

## ***Fact Sheet: The Impact of Nursing Workload on Bacterial Nosocomial Infections in the Acute Care Setting***

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funded by the  
**Ontario Ministry of Health &  
Long-Term Care**  
1999-2004



### **What is Nursing Workload?**

- Koehoorn et al. (2002) define workload as, “a balance of job demands with sufficient resources (adequate staffing, time available) to plan and carry out work”.

### **How is Nursing Workload Measured?**

Nursing workload is measured by patient classification tools, such as PRN, GRASP, and Medicus.

- PRN® measures each direct care item by assigning it a point value, multiplied by five, to determine the time required completing an activity. A value for indirect nursing care is added to calculate the total hours of care given (O’Brien-Pallas, Cockerill & Leatt, 1992).
- GRASP® calculates the time that is spent on patient activity over a 24 hour period (Trundle, Farrington, Anderson & Redpath, 2001).
- Medicus® contains 37 indicators to assess patients and to determine which of the five levels of care apply to them (O’Brien-Pallas, Cockerill & Leatt, 1992).

### **How has Nursing Workload Changed?**

- There has been an overall increase in work intensity and complexity in the downsized health care environment. Hospitalized patients require more hospital resources (O’Brien-Pallas, Thomson, Alksnis & Bruce, 2001, Baumann & Underwood, 2001).
- Analysis of nursing workload demonstrates that patient and environmental factors significantly increase nursing workload and reduce nurses’ ability to take on more work (O’Brien-Pallas, Thomson, Alksnis & Bruce, 2001).

### **What are Bacterial Nosocomial Infections?**

- The Center for Disease Control and Prevention defines a nosocomial infection as “a localized or systemic condition that results from adverse reactions to the presence of an infectious agent(s) or its toxin(s) and that was not present or incubating at the time of admission to the hospital” (Croft, Jani & Prakash, 2003).
- Bacteria that cause nosocomial infections include: Staphylococcus aureus, Escherichia coli, Proteus mirabilis, Enterobacter, Acinetobacter, Streptococcus pyogenes, Klebsiella pneumoniae, Enterococcus, Clostridium difficile (Croft, Jani & Prakash, 2003).
- Nosocomial infections are transmitted through contact, airborne droplet, and airborne dust routes. More than 20% of all nosocomial

infections are acquired in Intensive Care Units (Kaye, 2003). Hospitals with effective screening and infection control surveillance have lower rates of nosocomial infections. Hospitals should enforce strict handwashing, practice universal precautions, and use appropriate waste/linen disposal in order to reduce the transmission of nosocomial infections throughout.

- Several factors contribute to the high incidence of nosocomial infections in acute care settings:
  - Intensive Care Units have more chronic and severe acute illnesses (Kaye, 2003).
  - There is a high frequency of indwelling catheters among ICU patients that provides a point of entry into the bloodstream (Kaye, 2003).
  - Multi-drug resistance pathogens such as Methicillin-Resistant Staphylococcus aureus (MRSA) and Vancomycin-Resistant Enterococci (VRE) are being identified more frequently in acute care settings (Kaye, 2003).

### **Evidence from Six Recent Studies Support a Relationship Between Workload and Bacterial Nosocomial Infections:**

- Using the GRASP workload system to compare nursing workload during six MRSA outbreaks, an overall rise in staffing gaps was observed along with an increased workload between 1994 and 1997 in the hospital setting. Peaks of workload coincided with bursts of infection (Farrington, Trundle, Redpath & Anderson, 2000).
- MRSA cases were inversely correlated with peaks of nursing staff workload and reduced nurse/patient ratios within the unit (Vicca, 1999).
- Patient, practitioner, and organizational factors correlate with bloodstream infections in Intensive Care Units. Adequate staffing was labeled as one crucial factor in preventing bloodstream infections (Jackson, Chiarello, Gaynes & Gerberding, 2002).
- Understaffing, overcrowding and periods of increased workload in a Neonatal Intensive Care Unit resulted in additional costs and nosocomial infections i.e. cross-transmission of Enterobacter cloacae (Harbarth, Sudre, Dharan, Cadenas & Pittet, 1999).
- The incidence of MRSA and bed occupancy rates over a twenty-four month period (1999 and 2000) at St. Luke's Hospital in Malta showed a peak of MRSA incidence when bed occupancy was highest. Further study indicated a correlation of increased workload with the spread of MRSA in the ICU (Borg, 2003).
- A study on the impact of health care restructuring on nosocomial infections and transmission of antimicrobial resistant organisms found that understaffing and the educational skill level of the health care provider effects the transmission of microorganisms (Conly & Johnston, 2001).

### **Conclusion**

- Studies indicate that there is evidence correlating an increase in workload with the spread of bacterial nosocomial infections in acute care settings (Borg, 2003).
- Improvement in staffing levels and the reduction of overcrowding has proven to be effective in controlling endemic bacterial nosocomial infections spread in acute care settings (Borg, 2003).