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Leading Regulatory Excellence

The Results of TERCAP: Do More Errors Occur on the Night shift?

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Introduction

Background of this Study

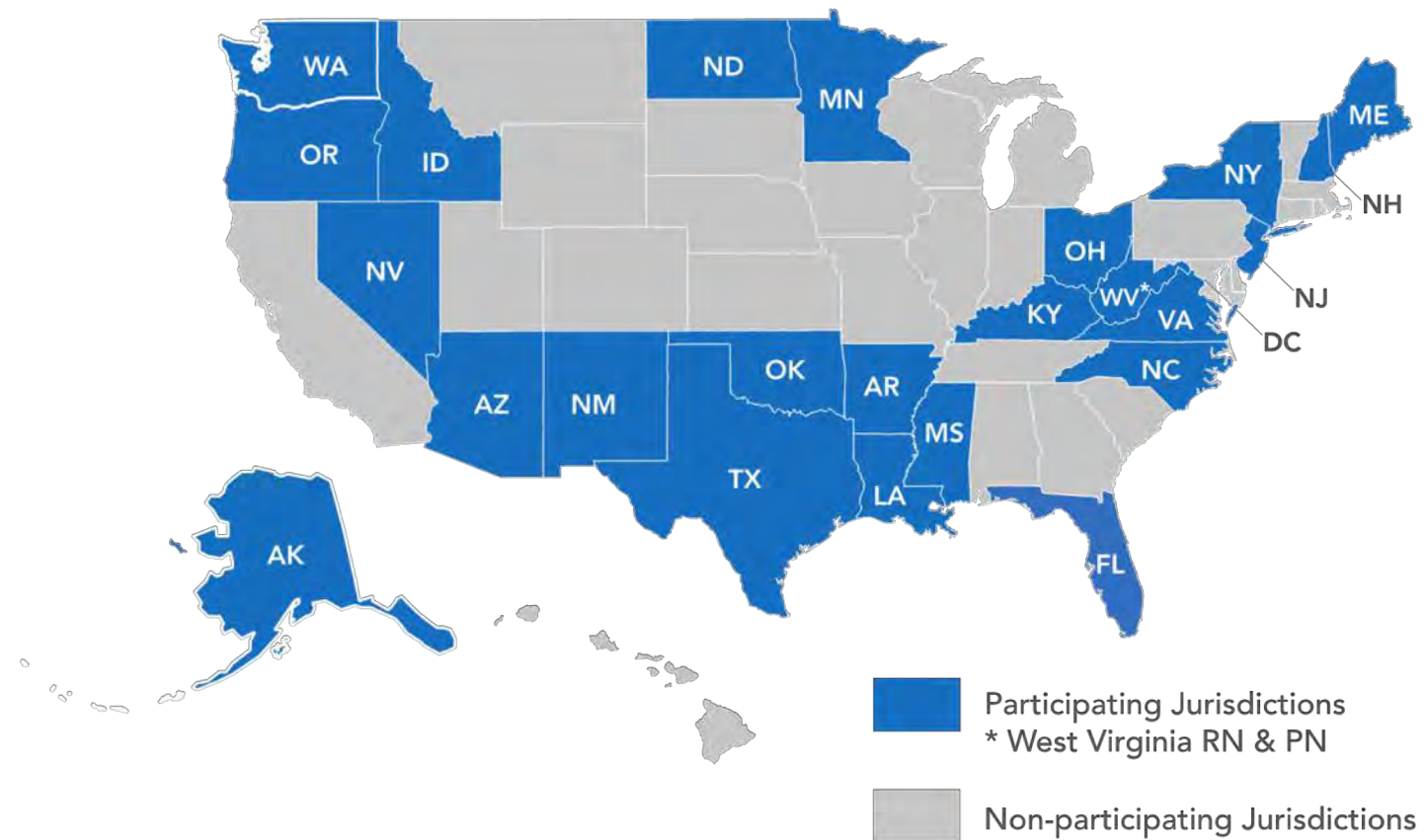
NCSBN is committed to understanding the causes and reducing the incidence of nursing practice errors. Studies of practice errors require large sample sizes, which have only recently become available.

Research Questions

- When did the nursing practice errors occur?
- What are the patient outcomes following nursing errors across different shifts?
- What are the potential risk factors associated with night shift errors?



2008-2018 Contributing BONs (26 BONs, N=4,835 cases)



Case Selection Criteria

Inclusion:

- A case involves a nurse who committed practice errors.
- A case involves one or more identifiable patients.
- A case involves a nursing practice error.

Exclusion:

- A case with missing records on when the incidents occurred
- An intentional misconduct or criminal conviction case or such information is unknown



Terminology

For the purpose of this study, shift is defined based on the time when an incident occurred:

- **Day Shift:** anytime between 7:00 am to 2:59 pm
- **Evening Shift:** anytime between 3:00 pm to 10:59 pm
- **Night Shift:** anytime between 11:00 pm to 6:59 am

Data Collection Instrument

The instrument contains 45 mandatory and 17 optional questions, consisting of the following five sections:

Section 1: Nurse Characteristics

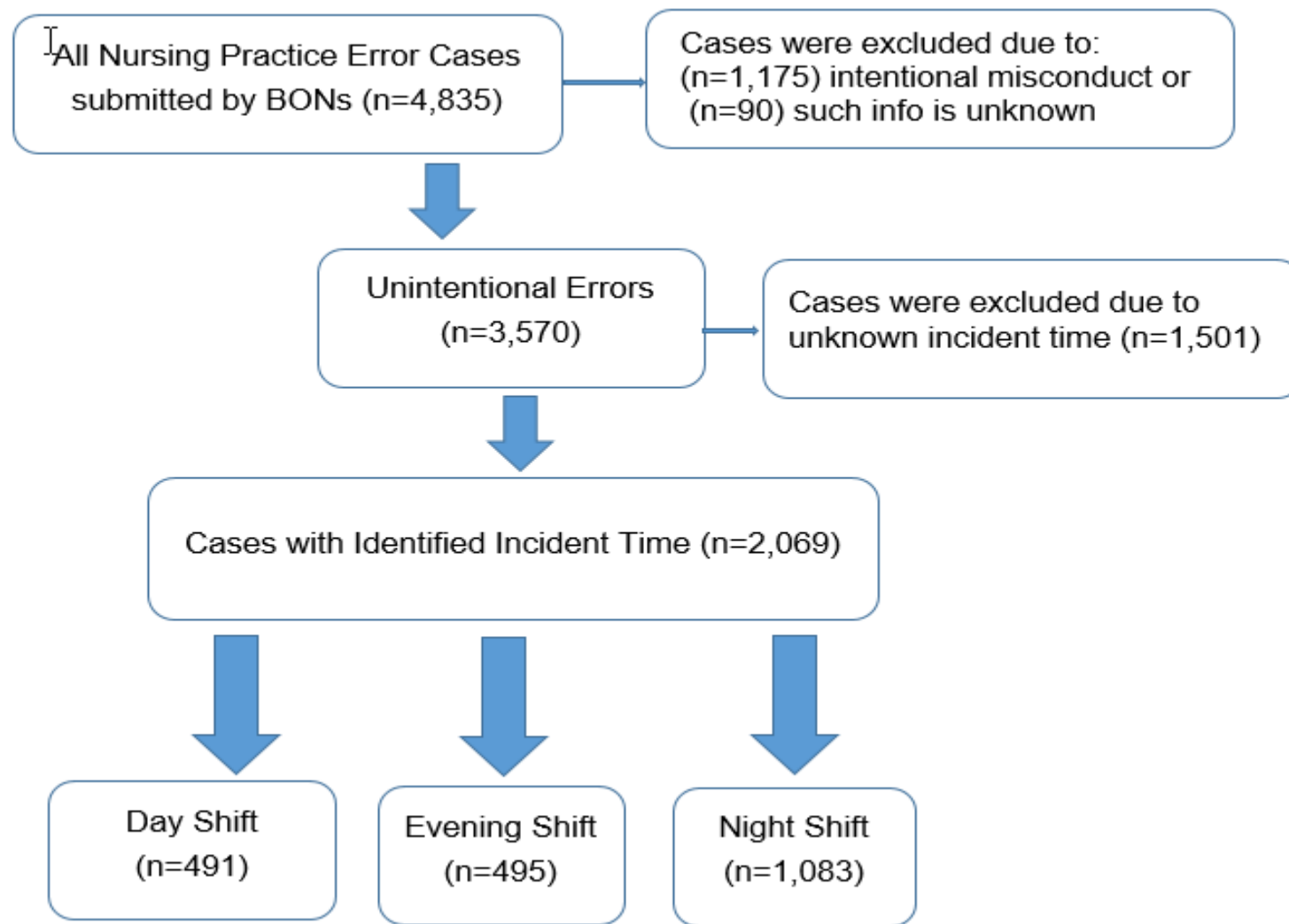
Section 2: Patient Characteristics

Section 3: Systems Factors

Section 4: Practice Errors

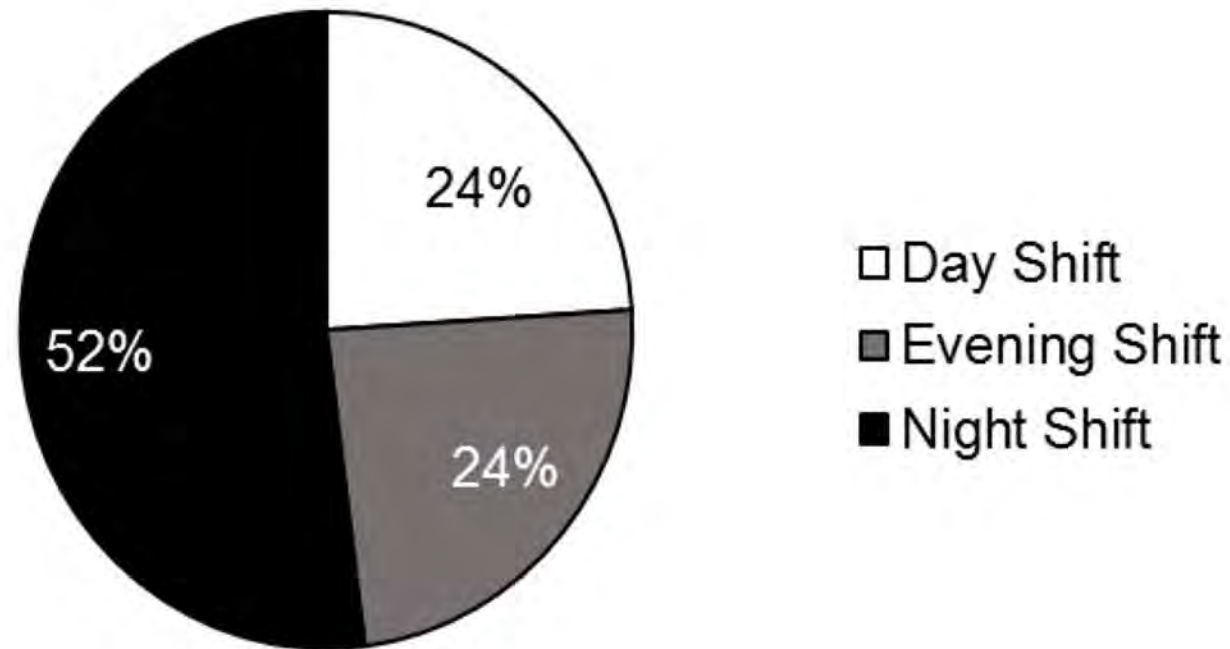
Section 5: Optional Questions

Case Selection Procedure



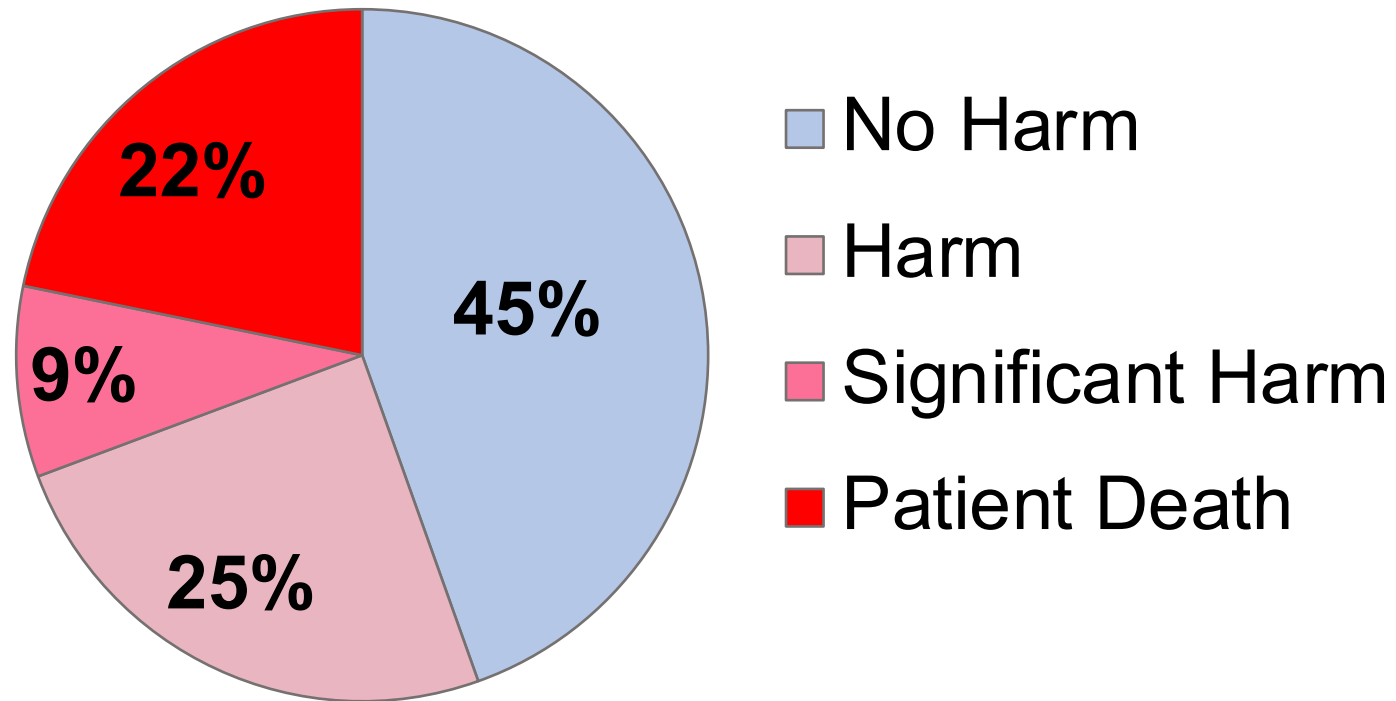
Time When Incidents Occurred

Significantly more instances of nursing errors occurred during the night shift.



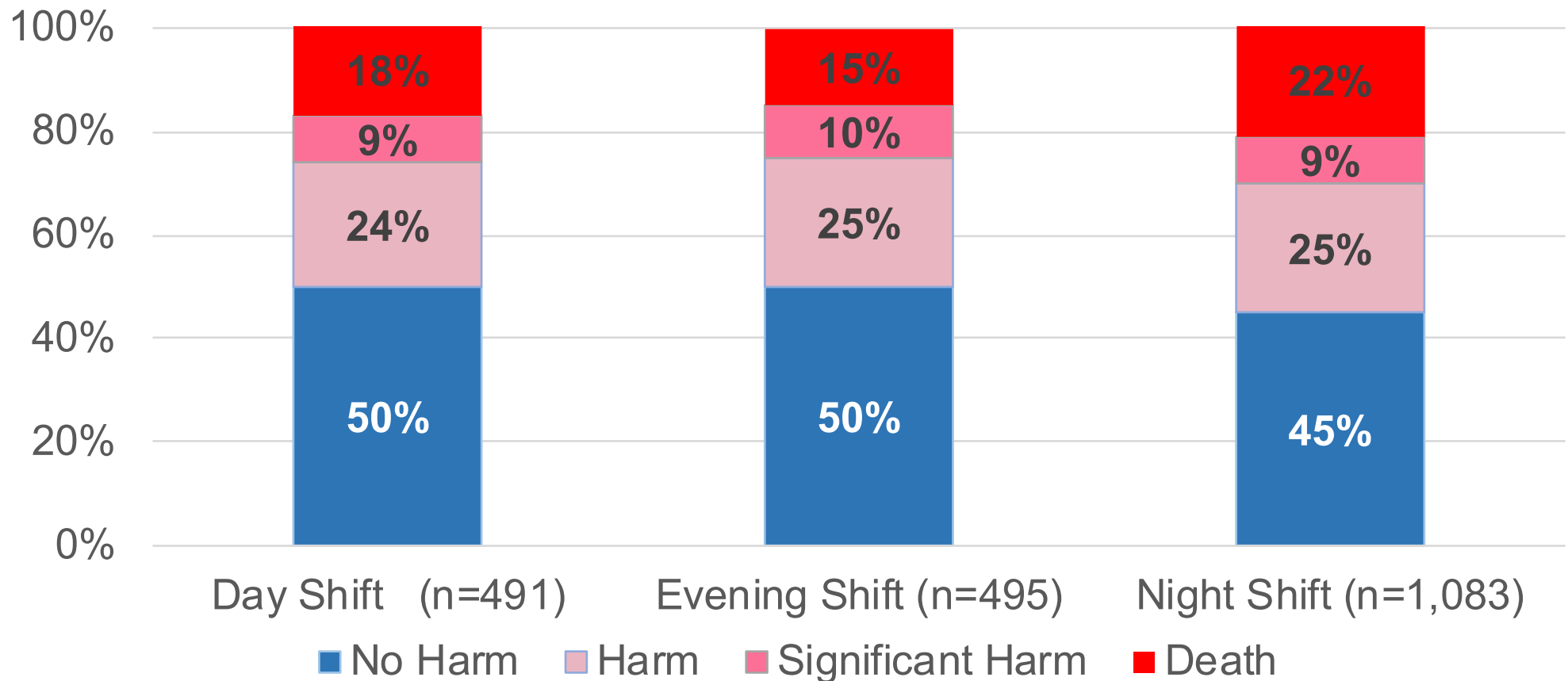
(n=2,069)

Night Shift Errors and Patient Harm (n=1,083)



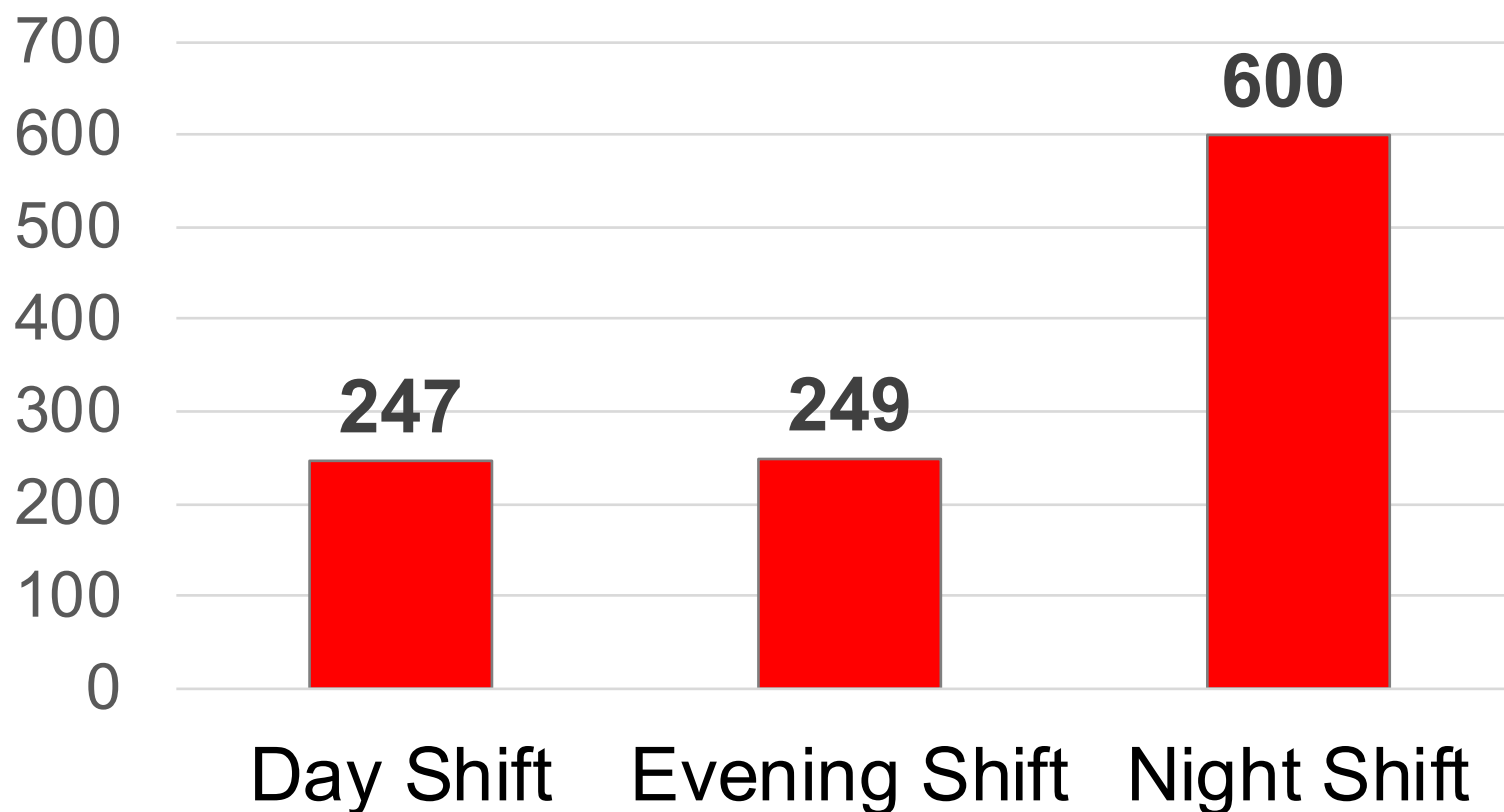
Errors and Patient Harm Across Shifts

A comparatively higher proportion of patient harm occurred during the night shift compared to that occurred during day or evening shifts.



Total Number of Patient Harm Cases

Twice as many patient harm cases were reported on the night shift than any other shifts.



Lack of Intervention on Night Shifts

57% of the night shift errors were related to lack of intervention on behalf of a patient and 74% of these errors resulted in harm to patients.

	Group	Patient Outcomes		χ^2 (P)
		Harm	No Harm	
Lack of Intervention	No (n= 467)	31% (146)	69% (321)	193.61 (<.001)
	Yes (n=616)	74% (454)	26% (162)	

Lack of Intervention Across Shifts

Significantly higher proportion (58%) of errors relating to failure to intervene on behalf of patients occurred during night shifts compared to day (18%) and evening (24%) shifts.

Lack of Intervention	Day Shift	Evening Shift	Night Shift
Did not intervene*	18% (89)	24% (121)	58% (287)
Did not intervene on time	21% (88)	22% (95)	57% (240)
Did not intervene skillfully	25% (118)	23% (107)	52% (239)

* $\chi^2=11.78$, $df=2$, $P<0.001$

Characteristics of Nurses

Who Committed Errors – License Type

Compared to LPN/VNs, a slightly higher proportion of RNs committed errors during night shifts compared to day shifts.

License	Day Shift	Evening Shift	Night Shift
RN	58% (287)	56% (278)	64% (689)
LPN/VN	36% (176)	40% (200)	32% (351)
APRN	1% (7)	1% (3)	2% (19)
Multiple	4% (21)	3% (14)	2% (23)

Characteristics of Nurses

Who Committed Errors – Work Hours

A higher proportion of nurses who worked on a 12 hour shift committed errors during evening and night shifts compared to day shifts.

Work Hour	Day Shift	Evening Shift	Night Shift
8 hour	49% (223)	43% (202)	47% (418)
10 hour	4% (17)	2% (10)	2% (19)
12 hour	36% (163)	47% (218)	44% (392)
Other	10% (48)	8% (38)	7% (58)

Nurses' Perceived Causes for Errors

A comparatively higher proportion of nurses working on night shifts believe that fatigue/lack of sleep contributed to errors compared to those working on other shifts.

Nurses' Perceived Contributing Factors	Day Shift (n=253)	Evening Shift (n=287)	Night Shift (n=261)
Work Stress	34% (87)	38% (110)	31% (81)
Lack of Support	23% (59)	28% (81)	21% (56)
Fatigue/Lack of Sleep	11% (27)	7% (21)	16% (41)
Lack of Staff	11% (28)	17% (48)	12% (32)

Limitations

- This analysis was based on the available data voluntarily submitted by the participating BONs.
- Lack of data regarding staffing across shifts, specifically the proportions of RNs and LPNs/VNs, limits our ability to draw conclusions.
- We do not have data on whether the night shift nurses worked a second job during day time, nor on the number of consecutive night or rotating shifts they have worked.

Summaries of the Current Study

- Error rate during the night shift is twice that of day or evening shifts and results in more patient harm.
- Errors relating to lack of intervention tend to occur more frequently on the night shift and are significantly associated with patient harm.
- Fatigue could be associated with a higher risk of night shift errors.

Contact Information

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Thank you!

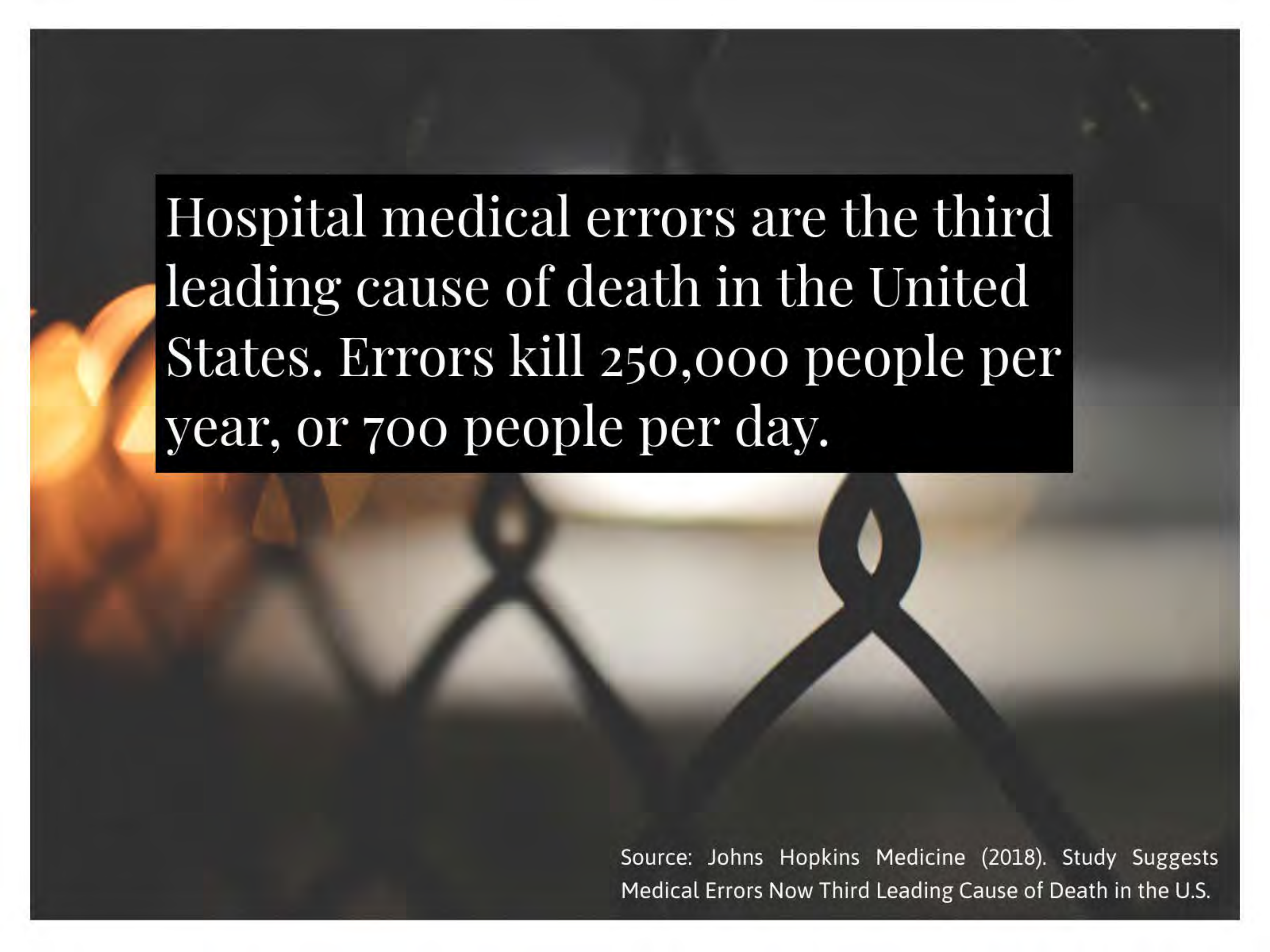




NCSBN

National Night

Patient Safety Study



Hospital medical errors are the third leading cause of death in the United States. Errors kill 250,000 people per year, or 700 people per day.

Source: Johns Hopkins Medicine (2018). Study Suggests Medical Errors Now Third Leading Cause of Death in the U.S.

“

...most of these [errors] have a second victim: the nurses, doctors, social workers, managers, pharmacists involved in their care

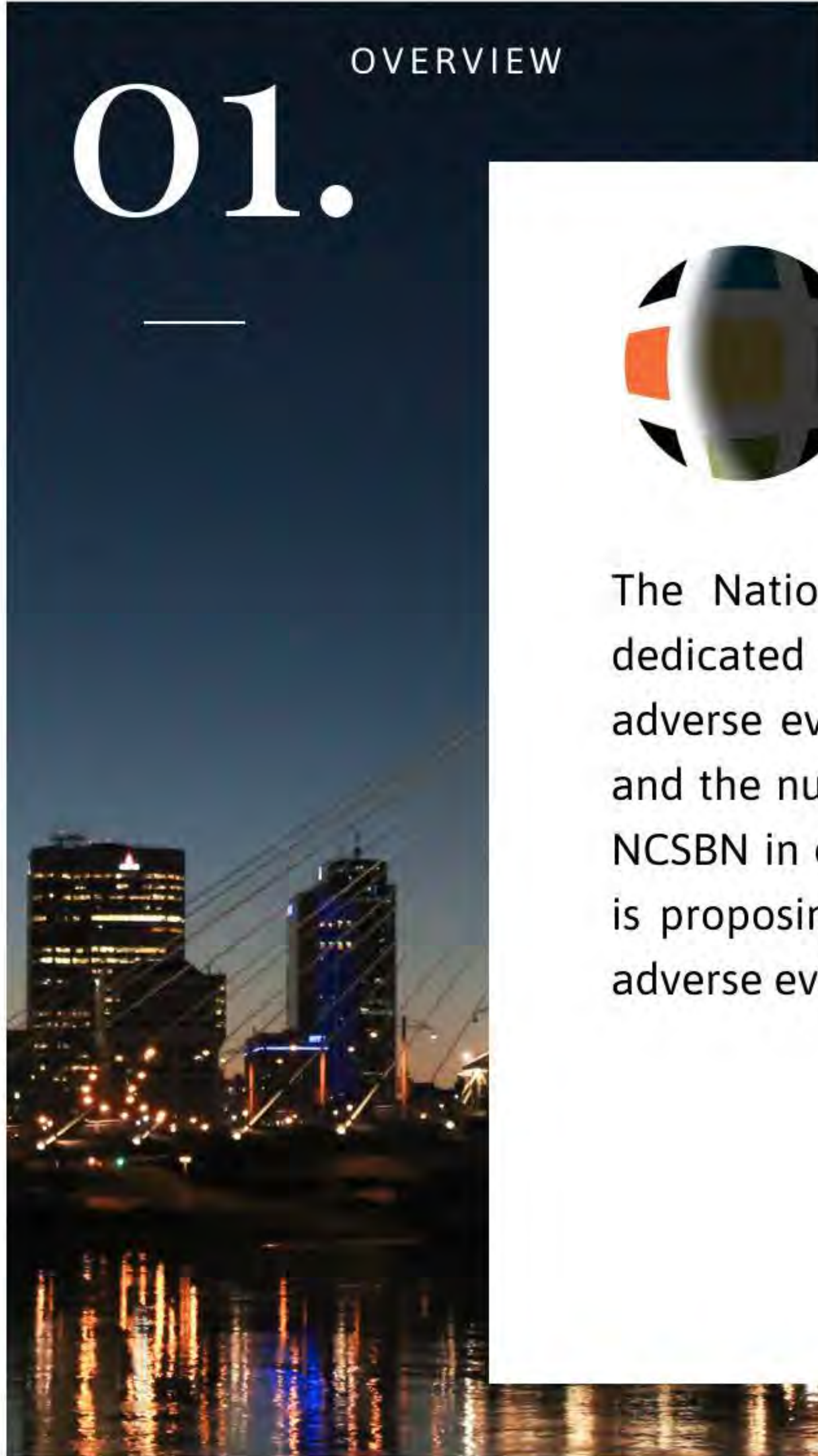
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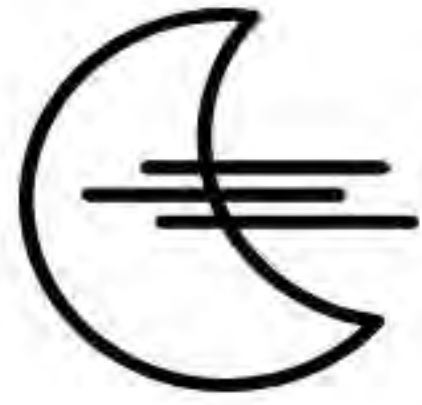
- Stephen Swensen



NCSBN National Night Shift Patient Safety Study

The National Council of State Boards of Nursing (NCSBN) is dedicated to public protection. In an effort to prevent nurse adverse events proactively before there is any harm to a patient and the nurse incurs the many consequences of an adverse event, NCSBN in conjunction with nurse leaders in research and practice is proposing a large-scale, national, multi-site study focused on adverse events involving a nurse during the night shift hours.





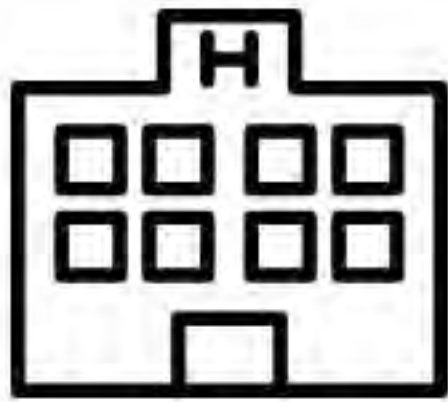
Fatigue

Night shift nurses experience fatigue and can suffer from sleep disorders



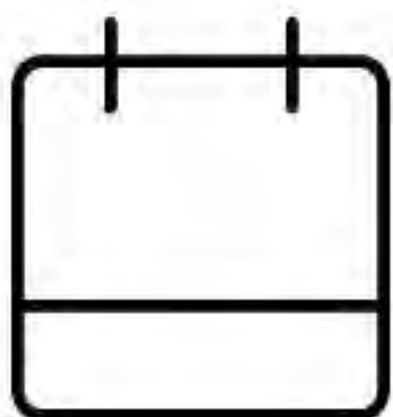
Nurse Well-Being

Night shift nurses experience diminished well-being



Facility & Nurse Characteristics

Technology and training can mitigate night shift dangers



Scheduling

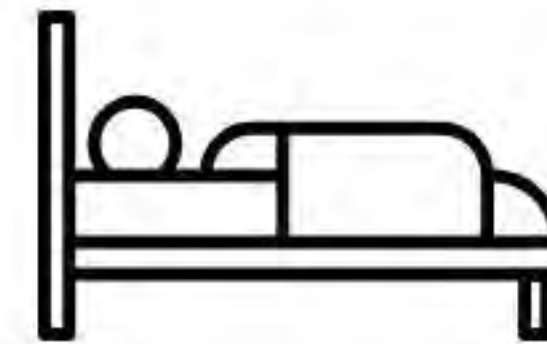
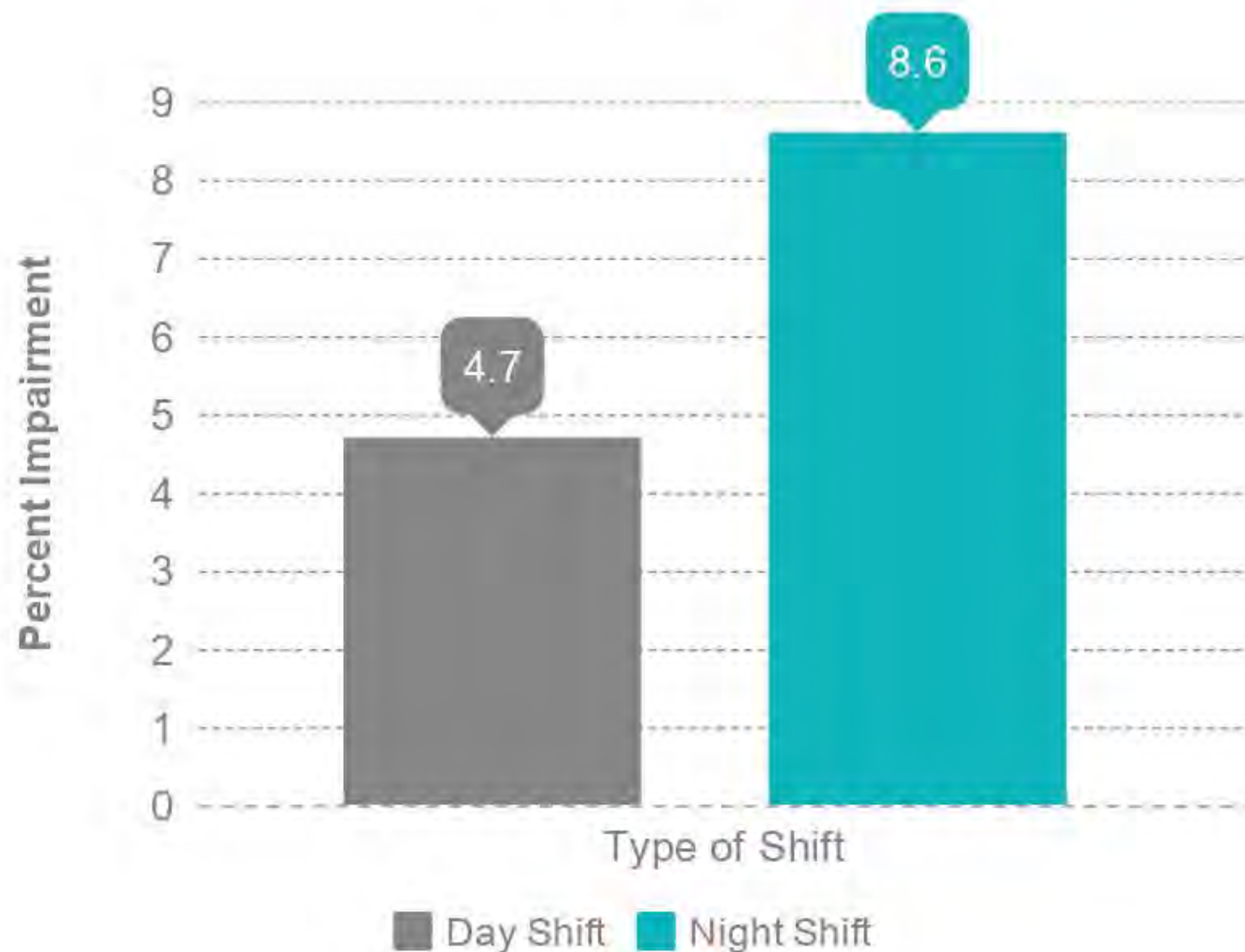
Long shifts, consecutive shifts, and overtime increase danger

02.

BACKGROUND

FATIGUE

Percent of Attention Impairment After End of Shift



Acclimated sleep schedules



Sleep deprivation and somnolence

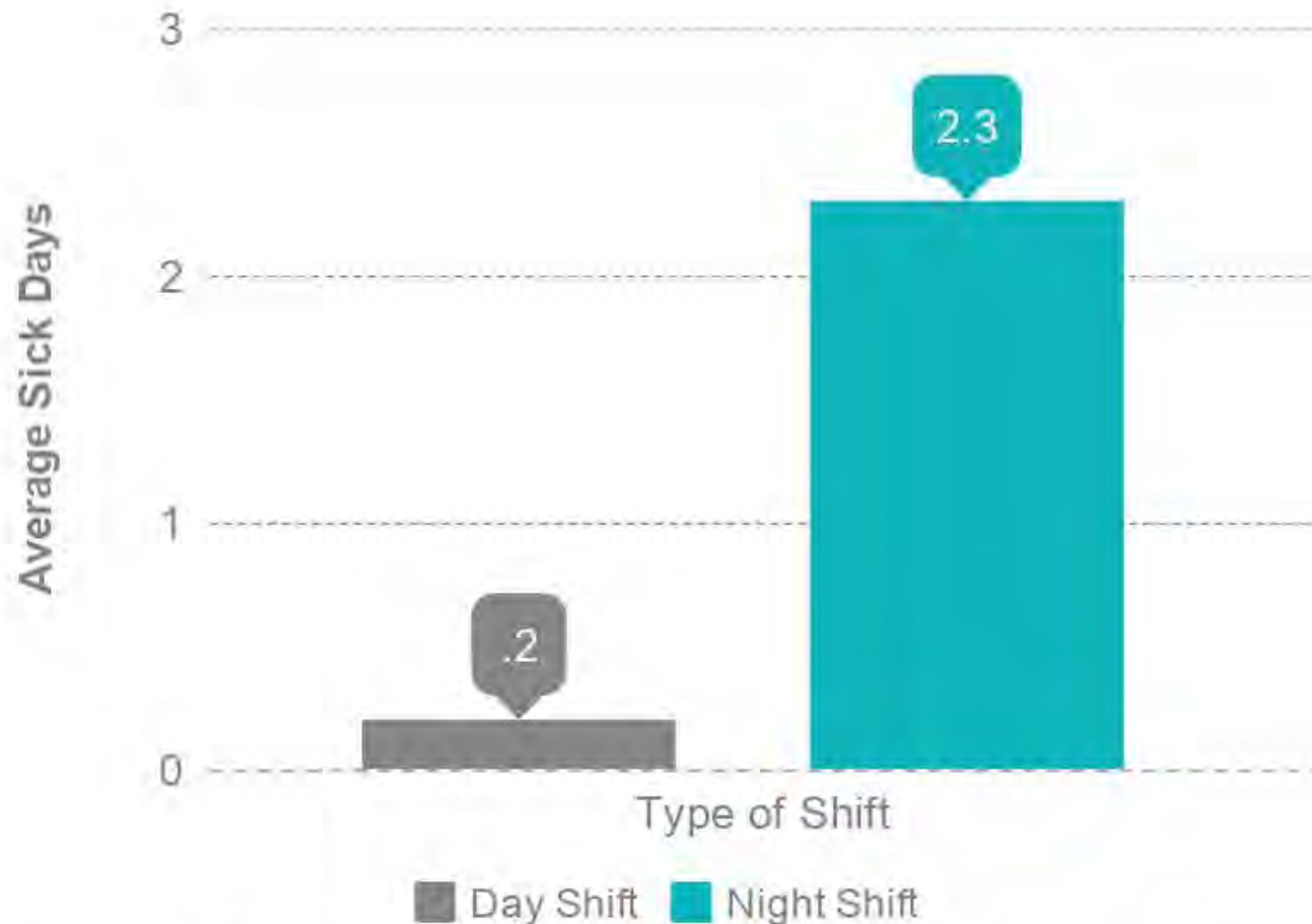


Hard to identify impairment from fatigue

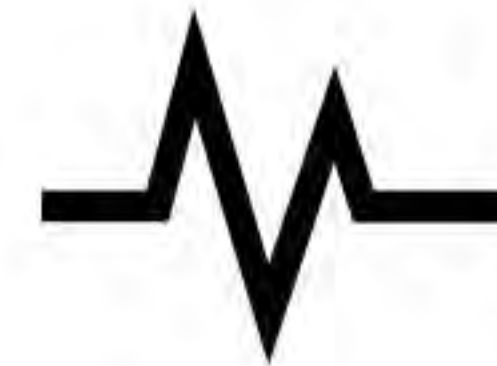
Source: Niu et al (2012) A Comparison of the Effects of Fixed- and Rotating Shift Schedules on Nursing Staff Attention Levels: A Randomized Trial.

NURSE WELL-BEING

Number of Sick Days Taken in Past 3 Months for Personal Illness



Source: Burch et al (2009) Shiftwork Impacts and Adaptation Among Health Care Workers



Night shift workers are at an elevated risk for heart disease



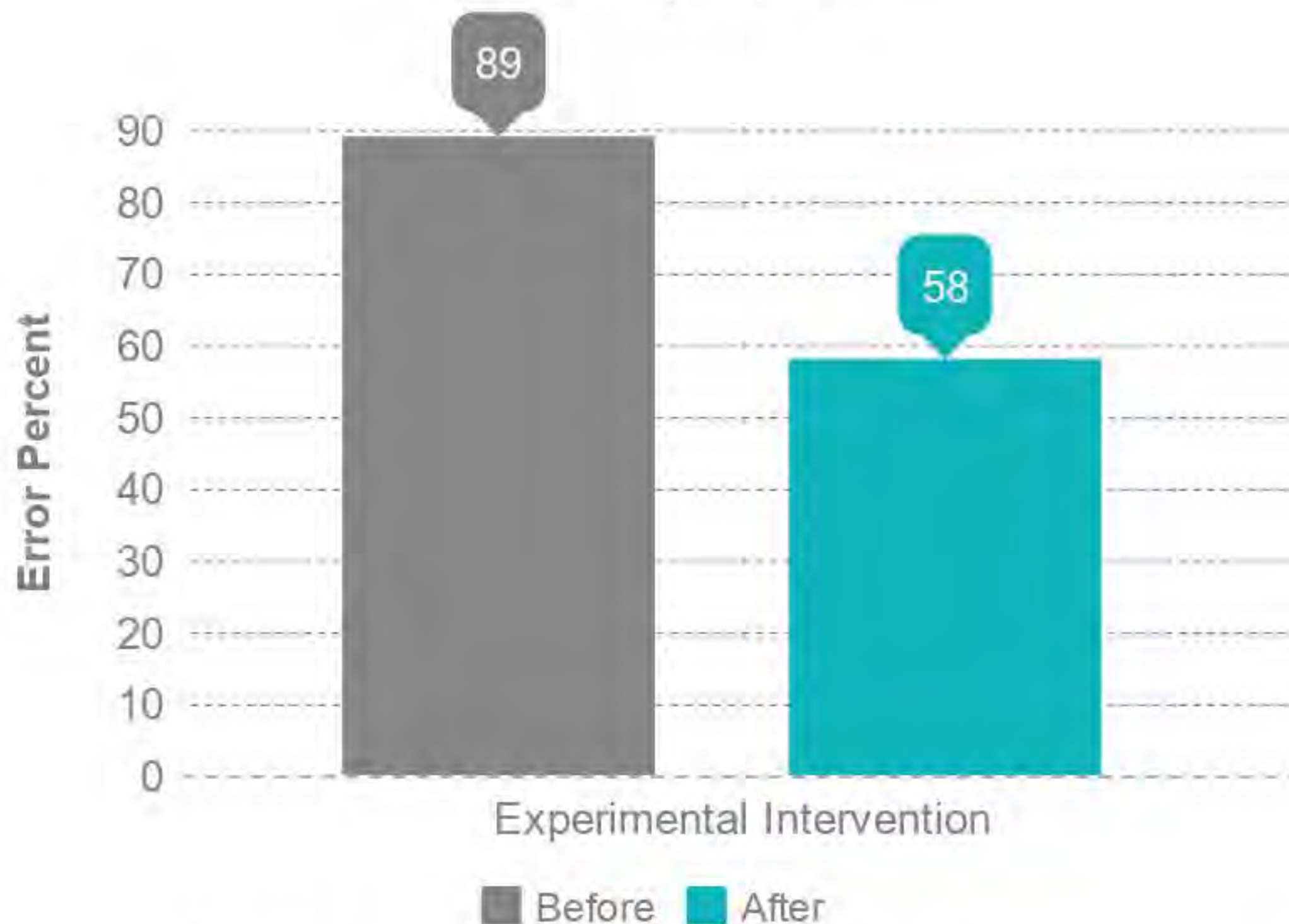
Night shift work increases absenteeism and is a common reason to quit



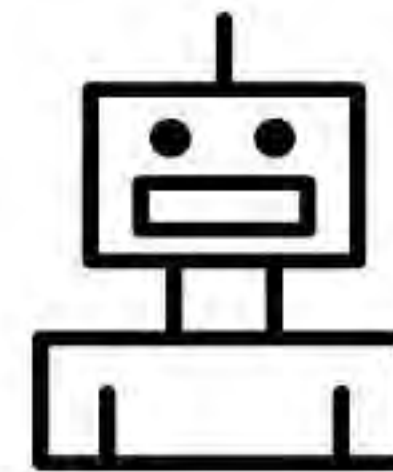
Well-being is linked to propensity to commit errors

FACILITY & NURSE CHARACTERISTICS

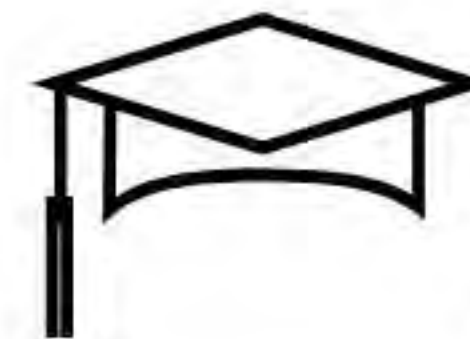
Error Percent Before and After Using Programmable Infusion Pump With Interruptions



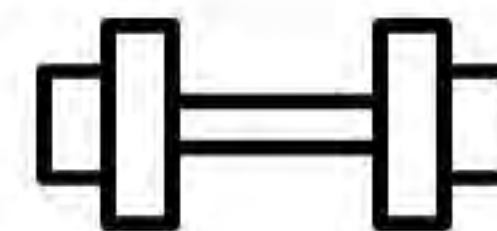
Source: Prakash et al (2014). Mitigating errors caused by interruptions during medication verification and administration: interventions in a simulated ambulatory chemotherapy setting.



Technology can mitigate dangerous situations to prevent errors



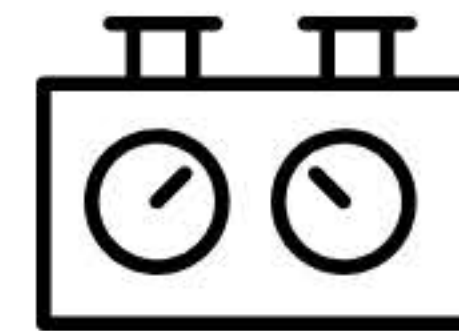
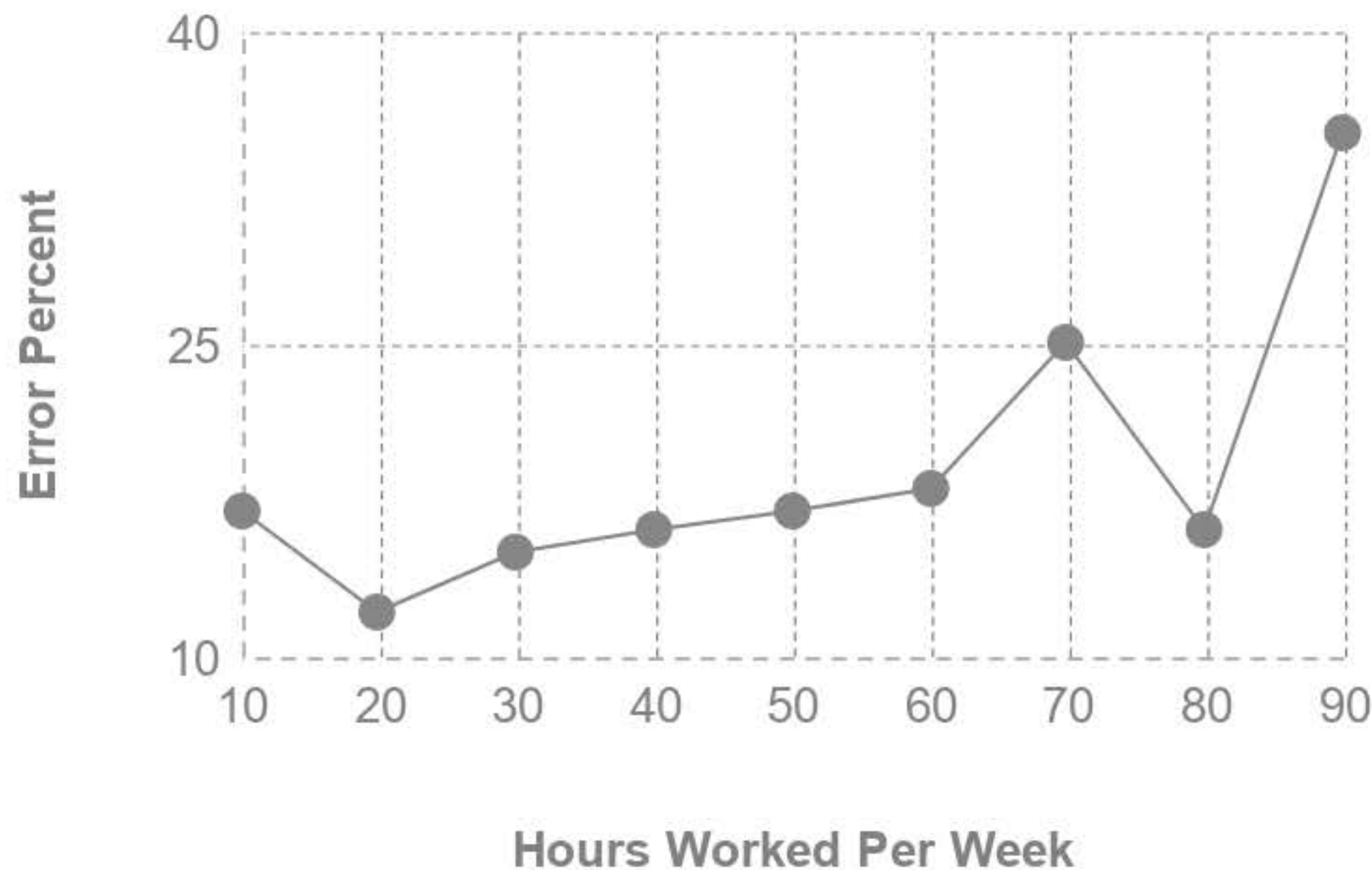
Night shift nurses are younger and less experienced in general than day shift nurses



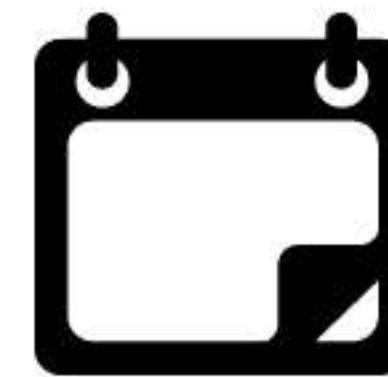
Night shift nurses have less access to training

SCHEDULING

Percent of Nurses Reporting Occasional/Frequent Wrong Medication or Dose Administration



Long shifts lead to more errors



Night shifts can be the second in a consecutive shift or a quick return

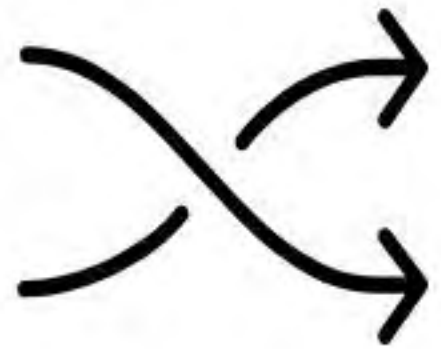


Night shifts could also be overtime

Source: Olds & Clarke (2010). The Effect of Work Hours on Adverse Events and Errors in Health Care.



How does a night shift with a patient safety event differ from a typical night?



How do the causes of night shift events interact?



What can narrative accounts of errors tell us?



What are other undiscovered causes of patient safety events?

**STILL
UNKNOWN**





GOAL

NCSBN will build on
the current
literature by
conducting a
prospective, multi-
site study of patient
safety events during
the night shift

04.

THE QUESTION

RESEARCH QUESTION

What are the surrounding factors of patient safety events involving nurses on the night shift?

To examine this, nurses and nurse managers at facilities will complete measures nightly to track several factors that have been shown to contribute to patient safety events during the night shift, including whether an event or near miss occurred. The specifics of the study and the measures are still in the process of being created and will be vetted by a panel of experts. Generally, however, we are planning to collect data at three different times: at study initiation, nightly, and when an error occurs.



05.

THE STUDY

AT STUDY INITIATION

Initially, general information about the facility will be gathered including facility size, facility staffing procedures, and fatigue management plans, and more.

NIGHTLY

Various factors that have been shown to contribute to errors will be collected nightly including: patient to staff ratios
acuity levels of patients
fatigue levels
unusual requests, and more.

WHEN AN ERROR OCCURS

When an error occurs, the contributing and mitigating factors and a narrative account of the error will be collected





06.

RESULTS

After completion of the study, we will be able to examine with a longitudinal lens the factors that led to an error on the night shift and related these factors to nights without any errors.

In addition, we will use the narrative accounts of errors to categorize errors by their contributing factors using machine learning methods, a technique that is already utilized in aviation safety.

“

Incompetent people are, at most, 1% of the problem. The other 99% are good people trying to do a good job who make very simple mistakes and it's the process that set them up to make these mistakes.

”

- Lucian Leape



THANK
YOU

Questions? Comments?

If you are interested in participating in the study or know a facility that might, please contact me:

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