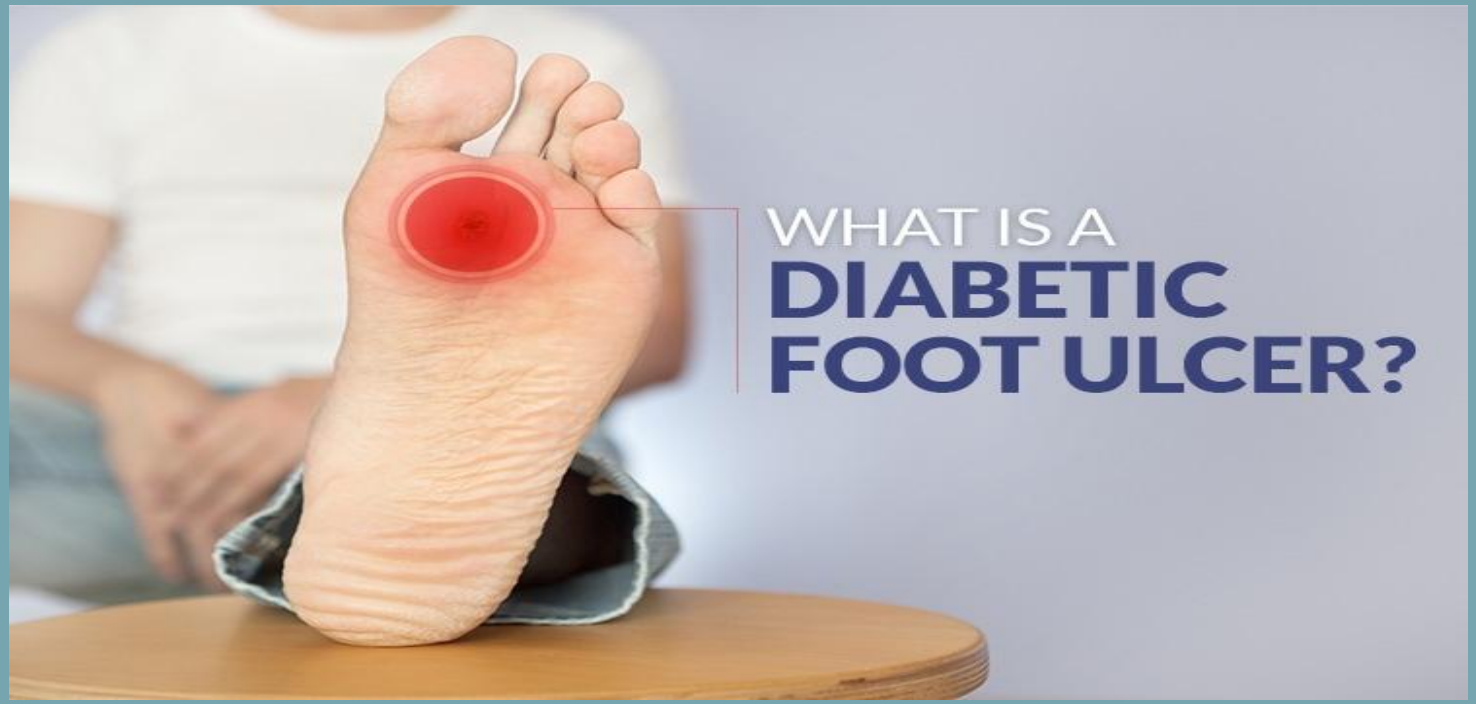
Diabetic Foot Ulcers

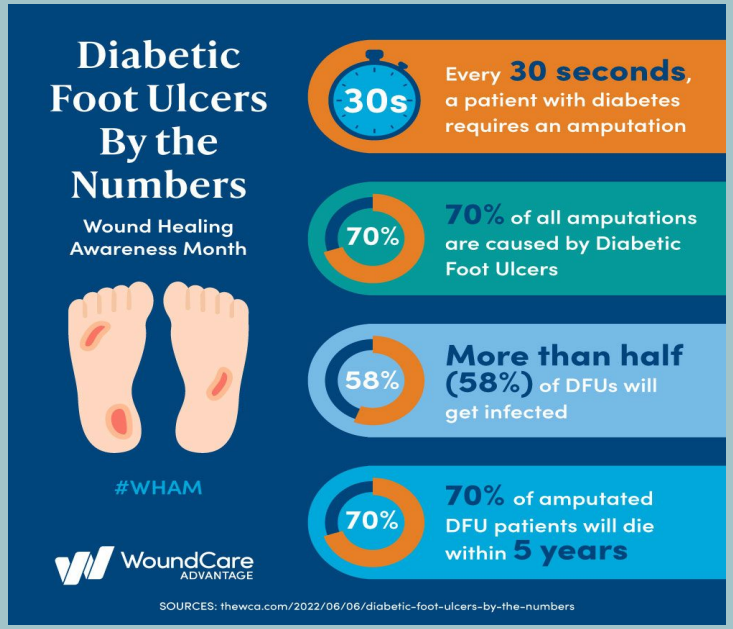


Student: Sezim Seno

Epidemiology of Diabetic Foot

- Diabetic Foot Ulcers(DFU) are common complications of poorly controlled diabetes mellitus (DM)
- The global prevalence of diabetes mellitus is estimated 382mln including the US
- DFU complication problems affects 131 mln globally
- Morbidity: Approximately 15% of diabetic patients develop DFU in their lifetime
- Recurrence rates 65% of patients (3-5 years)
- Amputation incidence is 20%
- Mortality after DFU is 50-70%
- Current economic burden of DFU and amputations in US is 11 billion

Wound Management & Prevention l Home



Disparities of DFU

Age:

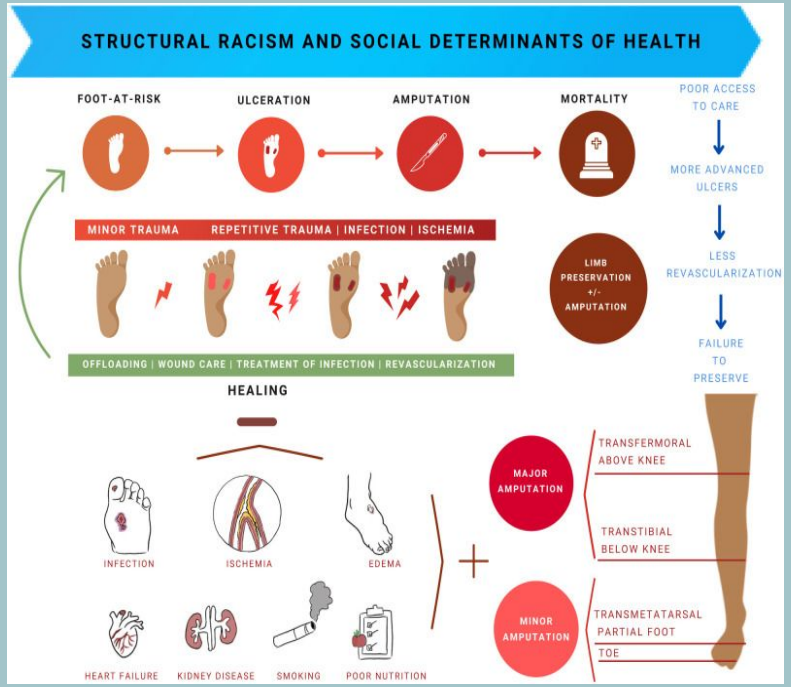
- The risk of DFU is increase with age, duration of DM
- Young and middle age people have more advanced foot ulceration due to poor lifestyle, high A1C, higher PN and smoking

Sex/Gender:

- DFU is 1.5 higher in males than in females
- Minor and major amputation is also higher in men(because of underlying risk factor, access to care, screening, and adherence to treatment)

Race/ Ethnicity

- Black, Hispanic and other non-white adults experience in higher rates



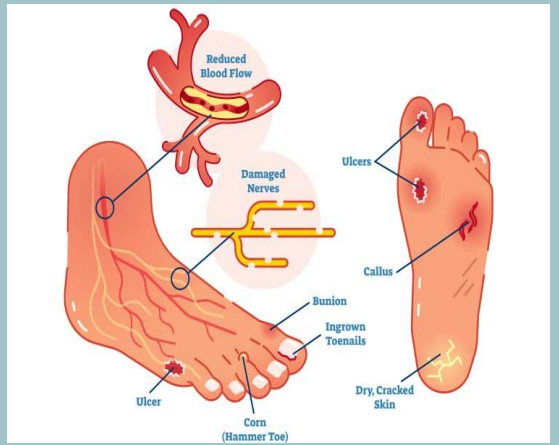
Etiology of Diabetic Foot Ulcer

Formation of DFU is multifactorial

- Poor management of DM and chronic hyperglycemia
- Peripheral Neuropathy(PN)
- Peripheral Vascular Disease (PVD) due to atherosclerosis→poor circulation→ tissue ischemia
- Peripheral Artery Disease (PAD)
- Calluses or foot deformities, muscle dystrophy
- Improper footwear & care (causes foot injury)
- Repetitive mechanical trauma of the foot or toes
- Infections of the foot / previous healed ulcer

DFUs are classified into 3 types:

1. Purely neuropathic 35%
2. Purley Ischemic 15%
3. Mixed neuroischemic 50%

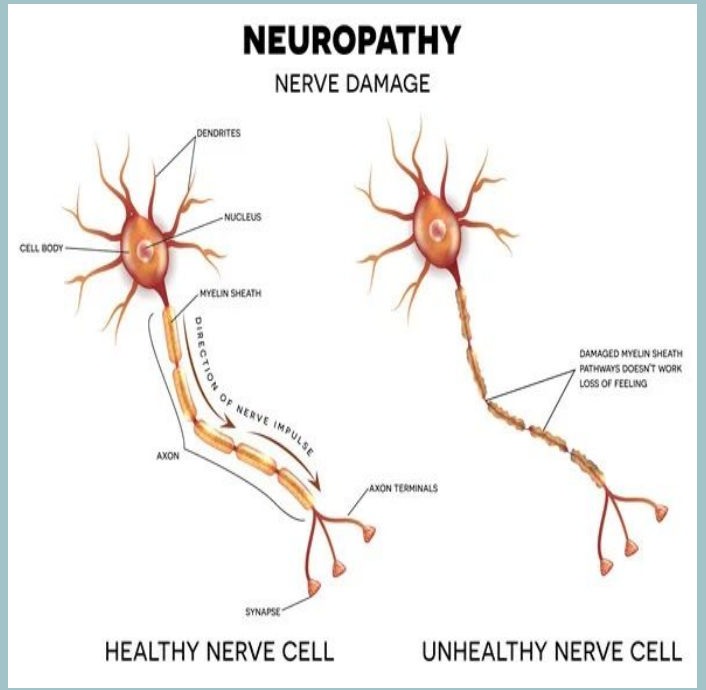


Neuropathy→Neuropathic Ulcers

60% of DM →Neuropathy→DFU

Neuropathy is a nerve damage due to high blood sugar, causes numbness, tingling, a burning feeling, pain, cramps or weakness in the hands and feet, further may spread into limbs

- Peripheral Neuropathy
- Autonomic Neuropathy

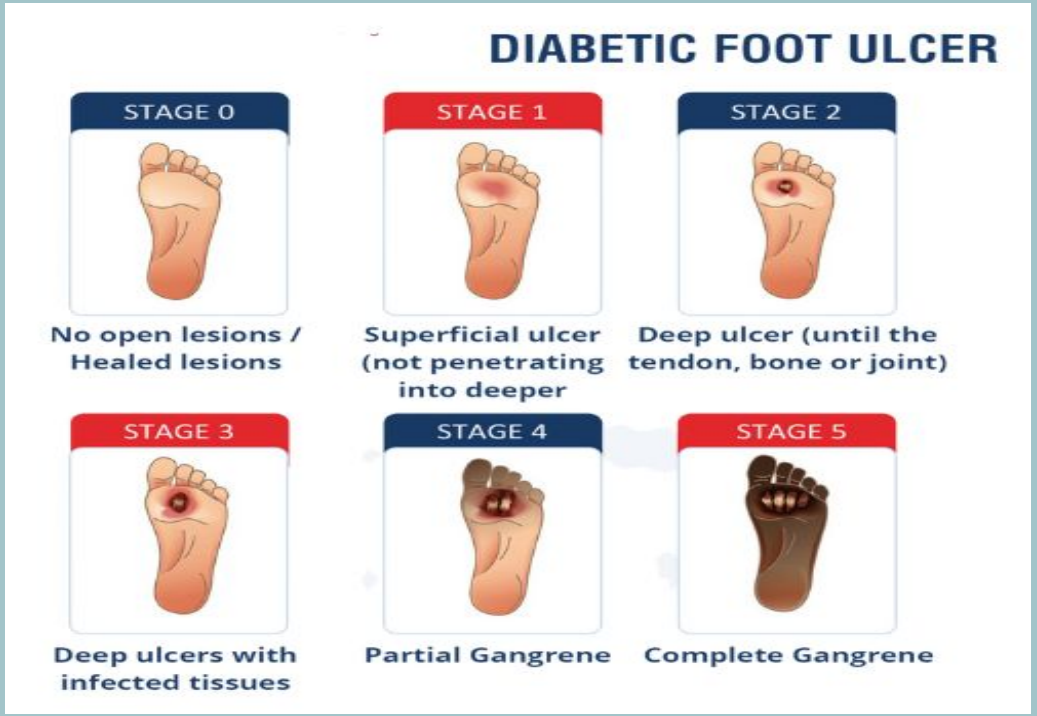


Diabetic Foot ulcers

Stages vary from different factors

DFU leads

- **Infection**
- **Amputation**
- **Disability**
- **Death**



Infection of DFU

Infection predispose to DFU , and ulcers also predispose to infections

50% ulcers associated with skin and soft tissue infection

Most common causative pathogens :

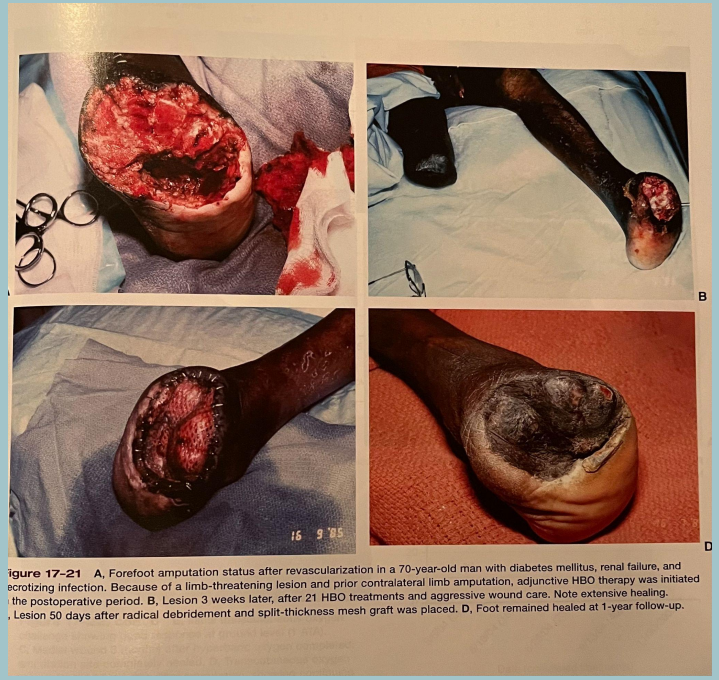
- Staphylococcus spp.
- Streptococcus spp.
- Typically polymicrobial

DM→ impares immune system:

- ↓ cytokine production
- Defects phagocytosis
- Immune cell dysfunction

If ulcers size >2cm² and/or ulcer depth >3mm →Diabetic ***osteomyelitis*** (infection of the bone tissue)

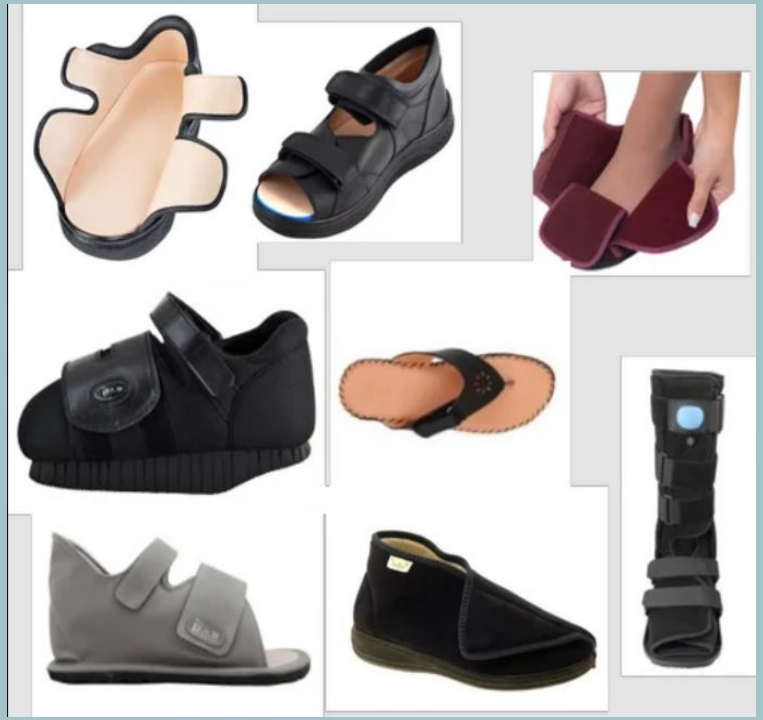
Amputation of Gangrenous DFU



igure 17–21 A, Forefoot amputation status after revascularization in a 70-year-old man with diabetes mellitus, renal failure, and ecrotizing infection. Because of a limb-threatening lesion and prior contralateral limb amputation, adjunctive HBO therapy was initiated the postoperative period. B, Lesion 3 weeks later, after 21 HBO treatments and aggressive wound care. Note extensive healing. , Lesion 50 days after radical debridement and split-thickness mesh graft was placed. D, Foot remained healed at 1-year follow-up.

Prevention of DFU/Diabetic footwear

- Prevention and Timely screening is a key
- (visit to Podiatrist)
- Wearing proper fit footwear (covered by insurance)
- Glycemic control (diet education)
- Infection control
- Multidisciplinary intervention (physician, podiatrist, RN, RD) for treatment is necessary



Case Study/Nutrition Assessment

HPI: Abscess of foot, cellulitis of RLE, acute osteomyelitis

Food & Nutrition Hx: 59 y.o male admitted with foot abscess, infected diabetic foot wound of right foot. Pt's PMH of DM-2, HTN. Currently, pt has a good appetite and P.O intake. Pt denies constipation, diarrhea, nausea, and vomiting.

Food intolerance: No

Food allergy: No known allergies

Feeding Ability: Independent

Appetite Evaluation: Good (>75% PO intake)

Factors Affecting PO intake: None

Pain interfering with orally intake: No

Anthropometrics:

Height: 173 cm(5'8.11")

Weight: 92.5kg (203 lb 14.8oz)

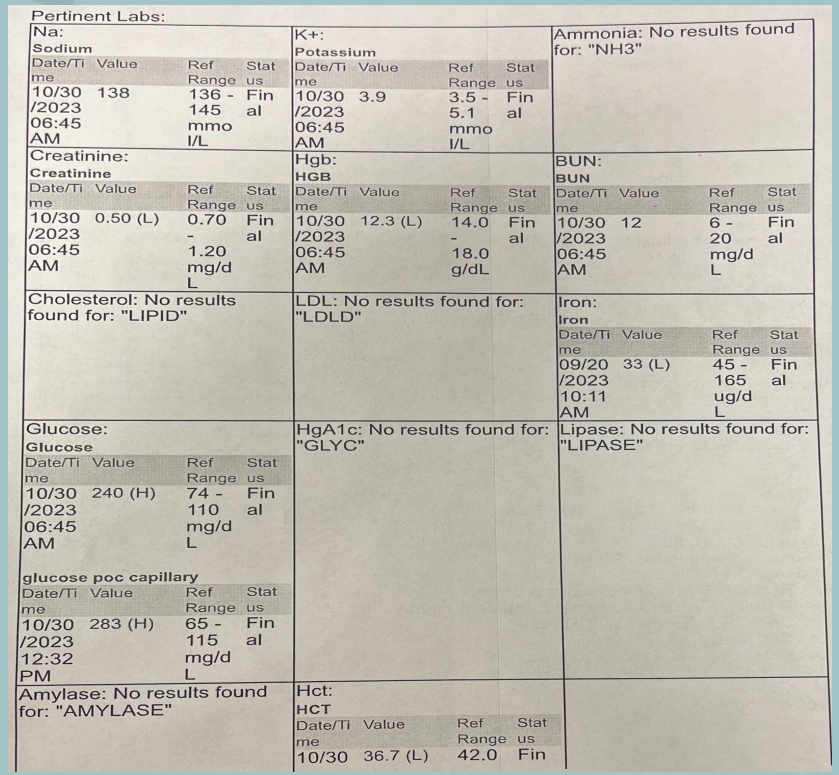
BMI: 30.9 (Overweight)

IBW: 80kg(176lb 5.9 oz)

UBW: 92.5kg (203 lbs)

Wt loss criteria: none

Patient's labs/medications



Pertinent Labs:

Na:
Sodium

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	138	136 - 145 mmol/L	Final

K+:
Potassium

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	3.9	3.5 - 5.1 mmol/L	Final

Ammonia: No results found for: "NH3"

Creatinine:
Creatinine

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	0.50 (L)	0.70 - 1.20 mg/dL	Final

Hgb:
HGB

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	12.3 (L)	14.0 - 18.0 g/dL	Final

BUN:
BUN

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	12	6 - 20 mg/dL	Final

Cholesterol: No results found for: "LIPID"

LDL: No results found for: "LDLD"

Iron:
Iron

Date/Time	Value	Ref Range	Status
09/20/2023 10:11 AM	33 (L)	45 - 165 ug/dL	Final

Glucose:
Glucose

Date/Time	Value	Ref Range	Status
10/30/2023 06:45 AM	240 (H)	74 - 110 mg/dL	Final

glucose poc capillary

Date/Time	Value	Ref Range	Status
10/30/2023 12:32 PM	283 (H)	65 - 115 mg/dL	Final

HgA1c: No results found for: "GLYC"

Lipase: No results found for: "LIPASE"

Amylase: No results found for: "AMYLASE"

Hct:
HCT

Date/Time	Value	Ref Range	Status
10/30	36.7 (L)	42.0	Fin

Current Medications:

Scheduled Meds:• amLODIPine, 10 mg, Oral, Daily
- aspirin, 81 mg, Oral, Daily
- atorvastatin, 20 mg, Oral, Nightly
- enoxaparin, 40 mg, Subcutaneous, Daily
- gabapentin, 100 mg, Oral, TID
- insulin glargine, 36 Units, Subcutaneous, Q12H SCH
- insulin lispro, 0-10 Units, Subcutaneous, With meals & nightly
- insulin lispro, 17 Units, Subcutaneous, TID AC
- losartan, 25 mg, Oral, Daily
- metFORMIN XR, 500 mg, Oral, Daily with breakfast
- vancomycin, 1,500 mg, IV Infusion, Q8H SCH

Continuous Infusions:

PRN Meds:.• acetaminophen
- dextrose
- glucagon

Estimated Nutritional Requirements Based on: IBW

Diet order/supplements: Diabetic Medium CCD(1800-2000 kcal)

Calories	2400	kcal/ day, based on	30	kcal/kg
Protein	96	gm/day, based on	1.2	m/kg
Fluids	2400	ml/kg, Based on	30	ml/kg

Current Nutrition Order Meets Estimated Needs: no

Nutrition Diagnosis

PES: **Altered nutrition status RT to DM requiring modified CHO intake AEB hyperglycemia.**

NFPE: No visual wasting observed

Does the patient have malnutrition: At risk for

Nutrition Intervention/MNT

Nutrition Education: Yes

Verbalized understanding: Provided diabetic educational materials in Russian language, explained how to count carbohydrates and how to monitor blood sugar via diet.

Expected compliance: Poor

Recommendations: Change to diabetic high CCD, supplement with Juven(90kcal, 14g of protein) 1pk/day, Vitamin B12, Vitamin C and Zinc, omega-3, supplementation for wound healing, proper hydration

Goals: Improve understanding and compliance to diet, promote healthy eating habits, improve nutrition related labs, achieve/maintain hydration, improve skin integrity.

Juven is rich with aa : Arginine & Glutamine supports DFU healing

[Juven® | Therapeutic Nutrition Powder]

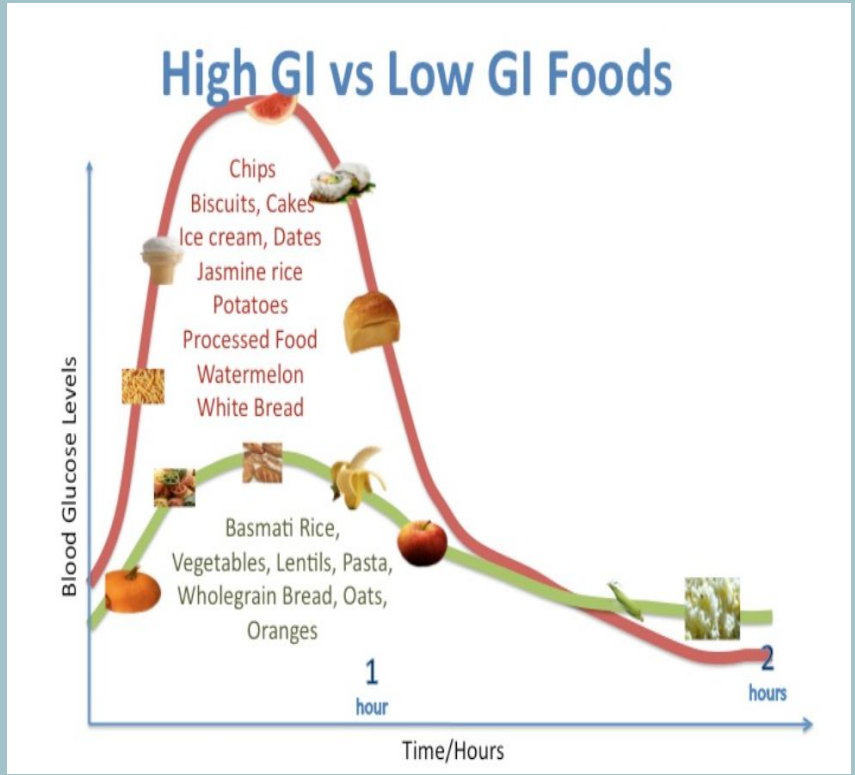
Monitoring/Evaluation

- Maintain weight , + or -2%
- Maintain hydration
- Electrolytes WNL
- Promote wound healing
- Comply with nutrition Rx
- Improve food/nutrition related knowledge

Reassessment due date: in 5 days

Discharge plan: Discharge on recommended diet

Referral to outpatient department: Yes (needs further diabetic education)



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