

## Role of Malnutrition in Increasing Risk of Hospital Readmissions

### SUMMARY

Malnutrition is common across healthcare settings. Multiple factors contribute to malnutrition and it often results in negative clinical and economic outcomes, including decreased strength, impaired functionality and quality of life, increased morbidity and mortality, longer hospital stays, and increased risk for hospital readmissions. These outcomes have significant implications for the U.S. healthcare system, including increasing the cost of care which contrasts with current healthcare law that is focused on cost containment and reducing hospital readmissions.

### SCIENTIST BIOGRAPHY



Abby Sauer, MPH, RD joined Abbott Nutrition in 1999 and is currently a Section Manager within the Scientific and Medical Affairs department. She manages the Adult Scientific Brand Management team within Nutrition Science. Her areas of experience include malnutrition, nutrition screening, assessment, and intervention, geriatric nutrition, oncology nutrition, and renal nutrition.

Abby earned her BS in dietetics from Miami University in Oxford, Ohio and completed her dietetic internship at Barnes Jewish Christian Hospital in St. Louis, Missouri. She earned a Masters in Public Health from The Ohio State University.



Dr. Menghua Luo, MD, PhD joined Abbott Nutrition in 2009 and is currently a research scientist in Adult Clinical Nutrition group within the Scientific and Medical Affairs department. Her responsibility is to lead clinical nutrition research activities in areas of hospital nutrition, critical care and respiratory health by providing scientific leadership and direction on Abbott-initiated or IIS-initiated clinical trials and new business initiatives to ensure proper and adequate support to product indications and claims.

Dr. Luo earned her medical degree from Chongqing Medical University, China, Master's degree in human nutrition from the University of Alabama, Tuscaloosa, AL and a PhD degree in clinical nutrition from Emory University, Atlanta. Dr. Luo had conducted clinical trials in patients with various medical conditions such as critical illness, short bowel syndrome, diabetes, chronic obstructive respiratory diseases, and others.

### THE CURRENT HEALTHCARE LANDSCAPE AND FOCUS ON HOSPITAL READMISSIONS

Hospital readmissions are a growing problem for the U.S. healthcare system, which drain costs and resources and negatively impact patients' quality of life. Hospitals have become "revolving doors" for many patients who are readmitted quickly after discharge, particularly older adults with certain chronic diseases or comorbidities. Almost one fifth (19.6%) of Medicare beneficiaries who had been discharged from a hospital were readmitted within 30 days.<sup>1</sup> For older adults, three conditions account for almost 15% of hospitalizations – congestive heart failure (CHF), acute myocardial infarction (AMI), and pneumonia (PNA).<sup>2</sup> Among Medicare beneficiaries hospitalized for these conditions, 30-day readmission



rates are 24.8%, 19.9%, and 18.3% respectively, and the majority of readmissions occur within 15 days of the initial hospitalization.<sup>3</sup>

Not only are readmissions common, they are also costly to the healthcare system. Estimates show that readmissions cost approximately \$26 billion annually, including \$17 billion for Medicare inpatient hospital costs, with up to 76% of these readmissions being deemed as potentially avoidable.<sup>1,4</sup> These figures highlight significant gaps in the current healthcare delivery system during hospitalization and during transition of care after hospital discharge, and the need for comprehensive solutions to improve care and reduce costs.

The Patient Protection and Affordable Care Act (PPACA) is making significant changes to U.S. health care delivery and incorporates a 'pay for performance' approach. The main goal of PPACA is to decrease the number of uninsured Americans and reduce the overall costs of healthcare. A recent high-profile effort of PPACA is reducing unnecessary hospital readmissions through the Hospital Readmission Reduction Program (HRRP). The HRRP provides incentives for the reduction of preventable hospital readmissions while encouraging hospital care coordination.<sup>5</sup> This program requires the Centers for Medicare & Medicaid (CMS) to reduce payments to hospitals and integrated delivery systems with higher than expected readmission rates. Effective October 1, 2012, CMS reduced payments to hospitals with excessive readmissions rates for the three aforementioned key patient populations – CHF, AMI, and PNA. Through this program, CMS can withhold up to 1 percent of all inpatient Medicare payments starting in 2013, up to 2 percent in 2014, and up to 3 percent in 2015. Additionally, starting October 1, 2014, CMS will begin withholding payments for excessive readmissions related to other diagnoses including chronic obstructive pulmonary disease (COPD), elective total hip arthroplasty (THA) and total knee arthroplasty (TKA).

To date, many hospitals have been penalized for high readmission rates resulting in millions of dollars in reduced payments. A 2013 report from the Health Industry Distributors Association (HIDA) showed that in 2013, more than 2,000 hospitals were penalized by CMS resulting in an estimated \$280 million in reduction in payments.<sup>6</sup>

### **NUTRITIONAL RISK FACTORS FOR HOSPITAL READMISSIONS**

The American population is aging and older adults often suffer from more acute and chronic health conditions and utilize more health care than younger-aged counterparts. In addition, older adults are at higher risk for nutritional deficits, weight loss, muscle loss and malnutrition. Malnutrition impacts older adults across the health care continuum, from community-dwelling older adults to those in the hospital, affecting up to 60% of hospitalized older adults.<sup>7</sup> The cause of malnutrition is often multifactorial, including aging itself, inadequate food intake, and acute and chronic medical conditions.<sup>7,8</sup> Often, older adults do not just suffer from malnutrition alone; it is frequently accompanied by loss of lean body mass (LBM) and strength or functionality, or sarcopenia. Moreover, older adults are more likely to be hospitalized for illness, injuries, and surgeries, further accelerating the loss of LBM, and resulting in weakness, decreased mobility, reduced functionality, and decreased ability to perform activities of daily living (ADL) thereby adding to caregiver burden.<sup>9-12</sup>

Patients with nutritional risk factors, weight loss, and/or malnutrition are more likely to experience hospital readmission than well-nourished patients.<sup>13-17</sup> One study found that hospitalized patients who had lost weight or exhibited no improvement in serum albumin within one month of discharge had a greater risk for readmission when compared to well-nourished patients.<sup>15</sup> Additionally, two studies in 2011 showed that weight loss (OR 1.26) and being underweight [adjusted Odds Ratio (OR) 12.7] were significant predictors

of readmission.<sup>13,18</sup> Research by Thomas et al found that 25% of malnourished older adults required hospital readmission compared to 11% of well-nourished patients.<sup>15</sup> A recent (2012) prospective study of hospital patients showed that malnourished patients were more likely to be readmitted within 15 days than well-nourished patients (adjusted relative risk=1.9, 95% CI 1.1-3.2, p=0.025).<sup>19</sup> Additionally, hospital patients with sarcopenia have been shown to have a significantly higher risk of non-elective hospital readmissions in the 6 months after hospital discharge than patients without sarcopenia (adjusted hazard ratio 0.53, 95% CI: 0.32-0.87, p=0.013).<sup>20</sup> A 2007 study by Laniece et al., of over 1,000 adult inpatients showed that markers of frailty and severe disability for self-feeding were the most important predictors of early readmission to the hospital.<sup>14</sup> Specifically, patients with a recent loss of the ability to self-feed had an almost 2 times increased risk for readmission (OR 1.9).<sup>14</sup> These data highlight that nutritional risk is associated with increased risk of readmission, and that early identification of these factors in key patient populations could help reduce potentially avoidable readmissions. See Table 1 below for key nutritional risk factors associated with hospital readmission.

Patients with acute or chronic diseases often experience malnutrition<sup>21</sup> and have increased readmission risk. A 2010 study of hospital patients aged 50 and older found that chronic conditions, such as CHF, diabetes, cancer, and renal disease, were associated with unplanned readmissions.<sup>13</sup> Research has also shown that malnutrition is an independent predictor of readmission in patients with PNA.<sup>22</sup> In patients with COPD, those readmitted within three months of hospital discharge had less lean body mass than those who were not readmitted.<sup>23</sup> Surgery patients with malnutrition have also been shown to be at higher risk for hospital readmission. Kassin et al.<sup>24</sup> demonstrated that in 1,442 general surgery patients, malnutrition is one of the top 3 reasons and accounts for 10.4% of 30-day readmissions.

**Table 1: Key Nutritional Risk Factors and Patient Conditions Associated with Hospital Readmission**<sup>13-17,19,20,22-24</sup>

Frailty (such as poor overall condition, pressure ulcers, and prior hospitalization)
Severe disability (such as inability to self-feed)
Unintended weight loss
Low Body Mass Index (BMI)
Underweight and Overweight
Chronic conditions or diseases (such as cancer, renal failure, COPD, pneumonia, CHF, and diabetes)
Major surgery

An additional factor to consider when addressing hospital readmissions is the care patients receive both during and after hospitalization. A recent commentary by Krumholz published in The New England Journal of Medicine in 2013 states that to promote a successful recovery after hospitalization, health care professionals need to focus on not only the admitting diagnosis but also the effects of that hospitalization on the patient's body function.<sup>25</sup> At discharge, patients' physiological systems are often impaired, their reserves are depleted, and their body cannot effectively defend itself, a term referred to as "post-hospital syndrome".<sup>25</sup> This syndrome occurs as a result of hospitalization for an acute illness along with other factors including sleep deprivation, decreased cognitive function, pain and discomfort, and poor nutrition.<sup>25</sup> It is suggested that the healthcare team implement interventions to improve the health status



of these patients after hospital discharge, including promoting good nutrition and addressing nutritional deficiencies.<sup>25</sup>

## **CONCLUSION**

Hospital patients, especially older adults and those with chronic disease are at high risk for readmissions. These readmissions result in high costs to the healthcare system and to the patient, in regards to quality of care and quality of life. Key patient populations, including those with CHF, AMI, PNA, and COPD, are the focus of current CMS strategies to reduce payment for excessive readmission rates to help contain costs. Nutrition risk factors, including weight loss and inability to self-feed, are associated with higher readmission rates.

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