

### Author's Note:

The aim of the study was to assess the influence of malnutrition on the prevalence of nosocomial infections (NIs) in non-selected hospital in-patients.

**A**pproximately 2 million nosocomial infections (NIs) are diagnosed each year in the United States, at great cost to patients and the health care system. Patients who develop an NI are two to three times more likely to die, 60% more likely to spend time in an ICU, and two to five times more likely to be readmitted to the hospital than those who do not. The direct economic impact of NIs in the US each year is \$5–10 billion.

Malnutrition, which is highly prevalent among hospitalized patients (up to 60%), has been linked to increased in-hospital morbidity, including infections. Thus, a research team in a university hospital designed a prospective study to determine whether malnutrition is an independent risk factor for NIs. The team surveyed the prevalence of NIs among 1637 in-patients. Patients' actual and usual body weights were recorded and serum albumin levels measured the week before the study began. Nutritional status was determined using the nutritional risk index (NRI) for 630 patients.



### Key Takeaways:

*Nosocomial infections (NIs) represent a direct economic liability of \$5-10 billion per year in the USA. Early screening for malnutrition may be helpful to reduce the high prevalence of NIs.*

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NRI results revealed that 427 (67.8%) were malnourished. NI prevalence was 8.7%—4.4% in nonmalnourished patients, 7.6% in moderately malnourished patients, and 14.6% in severely malnourished patients ( $P=0.009$ ). Univariate analysis showed the following patient-associated variables to be significantly associated with NIs:

- Serum albumin levels (sometimes used as an indicator of nutritional status) ( $P=0.04$ ) (concentration  $<35$  g/L)
- Age ( $P=0.05$ )
- Actual weight ( $P=0.02$ )
- Immunodeficiency ( $P=0.0007$ )
- NRI ( $P=0.01$ )

The Table at right shows the odds ratio associated with each patient-related variable. Several procedure-related variables such as presence of a vascular or urinary catheter and surgical intervention also were associated with NIs.

These data show a strong link between malnutrition and the prevalence of NIs. The researchers suggest that health care professionals need to be more aware of malnutrition and its consequences, and that the presence of nutritional support teams can help raise awareness of the condition. The researchers hypothesize that addressing hospital malnutrition

will lead to decreased NIs, as implementation of malnutrition screening and treatment in hospitals reduces length of stay, cost of care, and severe disease complications. Thus, the research team concludes that early screening for malnutrition using a simple, inexpensive tool may help reduce the high prevalence of NIs and their associated costs.

### Risk Factors for Malnutrition

| Variable                             | Odds ratio | 95% CI     |
|--------------------------------------|------------|------------|
| <b>Nutritional Risk Index</b>        |            |            |
| $\geq 97.5$<br>(well nourished)      | 1.00       |            |
| 83.5–97.5<br>(moderate malnutrition) | 1.46       | 1.21–2.11  |
| $< 83.5$<br>(severe malnutrition)    | 4.98       | 4.60–6.40  |
| <b>Age</b>                           |            |            |
| $\leq 40$ years                      | 1.00       |            |
| $> 40$ years                         | 1.97       | 1.84–2.10  |
| <b>Current Weight</b>                |            |            |
| $\geq 50$ kg                         | 1.00       |            |
| $< 50$ kg                            | 10.40      | 9.50–11.30 |
| <b>Albumin level</b>                 |            |            |
| $\geq 35$ g/L                        | 1.00       |            |
| $< 35$ g/L                           | 1.36       | 1.34–1.38  |
| <b>Immunodeficiency</b>              |            |            |
| No                                   | 1.00       |            |
| Yes                                  | 1.80       | 1.45–2.15  |

Revised risk factors for malnutrition were released in 2012.

## Nutrition Conclusion

Early screening for malnutrition may help reduce the high prevalence of nosocomial infections (NIs) and their associated costs.

Reference: Schneider SM et al, *Br J Nutr* 2004; 92: 105-111.