مركز إمبريال كوليدج لندن للسكري
IMPERIAL COLLEGE LONDON DIABETES CENTRE

Brought to you by Mubadala Healthcare

OUTCOMES REPORT 2009

Chairman's Message

Imperial College London Diabetes Centre (ICLDC) was one of the first facilities to be established as part of Mubadala Healthcare's vision to bring world-class healthcare to Abu Dhabi. The Centre is a prime example of how this vision is being realized - addressing one of the region's most pressing healthcare issues by harnessing the world-renowned medical expertise of Imperial College London to create a diabetes centre of excellence right here in Abu Dhabi.

Since its opening in 2006, ICLDC has treated more than 30,000 patients and reached out to countless others through its high-profile awareness campaigns, community outreach programs and professional and patient education programs. The combined efforts of ICLDC's dedicated specialists and staff are paving the way to improve the quality of life for those living with diabetes and, ultimately, to reduce the prevalence of this condition in the region.

We at Mubadala Healthcare are immensely proud of ICLDC's excellent work and impressive achievements over the Centre's first four years of operation, some of which are detailed in this report. We look forward to supporting the Centre's continued progress in diabetes treatment, training, public health and research for many years to come - especially with the opening of ICLDC's new state-of-the-art facility in Al Ain, which is currently under construction and scheduled to open in the second half of 2011.

Suhail Mahmood Al Ansari
Chairman of Imperial College London Diabetes Centre and Head of Mubadala Healthcare

Board Members

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About ICLDC

In 2004, Mubadala Development Company and Imperial College London came together for a synergetic endeavour in the fields of education, healthcare, research and development.

The first initiative to come out of this partnership was the Imperial College London Diabetes Centre in Abu Dhabi, wholly owned by Mubadala.

The Imperial College London Diabetes Centre (ICLDC) is a state-of-the-art facility specialising in Diabetes treatment, public health, training and research.

Treatment: the Centre allows the highest level of specialised patient care from first diagnosis to the management of all the complications associated with diabetes. Facilities at ICLDC are world class. The Centre has significantly more specialised doctors than any diabetes unit currently in the UAE.

Public Health: In February 2007 ICLDC launched "Diabetes, Knowledge, Action" the award winning public health awareness campaign under the patronage of HH Sheikha Fatima bint Mubarak and in partnership with the Emirates Foundation for Philanthropy, to increase awareness of the seriousness of diabetes and its risk factors and create interactive activities to encourage healthier lifestyles.

Training and Education: ICLDC organises specialist seminars targeted towards healthcare professionals (accredited for CME credits) and weekly in-house seminars for resident doctors.

Research: ICLDC encompasses epidemiological, basic clinical and genetic research focusing on diabetes in the UAE.

Imperial College London

Established in 1907, Imperial College London is a collaborative merger of a number of leading schools of science, technology and medicine in the UK. Imperial College London is an independent body of the University of London dedicated to outstanding education and research in science, engineering and medicine.

Imperial College London is ranked as one of the world's leading scientific, engineering and medical research and teaching institutions, with the aim of developing scientific strategies that meet the ever evolving needs of society, industry and healthcare.

With a full time staff of 5,764 and over 11,150 full time students, the college is the largest operational university in England, holding seven central and west London campuses and two in the country's south-east region.

As one of the United Kingdom's top three university institutions, Imperial College London's reputation for excellence in teaching and research attracts students and staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and management and delivers practical solutions that enhance the quality of life and the environment – underpinned by a dynamic enterprise culture.

Imperial College London is affiliated to the following teaching hospitals in London: Hammersmith Hospital, Chelsea and Westminster Hospital, St Mary's Hospital, Charing Cross Hospital, The Royal Brompton Hospital, Harefield Hospital, Queen Charlotte's Hospital, Royal Marsden Hospital and Northwick Park Hospital.

Mission & Vision

Our Mission

To understand, tackle and prevent diabetes

A solution must be found firstly to understand why the problem of diabetes exists within the UAE, secondly to tackle the existing problem in terms of world-leading treatment to prevent and manage complications, and thirdly to prevent diabetes from developing in the first place in individuals who are at high risk. Clearly the solution cannot be provided by one small clinic, a group of community practices, or the endocrine department of a particular hospital – the numbers of patients are simply too great.

Our Vision

To be first choice for providing quality diabetes services in the region

Our vision, utilising on-site staff and expertise of Imperial College London, is to create a Centre of Excellence for diabetes with a multi-disciplinary approach covering all aspects of diabetes and its complications. The Centre will liaise closely with the various UAE health bodies, government and private hospitals and primary care services within the UAE to facilitate a concentrated effort in the fight against diabetes. The Imperial College London Diabetes Centre in Abu Dhabi will have significantly more physicians than any diabetes unit currently in the UAE and will initiate a robust diabetes Registry for the patients which can interface with national healthcare centres. Unique to the Imperial College London Diabetes Centre will be a teaching and training programme for local and regional doctors to update them on all new developments in diabetes management at frequent intervals. Finally, a crucial function of the Imperial College London Diabetes Centre will be world-class research into why diabetes occurs at such high levels in the country. The more we understand why, the more we can instigate preventative and predictive measures.

Accreditation and Certification by JCI

- Accreditation is a process that evaluates whether a health care organisation meets a set of recognised standards designed to improve the safety and quality of care. It is about improving patient care, ensuring a safer working environment and continually working to reduce risks to both patients and staff.

- Certification is a process that evaluates the clinical care program of a healthcare organisation to determine if it meets a set of recognised standards designed to improve the safety and quality of care in specific diseases.

In line with the strategic Mission "To be the first choice for providing quality diabetes services in the region", ICLDC has been implementing robust process improvement (RPI) concepts and methodology for designing and redesigning clinical and managerial processes, with an emphasis on quality of care, patient safety, and patient satisfaction. These processes and the resulting outcomes are meticulously assessed by the Joint Commission International (JCI) surveyors for compliance to JCI's standards.

ICLDC underwent the JCI Accreditation survey for Ambulatory Care on 2-5th November 2009, which was successful. The areas of exemplary performance noted in the report were outstanding process and patient flow design for this facility

and patient care. Electronic medical records facilitated the integration of multidisciplinary care via concurrent documentation and immediate availability of test results. Patient care processes and outcomes were tracked in real time with alerts to physicians showing which targets were out of range. The Centre is an example of idealised design actualised prior to opening the facility.

ICLDC then continued the journey of clinical excellence by using RPI to prepare for the Clinical Care Program Certification in Diabetes Mellitus, while ensuring performance monitoring and clinical processes were compliant with the revised 2010 JCI Standards.

The survey for the Clinical Care Program Certification in Diabetes Mellitus which took place on 4-5th July 2010 was again successful with exemplary performance.

Imperial College London Diabetes Centre is the first facility worldwide to achieve both JCI Accreditation in Ambulatory Care and JCI Certification in the Clinical Care Program for Diabetes Mellitus.

Excellence in Outpatient Department

These are the things that make us different

- JCI accreditation for Ambulatory care and JCI certification in the Clinical Care Program for Diabetes Mellitus

- Comprehensive and largest outpatient facility for diabetes and its complications in the UAE (over 12,000 patients with diabetes have been treated so far)

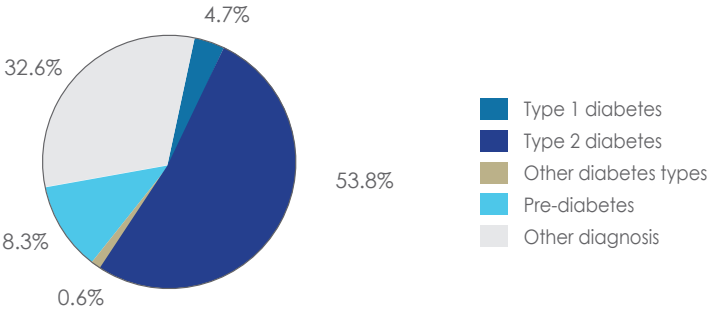
- Affiliation to Imperial College London
  - Weekly case presentations via video-conferencing for complex cases

- Unique paperless IT system ("DIAMOND")
  - Medical machines interfaced to the Patient Electronic Medical Record
  - Minimises transcription errors, avoids lost reports, avoids delayed receipt of results
  - Automated pop-ups for prompting doctors when results off target
  - Prescribing warnings to minimise risk (eg ACEI/ARB and high K)
  - Automated audit of individual doctor performance
  - Automated audits/reports for Quality Improvement
  - Patient is given printout with all results and doctors' recommendations at the end of the consultation
  - Automated predictions for optimal arrival time of patients to prevent unnecessary patient waiting
  - Highly-protected access to maintain patient confidentiality

- Commitment to Quality of Care and Patient Safety

Demographics and Baseline statistics

Number of patient visits (16% of which were first visits)	49,274
Number of individual patients served	15,680
Average number of visits per patient	3



ICLDC Personnel & Operations

Imperial College London Diabetes Centre has attracted a world-class faculty of physicians specialising in the prevention, management and treatment of diabetes and its related complications, such as cardiovascular disease, renal and retinal issues. The collective experience and focus of the team spans the various types of diabetes, as well as diabetes at different stages of life. This includes the treatment of juvenile diabetes, gestational diabetes as well as the preventative management of type 2 diabetes by simply encouraging healthy lifestyle choices. ICLDC engages in on-going education of diabetes and its related complications through regular Specialist Lectures delivered by resident and visiting professors, including a Continuous Medical Accreditation programme for ICLDC physicians, which is also open to doctors practising in the UAE.

Imperial College London Diabetes Centre Services

The Centre is a state-of-the-art specialised out-patient clinic for diabetes and its complications. Offering world-class diabetes management based on the most up-to-date evidence-based medicine.


PHILIPS

Treatment Centre

1. Diabetes
A Multi-Disciplinary Approach
Latest evidence-based protocols
"One-Stop" Shop with on-site blood analysis
Strong emphasis on prevention of diabetes complications
Management of pre-diabetes/impaired fasting glucose (IFG)/impaired glucose tolerance (IGT)

2. Endocrinology
Adult Endocrinology
Thyroid and Parathyroid Gland disorders
Hirsutism and Polycystic Ovary Syndrome
Pituitary Gland disorders
Adrenal Gland disorders
Reproductive Endocrinology
Disorders of Menopause
Osteoporosis (bone densitometry available on site)
Vitamin D deficiency
Endocrine problems with pregnancy
Management of Gut Hormone disorders

Paediatric Endocrinology
Growth disorders
Disorders of puberty
Congenital Adrenal Hyperplasia
Disorders of sex development and differentiation
Endocrine late effects of Cancer treatment

3. Metabolic and Electrolyte Disorders
Lipid (Cholesterol) disorders
Hypertensive disorders
Obesity
Insulin Resistance
Potassium, Sodium and Magnesium disorders
Metabolic bone diseases and Calcium disorders

4. Heart disease prevention (non-invasive cardiology)
Non-invasive investigation suite
Latest echocardiography technology to detect earliest signs of heart disease
Cardiac stress testing

5. Dietetic Services
Healthy eating advice
Diabetes prevention advice
Weight management advice

6. Ophthalmology
Consultant ophthalmology assessment
Retinal photography
Retinal laser treatment

7. Nephrology (Kidney disease)
Consultant nephrology assessment
Investigation and follow-up of kidney disease

8. Podiatry
Qualified expert in podiatric medicine
Management of foot problems

9. Radiology
Ultrasound, including imaging of the liver, kidneys, bladder, pelvis and thyroid.
Doppler ultrasound, including duplex and colour-flow imaging
X-ray facility

10. Laboratory
Onsite testing for a wide range of both blood and urine tests

11. Pharmacy
Medications for most illnesses and complications

Quality of Clinical Care

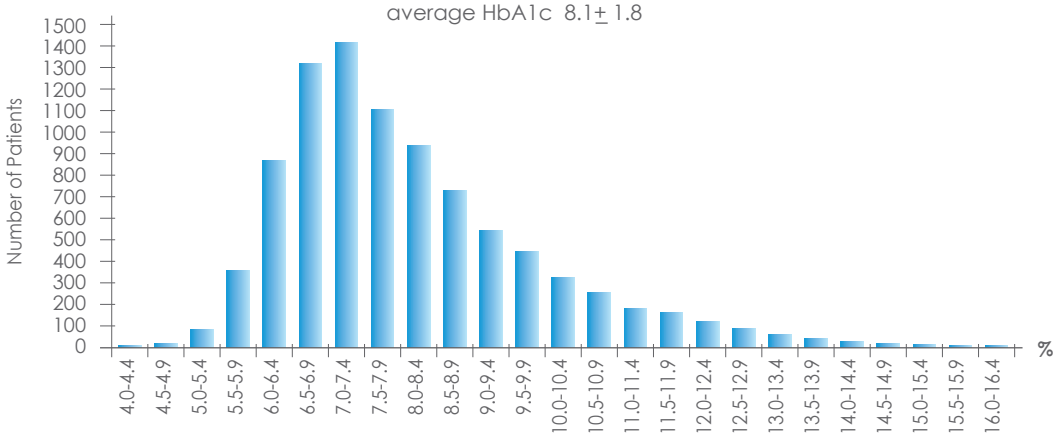
1. HbA1c

HbA1c is a marker of how good the glucose is controlled in the body, and gives an indication of this state over the previous three months. According to the American Diabetes Association, the target HbA1c result should be under 7%. The higher the HbA1c result, the worse the diabetes control.

HbA1c measurement forms part of the regular patient visit to ICLDC, and the average HbA1c for all patients seen in 2009 (latest visit) is 8.1%. This is further displayed in the line graph where first visit results are compared to improved results in follow-up visits.

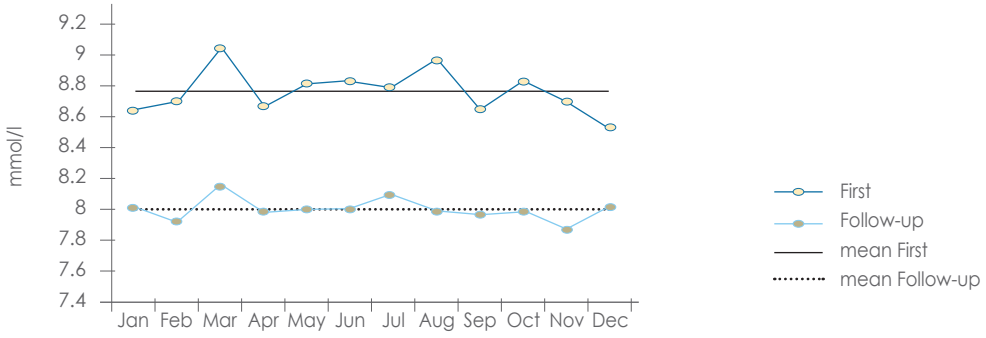
HbA1c distribution [n=9,064]

average HbA1c 8.1± 1.8



Mean HbA1c measurements for diabetes patients per month

First vs Follow up visits in 2009

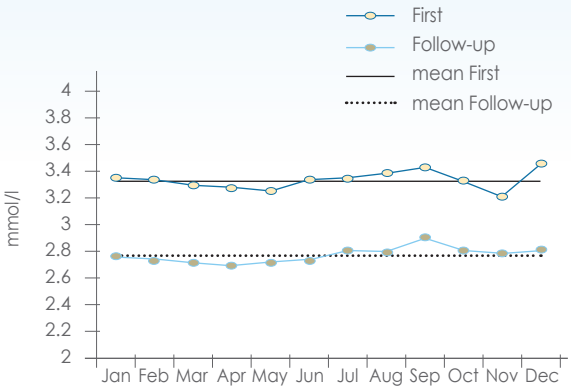


2. LDL Cholesterol

The LDL Cholesterol is also known as the "bad" cholesterol, and the lower the value, the better protection the patient has from cardiovascular diseases such as heart attacks, strokes and arterial insufficiency of the legs (claudication). According to the American Diabetes Association, the target LDL result should be under 2.6 mmol/L for those without cardiovascular disease, and under 1.8 mmol/L for those with cardiovascular disease. LDL is regularly monitored and aggressively lowered with medication at ICLDC, and in 2009 the average for patients without heart disease is 2.9 mmol/L, while for those with heart disease the average is 2.6 mmol/L. The line graph shows improvement of LDL results from first visit compared to follow-up visits.

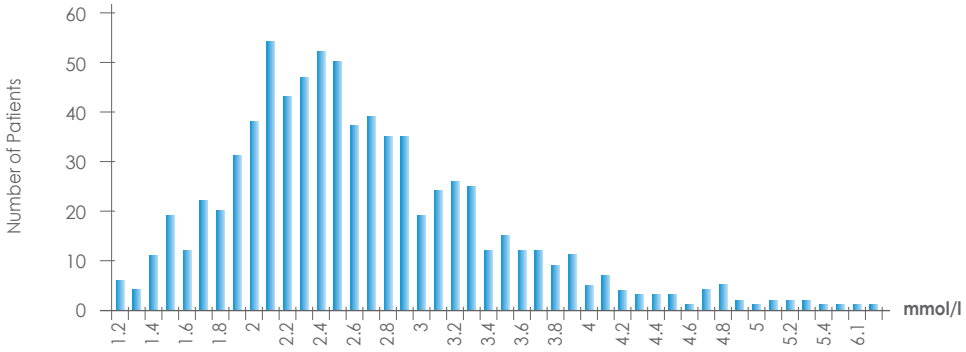
Mean LDL measurements per month for diabetes patients

First vs Follow up visits in 2009



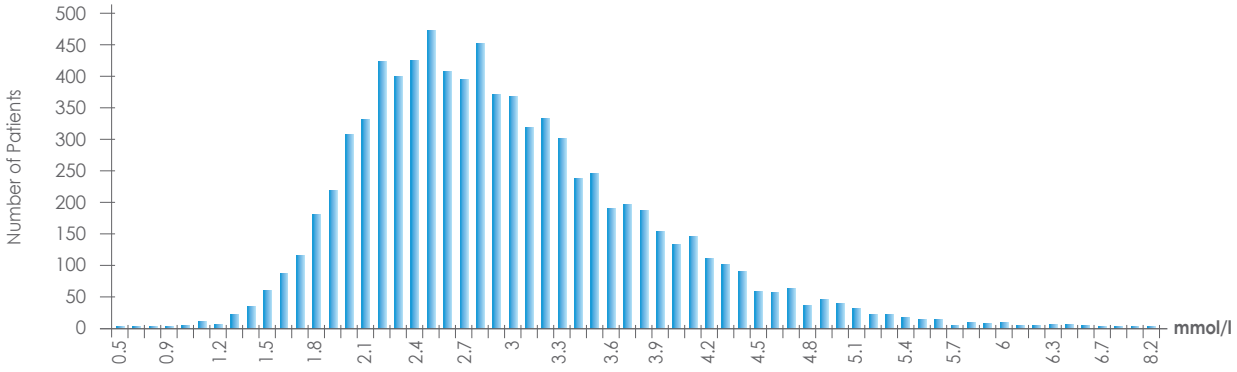
LDL distribution for diabetes patients with heart disease [n=768]

average LDL 2.6± 0.8



LDL distribution for diabetes patients without heart disease [n=8,228]

average LDL 2.9± 0.8

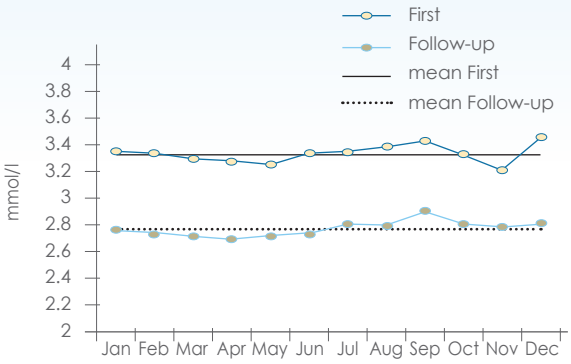


3. Blood Pressure

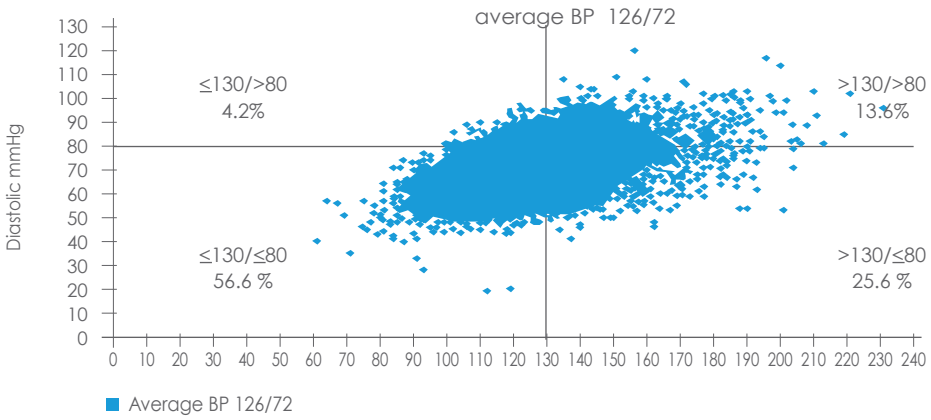
More than 65% of our diabetes patients suffer from high blood pressure (hypertension). This is largely lowered through the use of blood pressure lowering medication. High blood pressure significantly increases the risk of cardiovascular and kidney disease in patients with diabetes, and ICLDC concentrates intensely on blood pressure control. The American Diabetes Association recommends that the blood pressure of patients with diabetes should not exceed 130/80 mmHg. The average blood pressure for all patients seen in 2009 (latest visit) is 126/72 mmHg, and this is further displayed in the line graph where first visit results are compared to improved results in follow-up visits.

Mean systolic blood pressure per months for diabetes patients

First vs Follow up visits in 2009



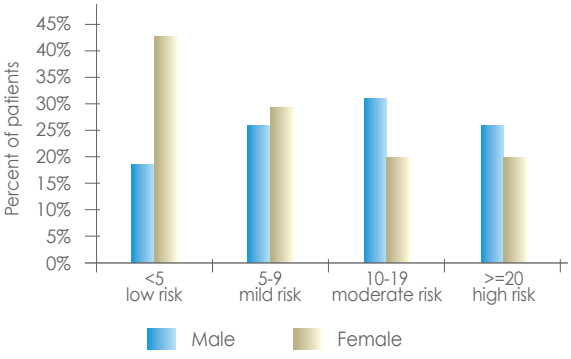
Blood Pressure [n=9,147]



4. Cardiovascular Disease Risk

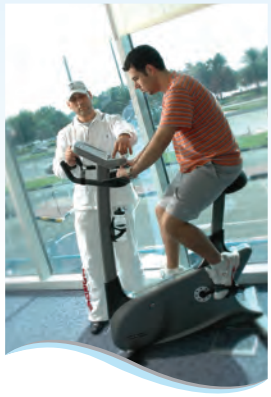
Following the successful UKPDS trials from Oxford, a risk equation was modelled for patients with diabetes to predict their risk of developing heart disease in future. This equation is known as the UKPDS cardiovascular risk calculator, and the score is calculated for all diabetes patients attending ICLDC. The variables for the equation include age, gender, smoking, duration of diabetes, blood pressure, cholesterol, HbA1c (marker of glucose control). It is used by the physicians to tailor the treatment for every patient to ensure that high-risk individuals are given maximum therapy to prevent

Cardiovascular Risk for diabetes patients [n=8,149]



heart disease (including lipid-lowering and high blood pressure medication, in addition to tight glucose control).

Of the 9,199 diabetes patients seen in 2009, 8.48% already had heart disease, while the UKPDS cardiovascular risk scores for the remaining patients are displayed in this chart. It is important to note that these risk scores include patients whose high risk has been successfully minimised with lipid-lowering medication, blood pressure control medication, smoking cessation education and tight glucose control.

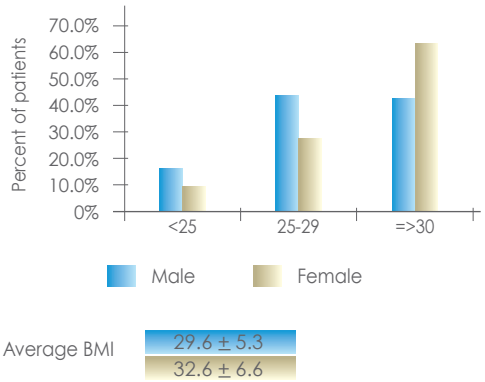


5. BMI

One of the greatest risk factors for developing diabetes is weight gain, particularly when this results in obesity. The medical definition of obesity is when the Body Mass Index [BMI = weight (kg) / height $(m)^2$] is 30 kg/m^2 or above, while a BMI between 25-30 kg/m^2 signifies being overweight. The vast majority of patients seen with diabetes at ICLDC are either obese or overweight, and this may have played a role in their predisposition to diabetes. Once diabetes is diagnosed, obesity is certainly not ideal and will lead to other complications, including high blood pressure and high cholesterol levels. It is critically important for overweight and obese individuals both with a family predisposition to developing diabetes and those who have developed diabetes to try to lose weight and maintain a healthy lifestyle as far as possible.

The average BMI for all patients seen in 2009 (latest visit, above 18 years) is 31%, and this is further displayed in the line graph where first results are compared to follow-up visits. Of all parameters healthcare providers try to improve, BMI is the most challenging, and indeed several of the international trials on diabetes control reveal weight gain in association with glucose control improvement. ICLDC continues to emphasise the importance of weight loss or at least weight maintenance as glucose control improves.

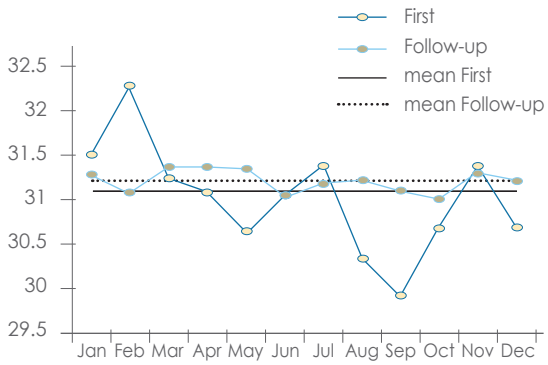
Body Mass Index distribution of diabetes patients aged 18 and above [n=8,783]



Average BMI	29.6 ± 5.3
	32.6 ± 6.6

Mean BMI measurements per month for diabetes patients

First vs Follow up visits in 2009



6. Spectrum of complications treated at ICLDC

The various complications of diabetes detected at ICLDC are listed in this table. At ICLDC, we aim to detect these early through comprehensive examinations by our specialists.

Diabetes-associated complications (>18 years only)	
% adults with heart disease	8.48%
% adults with retinopathy	6.32%
% adults with peripheral vascular disease	6.12%
% adults with neuropathy	25.24%
% adults with nephropathy	23.10%

Procedure Statistics

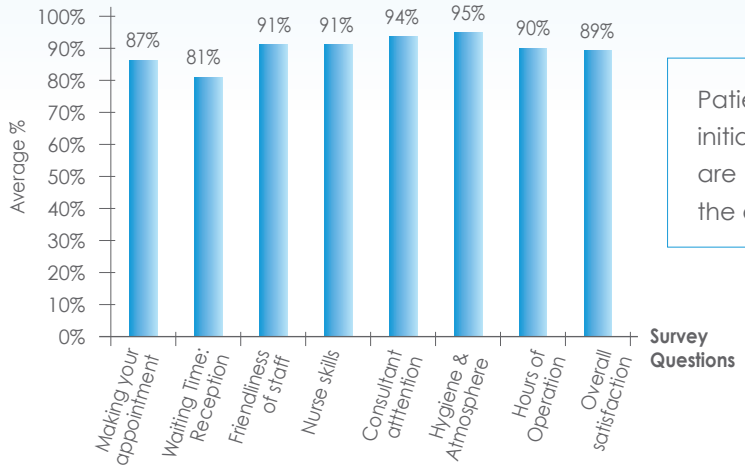
(results of tests related to diabetes management are made available during the patient's visit)

(Patients receive a printout that shows the results in full at every consultation)

Procedure Statistics	
Pathology tests	373,923
Retinal Photographs	6,812
Echocardiograms	1,182
X-rays	793
Stress tests or stress echocardiograms	384
Retinal Laser treatments	111

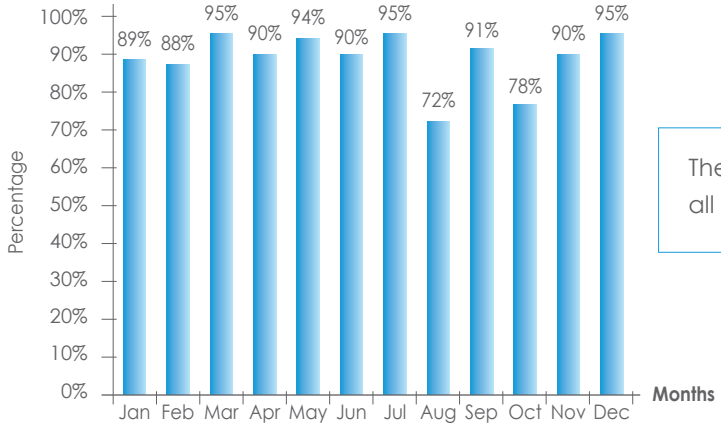
Patient Satisfaction, Quality of Care

Overall Satisfaction 2009 (per month)
total questionnaires received n=561



Patient satisfaction is one of the strategic initiatives of the Centre. The 2009 outcomes are evident from the graph provided in the eight areas monitored (n=561).

Overall Satisfaction 2009 (per month)
total questionnaires received n=561



The overall satisfaction 2009 was 89% from all surveyed patients.

Patient concerns are categorized into eight areas to identify the areas of high importance for further improvement. The areas continually monitored cover Treatment, Humaneness, Environment, Access, Communication and Service.

Public Health Awareness Campaign

Eat Right

Aim: To communicate the importance of adopting healthier lifestyles at a young age through a one-hour interactive presentation to school-aged youth throughout the UAE.

Outcome:

- 35 public and private schools
- 3,500 Students

PLAY SPORTS! live healthily

Aim: To encourage a corporate-community football tournament geared to promoting the importance of an active lifestyle.

Outcome:

- 8 teams
- 7 sponsors
- 160 players
- 2000 participants

90% of the 360 players of the 2009 football tournament indicated that they have started taking up sports as a regular activity after their participation in the event.

Cook Healthily

Fatafeat Cooking Show- Sukar Mazbout

Aim: To educate the public on how to make healthier choices in the kitchen through a multi-programme healthy cooking show aired during Ramadan.

Outcome:

- 1 million-plus viewers

WALK UAE

Aim: To create a collective conscious decision to fight diabetes through a publicly visible Walkathon, engaging the different community members in an enjoyable outdoor activity for a worthwhile cause and promoting the importance of an active lifestyle.

In 2009 much effort was also placed on reaching out to the community to form alliances and collaborate with local establishments.

Outcome:

- More than 12,500 UAE residents and visitors participated

World Diabetes Day UAE Unites for Diabetes 2009

Each year over 200 events are organised globally to mark World Diabetes Day on November 14. In line with this, ICLDC holds a 'UAE Unites for Diabetes' Press Conference on diabetes in the UAE. This conference brings together high profile speakers on health in the nation as well as international expertise on the condition at Imperial College London Diabetes Centre.

Diabetes UAE Online

A "Diabetes, Knowledge, Action" website was created in 2007 for the campaign to centralise all the information on the campaign and to act as a resource for media and the public.

Visit www.diabetesuae.ae

IN PARTNERSHIP WITH

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