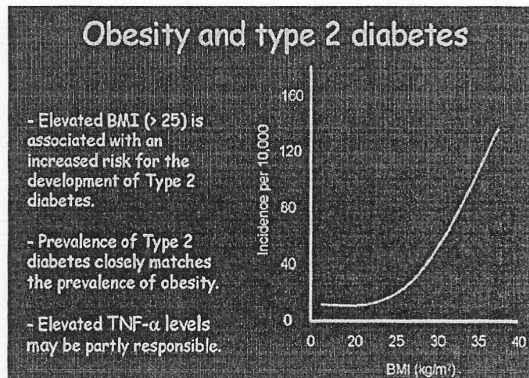
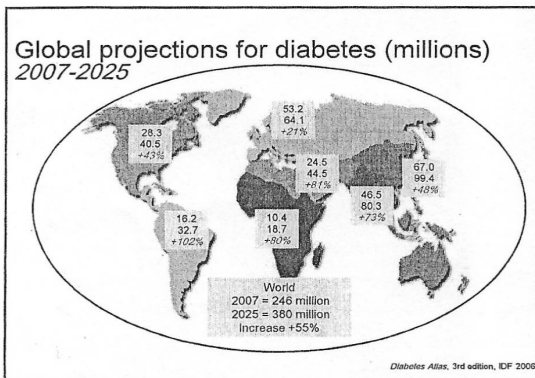


T2DM MED 341 FEB 2017

AlMaatouq MA, MD

OBJECTIVES:

1. SCOPE OF DIABETES
2. MAKING THE DIAGNOSIS
3. PATHOPHYSIOLOGY
4. DISEASE CONSEQUENCES
5. MANAGEMENT
6. CONCLUSION



Obesity in Saudi Arabia

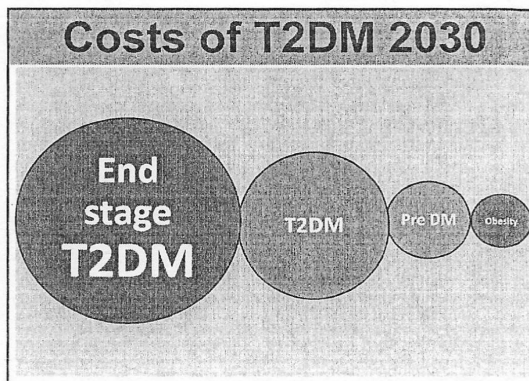
Mansour M. Al-Nozha, Yaqoub Y. Al-Mazrou, Mohammed A. Al-Maatouq, et al

Methods: This study is a community-based national epidemiological health survey, conducted by examining Saudi subjects in the age group of 30-70 years of selected households over a 5-year period between 1995 and 2000 in KSA.

Results: Data were obtained by examining 17,232 Saudi subjects from selected households who participated in the study. The prevalence of overweight was 36.9%. Overweight is significantly more prevalent in males (42.4%) compared to 31.8% of females (p<0.0001). The age-adjusted prevalence of obesity was 35.5% in KSA with an overall prevalence of 35.6% [95% CI: 34.9-36.3], while severe (gross) obesity was 3.2%. Females are significantly more obese with a prevalence of 44% than males 26.4% (p<0.0001).

Conclusion: Obesity and overweight are increasing in KSA with an overall obesity prevalence of 35.5%.

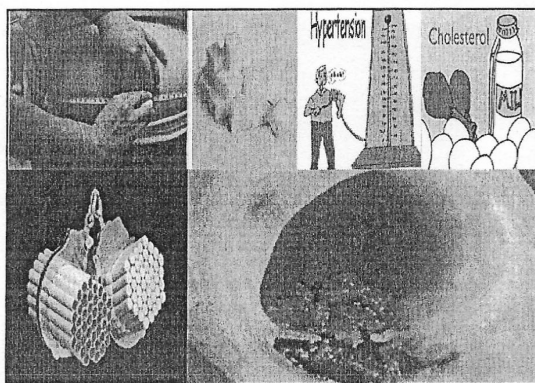
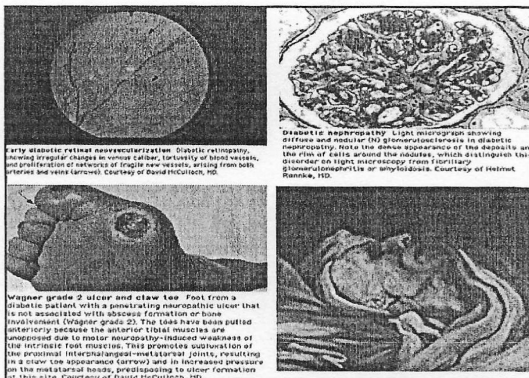
Saudi Med J. 2007 Apr ;28 (4):559-68



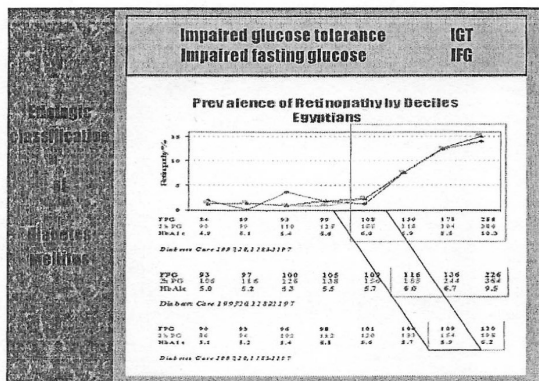
Diabetes mellitus in Saudi Arabia

Al-Nozha MM, Al-Maatouq MA, Al-Mazrou YY, et al

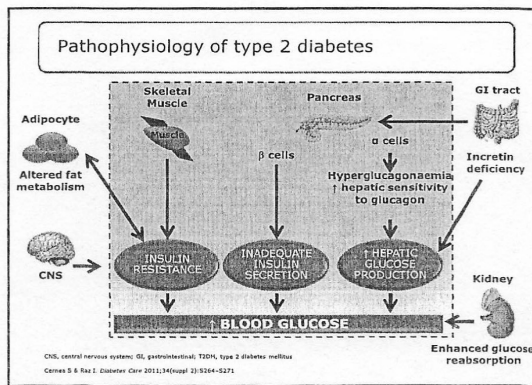
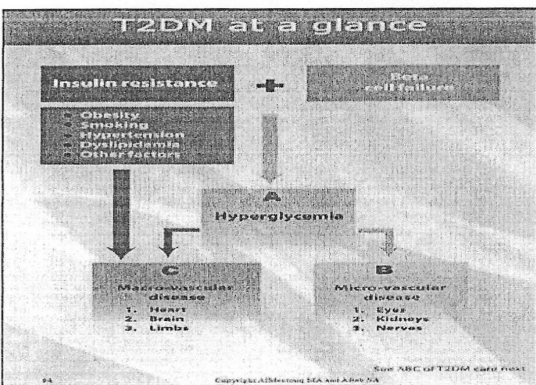
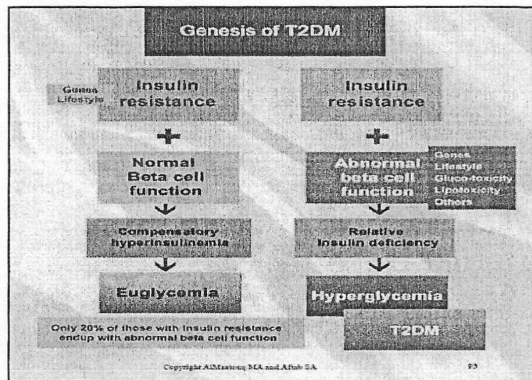
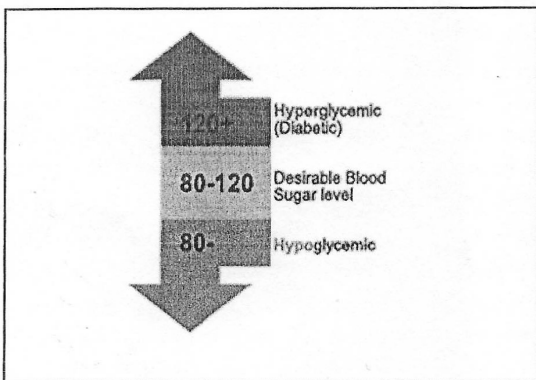
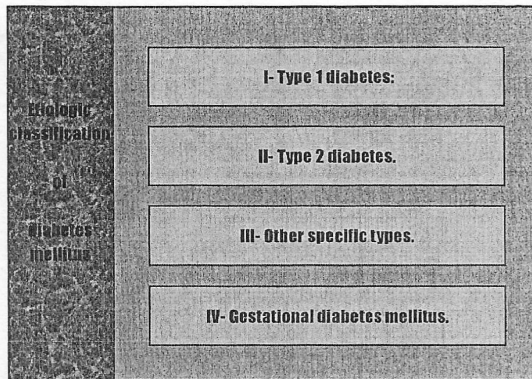
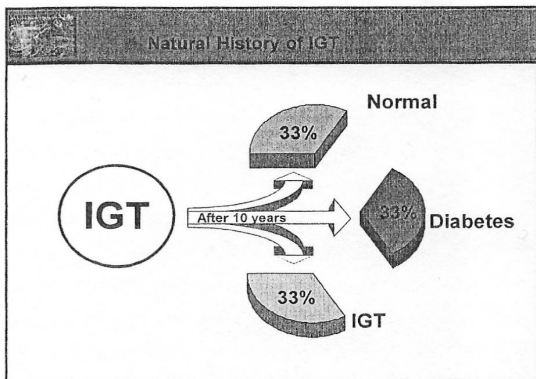
- OBJECTIVE:** Diabetes mellitus (DM) is a major public health problem worldwide, and it is a known risk factor for coronary artery disease (CAD). New recommendations for the diagnosis of diabetes have changed the epidemiology of DM. Therefore, we designed this study with the objective to determine the prevalence of DM among Saudis of both sexes, between the ages of 30-70-years in rural as well as urban communities. This work is part of a major national project: Coronary Artery Disease in Saudis study (CADISS) that is designed to look at CAD and its risk factors in Saudi population.
 - METHODS:** This study is a community-based national epidemiological health survey, conducted by examining Saudi subjects in the age group of 30-70-years of selected households over a 5-year period between 1995 and 2000. Data were obtained from history, fasting plasma glucose levels, and body mass index. The data were analyzed to classify individuals as diabetic, impaired fasting glucose and normal, using 1997 American Diabetes Association (ADA) criteria, which was adopted by the World Health Organization (WHO) in 1998, to provide prevalence of DM in the Kingdom of Saudi Arabia (KSA).
 - RESULTS:** A total of 17232 Saudi subjects were selected in the study, and 16917 participated (98.2% response rate). Four thousand and four subjects (23.7%), out of 16917 were diagnosed to have DM. Thus, the overall prevalence of DM obtained from this study is 23.7% in KSA. The prevalence in males and females were 26.2% and 21.5% (p<0.00001). The calculated age-adjusted prevalence for Saudi population for the year 2000 is 21.9%. Diabetes mellitus was more prevalent among Saudis living in urban areas of 25.5% compared to rural Saudis of 19.5% (p<0.00001). Despite the readily available access to healthcare facilities in KSA, a large number of diabetics 1116 (27.9%) were unaware of having DM.
 - CONCLUSION:** The overall prevalence of DM in adults in KSA is 23.7%. A national prevention program at community level targeting high risk groups should be implemented sooner to prevent DM. We further recommend a longitudinal study to demonstrate the importance of modifying risk factors for the development of DM and reducing its prevalence in KSA.
- Saudi Med J. 2004 Nov;25(11):1603-10.



What is the GOLD standard for the Diagnosis of Diabetes?



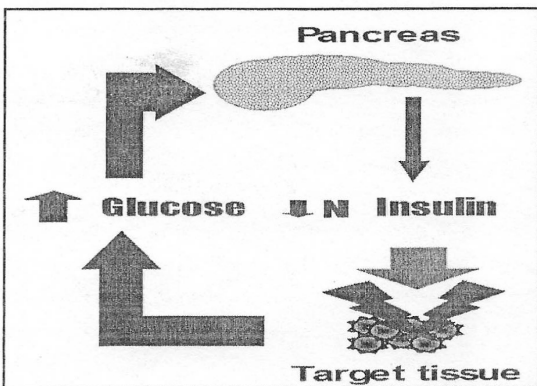
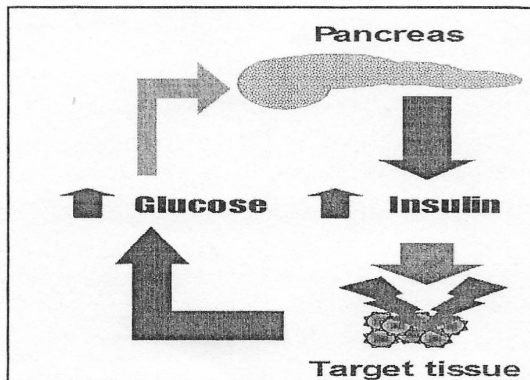
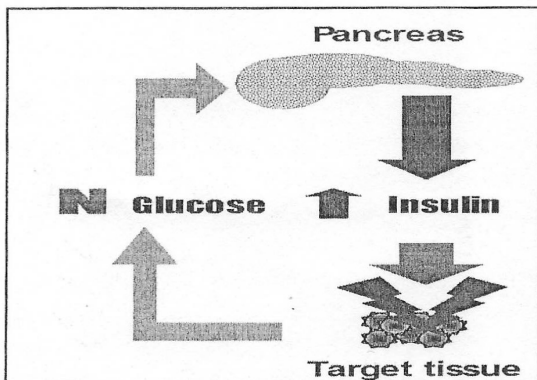
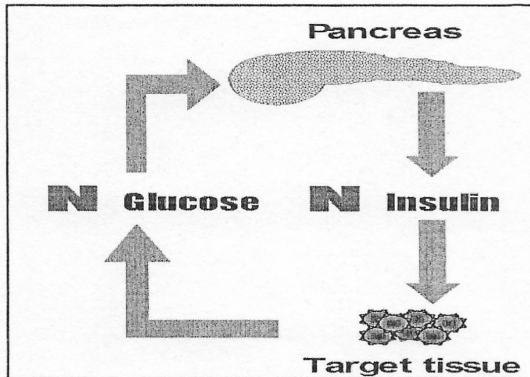
- ### Diagnostic criteria for T2DM
- 8 hours fasting plasma glucose value ≥ 126 mg/dL (7 mmol/L)
 - OR
 - Polyuria, polydipsia, unexplained weight loss and random plasma glucose value ≥ 200 mg/dL (11.1 mmol/L)
 - OR
 - 2 hour plasma glucose during a (75 g anhydrous glucose) OGTT ≥ 200 mg/dL (11.1 mmol/L)
 - OR
 - HbA1c $\geq 6.5\%$
- 1, 3 & 4 to be confirmed by repeat testing on a different day if no unequivocal hyperglycemia
- Copyright © 2007 American Diabetes Association





TNF-alpha may induce insulin resistance in obesity

The cytokine tumour necrosis factor- α (TNF- α) is produced from adipose tissue, and TNF- α levels are often elevated in obesity.

- Administration of TNF- α leads to insulin resistance.
- Over-expression of TNF- α in adipose and muscle of obese, insulin resistant diabetic subjects is positively correlated with insulin resistance.
- Polymorphisms at the TNF- α locus correlate with insulin resistance.
- TNF- α inhibits insulin receptor signalling in adipocytes.
- TNF- α deficiency (knockout mice) prevents diet-induced insulin resistance.



Patients with type 2 diabetes are at heightened risk of disabling complications versus non-diabetics

Complication	Relative Risk*
Blindness	↑↑ 20
End-stage renal disease	↑↑↑ 25
Amputation	↑↑↑ 40
Myocardial Infarction	↑↑ 2-5
Stroke	↑ 2-3
Lifespan	↓ 6 years

* Diabetics versus non-diabetics

Byrnes L. Eur Heart J. 2007; 28: 88-106

Burden of Type 2 Diabetes

15 Years Follow-up

100 Patients - Age 55

Complications

- Heart attacks: 27 patients
- Stroke: 10 patients
- Retinopathy: 23 patients

Premature Mortality

- Diabetes deaths: 28 patients
- Life expectancy: 5-7 years ↓

UKPDS 33. Lancet 1998; 352: 837-43

The ABC of T2DM care

Glycemic control is important. Non glycaemic factors are even more important towards outcome

A Glucose

- Glycemic control
- HbA1c/HbGM
- Hypox / illness
- Work / leisure
- Special events

B Microvascular

- Kidneys
- Eyes
- Feet
- Nerves
- Erectile Dysfunction

C Macrovascular

- BP
- Lipids
- Aspirin
- Smoking cessation
- Diet / Exercise

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1% reduction in risk of:

- Death from diabetes: -21%
- Heart attacks: -14%
- Microvascular complications: -37%
- Peripheral vascular disorders: -43%

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Benefits of intervention to reduce multiple risk factors – Danish Steno 2 Study

53% Risk Reduction with Intensive Therapy

Gaede P et al. NEJM 2003; 348: 383-393
Gaede P et al. NEJM 2008; 358: 580-591

T2DM: 2nd FU OPD visit Consolidation of therapy

1) BP

- ACE Inhibitor
- ARB
- Thiazide
- Beta Blocker / CCB

2) Proteinuria

- ACE Inhibitor
- ARB
- BP Control
- Nephrology

3) CVS

- Statins
- Diet
- Regular walking
- Aspirin

4) Eyes

- Macula
- Retina
- Comprehensive eye examination
- Ophthalmologist

5) Feet

- Vascular
- Infections
- Deformity
- Neuropathy

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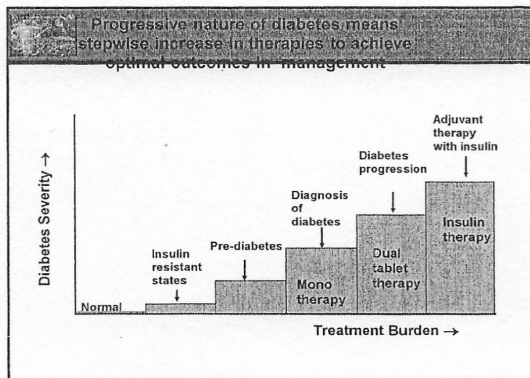
Lessons from major trials

- DM complications are present at diagnosis
- DM complications progress with time
- DM control predicts rate and state of complications
- Early and sustained control limits complications
- Management is multifaceted and complex
- Majority of patients are NOT at target

Guidelines need to address all concerns

Targets

1. HgbA1c: 7% Early Young No AT
2. HgbA1c: 8% Late Old W AT



PATHOPHYSIOLOGIC-BASED (DEFRONZO) ALGORITHM

Lifestyle + TRIPLE COMBINATION:
Metformin + PIO + GLP-1 Analogue

↓

HbA_{1c} < 6.0%

CONSENSUS

8579 THE CLIN

Optimising the medical management of hyperglycaemia in type 2 diabetes in the Middle East: pivotal role of metformin

Saudi Arabia, Kuwait, Egypt, Lebanon, UAE, Jordan

M. Al-Maatouq,¹ M. Al-Arouj,² S. H. Assaad,³ S. N. Assaad,³ S. T. Azar,⁴ A. A. K. Hassoun,⁵ N. Jarrah,⁶ S. Zatar,⁷ K. G. M. M. Alberti⁸

The burden of diabetes is high in the Middle East

The Middle East has largely been overlooked by guideline writers

Al-Maatouq M. Int J Clin Pract 2010; 64: 149-159

Recommended treatment algorithm for the Middle East

AlMaatouq MA. Int J Clin Practice 2010; 64: 149-159

Potential benefits of moderate (5-10%) weight loss in high risk patients with the metabolic syndrome

J P Despres. BMJ 2001; 322:718-720

Practical dietary advice

1. Salad: 1hour BEFORE the meal
2. ¼ - ½ what you are used to. No cheating.
3. 1 Fruit per meal (juice is fruit)
4. 2 DATES BID (1 extra date BID)
5. No Communal eating
6. Avoid what you can live without.

Make Your Diabetic Patients Walk

Long-term impact of different amounts of physical activity on type 2 diabetes

CHRISTINA DI LORENTO, MD
CAROLINE FANDELL, MD
PASCAL LAURIE, MD
CROCIERE MEDUNGO, MD
SERENA DI CICCIO, MD
NARAYANA PARASATHI, MD

ANITA RANCIHELLI, MD
CRISTINA PARONI, MD
CARLO TULLIANO, MD
FABIO SANTUCCIANO, MD
PIRROSCALO DI FIO, MD

Western and developing countries face two serious health problems: the rising prevalence of obesity and diabetes and the fact that people no longer used to be physically active in their daily lives (1,2). Major studies

- T2D
- n = 182
- 2 year follow up
- HbA1c baseline: 7.6%
- Diabetes duration: 7.6 years
- Advice for physical activity: moderate, aerobic endurance training (30-60% of max. HF), aim: > 10 MET/h /wk
- 7 visits, total of ca 2 h counseling, 1 visit every 3 Month

Di Loreto et al., Diabetes Care, 2005

Effects of physical activity in T2DM

	Walking / Hours / Week					
	0	1.5	4	5.5	7.5	12
Weight (kg)	+0.8	+0.6	+0.1	-2.2	-3.0	-3.2
Waist (cm)	+1.0	+1.0	-0.9	-3.8	-5.5	-7.1
HbA _{1c} (%)	+0.03	-0.06	-0.44	-0.8	-1.11	-1.19
BD syst. (mmHg)	-1.8	-1.5	-6.4	-5.5	-6.6	-9.2
BD diast. (mmHg)	-4.6	-2.4	-2.9	-4.8	-5.3	-7.1
Chol. (mg/dl)	-3.8	-5.6	-10.2	-10.7	-7.4	-10.9
LDL-Chol. (mg/dl)	-4.5	-7.1	-3.4	-5.8	-6.3	-6.3

e.g. 21-30 MET: 45 min walking (4 mph) /day, ca. 5 km/day p < 0.05
Di Loreto G, et al. Diabetes Care (2005)28: 125-1302

All medical risks

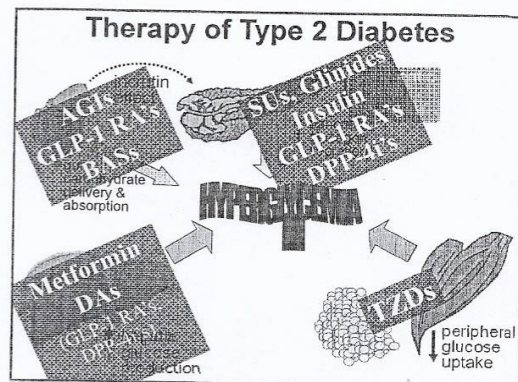
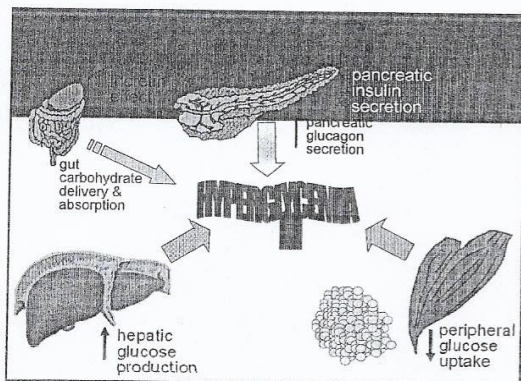
- Diabetes complications
- Poor glycemic control
- Pulmonary embolism
- Wound infection
- Gastrointestinal bleeding
- Gallstones
- Failure to lose weight
- Intractable vomiting/kwashiorkor (B1)
- Mortality (0.1%-2%)

Gastric bypass:

- Anastomotic leak with peritonitis
- Stomal stenosis
- Marginal ulcers
- Staple line disruption
- Nutrient deficiencies (iron, calcium, folic acid, vitamin B12)
- Dumping syndrome
- Small bowel obstruction
 - Internal hernia
 - Adhesions

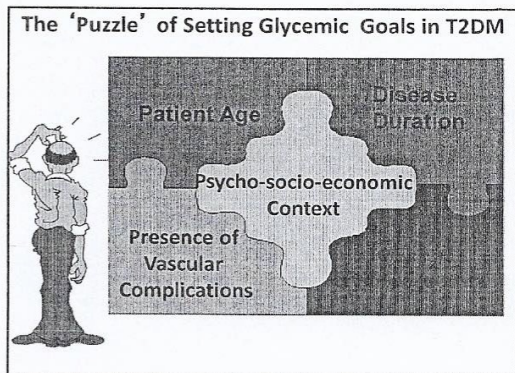
Common medical procedures

- Bariatric revision
- Esophageal dilatation
- Band or port infections
- Port disconnection
- Port displacement
- Biliopancreatic diversion:
 - Anastomotic leak with peritonitis
 - Protein-calorie malnutrition
 - Calcium, iron, folic acid, fat soluble vitamin (A,D,E,K) deficiencies
 - Dehydration
 - Steatorrhea
 - Small bowel obstruction
 - Internal hernia
 - Adhesions



Healthy eating, weight control, increased physical activity & diabetes education

Therapy	Insulin	Oral Agents	GLP-1 Agonists	SGLT2 Inhibitors	Diuretics	Beta Blockers	Statins	ACE Inhibitors	ARBs	Aspirin	Other
Monotherapy	Metformin										
Dual therapy	Metformin + Sulfonylurea										
	Metformin + DPP-4 Inhibitor										
Triple therapy	Metformin + Sulfonylurea + DPP-4 Inhibitor										
	Metformin + Sulfonylurea + GLP-1 Agonist										
Controlled/Injectable therapy	Basal-Bolus Insulin										
	Basal-Bolus Insulin + GLP-1 Agonist										



GO TO IT

Abbott's manual of **DIABETES PRACTICE**

Goals, Targets, Tools & Outcome monitoring

Adapting the guidelines to individualization of care

Casablanca March 2011

Abbott, MA, M.D. Arabi, A.L.D.

Out-Patients: T1DM, T2DM, COM
In-Patients: Critical Care, Surgery, Medicine, OB/Gyn, Psychiatry