EDITORIAL

ORIGINAL ARTICLES
• Emerging science – the use of probiotics in diabetic foot ulcer treatment
• Pharmacists and Insulin management: Beyond dispensing
• Poor Diabetes Management... ‘Us’, ‘Them’ or the ‘Environment’?

CPD ACCREDITED DIABETES TRAINING

"Today, as before, many pharmacists provide patient-centered services like medication coordination, medication management, patient education, and more. We are the front line of the health care team and often see patients more than any other provider. Pharmacists have become the most over-trained and under-utilized professionals in America."

Congressman Earl L. ‘Buddy’ Carter
Editor’s comment

It was refreshing to read a recently published article entitled ‘Language Matters’ by the National Health Service (NHS) England. I urge all of us involved in the care of people with diabetes to read and familiarize ourselves with the contents of this important document. And, in case you may think that this is only a UK-centric train of thought, a task force consisting of representatives from the American Association of Diabetes Educators (AADE) and the American Diabetes Association (ADA), also recently compiled a comprehensive review of the topic.

Diabetes and the care of this epidemic condition is about much more than glucose. Thus, the nuances that pervade our consultation transactions are perhaps as important as (some would say more so) than downloading a blood glucose meter or measuring blood pressure. This line from the introduction of the NHS document may resonate with many of us:

“People with diabetes internalise messages from the media, from those around them, but most of all from their healthcare providers. When these messages are perceived negatively, whether it is intended or not, this can lead to feelings of shame, guilt and resentment. People who are ashamed of a condition will find it much harder to engage and manage that condition proactively.”

We as healthcare providers must continuously strive to enhance our care in the delivery of services by means of important ‘medical’ actions, including dynamic adjustments to insulin and other therapies, selecting appropriate oral medications and screening for sentinel signs of developing complications.

Equally important however, is the manner in which we do these things, whilst being ever-mindful of the language choices we make each and every day.

Dr Stan Landau
Editor
email: StanL@CDEDiabetes.co.za

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Diabetic foot wound care practitioners understand that the three ‘pillars’ of foot ulcer healing consist of tight blood glucose control, offloading of pressure on the wound and optimum care of the wound itself (which includes ensuring good blood supply to assist the wound healing process). Good blood supply supplies ‘nutrition’ to the wound, although the word ‘nutrition’ in diabetes has other dietetic connotations. In the past decade, emerging research into the specifics of the wound bed environment has brought us further understanding of such entities as wound biofilm, protein destroying enzymes called proteases, colonization by microorganisms and antibiotic resistance. Wound dressing companies have developed specialized dressings to address each wound scenario, bringing in different approaches to break down biofilm, reduce the harmful bacterial load and stimulate tissue growth.

Biofilms are complex microbial communities containing bacteria and fungi. The microorganisms produce and secrete a protective matrix that attaches the biofilm firmly to a living surface like a wound or a non-living surface like an instrument (Stoodley et al., 2002). Biofilms are heterogeneous communities that are continuously changing (Hall-Stoodley et al., 2009). They may consist of a single bacterial or fungal species, or may be polymicrobial, containing multiple diverse species (Trengove et al., 1996).

In a wound, you can imagine the biofilm as a densely packed colony of bacteria embedded in a thick, slimy barrier of sugars (polysaccharides) and proteins. The biofilm barrier protects the harmful microorganisms beneath from external threats.

Most people will have heard of probiotics as a supportive treatment to gastrointestinal disorders. The human gut is naturally populated with millions of beneficial bacteria which, in healthy individuals, exist in balanced colonies, collectively called our gut ‘microbiome’. Antibiotics destroy both beneficial and harmful bacteria; hence one should administer probiotics with a course of antibiotics (but not to be taken at the same time of the day). An imbalanced microbiome or dysbiosis is related to gastrointestinal problems such as diarrhoea and inflammatory bowel disease and problems outside the gut including obesity, allergies and skin disorders (Vandenplas et al., 2015).

Most early studies regarding skin outcomes were those in which probiotics were taken orally. Newer studies are investigating topical
A meta-analysis of animal studies performed in early 2017 (Tsiouris et al.) found that administration of probiotics is an effective pharmacological treatment of cutaneous animal wounds, but that further research is required.

application, but there are limitations due to a lack of regulatory consensus in different parts of the world.

In 2010, Peral et al. in Tucuman, Argentina, tested bacteriotherapy with Lactobacillus plantarum on infected chronic leg ulcers. They produced a culture of the probiotic and applied it to the wounds of 14 patients with diabetes and 20 who did not have the condition. Wound debridement (clearing of dead tissue), granulation tissue (healthy new tissue containing new blood supply) formation and total healing after 30 days were found in 43% of subjects with diabetes and in 50% of those without diabetes. When the researchers looked at cells from the wounds after 10 days, they found that there was a decrease in the percentage of diseased and necrotic cells and an enhancement of Interleukin-8 production.

Interleukin-8 or IL-8, now renamed CXCL8, is an important mediator of our immune system response. CXCL8 has two main functions: CXCL8 is the primary cytokine (messenger protein) involved in the recruitment of neutrophils (white blood cells that fight infection) to the site of damage or infection, in a process called chemotaxis (Modi et al., 1990). This causes target cells, primarily neutrophils, but also other granulocytes, to migrate toward the site of infection. CXCL8 induces phagocytosis (engulfing of infective bacteria to destroy them) once they have arrived. CXCL8 is also known to be a potent promoter of angiogenesis (formation of new blood vessels).

There are hundreds of different probiotic strains. Even within the genus Lactobacillus, there are more than 150 different species including L. plantarum, L. acidophilus, L. reuteri and L. rhamnosus. Many of these are found in fermented food items such as yoghurt, kefir, kimchi, sauerkraut and salt-pickled vegetables. Within each species, there are further hundreds of strains which are numbered, such as Lp299v. Probiotics can strengthen the immune system, reduce inflammation and promote wound healing through an array of mechanisms such as the production of inhibitory acids or bacteriocins, the excretion of natural antibiotics, blockage of pathogen adhesion, nutrient competition and antioxidant activity (Tavaria, 2017).

Painstaking research is required to pinpoint the exact effect of each strain on the body before any claims can be made.

In 2016, continuing research at the national university in Tucuman, Argentina (Cabrera et al.) designed two pharmaceutical dosage forms by using Lactobacillus plantarum culture supernatants (the clear liquid left above the solids after spinning in a centrifuge to concentrate the cells). These formulations have been cleared for use in clinical trials on wounds with chronic ischaemia (lacking good blood supply).

Animal studies have been used to investigate the efficacy of probiotics such as L. brevis, L. fermentum, L. plantarum and L. reuteri as treatment for skin wounds. A meta-analysis of animal studies performed in early 2017 (Tsiouris et al.) found that administration of probiotics is an effective pharmacological treatment of cutaneous animal wounds, but that further research is required.

Late last year, a study at Babol University of Medical Sciences in Iran tested the benefits of probiotic administration in

Subjects with a diabetic foot ulcer who received probiotic supplementation for 12 weeks in a randomized double-blind, placebo-controlled trial, experienced faster wound healing, coupled with an improved glycaemic and lipid profile, compared with patients who had been assigned a placebo.

patients with diabetes-related foot ulcers (Mohseni et al.). Subjects with a diabetic foot ulcer who received probiotic supplementation for 12 weeks in a randomized double-blind, placebo-controlled trial, experienced faster wound healing, coupled with an improved glycaemic and lipid profile, compared with patients who had been assigned a placebo. The probiotic capsules contained Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus fermentum and Bifidobacterium bifidum. All participants also underwent standard treatment for wound care. Probiotic supplementation also had an effect on lipid profiles and inflammatory markers when compared with placebo. The researchers noted that information was not collected on faecal bacterial loads before and after probiotic administration, or on the characterization of the microbiome at baseline, during and after therapy. A further shortcoming of the study was that bacterial cultures were not taken.

Most recently, Dr David Armstrong reports from the USA that researchers are showing faster wound healing following the administration of lactic acid bacteria into wounds. He refers to a study by Vågesjö et al., published online in the Proceedings of the US National Academy of Sciences that used a mouse model to demonstrate wound healing. Researchers transformed lactobacilli with a plasmid encoding chemokine 12 (CXCL12), noting that this enhanced wound closure via proliferation of dermal cells and macrophages. It also resulted in more transforming growth factor-beta (TGF-β) expression in macrophages. The study notes that bacteria-produced lactic acid reduced the local pH, which inhibited the peptidase CD26 and facilitated a higher availability of bioactive CXCL12.

The authors also noted that lactobacilli delivering CXCL12 improved wound closure in mice with hyperglycaemia or peripheral ischaemia, conditions associated with chronic wounds and that the treatment showed macrophage proliferation on human skin in an in vitro model of wound epithelialization.

This is exciting news, although admittedly in early days. We can use a probiotic (Lactobacillus species) that is already a part of our beneficial bacterial microbiome (Dixit and Simon, 2012) and enable it to produce factors, in this case CXCL12, which may have positive wound healing attributes.

References on request
Pharmacists and Insulin management: Beyond dispensing

Introduction
South Africa (SA) is a changing nation facing many political, economic and health system challenges (Gilbert, 1998). The high prevalence of communicable and non-communicable diseases and a serious shortage and maldistribution of healthcare professionals (HCPs) provides a growing burden on the already strained South African Department of Health (Gray, Riddin & Jugathpal, 2016).

The statistics of diabetes and undiagnosed diabetes in the African region are alarming. In 2017, the International Diabetes Federation (IDF) estimated that up to 3.6 million adults in SA had diabetes - this number will more than double by 2045 (IDF, 2017). The diabetes epidemic, silently fuelled by co-existing Human Immunodeficiency Virus (HIV), tuberculosis and obesity epidemics, is growing faster than our ability to cope with it. Tuberculosis and diabetes are the leading causes of mortality in SA, followed by cardiovascular disease, heart disease and HIV.

All people with type 1 diabetes must be treated with full insulin replacement therapy. People with type 2 diabetes, a progressive condition, will require insulin therapy when their pancreatic beta cells cannot produce enough insulin. Insulin is thus a major part of diabetes treatment. Unfortunately, there is no set insulin regimen template or ‘sliding scale’ one can follow to achieve the physiological supplementation or replacement needed. Insulin management needs individualised titration and educational sessions with an insightful healthcare professional (HCP). Numerous areas need to be explored in insulin management (Avalere Health LLC, 2014):
- Understanding the physiology of diabetes
- Understanding insulin regimens
- Hypoglycaemia
- Hyperglycaemia
- Goal setting
- Dose adjustments
- Medication adherence
- Injection technique
- Glucose monitoring
- Understanding and preventing potential complications of diabetes
- Healthy lifestyle choices
- Coping with religious fasting periods

This poses a great opportunity and need for the pharmacy profession to actively join other HCPs in insulin management.
The community pharmacist

Community pharmacists are uniquely positioned as the most accessible HCP. As result, pharmacists have the opportunity to engage with people from lower socio-economic backgrounds who are less likely to visit a general practitioner and more likely to suffer from lifestyle related conditions (Willis et al., 2014).

The pharmacy profession is regulated by the South-African Pharmacy Council (SAPC). To practice lawfully, pharmacists have to be registered with the SAPC and adhere to their stated actions, procedures and processes. The pharmacists’ scope of practice describes the actions, procedures and processes required for registration.

According to the SAPC, the pharmacy profession is patient-orientated and information driven. The profession is committed to co-operate with other HCPs in order to render a professional service of high standard in meeting the healthcare needs of the people of South Africa. The SAPC (2016) sees the pharmacist as the:

• “Custodian of medicines;
• Formulator, manufacturer, distributor and controller of safe, effective and quality medicine;
• Advisor on the safe, rational and appropriate use of medicine;
• Provider of essential clinical services including screening and referral services;
• Provider of healthcare education and information;
• Provider of pharmaceutical care by taking responsibility for the outcome of therapy and by being actively involved in the design, implementation and monitoring of pharmaceutical plans;
• Provider of cost-effective and efficient pharmaceutical services”.

Whilst a vast amount of literature calls on the need for pharmacists to have an extended scope of practice, this article would like to highlight the current opportunities pharmacists have to engage in insulin management.

Custodian, distributor and controller of safe, effective and quality medicine

Pharmacists have to ensure that insulin is available to the public. Orders from wholesalers should be placed timeously and with good consideration to the quantities and expiry dates. Not too little and not too much, as fridge line items cannot be returned. Cold chain management and proper storage of insulin should be monitored to ensure provision of effective and safe insulin.

Advisor on the safe, rational and appropriate use of medicine

Insulin is a high-alert medication that can cause harm when prescribed inappropriately or is wrongly administered (Cornish, 2014). Most importantly, the risk of hypoglycaemia associated with insulin administration should be highlighted. Although insufficient glucose monitoring in rural areas is a major problem contributing to hypoglycaemia, insulin is the main drug responsible for hypoglycaemia hospital admissions (Mouton et al., 2016).

For people to use insulin safely, they need to understand how their insulin works and why that particular insulin has been prescribed. Pharmacists need to explain the time of onset, time to and duration of peak action and total duration of action for each insulin. We need to advise on proper storage of insulin and how to safely discard empty insulin pens and used needles. Proper injection techniques and injection site rotation must be reinforced at every opportunity. We should also offer shorter needles (4, 5 or 6 mm), as many people are using the same insulin needles they were prescribed at diagnosis (Sim et al., 2014).

Provider of essential clinical services including screening and referral services

People with diabetes (especially when the condition is not controlled) have an increased risk of developing complications affecting mainly the cardiovascular system. These include both the macrovascular complications of myocardial infarction, cerebrovascular accident and peripheral vascular disease and microvascular complications of the eyes, heart, kidneys, nerves, skin and feet. People with diabetes are also prone to co-morbidities like cognitive impairment, cancer, fatty liver disease, fractures, hearing impairment, obstructive sleep apnoea, low testosterone, periodontal disease, and
psychosocial and emotional disorders like anxiety, depression and eating disorders (American Diabetes Association [ADA], 2018).

Chronic complications of uncontrolled diabetes contribute immensely to the disability and increased mortality and morbidity of people with the condition. A few studies have shown that diabetes in SA is not properly treated to target and that screening processes for complications are insufficient (Tumbo & Kadima, 2013; Dunbar, Hellenberg, & Levitt, 2015; Pinchevsky et al., 2015; Steyn et al., 2008). By being familiar with diabetes complication screening protocols (Table 1), pharmacists can encourage and urge people with diabetes to go for their relevant screenings.

Glucose testing, cholesterol testing, blood pressure monitoring, calculation of body mass index and diabetes education are some of the essential clinical services offered by numerous community pharmacies. Pharmacists are allowed to charge a fee for those services. Be mindful that even when the finger-prick total cholesterol result is within a normal range, the person with diabetes might still be at increased risk for cardiovascular disease due to abnormal lipid metabolism accompanying diabetes. In the context of diabetes, a full serum lipogramme done by a laboratory is recommended to expose an ‘atherogenic lipoprotein profile’ which would otherwise remain hidden.

It is important for pharmacists to recognize when healthcare issues fall outside their scope of practice. The severity of the patient’s condition and the pharmacist’s capability should guide referrals to other members of the healthcare team for more specialised care.

Pharmacists should preferably communicate their referrals in writing. Written referrals should include a short summary of the medical history and short descriptions of the current medical problem, therapies, and need for referral. A pharmaceutical care plan can be added if available or necessary (WHO, 2006).

**Table 1: Recommendations for diabetes complication screenings (ADA, 2018; Society for Endocrinology, Metabolism and Diabetes of South Africa [SEMDSA], 2017):**

**Annual screening for diabetes complications recommended from time of diagnosis of type 2 diabetes, or for post-pubertal people with type 1 diabetes, five years after diagnosis:**
- Nephropathy by testing urine for albuminuria and albumin-to-creatinine ratio.
- Retinopathy screening by an ophthalmologist or optometrist. As pregnancy is a special risk factor for worsening of retinopathy, pregnant ladies with diabetes should undergo eye screening every trimester and 1 year postpartum.
- Peripheral neuropathy by the use of a 10 g monofilament or to check for loss of vibration sensation at the great toe.
- Foot examinations, including inspection of the skin, foot deformities, neurological and vascular assessments.

**Periodic screening for the following co-morbidities are recommended:**
- Sexual dysfunction
- Depression
- Anxiety disorders
- Serious mental illness
- Disordered eating behaviours
- Autoimmune conditions (for people with type 1 diabetes)

**Provider of healthcare education and information**
Pharmacists have many opportunities to deliver diabetes education and underpin information given by other members of the diabetes care team (Avalere Health LLC, 2014).

Diabetes Self-Management Education (DSME) requires more from a HCP than the plain offering of health information and advice. In fact, the giving of advice may only lead to 10% of change in susceptible individuals. Some people even find unwelcomed advice confrontational or rude and it may hinder possible change (Hill 2009).

DSME is a skilful mix between the giving of information and counselling with the goal to motivate change. DSME is a continuous process that enables the person with diabetes to develop the knowledge, skills and abilities necessary to manage their diabetes. Follow-ups and reinforcements are thus essential. It is guided by evidence-based standards and aims to improve clinical outcomes and quality of life. DSME should be adapted to accommodate cultural differences, beliefs and attitudes, literacy
levels, financial status, age and physical limitations (Haas et al., 2014; Grillo et al., 2013).

Given the acute shortage of HCPs available to deliver DSME, pharmacists in SA should take on a more active role in diabetes education (Berg, Dodd, & Dodd, 2010). Berg and colleagues (2010) suggest that community pharmacists take on the role of tutor and facilitator, organizing and even leading study circles in their pharmacies. The goal is to gain knowledge and learn about diabetes from invited lecturers, literature, and people’s experiences. The Diabetes Prevention Program Outcomes Study showed that education delivered in groups is more cost-effective than individual education. The study showed that group education of at least 10 people reduced costs by about a third compared to individual education (Herman, 2015).

Awareness-raising and health promotion is another important facet of education. Pharmacists are ideally situated to encourage people to adopt and maintain healthy behaviours. Smoking cessation is an area where pharmacist interventions were found to be extremely successful and cost effective compared to self-quitting or minimal interventions like ad hoc advice (Brown et al., 2016).

Smoking increases cardiovascular mortality two- to three-fold in people with diabetes. Accordingly, smoking cessation programmes should be a vital strategy in diabetes management. It has to be mentioned that smoking cessation worsens glucose control for up to a year after quitting, most likely due to increased appetite and weight gain. However, long-term cardiovascular benefits outweigh the short term lack of glucose control and people with diabetes should still be encouraged to quit (Chang, 2012). Smoking cessation shows immediate benefits, with the lowering of blood pressure within minutes after stopping as well as longer term reduction of co-morbidities. Over-the-counter nicotine replacement therapies - especially a combination of a patch to control withdrawal symptoms, and gum or spray to relieve cravings - have been proven to be effective in smoking cessation (Grade A recommendation). It should be recommended at primary care level, in addition to proper motivational counselling and support. People with a higher level of dependence need to be referred for prescription medication or counselling (Zyl-Smit et al., 2013).

Pharmacy-delivered interventions in alcohol reduction have not been proven to be significant compared to other health settings and their effect on weight management has shown short-term benefit only according to a systematic review by Brown and colleagues (2016). A practical suggestion to pharmacists is to keep help-line numbers and personal crisis help services’ numbers readily available to distribute. Refer patients to relevant HCPs when necessary.

Provider of pharmaceutical care by taking responsibility for the outcome of therapy and by being actively involved in the design, implementation and monitoring of pharmaceutical plans

The pharmacy profession has changed over the past few decades. Gradually, the focus has changed from being product-orientated to being patient-orientated. The term ‘pharmaceutical care’ encompasses this patient-centred approach. The role of the pharmacist has expanded from mere dispensers of medication to include additional responsibility for patient outcomes and quality of life (Wiedenmayer et al., 2006). It is easy to view medication as a consumer product, but by involving the pharmacist, medication has the ability to become a health resource. Many pharmacists are unaware of this obligation or may view it as an extra task to be performed. However, pharmacists need to understand that pharmaceutical care is beneficial to both the patient and to the pharmacist. It grants pharmacists individual and professional recognition, and as a result of their more active role in healthcare, facilitates professional growth (Pharmaceutical Care Forum, 2008).

A practical suggestion to pharmacists is to keep help-line numbers and personal crisis help services’ numbers readily available to distribute
Pharmaceutical care involves proper medication reviews with the aim to prevent adverse drug reactions and increase adherence and desired medication outcomes. Before a drug is dispensed, prescriptions should be reviewed for drug related problems, drug-drug interactions and drug-disease interactions. Drug related problems include the following (Wiedenmayer et al., 2006):

- new or additional drug required;
- wrong drug;
- medication not indicated;
- too little or too much of the correct drug;
- drugs not taken appropriately;
- adverse drug reactions.

To monitor drug outcomes, pharmacists therefore have an obligation to be aware of factors that contribute to poor adherence including the presence of multiple chronic conditions, the prescribing of complex drug regimens and systemic factors like financial barriers, transport-related issues and fragmented healthcare systems (Brown & Bussell, 2011). Patient-related factors contributing to poor adherence can be unintentional or intentional. Unintentional non-adherence includes forgetting to take medications, not understanding instructions, language barriers, and poor sight. Intentional non-adherence includes patients' beliefs about their condition or the medication. Health literacy affects both intentional and unintentional non-adherence and is regarded as the cornerstone of adherence (Kenning et al., 2015; Lee, 2015).

Behavioural interventions, motivational interviewing skills and structured educational programmes have significantly been associated with better adherence. Some practical considerations when addressing adherence barriers are provided by Lee (2015) and Brown & Bussell (2011):

- Medication adherence is not only the patient’s responsibility; thus be wary of having an accusing attitude.
- Medication-taking behaviour is complex and identification might need specific interviewing skills.
- Make sure people understand. About half of people that walk out of a pharmacy do not completely know how to take their medication.
- Guide people to trusted websites for information.
- Oral instructions or advice are easily forgotten. Provide a hand-out to reinforce.
- If possible, offer to print labels or instructions in a bigger font for the visually impaired.
- Offer to compile a medication schedule chart for those people with co-morbidities and difficult medicine regimens.

Provider of cost-effective and efficient pharmaceutical services

A key tool for pharmacists to provide cost-effective and efficient pharmaceutical services is to be up-to-date with evidence-based information (Al-Quteimat & Amer, 2016).

Pharmacists need to be inquisitive and have a hunger to pursue knowledge. Active participation in educational activities to maintain competence and professional growth and applying learnings to patient care, are the driving forces of continuing professional development (CPD). It is a very different mind-set to one of sitting through talks just to get the required points for registration (Eckel SF, 2013).

Being a healthcare professional, pharmacists have a moral obligation to respect, consider and have compassion towards other people in a non-judgemental way. Pharmacists should first and foremost earn the trust of the person with diabetes by being competent, truthful, responsible and committed to confidentiality. This way, professional relationships can be built. Proper provision of pharmaceutical services cannot be done in isolation, but as part of a healthcare team. (Allison & Chara, 2016; Wiedenmayer et al., 2006). Pharmacists themselves must actively integrate into the diabetes care team. They need to be assertive, visible, assessable, patient-orientated, and have both vision and a voice (Jorgenson et al., 2013).

Conclusion

Insulin management involves time-consuming education on a variety of areas and exploration of many variables. Given the background of the growing diabetes epidemic and the shortage of HCPs, a great need exists for pharmacists to assist in the management of insulin therapy. The pharmacy profession has the potential and ability to help people manage their insulin if they aspire to work to the full extent of their recognized scope of practice (Sim et al., 2014).

References on request

Unique features and innovative design: the NEW Accu-Chek® Guide wireless blood glucose monitoring system by Roche Diabetes Care offers smart solutions for easier testing¹

The Accu-Chek® Guide system is Roche Diabetes Care’s new generation of wireless blood glucose monitoring (BGM) systems, designed to respond to previously unmet needs of people with diabetes and their healthcare professionals. It offers new features such as the innovative SmartPack™ spill-resistant strip vial and new test strip chemistry and design. The system uses Bluetooth™ low energy (BLE) connectivity to the mySugr diabetes management app and offers reliable test results that exceed the new global ISO 15197:2013/EN ISO 15197:2015² accuracy standards. The Accu-Chek® Guide system provides people with diabetes more than just numbers, to help with managing their condition.

Designed to address unmet needs of people with diabetes

Structured use of SMBG (self-monitoring of blood glucose) can empower the person with diabetes and enhance their self-management through understanding the effects of food, medication and exercise on their blood glucose levels.³ Additional benefits of structured SMBG include improved glycaemic control with a reduced incidence of acute and long-term complications.³,⁴,⁵ Studies reveal that an increase in SMBG frequency is associated with a significant reduction in HbA1c values in people on insulin therapy.⁶ Non-engagement with routine SMBG remains a common issue⁷ and people with diabetes report they would test more frequently if the procedure was easier and more discreet.⁸ The new Accu-Chek® Guide system has been tailored to the specific needs of people with diabetes to make every day BG monitoring easier. In fact, 9 out of 10 (97%) participants surveyed, agreed that the Accu-Chek® Guide system is extremely easy to use.¹⁰

Easier testing and tighter accuracy

The unique Accu-Chek® Guide SmartPack™ test strip vial is spill-resistant. It holds test strips tightly in place while also making it easy to remove just one strip at a time.

The test strip quickly draws a small (0.6 µL) drop of blood from anywhere on the edge of the wide yellow dosing area. This enables easy blood dosing especially for those with vision or dexterity issues. The test strip guiding port light is particularly helpful for people with poor eyesight or when testing in low light conditions. Once the blood sample has been applied, results are available in less than four seconds. Finally, the strip ejector on the meter permits easy and hygienic removal of the used test strip without handling it.

The Accu-Chek® Guide system, with its FAD-GDH enzyme-based test strip chemistry, delivers an advanced level of accuracy, meeting 10/10 and 15/15 of the current global system accuracy criteria (ISO 15197:2013/EN ISO 15197:2015) respectively.² Consistently accurate measurements are essential for reliable BG monitoring and deriving the correct therapy decisions.¹¹,¹²

Smart diabetes management tools

The Accu-Chek® Guide meter has a number of features that may help people with diabetes overcome challenges associated with adherence to SMBG regimens. These include reminder alerts that help users to schedule components of their routine, and an advanced displaying of data which may provide users and healthcare professionals with a more comprehensive overview of measures of diabetes management. The pattern detection feature helps raise user’s awareness by detecting high or low patterns in blood glucose levels related to specific meals, bedtime and fasting. Users can also set up a single target range or a dual range for before and after meal target ranges.
Smartly stored results using mySugr, already loved by over 1,000,000 people with diabetes worldwide

The Accu-Chek® Guide system sends readings wirelessly to the mySugr app on the user’s smartphone so that they can access their data anytime. The mySugr app simplifies life with diabetes by making it quick and easy to collect relevant self-management data in one place through a growing number of connected devices and integrations. mySugr’s playful and person-centred approach to dealing with diabetes is used and loved by over 1,000,000 people with diabetes worldwide and has gained widespread approval as an app that makes dealing with diabetes data easy, fun, and immediately useful. In short, mySugr makes diabetes suck less.

About Roche Diabetes Care

Roche Diabetes Care is a pioneer in the development of blood glucose monitoring systems and a global leader for diabetes management systems and services. For more than 40 years, the Accu-Chek® brand has been dedicated to enabling people with diabetes to live life as normally and actively as possible as well as to empowering healthcare professionals to manage their patients’ condition in an optimal way. Today, the Roche Diabetes Care portfolio offers people with diabetes and healthcare professionals innovative products and impactful solutions for convenient, efficient and effective diabetes management. These range from blood glucose monitoring, continuous glucose monitoring, information management to insulin delivery.

For more information on the Accu-Chek® Guide system please visit www.accu-chek.co.za.

References:
Poor Diabetes Management...
‘Us’, ‘Them’ or the ‘Environment’?

Introduction
This article serves to highlight the problem that diabetes poses for South Africa, to explore three primary reasons for poor metabolic control and finally to discuss the CDE Diabetes Management Programme as an example of a possible solution to the underlying causes.

The Problem
Diabetes is one of the leading clinical and financial burdens facing the private and public healthcare sectors in South Africa. Approximately, ten percent of South Africans have diabetes, with prevalence increasing with increasing age (16.7 % in those aged 45-54, 24.4 % in those aged 55-64 and 19 % in those over 65 years). Comparatively, 8.5 % of people have type 2 diabetes globally (World Health Organization, 2016). These figures are particularly concerning due to the rising age of beneficiaries within medical schemes in the private healthcare sector and for which type 2 diabetes is an ever-increasing burden - the number of medical aid-funded Members with type 2 diabetes has increased by 35.35 % within just 5 years (Council for Medical Schemes Research and Monitoring Unit, 2018). Type 2 diabetes is now the third most common chronic disease of lifestyle (CDL) in the medical scheme-funded population, after hypertension and hyperlipidaemia (Council for Medical Schemes Research and Monitoring Unit, 2018).

Approximately 70 % of people with diabetes have hypertension and/or dyslipidaemia, which further increases the cardiovascular risks associated with the condition (SEMDSA Guideline Committee, 2017). Diabetes is currently the fifth leading cause of mortality in South Africa, the leading cause of mortality in women (Mortality and causes of death in South Africa, 2015: Findings from death notifications, 2017) and remains within the top 5 leading causes of disease-induced disability (IHME, n.d.). The exact costs associated with diabetes in South Africa are unknown. However globally, diabetes accounts for 12 % of total global healthcare expenditure (International Diabetes Federation, 2015). It is important to note that data from the United Kingdom (UK) suggests that 80 % of the total costs of treating diabetes in the National Health Service (NHS) are attributable to diabetes-related complications, and only 8 % on direct therapeutic interventions (Hex, Bartlett, Wright, Taylor, & Varley, 2012). Thus, the focus of care has to focus on the prevention of diabetes-related complications through improved management of glycaemic control, hypertension and dyslipidaemia (Clearinghouse, 2008; Stratton et al., 2000; The Diabetes Control and Complications Trial Research Group, 1993).

Although it appears obvious that ‘all should be well’ with improved metabolic control, achieving this control is often more theoretical rather than realisable in ‘the real world’. This is reflected by the poor metabolic control seen globally (Pinchevsky, Butkow, Chirwa, & Raal, 2015).
In an attempt to understand the causes of poor diabetes management, we need to consider three primary factors; ‘us’, the healthcare professionals, ‘them’, the people with diabetes and the ‘environment’ in which we all interact. Interestingly, research data shows that if a diabetes intervention is focused around just one of these factors, the quality of care and outcomes are unlikely to improve (SEMDSA Guideline Committee, 2017).

Are ‘we’ the problem?

Healthcare professional training

Before we sharpen our pitchforks and come after healthcare professionals for poor diabetes care outcomes, we need to ask a simple question, “Have providers received sufficient training to offer adequate care?” In a country which still seems to view all general practitioners as uniform, the answer would be yes. But, as we investigate this in more detail, it becomes evident that this is not the case. International studies have shown that the average healthcare professional (HCP) receives a mean of 7.4 hours of diabetes training at an undergraduate level (Ho, Bch, & Woo, 2016). In comparison, a CDE-trained HCP who has completed ‘just’ the CDE 5-Day Advanced Course in Diabetes Care and one CDE Postgraduate Forum has already received an additional ~ 44 hours of specialised diabetes training (Some HCPs have attended all 19 previous CDE Weekend Forums). The lack of training is further seen where 87 % of doctors felt that they needed additional training on prescribing insulin (Jose, Bedward, Narendran, & Cooper, 2012). As we turn our attention closer to South Africa, the problem of training is evident here as well. South African doctors (including specialists) and nurses have average to poor diabetes knowledge, and 80.9 % feel that additional advanced training in diabetes is required (Zyl & Rheeder, 2008). This lack of education has resulted in many HCPs being unfamiliar with various insulin regimens and devices (Lee, Lee, & Ng, 2012), and in various perceptions amongst healthcare providers - for example, 35 % felt that insulin increases risk of blindness, renal failure, amputations, heart attacks and early death, which is contrary to the established evidence (Lee et al., 2012). The data is clear that simply having clinical guidelines in circulation does not improve clinical practice; few are read, fewer are understood and healthcare providers overestimate their adherence to these guidelines (Phillips et al., 2001).

Treatment inertia

A current misconception within the private healthcare environment is that as long as the patient sees their healthcare provider ‘all should be well’. One will often hear praise for ‘compliant’ healthcare providers who ‘see’ their patients. However, is ‘compliance’ to a doctor consultation benefit really the same as achieving ‘adherence’ to a risk-appropriate, individualised clinical target outcome? The answer is a resounding no. This is evident in data showing that patients on average will have poor glycaemic control for in excess of 7.2 years before therapy for glycaemic control is intensified (Kamlesh Khunti, Wolden, Thorsted, Andersen, & Davies, 2013). Put alternatively, therapy is typically only intensified when HbA1c increases to beyond 8.9 % (K Khunti, Dami, Meneghini, Pan, & Yale, 2012). Shockingly, 55.6 % of doctor consultations will result in no change in therapy despite patients not being at target (Bralic Lang, Bergman, & Kranjecvic, 2015). Thus, just having a patient walk into a consultation room does not guarantee quality care.

Patient under-servicing

Local data (Table 1) reflects the gross under-servicing within the private medical aid environment (Council for Medical Schemes, 2017). Despite recommendations for the routine use of statin therapy in the majority (if not all) people with diabetes, only 40 % of people with type 2 diabetes are prescribed statin therapy (Pokharel et al., 2016).

| Table 1: Utilisation of services - private healthcare sector 2016/2017 (Council for Medical Schemes, 2017) |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Type 2 Diabetes Mellitus        | Type 1 Diabetes Mellitus        |
| Urine protein / creatinine ratio test | At least two (2) HbA1c tests | Urine protein / creatinine ratio test | At least two (2) HbA1c tests |
| At least one (1) total cholesterol test | At least one (1) total cholesterol test |
| 47.0 %                         | 25.0 %                         | 46.6 %                         | 22.1 %                         |
| 25.3 %                         | 22.1 %                         | 22.1 %                         | 22.1 %                         |
Attitudes towards people with diabetes

Beyond which tests are performed or which medications are prescribed, ‘softer’ elements of care also influence metabolic control, including attitudes of HCPs towards the person with diabetes. Patients have reported that doctors lack empathy and do not provide support and that consultations often feel rushed (Sohal, Sohal, King-Shier, & Khan, 2015). This perceived lack of interest in the patient’s situation makes care feel ‘generic’ (everyone receives the same script). Care fails to be individualised to the patients economic, social and cultural needs (Sohal et al., 2015). Patients remain repeatedly shamed for their weight (Huizinga, Cooper, Bleich, Clark, & Beach, 2009) and pre-judged - “counselling does not change behaviour so why bother” (Laws et al., 2009). A common HCP perception regarding insulin is that patients will not be able to take it properly, so prescribing the insulin is unlikely to work and it is just hassle to prescribe (Lee et al., 2012). Because of the judgemental nature of some HCPs, it is not surprising that patients may be reluctant to share their struggles or failures with their healthcare providers. This obviously makes treatment decisions very difficult for the HCP (Fagerli, Lien, & Wandel, 2007).

Are ‘they’ the problem?

Lack of Patient Education

Member education and self-care management remain the fundamentals of improved diabetes care (SEMDSA Guideline Committee, 2017). However, education which ultimately results in self-care behaviour change requires significantly more than providing printed education materials (SEMDSA Guideline Committee, 2017). Globally, only 42 % of patients receive any form of face-to-face diabetes education (Chan et al., 2009). Little is known regarding what happens in education consultations, but patients are often not taught about the risks associated with their condition and the benefits of improved metabolic control (Lee et al., 2012). One could argue that if the benefit of improved care is not known, we cannot expect people with diabetes to be mobilised to action. Insulin is once again a neglected aspect of patient education, as patients are not taught the progressive nature of type 2 diabetes and that insulin is likely to be needed in time. And, for those on insulin therapy, few are taught how to inject properly (Lee et al., 2012).

Time Constraints

If a person with diabetes is one of the lucky few in South Africa who receives diabetes education, he or she is faced with the challenge of finding the time to actually perform adequate self-care. Taking medication, testing blood glucose levels, preparing healthy meals, attending to daily foot surveillance and care and exercising regularly have shown to take roughly 2 hours a day (Russell, Suh, & Safford, 2005). Considering the ‘burden’ of self-care, it is not surprising that regular patient support, education and motivation is required (SEMDSA Guideline Committee, 2017).

Health Care Professional Interactions

What is said in the consultation does not guarantee what was heard or understood. Many people with diabetes report that they struggle to understand what is said in consultations with their healthcare professionals (Rhodes & Nocon, 2003).

Physical activity

Patients have a low understanding of the value of exercise and how to incorporate activity into their regular lifestyle, especially if the guidance has not been adapted for their age or culture (Jepson et al., 2012; Moore et al., 2011). It is therefore not surprising that only 38.5 - 41.7 % of patients with diabetes engage in physical activity according to guidelines (Zhao, Ford, Li, & Mokdad, 2008). Considering the ‘burden’ of self-care, it is not surprising that regular patient support, education and motivation is required (SEMDSA Guideline Committee, 2017)
Non-adherence to therapy and inappropriate self-adjustment of insulin is common and often not disclosed to healthcare providers (Lawton et al., 2005)

Medical Nutritional Therapy
In South Africa, non-compliance to dietary recommendations may be as high as 77% (Winskill, 2015). Dietary advice is often not adjusted to social and or culturally-specific needs of the patient and the use of generic ‘diet’ sheets or lists of foods not to eat still runs rife, despite a lack of evidence for these approaches (SEMDSA Guideline Committee, 2017; Sohal et al., 2015).

Foot care
International data shows that only 30.1% of patients have good knowledge on foot care (Desalu et al., 2011). This knowledge translates into only 10% of patients showing good practice of diabetes foot care. 88.6% wear inappropriate shoes and 80% partake in risky ‘self-help’ foot care treatments (Chiwanga & Njelekela, 2015; Desalu et al., 2011).

Medication ‘Compliance’
Poor medication ‘compliance’ is attributed to 23% of patients who present with poor control (Raebel, Schmittdül, Karter, Koniezyzy, & Steiner, 2013). In insulin-naive patients, 4.5% who are prescribed insulin will not fill their prescription the first time and 25.5% do not fulfil a repeat prescription (Karter et al., n.d.). The majority of non-adherent patients claimed providers failed to adequately explain the risk and benefits associated with using insulin (Karter et al., n.d.). Patients report that they are not ‘sick’, so they cannot see why they should take insulin (Lawton, Ahmad, Hallowell, Hanna, & Douglas, 2005). Non-adherence to therapy and inappropriate self-adjustment of insulin is common and often not disclosed to healthcare providers (Lawton et al., 2005).

Self-monitoring of blood glucose (SMBG)
It well established that self-monitoring of blood glucose is vital to assist both the provider and the patient to make therapy adjustments, be it lifestyle or medication (SEMDSA Guideline Committee, 2017). Despite this vital aspect of care, data from Africa suggests that compliance to testing recommendations may be as low as 10%, 2 years after an SMBG intervention (Wambui Charity et al., 2016). A further question needs to be asked – are patients taught how into interpret and act on their blood glucose readings in an appropriate and insightful manner, or are the few who test simply just pricking their fingers by ‘rote’?

Is the ‘Environment’ the Problem?
We can only understand the behaviours of healthcare providers and patients in the context of their environment, the ‘arena’ within which they interact.

In attempting to understand why few healthcare providers are trained in diabetes, could it be due to South Africa’s aggressive focus on HIV/AIDS and TB in recent years, potentially at the expense of other conditions? Is it that most institutions do not create an environment that encourages further training in diabetes? (Phillips et al., 2001). Or is it that when training is provided, the quality of the training is often poor (Phillips et al., 2001). Addressing the clear lack of HCP diabetes training we see in the South African context, it often appears that the goal is simply read an article, answer the questions and get the continuing professional development (CPD) points – rather than learning, reflecting on what has been learned, comparing this to current practice and using the resultant cognitive dissonance to drive changes in attitudes, values and beliefs and ultimately, practice change. Outside of CDE-facilitated education events in diabetes, some healthcare providers are lucky enough to attend formal training. However, many of these talks appear to be funded by the pharmaceutical industry and the topics largely focus on the latest (and expensive) ‘wonder’ drugs. Very little is presented on the gamut of practical diabetes care or of how to integrate this with patient experience. Despite the overwhelming challenge that diabetes clearly poses for South Africa, no healthcare provider groups outside of the CDE Network are expected to earn a minimum amount of CPD points specific to diabetes. Thus, we can meet our CPD point requirements for years, never touching an article with even the word diabetes in it. Yet, somehow legally, we are all allowed to treat diabetes based on ~7.4 hours training at university some 20 – 30 years ago when it used to still be called ‘insulin- and non-insulin
dependent diabetes’. Outside of the CDE Network, healthcare professionals are not acknowledged for further training in diabetes – no wonder the desire to be trained is poor.

In South Africa, most medical aids function on a fee-for-service basis, where healthcare providers are paid for a consultation, not an outcome - accountability for care provided is thus minimal (Gracey, 2015). Furthermore, fee-for-service funding does not reward doctors who have facilitated improved metabolic control in their patients (very different from rewarding just for performing a sentinel blood test) and fails to fund the additional care co-ordination required to manage chronic conditions (Gracey, 2015).

A Member survey recently conducted by the Independent Practitioners Association Foundation (IPAF) revealed the following insights regarding the typical medical aid funded managed fee-for-service models.

- 76 % “Fee-for-service model increases administration time”
- 98 % “I do not want to be ‘peer reviewed’ by non-doctors”
- 87 % “Administrator-driven protocols impair patient care”
- 85 % “Patient care will be compromised by limiting the amount of consultations”.

It is not surprising that doctors felt patient care is compromised by limiting consultations. ‘Prescribed minimum benefits’ (PMB) tend to result in a maximum care allocation per patient (e.g. 4 doctor visits per year, 1 dietitian, 1 podiatrist). In the context of diabetes, this just does not make sense. Some patients may require 2 doctor consultations per year, whereas a 6-year-old child newly diagnosed with type 1 diabetes may require 6 or more consultations, some of which will not be funded. A global fee model allows for patients who only require 2 doctor consultations to cross-subsidise the patient who requires 6 – allowing true person-centric care. A further limitation seen with prescribed minimum benefits is that the vital services of a diabetes educator are not funded from risk, but rather from the patient’s savings. It is thus not surprising that we have so few diabetes educators in South Africa - PMB does not recognise them and allow them a livelihood. It boggles the mind that schemes are paying for more and more expensive medications, a month’s supply of some costing up to four times more than a single diabetes educator consultation. The insulin or medication may be funded (subject to formularies) but no reimbursement structure exists for the diabetes educator – this highly skilled health professional has the skills and insight to care for, counsel, educate and coach each person according to their place on a continuum of acceptance, knowledge, skill, insight, motivation, resilience and resourcing on how to integrate diabetes and its entire daily self-care burden into his or her life. Self-care of diabetes involves far more than just taking the prescribed medication. It is thus obvious why so few patients see a diabetes educator and why so few are taught how to take their insulin.

Clearly, patients do not test their blood glucose levels as often as they should, but when many schemes provide insufficient funding for strips, it is not surprising that patients ration their strips and only test when they ‘feel bad’ and are at risk of decompensating.

What is a patient to do when they have a diabetes emergency at home? Within the CDE Network, each Member of the CDE Diabetes Management Programme has 24/7/365 access to an emergency ‘Hotline’. Skilled professionals are available to assist with home-treatable diabetes emergencies and prevent unnecessary and costly hospital admissions for developed acute complications of diabetes. Outside of the CDE Network, such a specialised service does not exist, so typically patients end up in a casualty and are admitted for several days, often in ICU, for a community-preventable event, placing avoidable upward pressure on spiralling medical aid contributions.

Podiatrists are typically offered a single foot screening consultation (30 minutes or less) under PMB, but any treatment or more frequent visits are typically funded from savings. However, once a limb requires an amputation, funds are then available - a little too late...

In South Africa, most medical aids function on a fee-for-service basis, where healthcare providers are paid for a consultation, not an outcome - accountability for care provided is thus minimal (Gracey, 2015)
The CDE Diabetes Management Programme

Figure 1 shows that the CDE is able to improve and sustain glycaemic control, with better outcomes than those attained within landmark clinical trials for diabetes. Additional findings included:

- >85% reduction in acute diabetes-related hospitalisations
- 40% reduction in admissions for diagnoses directly or indirectly related to diabetes (acute or chronic complications)
- 20% reduction in length of stay
- 50% reduction in all-cause admissions

These results beg the question – how did CDE achieve this success? Simply by targeting interventions at the all three of the primary factors required to improve care – the healthcare provider, the person with diabetes and the environment in which we mutually interact. CDE empowers healthcare providers, teaching far more than just knowledge, also providing insight into how to communicate with, share information with, counsel and coach our patients to reach their treatment targets and achieve optimal health, function and purpose. CDE pioneered patient ‘education’ in its true form 24 years ago. The environment, and thus the funding of healthcare within CDE has also allowed greater accountability and engagement of the healthcare providers in the care of their patients. Further research specifically on the CDE Diabetes Management Programme, found it to be cost effective and went on to suggest the model as a solution for even the resource-restricted public healthcare sector (Volmink, Bertram, Jina, Wade, & Hofman, 2014).

Conclusion

Published data on strategies to improve diabetes management has, over the years, often replicated many of the approaches the CDE has offered since its inception. The following are the most significant factors to improving diabetes care: (American Diabetes Association, 2018; Canadian Diabetes Association, 2013; Gracey, 2015; Hempel et al., 2010; Renders et al., 2003; Shojania, Ranji, & McDonad, 2006; Tricco et al., 2012):

- A structured, trained Network of Diabetes Team Care professionals
- Continuous training of healthcare professionals
- Specialist support of primary care providers
- Patient education and coaching through multiple education mediums, including face-to-face patient education.
- Care coordination / Case management at the point of care, by the treating healthcare professional, most often by the Diabetes educator

Despite, the overwhelming risk that diabetes poses for South Africa and the healthcare sector, and the complex reasons behind typically poor diabetes management resulting from provider, patient and environmental factors, the CDE Network has sustainable and evidence-based solutions for many of these challenges. However, effective diabetes management, like diabetes the condition, is a constantly moving target – as funding and healthcare professional resources dwindle and the burdens of chronic conditions like diabetes and its associated cardiovascular risks rise, we need to continually review our approaches. We need to keep them relevant to the present, while avoiding the pressure to resign ourselves to ‘care’ characterised by ‘ticking the boxes’. The CDE is committed to doing this in the interests of better diabetes care for all. Are you?

References on request
Presents a Five-Day Advanced Course in Diabetes Care for Health Professionals 2018

DIABETES ~ THE BURDEN, THE RELIEF

Latest estimates place the age-adjusted (20-79) comparative prevalence of Diabetes Mellitus in South Africa at possibly as high as 10.6% (International Diabetes Federation, 2017) and this is increasing. In Africa, over 69% of persons with the condition are undiagnosed and at risk from disabling and life threatening complications. Diabetes, together with its associated cardiovascular risk factors is one of the leading causes of death, either directly or indirectly, in our population.

Over the past three decades, it has become evident that good control of diabetes, as well as the common co-morbidities of hypertension and the dyslipidaemias, is vital to prevent or delay the devastating long-term complications of diabetes. To achieve this, people with diabetes need to understand their largely silent condition and the correct principles of self-care.

Health professionals often do not have access to updated approaches to a chronic, mostly self-managed condition such as diabetes ~ vital opportunities for therapeutic interaction and patient education are lost. Additionally, insight is needed into the ever-widening range of available medications and treatment strategies as well as the relationships between cardiovascular and other risk factors and diabetes.

As health services evolve, there is a move towards Team Management of Chronic Conditions. This has resulted in the rest of the Health Care Team (Nurses, Pharmacists, Dieticians, Podiatrists, Biokineticists and others) playing an ever-increasing role in diabetes care.

WHO SHOULD ATTEND THE COURSE?

This is an Advanced Course, and is aimed at Health Care Professionals who have a basic knowledge and understanding of diabetes mellitus. It is designed to give an extensive overview of the core principles of modern team diabetes management, so enabling the participants to understand the condition in sufficient depth, to make a real difference in the lives of people with diabetes. Pre and Post Course multiple-choice knowledge evaluation tests are administered, to allow for evaluation of the learning experience.

Attendance is also part of the contractual requirements for Practitioners wanting to open CDE affiliated “Centre for Diabetes Excellence” Branches.

COMMENTS FROM DELEGATES TO PREVIOUS 5-DAY COURSES:

I realise that I had been blundering around in the dark in treating my patients with diabetes and now someone has turned on the light! This a life changing Course. You have reformed my medical practice forever - General Practitioner

It was a superb Course & should result in a marked improvement in the care of people with diabetes - Registered Nurse

I enjoyed the Course thoroughly. I will manage patients with diabetes with more self-confidence. The talks were excellent, well organized and well presented - Registered Dietician

The message that you convey is that you care. The variety of topics was great. The balance between active participation and listening was great. The great teaching skills in all lectures promote learning - Registered Nurse

All speakers were excellent and displayed an impressive knowledge of their subjects. Your commitment as professionals is highly commendable. I learned a lot from this superb Course. Consequently, I will be able to treat my patients better - Medical Specialist

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CPD ACCREDITED DIABETES TRAINING

CPD ACCREDITED

The Course offers 34 contact hours. The Course is accredited to provide 30 CPD points for Medical Practitioners and other Healthcare Practitioners registered with the Health Professions Council of South Africa.

Pre-Course readings will be supplied by e-mail to all delegates and an electronic manual of all speaker notes will be provided on the first day of each Course.

Official completion certificates will be provided to delegates who achieve a mark of at least 60% in the final Post-Course Knowledge Evaluation.

ANSWERS TO FREQUENTLY ASKED QUESTIONS

Presented at: Glenhove Conference Centre, 52 Glenhove Road, Melrose Estate, Johannesburg.

Dates & Fees: Available at www.cdediabetes.co.za (Click on Diabetes Courses). Next Course: 27 to 31 August. Early bookings are advised.

Course Hours: Five days of lectures, workshops and discussion (08h00 – 17h00).

Dress: Comfortable, smart-casual

Language Medium: English

Course Information: The Course Coordinator

Tel: +27 11 053-4400 / Fax: +27 (0)86 247-0674

E-mail: JohnB@CDEDiabetes.co.za

PROGRAMME SUMMARY

The Course is aligned with the latest evidence based treatment guidelines. Case studies and problem solving approaches are a vital part of the learning process.

TOPICS INCLUDE:

- Holistic Team Care Philosophy & Educational Approaches
- Diagnosis, Classification, Pathophysiology & Prevention of Type 1 & Type 2 Diabetes Mellitus
- Other types of diabetes including Gestational Diabetes
- Treatment of Type 1 & Type 2 Diabetes
- Psychological Adjustment to Diabetes
- Meal Planning & Nutrition in Diabetes
- The Importance of Exercise in Diabetes
- The Medical Management of Diabetic Ketoacidosis
- The Foot of the Person with Diabetes
- Acute Complications of Diabetes
- Diabetes as a Micro- & Macro-vascular Disease & Risk Factor Control
- Managed care in diabetes
- Interactive Team-facilitated Case Study Sessions
- Practical Workshop on Self Care Devices & Equipment

OUR INTERDISCIPLINARY TEAM OF COURSE LECTURERS AND FACILITATORS

Larry A. Distiller  
BSc MBBCh (Rand) FCP (SA) FRCGP (London) FACE  
Specialist Physician, Endocrinologist

Brian D. Kramer  
MBCh (Rand) DMRD (London) FCP (SA) DTM&H (Wits)  
Specialist Physician, Endocrinologist

Jay Narainsamy  
MBChB (Natal) FCP (SA) MMed (UKZN) Cert Endocrinology (SA)  
Specialist Physician, Endocrinologist

David Segal  
MBChB (Wits) FAAP (USA)  
Paediatric Endocrinologist

Debbie Gordon  
MBChB (Wits) FCP (SA)  
Specialist Physician, Endocrinologist

Stan Landau  
MBChB (Stell) FCP (SA)  
Specialist Physician

Andrew Heilbrunn  
B PHYS ED (Wits) BA (Hons) Biokinetics  
Biokineticist

Michelle Daniels  
BSc Dietetics (Natal) Dip. Hosp. Dietetics (Pretoria)  
Registered Dietician

Gerda Janse van Rensburg  
ND Pod SA IIWCC (Toronto, US) PgDipDM (Glamorgan)  
Podiatrist

Michael Brown  
B. Nursing (Wits) ACDM (Wits)  
Diabetes Specialist Nurse

Rosemary Flynn  
MSC (Clinical Psychology)  
Clinical Psychologist