

# Findings and Strategies from Research Literature

IOM Committee on Optimizing Graduate Medical  
Trainee (Resident) Work Schedules to Improve  
Patient Safety

Arpana R. Vidyarthi, MD  
Assistant Professor of Medicine  
Director of Quality, Division of Hospital Medicine  
Director of Quality and Safety Programs, GME  
University of California, San Francisco

# Residents: Fatigue, Errors, and Handoffs

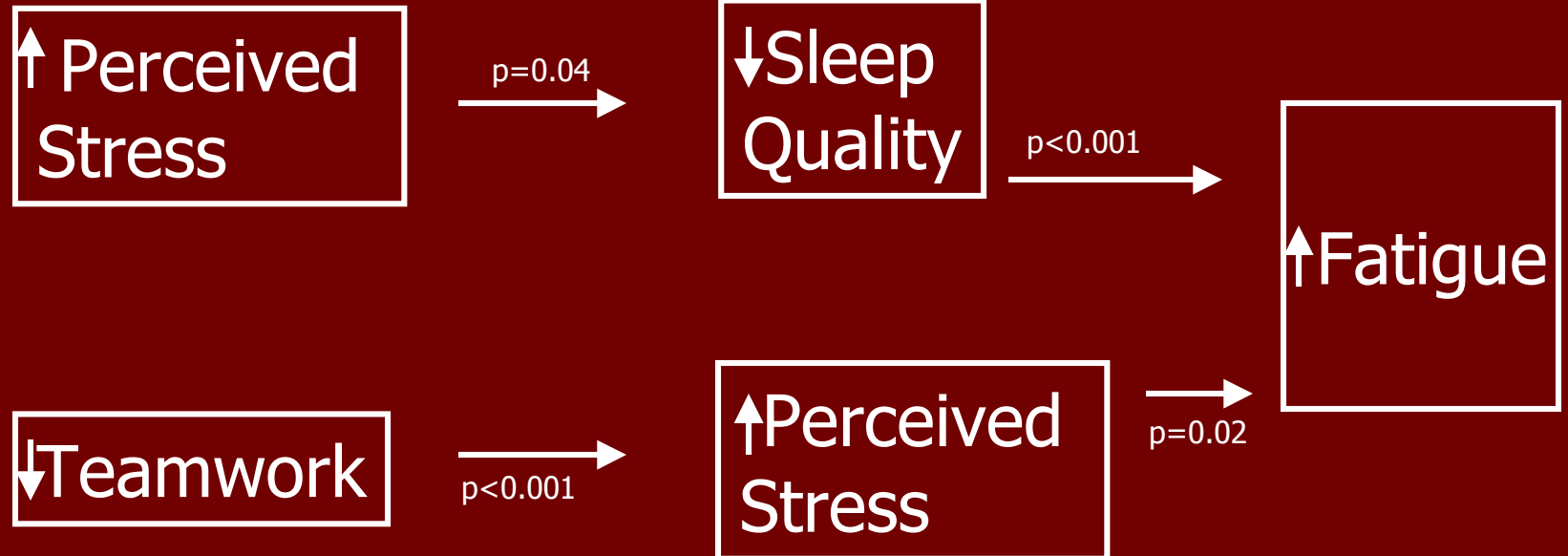
- n Overview of the data from the University of California San Francisco experience
  - § Predictors of Fatigue
  - § Self-reports of Errors
  - § Impact on Discontinuity and Handoffs

# Impacts of Fatigue on Residents

- n Conflicting results
  - Test scores
  - Tasks
  - Attentional failures

- n To determine the predictors of fatigue for residents
  - Cognitive specialty interns
  - Validated scales
    - § Chalder Fatigue Scale
    - § Medical Outcomes Study Sleep Score
    - § Cohen Perceived Stress Scale
    - § Teamwork scale

# Long Work Hours are Not Associated with Fatigue



Regression model includes: Gender, Hours worked Teamwork

# Impact of Duty Hour Reduction on Perceptions of Patient Care

- n January 2003: system changes to decrease duty hours
  - Day float
  - Enforced signout times
  - Expansion of night float

- n February 2003: survey
  - Questions designed through focus groups and expert opinion
  - 76% response rate
  - Frequency: 1=never, 5=very often

# Epidemiology of Errors

## Frequency of Engaging in Common Sub-Optimal Patient Care Practices

<u>Variable</u>	<u>Mean</u>	<u>SD</u>
During your most recent inpatient rotation work-week, how often did you...?		
Work while impaired by fatigue	3.73	0.85
Forget to transmit information during sign-out	2.13	0.69
Report information that you were unsure of	1.92	0.81
Write uncertain information in a patient's chart	1.74	0.78
Make up information to report to your superior	1.13	0.54
Summary Score of Suboptimal Care (Cronbach's $\alpha=0.75$ )	2.16	0.54

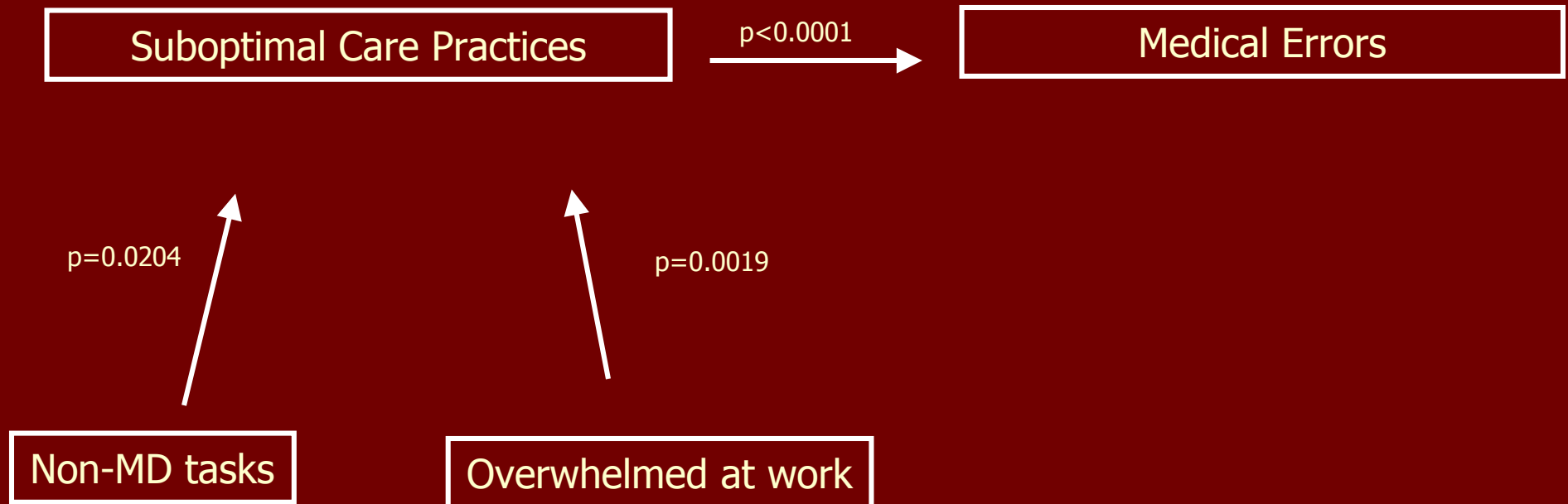
# Epidemiology of Errors

## Frequency of Committing Errors

<u>Variable</u>	<u>Mean</u>	<u>SD</u>
How often do you make errors because of...?		
Work-Stress:		
Fatigue	3.11	0.77
Excessive Workload	3.11	0.84
Inadequate Time	3.04	0.89
Distractions	2.77	0.86
Stress	2.57	0.91
Intellectual Stress:	2.39	0.54
Inadequate Knowledge	2.67	0.62
Inadequate Supervision	2.12	0.65
Work Stress Summary Score (Cronbach's $\alpha=0.85$ )	2.92	0.67
Intellectual Stress Summary Score (Cronbach's $\alpha=0.60$ )	2.39	0.54

# Hours Worked are Not Associated with Suboptimal Care or Errors

Predictors of Reported Suboptimal Care and Errors\*

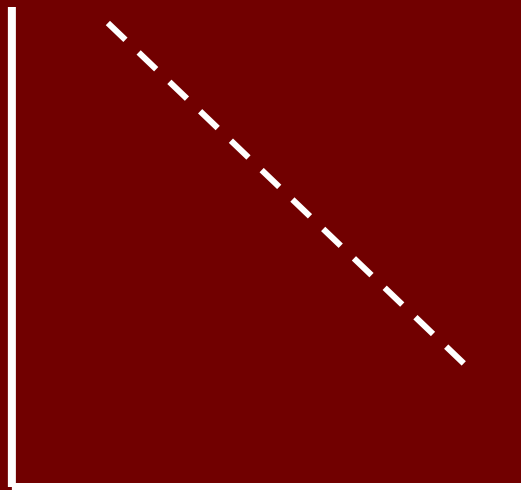


\*Regression models included: PGY year, hours worked > 80, non MD tasks > 50%, feeling overwhelmed at work

# Decreasing Hours Increases Handoffs

## The Relationship

Handoffs



Hours worked

## The Implication

Handoffs increase with any decrease in hours worked

Handoffs represent gaps in care

- Vulnerable times of transfer of information and responsibility
- Great potential for error

# Scope of the Issue is Large

## n UCSF Medicine Service

- 15 handoffs per patient for a 5 day length of stay
- 300 handoffs per month for each intern

## n Nationally

- 8000 training programs
- 100,000 trainees
- 7.2 million patients

**UCSF Medical Center: 4000 handoffs daily,  
1.5 million handoffs a year**

# Handoffs Associated With Harm

- n Discontinuous care causes harm
  - Cross-coverage physician identified as most significant risk for an adverse event (OR 6.1 p0.02)
- n Handoffs are communication
  - Communication failures: primary root cause of sentinel events
- n Handoff errors in residency
  - Content commissions (62%)
- n Content omissions common
  - 1% of all communication

From theory to practice, each break in care leaves patients vulnerable

Petersen, Brennan, et al. Ann Int Med, 1994; 121(11): 866-72

Sentinel Event Statistics. The Joint Commission. Available at: [www.jointcommission.org/SentinelEvents/Statistics/](http://www.jointcommission.org/SentinelEvents/Statistics/)  
Accessed May 25, 2007.

Arora V, et al. Qual Saf Health Care. 2005;14:401-407.

Nolan TW. BMJ. 2000;320:771-773;

# Conclusions

- n DHR may have a positive impact on patient safety
- n Nature of work may be more correlated to errors and experience than the hours worked
  - Address the nature of work
    - § Administrative work
    - § Teamwork
    - § Well-being
- n Intrinsic increase in discontinuity necessitates as gap in care