Diabetes In Qatar

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The presenters have no actual or potential conflict of Interest in relation to this presentation.
Estimated number of people with diabetes worldwide and per region in 2015 and 2040 (20-79 years)

- **North America and Caribbean**
  - 2015: 44.3 million
  - 2040: 60.5 million

- **Europe**
  - 2015: 59.8 million
  - 2040: 71.1 million

- **Middle East and North Africa**
  - 2015: 35.4 million
  - 2040: 72.1 million

- **South and Central America**
  - 2015: 29.6 million
  - 2040: 48.8 million

- **Africa**
  - 2015: 14.2 million
  - 2040: 34.2 million

- **South East Asia**
  - 2015: 78.3 million
  - 2040: 140.2 million

- **Western Pacific**
  - 2015: 153.2 million
  - 2040: 214.8 million

**Global**
- 2015: 415 million
- 2040: 642 million
Figure 3.1 IDF regions by age-adjusted comparative prevalence (%) of diabetes (20-79 years), 2015 and 2040

Figure 3.2 Prevalence of people with diabetes by age and sex, 2015
Diabetes survey - Qatar

- Diabetes prevalence 17% and 11-23% has pre-diabetes
- Approximately 23% of pregnant women in Qatar have Gestational diabetes.
- It is estimated that one third of diabetics are not aware of their disease
- Diabetics 
  - 55% of Dialysis
  - 61% of ACS
  - 77% of Stroke & TIA
Diabetes Registry-Qatar


- Type 1: 4.65%
- Type 2: 94.9%
- Prediabetes: 0.4%
- Secondary: 0.05%
## Diabetes Complications:

<table>
<thead>
<tr>
<th>Complications</th>
<th>Cardio vascular</th>
<th>Retinopathy</th>
<th>Nephropathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (49.1%)</td>
<td>107</td>
<td>276</td>
<td>374</td>
</tr>
<tr>
<td>Male (50.9%)</td>
<td>244</td>
<td>344</td>
<td>532</td>
</tr>
<tr>
<td>Total Number 2000 Patients</td>
<td>351</td>
<td>620</td>
<td>906</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>17.5 %</td>
<td>31 %</td>
<td>45.3 %</td>
</tr>
</tbody>
</table>
BMI Percentages

- Obese: 54.6%
- Overweight: 31.9%
- Normal weight and below: 13.4%
Dyslipidemia -34%  (LDL Readings < 2.6 mmol/L)

<table>
<thead>
<tr>
<th>LDL &lt; 2.6 mmol</th>
<th>Number of Patients out of 2000 Patients</th>
<th>Percentages (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Readings</td>
<td>1260 Patients</td>
<td>63 %</td>
</tr>
<tr>
<td>Current Readings</td>
<td>1280 Patients</td>
<td>64 %</td>
</tr>
</tbody>
</table>
## Hypertension - 67.3%

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Systolic &lt; 140 mmHg</th>
<th>Diastolic &lt; 90 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>66.9%</td>
<td>92.6%</td>
</tr>
<tr>
<td>Female</td>
<td>71.5%</td>
<td>94.5%</td>
</tr>
</tbody>
</table>
Global health spending to treat diabetes

**Spending**

- Increase of 19%

**Cases of diabetes**

- Increase of 35%

**Billion USD**

2015: 500, 2040: 750

**Million**

2015: 400, 2040: 600

IDF Diabetes Atlas-2015
Diabetic Patients Flow Chart

Welcome

Registration Desk

Appointment Registry

The Store

Pharmacy

Retina Clinic

Dietitian Clinic

Diabetic Educator

Physician Room

Podiatry Clinic

Assessment Room

Welcome and Wellness

Good Bye
Diabetes Education: Patients

- Immunization
- Pathophysiology
- Types
- Physical activity
- Medications
- Monitors
- Sick days
- Hypo & Hyper
- Insulin pump
- Special Occasions
  - Women & DM
- Complications

DESMOND CURRICULUM

- Developing a personal plan
- The Patient Story
- What diabetes is
- Main ways to manage diabetes
- Diabetes
  - Diabetes and Hajj
  - Food choices
  - Diabetes and Ramadan
- Monitoring and taking action
- Housekeeping
- Screening/annual clinics
- Stress and emotion
- Physical activity
- Diabetes consequences/personal risk

Institute for Healthcare Improvement

Brought to you by Hamad Healthcare Quality Institute
Educational Materials Developed
EYES ON DIABETES

Diabetes can lead to eye disease which can cause blindness if not caught early. Screening for diabetes complications is important to ensure optimal health.
Qatar National Diabetes Strategy 2016-2022

**Awareness and Prevention**
Deliver clear messages in targeted promotional campaigns, reinforced across multiple channels

**Patient Empowerment**
Provide education and coaching to empower patients to take action to improve their own health outcomes

**Care Delivery**
Design the governance, structure, process to guide HCPs and patients around the new diabetes care model

**Human Capital and Capacity Building**
Build the pool of diabetes care resources, increase capability, developing the infrastructure, policies and enablers

**Information Management**
Build new policies, infrastructure and capabilities for health information collection, analysis, communication and reporting

**Research**
Govern the national research agenda and to build the national diabetes research platform, infrastructure and capabilities
Stages of behaviour change

Precontemplation
( unaware of the problem )

Contemplation
( aware of the problem and of the desired behavior )

Preparation
( intends to take action )

Action
( practices the desired behavior )

Maintenance
( works to sustain the behavior change )

Educate

Facilitate action

Reinforce changes, reminder communications

Marketing & Communication Tasks

Create awareness; change values and beliefs

Persuade and motivate

The Transtheoretical Model of Behavioral Change
## Diabetes Prevention

**Local and National Media**
Providing continuous, comprehensive and reliable information on healthy lifestyle issues

**Local and National Authorities**
Responsible for long-term strategy planning, sustainability and quality management of the preventive efforts

<table>
<thead>
<tr>
<th>Individual Level</th>
<th>Societal Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Group:</strong> Persons at risk of T2DM</td>
<td><strong>Target Group:</strong> Whole Population</td>
</tr>
<tr>
<td><strong>Goal:</strong> Promote lifestyle changes to reduce diabetes risk and improve health</td>
<td><strong>Goal:</strong> Integration of less obesogenic/diabetogenic/sedentary environment</td>
</tr>
</tbody>
</table>

**Involved Players:**
- Multidisciplinary Team of
  - Doctors, dentists, nurses
  - Public health experts
  - Registered dietitians
  - Exercise specialists

**Involved Players:**
- Local decision makers/city planners
- Kindergartens and schools
- Communities industries
- Sports clubs facilities
- Patient associations
- Health insurance companies

**Political level:** Health in ALL policies, following a national action plan for prevention with focus on
- A. Advocacy
- B. Community support
- C. Fiscal and legislative changes involving infrastructure
- D. Engagement of private sector (e.g., health at workplace and ensuring healthy policies in food industry)
THANK YOU
Insulin Safety

Jo Butler – CNS Diabetes HMC
Overview

- History of insulin
- Preventing insulin errors
- Mastering injection technique
- Quiz!!
History of insulin

- Insulin first used for the treatment of diabetes in 1922
- Produced from beef and pork pancreas
- Short duration period and required several injections a day
- Had to be given through re-useable glass syringes with needles which were large and blunt
- The first commercially available insulin was produced in 1923 – Iletin
Before and after insulin
Insulins vials available at HMC
Pens and Cartridges
Quiz!!

Insulin aspart (NovoRapid) should be injected

A) Immediately before a meal

B) 10 - 15 minutes before a meal

C) 20 - 30 minutes before food

D) Soon after a meal
Insulin aspart (NovoRapid) should be injected

A) Immediately before a meal

B) 10 - 15 minutes before a meal

C) 20 - 30 minutes before a meal

D) Soon after a meal
Quiz!!

Insulin glargine (Lantus) should be injected:

A). Immediately before the evening meal?

B). Before bed?

C). Before breakfast?

D). The same time every day?
Quiz!!

Insulin glargine should be injected:

A). Immediately before the evening meal

B). Before bed

C). Before breakfast

D). The same time every day
Insulin

- Insulin saves lives

- But insulin can be life threatening.

- Insulin is in the top 10 list of High Alert medications worldwide
Insulin errors
Types of errors

More than 60% of the reported events of insulin error in the UK were caused by:

- Wrong insulin
- Wrong time
- Insulin omission
- Prescription error

National Patient Safety Agency, 2010
Types of errors

- Insulin written as ‘u’ instead of units: 4u can read as 40
- Unclear verbal message
- Sound alike insulin
- Failure to use correct device – syringe or pen
- ‘Sliding scale’ insulin regimens
- Errors when converting from IV insulin infusion to usual medication
## Sound alike insulins

<table>
<thead>
<tr>
<th>Insulin Brand</th>
<th>With</th>
<th>Possible Sound Alike Insulins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humalog</td>
<td>with</td>
<td>Humalog Mix 75/25, Humalog Lispro</td>
</tr>
<tr>
<td>Humulin</td>
<td>with</td>
<td>Humulin 70/30, Humulin R, Humulin N</td>
</tr>
<tr>
<td>NovoRapid</td>
<td>with</td>
<td>Actrapid, NovoMix 30</td>
</tr>
<tr>
<td>Insulin glulisine (Apidra)</td>
<td>with</td>
<td>Glargine (Lantus)</td>
</tr>
<tr>
<td>Levemir (Detemir)</td>
<td>with</td>
<td>Lantus</td>
</tr>
</tbody>
</table>
Insulin Errors - Syringes

- Insulin syringes are based on units not on volume

- They can only contain 100 units maximum (1ml)

  ‘Patient given 8mls of NovoMix 30 instead of 8 units’

- Do NOT use intravenous syringes to measure insulin doses.
Insulin errors - pen devices

• Failure to mix insulin
• Priming pen
• Removing needles too quickly
• Needle stick injury
• Using a syringe to withdraw insulin from a cartridge
• Sharing of insulin pens
• Incorrect use of button
Sliding Scale Insulin

- Subcutaneous insulin given when blood glucose levels are high.
- No physiological basis for this therapy
- The aim is to prevent hyperglycemia not to cause fluctuating blood glucose levels
Hyperglycemia

• Hyperglycemia in hospitalized patients is associated with poor outcomes
• Increases length of stay
• Delays wound healing
• Increases risk of infection
• Patients with diabetes vulnerable to heel ulcers
• Increases Diabetic Ketoacidosis / Hyperglycemic Hyperosmolar State
Recommendations

• The sole use of sliding scale insulin in the inpatient hospital setting is strongly discouraged.
• Oral hypoglycemic agents are inappropriate in most hospitalized patients.
• Scheduled insulin regimens are recommended to manage hyperglycemia in patients with diabetes.
• The use of additional short or rapid-acting insulin in conjunction with scheduled insulin doses to treat BG levels above desired targets, is preferred
Medication reconciliation

Is the process of creating and maintaining the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and using that list to guide therapy.’

Prescriptions for new or changed medication should be filled and reviewed with the patient and family at or before discharge
Injection Technique
True or False?

- Insulin is injected into the fatty layer under the skin? **TRUE**
- The more you weigh the thicker the skin? **FALSE**
- Older people have thinner skin than younger people? **FALSE**
- Most people can use shorter length 4mm needles? **TRUE**
- You do not have to use ‘pinch-up’ when using short needles? **TRUE**
• A 4mm needle is the safest pen needle for adults and children regardless of age, gender and Body Mass Index (BMI).
• Children age 6 and under or very thin adult BMI <19 can use 4mm with pinch-up.
Change the needle!
Injection technique

- Wash hands
- Explain procedure to the patient
- Palpate injection site
- Clean site – leave to dry
- Inject at a 90 degree angle.
- Inject slowly
- Ensure the plunger is fully depressed
- **How long do you leave a pen needle in the skin for?**
  - **10 seconds**
- Withdraw the needle
- Apply gauze swab if there is bleeding
- Do not massage the skin
- Safely remove and dispose of the needles
Thank you
References

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- NovoRapidSPC http://www.medicines.org.uk/EMC/medicine/25033/SPC/NovoRapid+100+U+ml+in+a+vial%2C+NovoRapid+Penfill+100+U+ml%2C+NovoRapid+FlexPen+100+U+ml%2C+NovoRapid+FlexTouch+100+U+ml/
Hypoglycaemia in Inpatients

Stephen Beer Senior Consultant  Endocrinology
National Diabetes Centre Al Wakra Hospital Qatar
Qatar Metabolic Institute
Session Objectives

At the end of this session the attendee will be able to:

- Appreciate both the size of the problem and its potential severity
- Identify those factors which increase the risk of hypoglycaemia in inpatients
- Describe both the correct treatment and the underlying physiological principles behind it
- Leave with a practical idea for a simple quality improvement project
Lets make it interactive!

- By the way Cerner says fasting glucose is 3.3-5.5
- So what is definition of hypoglycaemia in a diabetic
  - <2.8
  - <3.3
  - <4.0
  - <5.5
Correct answer

• <4.0
Size of the problem

• Farrokhi et al (2012) reported a prevalence of severe hypoglycaemia ranging from 5% to 32% in inpatients treated with insulin

• NaDIA (National Diabetes Inpatient Audit 2012) data shows 22.4% of inpatients with diabetes experienced one or more hypoglycaemic episodes (<4.0), with 10.5% experiencing one or more <3.0
Severity

- Turchin et al (2009) 4368 admission episodes with diabetes, 1/3 on regular insulin
- With hypoglycaemia 66% increased risk of death within 1 year
- 2.8 days longer in hospital compared with no hypoglycaemia
Potential causes (1) Medical issues

- Inappropriate use of ‘stat’ or PRN short acting insulin
- Acute discontinuation of long term steroid therapy
- Major amputation
- Incorrect insulin prescription or administration
- Inappropriate timing of insulin/OHA therapy in relation to meal or feed
- Inadequate mixing of intermediate acting or mixed insulins
Potential causes (2) Reduced CBH intake

- Missed or delayed meals
- Less CBH than normal
- Change of timing of main meal
- Lack of snacks
- Prolonged starvation
- Vomiting
- Reduced appetite
Potential Causes (3)

• Lipohypertrophied injection sites
How do we treat?

• Conscious alert able to swallow
• 5 g CBH
• 10g CBH
• 15-20g CBH
Correct answer

• 15-20 g-of the patients choice

• Examples would be 5-7 Dextrosol tabs

• 150-200 mls pure fruit juice
Can we give chocolate?

- Yes?
- No?
Correct answer

• No-chocolate has fat added, slows absorption
How long do we wait before checking glucose

• 5 minutes
• 10-15 minutes
• 30 minutes
Correct answer

• 10-15 minutes
How long if glucose not greater than 4?

• After first treatment?
• After second treatment?
• After third treatment?
Correct answer

• After third treatment
Next step

- 1 mg glucagon IM
- 50 mls 50% glucose IV stat
- 150-200ml 10% glucose over 15 minutes
Correct answer

- Either glucagon, or 10% glucose

- Glucagon may be less effective in sulfonylurea therapy, or in context of alcohol consumption
Next step

- Do nothing else once glucose >4
- Give long acting CBH
- Ensure next insulin dose is omitted if due
Correct answer

• Give long acting CBH-Two biscuits, one slice of bread, 200-300 mls of milk

• Never omit the insulin dose (but regimen may need altering)
Conscious, but confused, able to swallow

- Squeeze Insta-glucose between teeth and gums

- 1 mg glucagon IM
Correct answer

• Either, but can repeat gel X2, only give glucagon X1
How much glucose in Insta-glucose?
• 24 grams
Why not have a Hypo Box?
Thank you.
Medical Nutrition Therapy in Management Diabetes II

Muneera Al Ali, BcS, MBA, Certified DESMOND educator
Facility Head Dietitian-Al Wakra Hospital
CONTENT

- Diabetes Overview
- Diabetes Management
- Role of Clinical Dietitian in Diabetes Management
- Medical Nutrition Therapy and ABCs. Management
- Role of Clinical Dietitian in Weight management
- Physical Activity and Diabetes Management
Objectives

• Identify the Role of Clinical Dietitian for adult with diabetes

• understand the Goals of Medical Nutrition Therapy (MNT) for Adults with Diabetes

• Understand the evidence-based of MNT for ABCs management for adult with diabetes.

• Demonstrate how to implement the MNT in weight management and lifestyle of adults with diabetes for optimal care
Overview

Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycemic control.

Ongoing patient self management education and support are critical to preventing acute complications and reducing the risk of long-term complications.
Diabetes Management

Treatment decisions should be timely, rely on evidence-based guidelines, and be made collaboratively with patients based on individual preferences, prognoses, and co morbidities.
Diabetes Management

Follow-up: Monitor and Evaluate
Collect
Assess
Patient-Centered Care
Document
Plan
Implement
Collaborate
Role of Clinical Dietitian in Diabetes Management

Academy of Nutrition and Dietetics, Evidence-Based for Clinical Nutrition Practice Guidelines recommend the following structure for the implementation of MNT for adult with Diabetes:

- A series of 3 – 4 encounters with an Clinical Dietician lasting from 45-90 minutes.
- The series of encounters should begin at diagnosis of diabetes or at first referral to an Dietician for Medical Nutrition Therapy (MNT) for diabetes and should be completed within 3 – 6 months.
- The Dietitian should determine whether additional MNT encounters are needed.
- At least 1 follow up encounter is recommended annually to reinforce lifestyle changes and to evaluate and monitor outcomes that indicate the need for changes in MNT.

Dietitians work as trained diabetes educators within diabetes self management education programs.

Dietitians provide individualized therapy and counseling related to nutrition in both one-to-one and group-based settings with patients, taking into account personal and cultural beliefs, preferences, lifestyle and the willingness and ability of the person to change.
Role of Registered Dietitian (RD) in Diabetes Management

- Dietitians working in diabetes also play key roles advising on:
Role of Clinical Dietitian in Diabetes Management

In accordance with the national standards for diabetes self-management education and support to: facilitate the knowledge, skills, and ability.

Necessary for diabetes self-care and support is: To assist with implementing and sustaining skills and behaviors needed for ongoing self-management, both at diagnosis and as needed thereafter.

The key goals of diabetes self-management education and support is: To improved clinical outcomes, health status, and quality of life that should be measured and monitored as part of routine care.
## Diabetes Self-management Education and Support for Adults With Type 2 Diabetes: Algorithm of Care

ADA Standards of Medical Care in Diabetes recommends all patients be assessed and referred for:

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Education</th>
<th>Emotional Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered dietitian for medical nutrition therapy</td>
<td>Diabetes self-management education and support</td>
<td>Mental health professional, if needed</td>
</tr>
</tbody>
</table>

### Four critical times to assess, provide, and adjust diabetes self-management education and support

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At diagnosis</strong></td>
<td><strong>Annual assessment of education, nutrition, and emotional needs</strong></td>
<td><strong>When new complicating factors influence self-management</strong></td>
<td><strong>When transitions in care occur</strong></td>
<td></td>
</tr>
</tbody>
</table>

### When primary care provider or specialist should consider referral:

- Newly diagnosed, all newly diagnosed individuals with type 2 diabetes should receive DSME/S
- Ensure that both nutrition and emotional health are appropriately addressed in education or make separate referrals
- Newly diagnosed individuals with type 2 diabetes should receive DSME/S
- Long-standing diabetes with limited prior education
- Change in medication, activity, or nutritional intake
- HbA1c out of target
- Maintain positive health outcomes
- Unexplained hypoglycemia or hyperglycemia
- Planning pregnancy or pregnant
- For support to attain and sustain behavior change(s)
- Weight or other nutrition concerns
- New life situations and competing demands
- Change in: Health conditions such as renal disease and stroke, need for steroid or complicated medication regimen
- Physical limitations such as visual impairment, dexterity issues, movement restrictions
- Emotional factors such as anxiety and clinical depression
- Basic living needs such as access to food, financial limitations
- Change in: Living situation such as inpatient or outpatient rehabilitation or now living alone
- Medical care team
- Insurance coverage that results in treatment change
- Age-related changes affecting cognition, self-care, etc.
Role of Dietitian in Diabetes Management

Diet plus Drug Therapy
Relative frequency of patients reaching HbA1c targets (A1c ≤ 7%) and at risk (A1c ≥ 9%) with T2D managed by diet plus drug therapy (oral agents, insulin, and other injectables).

McNemar test exact (significance taken at P<0.05)
* Denotes significant decrease in patients at risk (A1c ≥ 9%) (P<0.001) and significant increase in patients meeting targets (A1c ≤ 7%) (P<0.001).
† Denotes maintenance of treatment effect at 1-year as compared to end-of-program (P>0.05).

Diet Alone
Relative frequency of patients reaching HbA1c targets (A1c ≤ 7%) and at risk (A1c ≥ 9%) with T2D managed by diet alone.

McNemar test exact (significance taken at P<0.05)
* Denotes significant increase in patients meeting targets (A1c ≤ 7%) (P<0.001).
† Denotes maintenance of treatment effect at 1-year as compared to end-of-program (P>0.05).
Goals of Medical Nutrition Therapy (MNT) for Adults with Diabetes

- To Attain individualized glycemic, blood pressure, and lipid goals.
- General recommended goals from the ADA for these markers are as follows:

<table>
<thead>
<tr>
<th>A1C</th>
<th>&lt; 7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure</td>
<td>&lt;140/80 mmHg</td>
</tr>
<tr>
<td>LDL cholesterol</td>
<td>&lt;100 mg/dL</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>&lt;150 mg/dL</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td>&gt;40 mg/dL; &gt;50 mg/dL for men; &gt;50 mg/dL for women</td>
</tr>
</tbody>
</table>

- MNT can achieve a decrease in HbA1C by 0.5-2%
- Achieve and maintain body weight goals.
- Delay or prevent complications of diabetes.

MNT and Management of ABCs

Diet and physical activity are critically important in the management of the ABCs (A1c, Blood pressure and Cholesterol) of type 2 diabetes.

Role of MNT in Treatment Targeting:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>Hyperglycemia</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Hyperlipidemia</td>
</tr>
</tbody>
</table>
Goals of MNT for Adults with Diabetes

- To address individual nutrition needs
- To maintain the pleasure of eating
- To provide diabetic patient with practical tools for day-to-day meal planning

MNT and Management of ABCs

1- In Treatment Targeting Hyperglycemia
Carbohydrate Counting:

- Basic CHO Counting
- No Insulin or mixed insulin regimen
- Well distributed CHO over 3 meals (individualized)
  - Decrease % at breakfast: e.x. 30%, 35%, 35%
  - Snacks rich in proteins, fats and low in CHO
# Examples of Carb Amounts in Foods

<table>
<thead>
<tr>
<th>Bread, Cereal, Grain, Pasta, and Rice</th>
<th>One serving = 15 g carbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bagel (½ large bagel or 1 oz)</td>
<td></td>
</tr>
<tr>
<td>Biscuit (2½ inches across)</td>
<td></td>
</tr>
<tr>
<td>Bread, white or whole wheat, pumpernickel, rye (1 slice or 1 oz)</td>
<td></td>
</tr>
<tr>
<td>Bun, hamburger or hot dog (½ bun or 1 oz)</td>
<td></td>
</tr>
<tr>
<td>Crackers, saline or round butter (6 to 8)</td>
<td></td>
</tr>
<tr>
<td>English muffin (½)</td>
<td></td>
</tr>
<tr>
<td>Muffin toast (6 slices)</td>
<td></td>
</tr>
<tr>
<td>Oyster crackers (20)</td>
<td></td>
</tr>
<tr>
<td>Pancake or waffle (4 inches across)</td>
<td></td>
</tr>
<tr>
<td>Stuffing (½ cup)</td>
<td></td>
</tr>
<tr>
<td>Tortilla, corn or flour (6 inches across)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Starchy Vegetables (One serving = 15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadfruit (1/4 cup small cubes)</td>
<td>Potatoes, mashed (½ cup)</td>
</tr>
<tr>
<td>Corn/peas (½ cup)</td>
<td>Pumpkin, cooked (1 cup small cubes)</td>
</tr>
<tr>
<td>Corn on the cob, large (½ cob)</td>
<td>Squash, acorn, butternut (1 cup)</td>
</tr>
<tr>
<td>Mixed vegetables with corn, peas, or pasta (1 cup)</td>
<td>Sweet potato (½ cup)</td>
</tr>
<tr>
<td>Potato, baked (1 small or ½ large, 3 oz)</td>
<td>Yam (1½ cup)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dried Beans, Peas, and Lentils (One serving = 15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked beans (½ cup)</td>
<td>Lentils, cooked (½ cup)</td>
</tr>
<tr>
<td>Beans—black, garbanzo, kidney, navy, lima, pinto, white (cooked ½ cup)</td>
<td>Peas—black-eyed, split, cooked (½ cup)</td>
</tr>
<tr>
<td>Hummus (½ cup)</td>
<td>Retried beans (½ cup)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nonstarchy Vegetables (One serving = 5 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, 1 serving = 1 cup raw, ½ cup cooked, ½ cup juice, or ½ cup tomato sauce.</td>
<td>Beans wax or greem, bean sprouts, beets, broccoli, brussel sprouts, cabbage, carrots, cauliflower, celery, cucumber, eggplant, greens, mushrooms, lettuce, nripepe, okra, onions, peas pods, peppers, radishes, rutabaga, spinach, tomatoes, zucchini.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fruit (One serving = 15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple or orange (1 small)</td>
<td>Kiwi (1)</td>
</tr>
<tr>
<td>Apricots (4 whole or 8 dried halves)</td>
<td>Mango (½ small or ½ cup)</td>
</tr>
<tr>
<td>Banana, extra small (1 or 4 oz)</td>
<td>Papaya (½ small fruit or 1 cup cubes)</td>
</tr>
<tr>
<td>Blueberries (¼ cup)</td>
<td>Passion fruit (¼ cup)</td>
</tr>
<tr>
<td>Canned fruit in juice (½ cup)</td>
<td>Peach (1 medium)</td>
</tr>
<tr>
<td>Cereals:</td>
<td>Pear (½ large)</td>
</tr>
<tr>
<td>Cold cereal, unsweetened (¼ cup)</td>
<td>Pineapple (½ cup)</td>
</tr>
<tr>
<td>Cooked cereal, sugar-coated (¼ cup)</td>
<td>Plum (2 small) or 3 dried plums</td>
</tr>
<tr>
<td>Grains, oatmeal, grits (1 cup)</td>
<td>Raspberries (1 cup)</td>
</tr>
<tr>
<td>Grandola (½ cup)</td>
<td>Strawberries (1½ cup)</td>
</tr>
<tr>
<td>Puffed cereal (½ cup)</td>
<td>Watermelon (1½ cup)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grains (cooked):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley (9 cup)</td>
<td>Fat-free, artificially sweetened yogurt (94 cal)</td>
</tr>
<tr>
<td>Couscous (½ cup)</td>
<td></td>
</tr>
<tr>
<td>Pasta (½ cup)</td>
<td></td>
</tr>
<tr>
<td>Quinon (1 cup)</td>
<td></td>
</tr>
<tr>
<td>Rice, white or brown (1 cup)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milk (One serving = 12.15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat-free or low-fat milk, soy or row's (1 cup)</td>
<td>Fat-free plain yogurt (94 cal)</td>
</tr>
<tr>
<td>Fat-free plain yogurt (94 cal)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Snack Foods (One serving = 15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal crackers (8 crackers)</td>
<td>Pretzels (94 cal)</td>
</tr>
<tr>
<td>Ginger snaps (3 cookies)</td>
<td>Rice cakes (2 cakes)</td>
</tr>
<tr>
<td>Graham crackers (3 squares)</td>
<td>Snack chips (15-20 chips)</td>
</tr>
<tr>
<td>Popped popcorn (3 cups)</td>
<td>Vanilla wafers (5 wafers)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sweets (One serving = 15 g carbs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownie, unfrosted (1¼-inch square—1 oz)</td>
<td>Cupcake, small, frosted (1½ oz)</td>
</tr>
<tr>
<td>Cake, unfrosted (2-inch square—1 oz)</td>
<td>Doughnut, glazed (2-3 oz)</td>
</tr>
<tr>
<td>Cookies (2 small, sandwich type)</td>
<td>Milk, chocolate (1 cup)</td>
</tr>
<tr>
<td>Fruit juice bars (1 bar—3 oz)</td>
<td>Pie, pumpkin (½ pie)</td>
</tr>
<tr>
<td>Ice cream (¼ cup)</td>
<td>Pudding (94 cal)</td>
</tr>
<tr>
<td>Jam/jelly (1 tsp)</td>
<td>Rice pudding, sweet rice with milk (96 cal)</td>
</tr>
<tr>
<td>Muffin (¾ of 4-oz muffin)</td>
<td>Sherbet (½ cup)</td>
</tr>
<tr>
<td>Pancake syrup (1 tbsp)</td>
<td>Please note this has more carbs:</td>
</tr>
<tr>
<td>Regular gelatin (½ cup)</td>
<td>Pie, fruit, 2 crusts</td>
</tr>
<tr>
<td>Regular soda (½ cup)</td>
<td>(½ pie is 65 g carbs)</td>
</tr>
<tr>
<td>Sports drinks (1 cup)</td>
<td>Yogurt, frozen, fat-free (½ cup)</td>
</tr>
</tbody>
</table>

For more information on carbohydrate amounts, see Choose Your Foods: Exchange Lists for Diabetes or Official Guide to Diabetes Exchanges by the Academy of Nutrition and Dietetics and the American Diabetes Association. Available at eatright.org or store.diabetes.org.
Advanced CHO Counting

• **INSULIN TO CARBOHYDRATE RATIO**

• An insulin-to-carbohydrate ratio helps you dose how much rapid acting insulin you need to “cover” the carbohydrate you will eat at a meal or snack.
Calculate an insulin dose for food:
Step 1: Count up the total amount of carbohydrate in your meal or snack
Step 2: Divide the total grams of carbohydrates by your insulin-to-carbohydrates ratio to determine your insulin dose

Example
• Let’s say you plan to eat 45 grams of carbohydrate and your insulin-to-carbohydrates ratio is 1 unit of insulin for every 15 grams of carbohydrate eaten. To figure out how much insulin to give, divide 45 by 15.

\[
\frac{45 \text{ Grams Of Carbohydrate}}{15} = 3 \text{ units of insulin}
\]

= 3 units of insulin is needed for this amount of carbohydrate (45g)
Portion Size

A Handy Guide to Portion Sizes

You can stick with your portion size by using this quick guide to estimate portion sizes and calories. This tool can help you keep portion size that provide the amount of calories you need to help keep your blood sugar at target levels.

Your palm: unit including fingers and thumb is about 3 inches of baked and brown rice meal.

Your palm: unit including fingers and thumb is about 3 inches of baked and brown rice meal.

A Fist: about 1 cup or 30 grams of carbs for foods such as rice, pasta, or bread.

Your Thumb: about 1 tablespoon or 1 serving of regular-sized dressing, reduced-fat mayonnaise, or reduced-fat margarine.

Your Thumb Tip: about 1 teaspoon or 1 serving of margarine, mayonnaise, or other fats such as oils.

These portion estimates are based on a woman’s standard portion size. For men, use the standard portion sizes and increase food portions to the most accurate way to figure out portion sizes.
My Plate, My Wins: Make it yours

Find your healthy eating style. Everything you eat and drink over time matters and can help you be healthier now and in the future.

- Fruits
- Grains
- Vegetables
- Protein
- Dairy

Focus on whole fruits.
Vary your veggies.

Limit the extras. Drink and eat beverages and food with less sodium, saturated fat, and added sugars.

Create 'MyWins' that fit your healthy eating style. Start with small changes that you can enjoy, like having an extra piece of fruit today.

Move to low-fat or fat-free milk or yogurt.
Make half your grains whole grains.
Vary your protein routine.

ChooseMyPlate.gov
### MNT and Management of ABCs

#### Daily Food Group Targets — Based on a 2,000 Calorie Plan

Visit SuperTracker.usda.gov for a personalized plan.

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Daily Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruits</strong></td>
<td>2 cups</td>
</tr>
<tr>
<td>Focus on whole</td>
<td>1 cup counts as:</td>
</tr>
<tr>
<td>fruits and select</td>
<td>1 large banana</td>
</tr>
<tr>
<td>100% fruit juice when</td>
<td>1 cup mandarin orange</td>
</tr>
<tr>
<td>choosing juices.</td>
<td>½ cup raisins</td>
</tr>
<tr>
<td>Buy fruits that are</td>
<td>1 cup 100% grapefruit juice</td>
</tr>
<tr>
<td>dried, frozen, canned,</td>
<td></td>
</tr>
<tr>
<td>or fresh, so that you</td>
<td></td>
</tr>
<tr>
<td>can always have a</td>
<td></td>
</tr>
<tr>
<td>supply on hand.</td>
<td></td>
</tr>
</tbody>
</table>

| **Vegetables**   | 1 cup counts as: |
| Eat a variety of | 2 cups raw spinach |
| vegetables and add | 1 large bell pepper |
| them to mixed dishes | 1 cup baby carrots |
| like casseroles, | 1 cup green peas |
| sandwiches, and wraps. | 1 cup mushrooms |
| Fresh, frozen, and canned |                      |
| count, too. Look for |                      |
| "reduced sodium" |                      |
| or "no-salt-added" |                      |
| on the label.       |                      |

| **Grains**        | 1 ounce counts as: |
| Choose whole-grain | 1 slice of bread    |
| versions of common | ½ cup cooked oatmeal |
| foods such as bread, | 1 small tortilla |
| pasta, and tortillas. | ½ cup cooked brown rice |
| Not sure if it's whole | ½ cup cooked grits |
| grain? Check the ingredients list for the words "whole" or "whole grain." | |

| **Dairy**         | 1 cup counts as: |
| Choose low-fat (1%) or | 1 cup milk |
| fat-free (0%) dairy. | 1 ounce tuna fish |
| Get the same amount of | ½ cup cooked beans |
| calcium and other nutrients as whole milk, but with less saturated | 1 tsp peanut butter |
| fat and calories.     | 1 egg |
| Lactose-intolerant? Try |                      |
| lactose-free milk or a fortified soy beverage. |                      |

| **Protein**       | 1 ounce counts as: |
| Eat a variety of protein foods such as beans, | 1 ounce tuna fish |
| soy, seafood, lean meats, poultry, and unsalted nuts and seeds. | ½ cup cooked beans |
| Select seafood twice a week. Choose lean cuts of meat and ground beef that is at least 93% lean. | 1 tsp peanut butter |

#### Water

Drink water instead of sugary drinks.

Regular soda, energy or sports drinks, and other sweet drinks usually contain a lot of added sugar, which provides more calories than needed.

#### Activity

Don't forget physical activity!

Regular exercise can help you prevent disease and manage your weight.

Kids ≥ 60 min/day | Adults ≥ 150 min/week

---

**MyPlate, MyWins**

Healthy Eating Solutions for Everyday Life

ChosenMyPlate.gov/MyWins

Center for Nutrition Policy and Promotion
May 2016
CNBP-29

USDA is an equal opportunity provider, employee, and lender.
Qatar dietary guideline
Reading Food Labels to Manage Diabetes

- Labels include the total calories as well as the calories from fat

- General Guide to Calories per serving:
  - 40 calories is low
  - 100 calories is moderate
  - 400 calories or more is high
### Nutrition Facts

**Serving Size:** 1 cup (236ml)  
**Servings Per Container:** 1

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories</th>
<th>Calories from Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Daily Value*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fat</strong></td>
<td>5g</td>
<td>8%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>3g</td>
<td>15%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>20mg</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>120mg</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>11g</td>
<td>4%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>11g</td>
<td></td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>9g</td>
<td>17%</td>
</tr>
</tbody>
</table>

Vitamin A: 10%  
Vitamin C: 4%  
Calcium: 30%  
Iron: 0%  
Vitamin D: 25%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
Why Update the Nutrition Facts Label?

- Reflects updated scientific information, including the link between diet, chronic diseases, and public health
- Updated serving sizes are needed to reflect changes in amounts of foods consumed
- Format draws attention to calories and serving sizes, two important elements in making healthier food choices
## NEW LABEL / WHAT’S DIFFERENT

- **Servings:** larger, bolder type
- **New:** added sugars
- **Change in nutrients required**
- **Serving sizes updated**
- **Calories:** larger type
- **Updated daily values**
- **Actual amounts declared**
- **New footnote**

### Nutrition Facts

<table>
<thead>
<tr>
<th>Amount per serving</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>230</td>
</tr>
<tr>
<td>Total Fat</td>
<td>8g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>160mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>37g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>4g</td>
</tr>
<tr>
<td>Total Sugars</td>
<td>12g</td>
</tr>
<tr>
<td>Includes 10g Added Sugars</td>
<td>20%</td>
</tr>
<tr>
<td>Protein</td>
<td>3g</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>2mcg</td>
</tr>
<tr>
<td>Calcium</td>
<td>260mg</td>
</tr>
<tr>
<td>Iron</td>
<td>8mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>235mg</td>
</tr>
</tbody>
</table>

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.
Added Sugars

- FDA is requiring grams and % Daily Value for added sugars
- It is difficult to meet nutrient needs and calorie limits if consuming more than 10 percent of calories from added sugar
- Dietary patterns lower in sugar-sweetened foods and beverages are associated with a reduced risk of cardiovascular disease
- Design clarifies that added sugars are a subset of total sugars
The American Diabetes Association’s *Standards of Medical Care in Diabetes 2016* acknowledges that research addressing Glycemic Index and Glycemic Load in people with diabetes is “complex” and references that a few studies have resulted in a small decrease in A1c when a lower Glycemic Load is consumed.
MNT and Management of ABCs

2- In Treatment Targeting Hypertension

• Hypertension (defined as a blood pressure ≥140/90 mmHg) is an extremely common comorbid condition in diabetes, affecting ~20–60% of patients with diabetes, depending on obesity, ethnicity, and age.

• Hypertension substantially increases the risk of both macrovascular and microvascular complications, including stroke, coronary artery disease, and peripheral vascular disease, retinopathy, nephropathy, and possibly neuropathy.
DASH DIET, Other Recommendations

Dietary Approaches to Stop Hypertension (DASH) eating pattern:

• Restricting Sodium intake (2300mg/day)
• Increasing consumption of fruits and vegetables (8-10 serving /day)
• Low fat dairy products (2-3 serving/day)
• Reducing excess body weight.
• Increase level of activity (150min/wk)
• Smoking cessation.

• Avoid excessive alcohol consumption ( no more than 2 serving per day in men and no more than 1 serving per day in women)
<table>
<thead>
<tr>
<th>Food Groups</th>
<th>Serving Size</th>
<th>Recommended Servings/Day in the DASH Eating Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain*</td>
<td>1 slice bread, 1 oz dry cereal, 1/2 cup cooked rice, pasta, or cereal</td>
<td>6, 6–8</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1 cup raw, leafy vegetables, 1/2 cup cut-up raw or cooked vegetables, 1/2 cup vegetable juice</td>
<td>3–4, 4–5</td>
</tr>
<tr>
<td>Fruits</td>
<td>1 medium fruit, 1/4 cup dried fruit, 1/2 cup fresh, frozen, or canned fruit, 1/2 cup fruit juice</td>
<td>4, 4–5</td>
</tr>
<tr>
<td>Fat-free or low-fat milk and milk products</td>
<td>1 cup milk or yogurt, 1 1/2 oz cheese</td>
<td>2–3, 2–3</td>
</tr>
<tr>
<td>Lean meats, poultry, and fish</td>
<td>1 oz cooked meat, poultry, or fish, 1 egg</td>
<td>3–6, ≤ 6</td>
</tr>
<tr>
<td>Nuts, seeds, and legumes</td>
<td>1/3 cup or 1 1/2 oz nuts, 2 Tbsp peanut butter, 2 Tbsp or 1/2 oz seeds, 1/2 cup cooked legumes</td>
<td>3 per week, 4–5 per week</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>1 tsp soft margarine, 1 tsp vegetable oil, 1 Tbsp mayonnaise, 2 Tbsp salad dressing</td>
<td>2, 2–3</td>
</tr>
<tr>
<td>Sweets and added sugars</td>
<td>1 Tbsp sugar, jelly, or jam, 1/2 cup sorbet or gelatin, 1 cup lemonade</td>
<td>0, ≤ 5 per week</td>
</tr>
</tbody>
</table>

*Whole grains are preferable for most servings because of their higher fiber and nutrient content.
MNT and Management of ABCs

3- In Treatment Targeting Hyperlipidemia
TLC Diet

• The National Heart, Lung, and Blood Institute created the Therapeutic Lifestyle Changes (TLC) diet especially for people with high levels of cholesterol.
TLC Diet Recommendation

• Intake of saturated fat should be kept below 5-6 % of the total calorie intake
• Daily cholesterol should be kept below 200mg
• Sodium intake must be limited to 2400 mg per day
• 25-35% of daily total calories should come from fat intake (PUFA up to 10%, MUFA up to 20%)
• Physical activity must be maintain regularly along with diet, i.e. at least 150 min per week

Systematic review of randomized controlled trials (RCTs):
Compared to low CHO diets, low GI diet and high protein diets, Mediterranean diet was the most effective in increasing HDL-C and the only one that lowered Triglycerides.

Role of Clinical Dietitian in Weight management

Factors affecting calories in weight management:

• Age, gender, height, weight, and activity level.

Recommendation of calorie:

• Men, active women - 33cal/Kg
• Most women, sedentary men, and adults over 55 years - 29cal/Kg.
• Sedentary women, obese adults - 22cal/Kg.
• Pregnant, lactating women – (33- 37) Cal/Kg.

To lose (0.5 -1) Kg per week (a safe rate of weight loss), subtract (500 – 1000) calories from the total number of calories intake to maintain weight.
Physical Activity and Diabetes Management

Recommendations:

- All adults, and particularly those with type 2 diabetes, should decrease the amount of time spent in daily sedentary behavior.

- Structured lifestyle interventions that include at least 150 min/week of physical activity and dietary changes resulting in weight loss of 5%–7% are recommended to prevent or delay the onset of type 2 diabetes in populations at high risk and with prediabetes.

- Daily exercise, or at least not allowing more than 2 days to elapse between exercise sessions, is recommended to enhance insulin action.

• The recommended amount of exercise is 30 minutes per day 5 times week.

• Additional carbohydrate intake and/or insulin reductions are typically required to maintain glycemic balance during and after physical activity. Frequent blood glucose checks are required to implement carbohydrate intake and insulin dose adjustment strategies.
Thank you.
Diabetes Education at Qatar

Manal Musallam RN CDE, MPH
AAED of Diabetes Education
• 1875 Education first appears in the literature (Bouchardat, 1875).
• 1918 Diabetes education is recognized for improving clinical outcomes (Joslin, 1918).
• 1940 The UK offers diabetes education.
• 1973 AADE was established from multidisciplinary team.
• 1980 Diabetes education is recognized as a specialty (IDF Education Module 2011).
• 1990 evidence supports education and the role of the interdisciplinary team as an essential part of secondary prevention of complication.
• 2006 DSME identified the 7th self care behaviors and Empowerment model .
• 2011 DSME/S was identified by task force group from AADE and ADA.
In Qatar

2015
DE recognized in national Diabetes strategy as profession

2014
15 Multi-disciplinary DE certified by CANQ Qatar

2005
6 Nurses Certified DE by AAED

2000
4 nurses Certified DE by KSA

1997
2 nurses
Figure 31: Summary of HCP's resources to meet the patient demand along the patient pathway in Qatar
Diabetic patient or at risk of diabetes will receive high quality of education and training to improve their health status and quality of life in order to reduce burden of the disease.
Objectives of the Diabetes Education

• Provide the patient and their family with information that will enhance their knowledge and skills to manage diabetes.
• Empower patient and their family to participate in decision making.
• Update other health providers knowledge and skills related to diabetes management.
• Collaborate with other organizations in order to increase public awareness.
• Establish evidence based standards for diabetes education and care.
AADE Behavioral goals

7 Goals

- Healthy eating
- Being active
- Healthy coping
- Reducing risks
- Monitoring
- Problem solving
- Taking medication

(AADE2009)
Diabetes Education Outcomes

Immediate
- Learning*
  - Knowledge Skills

Intermediate
- Behaviour Change*
  - Exercise
  - Diet
  - Taking medication
  - Monitoring
  - Problem-solving
  - Reducing risk
  - Healthy coping

Post-Intermediate
- Clinical Improvement
  - Clinical Indicators
    - HbA1c
    - BP
    - Lipids
  - Process Measures
    - Eye exam
    - Foot exam
  - Other Measures
    - Smoking cessation
    - Aspirin use
    - Pre-pregnancy counselling

Long Term
- Improved Health Status
  - Overall Health Status
  - Quality of Life
  - Days Lost From Work or School
  - Diabetes Complications
  - Healthcare Costs
Diabetes Education Program

Diabetes Education

- Health Care Providers
- Patients
- Public Awareness
<table>
<thead>
<tr>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of North Atlantic Diabetes Course.</td>
</tr>
<tr>
<td>Diabetes Education foundation Course for Nurses</td>
</tr>
<tr>
<td>Michener Diabetes Education Course.</td>
</tr>
<tr>
<td>Patient Program</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>DESMOND Program</td>
</tr>
<tr>
<td>Diabetes Conversation Maps</td>
</tr>
<tr>
<td>Phone Reminder Program</td>
</tr>
<tr>
<td>One to One Diabetes Education</td>
</tr>
</tbody>
</table>
How Services provided?

- Referrals
- Clinics
- Home glucose monitoring
Adoption of DESMOND for Patient Education

- Training on the program started on April 2015 for the interested educators.
- April 2016 seven Educators are accredited as DESMOND trainer.
- Qatar is the first country using DESMOND in the MENA region.
- 2017 translation of DESMOND into Arabic started in collaboration with Leicester diabetes centre.
- First paper submitted to IDF.
<table>
<thead>
<tr>
<th>Stream</th>
<th>Abstract - Education and Integrated Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>Diabetes education</td>
</tr>
<tr>
<td>Abstract number</td>
<td>AD-0270</td>
</tr>
<tr>
<td>Abstract title</td>
<td>Crossing international boundaries with type 2 diabetes structured education DESMOND in Qatar</td>
</tr>
<tr>
<td>Co-authors</td>
<td>M. Musallam¹, M. Davies², K. Khunti², H. Daly³, J. Butler¹, C. Taylor³, L. Gray², B. Stribling³, R. Dughmosh¹, M. A. Jayyosi¹, Zirie¹, and A.B. Abou-Samra¹</td>
</tr>
<tr>
<td></td>
<td>¹Qatar Metabolic Institute, Hamad Medical Corporation, Diabetes, Doha, Qatar.</td>
</tr>
<tr>
<td></td>
<td>²University of Leicester, Leicester Diabetes Centre, Leicester, United Kingdom.</td>
</tr>
<tr>
<td></td>
<td>³University Hospitals of Leicester, Leicester Diabetes Centre, Leicester, United Kingdom.</td>
</tr>
</tbody>
</table>
Interactive visual & verbal tools designed to engage people with diabetes in meaningful conversation about five different diabetes as below:

1. living with diabetes.
2. How diabetes works.
3. Healthy eating & keeping active.
5. Ramadan & diabetes.
Conversation Map at HMC

Poor attendance
20%

Create competition conversation map

Attendance Increased Up to 150%
Conversation Map at HMC
Diabetes Competitions

Schools Competition

Ramadan Competition
الفحصات الدورية
المضاعفات
البنكرياس و وظائفه
الجلوكوز و مصادره
National Day
النشاط البدني
الدولية قطر
18 ديسمبر
Phone Reminder Program

- self-monitoring prescription
- pathway
- Re-education
Before Phone Reminder Program

GDM Patient Compliance
- GDM Patients in compliance with SMBG: 38%
- GDM Patients Non-compliance with SMBG: 62%

Type 2 DM Patients Compliance with SMBG
- Type 2 DM Patients in compliance with SMBG: 78%
- Type 2 DM Patients Non-compliance with SMBG: 22%
Post Phone Reminder Program

**GDM Patient Compliance**
- GDM Patients in compliance with SMBG: 98%
- GDM Patients Non-compliance with SMBG: 2%

**Type 2 DM Patient Compliance**
- Type 2 DM Patients in compliance with SMBG: 58%
- Type 2DM Patients Non-compliance with SMBG: 42%
### Diabetes Education Effect on HbA1C

<table>
<thead>
<tr>
<th>HbA1c</th>
<th>Before</th>
<th>After</th>
<th>reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 7.7%</td>
<td>26 pt. 6.7%</td>
<td>14 pt. 6.5%</td>
<td>0.2%</td>
</tr>
<tr>
<td>7.7 - 9.0%</td>
<td>26 pt. 8.4%</td>
<td>17 pt. 8.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>&gt;9.0%</td>
<td>69 pt. 11.4%</td>
<td>48 pt. 10.6%</td>
<td>0.8%</td>
</tr>
<tr>
<td>HbA1c (mean)</td>
<td>10.3%</td>
<td>8.9%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
Effect of HbA1C

- Deaths related to diabetes: 21%
- Microvascular complications: 37%
- Myocardial infarction: 14%

We are organizing different campaigns through the year like:

- World Diabetes Day.
- Diabetes Occasions (Ramadan, Hajj, …etc.)
- National Sport Day.
- Vaccination Campaign.
- School & Diabetes Campaign.
Examples

World Diabetes Day

Hajj

Ramadan
Educational Materials

- Signs and Symptoms of Hypoglycemia and Hyperglycemia
- Protection and Prevention Against Type 2 Diabetes
- Injection Techniques
- Insulin Pen
- Insulin Pump
- Diabetes and Hajj
- Fasting and Diabetes
Imam Mosques Workshops
Achievements

Certificate of Achievement

Mona Hussein ElGamal

has successfully completed a course

Fundamentals of Diabetes Education

Dr. Ken MacLeod
President

5/6/2015
Achievements

Stars of Excellence
Employee Awards and Recognition Program 2015

HMC Education Award
Rising Star

Presented to
Manal Musallam Othman

In recognition of achieving the highest standards in the A Multidisciplinary Diabetes Education Course Awarded on 4 November 2015

Hanan Al-Kuwari, PHD
Managing Director

STARS OF EXCELLENCE
Employee Awards and Recognition Program

HMC Spirit of Service Award
Glowing Star

Presented to
Diabetes Educators Team

In Recognition of Achieving Excellence in Service
Awarded on 23 May 2010

Dr. Hanan Al Kuwari
Managing Director
Thank you.