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Diabetes Care in 2012: The 4 Essential Pearls for Primary Care Physicians
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Type 2 diabetes mellitus (T2DM) represents a major global public health threat. According to the World Health Organization, 346 million people worldwide have diabetes and an estimated 3.4 million people died from consequences of high blood sugar in 2004. In Singapore, the prevalence of diabetes mellitus among adults aged 18 to 69 has gone up from 8.2% in 2004 to 11.3% in 2010.

The primary care physicians will play an increasingly important role in the management of diabetic patients in the community. Over the last five years, several landmark studies that challenged our glucose-centric way of managing diabetic patients were published. This article will serve as a timely update to our primary care physicians with keen interest in the management of patients with T2DM. I will present the 4 essential pearls in the management of T2DM.

Two recent cases
Mr. CKK was a 43 year-old gentleman who has a history of fatty liver. He had concomitant mixed dyslipidaemia and was treated with simvastatin and fenofibrate. He was a chronic smoker. Although asymptomatic, he was recently diagnosed with diabetes during his annual health screening. He underwent 75g oral glucose tolerance test; the fasting plasma glucose was 7.9 mmol/l and the 2h post-challenge plasma glucose was 11.1 mmol/l. The HbA1c was 8.1%. His body mass index (BMI) was 28.1 kg/m². Both his parents had diabetes in their sixties.

Mr. HCW, an ex-smoker, was a 74 year-old gentleman with T2DM for 15 years. His diabetes was complicated by proliferative retinopathy (requiring pan-retinal laser photocoagulation) and nephropathy (microalbuminuria). Other than concomitant hypertension and dyslipidaemia, he had a significant past history of ST-elevation myocardial infarct (STEMI) in 2008. He had been on regular follow-up with his general practitioner for management of diabetes and was treated with metformin (850 mg bd) and glibenclamide (10 mg om). His latest HbA1c was 8.3%. He experienced occasional episodes of nocturnal hypoglycaemia and had gained significant weight as a result.

1. Intensive glycaemic control at time of diagnosis
Mr. CKK has newly diagnosed diabetes and he should receive intensive glycaemic control to achieve near normal glycaemia. In the United Kingdom Prospective Diabetes Study (UKPDS), 4,209 patients with newly diagnosed T2DM were randomly assigned to receive intensive therapy or conventional therapy for glucose control. Over 10 years, intensive glucose control (mean HbA1c 7.0%) by either sulphonylurea or insulin significantly decreased the risk of microvascular complications, but not macrovascular complications, compared to conventional treatment (mean HbA1c 7.9%). Each 1% reduction in HbA1c was associated with reductions in risk of 37% for microvascular complications. However, the 10-year post-trial follow-up study of these UKPDS patients suggests that intensive glycaemic control can have long-lasting benefits in reducing the incidence not only of microvascular complications but also of myocardial infarction and death from any cause. These benefits occurred despite the early loss of within-trial differences in HbA1c levels between the intensive and conventional treatment groups. These findings support the notion of a sustained, legacy effect of intensive glycaemic control at the early stage of the disease.

2. Individualise HbA1c targets
Two recent studies sought to determine the effect of lowering the glucose to near-normal levels on cardiovascular risk but with differing outcomes. In...
The most compelling message from both studies is that near-normal glycaemic control should not be achieved for all patients and HbA1c targets should be individualised.

In the Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation (ADVANCE) study, intensive glycaemic control was associated with a significant reduction in albuminuria (but not macrovascular events) with an HbA1c target of <6.5% compared with standard therapy. On the other hand, in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, the glucose control arm was halted early due to the finding of an increased mortality rate in the intensive group (targeting HbA1c below 6.0%) compared with the standard group. Secondary analyses in the ACCORD trial did show significant reductions in cardiovascular events in patients who did not have known cardiovascular disease before randomisation. The most compelling message from both studies is that near-normal glycaemic control should not be achieved for all patients and HbA1c targets should be individualised. Mr. CKK should have a target HbA1c as near normal as possible (i.e. <6.5%) if this can be achieved without significant hypoglycaemia in view of his short duration of diabetes and absence of known cardiovascular disease. On the other hand, Mr. HCW is an elderly man with chronic T2DM complicated by advanced atherosclerosis and has a history of severe hypoglycaemia. I will adopt an HbA1c target of between 7.0 to 8.0% for him as he is vulnerable to the harmful effects associated with tight glycaemic control.

3. Avoid hypoglycaemia

In both the ADVANCE and ACCORD studies, the rates for hypoglycaemia were significantly higher in the groups receiving intensive therapy. This is not surprising as hypoglycaemia is the most common side effect of glucose lowering therapies in T2DM. Although most episodes of severe hypoglycaemia resolve without apparent permanent injury, there are reports of acute coronary syndromes coinciding with hypoglycaemia in people with T2DM. A recent study also showed that severe hypoglycaemia was strongly associated with increased risks of a range of adverse clinical outcomes, including vascular events and death. Although a direct causal relationship was not shown in this study, the presence of severe hypoglycaemia should raise clinical concerns.
References


4. Aggressive management of cardiovascular risk factors
Mr. CKK is relatively young but is at risk of cardiovascular events as T2DM is a coronary heart disease risk-equivalent. Although improved glucose control can clearly protect against the development of microvascular complications, the absence of a reduction in macrovascular events (from ACCORD and ADVANCE) implicates an addictive effect of non-glycaemic risk factors such as hypertension, hyperlipidaemia and hypercoagulability. There is clear evidence that aspirin, a statin, and the targeted lowering of blood pressure are each associated with substantial reductions in cardiovascular risk in patients with T2DM. There may be even greater benefit when these reductions are achieved together as shown in the Steno-2 study. In this study, intensified multi-factorial intervention to address all three risk factors in patients with T2DM and microalbuminuria showed significant reduction in cardiovascular events compared to conventional treatment after a mean treatment period of 7.8 years. The 13.3 year follow-up observation study without active intervention continued to show reduction in cardiovascular events and had an additional finding of reduction in mortality. As such, both Mr. CKK and Mr. HCW should be treated to targets for non-glycaemic cardiovascular risk factors.

Conclusion
It is important for our primary care physicians to understand the disease spectrum of patients with T2DM and individualise treatment accordingly. The use of appropriate anti-diabetic medications is also paramount in reducing the risk of hypoglycaemia for certain at-risk groups of patients. Treating non-glycaemic cardiovascular risk factors to targets should be part of the agenda during each clinic consultation. With the increasing prevalence of T2DM, primary care physicians will play a key role in the long-term management of these patients.
Type 1 diabetes (T1DM) is characterised by absolute insulin deficiency of insulin secretion, predisposing individuals to ketoacidosis and necessitating insulin replacement.

Worldwide, the incidence of T1DM has been increasing, particularly in children under the age of 5 years\(^1\). In general, T1DM comprises around 5-10% of the total diabetes prevalence. In Singapore, the incidence of childhood type 1 diabetes mellitus in Singapore is relatively low compared with developed countries at 2.46 per 100,000 children aged 1-12 years\(^2\). Yet, it remains the predominant form of diabetes affecting children in Singapore.

**Case study**
Miss DH is a 28 year-old lady who was diagnosed with T1DM at the age of seven years. In 2003 (age 20 years old), she started experiencing more frequent episodes of hypoglycaemia. This culminated in an admission with severe hypoglycaemia, having lost consciousness at home. Following this, she was converted from the older human insulins to analogue insulins. Despite this, she continued to document frequent hypoglycaemia, mostly between or before meal times, with erratic high readings after mealtimes. There appeared to be little predictability or pattern with her readings and she continued to be unaware of her hypoglycaemia. There were no other symptoms suggestive of gastroparesis and there was some lipohypertrophy on her abdomen but despite rotating the injection sites, this erratic pattern continued. HbA1c throughout the years appeared well (perhaps too tightly) controlled, ranging from 5.7-7.5%. However, HbA1c clearly describes just one aspect of glucose control ie the average. It does not illustrate the fluctuation of glucose around this mean glucose level.

Figure 1 demonstrates the interstitial glucose profile of this patient over 24 hours, using a continuous glucose monitoring sensor device. The large variation in glucose range from hypoglycaemia to marked hyperglycaemia (2.2-20 mmol/l) is typical of an individual with T1DM. ‘Brittle diabetes’ is an ill-defined term previously used to describe those with diabetes which is difficult to control, or with wide fluctuations in glucose levels, such that these individuals are deemed to be often at the threshold of either hypoglycaemia or diabetes ketoacidosis. However, it is now clear that most individuals with T1DM experience glucose profiles like these, even when they are on basal-bolus insulin regimens which aim to mimic physiological insulin replacement.

Where is the missing link? Carbohydrate is the main macronutrient that results in post-prandial glucose increase and should therefore be the major determinant of bolus insulin doses. In contrast, prescriptive doses of

\[\text{Figure 1} \quad \text{24-hour interstitial glucose profile measured using a continuous glucose monitoring sensor.}\]
bolus insulin (e.g. 6 units thrice daily) do not take into account varying amounts of carbohydrate intake, with the resultant large variations in glucose level following a meal. Those who are on fixed insulin regimens are expected to maintain fixed carbohydrate intake on a day-to-day basis with respect to time and amount. Unsurprisingly, few individuals adhere to this, carbohydrate intake on a day-to-day basis with respect to time are on fixed insulin regimens are expected to maintain fixed large variations in glucose level following a meal. Those who varying amounts of carbohydrate intake, with the resultant bolus insulin (e.g. 6 units thrice daily) do not take into account quality of life. Currently, Singapore General Hospital (SGH) (HbA1c) without increased hypoglycaemia and an improved programme, showing improved, sustained glycaemic control in T1DM needs to involve education of the patient in self-management and carbohydrate counting. This may be achieved through the Dose Adjustment For Normal Eating (DAFNE) programme which originated from Germany. Longer-term studies have supported the efficacy of such a programme, showing improved, sustained glycaemic control (Hba1c) without increased hypoglycaemia and an improved quality of life. Currently, Singapore General Hospital (SGH) is the only centre in Asia that runs such a programme. The sgDAFNE team consists of a Dietitian, Diabetes Nurse Educator and a Physician. Together, a comprehensive curriculum is delivered to T1DM participants, aimed at equipping individuals with knowledge in advanced carbohydrate counting, analysing glucose levels and making informed decisions on bolus/prandial insulin doses and managing situations like eating out, snacking and physical activity.

The importance of education in self-management is highlighted using an example of the treatment of hypoglycaemia (shown in figure 2) from the same patient after undergoing the DAFNE programme. In figure 2, bedtime hypoglycaemia occurred at 0015hrs (capillary glucose or CPG level of 2.4 mmol/l). In general, hypoglycaemia should be treated with 15-20g of quick-acting carbohydrates and glucose re-checked 15 minutes later to ensure adequacy of treatment. In this case, the patient consumed 18g of fruit juice and CPG re-checked 15 minutes later was 5.3 mmol/l. A further 14g of crackers (longer-acting carbohydrates) was consumed as there was going to be a prolonged period before the next meal intake and basal insulin was already on board. Figure 2 shows that following this treatment, glucose levels remained at a safe and good level of 7 mmol/l till the following morning.

Relevance to T2DM
The principles of T1DM management are relevant and may be applied to treating type 2 diabetes (T2DM). In particular, other structured education programmes adapted from DAFNE such as the DESMOND and X-PERT programmes, both aim to equip T2DM individuals with self-management skills and the knowledge to make better food choices. These have shown to be useful on multiple levels: improved glycaemic control and body anthropometry. Singapore General Hospital will be aiming in the future to conduct similar programmes for individuals with T2DM.

Young Adults with Diabetes (YAD)
Lastly, as young individuals with diabetes progress from childhood to adulthood, they are often faced with multiple challenges and distractions which often result in greater attrition rates, and deteriorating glycaemic control. The Young Adults with Diabetes (YAD) clinic held weekly at SGH is a new set-up in Singapore and this was started in April 2011. It aims to provide focused, developmentally appropriate and individualised care to help adolescents/young adults with diabetes transition from childhood to adulthood seamlessly. The YAD team consists of diabetes nurse educators, diabetes dietitians, the medical social worker and the endocrinologist. The number of appointments in each clinic is deliberately kept small in recognition of the greater needs of these individuals.

The role of general practitioners
Although classically known to present abruptly in young children under 10 years old, T1DM may occur at any age and may be of more gradual onset. Having a high index of suspicion is thus required to diagnose T1DM. The diagnosis of diabetes in a child under 10 years of age is highly likely to be T1DM, however at least 50% of individuals with T1DM present after they are 15 years old. Hence those who are lean and hyperglycaemic despite multiple oral glucose lowering agents or those who experience an abrupt deterioration in their glycaemic control ought to be evaluated further with a GAD antibody and a fasting C-peptide level to assess their endogenous insulin reserve. Doubts about their absolute need for insulin should prompt a referral to an endocrinologist for further assessment.

Although most patients with T1DM ought to be managed in the tertiary care setting, GPs play an important role on a day-to-day basis. As a chronic illness, complications of T1DM are inevitable both in the short- and long-term. GPs are well-placed to assess and treat the micro- and macrovascular complications those with longer-standing T1DM are at risk of, or refer these patients for specialist care in an expectant manner.

On a day-to-day basis, appropriate treatment of hypoglycaemia (example described above) and appropriate management of glucose and insulin on sick days may help prevent progression to severe hypoglycaemia and diabetes ketoacidosis respectively. On sick days, those with T1DM should be reminded to test their capillary glucose more frequently, to test for ketones and to keep well-hydrated when they are not well. Basal insulin should never be stopped since this is required to prevent ketogenesis. In fact, the dose of insulin required may need to be increased in sick states. Those who have injected prandial insulin but are unable to complete their meal ought to make up for the deficit in carbohydrates using carbohydrates that are easily consumed e.g. juice/honey. Those who are unable to retain any fluids or food and are constantly vomiting ought to be referred for emergency care.

Services at SGH for T1DM

More advanced technology such as continuous glucose monitoring sensors and insulin pumps may offer improved management in T1DM, provided these devices are used well. Employing these tools, together with a dedicated multi-disciplinary team, and the use of T1DM-specific advanced carbohydrate counting and self-management structured education programmes, Singapore General Hospital is geared up to provide comprehensive care to those with T1DM. The goals in any chronic disease management being life-long in nature, the YAD clinic is yet another facet of holistic care aiming to ensure the needs of young individuals with diabetes are pre-empted and provided for.

Dose Adjustment For Normal Eating (DAFNE) Programme

A comprehensive curriculum is delivered to T1DM participants, aimed at equipping individuals with knowledge in advanced carbohydrate counting, analysing glucose levels and making informed decisions on bolus/prandial insulin doses and managing situations like eating out, snacking and physical activity.
Women with type 1 and type 2 diabetes mellitus face greater pregnancy-related risks compared with the general maternity population. Elevated blood glucose in early pregnancy has been strongly correlated with foetal congenital anomalies and miscarriage. There is strong evidence that intensive glycaemic control before conception and during the first trimester of pregnancy decreases the incidence of birth defects to approximate that of infants of women without diabetes.

Studies in women with diabetes have shown that preconception care is associated with a significant reduction in congenital malformations. Unfortunately, unplanned pregnancies still occur in about two-thirds of women with diabetes, leading to a persistent excess of malformations in their infants. Preconception care worldwide is poor in women with diabetes, especially those with type 2 diabetes.

The following are two case illustrations before we examine the role a primary care physician can play in the preconception care of women with diabetes.

Case 1
A 31 year-old Chinese woman, with a known history of type 2 diabetes mellitus of five years’ duration, had an unplanned pregnancy when she missed her menses by two weeks in April 2010. Her HbA1c was 8.1% prior to conception. She was then converted from her oral glucose-lowering drugs (glipizide and metformin) to insulin therapy with the aim of optimising her glucose control. However despite achieving satisfactory glucose targets with insulin treatment within the subsequent two weeks, she unfortunately suffered a miscarriage at nine weeks’ gestation.

This case highlights the importance of good glycaemic control before conception as well as during the first trimester of pregnancy in order to reduce the risk of miscarriages for women with diabetes.

Case 2
A 35 year-old Malay woman, with a known history of type 2 diabetes mellitus (not on regular follow-up), saw an obstetrician only when she was 16 weeks pregnant. At that point, her HbA1c was 10.7% and she was initiated on insulin therapy to optimise her blood glucose levels. A foetal anomaly scan performed at 20 weeks’ gestation however demonstrated left renal agenesis. Although her glycaemic control was optimised and she did not develop other adverse pregnancy outcomes such as macrosomia or pre-eclampsia, the congenital malformation in the infant could not be reversed.

Foetal organogenesis is largely complete by eight weeks after the last menstrual period (six weeks post-conception).
This case highlights the increased risk of delivering an infant with a major anomaly if the mother’s diabetes is poorly controlled during the early weeks of pregnancy (in many cases before the woman even knows that she has conceived).

What is the role of a primary care physician?

1. Pre-pregnancy counseling
As a primary care physician, you may be the only healthcare provider many women with diabetes see on a regular basis before pregnancy and at the time of conception. You can offer information, care and advice to women with diabetes who are planning to become pregnant before they discontinue contraception. Providing this information to these women and striving to achieve optimal glycaemic control before they conceive will improve outcomes for both mothers and babies.

All women with diabetes of child-bearing age should be advised on the risks of diabetes in pregnancy, both to the mother and the baby (see Table 1). They should be advised that they can reduce these risks with good glucose control before and during pregnancy.

2. Advice on contraception
Information on pregnancy and contraception should be given to all women with diabetes of child-bearing age. There are no contraceptive methods that are specifically contraindicated in women with diabetes. Methods with proven high degrees of effectiveness, for example hormonal contraceptives and intrauterine devices, should be advised because unexpected failure of contraception can lead to serious complications for the infant of a woman with poorly controlled diabetes.

Blood glucose control should be optimised to prevent miscarriage and congenital malformations. Any improvement in HbA1c towards normal should be encouraged.

<table>
<thead>
<tr>
<th>Risks to the mother</th>
<th>Risks to the baby</th>
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<tbody>
<tr>
<td>Pregnancy-induced hypertension</td>
<td>Congenital malformations</td>
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<td>Pre-eclampsia</td>
<td>Miscarriage or stillbirth</td>
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<td>Polyhydramnios</td>
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<td>Cesarean section</td>
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<td>Birth trauma</td>
<td>Neonatal hypoglycaemia</td>
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<tr>
<td>Worsening of retinopathy / nephropathy</td>
<td>Neonatal respiratory distress</td>
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3. Optimisation of blood glucose control
Blood glucose control should be optimised to prevent miscarriage and congenital malformations. Any improvement in HbA1c towards normal should be encouraged. If possible, HbA1c should be <7.0% taking hypoglycaemic risk into account. Women with HbA1c >10.0% should be advised to avoid pregnancy. The importance of avoiding unplanned pregnancy should be emphasised.

Self-monitoring of blood glucose should be encouraged for all women with diabetes. Fasting blood glucose should be maintained between 4.4 and 6.1 mmol/l and 2-hour post-meal blood glucose should be kept <8.6 mmol/l.

Metformin crosses the placenta and achieves therapeutic levels in the foetus. Presently, there are no long-term safety data in infants whose mothers were treated with metformin in early pregnancy. Oral medications have also not been adequately studied for the treatment of pre-existing type 2 diabetes in pregnancy.

If a woman with type 2 diabetes expresses desire for pregnancy, oral glucose-lowering drugs should be discontinued and insulin therapy should be initiated. Human insulin (regular insulin and NPH insulin) remains the insulin of choice.

4. Lifestyle modification
Smoking and alcohol cessation should be strongly advised.

Women with type 2 diabetes whose body mass index (BMI) are over 27.5 kg/m2 should be encouraged to lose weight before conception wherever possible, with lifestyle intervention and exercise. There is no adequate safety data on the use of orlistat in pregnancy and orlistat should be avoided if the woman with diabetes plans to conceive.
5. Complication screening and monitoring

Clinical evaluation should be performed to assess for or detect the presence of diabetes-related complications.

Hypertension is a frequent concomitant or complicating disorder of diabetes. Pregnancy-induced hypertension is a potential problem for women with diabetes, particularly when proteinuria in excess of 190 mg/day is present before conception or in early pregnancy. Known hypertension in a woman with diabetes planning for conception should be treated with medications not known to be teratogenic, such as methyldopa and hydralazine, in addition to lifestyle modification. Angiotensin-converting enzyme (ACE) inhibitors and angiotensin-II receptor blockers (ARBs) are contraindicated in pregnancy as they have been linked with teratogenesis. Atenolol may be associated with a greater risk of small-for-gestational age (SGA) infants and should be avoided.

Diabetic retinopathy may accelerate during pregnancy. The risk can be reduced by gradual attainment of good metabolic control before conception and by pre-pregnancy laser photocoagulation in women with standard indications for therapy. Therefore, a baseline dilated eye examination is necessary before development and/or progression of diabetic retinopathy.

Baseline assessment of renal function by serum creatinine and some measure of urinary protein excretion (urine albumin-to-creatinine ratio or 24-hour albumin excretion) should be performed before conception and followed at regular intervals. ACE inhibitors or ARBs given for the treatment of microalbuminuria should be discontinued in women who are attempting to become pregnant.

Statins are contraindicated in pregnancy due to reports of teratogenesis. As such, statins should be discontinued before pregnancy in women with diabetes who are planning to conceive or as soon as pregnancy is confirmed. Omega-3 fatty acids can be started and continued in pregnancy for hypertyglicrideremia.

6. Folic acid supplementation

Women with diabetes who are planning to become pregnant should be advised to take folic acid (5 mg/day) until 12 weeks of gestation to reduce the risk of having a baby with a neural tube defect.

7. Early pregnancy management

Once pregnancy is confirmed by urinary or serum β-hCG, the woman with diabetes should be referred early to a centre with a multidisciplinary team, including the obstetrician, endocrinologist, dietitian and diabetic nurse educator, so that glucose control in early pregnancy can be further optimised.

If not already done, oral glucose-lowering drugs, ACE inhibitors or ARBs, and statins should be discontinued as soon as pregnancy is confirmed and insulin therapy should be started.

References


sgDAFNE: The Singapore Experience

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In November 2010, a pioneer team comprising one nurse educator, one dietitian and an endocrinologist from Singapore General Hospital completed a DAFNE (Dose Adjustment For Normal Eating) course and post-course educator training at the OzDAFNE centre, Diabetes Australia-Victoria.

Upon returning to Singapore, the newly-christened sgDAFNE team adapted the materials generously shared by OzDAFNE, and developed a culturally relevant sgDAFNE programme, including a modified carbohydrate portion booklet for use in Singapore and South East Asia. To the best of our knowledge, we are the first centre in Asia to offer the DAFNE programme, and the sgDAFNE team has conducted two courses in 2011, with at least three more scheduled for 2012. We had also conducted a healthcare professionals DAFNE awareness day on World Diabetes Day in November 2011.

The inaugural course in April 2011 was conducted under the watchful eye of an auditor from Diabetes Australia (Vic), and OzDAFNE has graciously taken us under the umbrella of the OzDAFNE collaborative. We are committed to contributing to the OzDAFNE database, until such time that the sgDAFNE programme is able to establish its own independent Collaborative.

Many challenges have surfaced in the development and implementation of sgDAFNE. Prior to DAFNE, there was no structured or standardised education and self-management program for type 1 diabetes in Singapore. It was a paradigm shift for most patients, some of whom still functioned in a rather paternalistic and hierarchical doctor-patient relationship, and were not attuned to a patient empowerment concept. The programme demands a higher intensity of self-blood-glucose monitoring than routine care, and purchases of glucometer and test strips are all out-of-pocket expenses with no insurance re-imbursement or government healthcare financing available. Some patients had never previously done blood ketone testing, as the cost is prohibitive (US$3-4/ketone strip).

Another major task was developing the carbohydrate counting material for the local Singapore / Asian context – the dietetics team laboured long and hard, and was thrilled to finally produce our own sgDAFNE carbohydrate portion booklet in the first quarter of 2011. In adapting the patient material, we also had to take into consideration the sociocultural contexts of food and diabetes: many Singaporeans dine out for most meals of the day, and it was often challenging to calculate hidden carbohydrates (eg in sauces/gravies) or accurately estimate portion sizes. Some Singaporeans tend to be ‘grazers’ and snack throughout the day rather than eating full meals at regular times – although the DAFNE curriculum equips patients with the ability to calculate and dose for snacks, difficulties did arise with interpretation of pre-meal levels as well as factoring in insulin stacking. The very act of injecting insulin in public, as well as the weighing of foods, was a daunting barrier for some patients. With two groups of graduates, the sgDAFNE team has also found that the local patients may be more insulin sensitive (requiring 1:1 rather than 2:1 or 1.5:1 ratios) than previously thought. The issue of overinsulisation (prior to entry into the DAFNE programme) has also surfaced, and to the delight of patients and the sgDAFNE team alike, some patients have had dose reductions of 25-40%.

sgDAFNE has been an exciting journey for all involved, healthcare professionals and patients alike, and we look forward to extending the program island-wide and to the rest of South East Asia.
Diabetes Mellitus and Peripheral Vascular Disease: Preserving Limbs, Saving Lives

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Presentation and Disease Progression
Peripheral vascular disease (PVD) of the lower limbs results from atherosclerotic stenoses or occlusions of the arteries in the lower limbs. Multiple risk factors include chronic smoking, hypertension and end-stage renal disease.

In Singapore and Asia, the most significant risk factor is the presence of diabetes mellitus. This is especially prevalent in diabetic patients who have poor or suboptimal blood glucose control. Multiple studies have shown a correlation between poor blood glucose (elevated HbA1c) and the development of PVD. This is further accentuated if the patients also have concomitant poorly controlled hypolipidaemia or who continue smoking cigarettes.

Patients with PVD present with two broad groups of symptoms and signs.
The first group develops Intermittent Claudication, which is characterised by severe cramping pain of the affected segment of the lower limb (i.e. thigh, calf or foot) that develops on walking or exercise. The pain onset is usually after a repeated, fixed distance of walking or duration of exercise and is relieved by simply standing still. Over time, if untreated, these patients may find a gradual decrease of pain-free walking distance or duration of exercise. In very severe cases, patients are unable to walk more than a few metres.

The second group comprises patients who progress from intermittent claudication pain to pain at rest, especially on laying down (critical ischaemia) or those who develop non-healing foot ulcers or gangrene of the toes/foot. These patients require more emergent treatment as they have a significant risk of undergoing a major amputation (i.e. below-knee or above-knee amputation) resulting in limb loss. With limb loss, these patients find a significant decrease in their quality of life due to a loss of mobility. Many spend their remaining lifespan either bed-bound or wheelchair-bound.

As a result, these patients often lose their employment and are homebound. There is also a significant physical and financial strain on family members and caregivers as patients require constant physical support, nursing and medical care.

Diagnosis
Intermittent Claudication
A good history and physical examination is sufficient to make a diagnosis of claudication.

Four key characteristics of intermittent claudication are:

a) Cramping pain in the affected limb segment (thigh, calf or foot), that is
b) Reproducible on walking the same fixed distance or fixed duration of exercise, that is

c) Relieved by simply standing still (not sitting down), with
d) No evidence of sciatic pain (shooting numbing pain) with radiation from the lower back.

Patients may have absent or diminished peripheral pulses on physical examination that may indicate the arterial segment affected i.e. absent femoral artery pulse suggests upstream aorto-iliac arterial disease, absent popliteal pulses suggests femoral arterial disease. Investigations to confirm the diagnosis include a simple Ankle-Brachial Pressure Index (ABPI) test before and after exercise or walking (which will show a decrease in values), or a duplex ultrasound arterial scan to identify segments of arterial disease.

Critical Ischaemia and Tissue Loss
Patients with rest pain present with severe debilitating pain at rest, made worse on laying down. They may also notice that the affected lower limb is cold and pale-looking. Relief is obtained from keeping the limb in a dependent position (gravity improving blood flow) and patients frequently sleep sitting in a chair. Patients with tissue loss present with either chronic non-healing ulcers or gangrene of the toes/foot. They may have underlying osteomyelitis and in severe cases, may develop life-threatening systemic sepsis from the infected ulcer/gangrene. Concomitant signs include absent limb pulses and purulent discharge from the wounds. A duplex arterial ultrasound scan is used to determine the affected arterial segment when planning for interventional treatment.
Therapy and Treatment
In all patients with DM and PVD, there are three key principles to guide our therapy:

1. Control of risk factors and exercise therapy
This forms the cornerstone of treatment for PVD patients. We aim for optimal blood glucose and blood pressure levels. Patients are also started on statins to control cholesterol levels and promote atherosclerotic plaque regression. Unless contraindicated, all patients are started on anti-platelet drug therapy (aspirin or clopidogrel). Anti-platelet therapy has been proven in PVD patients to have a reduction in risk of developing a myocardial infarction or cerebrovascular accidents. For patients with intermittent claudication, exercise therapy is also encouraged. This involves encouraging patients to continue walking despite pain with the goal of encouraging smaller collateral vessels to grow and induce new blood supply to the limb muscles.

2. Improvement of arterial blood flow
This involves the total arterial flow to the limb and is done using minimally invasive angioplasty and stenting techniques or open surgical bypass surgery. We generally reserve arterial revascularisation procedures for patients with severe claudication pain or those with critical ischaemia/tissue loss. This is because any arterial revascularisation surgery carries with it a degree of morbidity and mortality risks (albeit small).

In open surgical bypass, the patient’s autologous saphenous vein is first harvested and then used as a conduit to bypass the stenotic or occluded arterial segment. Sometimes, an artificial or prosthetic blood vessel graft is used as the conduit. Bypass surgery is effective and has good durability, akin to starting a new highway of blood flow. Frequently, patients need only a single procedure. However, patients for bypass surgery have to be medically fit to undergo the surgery and accept the multiple long incisions. Patients also have the bypass surgery carried out either under general or regional anaesthesia. Recovery is also slower due to the incision wounds. As such, many patients with multiple co-morbid diseases may not be suitable for bypass surgery.

3. Improvement of arterial blood flow
Increasingly, more and more patients are being offered and have chosen to undergo minimally invasive angioplasty and stenting procedures instead.

Open limb salvage bypass surgery using vein graft.

Minimally invasive angioplasty and stenting of the iliac arteries for limb salvage.
Increasingly, more and more patients are being offered and have chosen to undergo minimally invasive angioplasty and stenting procedures instead. This procedure is done via a small puncture wound in the groin femoral artery or the foot arteries, under local anaesthesia and intravenous sedation.

Essentially, a guidewire is used to traverse the stenosis or occlusion, followed by an angioplasty balloon to dilate the affected segment to obtain vessel patency again. We sometimes use adjunct devices to help us keep the arteries open and patent post-angioplasty and prevent repeat stenosis and occlusions.

These include special cutting balloons, bare metal stents and drug-eluting (drug-delivering) angioplasty balloons and stents. Obviously, angioplasty and stenting does not offer as much durability as a bypass and patients may require repeat procedures to keep the arteries patent. The upside is that the morbidity and mortality risks to patients are reduced significantly and patients can be discharged home earlier compared to a patient who has undergone open bypass surgery. Angioplasty also allows us to treat multiple target vessels in the lower limb as opposed to one vessel in open surgery.

In fact, at SGH the majority of patients are offered an angioplasty/stenting first approach to arterial revascularisation ahead of open surgical bypass.

3. Control of concomitant infection
Another key principle is adequate treatment of infection. Antibiotics are prescribed according to wound cultures. Gangrenous toes are amputated and infected tissues removed. The goal is adequate debridement and amputation yet retaining a functional lower limb and foot. We try to avoid major amputations unless absolutely required. The resultant wounds from surgical debridement are then cared for using a wide-range of wound care techniques. These include special anti-bacterial wound and negative pressure wound care dressings.

We also frequently use skin/muscle flap or skin grafts to cover the debridement wounds to accelerate wound healing. This process then allows the patient to regain their mobility and resume their activities of daily living.

At SGH, we have developed a multi-pronged, multi-specialty approach to caring for diabetic patients with PVD. Our team comprises vascular surgeons, interventional radiologists and specialist wound care nurses. We carry out the angioplasty procedures in a dedicated hybrid OT with a special team of dedicated surgeons, anaesthetists and endovascular nurses. Our main goal is to preserve lower limbs and prevent major amputations for we strongly subscribe to the philosophy that patient mobility and independence sustains their quality of life.
Vascular Services at SGH

The Vascular Service, Department of General Surgery at Singapore General Hospital manages problems related to arteries, veins and the lymphatic system. These may be non-urgent like varicose veins, or life-threatening like ruptured abdominal aortic aneurysms.

Urgent cases are seen usually at the Emergency Department by the vascular surgeon on call at any time on a 24-hour basis every day. Non-urgent problems are seen on an appointment basis in the Specialist Outpatient Clinic.

GP Contact
GP s can call 6321 4402 for appointments. Appointments can also be made through the Specialist Outpatient Clinic Appointment Centre at 6321 4377.

For referrals, a friendly chat or discussion, our GP partners can call 6321 4051 (Dept of General Surgery)

Conditions treated at the SGH Vascular Service
- Diseases of the Artery
  - Abdominal and peripheral aneurysm
  - Carotid artery disease for stroke
  - Renal artery disease
  - Leg ischaemia (acute, chronic)
  - Arm ischaemia
  - Vascular trauma
  - Intestinal vessel blockage (Visceral ischemia)
- Diseases of the veins
- Malformation of blood vessels
- Diseases of the lymphatic system
- Kidney failure requiring dialysis
- Other symptoms (eg leg swelling)

Services provided by the SGH Vascular Service:
1. Specialist Outpatient Services
   Clinic consultations are at Clinic C, Block 3 Basement 1.

2. Endovascular procedures and open vascular surgery for arterial disease
   Management for vascular conditions may be performed using minimally invasive procedures involving balloon angioplasty and stents as well as laser treatment.

3. Venous surgery

4. Emergency services
   This includes urgent surgery for vascular conditions such as bleeding from burst aneurysms as well as vascular injuries due to trauma.

5. Vascular Studies Unit
   Non-invasive evaluation of arteries and veins are performed at our Vascular Studies Unit in Block 5 Level 8. This involves the scanning of vascular structures and pressure measurements. They include:
   - Abdominal aorta, endograft, renal artery, mesenteric artery, peripheral vessel assessment
   - Ankle brachial pressure index (ABPPI)
   - Arterio-venous fistula (AVF) surveillance
   - Carotid/Vertebral artery assessment
   - Laser doppler flowmetry
   - Toe (Finger) pressure
   - Vascular graft surveillance
   - Vascular ultrasound/Duplex
   - Venous scan to assess venous thrombosis and venous insufficiency
   - Walk test

6. Access for dialysis in kidney failure
   - Peritoneal access surgery for peritoneal dialysis
   - Vascular access surgery for renal haemodialysis

7. Evaluation and Outpatient management of ulcers

8. Evaluation of leg swelling
Professor Ivy Ng Appointed as New GCEO of SingHealth

Prof Ivy Ng has been appointed Group Chief Executive Officer of Singapore Health Services Pte Ltd (SingHealth) as of 22 January 2012. She was formerly the Group’s Deputy Chief Executive Officer from July 2008 and Chief Executive Officer of KK Women’s & Children’s Hospital (KKH), a position she held since 2004.

A paediatric geneticist by training, Prof Ng is currently a practising clinician and serves as Senior Consultant in the Genetics Service, Department of Paediatric Medicine at KKH and is a Director of the National Thalassaemia Registry. Her research interests include Thalassemia (prevention, molecular variants and epidemiology), dysmorphology and mental retardation. She is internationally renowned for her work in Thalassaemia. She also plays an active role in the education of medical students and Residents in her capacities as Clinical Professor of Yong Loo Lin School of Medicine, NUS and Adjunct Professor of Duke-NUS.

At SingHealth, Prof Ng has been deeply involved in spearheading the Academic Medicine Partnership with Duke-NUS. As CEO of KKH, she established the Hospital as one of the top women’s and children’s hospitals in the region. Her passion and commitment to service quality also saw KKH receiving the WHO-UAE Health Foundation Award in 2009 for outstanding clinical outcomes achieved through its integrated perinatal care programme. She was conferred the Singapore Human Resource Institute Leading CEO Award 2008.

Despite her heavy responsibilities and hectic schedule, she contributes as Chairman of several health endowment funds. She is the Vice-President of Ronald McDonald Children’s Charities, Honorary Director of Mercy Relief and a member on the boards of SingHealth Foundation, Eastern Health Alliance and Integrated Health Information Systems.

Greater Convenience for Patient Visits
SGH Introduces Self-Registration for Ward Visitors

Visitors to wards at Singapore General Hospital (SGH) can now enjoy a more convenient and hassle-free registration with the introduction of self-registration kiosks. The automated kiosks not only improve the visitors’ registration process, it also facilitates contact tracing for the safety of patients and visitors, should the need arise.

What visitors need to have to use the automated system:
- Visitor’s name, identity card
- Local mobile number
- Patient’s full name
- Ward, room and bed number

The self-registration kiosks are located at Blocks 4, 5 and 7. Visitors can approach the registration or information counters if help is needed. For more information, visit www.sgh.com.sg.

There will be no change to the visitors’ policy of 4 visitors a patient. Patients not only need the time to rest and recuperate, but as SGH is a tertiary hospital with a high number of patients with complex conditions and lowered immunity, the controlled numbers reduce the patients’ exposure to infection.
On Saturday 3rd Dec 2011, SingHealth and SGH organised a dialogue session with General Practitioners at the Grand Copthorne Waterfront Hotel. It is one of six organised by the respective public healthcare clusters from November to December 2011. This follows the MOH Primary Care Workplan event on 8 October 2011 where MOH shared its primary care masterplan and sought views from GPs.

Over 100 GPs attended our event and engaged in a lively dialogue on how to enhance the partnership to bring more seamless, convenient and optimal care to chronic patients. During the dialogue, SingHealth, SGH and KKH shared progress updates and clinical outcomes of care partnership programmes with GPs.

The Chronic Disease Management Office or CDMO acknowledged the contributions of the Delivery On Target or DOT GPs in the care and treatment of chronic patients over the last few years and a few DOT GPs shared about their positive experiences with the programme where patients are right-sited and managed by GPs in the community.

The highlight of the event was the breakouts and dialogue sessions where participants shared candid and valuable feedback on the models of Family Medicine Clinics, Community Health Centres and Ambulatory Medical Centres as proposed under MOH’s workplan. Minister of State (Health) Dr Amy Khor and other MOH representatives were also present at the event.

SingHealth would like to take this opportunity to sincerely thank all the GPs and attendees who took the time off on a weekend to attend this session. The views and feedback are appreciated by the Ministry and SingHealth.
Introducing Health Buddy!
The Guide to Health from SingHealth

It offers:
• The location of the nearest GP clinic plus opening hours
• Answers from medical professionals to health-related questions

All this and more on Health Buddy!

Developed by SingHealth, Health Buddy is Singapore’s most comprehensive health mobile application. Featuring a complete host of useful and relevant information to keep you healthy, the information on Health Buddy was identified from the most relevant and popular searches from SingHealth’s multiple health websites and customised for this handy phone app.

Health Buddy is available for iPhone, Android and Blackberry smartphones.

What’s on at Health Buddy:

Find a GP / Family Doctor
• Comprehensive list of GP clinics in Singapore, with location maps, opening hours and direct call function. Includes full listing of GPs on the Community Health Assist Scheme (CHAS).

Medical Conditions & Treatments
• A wide range of health conditions, including causes, signs and symptoms, treatment options, plus when and where to seek treatment, written by medical doctors and healthcare professionals from across the SingHealth Group.

Specialties & Services
• SingHealth offers over 40 clinical specialties and sub-specialty services, through its institutions – Singapore General Hospital, KK Women’s and Children’s Hospital, National Cancer Centre Singapore, National Dental Centre Singapore, National Heart Centre Singapore, National Neuroscience Institute, Singapore National Eye Centre (and 9 SingHealth polyclinics).
• Read about the services available and call for an appointment directly. Directional maps are provided to enable users to locate the clinics easily within the hospital or national specialty centres.

Find a Specialist
• View doctor profiles by searching the name of the specialist, medical specialty or SingHealth institution. Subspecialty expertise, resumes and photographs are also provided where available.

SingHealth Hospital / Centre
• Call to make an enquiry or appointment, view institution charges, and navigate around individual Hospitals/Centres using internal floor maps. Direct access to SingHealth polyclinic webcams and Queue Watch also available.

Health Tips, Videos & Promotions
• A collection of Health Tips and Advice for Men, Women and Children, updated weekly through written articles and Videos.

Health News & Events
• Users receive news updates and latest public events organised by SingHealth.

News at SingHealth
Dabigatran Offers a Boost for Anti-Coagulant Therapy

A viable alternative to warfarin therapy is available to physicians managing patients with atrial fibrillation (AF) who are at risk of stroke. With a more predictable dose-effect profile and no need for INR (International Normalised Ratio) monitoring, dabigatran etexilate is the first oral anti-coagulant to receive FDA approval in the last 50 years.

Results of the RE-LY (Randomised Evaluation of Long Term Anticoagulant Therapy) trial show that 150mg of dabigatran twice daily reduces the risk of stroke and systemic embolism by an additional 35% compared with optimal warfarin treatment in patients with AF. The largest published AF trial to date, RE-LY involved more than 18,000 patients, 15% of whom were Asians, including 65 patients from Singapore.

A direct thrombin inhibitor, dabigatran is part of a newer generation of oral anti-coagulants. Unlike warfarin, the current standard therapy for the prevention of AF-related strokes, it is not metabolised by liver cytochrome P450 enzymes and is not associated with significant drug-drug or drug-food interactions.

The higher cost of the drug compared to warfarin and the twice-daily dose (versus warfarin’s once daily) are the downsides of this anti-coagulant.

However, taking into consideration the requisite anti-coagulation monitoring (more frequently, e.g. weekly, if INR goes out of range) and the potential hospitalisation due to complications associated with warfarin, dabigatran may offer a better option for patients. "Warfarin treatment is notoriously difficult, and is frequently suboptimal. I believe dabigatran will make anti-coagulant therapy simpler for both patients and their caregivers,” said Associate Professor Tan Ru San, Senior Consultant, Department of Cardiology, and Director of Clinical Trials, National Heart Centre Singapore, as well as steering committee member and national coordinator of the RE-LY trial.

The risk of intracranial bleeding with dabigatran is almost 60% less than warfarin. As the drug is contraindicated in patients with severe renal impairment, patients on dabigatran need to be monitored periodically, e.g. every few months, for kidney function.

Besides stroke prevention in AF, dabigatran is also approved in Singapore for the prevention of deep vein thrombosis during orthopaedic surgery. Studies are ongoing for its use in the treatment of established deep vein thrombosis and pulmonary embolism.
Singapore General Hospital
Promotions, Senior Consultants

Dr Guo Changming
Senior Consultant
Dept Orthopaedic Surgery
Sub-specialty Spine Service

Dr Koh Suang Bee Joyce
Senior Consultant
Dept Orthopaedic Surgery
Sub-specialty Trauma Service

Dr Tan Wei Ching
Senior Consultant
Dept Obstetrics & Gynaecology
Sub-specialty Maternal Fetal Medicine

Asst Prof Tan Thuan Tong
Senior Consultant
Dept Infectious Diseases
Sub-specialty General Internal Medicine, Infectious Diseases, Molecular Bacteriology

Dr Varsha Atul Shah
Senior Consultant
Dept Neonatal & Developmental Medicine
Sub-specialty Neonatal Ambulatory Paediatrics and Developmental Paediatrics

Asst Prof Lee Huei Yen
Senior Consultant
Dept Psychiatry
Sub-specialty Eating Disorders, Women’s Mental Health, General Psychiatry

Asst Prof Kee Yi Shern Terence
Senior Consultant
Dept Renal Medicine
Sub-specialty General Nephrology and Renal Transplantation

Dr Low Su Ying
Senior Consultant
Dept Respiratory & Critical Care Medicine
Sub-specialty Pulmonary Medicine, Interstitial Lung Disease, Asthma

Dr Ong Thun How
Senior Consultant
Dept Respiratory & Critical Care Medicine
Sub-specialty Pulmonary Medicine, Asthma, Sleep Medicine

Dr Wong Wai Yin
Senior Consultant
Dept Nuclear Medicine & PET

Singapore General Hospital
Promotions, Consultants

Dr Emily Ho Tse Lin
Consultant
Dept Endocrinology
Sub-specialty Obesity, General Endocrinology

Dr Ng Shin Yi
Consultant
Dept Anaesthesiology
Sub-specialty Intensive Medical Care

Dr Ng Tze Luen, Adrian
Consultant
Dept Anaesthesiology
Singapore General Hospital
Promotions, Associate Consultants

Dr Loh Wei-Tsen Kenny
Associate Consultant
Dept Anaesthesiology

Dr Ng Bang Teen
Associate Consultant
Dept Anaesthesiology
Sub-specialty General Anaesthesia

Dr Tay Ching Yit Wilson
Associate Consultant
Dept Anaesthesiology

Dr Tan Wah Siew
Associate Consultant
Dept Colorectal Surgery

Dr Chng Chiaw Ling
Associate Consultant
Dept Endocrinology
Sub-specialty Thyroid Diseases & General Endocrinology

Dr Tan Shu Yun
Associate Consultant
Dept Family Medicine & Continuing Care

Dr Goh Boon Bee
Associate Consultant
Dept Gastroenterology & Hepatology
Sub-specialty Hepatology

Dr Wong Guan Wei
Associate Consultant
Dept Gastroenterology & Hepatology
Sub-specialty Diagnostic & Therapeutic Endoscopy

Dr Poh Seng Yew
Associate Consultant
Dept Orthopaedic Surgery
Sub-specialty Orthopaedic Sports Medicine

Dr Sudhakar Subramani
Associate Consultant
Dept Anaesthesiology

Dr Apoorva Gogna
Associate Consultant
Dept Diagnostic Radiology

Dr Chuaah Sai Wei
Associate Consultant
Dept Gastroenterology & Hepatology

Dr Tan Hiang Keat
Associate Consultant
Dept Gastroenterology & Hepatology

Dr Colin Phipps Diong
Associate Consultant
Dept Haematology

Dr Lee Yuh Shan
Associate Consultant
Dept Haematology

Dr Masithah Binte Ibrahim
Associate Consultant
Dept Neonatal & Developmental Medicine

Dr Ng Siew Weng
Associate Consultant
Dept Plastic, Reconstructive & Aesthetic Surgery

Dr Lim Choo Gee
Associate Consultant
Dept Renal Medicine

Dr Tan Hiang Keat
Associate Consultant
Dept Gastroenterology & Hepatology

Dr Colin Phipps Diong
Associate Consultant
Dept Haematology

Dr Lee Yuh Shan
Associate Consultant
Dept Haematology

Dr Lim Choo Gee
Associate Consultant
Dept Renal Medicine
Dr Francisco Salcido-Ochoa  
Associate Consultant  
Dept  
Renal Medicine

Dr Chan Mei Fung Michelle  
Associate Consultant  
Dept  
Pathology  
Sub-specialty  
Histopathology, Cytology

Dr Sim Heng Chiak James  
Associate Consultant  
Dept  
Pathology  
Sub-specialty  
Microbiology

Dr Lo Soo Kien  
Senior Consultant  
Dept  
Medical Oncology  
Sub-specialty  
Breast, Colorectal, Hepatobiliary, Upper GI

Dr Lai Juen Bin  
Consultant  
Dept  
Oral & Maxillofacial Surgery

Dr Tan Wah Ching  
Consultant  
Dept  
Oral & Restorative Dentistry

Dr Wang Lian Chek, Michael  
Senior Consultant  
Dept  
Radiation Oncology  
Sub-specialty  
Colorectal, Genitourinary, Hepatobiliary, Upper GI

Dr Lai Juen Bin  
Consultant  
Dept  
Oral & Maxillofacial Surgery

Dr Seah Tian Ee  
Consultant  
Dept  
Oral & Maxillofacial Surgery

Dr Tan Ju Le  
Director  
Dept  
Adult Congenital Diseases  
Sub-specialty  
Adult Congenital Heart Disease (ACHD), Echocardiography

Dr Aaron Wong  
Director  
Dept  
Interventional Cardiology  
Sub-specialty  
Interventional Cardiology

Dr Lim Lee Hooi  
Consultant  
Dept  
Oculoplastic/Aesthetic Eyelid Service, Cataract & Comprehensive Ophthalmology Service

Dr Ching Chi Keong  
Director  
Dept  
Electrophysiology and Pacing  
Sub-specialty  
Electrophysiology and Pacing

Dr Sim Kheng Leng David  
Co-Director  
Dept  
Heart Failure Programme  
Sub-specialty  
Heart Failure, Heart Transplantation

National Cancer Centre Singapore  
Promotions

National Dental Centre of Singapore  
Promotions

National Heart Centre Singapore  
Subspecialty Appointments

Singapore National Eye Centre  
Promotions
Neurosurgery - GP Update

Find out the latest updates on management options for head injuries, facial and trigeminal pain and MIS Spine surgery from specialists from the National Neuroscience Institute.

<table>
<thead>
<tr>
<th>Time</th>
<th>Programme</th>
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<tbody>
<tr>
<td>1 pm</td>
<td>Registration and Lunch</td>
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<tr>
<td>2 pm</td>
<td>Head Injury in Primary Health Care</td>
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<td></td>
<td>A/P Ivan Ng</td>
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<tr>
<td>2.30 pm</td>
<td>Facial and Trigeminal Pain Management</td>
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<td>A/P John Thomas</td>
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<tr>
<td>3 pm</td>
<td>Minimally Invasive Spine Surgery</td>
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<td>A/P Ernest Wong</td>
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<td>3.30 pm</td>
<td>End</td>
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</tbody>
</table>

Date  
25 February 2012, Saturday

CME Points  
Application in process

Contact  
Fax: 6223 9789
Email: pgmi@sgh.com.sg

Registration is required.

5th Gynaecological & Early Pregnancy Ultrasound Workshop

A post-graduate skills training programme that will provide an understanding of ultrasound physics, technology and basic skills to perform and interpret the images with emphasis on first trimester pregnancy failure.

Topics include practical guidelines in the diagnosis of pregnancy failure, classification of miscarriage by ultrasound, ectopic pregnancy as well as normal and abnormal variations observed during first trimester. A sonographic approach to endometrial diagnosis and practical guide to the diagnosis and management of adnexal pathology is also included.

At the end of the course, there will be a hands-on session with patients.

Date  
31 March 2012, Saturday

Time  
8.45 am to 4 pm

Venue  
SGH Postgraduate Medical Institute (Lecture) Obstetrics & Gynaecology Centre (Practical)

CME Points  
Application in process

Fees  
(non-SingHealth staff):
Morning lecture - $120
Full day session - $240

Contact  
Fax: 6223 9789
Email: pgmi@sgh.com.sg

Registration is required.

Coming Up! Look out for details of the following courses.

21 Apr, 1 to 4 pm
Obstetrics & Gynaecology Updates by Dept of Obstetrics & Gynaecology, SGH
The seminar aims to enable GPs to:

1. Discuss the diagnosis, prognosis, and management of Bell's palsy and vestibular neuritis.
2. Understand the diagnosis, prognosis & management of carpal tunnel syndrome, ulnar nerve palsy, cervical radiculopathy, meralgia paraesthetica, peroneal nerve palsy & lumbosacral radiculopathy.
3. Describe the pathogenesis and clinical features, as well as the different classes of medication for neuropathic pain.
4. Prescribe treatment for neuropathic pain according to the different mechanisms of the pain.

Date
April 2012
(Date to be advised on www.nni.com.sg)

Time
1pm – 4pm

Venue
NNI Exhibition Hall
(Basement 1)

CME Points
Accredited for 2 CME points

Fees
Free

Contact
nni_secretariat@nni.com.sg

5th Singapore International Parkinson’s Disease and Movement Disorders Symposium

The symposium will focus on the genetics, pathogenesis, diagnosis and management of Parkinson’s Disease and Movement Disorders. There will be plenary sessions, parallel sessions and video presentations covering all major aspects. Participants will get to listen to talks by renowned international speakers and local experts and learn about the latest research and perspectives, getting the most up-to-date information in the field of Parkinson’s Disease and Movement Disorders.

Date
23 - 24 March 2012, Friday - Saturday

Time
8.30 am to 5.30 pm

Venue
Concorde Hotel Singapore
100 Orchard Road
Singapore 238840

CME Points
Accredited for 8 CME points

Fees
Physicians and Researchers - $250 (before 9 March), $300 (after 9 March)
Trainees, Nurses, Allied Health Professionals, Other Medical Professionals - $170 (before 9 March), $220 (after 9 March)

Contact
National Neuroscience Institute
11 Jalan Tan Tock Seng

Tel: 6357 7152 / 63577162
Fax: 6256 4755
Email: nni_secretariat@nni.com.sg

Registration is required.

Neuromuscular Disorders and Neuropathic Pain

The seminar aims to enable GPs to:

1. Discuss the diagnosis, prognosis, and management of Bell’s palsy and vestibular neuritis.
2. Understand the diagnosis, prognosis & management of carpal tunnel syndrome, ulnar nerve palsy, cervical radiculopathy, meralgia paraesthetica, peroneal nerve palsy & lumbosacral radiculopathy.
3. Describe the pathogenesis and clinical features, as well as the different classes of medication for neuropathic pain.
4. Prescribe treatment for neuropathic pain according to the different mechanisms of the pain.

Date
23 - 24 March 2012, Friday - Saturday

Time
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Venue
Concorde Hotel Singapore
100 Orchard Road
Singapore 238840

CME Points
Accredited for 8 CME points

Fees
Physicians and Researchers - $250 (before 9 March), $300 (after 9 March)
Trainees, Nurses, Allied Health Professionals, Other Medical Professionals - $170 (before 9 March), $220 (after 9 March)

Contact
National Neuroscience Institute
11 Jalan Tan Tock Seng

Tel: 6357 7152 / 63577162
Fax: 6256 4755
Email: nni_secretariat@nni.com.sg

Registration is required.
Updates on Paediatric Eye Conditions and Adult Strabismus for Family Physicians and Paediatricians

The workshop will provide participants with updates and practical information on the identification, evaluation and management of common paediatric eye conditions and strabismus. It includes video demonstrations of eye examination techniques.

Course Director
Dr Quah Boon Long

Course Co-ordinator
Dr Zena Lim

Course Faculty
Dr Audrey Chia  
Dr Sonali Farzavandi  
Dr Lam Pin Min  
Dr Yvonne Ling

Date
3 March 2012, Saturday

Time
2pm – 4pm  
*Lunch from 1pm

Venue
Level 4, Auditorium, Tower Block,  
Singapore National Eye Centre

Contact
Training and Education Department  
Singapore National Eye Centre  
11 Third Hospital Avenue  
Singapore 168751

Fax: 6226 3395  
Email: meet@snec.com.sg

Registration
Waived

Updates on Corneal Surgery and External Eye Diseases for Family Physicians

This is a two-hour course that will provide family physicians with updates and practical information on corneal diseases, corneal surgery, contact lenses, etc. Topics such as the management of dry eyes, ocular allergy, infective keratitis and other corneal diseases, external eye diseases, corneal transplantation techniques, types of contact lenses management and contact lens complications will be covered.

Course Director
Prof Donald Tan

Course Co-ordinator
Adj. Assoc Prof Jodhbir S. Mehta

Course Faculty
Dr Anshu Arundhati  
Dr Cordelia Chan  
Dr Lim Li  
Dr Ti Seng Ei  
Adj Assoc Prof Louis Tong

Date
11 August 2012, Saturday

Time
2pm – 4pm  
*Lunch from 1pm

Venue
Level 4, Auditorium, Tower Block,  
Singapore National Eye Centre

Contact
Training and Education Department  
Singapore National Eye Centre  
11 Third Hospital Avenue  
Singapore 168751

Fax: 6226 3395  
Email: meet@snec.com.sg

Registration
Waived