of facilities available in the system and reported positive impact on the detection and reduction of prescription errors. However, 1 in 5 will still choose traditional paper records if there were no penalties. Additionally, the pharmacy staff expressed concern with the amount of time it took to process prescriptions requiring amendment or inclusion of items that have to be purchased externally. They were also less satisfied with the speed of the system.

**Conclusion:** This survey suggests that physicians and pharmacy staff favour the use of an electronic prescription system and suggests opportunities for system enhancement.

## P56

### Knowledge, Attitude and Practices (KAP) on Metered-dosed Inhaler (MDI) Technique

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**Aim:** To determine the KAP of asthmatic patients on their inhaler technique and their ability to use the MDI.

**Methods:** One hundred and three patients were recruited from 4 polyclinics. The patients' MDI techniques were assessed using an 11-item checklist and graded based on a set of predetermined criteria. Subjects were later guided through a peer-validated KAP survey.

**Results:** Only 20% of the respondents were able to carry out the recommended MDI technique. On average, respondents scored 60% (3 out of 5) in the knowledge section. Only 47% of respondents knew of the need to clean their inhalers regularly. The respondents scored a good average attitude score of 80% (24 out of 30). In the Practice section., respondents scored 63% (5 out of 8). Only 50% of respondents used the reliever before the preventer where both were indicated. The proper timing between actuation and coordination is a critical step commonly carried out by respondents incorrectly (48%). There were secondary findings from the study. The mean MDI score for respondents who demonstrated sub-optimal and poor techniques was 8 out of 11. Hence, the MDI score alone may not be a good indicator of individual MDI competence. No statistically significant relationship was found between the MDI scores and respondents' demographic variables ( $P > 0.05$ ). A positive correlation is found between MDI scores and KAP scores ( $P < 0.01$ ).

**Conclusions:** A holistic approach should be adopted to improve patients' MDI technique. This study revealed weaknesses in patients' knowledge, attitudes and practices of MDI technique that can be improved on.

## P57

### Determinants of Polyclinic Demand to Aid Planning

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**Background:** Planning of polyclinic services and their location require various determinants of demand such as population growth and geographical distribution, ageing, utilisation profile.

**Aim:** To describe various determinants of demand to aid the future planning of polyclinics.

**Methods:** Data from various sources were used for analysis; i.e. Statistical Bulletins, Ministry of Health, and administrative databases (2006) of polyclinics under the National Healthcare Group and SingHealth Services. Geographical information system was used to geo-analyse catchments and distances travelled, and where applicable, the findings were compared with Primary Healthcare Survey 2005.

**Results:** The overall trend in polyclinic attendances increased in tandem with population growth. In 2006, while utilisation rates for total resident population was 0.99%, the rate was significantly higher at 2.75% for those aged 65+ years. Almost 30% of the resident population attended the polyclinics at least once. The frequency of attendances decreased exponentially: 37% of the patients attended the polyclinics once in 2006, and 26% attended at least 5 times. 95% of the patients stayed within 5 km of a polyclinic, while 62% of them lived within 2.5 km. 74% of the visits were nearest to the patients' postal addresses and about 85% of the patients remained within 1 polyclinic.

**Conclusion:** The locality of polyclinics has been planned appropriately to cover major dwelling areas, where patient catchment is localised and patients are generally loyal to particular polyclinics. With our ageing population, polyclinic attendances are expected to increase. The various determinants of demand can help in planning the size and location of future polyclinics.

## P58

### **Risk Factor Control and Secondary Prevention Among Post-stroke Patients at the National Healthcare Group Polyclinics, Singapore**

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**Aim:** To study risk factor control and secondary prevention among post-stroke patients at the National Healthcare Group Polyclinics (NHGP) in Singapore.

**Methods:** A retrospective review of post-stroke patients who had a minimum follow-up of 6 months at the NHGP with a diagnosis of stroke (ICD9CM Code 436). Patients were randomly sampled from the Medical Records System from each polyclinic. Trained nurses reviewed medical records and collected data on blood pressure (BP) and LDL-cholesterol

control and prescription of anti-platelet or warfarin for patients with ischaemic stroke. Data was analysed using SPSS v15.

**Result:** A total of 410 patients were studied. There were more males (54.6%) than females (45.4%), the majority were 65+ years of age (59.8%), predominantly Chinese (90.0%) and 94.6% had ischaemic stroke, 5.4% had haemorrhagic stroke. BP was monitored at least 4-monthly in 408 patients (99.5%), of which 274 (67.2%) achieved target BP below 140/90 mmHg. The mean systolic and diastolic BP were 131 mmHg and 78 mmHg respectively. Serum lipids were monitored at least annually in 330 patients (80.5%), of which 131 (39.7%) achieved target LDL-cholesterol below 2.60 mmol/L with mean LDL-cholesterol of 2.84 mmol/L. Among patients who had ischaemic stroke without cardiac embolic source, 318/351 (90.7%) were prescribed anti-platelet agent. Among patients who had an ischaemic stroke with atrial fibrillation, 27/37 (73.0%) were on warfarin, most of the remaining patients not on warfarin were 65+ years old.

**Conclusion:** Most of the post-stroke patients were receiving optimal care and had BP controlled. Cholesterol control could be further improved.

## P59

### **Alcohol Intoxication Among Children in The Netherlands**

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**Aim:** To study the number and characteristics of children who are admitted to the hospital because of alcohol intoxication and to create a prevention system in line with primary care.

**Setting:** All Hospitals in the Netherlands.

**Methods:** All paediatricians of the country report monthly by standardised interview, the parameters of the children who were hospitalised in the paediatric wards. By means of a Prevention Intervention System (PIS) the children in the pilot region of Delft were controlled in time to prevent a second hospitalisation in line with primary care.

**Results:** From January till November 2007, 240 children were admitted nationwide; 60% were girls with a mean blood alcohol level of 1.8 g/L. The majority consumed (part of the) alcohol at home. The mean age was 13.6 years. The PIS was successfully introduced as a pilot; 95% of the children were successfully treated.

**Conclusion:** The number of children admitted with alcohol intoxication in the Netherlands is significant. The PIS as a pilot was successful. Implementation of this system nationwide will be executed.

**P60**

**Willingness to Travel for Polyclinic Services**

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**Aim:** To examine travel distance by patients to polyclinics as an aid to future planning.

**Methods:** A national database containing 3 million polyclinic consultations in 2006 were geo-analysed using ARC/VIEW GIS and MapInfo DriveTime softwares. Residential postal codes of each patient and 18 polyclinics were mapped by geographical zones. Shortest road distance travelled between patients' residence and their choice of polyclinics was computed to assess their willingness to travel for polyclinic services.

**Results:** The geographical catchment of every polyclinic was

highly localised. Overall, patients travelled an average of 3.9 km to the polyclinics to seek medical treatment. Shortest distances were travelled by those who attended Sengkang (2.6 km), Pasir Ris (2.8 km), Hougang (3 km), Tampines (3.6 km) and Bedok (3.6 km) Polyclinics, while longest distances were travelled by those who attended Outram (8.7 km), Jurong (5 km), Woodlands (4.9 km) and Clementi (4.7 km) Polyclinics. The young and elderly travelled the shortest distances, being 3.2 km and 3.5 km for those aged <15 years and 65+ years, respectively. Residents too travelled shorter distances than their non-resident counterparts (3.7 km vs 9.1 km). Likewise for patients with chronic conditions compared to those with acute conditions (3.7 km vs 4.2 km).

**Conclusion:** Geographical catchments of polyclinics are highly localised. The longer distances travelled to some polyclinics, coupled with other determinants (e.g. high volume of attendances, long waiting time) may indicate a demand that is not met (e.g. Jurong, Woodlands, Clementi). Travel distance should be a consideration when planning services for targeted population groups; e.g. the very young, elderly and those with chronic diseases.

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