

Sigma Theta Tau International
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Are there economic benefits from increased nursing staffing in acute hospitals?

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A little bit about me

35 years working in hospitals

- 15 years in nursing administration

Executive Director of Nursing 600 bed public teaching hospital SCGH (2nd busiest Hospital in Australia)

- Designated a Magnet hospital in 2009

Department of Health Chief Nurse (policy role) for WA 6 months

Head of School, Nursing and Midwifery 4 years



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Outline:

- Present the benefits of increased nursing hours of care on health outcomes
- Present the economic impact of increased nursing hours of care
- Discuss cost effectiveness of increased staffing compared to other interventions



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“I DON'T HAVE TIME TO GRANT YOU THREE WISHES, BUT YOU CAN MAKE ONE REQUEST THAT MIGHT NOT NECESSARILY COME TRUE”

www.nurtoon.com



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Health Outcomes:

USA

- Each additional patient added to nurses workload associated with 7% increase in risk of dying and failure to rescue within 30 days admission

(Aiken et al 2002)

Also found a 10% increase in degree educated nurses was associated with:

- 5% decrease in chance of patients dying and failure to rescue within 30 days of admission (Aiken et al 2003)



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Health Outcomes:

USA

Significant patient outcomes were adversely affected by lower nurse staffing levels

- Mortality, DVT, pneumonia, UTI, pressure injuries, length of stay and failure to rescue
- Failure to rescue = death from complication of pneumonia, shock or cardiac arrest, upper GI bleeding, sepsis or DVT.

(Needleman et al. 2002)

High patient turnover (4%), below target staffing (2%) on a shift increase the risk of dying (Needleman et. al. 2011)



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Health Outcomes: Canada

- Higher percentages of registered nurse staff, higher percentages of baccalaureate-prepared nurses, higher nurse reported adequacy of staffing and resources were associated with lower 30-day mortality rates in medical patients

(Tourangeau et al. 2007)

- Characteristics that predicted 30-day mortality were higher nurse education level, richer nurse skill mix, higher proportion of casual or temporary positions, (Estabrooks et al., 2005)



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Health Outcomes: UK

- Hospitals with a higher proportion of registered nurses compared to non registered nurses were associated with lower rates of 30-day mortality.
- The patients in favourably staffed hospitals had lower surgical mortality and lower failure to rescue rates.
- Patients in the hospitals with the poorest nurse-to-patient ratios had 26% higher mortality. (Rafferty et al., 2007)



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Health Outcomes:

New Zealand

Effects of health reengineering on nursing and patient outcomes

- Nurse hours declined by 36%
- Significant increases in complications for patients;
 - central nervous system complications,
 - wound infection,
 - pulmonary failure,
 - physiological and metabolic derangement,
 - urinary tract infections,
 - Sepsis,
 - Pressure injuries (McCloskey and Diers 2005)



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Health Outcomes:

Australia - NSW Study

- Skill mix with higher proportion of RNs produced statically significant decreases in:
 - Pressure injuries
 - gastrointestinal bleeding
 - sepsis
 - shock
 - physiologic/metabolic derangement
 - pulmonary failure
 - failure to rescue
 - Falls

(Duffield et al. 2007)



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Health Outcomes:
Australia WA

The impact of implementing NHPPD Staffing Method (313 FTE increase in nurse staffing in study hospitals)

25 % decrease in mortality rate

- Medical 24%
- Surgical 25%

Significance set at p value of ≤ 0.05



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Health Outcomes: Australia WA

In surgical patients:

- 54% decrease in CNS complication rate,
- 17% decrease in pneumonia rate and
- 37% decrease in ulcer/ gastritis/ UGI bleed rate

(Twigg et al. 2011)



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Health Outcomes:
Australia WA

The Importance of Skill Mix:

Skill mix was defined as the percentage of RN hours

The changes in the rate of the nurse sensitive outcome is associated with each 1% increase in RN hours.



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Hospital 1 (skill mix 88.46%)
16% increase in pneumonia

Hospital 2 (skill mix 81.55%)
84.05%)
10% decrease pneumonia

19% decrease in DVT

17% decrease in surgical sepsis

27% decrease in shock/cardiac arrest

12% decrease in failure to rescue

But7% increase in UTI

Hospital 3 (skill mix

4% decrease in medical pneumonia

5% decrease ulcer/gastritis/UGI
bleed

2% decrease mortality medical
patients

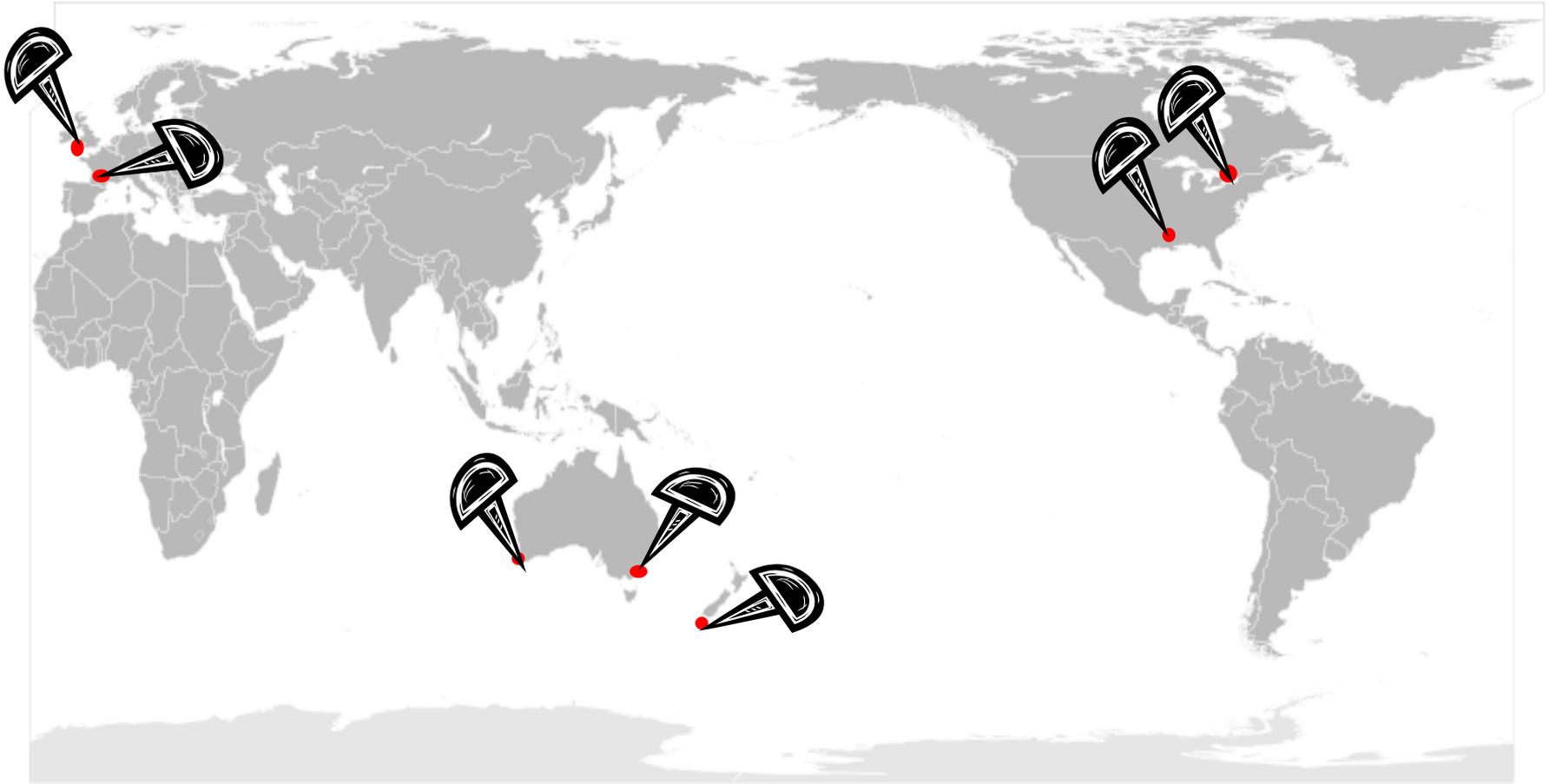
10% increase shock/cardiac arrest

(Twigg et al. 2012)



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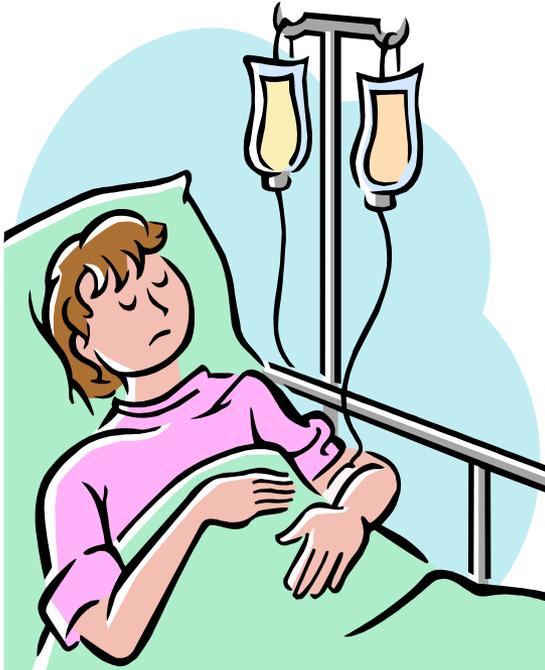




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The economic impact of increased nursing hours of care



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Economic impact :

Improving the RN mix to the 75th percentile without changing the total hours of care would result in significant cost savings by reduced adverse events (Needleman 2005)

Modelling of Michigan hospitals (prevention of pneumonia and nosocomial infections) found savings in adverse patient outcomes in a typical 200 bed hospital that moved from a 1-to-5 nurse-to-patient ratio to a 1-to-4 ratio over a 10 year period was US\$7.5M in the first year and more than US\$11M by year 10 (Michigan Nurses Association 2004)



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Economic impact:

US cost effectiveness modelling based on two large patient outcome studies found:

Increasing the nurse-to-patient ratio from 1-to-8 to 1-to-4 would save additional lives at a cost of US\$136,000 per life saved.

This constituted a considerable saving compared to the cost of thrombolytic therapy in acute myocardial infarction at US\$182,000 per life saved or routine cervical cancer screening at a cost of US\$432,000 per life saved.

(Rothberg, Abraham, Lindenauer and Rose 2005)



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Economic impact:

Quality and cost analysis of nurse staffing, discharge preparation and post discharge utilization

Higher non overtime RN staffing decreased odds of readmission (OR = 0.56)

Higher RN overtime staffing increased odds of ED visit (OR1.70)

A 1 SD increase in RN non overtime staffing (0.75 hours-per-patient-day) net saving of US \$409.50 per patient and estimated US\$11.64 million per annum

A 1SD decrease in RN overtime (0.07 hours-per-patient-day) resulted in estimated savings of US \$ 8.18 per patient and a estimated US\$544,000 per annum.

Rationale – better discharge planning.

(Weiss ME, Yakusheva O, Bobay K, L. 2011)



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Economic impact:

Study of 2 CCU's examined the incremental cost of adverse events and the rate of near misses recovered by nurses:

Found 66 recovered near misses during 308 observation hours

34 (51%) were judged by physicians to be likely to have harmed the patient

This extrapolated to 2296 AE's annually

Savings from prevented adverse events = \$2.2M - \$13.2M

Nurse staffing costs = \$1.36M over the same period

The potential savings from prevention of AE's was far greater than the nursing staffing costs (Rothschild, Bates, et al. 2009)



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Economic impact:

Cost-effectiveness analysis of increasing nurse staffing levels to 75th percentile in post operative cardiac wards

Previous study found a decrease in mortality with increased staffing

Cost of increased staffing = €1,211,022

Avoid estimated 45.9 deaths a year and generate 458.89 life years gained annually

Cost effectiveness ratio of €26,372 per avoided death and €2,639 per life year gained

Increasing nurse staffing appears to be a cost effective intervention when compared to other cardiovascular interventions.

(Van den Heede, Simoens, et al. 2010)



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WA Analysis:

Longitudinal study, involved the retrospective analysis of a cohort of multi-day stay patients admitted to adult teaching hospitals.

Hospital morbidity and staffing data from September 2000 until June 2004 were used to analyse nursing-sensitive outcomes pre and post implementation of the Nurse Hours per Patient Day staffing method (214 279 patient records)

Individual patient risk adjustment undertaken

Only NSO's significant ($p < 0.004$) included in economic analysis

The cost of the intervention comprised increased nursing hours following implementation of the staffing



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WA Analysis:

The number of nursing-sensitive outcomes was 1,357 less than expected post implementation

Included 155 fewer 'failure to rescue' events.

The 1,202 other nursing-sensitive outcomes prevented were 'surgical wound infection', 'pulmonary failure', 'ulcer, gastritis, upper gastrointestinal bleed' and 'cardiac arrest'.



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WA Analysis:

One outcome, pneumonia, showed an increase of 493.

Analysis of life years gained (discounted at 3% to reflect the economic benefits gained in the future would be less than the present) was based on the failure to rescue events prevented

Total life years gained was 1,088. (Discounted)

The cost per life year gained was AUD\$8,907.
Sensitivity analysis AUD\$5,697 - AUD\$12,213



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WA Analysis:

A reasonable threshold for cost-effectiveness in Australia is \$30-60,000 per life year gained

The implementation of the Nurse Hours per Patient Day staffing method was cost-effective when compared with thresholds of interventions commonly accepted in Australia.

The results (cost per life year gained AUD\$8,907) fall within the cost-effectiveness thresholds of the US, the UK and Sweden suggesting broader application than that of Australia



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Twigg, D., Geelhoed, E., Bremner, A., & Duffield, C., (2013). The economic benefits of increased levels of nursing care in the hospital setting. *Journal of Advanced Nursing* doi: 10.1111/jan.12109



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In summary:

Nurses play an important role in providing a continuous surveillance system enabling the early detection and prompt intervention when patients' conditions deteriorate (Aiken 2002).

The ability of nurses to initiate actions that minimise adverse events and negative outcomes for patients is directly linked to the hours of care, skill mix and educational preparation

Adequate staffing has been shown to be cost effective and affordable.



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Thankyou



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