Pressure Ulcers & Nutritional Deficits in Elderly Long-Term Care Patients: Effects of a Comprehensive Nutritional Protocol on Pressure Ulcer Healing, Length of Hospital Stay & Health Care Charges

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Pressure Ulcers in Combination with Malnutrition

- Pressure ulcers in combination with malnutrition are accruing at an alarming rate among the elderly institutionalized patients.



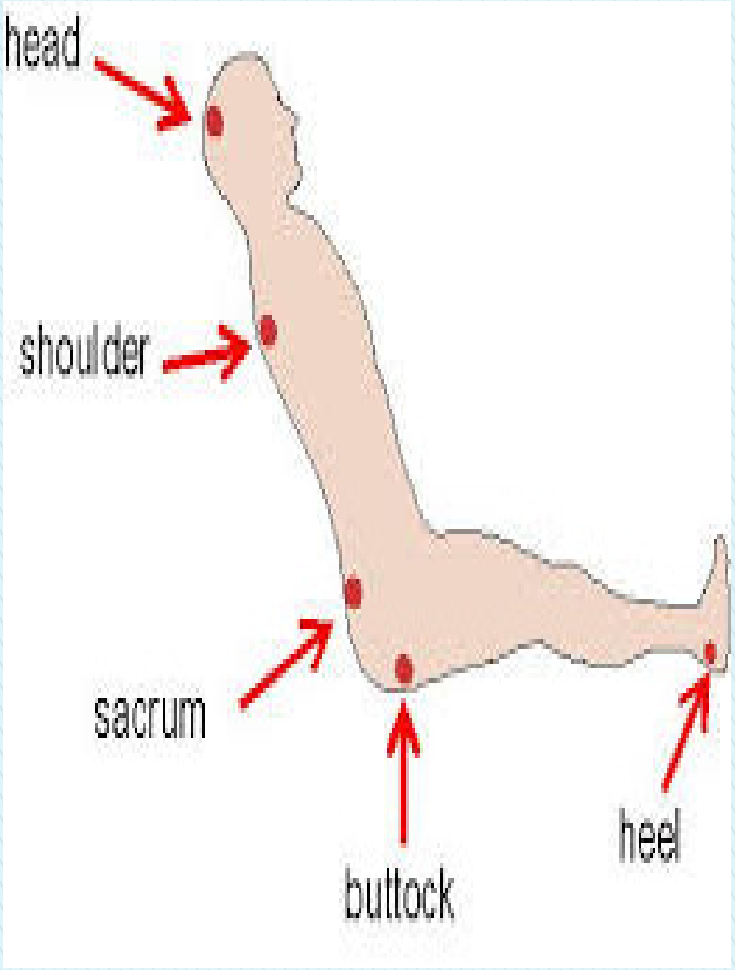


Under-nutrition

- Under-nutrition amongst older people is a global crisis that is set to increase.
- Under- nutrition and protein–energy malnutrition ranges from 23% to 85% of the elderly population.
- More than 91% of the subjects admitted to subjects admitted to sub-acute care are either malnourished or at risk of malnutrition.

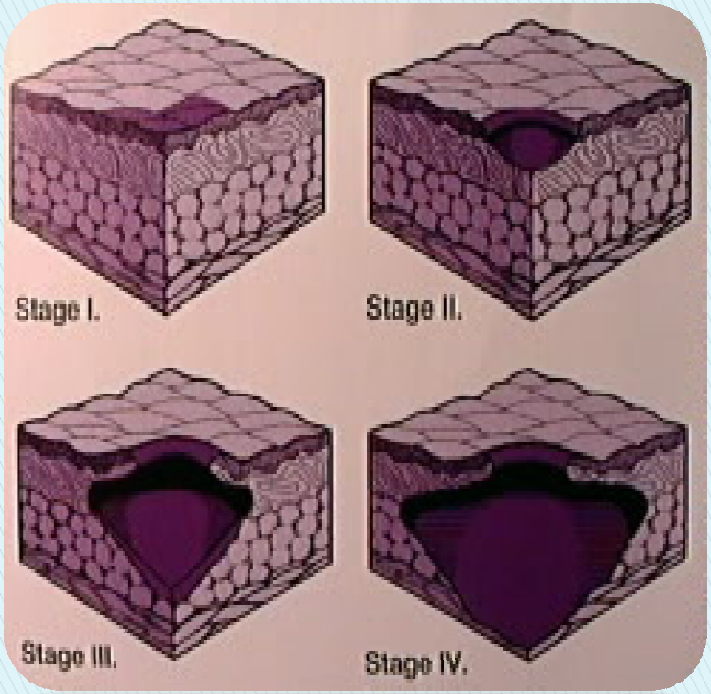
Pressure Ulcers

- Pressure ulcers are wounds caused by persistent pressure or friction that damages the skin and its underlying architecture.
- Most common over bony prominences, mainly back of the head, sacrum, and heels.
- Develops at sites where tissue has been compressed causing ischemia and hypoxia.



Classification of Pressure Ulcers

- Stage 1 – intact skin with erythema
- Stage 2 – partial thickness loss of dermis
- Stage 3 – full thickness tissue loss
- Stage 4 – full thickness tissue loss with exposed bone, tendon or muscle
- Deep tissue injury
- Unstageable pressure ulcer



(National Pressure Ulcer Advisory Panel, 2007)

Significance

- Over one million patients develop pressure ulcers annually.
- In hospitals, the pressure ulcer rate is 16%.
- One in 10 patients in nursing homes has pressure ulcers.
- Long term care facilities varies between 2.4% to 23%, with a reported incidence as high as 24%

Significance

- Death rate of 1 in 8 when pressure ulcers were included as a secondary diagnosis.
- Estimates indicate that hospital stays for pressure ulcers total $11 billion.

Study Purpose

In elderly long-term care patients with pressure ulcers the purpose of this pre/post intervention study was to compare the effects of a comprehensive, interdisciplinary, nutritional protocol on:

- pressure ulcer wound healing
- length of hospital stay
- health care charges for pressure ulcer management

Sister Emmanuel Hospital
FOR CONTINUING CARE

- ✓ 29 be acute long term care facility located inside of Mercy Hospital.
- ✓ Annual number of patients: approximately 375.
- ✓ Annual number with pressure ulcers: approximately 210.



Inclusion Criteria

A convenience sample of 100 patients with pressure ulcers:

- ✓ 50 pre-intervention(10/1/2008 – 9/31/2009)

- ✓ 50 post intervention (10/1/2009 – 7/31/2010)

All patients with Stage II or Stage III pressure ulcers

Male and Female 60 years old and above all races ethnicities



Measures- Risk Assessment

- Braden Scale: Risk assessment for pressure ulcers.
- Composed of six sub-scales: sensory perception, moisture, activity, mobility, nutrition, and friction/shear.
- Five of the subscales: sensory perception, mobility, activity, moisture, and nutrition have scores that range from 1 to 4, 1 = the lowest score and 4 = the highest score.

Measures- Ulcer Wound Healing

- Measurement includes:
- Wound size, depth, edges, undermining, necrotic tissue type, necrotic tissue amount, exudates type, exudates amount, skin color surrounding wound, peripheral tissue edema, peripheral tissue indurations, granulation tissue, and epithelialization.
- PSST scores ranges from 13-65, and reflect wound health.

Scores were classified into 3 categories:

- Tissue Health (PSST scores 1– 13)
- Tissue Regeneration (PSST scores 14 – 20)
- Tissue Degeneration (PSST scores $\geq$ 21)

Post-intervention Ulcer Care Protocol

- Diet
- Tube feeding (rate of the tube feed was adjusted based on the type of formula (example calories per kg of body weight; for protein 59 kg x 1.8-2.5g/kg)

Interdisciplinary team:

- Physical and Occupational therapists: evaluated all patients and developed interdisciplinary goals to assist patients with strengthening exercises, mobility and activities of daily living.
- Speech therapists: evaluated patients and would treat patients when required to avoid aspiration and to increase nutritional intake.

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Patient information

WOUND CARE PROTOCOL

The following will be undertaken by the clinical team for the patients requiring wound care. This protocol will be followed unless otherwise ordered by the physician.

1. Wound Type(s): _____

☐ Wound photograph (on admission, once a week, at discharge, and if deterioration continues)
☐ Turn patient every 2 hours ☐ Complete wound assessment

2. Labs: If not done within the past 72 hours
☐ Baseline: CBC, SMA 7, TIBC, Serum Iron, Wound culture(s), Albumin,
☐ Baseline and weekly thereafter: Prealbumin

3. Consults: ☐ Dietitian ☐ Physician to manage wound: _____

4. Treatments: ☐ Skin Care Protocol

5. ☐ **Dressing change:** Product(s): _____ and frequency _____
- as ordered by physician and/or wound care nurse.

6. ☐ **Vitamins:** ☐ **solid PO** ☐ **or equivalent liquid NG or PEG** (NOTE: Liquids are MV, Iron, Vit C and Cod Liver for Vit A
Multivitamins w/Minerals: daily Vitamin C 500mg: bid Zinc sulfate 220mg: bid
Ferrous sulfate 324mg: daily Vitamin A 10,000 units: daily

7. Protein supplementation:

☐ **All** patient with decubitis – **Proteinex** protein supplement **30ml daily**

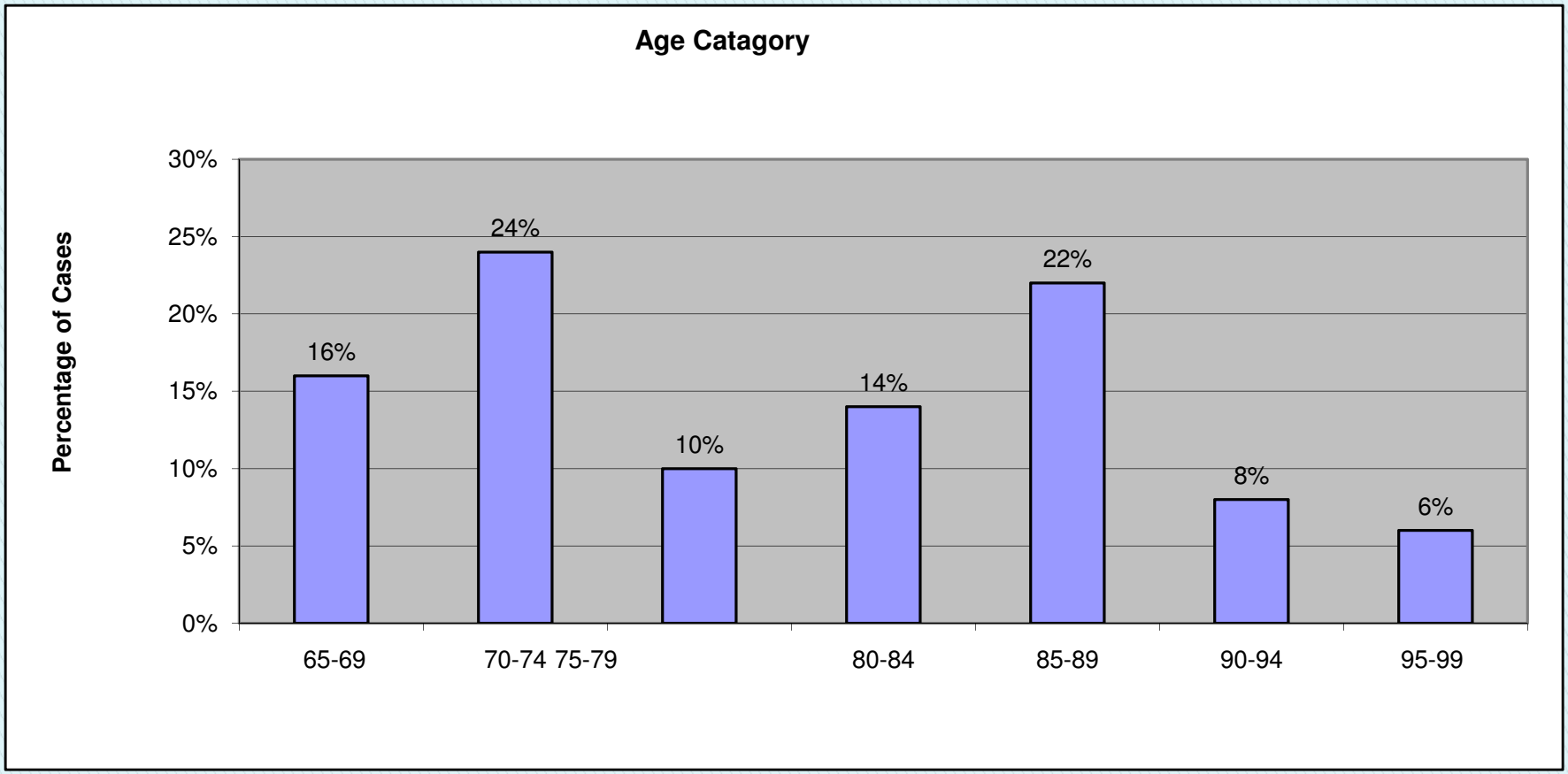
☐ Patients with **MODERATE** malnutrition (Albumin level: 2.1-2.9g/dl; PreAlbumin 5-9 mg/dl) add another dose of **Proteinex** for a total of: **Proteinex 30ml bid**.

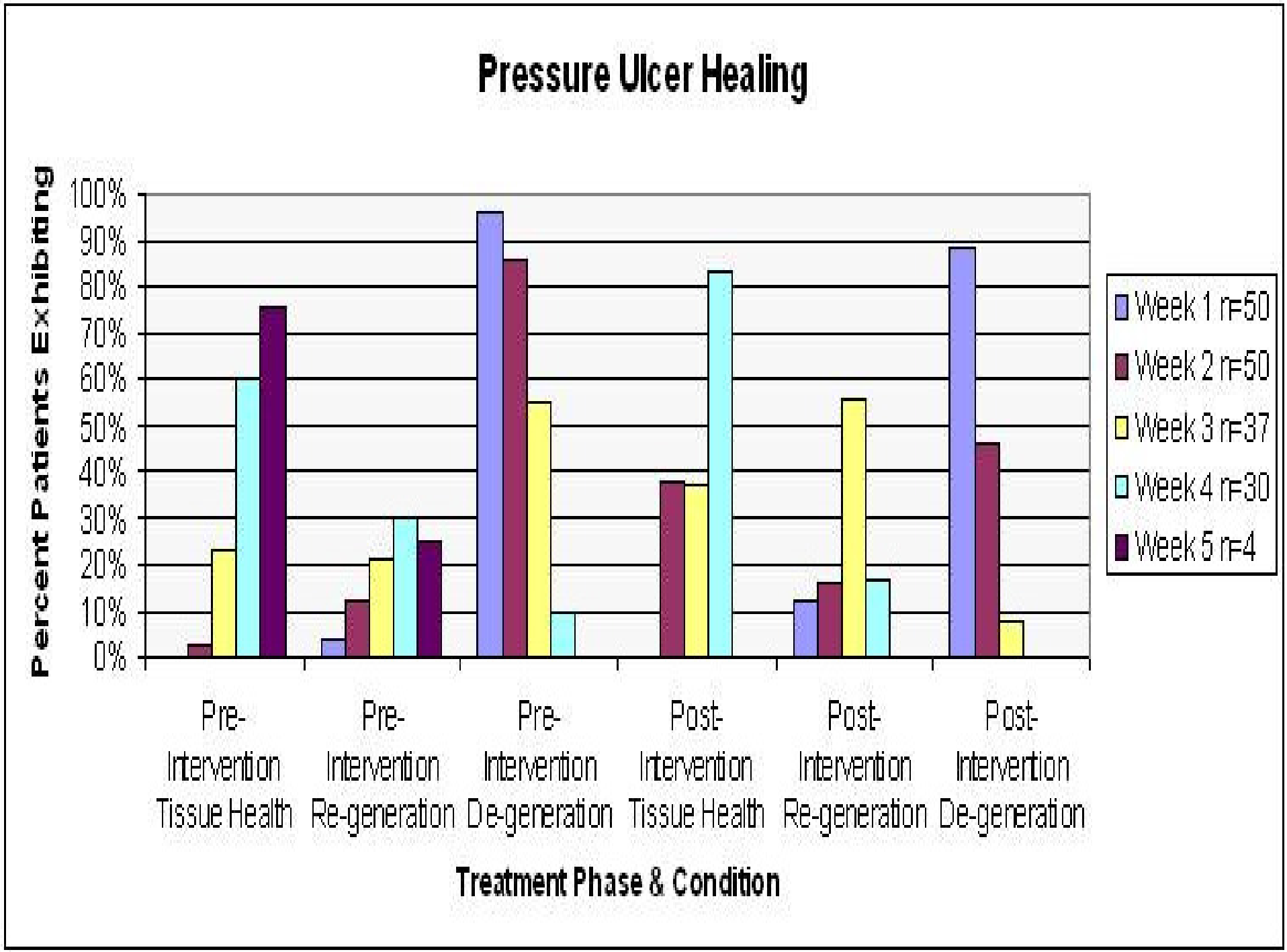
☐ Patients with **SEVERE** malnutrition (Albumin level: less than 2.1g/dl; PreAlbumin less than 5mg/dl) replace Proteinex with **Proteinex-WC 30ml bid**.

Clinician Signature **Date:** **Time:**

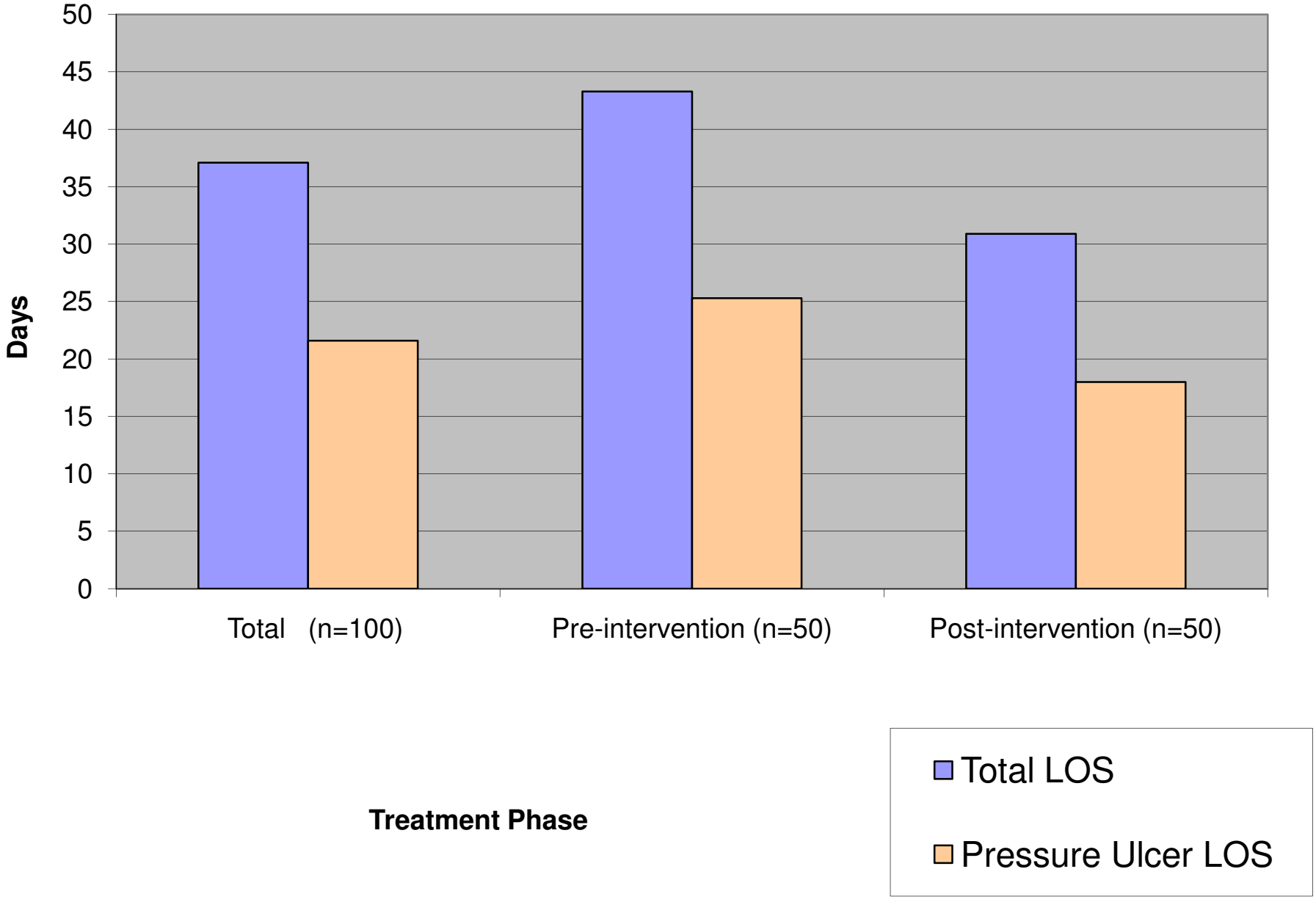
Protocol may be completed by Nurse or Dietitian

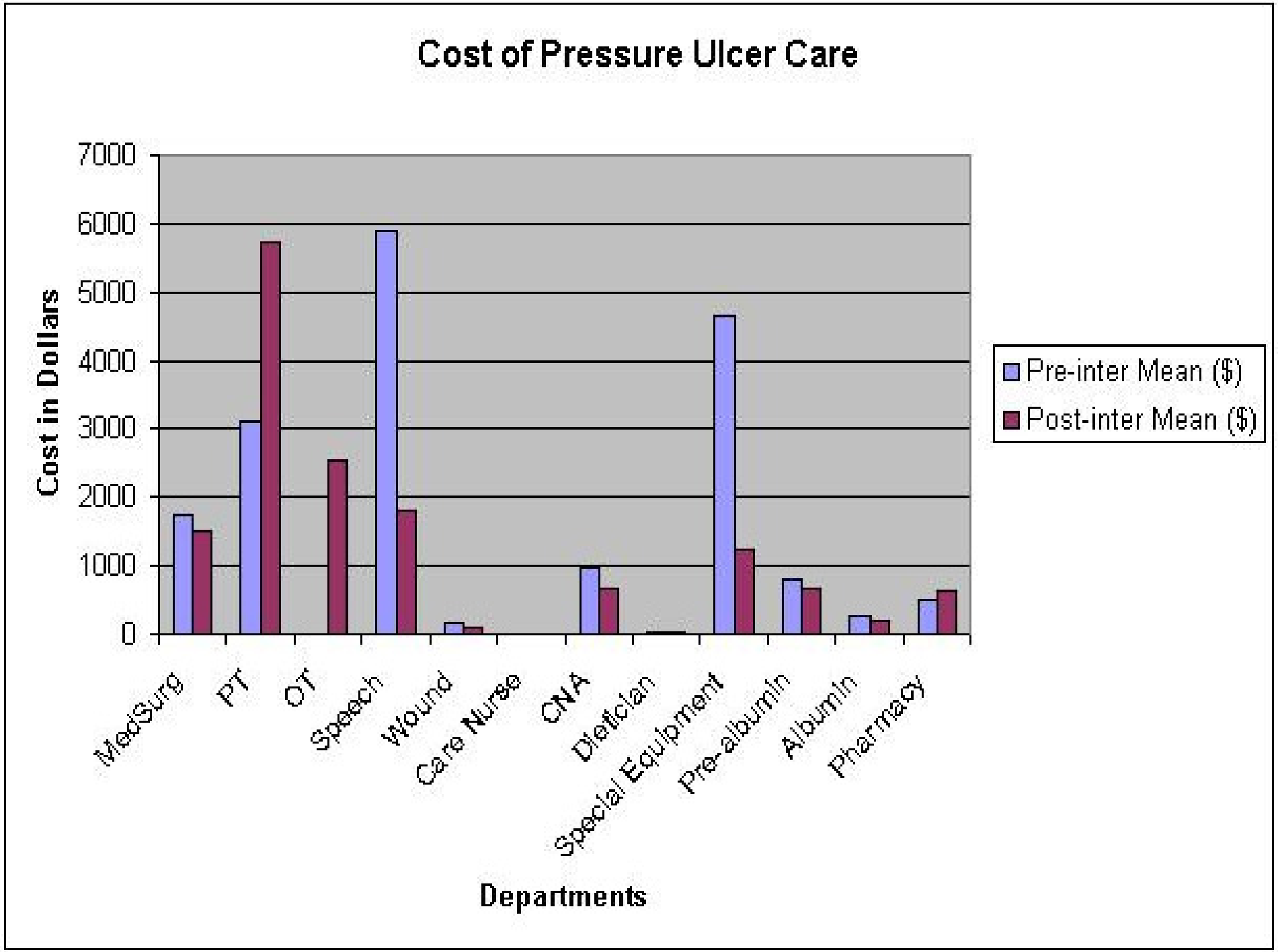
Age N=100


Age Catagory
Percentage of Cases
30%
25%
20%
15%
10%
5%
0%
16%
24%
10%
14%
22%
8%
6%
65-69
70-74
75-79
80-84
85-89
90-94
95-99


Pressure Ulcer Healing
Percent Patients Exhibiting
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Pre-Intervention Tissue Health
Pre-Intervention Re-generation
Pre-Intervention De-generation
Post-Intervention Tissue Health
Post-Intervention Re-generation
Post-Intervention De-generation
Treatment Phase & Condition
Week 1 n=50
Week 2 n=50
Week 3 n=37
Week 4 n=30
Week 5 n=4

Pressure Ulcer and LOS




Cost of Pressure Ulcer Care
Cost in Dollars
7000
6000
5000
4000
3000
2000
1000
0
MedSurg
PT
OT
Speech
Wound
Care Nurse
CNA
Dietician
Special Equipment
Pre-albumin
Albumin
Pharmacy
Departments
Pre-inter Mean ($)
Post-inter Mean ($)

Conclusion

Study findings indicate that this comprehensive nutritional intervention was effective in improving pressure ulcer wound healing. Decreasing both hospital length of stay for treatment of pressure ulcer and total hospital length of stay while showing no significant additional charges for treatment of pressure ulcers.

