


Circadian Science and Our Job

The challenge of emergency department night shift-work

“It is time to take creative, bold steps towards solving the serious problems produced by night-shift work.”

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Compare Health Affordable Care Act Obamacare Health

ER VISITS RISE UNDER OBAMACARE

Emergency room physicians say that since Jan. 1, 2014, when the requirement to have health coverage took effect, the volume of patients coming to their ER departments has:

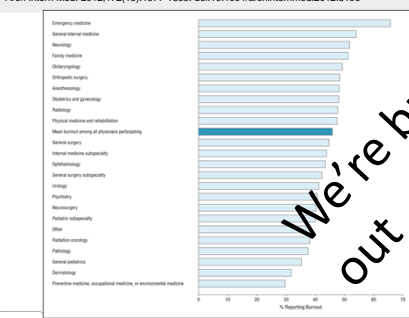
| | |
|--------------------|-----|
| Increased greatly | 28% |
| Increased slightly | 47% |
| Remained the same | 17% |
| Decreased slightly | 5% |
| Decreased greatly | 0 |
| Not sure | 3% |

We are needed more than ever

The JAMA Network

From: Burnout and Satisfaction With Work-Life Balance Among US Physicians Relative to the General US Population

Arch Intern Med. 2012;172(18):1377-1385. doi:10.1001/archinternmed.2012.3199

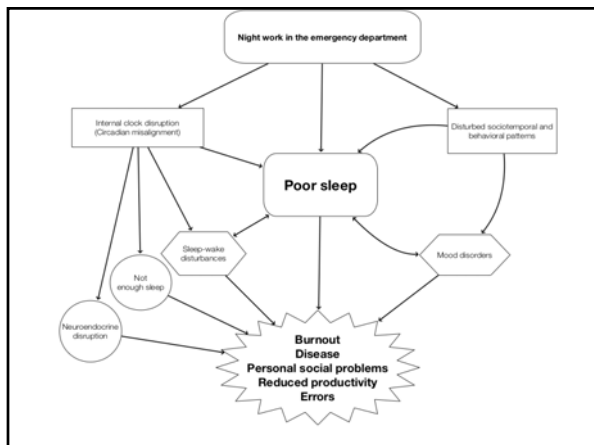


| Specialty | % Reporting Burnout |
|--|---------------------|
| Emergency medicine | ~45 |
| General internal medicine | ~35 |
| Neurology | ~35 |
| Family medicine | ~35 |
| Otolaryngology | ~35 |
| Orthopedic surgery | ~35 |
| Anesthesiology | ~35 |
| Obstetrics and gynecology | ~35 |
| Pathology | ~35 |
| Physical medicine and rehabilitation | ~35 |
| Medical oncology | ~35 |
| General surgery | ~35 |
| General medicine subspecialty | ~35 |
| Ophthalmology | ~35 |
| General surgery subspecialty | ~35 |
| Urology | ~35 |
| Pediatrics | ~35 |
| Neurosurgery | ~35 |
| Medical subspecialty | ~35 |
| Other | ~35 |
| Radiation oncology | ~35 |
| Psychiatry | ~35 |
| General pediatrics | ~35 |
| Dermatology | ~35 |
| Pediatric medicine, occupational medicine, or environmental medicine | ~35 |

We're burning out

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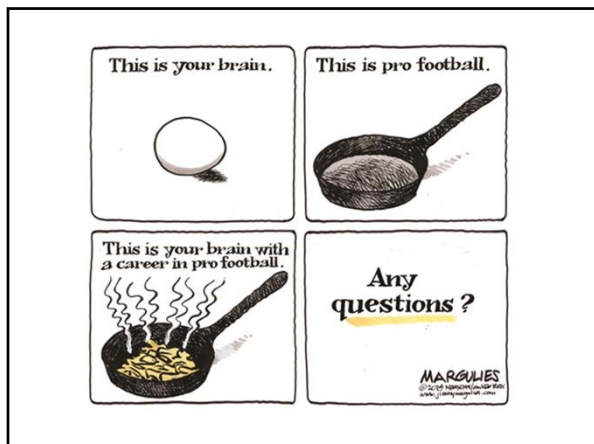
It's the sleep,
stupid



Sorry, it's real

**Night shift work is bad
for you**

(What you are about to see may
disturb you, younger viewers should
leave the room)



Rotating shift work

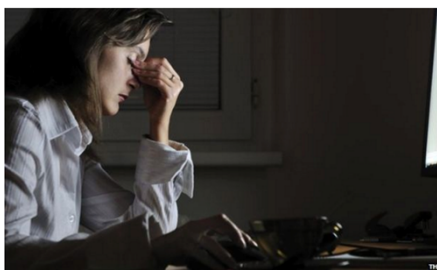
“There is no way to reduce circadian misalignment for a rapid rotation that includes both night shifts and day shifts, because the circadian clock cannot phase-shift fast enough. This type of shift system is very common, but should be abolished because of the performance, safety, and health problems it creates.” {Smith 2012}

Shift work dulls your brain - report

By James Gallagher
Health editor, BBC News website

Those with more than 10 years of shift work under their belts had the cognitive performance of someone six and a half years older.

© 4 November 2014 | Health



Working antisocial hours can prematurely age the brain and dull intellectual ability, scientists warn.

Sorry, it's real

- The WHO classifies night shift work as a carcinogen. {Straif 2007}
- Increased rates of breast cancer{Kolstad 2008}
- Increased risk of type II diabetes{Morikawa 2005}
- Increased risk of coronary artery disease{Puttonen 2010}
- Increased risk of ischemic heart disease{Frost 2009}

Sorry, it's real

- Increased risk of metabolic syndrome{Lin 2009}
- Increased risk of miscarriage and impaired fetal development including pre-term birth and low birth weight. {Mcdonald 1988; Somers 2000; Nurminen 1998}
- Increased risk for peptic ulcer disease and gastrointestinal disease{Knutsson 2010}

Sorry, it's real

- Increased risk of cognitive decline{Marquié 2014}
- Increased risk for substance abuse disorders psychiatric disease. {Nakata 2011,Cole 1990}
- Increased risk for family and interpersonal problems{Colligan 1989}

Don't blame
the victim

blame the
system



“Emergency”

136 million visits

11% admit rate

Metrics and most administrators are generally ignorant of circadian realities

- Seeing chest pain quickly matters
- 3 am med refill doesn't

The packed overnight Emergency Department is our own creation

- Boarding patients maximizing occupancy
- Low acuity visits “keep the lights on”
 - Generally have low societal value
 - Generally have low training value
 - Generate significant revenue in most systems

Among emergency physicians, who doesn't work nightshifts?

- a) Docs who didn't "know what they signed up for"
- b) Docs with "poor sleep hygiene" who then burn out.
- c) Docs who are "lazy"
- d) Any doc with enough power, capital (academic, administrative, financial), or seniority to opt out without getting fired.

If every department chairman, CMO, and CEO had to work nights what would happen?

- a) Nothing would change
- b) There would be radical and significant change in the structure and expectations of night work

Mitigation

- There is no way to reduce circadian misalignment for a rapid rotation that includes both night shifts and day shifts, because the circadian clock cannot phase-shift fast enough

Mitigation

- The actual cost of night shift-work is not accounted for in most compensation schemes.
 - Long-term health effects not factored
 - Career longevity effects not factored

Mitigation

1. Reduce exposure
2. Reduce exposure
3. Reduce exposure

Mitigation

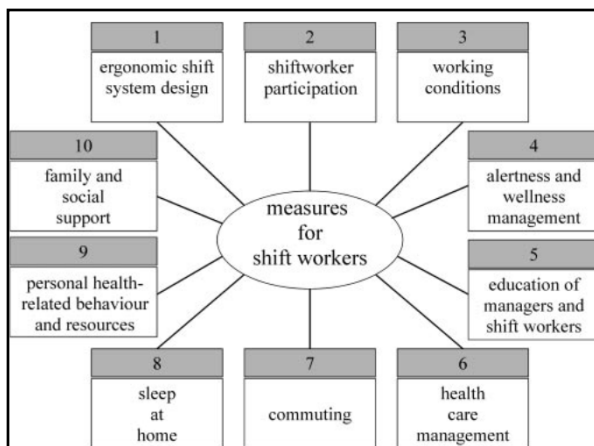
- Reducing individual exposure to is the primary way to meaningfully reduce the negative consequences of night shift-work
 - Fewer night shifts worked
 - Nights worked for a shorter period of time over career span
 - Shorter night shifts
 - Longer recovery after nights

Mitigation

- The detrimental effects of night shift-work accumulate based on both intensity and duration
- The longer night shifts are worked, the greater the risk for long-term ill effects
- The more night shifts are worked per month, the more the long-term ill effects

Mitigation

- Minimize extent of harmful effects
 - Maximize sleep hygiene
 - Maximize health promotion
 - Cardiovascular fitness
 - Psychological well being
 - Personal fulfillment
 - On-shift napping
 - Common sense shift rotations
 - Maximize cognitive off-loading (3am-6am)



Nocturnists are not a solution

- Nocturnists should not be encouraged as this simply concentrates the ill effects on a sub-group of individuals.
 - Nocturnists generally never fully adapt to night shift schedules

Other solutions

- Slow rotations with a single yearly period of nights
- Isolated night shifts with recovery
- Short night shifts (6 hours)
- Bifurcated or polyphasic sleep
- Melatonin and light manipulation may provide benefit in some scenarios.
- Napping – works but can be impractical

Other solutions

- Night shift tolerance decreases with age.
 - Reducing night shift burden should be a goal for older emergency physicians.
 - If a clinician does not work nights, early start day shifts are more feasible.
 - Early day shifts can be a strategy to shorten the night shift
 - “Casino shifts”

Summary

- Night shift work is detrimental to health
 - Largely unaccounted for in hospital planning
 - Increased advocacy for appropriate compensation is needed
- Night shift work should be minimized for any individual worker
 - The only clearly effective strategy for mitigating the negative effects of night work is to limit exposure

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