

LEARNING RESOURCE MATERIAL

“NURSING CARE OF PATIENTS WITH DIABETES MELLITUS TYPE -II”

27th April 2015

CLINICAL SPECTRUM OF DIABETES

- Diabetes Mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycemia.
- **Worldwide prevalence-** 285 million in 2010. According to International Diabetes Federation- 438 million by 2030. Prevalence of DM is increasing & that of Type 2 – rising more rapidly. Type 2 DM seen in younger age group in developing countries
- Type 1 DM- highest incidence in Scandinavia. Type 2 DM- highest in Pacific Islands & Middle East. Type 2 DM- intermediate in India & US. Leading cause of end stage renal disease, nontraumatic leg amputations, and adult blindness in U.S. DM- 5th leading cause of death worldwide
- Asian countries: Prevalence increasing rapidly. Different diabetes phenotype. Onset at lower BMI, younger age, greater visceral adiposity, low insulin secretory capacity
- Complex interaction of genetic & environmental factors. Factors contributing to hyperglycemia. Reduced insulin secretion. Decreased glucose utilization. Increased glucose production.
- Diagnosis:

Category	FPG (mg/dL)	2h 75gOGTT	A1C
Normal	<100	<140	<5.7
Prediabetes	100-125	140-199	5.7-6.4
Diabetes	≥126**	≥200	>6.5

Or patients with classic hyperglycemic symptoms with plasma glucose ≥200

** On 2 separate occasions

ETIOLOGIC CLASSIFICATION OF DM:

Type 1 diabetes – Idiopathic or Immune mediated

Type 2 diabetes- predominantly insulin resistance with relative insulin deficiency, predominantly insulin secretory defect with insulin resistance

- Other specific types of diabetes
 - a. Genetic defects of beta cell function- MODY
 - b. Genetic defects in Insulin action

c. Disease of Exocrine pancreas

d. Endocrinopathies

e. Drug or chemical induced

f. Infections

- Gestational DM
- Type 1 diabetes: Pancreas make **too little or no Insulin**. Autoimmune or Idiopathic. 1 in 20 people with diabetes have type 1. Most people are under age 20 when diagnosed. Symptoms usually start suddenly. Features of diabetes are evident when 70-80% beta cells are destroyed. Concordance in identical twins ranges between 40-60%. Risk of type 1 DM is 10 fold in relatives of patients. Risk is 3-4% if the parent has type 1 DM & 5-15% in the sibling.
- Type 2 diabetes: **Insulin resistance & decreased secretion**. Higher prevalence than type 1 DM. Most people are over age 40 when diagnosed, but type 2 is becoming more common in younger age group. **Overweight**, sedentary lifestyle. **Family history** of diabetes. 1 in 4 with type 2 aren't aware they have it. Strong genetic component. Concordance of type 2 DM in identical twins is between 70- 90%. Risk is 40% if both parents are diabetic
- MATURITY ONSET DIABETES OF YOUNG (MODY): Monogenic forms of diabetes with single gene mutation
- **Diagnostic Criteria**
 1. Aged <25 years at onset
 2. Autosomal transmission of diabetes with 3 generations involved
 3. Absence of ketosis at any time
 4. Controllable without Insulin atleast in early stages of diseaseGenetic analysis needed to confirm the diagnosis

LATENT AUTOIMMUNE DIABETES OF ADULTS (LADA)

Diagnostic criteria

1. Positive for at least 1 of the autoantibodies associated with type 1 DM
2. Age at onset >30 years
3. Free from Insulin treatment for first 6 months after diagnosis
4. Usually lean & have poor beta cell function
5. Require Insulin treatment much earlier in course of disease than type 2 DM

CLINICAL SPECTRUM

- Wide range of symptoms & signs-

Secondary to HYPERGLYCEMIA	Related to COMPLICATIONS
<ul style="list-style-type: none">• Increased thirst• Increased urination• Excessive hunger• Blurring of vision	ACUTE COMPLICATIONS <ol style="list-style-type: none">1. DKA- diabetic ketoacidosis2. HHS- hyperglycemic hyperosmolar state

<ul style="list-style-type: none"> • Slow healing of cuts or wounds • More frequent infections • Weight loss • Nausea and vomiting • Tingling and numbness <p>>60% patients are asymptomatic</p>	<p>CHRONIC COMPLICATIONS</p> <p>1. Microvascular</p> <p>Eye disease- retinopathy Neuropathy- sensory & Nephropathy</p> <p>2. Macrovascular</p> <p>Coronary Heart Disease Peripheral arterial disease Cerebrovascular disease</p> <p>Nonvascular-</p> <p>i. Gastrointestinal ii. Genitourinary iii. Dermatologic iv. Infections v. Cataracts vi. Glaucoma vii. Periodontal disease viii. Hearing loss</p>
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Acute complications

1. DKA

May be initial presentation in type 1 DM

Symptoms- Nausea, vomiting, polyuria, polydipsia, abdominal pain, shortness of breath

Signs- tachycardia, dehydration, hypotension, kussmaul respiration, abdominal tenderness, lethargy & coma

2. HHS

Seen in elderly patient with type 2 DM

Symptoms- polyuria, weight loss, diminished oral intake

Signs- profound dehydration, hypotension, tachycardia, mental confusion, lethargy & coma

Absence of nausea, vomiting, abdominal pain & kussmaul breathing.

PHYSICAL EXAMINATION IN DIABETES PATIENTS

<p>Height, weight, BMI, waist & hip circumference, W/H ratio</p> <p>BP measurement</p> <p>Thyroid examination</p> <p>Skin examination</p> <p>Dilated retinal examination</p> <p>Dental examination</p> <p>Foot Examination</p> <p>Inspection</p>	<p><u>INVESTIGATIONS IN PATIENTS WITH NEWLY DIAGNOSED DM</u></p> <p>FBG & PPPG</p> <p>HbA1C</p> <p>Fasting lipid profile</p> <p>LFTs</p> <p>Urine complete examination & assessment of microalbuminuria</p> <p>RFTs</p> <p>Haemogram</p>
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Palpation of DPA, PTA & ankle brachial index Ankle & knee jerks Proprioception, vibration & monofilament sensation	TSH ECG, X-Ray Chest
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DIABETIC FOOT

WAGNER CLASSIFICATION FOR DIABETIC FOOT LESIONS

Grade 0 –	No open lesion(callus may be present)
Grade 1 –	Superficial Ulcer
Grade 2 –	Deep Ulcer to Tendon, Capsule or Bone
Grade 3 –	Deep Ulcer with abscess, osteomyelitis, joint sepsis
Grade 4 –	Localized gangrene
Grade 5 –	Gangrene of entire foot
	Diabetic Foot, Charcot joint ,Warm, inflamed and swollen joint

CURRENT FACTORS AND LIFE STYLE CHOICES PREDISPOSING TO DM

- ☞ Overweight and obesity are complex health problems that affect more than two-thirds of adults globally.
- ☞ Many health conditions are associated with overweight and obesity including hypertension, CAD and type 2 diabetes.
- ☞ Health care practitioners are advising overweight or obese individuals to manage weight by lifestyle changes.
- ☞ Fortunately, lifestyle changes including healthy eating patterns, increased physical activity, and weight management often improve the risk factors associated with obesity.

FACTS

- ☞ Prevalence of type 2 diabetes is 3–7 times higher in obese (BMI >35 are 20 times more likely to develop diabetes).
- ☞ Obesity complicates the management of type 2 diabetes by increasing insulin resistance and blood glucose concentrations
- ☞ It further increases the risk of cardiovascular complications and mortality in patients with type 2 diabetes.

The recommended lifestyle interventions include:

- ☞ Exercise goal:
 - ☞ Moderate intensity exercise : 2½ hrs each wk
 - ☞ High intensity exercise : 1¼ hrs each wk
- ☞ Losing weight gradually to achieve a healthy BMI
- ☞ Replace refined carbohydrates with wholegrain foods
- ☞ Increase intake of vegetables and other foods high in dietary fiber.
- ☞ Reducing the amount of saturated fat in the diet
 - ☞ Improves lipid profiles
 - ☞ Improves blood sugar control, Insulin sensitivity of both skeletal and adipose tissue

- ☞ Exercise appears to decrease insulin resistance by activating glucose transporters. (This effect is transient and deteriorates within 72 hours) leads to an overall sense of well-being. When combined with dietary lifestyle intervention, helps prevent type 2 diabetes

Type Of Exercise: Moderate intensity : *2½ hrs each wk for 3-4 times a wk for 30-40 min a day*:- Brisk walking, Cycling on plains, Hiking, Gardening, Weight lifting

Vigorous intensity: *1¼ hrs each wk for 3-4 times a wk for 30-40 min a day*

Jogging, Swimming, Cycling rapidly, Football, Skipping

Precautions for Diabetics who use insulin;

- Wear well-fitting, protective footwear. Drink adequate liquids before, during, and after exercise
- to prevent dehydration, which can upset blood sugar levels.
- Measure blood sugar before, during, and after exercise to determine body's response to exercise. (If the pre-exercise RBS > 250 mg/dL postpone exercise)
- Consider a decrease insulin dose by about 30 percent during exercise.
- Choose an insulin injection site away from exercising muscles
- Keep rapidly absorbed carbohydrates on hand.
- Eat a snack 15 to 30 minutes before exercise, and again every 30 minutes during exercise
- Eat a source of slowly absorbed carbohydrates immediately after exercise to counter a post-exercise drop in blood sugar levels.

Importance of Nutrition advice:

- ☞ Diabetes is a metabolic disorder affecting carbohydrate , fat and protein metabolism.
- ☞ Proper dietary advice is an effective tool in combination with physical exercise
- ☞ Sustained dietary restriction improves Hb1Ac (in 12 months). Recommends caloric distribution of **40% CHO, 20-30% from proteins and 30-35% calories from fat.**
- ☞ Min. CHO intake should be no less than 130 g/day
- ☞ CHO source –**low GI and fibre intake** should be at least 20-35g/day
- ☞ Both protein and fat sources should be **low in saturated** and **omit trans fats.**
- ☞ Guidelines recommend **decreasing the daily maintenance caloric intake by 250-500 cal.**
- ☞ **Sodium <6 g /day** and if hypertensive then <3g/day

Smoking & diabetes:

Over 25% of people newly diagnosed with diabetes are smokers.

- ☞ Diabetics who quit smoking can decrease their risks.
- ☞ Most people who smoke find it difficult to quit
- ☞ Prescribe nicotine replacement treatment, if needed.

Smokers with diabetes have an increased risk of the following: Death (heart attacks and strokes), High LDL, cholesterol levels, Worsened blood sugar controlled as compared to non-smokers, Nerve damage from diabetes, Kidney disease leading to dialysis

Alcohol and Diabetes:

There is no need for people to give up alcohol but needs to be extra careful if pre-diabetic .

- ☞ Alcohol intake significantly increases the risk of hypoglycemia
- ☞ Moderate amounts cause hyperglycemia

- ☞ Excess alcohol hypoglycemia
- ☞ Beer and wine contain CHO and cause hyperglycemia.
- ☞ Alcohol stimulates appetite, which can cause overeating
- ☞ Alcohol interacts with the oral diabetes medicines or insulin
- ☞ Alcohol may increase triglyceride levels
- ☞ Alcohol may increase blood pressure.

Treatment and follow up:

Routine medical care is important to long-term health

- ☞ It helps in preventing, detecting, and slowing the progression to diabetes.
- ☞ A regular schedule for visits, screening, and monitoring tests are advised.

Stress management: Perform yoga/meditation.

- ☞ Perform deep breathing exercises (avoid if hypertensive), Listen music Visit place of worship, Share your problems with your family members or friends.

Sleep and Diabetes: Some research suggests that not getting enough sleep may impair insulin use and increase the risk for obesity.

- ☞ It is always wise to improve sleep habits

Health learning: For more education about disease and health:

- ☞ Read health magazines/books/newspaper.
- ☞ Talk to Friends/family
- ☞ Watch TV/radio.
- ☞ Surf internet websites for diabetes health
- ☞ Attend health education programmes/camps.

2.ASSESSMENT: A KEY TO PERSON CENTERED MANAGEMENT

Assessment of diabetes include:

Clinical manifestations in Type 1 will present themselves over a shorter time frame. The clinical manifestations include:

1. Polyuria: increased frequency of urination
2. Polyphagia: Increased appetite
3. Polydipsia: Frequent thirst

Clinical manifestations in Type 2 will appear over a long period of time and may be mistaken for other health problems and not diabetes.

1. Many people have diabetes an average of 5-7 years before diagnosis
2. Since many people with Type 2 are older, it is important to not just assume the symptoms are because someone is elderly. It is important to talk to your patients about the symptoms they are having and their risk factors.
3. Hyperglycemia causes you to be fatigued.
4. Dry skin
5. Numbness and tingling not only in feet, but hands/fingers.
6. Diabetes is the number one cause of preventable blindness.
7. Increased blood sugar interferes with the healing process.

8. Increased sugars also cause yeast infections
9. Sexual dysfunction can occur in both men and women as a clinical manifestation.

The three primary criteria for testing for diabetes in asymptomatic adult individuals

1. Testing should be considered in all adults who are overweight ($\text{BMI} \geq 25 \text{ kg/m}^2$) and have additional risk factors¹
2. In the absence of criteria (risk factors on previous slide), testing diabetes should begin at age 45 years
3. If results are normal, testing should be repeated at least at 3-year intervals, with consideration of more frequent testing depending on initial results and risk status
Age is a major risk factor for diabetes; therefore, testing of individuals (using A1C, FPG, or 2-hour OGTT) without other risk factors should begin no later than at age 45 years. Given the need for follow-up and discussion of abnormal results, testing should be conducted within the health care setting

THE DIAGNOSIS OF GDM :

when any of the following plasma glucose values are exceeded:

Fasting $\geq 92 \text{ mg/dL}$ (5.1 mmol/L)

1 h $\geq 180 \text{ mg/dL}$ (10.0 mmol/L)

2 h $\geq 153 \text{ mg/dL}$ (8.5 mmol/L)

Screening Options

- ☐ HbA1C
- ☐ Fasting glucose
- ☐ Oral Glucose Tolerance test

Regular monitoring of HbA_{1c}, which reflects a measure of glycemia over the previous 2–3 months, should be undertaken to ensure that patients are meeting and maintaining glycemic goals.

- ☐ Regular assessment of glycemia should lead to more proactive management of diabetes. For example, two consecutive measurements of $\text{HbA}_{1c} \geq 7.0\%$ should lead to a review of treatment, which in turn can reap significant benefits in terms of patient outcomes.
- ☐ $\text{HbA}_{1c} > 8\%$ is a sign of inadequate control for most people.
- ☐ HbA_{1c} targets need to be individualised, taking into consideration the patient's age and co-morbidities.

- ☐ **Monitor HbA_{1c} every 3 months in addition to regular glucose self-monitoring**

The *Global Partnership* has identified several key areas that will help the diabetes care team to increase the proportion of individuals achieving good glycemic control and thus decrease the risk of complications.

These include the need to clarify the definition of good glycemic control

- ensure frequent monitoring of glycemia
- adopt a holistic approach to disease management
- increase involvement of specialist care units.

Self-monitoring of blood glucose (SMBG) by the individual constitutes a crucial component of diabetes management.

It is imperative for healthcare providers to evaluate each individual's monitoring technique – both initially and at regular intervals thereafter – in order to ensure the accuracy of results. Benefits of self-management include improved HbA_{1c}, avoidance of hypoglycemia and increased lifestyle flexibility. Through the provision of education, the multidisciplinary team approach can ensure that the individual with diabetes is motivated and informed with respect to interpreting blood glucose results and initiate appropriate changes.

There is evidence that regular self-monitoring of blood glucose (SMBG) increases the proportion of individuals with type 2 diabetes who achieve their glycemic targets.

For example, in an assessment of data from > 3,000 clinic visits, the proportion of individuals achieving HbA_{1c} ≤ 8% increased in those who regularly self-monitored blood glucose (70%) compared with those who reported irregular or no self-monitoring (18% and 22%, respectively). Given the well-established link between elevated postprandial glucose (PPG) levels and cardiovascular risk,²⁻⁴ it is also important that patients monitor PPG as part of their SMBG schedule. Results should be discussed regularly with the other members of the diabetes care team so that the treatment regimen can be adjusted accordingly where necessary.

Blood Pressure: Done at every visit

- ▣ Target is <130/<80
- ▣ Target <140/<90

Fasting lipid levels are measured three monthly until stable and then 6 - 12 monthly thereafter. It is important that management should be individualised.

- ▣ **Nephropathy** : Accounts for 50% of patients with ESRD, Earliest clinical sign of nephropathy is *microalbuminuria*. If exceeds 30mg/24h on two consecutive random urines, need 24h urine sample
- ▣ **LFT: Testing of LFTs is recommended for people with diabetes:**
- ▣ **Ketones** : Check in pregnancy, During illness, If BS >240
- ▣ **Retinopathy Screening:** Type 1 annual starting after age 10 or after 5 years post diagnosis
 - Type 2 annual starting shortly after diagnosis
 - Consider less frequent if one or more normal exams (not usually done)
- ▣ **Neuropathies** : Group of diseases that affect all types of nerves. Includes peripheral, autonomic and spinal nerves. Prevalence increases with duration of the disease and degree of glycemic control. Screen at diagnosis and annual thereafter
- ▣ **Foot and Leg Problems: Sensory loss**
 - Every visit: visual inspection of skin, nails, lesions, color, deformity edema
 - Foot inspection every visit plus annual/prn:
 - Filament testing
 - Vibratory testing (128 HZ)
 - Reflexes
 - Teaching patient foot care-inspect feet and shoes daily
 - Examine feet every time goes to doctor
 - See podiatrist at least annually
 - Closed toe shoes
 - Trimming toenails

- Good foot hygiene
- Glycemic control is the key to preventing complications

BLOOD GLUCOSE MONITORING	URINE TESTING:
<p>✗ The Goal: Maintain blood glucose within target range.</p> <p>✗ Immediate benefit: Identification, treatment, and prevention of high and low blood glucose levels.</p> <p>✗ Long-term benefit: Decrease risk of long-term complications associated with hyperglycemia. Maximize health.</p> <p>✗ Challenge: Many variables can impact blood glucose. These variables include insulin, food, activity, stress, injury, and illness.</p> <p>Frequency and Timing of Monitoring:</p> <p>Insulin</p> <ul style="list-style-type: none"> ✗ 3 or more times a day or as per the protocol of agencies ✗ Fasting ✗ Before meals ✗ 2 hours after meals ✗ Bedtime <p>OR As per the specification for an individual patient</p> <ul style="list-style-type: none"> ✗ Regularly scheduled checks: ✗ Routine monitoring before meals and snacks ✗ Before, during and/or after physical activity <p>Extra Checks May Be Necessary:</p> <ul style="list-style-type: none"> • Hypoglycemia or hyperglycemia symptoms • Change in diabetes management • Periods of stress or illness 	<p>For glucose ; as renal threshold for glucose is 180mg/dl. And if level is above this then glucose is excreted in the urine and</p> <p>✗ presence of ketoneurea also indicate fat breakdown and some time may be associated with under nutrition level and hypoglycemic state.</p> <p>Blood Glucose Monitoring ASSESSMENT: Client's understanding</p> <ul style="list-style-type: none"> ✗ Health history ✗ Specific conditions of specimen collection ✗ Site selection ✗ Client's ability to self-test ✗ Presence of signs & symptoms glucose alteration ✗ Calibration of equipment <p>Blood Glucose Monitoring PLANNING IMPLEMENTATION Preparation</p> <p>Advances in Blood Glucose Monitoring Alternate site-testing</p> <ul style="list-style-type: none"> ✗ Continuous glucose monitors ✗ Non-Invasive ✗ Semi-Invasive ✗ Surgical ✗ Laser <p>HypoMon Silicon Micro Needle GlucoWatch Biographer REAL-Time Continuous Glucose Monitoring System Cell Robotics' Lasette</p>

DIABETIC MEDICATION UPDATE: ORAL MEDICATIONS

INDICATIONS

Random Blood Sugar < 300 mg/dl,
Fasting Blood Glucose < 250 mg/dl &
Inadequate control after exercise & diet therapy.

Types of oral medications

- Biaguanides: metaformin
- Sulfonylureas
- Meglitinides: repaglinide, nateglinide.
- α -glucosidase inhibitors : acarbose , miglitol.
- DPP-4 inhibitors :sitagliptin, saxagliptin.
- Bile acid sequestrants: colesevelam
- Dopamine-2 agonists : bromocriptine
- GLP-1 receptor agonists : canagliflozin
- Amylin mimetics

NURSES ROLE

Extensive education & self management of newly diagnosed.

Instruct the client:

- Healthy eating
- Regular exercise
- Taking medication safely, regularly & at specified times.
- Performing SMBG.
- Performing routine foot care.
- Developing coping skills
- Utilizing the health care system.

Monitoring drug effectiveness, side effects, and complications.

INJECTABLE MEDICINES IN DIABETES : INSULIN

Type - 1 DM : Insulin (essential for survival)

Type -2 DM :Patients sooner or later also require insulin to control blood sugar

Various Types Of Insulin

- Human insulin
- Short acting
- Long acting
- Designer insulins/analouges

Created by altering amino acid sequence of human insulin by means of genetic engineering

By adding retarding agents i.e. zinc & protamine

Time of onset and duration of action of regular insulin can be prolonged

Various Types Of Insulin

1. **Regular insulin** :Most commonly short acting insulin used, Onset of action 30-60 min, Peak-2-4 hrs. Duration 6-8hrs, given 30 min before food. Used as postprandial insulin In insulin pumps, Post operative control in major surgeries
2. **Neutral protamine hagedorn NPH/LENTE insulin** :Intermediate acting insulin, Onset of action 1-2 hours, Peak 4-8 hours, Duration of action 10-16 hours, Given just before bedtime

Used as basal therapy, If given before dinner causes nocturnal hypoglycemia

3. Premix Insulin

Combination of regular and NPH insulin, Available as 30:70, 25:75, 50:50, Lack of flexibility in adjusting dose, Used in Type II DM, Type I DM at time of diagnosis, Gestational diabetes

4. Insulin Analouges

Rapidly acting (Lispro/ Aspart/ Glulisine) : Onset 5-15 min, Peak ½ - 2 hrs, Lasts 2-5 hours
Advantages

Convenient admistration just prior to meals, Faster onset of action, Shorter duration of activity, Decreased post prandial hyperglycemic peaks

5. Long acting Insulins

Glargine , Detemer

Onset short, Provides basal insulin for 20-24 hrs ,Ones a day, Peakless

Fewer hypoglycaemic episodes, Cannot be mixed with regular insulins, Expensive

Storage

- Once opened keep for a month in fridge or at room temp.
- Must never be frozen, store away from source of heat
- If refrigeration not available – Frio bags available
- May be damaged by direct sunlight or vigorous shaking (roll gently between palms of hand to warm)
- Cold injection can be painful

Insulin practicalities

Insulin preparations can be clear or cloudy

Regular insulin is usually clear

Intermediate acting NPH/LENTE is usually clear

Exception is long acting insulin glargine which is a clear solution

Wash hand thoroughly before procedure

Insulin Injection Techniques

- Clean the rubber stopper of insulin vial with spirit
- Remove the plastic guard of the insulin syringe
- Draw in quantity of air equivalent to insulin dose to be withdrawn
- Inject the air into the vial
- Invert the vial & withdraw the required amount of insulin
- Insulin Injection Techniques
- Clean the skin and pinch up a fold of skin at inj. site
- Inject at 90 degree to the skin surface (subcutaneously)
- If two different types of insulin have to be mixed

- Always withdraw the clear insulin before cloudy insulin
- Insulin pens need not be refrigerated
- Discard disposable pens once insulin is exhausted
- Permanent pens use cartridges (Can be replaced)

Injection Technique: Important points

Commonly used (30 G needles)

Pain free inj. (31 G needles) e.g. Insulin pens

Replace insulin syringe or pen needles after 3 – 4 pricks as

- Loss of sharpness
- Increased pain

STANDARDIZED PROCEDURES FOR THE SAFE USE OF INSULIN

- Protocols for continuous insulin infusions in various settings and patient populations.
- Protocols for high-risk transitions of insulin therapy (e.g., critical care infusion to general ward).
- Conversion from infusion to intermittent subcutaneous administration.
- Patients not eating.
- Patients who are eating intermittently.
- Patients on continuous enteral nutrition.

THE ROLE OF THE NURSE IN DRUG ADMINISTRATION

- Patient's Rights
- Because of the risks involved in drug administration patients have the right to:
 - - be informed of the name, purpose, action & potential side effects of drugs
 - - refuse a medication regardless of the consequences
 - - receive labelled medications safely in accordance with the five (5) rights
 - - be adequately informed of the experimental nature of any drug and sign a written consent
- - not receive unnecessary medication

Nurses Competency

- Insulin therapy is a dynamic process in hospitalized patients, it is necessary that caregivers possess the knowledge to make critical decisions. All individuals who prescribe, dispense, prepare, administer, and monitor insulin should demonstrate knowledge and have ready access to information regarding insulin therapy management
- Appropriate assessment of nutritional intake.
- Potential insulin adverse effects.
- Cautions and warnings for insulin therapy.
- Potential drug–drug interactions.
- Potential for errors in providing insulin therapy.
- Proper storage and handling of insulin products and devices.
- Specifics regarding practices for safe insulin use within the organization.
- An accurate and complete history of current insulin therapy should be obtained and recorded
- Assessment of patient understanding/knowledge of diabetes and treatment

- **Administration of Insulin**

- 1. Proper patient identification
- 2. Insulin should be measured only using correct size insulin syringes or appropriate insulin delivery devices (e.g., insulin pens).
- 3. Insulins should be mixed only according to manufacturer's recommendations.
- 4. An independent double check with another caregiver should occur prior to administration
- 5. Whenever appropriate, patient and/or family should provide additional double check.
- 6. Patient should be evaluated for signs or symptoms of hypoglycemia.
- 7. When insulin doses are measured in an insulin syringe, the doses should be prepared at the patient's bedside.

Equipment required

- U100 disposable insulin syringe with 8mm needle
- Vial of insulin
- Or
- Pre loaded insulin device with appropriate needle
- Owen Mumford Uniguard Needle Remover (acute sites) or Novofine Needle Remover (community)
- Sharps box
- Gloves
- Blood glucose meter

Remembrance of the nurses

- The insulin syringe or pen device must not be prepared and stored in advance of the procedure
- Do not draw insulin from a pen cartridge using a needle or insulin syringe
- Report to a supervisor any bleeding from the injection site, pain following administration or if insulin appears at the site of injection
- Report any hypo- or hyperglycaemia on BG testing to the patient's diabetes team

DIABETES CARE EMERGENCIES: HYPOGLYCAEMIC AND HYPERGLYCAEMIC EPISODES

People with diabetes suffer from diabetic complications that may arise due to erratic blood sugar levels, missed meals, accidental overdose of medications, or too much strenuous exercise. These things could affect the sensitive body of a person with diabetes and could lead to serious incidences of hypoglycemia or hyperglycemia.

- Uncontrolled blood sugar often contributes to the incidence of diabetic emergencies and complications. Individuals who experience blood sugar levels that are too high or low for prolonged periods of time may develop conditions that could lead to a coma.
- Hypoglycemia results from excessively low blood sugar levels caused by either insufficient food consumption or the presence of too much insulin.

- **Hypoglycemia** : Hypoglycemia or low blood glucose is a clinical state associated with <55mg/dl or low plasma glucose with typical symptoms.

MILD HYPOGLYCEMIA (Warning Sign)

- mainly adrenergic or cholinergic symptoms

- Pallor
- Diaphoresis
- Tachycardia
- Palpitations
- Hunger
- Paresthesias

MODERATE HYPOGLYCEMIA (<40 mg/dL)

- mainly neuroglycopenic symptoms

- Inability to concentrate
- Slurred speech
- Slower reaction time
- Somnolence
- Confusion
- Irrational behaviour
- Blurred vision
- Extreme fatigue

SEVERE HYPOGLYCEMIA (<20 mg/dL)

- Associated with severe impairment of neurologic function
- Completely disoriented behavior
- LOC
- Coma

Seizure

WHAT TO DO?

1. First:

- Check
- Call
- Care

2. Then:

Rapid ABC Assessment

- Is the patient's airway patent?
- Is the patient's breathing effective?
- Is the patient's circulation effective?
- Looking for the signs and symptoms
- Always ask two very important questions to determine the nature of the problem:
 1. Have You Eaten Today?"
 2. "Have You Taken Your Medication Today?"

DO NOT do give **nothing** by mouth if the victim is **unconscious**.

Treatment : MILD HYPOGLYCEMIA

- Test Blood Glucose
- Oral carbohydrates (at least 15gm)

Sources include:-

- Three glucose tablets (5g each)
- 2 ½ cups of fruit juice

- ½ to ¾ cup regular soda
- 1 cup of milk
- 6 to 10 hard candies
- 2 to 3 teaspoons of honey
- If patient is unable to take orally give IV dextrose

MODERATE TO SEVERE HYPOGLYCEMIA

- Dextrose - 50mL of 50% dextrose IV bolus after blood draw followed by 10% dextrose
- Glucagon – 1mg IM or SC can be given
- Effective in treating hypoglycemia only if sufficient liver glycogen present
- Patient is urged to eat as soon as possible

PREVENTION: Patient education

- Knowing signs and symptoms of hypoglycemia
- Take meals on a regular schedule
- Carry a source of carbohydrate
- Self monitoring of blood glucose
- Take regular insulin at least 30 min before eating.

Diabetic Ketoacidosis : Caused by an absence of or inadequate amount of insulin resulting in abnormal metabolism of carbohydrate, protein, and fat

- Blood glucose level of greater than 250 mg/dL
- Clinical features
 - Hyperglycemia
 - Dehydration
 - Acidosis
 - Nausea/vomiting
 - Abdominal pain
 - Generalized weakness
 - Confusional state
 - Fever, dysuria, coughing
 - Chest pain
 - Palpitations
 - Thirst/polyuria
 - Shortness of breath
 - Malaise/lethargy

Assessment of DKA: Blood glucose levels vary between 300 to 800 mg/ dL

- Severity of DKA is not related to blood glucose level
- Ketoacidosis is reflected in low serum bicarbonate and low pH; low PCO₂ reflects respiratory compensation
- Ketone bodies in blood and urine
- Electrolytes vary according to water loss and level of hydration

Prevention : Assess for underlying causes, Diagnosis and proper management of diabetes.

- **Treatment of DKA:** Stabilize the patient's airway, breathing, circulation
- Cardiac monitoring and pulse oxymetry.
- Monitor serum glucose hourly and urine ketone
- Rehydration with IV fluid
- 2-3L of 0.9% saline over first 1–3 h (10–15mL/kg per hour)
- IV continuous infusion of regular insulin

- Reverse acidosis and restoration of electrolyte balance
 - Determine and treat any underlying causes of DKA eg. pneumonia, UTI and MI
- MONITOR**
- Blood glucose every 1–2 h; , EKG and electrolyte levels: potassium, Blood pressure, pulse, respirations, mental status, fluid intake and output every 1–4 h.

Hyperglycemic-Hyperosmolar Nonketotic Syndrome

- Hyperosmolality and hyperglycemia occur due to lack of effective insulin; ketosis is minimal or absent
- Hyperglycemia causes osmotic diuresis with loss of water and electrolytes; hypernatremia and increased osmolality occur
- Manifestations include hypotension, profound dehydration, tachycardia, and variable neurologic signs due to cerebral dehydration
- High mortality

CLINICAL FEATURES:

Usually elderly individual, type 2 DM

- Due to lack of effective insulin; ketosis is minimal or absent
- Mental confusion, lethargy, and coma
- Absence of nausea, vomiting, abdominal pain
- Frequent precipitants – pneumonia, sepsis, stroke MI, etc.,
- hypotension, profound dehydration, tachycardia, and variable neurologic signs due to cerebral dehydration

Treatment: IV FLUIDS

- 1–3L of 0.9% normal saline over the first 2–3 h. If the serum sodium >150 meq/L, 0.45% saline should be used.

INSULIN

- IV insulin bolus of 0.1units/kg followed by IV insulin at a constant infusion rate of 0.1units/kg per hour.
- If the serum glucose does not fall, increase the insulin infusion rate by twofold
- **Monitoring:** EKG, Vital signs, 1-2 hourly glucose, Serum electrolytes: 2-6 hourly BUN and creatinine: 6-24 hourly, Ketones: 6-24 hourly

DIABETES AND RELATED DISORDERS

Diabetes is a disease in which blood glucose or blood sugar, levels are too high.

- Type 1 diabetes
 - Body does not make insulin.
- Type 2 diabetes
 - Body does not make or use insulin well. Blood sugar is higher than normal called diabetes.
 - Having too much glucose in blood can cause serious problems.
 - Damage eyes, kidneys, and nerves.
 - Cause heart disease, stroke and even the need to remove a limb.

Diabetes Related problems

- Complications of diabetes
 - Acute
 - Hyperglycemia(DKA,HHNS)
 - Hypoglycemia
 - Chronic
 - Microvascular
 - Macrovascular
 - Infections
 - Microvascular complications
 - Diabetic retinopathy
 - Diabetic nephropathy
 - Diabetic neuro
 - pathy
 - Macrovascular complications
 - Coronary, cerebral and peripheral macro vessels
 - Coronary artery disease
 - Cerebrovascular accident (stroke)
 - Diabetic foot
 - **Diabetic eye disease**
 - Group of eye problems that people with diabetes may face as a complication of diabetes.
 - All can cause severe vision loss or even blindness.
 - Diabetic eye disease
 - Diabetic retinopathy
 - Damage to the blood vessels in the retina.
 - Cataract—
 - Clouding of the eye's lens.
 - Cataracts develop at an earlier age in people with diabetes.
 - Diabetic eye disease
 - Glaucoma—
 - Increase in fluid pressure inside the eye that leads to optic nerve damage and loss of vision.
 - A person with diabetes is nearly twice as likely to get glaucoma as other adults.
- Stages of diabetic retinopathy**
- Mild Nonproliferative Retinopathy.
 - Microaneurysms occur.
 - Moderate Nonproliferative Retinopathy.
 - Some blood vessels that nourish the retina are blocked.
 - Severe Nonproliferative Retinopathy.
 - Many more blood vessels are blocked, depriving several areas of the retina with their blood supply.

- These areas of the retina send signals to the body to grow new blood vessels for nourishment.
- Proliferative Retinopathy.
- At this advanced stage, the signals sent by the retina for nourishment trigger the growth of new blood vessels.
- These new blood vessels are abnormal and fragile.
- They grow along the retina and along the surface of the clear, vitreous gel that fills the inside of the eye.
- If they leak blood, severe vision loss and even blindness can result

How does diabetic retinopathy cause vision loss?

- Cause vision loss in two ways:
- Fragile, abnormal blood vessels can develop and leak blood into the center of the eye, blurring vision.
- Proliferative retinopathy :advanced stage of the disease.
- Fluid can leak into the center of the macula.
- The fluid makes the macula swell, blurring vision.
- Macular edema.
- It can occur at any stage of diabetic retinopathy, although it is more likely to occur as the disease progresses.
- About half of the people with proliferative retinopathy also have macular edema.

Who is at risk for diabetic retinopathy?

- All people with diabetes
- Both type 1 and type 2
- What to do to protect vision?
- Get a comprehensive dilated eye exam at least once a year
- Remember
- Proliferative retinopathy can develop without symptoms. At this advanced stage, you are at high risk for vision loss.
- Macular edema can develop without symptoms at any of the four stages of diabetic retinopathy.
- Whether or not you have symptoms, early detection and timely treatment can prevent vision loss.

Better control of blood sugar levels slows the onset and progression of retinopathy. The Diabetes Control and Complications Trial (DCCT)

Other studies have shown that controlling elevated blood pressure and cholesterol can reduce the risk of vision loss.

How to detect retinopathy and macular edema

- Comprehensive eye exam
 - Visual acuity test.
 - Dilated eye exam.
 - Tonometry.

Treatment

- No treatment is needed, unless you have macular edema.
- To prevent progression of diabetic retinopathy
 - Should control their levels of blood sugar, blood pressure, and blood cholesterol.
- Scatter laser treatment
 - Proliferative retinopathy is treated with laser surgery.
 - Helps to shrink the abnormal blood vessels.
- Vitrectomy
 - If the bleeding is severe
- laser surgery
 - Macular edema.
 - Called focal laser treatment.
 - Stabilizes vision.
 - Reduces the risk of vision loss by 50 percent.
- Research found that prompt treatment of macular edema with
 - The drug Lucentis alone or steroid injections.
 - Similar drugs, Avastin or Aylea

Diabetic Neuropathy :Diabetic neuropathies are a family of nerve disorders caused by diabetes.

- Nerve damage throughout the body. May be asymptomatic
- May have symptoms such as
 - Pain, tingling, or numbness
 - Loss of feeling—in the hands, arms, feet, and legs.
- Nerve problems can occur in every organ system
 - Digestive tract, heart, and sex organs.
- 60 to 70 percent of people with diabetes have some form of neuropathy.
- The highest rates of neuropathy are among people who have had diabetes for at least 25 years.
- Diabetic neuropathies
 - Problems controlling blood glucose,
 - High levels of blood fat
 - Blood pressure
 - Overweight.
- Symptoms of diabetic neuropathies
 - Numbness, tingling, or pain in the toes, feet, legs, hands, arms, and fingers
 - Wasting of the muscles of the feet or hands
 - Indigestion, nausea, or vomiting

Diabetic neuropathy : Types

- Peripheral neuropathy,
 - The most common type
 - Causes pain or loss of feeling in the toes, feet, legs, hands, and arms.
- Autonomic neuropathy

- Causes changes in digestion, bowel and bladder function, sexual response, and perspiration.
- It can also affect the nerves that serve the heart and control blood pressure, as well as nerves in the lungs and eyes.
- Cause hypoglycemia unawareness, a condition in which people no longer experience the warning symptoms of low blood glucose levels.
- Proximal neuropathy
 - Causes pain in the thighs, hips, or buttocks and leads to weakness in the legs.
- Focal neuropathy
 - Results in the sudden weakness of one nerve or a group of nerves, causing muscle weakness or pain.
 - Any nerve in the body can be affected.
- **Diabetic neuropathies Diagnosis**
- Symptoms and a physical exam.
- During the exam
 - Check blood pressure
 - Heart rate
 - Muscle strength
 - Reflexes
 - Sensitivity to position changes, vibration, temperature, or light touch.
- Foot Exams
- Comprehensive foot exam each year to check for peripheral neuropathy.
- Diagnosed with peripheral neuropathy need more frequent foot exams.
- Other Tests
- Nerve conduction studies or electromyography.
- A check of heart rate variability
 - shows how the heart responds to deep breathing and to changes in blood pressure and posture.
- Ultrasound uses sound waves to produce an image of internal organs.

Diabetic neuropathies Treatment

- To bring blood glucose levels within the normal range to help prevent further nerve damage.
- Blood glucose monitoring, meal planning, physical activity, and diabetes medicines or insulin will help control blood glucose levels.
- Additional treatment depends on the type of nerve problem and symptom.
- Pain Relief
- Medications
 - Tricyclic antidepressants and Antidepressants
 - Anticonvulsants
 - Opioids and opioidlike drugs
 - Duloxetine and pregabalin
 - Specifically for treating painful diabetic peripheral neuropathy.
- A device called a bed cradle
- Acupuncture, biofeedback, or physical therapy may help relieve pain in some people.

- Treatments that involve electrical nerve stimulation, magnetic therapy, and laser or light therapy

Gastrointestinal Problems

- To relieve mild symptoms of gastroparesis
 - Indigestion, belching, nausea, or vomiting
 - Eating small, frequent meals
 - Avoiding fats
 - Eating less fiber.
- When symptoms are severe
 - erythromycin to speed digestion,
 - Metoclopramide to speed digestion
 - Help relieve nausea, or other medications to help regulate digestion or reduce stomach acid secretion.
- To relieve diarrhea or other bowel problems
 - Antibiotic such as tetracycline, or other medications as appropriate.
- Dizziness and Weakness
 - Sitting or standing up slowly
 - Raising the head of the bed or
 - Wearing elastic stockings may also help.
- Urinary and Sexual Problems
- Urinary tract infection
 - Antibiotic.
 - Drinking plenty of fluids will help prevent another infection.
 - People who have incontinence should try to urinate at regular intervals—every 3 hours, for example
- Sexual Problems

To treat erectile dysfunction in men.

Vaginal lubricants may be useful for women when neuropathy causes vaginal dryness.

Diabetic nephropathy

- When blood sugars levels are high, sugar is passed into urine
- When this happens ,the pressure is high in the kidney filtering system(glomerulus) and changes in small blood vessels occur.
- This increased pressure causes damage to the filtering system so that proteins start leaking through the filter and appear in urine.

Symptoms

- No symptoms as the kidney damage starts and slowly gets worse.
- Begin 5 to 10 years before symptoms start.
- Severe and long-term (chronic) kidney disease
 - Fatigue most of the time
 - General ill feeling
 - Headache
 - Nausea and vomiting

- Poor appetite
- Swelling of the legs
- Itchy skin
- **Treatment of Diabetic Nephropathy**
- Hypertension Control - Goal: lower blood pressure to <130/80 mmHg
 - Antihypertensive agents
 - Angiotensin-converting enzyme (ACE) inhibitors
 - captopril, enalapril, lisinopril, benazepril, fosinopril, ramipril, quinapril, perindopril, trandolapril, moexipril
 - Angiotensin receptor blocker (ARB) therapy
 - candesartan cilexetil, irbesartan, losartan potassium, telmisartan, valsartan, esprosartan
 - Beta-blockers
- Glycemic Control
 - Preprandial plasma glucose 90-130 mg/dl
 - A1C <7.0%
 - Peak postprandial plasma glucose <180 mg/dl
 - Self-monitoring of blood glucose (SMBG)
 - Medical Nutrition Therapy
- Restrict dietary protein to RDA of 0.8 g/kg body weight per day

Treatment of End-Stage Renal Disease (ESRD)

There are three primary treatment options for individuals who experience ESRD:

1. Hemodialysis
2. Peritoneal Dialysis
3. Kidney Transplantation

Peripheral arterial disease

- Peripheral arterial disease(PAD) is a form of peripheral vascular disease that occurs when blood vessels in the legs are narrowed or blocked by atherosclerosis, decreasing blood flow to the feet and legs
- One in three people in diabetes over age 50 is estimated to have this condition
- If undetected, PAD can lead to amputation of the lower limbs and increase a person's risk of intermittent claudication.

Ankle brachial index (ABI)

- Compares the blood pressure in his or her arm .If the blood pressure in the ankle is lower than the pressure in the arm ,that person may have PAD

HYPERTENSION

- Systolic blood pressure of more than 140 mm hg
- Diastolic pressure more than 90mmhg
- Hypertension is an important cause of stroke, heart attacks and heart failures in diabetic patients and increases their risk of early death
- It also increases the risk of eye disease and kidney disease in patients with diabetes

Diabetic foot

- Angiopathy Neuropathy Infection
- Diabetic foot
- Minor trauma ,skin ulceration, faulty wound healing, infection and gangrene may lead to amputation

Diabetes Related problems

- Diabetic foot symptoms
 - Tingling ,numbness, pain or loss of sensation in the feet
 - Restricted blood flow to the legs and feet
 - Foot deformities including hammertoes
 - Stiff joints
- Infections
- Although not specifically an acute or a chronic complication, infections are a common concern of people with diabetes.

Certain types of infections occur with increased frequency in people with diabetes:

- Soft tissue infections of the extremities
- Osteomyelitis
- Urinary tract infections and pyelonephritis
- Candida infections of the skin and mucous surfaces
- Dental caries and infections
- Tuberculosis

Infections

- Hyperglycemia and glycosuria may influence the growth of microorganisms and increase the severity of the infection.

GUIDELINES FOR DIETARY INTAKE AMONG DIABETICS

- Recommends caloric distribution of **40% CHO, 20-30% from proteins and 30-35% calories from fat.**
- Min. CHO intake should be no less than 130 g/day
- CHO source –**low GI** and **fibre intake** should be at least 20-35g/day
- Both protein and fat sources should be **low in saturated** and **omit trans fats.**
- Guidelines recommend **decreasing the daily maintenance caloric intake by 250-500 cal.**
- **Sodium <6 g /day** and if hypertensive then <3g/day

Do's & Don't

Glycemic Index (GI): It **classifies food CHO** according to their effect on postprandial glycemia.

☞ The GI is the **blood glucose response to 50g CHO portion** of food

☞ It is **expressed as a percentage** of the same amount of CHO from a reference food.

Low GI products

Do not stimulate fat storage

Allows to eat more calories

Enhance athletic performance

Improve muscle to fat ratio

Normal Growth Hormone release

High GI products

Stimulate fat storage

Deter fat breakdown

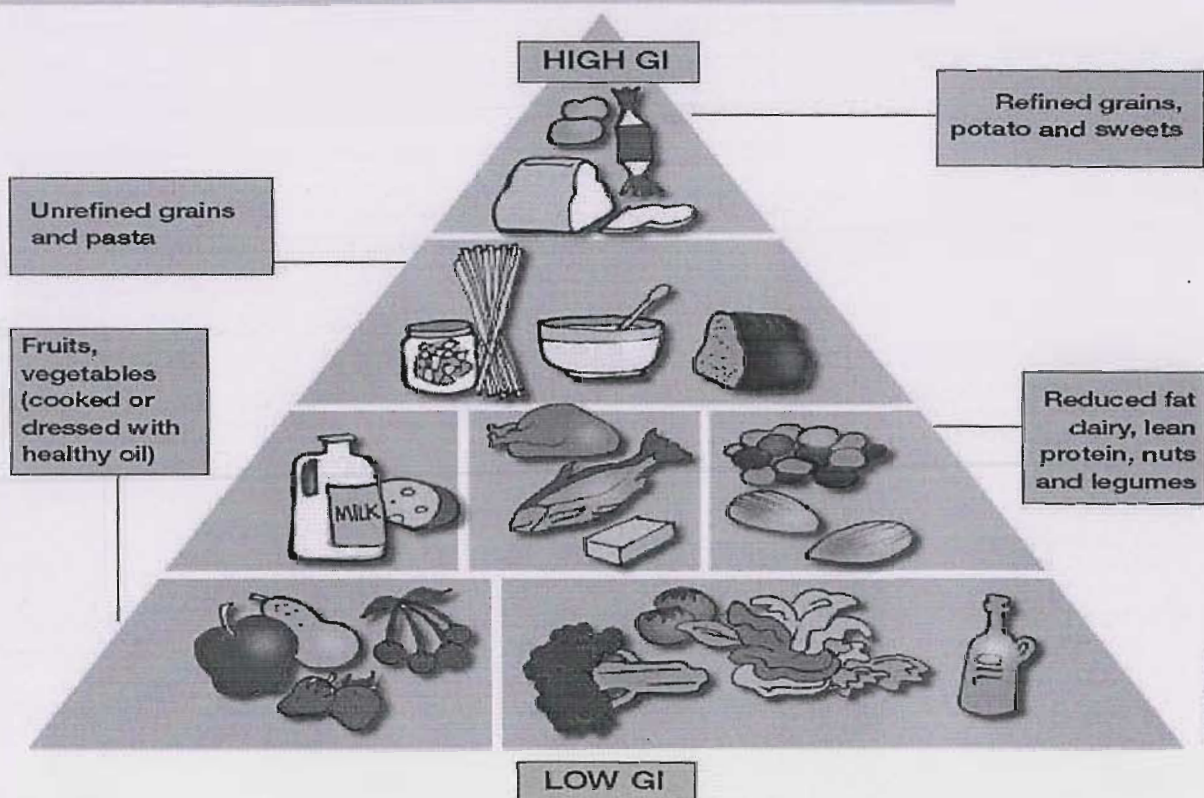
Reduce athletic performance

Increase abdominal fat

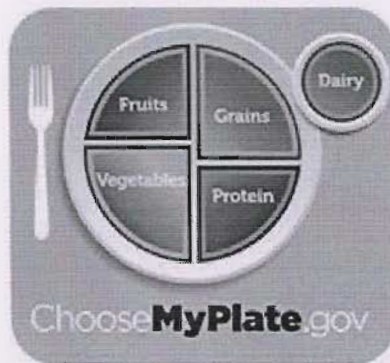
Stunt Growth Hormon release

Examples of high and low GI

High GI 70+	Low GI 0-55	Moderate 56-70
<ul style="list-style-type: none"> ☞ Whole wheat bread ☞ Potato ☞ White rice ☞ Rice idli & upma ☞ Glucose ☞ Maltose (>105) ☞ Skim milk 	<ul style="list-style-type: none"> ☞ Dense flour, wholegrain bread ☞ Oats, puffed rice ☞ Cornflakes ☞ Brown basmati rice, dalia ☞ Most fruits & vegetables ☞ Legumes, pulses, milk, curd ☞ peanuts 	



USDA recommendations



Balancing Calories

Enjoy your food, but eat less.


Avoid oversized portions.

o Foods to Increase

Make half your plate fruits and vegetables.

Make at least half your grains whole grains.

Switch to fat-free or low-fat (1%) milk.

SANOFI DIABETES 

<http://www.choosemyplate.gov/food-groups/> (accessed on 10/01/2012)

Diabetic foot

- Diabetic foot is a preventable complication of diabetes mellitus type 2, commonly occurs in patients of 10 or more year duration
- It represents in form of
 1. Neuropathic joint
 2. Ulceration, infection (diabetic gangrene)

Factors playing part:

- there is disturbed glucose metabolism which affects the nutrition of nervous system including peripheral nerve endings
- There is early involvement of the blood vessels
- This blunts all the sensation including proprioception
- It adversely affects the protective reflex mechanism, when foot is moving on uneven surface ligaments get stretched and due to disturbed reflex mechanism, muscles do not come into action
- This leads to over stretching of ligaments
- Which permanently increase their length or disrupts this leads to instability of the joints of the foot and deformity at different joints of the foot
- This subjects certain areas of foot to undue pressure which lead to ulceration and infection
- Blood vessels undergo atherosclerosis and interfere the nutrition of the tissue which may lead to necrosis and delay healing or even non healing ulcers mostly after trauma
- Tissues having high glucose concentration becomes good medium for the organism to multiply

Prevention of the diabetic foot should be started as soon as the disease is diagnosed, patients should be made aware of its complications including diabetic foot

- The most important factor in educating for prevention of diabetic foot includes maintaining the normal range of sugar level throughout the day by
 - Proper diet
 - Judicious exercise
 - Proper medication

Foot must be cleaned and kept dry

- Should always be cleaned first during bathing
- Foot wear must be soft and properly fitting
- Avoid any trauma to the foot even nail trimming should be done cautiously
- we can avoid undue pressure on any point of the foot by suitable modification of shoe or even a brace
- Self inspection:
 - Abrasion
 - Ulcer
 - Redness

DIAGNOSIS : Any change occurring in the shape of the foot must be noted and looked into immediately

- Any redness abrasion sign of infection should not be ignored
- Peripheral pulsation and sensation must be noted frequently
- Frequent check up are advised
- High degree of clinical suspicion
- Investigation and routine check up: blood sugar and blood urea
- Nerve conduction studies
- Doppler studies
- Lab. Investigations: Routine haemogram with ESR, Blood sugar, Renal and liver function tests

Decision making whether the foot can be saved or not? depends upon

- General condition of the patient
- Type of Infection
- Blood sugar level
- Extent of the tissue damage
- Blood circulation

Indication of amputation

- Gangrene
- Septicemia threatening life of the patient
- Totally deformed and nonfunctioning foot
- Level of amputation and prosthetic fitting:

Nurses and physiotherapist role :

- Good nursing care in form of giving medication on time, monitoring of blood sugar, maintain blood sugar level, advise on diet and hygiene measures and keeping environment clean for the patient

- Physiotherapy for maintaining muscle power movements of the joints and prevention of stiffness and deformity
- Care of the patient after discharge from the hospital by domiciliary nursing and physiotherapy is needed

NURSE'S ROLE IN PREVENTION OF DIABETIC FOOT

CHECK YOUR FEET EVERY DAY

look and feel the feet

- ✗ look at the feet from various directions: at the top, bottom, sides, and between toes.
- ✗ Check your feet for cuts, sores, red spots, swelling, and infected toenails..
- ✗ Check your feet each evening when you take off your shoes.
- ✗ If you have trouble bending over to see your feet, use a mirror to help. You can also ask a family member or caregiver to help you.

WASH YOUR FEET in warm, not hot, water. Do not soak your feet because your skin will get dry.

- ✗ Before bathing or showering, test the water to make sure it is not too hot. You can use a thermometer (90° to 95° F is safe) or your elbow to test the water.
- ✗ Use talcum powder to keep the skin between your toes dry to prevent infection

Keep the skin soft and smooth: Rub a thin coat of lotion, cream, or petroleum jelly on the tops and bottoms of your feet.

- ✗ Do not put lotion or cream between your toes because this might cause an infection

✗ ***Smooth corns and calluses gently***

✗ ***If you can see, reach, and feel your feet, trim your toenails regularly***

✗ ***Wear shoes and socks at all times***

✗ ***Protect your feet from hot and cold***

✗ ***Keep the blood flowing to your feet***

✗ ***Take care of your diabetes***

✗ Healthy Eating

✗ Exercise / Activity.

The Five “C’s” of Foot Care

- ✗ **Clean!** Clean and check feet daily. Wash with warm **not hot** water. Pat dry.
- ✗ **Condition!!** Use a moisturizer daily. Use one without perfume or alcohol
- ✗ **Care!!!** Clip normal nails straight across with a slight curve at the corners. ***Bathroom surgeons give up your license.***
- ✗ **Cover!!!!** Always wear shoes or slippers with a sole to protect your feet. Check your feet before and after wearing for any unusual marks or redness
- ✗ ***Use caution and call***

DIABETESS AND ALTERNATIVE TREATMENT

- Diabetes is termed as SILENT KILLER and recently evidence of cases of “Insulin resistance” and the occurrence of side effects from prolonged administration of conventional drugs have triggered the search for safe and effective alternatives. Ancient science of Ayurveda has discussed diabetes at length thousands of years ago. The knowledge and

effectiveness of diagnosis can be understood with the fact that Ayurveda has classified Diabetes (**madhumeha**) into 20 Types.

- Description of two types of Prameha from management point of view strikingly is the same Krisha Pramehi (Lean Diabetic) and Sthula pramehi (Obese Diabetic) are classified in Ayurveda on very similar grounds as Diabetics are classified in IDDM and NIDDM respectively. On the very similar pattern we find the classification as Sahaj pramehi (Congenital) and Apathaya nimmitaj (Due to overeating and wrong eating habits).

According to Ayurveda, prameha is divided in 4 major types (and total 21 types)

- Kapha type (again divided into 10 types)
- Pitta type (again divided into 6 types)
- Vata type (divided into 4 types)
- Juvenile diabetes for children (for unhealthy practices of parents)

Management of Prameha (Madhumeha):

Management of Prameha depends upon the following factors :-

1. The prakrithi of the patient
2. Dosha predominance of disease
3. Dooshya vitiation
4. Obstruction in srothus
5. Manasika Prakrithi
6. Ahara & Vihara
7. Hereditary factors etc...

Some other factors that help in the management of prameha :-

8. Vyaayam (Exercise),
9. Pathya (dietary regulation),
10. Panchakarma (Bio-purification procedures) and
11. The use of therapeutic measures (Medicines).

Herbs useful in treatment of diabetes:

***Pterocarpus marsupium* (Vijayasar)**

ADDRESSING EMOTIONAL NEEDS IN DIABETES MELLITUS

Reaction to being Diagnosed as a case of Diabetes mellitus

- **Stage 1:** Denial
- **Stage 2:** Anger
- **Stage 3:** Bargaining
- **Stage 4:** Depression
- **Stage 5:** Acceptance

Tiredness: Too high or too low blood sugar levels

In both cases, the tiredness is the result of having an imbalance between one's level of blood glucose and the amount or effectiveness of circulating insulin

Guilt: Often stemming from the media bombarding them with information suggesting that life style choices and eating habits are the sole reasons behind their diagnosis.

- Associated with increased substance abuse, suicidal tendencies and isolation.

Communicating with Healthcare Professionals

Feel being scolded

- Lie about their blood glucose results
- Feeling misunderstood
- Not feeling free to talk about what is really of concern e.g. how it is affecting your family
- Feeling that the healthcare professional is an “expert” and can’t be disagreed with

Not attending health appointments at all and avoiding healthcare professionals entirely

- Tackling Lifestyle Changes
- Cognitive Behavioral Therapy
- Behavior therapy
- Mindfulness/Meditation
- Relaxation exercise
- Pharmacotherapy