

# Importance of Good Nutrition in Wound Healing

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## Outline of Presentation

- Metabolic response in wound healing
- Main nutrients involved in healing
- Methods of assessing nutritional status
- The malnourished patient
- Meeting the nutritional needs of the patient

## The Metabolic Response

- Neuroendocrine response is initiated
- Intensity of the response is proportional to the injury
- Catabolism
  - continuous process
  - need for energy production for healing
  - complex substances → simpler parts: eg.protein into amino acids

### Major problem:

- Skeletal muscle breakdown of protein to meet energy needs
- Body needs glucose for energy
  - pancreas is stimulated to secrete glucagon
  - further breakdown of protein to glucose for energy
- The longer the catabolic state, the greater the risk of muscle wasting

### **Problem:**

- If not enough energy coming from the diet, body will breakdown muscle mass for wound healing
- Leads to:
  - loss of lean body mass
  - depression of the immune system
  - delayed wound healing

## **Main Nutrients in Wound Healing**

### **Main nutrients involved are:**

- Energy
  - carbohydrate and fat
- Protein
- Zinc
- Vitamin C and Vitamin A

## **Carbohydrate and Fat**

- Source of cellular energy
- Glucose
  - leukocyte functioning, WBC activity
  - collagen and proteoglycan synthesis
- Fat
  - component of cell membrane
  - fatty acid deficiency is thought to inhibit tissue repair

## **Protein**

- Aids re-vascularisation, fibroblast proliferation, collagen synthesis and lymphatic formation
- Hypoproteinemia delays wound healing
  - alters osmotic equilibrium, contributes to oedema formation
- 1.5 - 2.0 grams protein /kg body wt

## Zinc

- Directly involved in wound healing process
- cofactor for several enzymes
- deficiency impairs wound healing
  - reduces epithelialization rate
  - reduction in rate of gain of wound strength
  - reduction of collagen strength
- Supplementation only effective if deficient
- Over supplementation will interfere with copper absorption
- Interferes with copper metabolism and action of lysyl oxidase (collagen cross-linking)
- If deficient, max 200mg/day

## Vitamin C

- Essential for collagen synthesis and fibroblast proliferation
- Should only be supplemented in patients with deficiency
- If deficient, 1000mg /day

## Vitamin A

- Role in collagen synthesis and epithelialization process
- Enhances the early inflammatory reaction, stimulates epithelial cells and stimulate immune responsiveness
- If deficient, B-carotene 20 mg/day
- Recheck level every 10 days

## Assessing Nutritional Status

### Anthropometric data

- Height and weight → BMI
- Degree of weight loss
  - 10% unintentional weight loss over 1-3 months → **indicative of malnutrition**

## **In summary**

- most readily available parameter of nutritional status is WEIGHT
- Recommend:
  - Initial weight be obtained
  - Weight be obtained regularly (weekly)
  - % weight loss can be determined

## **Malnutrition**

### **Malnourished patient**

- poorer wound healing
- delayed and prolonged closure of wound
- increased length of stay

### **Why?**

- decreased muscle mass
- dehydration
- poor nutritional reserves of vitamins and minerals

## **Causes of Malnutrition**

- Nutritional requirements exceed intake
- Poor appetite
- Mal-digestion and mal-absorption
- Neurological status
- Impaired swallow
- Nausea and vomiting

## **Oral Nutritional Support**

- High energy and high protein diet
  - nourishing fluids (milkshakes, flavoured milk)
  - mid-meal snacks (cheese, yoghurt, custard)
- Modified consistency diet
- Therapeutic diet (e.g. diabetes)
- Vitamin and mineral supplementation
  - e.g. Centrum multivitamin or Supradyn Effervescent Multivitamin.