

Patient Safety Tip of the Week

July 29, 2014

The 12-Hour Nursing Shift:

Debate Continues

Our all-time most popular Patient Safety Tip of the Week was our November 9, 2010 Patient Safety Tip of the Week “[12-Hour Nursing Shifts and Patient Safety](#)”. In that column we discussed some of the pros and cons of these longer shifts as they related to both healthcare and other industries. We concluded that the literature to date really did not answer the question as to whether those shifts had a detrimental impact on patient safety or patient outcomes.

Then in our February 2011 What’s New in the Patient Safety World column “[Update on 12-hour Nursing Shifts](#)” and our November 13, 2012 Patient Safety Tip of the Week “[The 12-Hour Nursing Shift: More Downsides](#)” we discussed some evidence suggesting a detrimental impact of such hours on patient care and satisfaction as well as a longer term negative impact on nurses’ satisfaction ([Stimpfel 2012](#)).

There hasn’t been a whole lot on the 12-hour shift in the literature since that last column. But it did come up again in a couple articles within the past few months. The first was a Pennsylvania Patient Safety Authority review of data on incidents reported in which healthcare worker fatigue was noted to be a contributing factor ([Dubeck 2014](#)). Between 2004 and 2013 they found over 1600 such incidents involving fatigue on a variety of healthcare workers. Medication errors accounted for 62.1%, and errors related to a procedure, treatment, or test 26.4%. Dubeck discusses the 12-hour nursing work shift in addition to other factors which promote fatigue.

Another new study ([Chen 2014](#)), based on survey data, found that nurses on 12-hour shifts experienced a moderate to high level of acute fatigue and moderate levels of chronic fatigue and inter-shift recovery. Lack of regular exercise and older age were associated with higher acute fatigue. They concluded there is a need to establish fatigue intervention programs for nurses working 12-hour shifts.

There is ample evidence in the literature that fatigue has detrimental influences on attention and concentration, reaction time, cognition, communication and judgment among other things. Dubeck notes the widely quoted statistic that 17 hours of sustained wakefulness is equivalent to a blood alcohol level of 0.05% and that after 24 hours, it is equivalent to 0.10%. And we've done multiple columns on the impact of fatigue on healthcare workers, not only nurses but physicians, pharmacists and others (see the list at the end of today's column). One study ([Arnedt 2005](#)) demonstrated that resident performance impairment post-call after 4 weeks of heavy call is equivalent to or worse than the impairment observed at 0.04 to 0.05 g% blood alcohol concentration on tests of sustained attention, vigilance, and simulated driving. Moreover, residents' self-assessment of heavy call performance was limited and task-dependent. And there are numerous examples of the negative impact of fatigue on the health of nurses' themselves (eg. higher risks of needle sticks, car accidents, etc.) that we've noted in previous columns listed below.

But the fundamental question we are asking here is "Is there evidence that the 12-hour nursing shift results in more patient harm or worse patient outcomes than the more traditional 8-hour shift?" And, because no studies have been done allowing direct comparison of care rendered via the two scheduling patterns and eliminating potential confounding factors, we still cannot confidently answer that question. Because the 12-hour shift has become so popular, both with nurses and hospitals, it will likely take compelling evidence to cause reversion to shorter shifts. In fact, we previously noted the most common shift length in a survey was 12-13 hours, worked by 65% of nurses responding ([Stimpfel 2013](#)). Another recent paper puts that number at 75% ([Townsend 2013](#)). The majority of nurses we know like the 12-hour shift because of its flexibility and that it allows them to spend more time with their families and other activities outside the hospital.

There are some things we like about 12-hour shifts. The major one is the **reduction in handoffs**. In fact, in most industries that reduction in handoffs is touted as the most important benefit of 12-hour shift. Instead of the three handoffs seen with 8-hour shifts, you only have two handoffs with 12-hour shifts. And, just as importantly, you are typically handing off to the same individuals that you received a handoff from at the start of your shift (adding an element of "I want my handoff to be as good as the one I expect to get"). Since handoffs are very vulnerable to errors, anything that reduces the number of handoffs or improves their efficiency and efficacy is likely to improve patient care.

Another unknown variable is what we refer to as the "**consecutive day phenomenon**". A study on shift workers in fields other than healthcare ([Folkard 2003](#)) showed that the risk of incidents increased each consecutive day worked. For example, on average for night shifts risk was 6% higher on the second night, 17% higher on the third night, and 36% higher on the fourth night (for morning/day shifts the corresponding risks were 2%, 7% and 17%). Extrapolating, one might suspect that we might see fewer errors if you only have to work 3 straight days rather than 4 or 5. The Folkard study demonstrated that risks are not uniform throughout the day but are greater at certain times, especially at night, and even vary based upon temporal relationship to breaks. Those authors stress that all

these factors (number of successive night shifts, length of night shifts, and provision of breaks) must all be considered in combination. They note it is conceivable that a 12-hour night shift with frequent rest breaks might well prove safer than an 8-hour shift with only one mid-shift break.

Another factor in the 12-hour vs. 8-hour debate is the hours actually worked. In the old “8-hour shift world” it was very common for nurses to work back-to-back shifts (“doubles”) to fill in when scheduled nurses were unable to work. So those nurses were working at least 16 straight hours. So reversion to 8-hour shifts won’t be successful if many nurses now end up doing 16 consecutive hours.

But probably the most important point made in the Dubeck paper is that **solutions focusing only on hours worked are not likely to be very successful**. We agree wholeheartedly. We’re all familiar with the the work hour restrictions on residents and other physicians in training. The evidence of impact of those restrictions on patient outcomes is mixed and, overall, not very compelling. Dubeck notes that two of the major causes of fatigue (disruption of circadian rhythm sleep and sleep deprivation) are not addressed by pure work hour restriction policies.

Dubeck makes a case for more focus on **FRMS’s** (Fatigue Risk Management Systems) and interventions to mitigate errors that might be caused by fatigued healthcare workers. These might be modeled on similar programs recommended by the Federal Aviation Administration (FAA) for pilots and aviation personnel. She describes what an ideal FRMS would look like and cites one such FRMS being used by Queensland Health in Australia ([Queensland Health 2014](#)). Dubeck also provides a nice table of interventions and whether they do each of the following:

- Reduce fatigue
- Reduce or capture fatigue-related errors
- Minimize the harm caused by fatigue

For example, a napping strategy might only reduce fatigue whereas fatigue-proofing task procedures would impact the latter two categories.

Multiple studies have also demonstrated that people (in any industry, not just healthcare) **tend to underestimate their levels of fatigue and impairment** compared to their performance on formal testing. Some day we will have the equivalent of the brief “sobriety” test that can rapidly identify healthcare workers who are impaired by fatigue. We’ll leave development and validation of such a test up to our psychology colleagues but we’d envision that at regular intervals beyond 8 hours (maybe even sooner) the healthcare worker will get buzzed on his/her smartphone and have to complete some simple test of reaction times or attention span. If the worker scores outside the established threshold the hospital will need to have resources in place to take over duties of that worker (completely or at least temporarily until fatigue is alleviated by, for example, a nap).

We recommend you read our November 9, 2010 Patient Safety Tip of the Week “[12-Hour Nursing Shifts and Patient Safety](#)” to see some of the excellent prior work that has

been done by Geiger-Brown and colleagues ([Geiger-Brown 2010](#)) and Fallis and colleagues ([Fallis 2011](#)) regarding some of the strategies to mitigate nurse fatigue and also our columns listed below on the impact of fatigue in healthcare and other industries and use of strategies such as power naps.

Update: See also our October 2014 What's New in the Patient Safety World column "[Another Rap on the 12-Hour Nursing Shift](#)".

Some of our other columns on the role of fatigue in Patient Safety:

November 9, 2010 "[12-Hour Nursing Shifts and Patient Safety](#)"
April 26, 2011 "[Sleeping Air Traffic Controllers: What About Healthcare?](#)"
February 2011 "[Update on 12-hour Nursing Shifts](#)"
September 2011 "[Shiftwork and Patient Safety](#)"
November 2011 "[Restricted Housestaff Work Hours and Patient Handoffs](#)"
January 2010 "[Joint Commission Sentinel Event Alert: Healthcare Worker Fatigue and Patient Safety](#)"
January 3, 2012 "[Unintended Consequences of Restricted Housestaff Hours](#)"
June 2012 "[June 2012 Surgeon Fatigue](#)"
November 2012 "[The Mid-Day Nap](#)"
November 13, 2012 "[The 12-Hour Nursing Shift: More Downsides](#)"

Some of our other columns on housestaff workhour restrictions:

December 2008 "[IOM Report on Resident Work Hours](#)"
February 26, 2008 "[Nightmares: The Hospital at Night](#)"
January 2010 "[Joint Commission Sentinel Event Alert: Healthcare Worker Fatigue and Patient Safety](#)"
January 2011 "[No Improvement in Patient Safety: Why Not?](#)"
November 2011 "[Restricted Housestaff Work Hours and Patient Handoffs](#)"
January 3, 2012 "[Unintended Consequences of Restricted Housestaff Hours](#)"
June 2012 "[Surgeon Fatigue](#)"
November 2012 "[The Mid-Day Nap](#)"
December 10, 2013 "[Better Handoffs, Better Results](#)"
April 22, 2014 "[Impact of Resident Workhour Restrictions](#)"

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