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# **Nurse staffing: Key to good patient, nurse, and financial outcomes**

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136 Annual APHA Meeting, San Diego, CA  
October 26-29, 2008

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# Current healthcare climate

- Nursing shortage
  - Tight reimbursements to providers
  - Focus on capital & technology improvements:
    - may be more costly than improving staffing
    - may not improve quality and safety as intended
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# Presentation topics

- Conceptual framework
- Discuss the evidence on the importance of nurse staffing for:
  - Patient quality and safety
  - Staff satisfaction and health
  - Financial performance
- Recommendations



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# Definition of nurse staffing

- Number of nurses or nursing hrs/
  - the number of patients
  - or patient days
- Skill mix of nurses
- Little scientific evidence of exact nurse-to-patient-ratios needed
- Staffing adequacy is related to workload

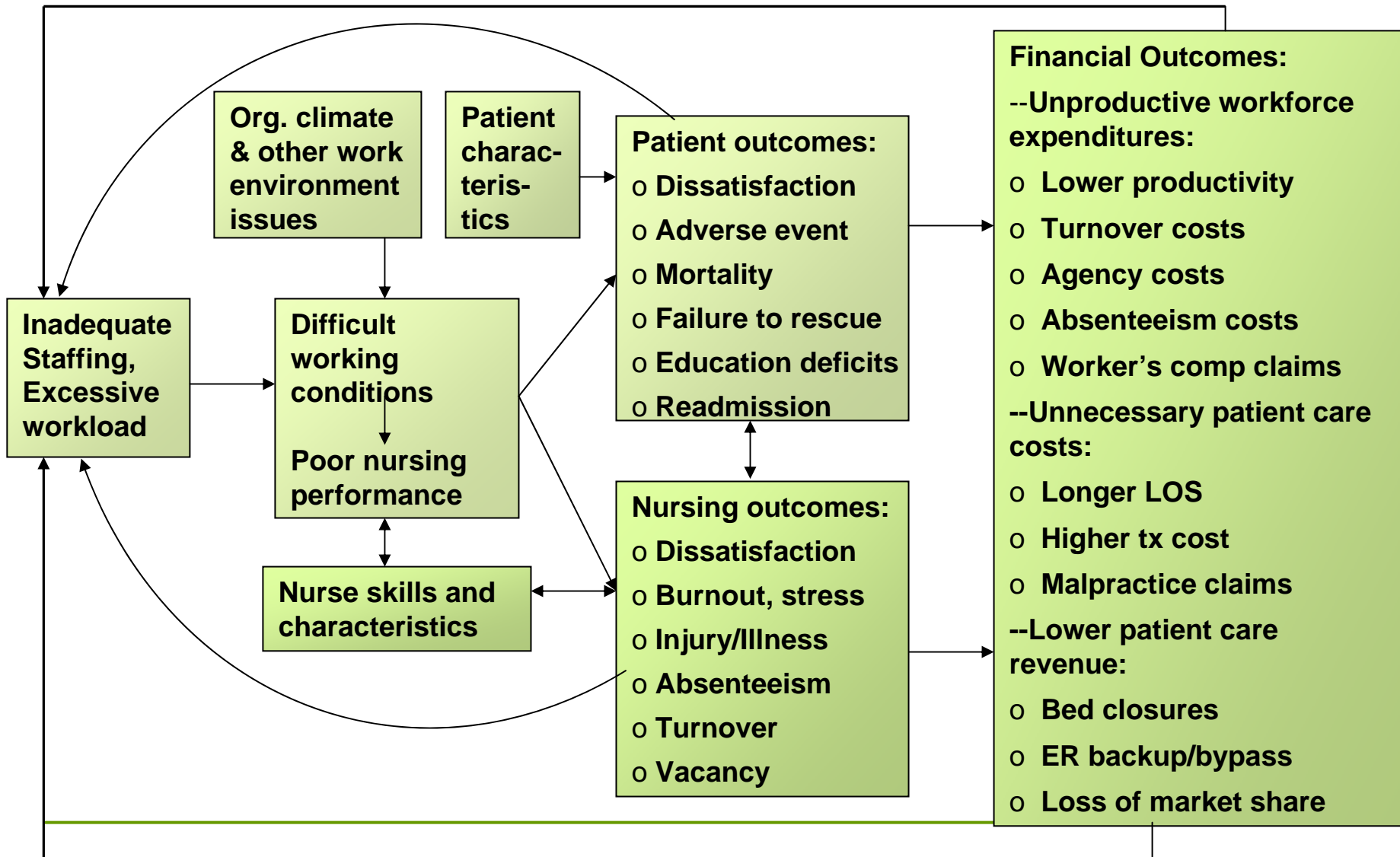


# Definition of workload

- The amount and intensity of work a nurse encounters in a given period of time.
- Affected by all of the following:
  - # of patients
  - patient acuity
  - patient throughput
  - unit design
  - technologies
  - human resources
  - amount of administrative tasks
  - skills and education of nurses



# Pathways of inadequate nurse staffing



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# Hypothesized impacts of understaffing

- Negative patient outcomes
    - patient dissatisfaction
    - adverse events
    - failure to rescue (FTR)
    - Mortality
  - Negative nursing outcomes
    - dissatisfaction
    - burnout
    - injury or ill-health
    - turnover
  - Higher costs and lost revenues due to:
    - lower productivity
    - higher turnover
    - use of agency nurses
    - more workers' compensation claims
    - longer patient lengths of stay
    - higher treatment costs
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# Evidence base for impact on outcomes

- Comprehensive literature review
- Several article databases 1980 - 2006:
- Multiple search terms
- Articles selected if they were original empirical literature
- Existing reviews discussed when evaluating the evidence



# RN staffing impact on patients, 2002-2006 (20 studies, 112 findings)

	Blood stream infections	Cardiac arrest/ shock	Complications	Falls	Failure to rescue
RN, LN / pt, pt day, apd	1 = NS		2 = (-)	3 = (-) 1 = NS	3 = (-) 2 = NS 1 = (+)
RN, LN skill mix	1 = NS			1 = (-) 2 = NS 1 = (+)	1 = (-) 1 = NS
RN ed level					1 = (-)

# RN staffing impact on patients, 2002-2006 (20 studies, 112 findings)

	Med errors	Mortality	Pneumonia	Post-op infections	Pt satisfaction	Pulmonary compromise
RN, LN / pt, pt day, apd	1 = (-) 1 = NS	5 = (-) 3 = NS	2 = (-) 1 = NS 1 = (+)	2 = NS	1 = NS 1 = (+)	1 = (-) 1 = NS
RN, LN skill mix	1 = (-) 1 = NS	2 = (-)	2 = (-)	1 = (-) 2 = NS	1 = (+)	1 = NS
RN ed level		2 = (-)				
Nurse/ pt		1 = (-)				

# RN staffing impact on patients, 2002-2006 (20 studies, 112 findings)

	Restraint use	Skin breakdown	Thrombosis	Urinary tract infections
RN, LN / pt, pt day, apd	1 = (-)	1 = (-) 3 = NS	1 = NS	1 = (-) 4 = NS
RN, LN skill mix		1 = (-) 1 = NS		3 = NS

# Impact on patients: reviews

- Lang et al., 2004, review 43 studies 1981–2003:
  - positive effect of nurse staffing with FTR and mortality
- Haberfelde et al., 2005:
  - evidence is mixed
- Lankshear et al., 2005:
  - accumulating evidence of a relationship between nurse staffing & patient outcomes.
- Lake & Cheung, 2006:
  - studies of falls and pressure sores 1998-2005
  - methodologies vary and the evidence is inconclusive.
- AHRQ, 2007 (Kane, et al., 2007):
  - large meta-analysis of studies 1990-2006
  - higher nurse staffing is r/t lower pt mortality, FTR

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# Impact on patients: summary

- Most studies find at least one positive relationship between staffing and patient outcomes and one insignificant or counter-intuitive relationship.
  - Counting the number of statistically significant relationships, the following outcomes stand out as being related to nurse staffing:
    - *Falls*
    - *FTR*
    - *Mortality*
    - *Pneumonia*
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# RN staffing & workload impact on nurses (22 studies, 36 findings)

	Burn-out	Disengagement & intent to quit	Exhaustion	Health status	Job dissatisfaction	Job satisfaction
Under-staffing	1 = (+)		1 = (+)		4 = (+)	1 = (-)
High workload		1 = (+)	2 = (+)		2 = (+)	2 = (-) 1 = NS
High job demands, stress	1 = (+)	1 = NS 2 = (+)	1 = (+)	1 (-)	2 = (+)	1 = (-)

# RN staffing & workload impact on nurses (22 studies, 36 findings)

	Life satisfaction & quality	Injury: assault	Injury: musculo skeletal	Injury: needle stick	Stress	Turn-over
Under-staffing				1 = (+)		1 = (+)
High workload		1 = (- ) 1 = (+)	1 = (+)	1 = (+)	1 = (+)	
High job demands, stress	2 = (- )		1 = (+)			1 = (+)

# Impact on nurses: emotional

- ***Emotional exhaustion, &/or burnout &/or job dissatisfaction*** are r/t:
  - ❑ insufficient nurse staffing
  - ❑ high work or job demands/pressure
  - ❑ high patient acuity
  - ❑ lack of time to do the job
  - ❑ too many things happening at once
  - ❑ exhaustion at the end of a shift
  - ❑ a sense of poor quality
  - ❑ fear of making or actually making a mistake

# Impact on nurses: physical

- Understaffing/high workloads/physical work demands/work pressure r/t
  - ❑ Higher probability of needle-stick injury (Clark, et al. 2002a,b)
  - ❑ Neck, shoulder, back injuries (Trinkoff, et al., 2003)
  - ❑ Poor health status of nurses (Landeweerd & Boumans, 1994)

# Impact on nurses: retention

- Indirect impact:
  - Staffing and workload are linked to
    - job dissatisfaction
    - work related exhaustion
    - lower quality of care
  - Job dissatisfaction, work related exhaustion, lower quality of care are linked to
    - intent to quit
    - quitting
- Direct impact:
  - higher work tempo is r/t intent to quit (Gardulf, et al.,2005)
  - poor staffing, poor work environment, work stress is why nurses left job (Strachota, et al., 2003)

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# Impact on nurses: summary

- Nearly all studies find that lower staffing or higher workload are related to
    - negative emotional and physical health
    - lower retention (directly or indirectly)
  - More studies of physical impacts need to be conducted
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# Impact on hospital finances



- Small number of studies
- Difficulty in making the linkage because benefits of better staffing are difficult to monetize
- Four approaches
  - 1) Efficiencies r/t impact on personnel and operating costs
  - 2) Cost savings r/t impact on patient LOS
  - 3) Cost savings r/t impact on patient adverse events
  - 4) Costs savings of reduced nurse turnover (thought to be affected by staffing)

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# Impact on finances: costs

- Older studies of the impact of RN skill mix on personnel & operating costs have mixed results.
  - A newer study of both personnel and operating costs finds that:
    - Greater RN skill mix is cost-neutral for both types of costs
    - Greater use of temp RNs leads to higher operating costs
    - (Bloom, Alexander, & Nuchols, 1997)
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# Impact on finances: patient LOS

- Lower LOS r/t
  - greater RN hours  
(Brown, et al., 2002; Shamian, et al., 1994)
  - higher nurse/patient ratios  
(Provonost, et al., 1999)
  - lower nurse workload  
(Behner, et al., 1990)

# Impact on finances: patient adverse events

- An increase in RN hours or proportion is r/t
  - a decrease in the odds of pneumonia
  - significantly lower lengths of stay
  - decreased medical cost (Cho, et al., 2003)
- An increase in RN hours
  - significantly **increases** operating **expenses** but has **no significant effect** on **profits** (McCue et al., 2003)
- An increase in RN skill mix
  - **increases** operating **expenses** and **lowers profits** (McCue et al., 2003)

# Impact on finances: patient adverse events

- Decreasing patients/nurse
  - lowers mortality and decreases costs but cost savings never completely offset the labor costs.
  - the cost effectiveness declines as the pt/nurse ratio declines
  - ***is more cost effective than other patient safety interventions*** (Rothberg et al., 2005)
- Raising the proportion of RNs without changing licensed hrs
  - is the least costly of several staffing improvement strategies
  - would result in a small average net benefit (negative net cost) (Needleman, et al., 2006)

# Impact on finances: nurse turnover



- For each nurse replaced, turnover costs include:
  - ❑ lower productivity of nurse leaving
  - ❑ termination costs
  - ❑ training costs
  - ❑ lower productivity of nurse hiring on
  - ❑ other common expenses

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# Impact on finances: nurse turnover

- Turnover is estimated in 2002 dollars to cost around
    - \$62,100 for a medical surgical nurse
    - \$67,100 for a specialized nurse (Jones, 2005)
    - This is 119-128% of the average 2002 RN salary
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# Recommendations

- ensure good staffing levels
  - maintain reasonable workload
  - make improvements in work environment
  - consider the opportunity costs of choices
  - be careful with innovations
  - evaluate interventions
  - promote staffing research
  - promote adequate supply of nurses
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