A Change for the Better?
A Qualitative and Quantitative Review of Senior Medical Residents’ Transition to a Reduced Duty Hour Model at McMaster University

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Date: October 24th 2014
I do not have an affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

Je n’ai aucune affiliation (financière ou autre) avec une entreprise pharmaceutique, un fabricant d’appareils médicaux ou un cabinet de communication.

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Objectives

• Outline the ‘Night Float’ model at McMaster University

• Qualitative methodology

• Results of qualitative component of study

• Limitations

• Future directions

• Conclusions
Background

• Reduced duty hours (RDH) internationally debated for decades, discussion recently sparked in Canada\textsuperscript{1}

• Literature shows variable findings in impact on:
  » Resident wellness, quality of life\textsuperscript{2,3}
  » Resident education and academic achievement\textsuperscript{4-6}
  » Patient safety and medical/diagnostic errors\textsuperscript{6,7}

• Increasing concern that RDH to 16 hours may become mandatory

• Aim to use qualitative and quantitative methodologies to study the implementation of night float model on SMRs within the CTU and ER
## Night float model

<table>
<thead>
<tr>
<th>Night float</th>
<th>SMR on CTU</th>
<th>ML SMR</th>
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</thead>
<tbody>
<tr>
<td><strong>9:00PM-10:00AM on Tuesday-Friday and Saturday-Monday blocks</strong></td>
<td><strong>8:00AM-5:00PM Monday-Friday, ‘Bridge’ 4-5 times/block when team on-call from 5:00PM-10:00PM</strong></td>
<td><strong>2:00PM-10:00PM Monday-Friday x 2 weeks and ‘double’ SMR on CTU (bridge), no weekend shifts</strong></td>
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<tr>
<td>Coupled with subspecialty, research, clinics rotations based on tiered system</td>
<td>2 weekend days each block (Saturday, Sunday) of 9:00AM-10:00PM</td>
<td>Coupled with 2 weeks of reading or dedicated research time</td>
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<td>6 blocks across PGY2/3</td>
<td>4 blocks across PGY2</td>
<td>2 blocks across PGY3</td>
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Methodology

Focus groups of 2-5 participants (separated by post-graduate year)

- Pre-NF May-June 2013
- Night float - July 1st 2013
- Post-NF May-June 2014

Qualitative data analyzed and codes identified

Theory of the ‘SMR’s night float experience’

Codes collapsed into concepts and categories
Experience of SMR on CTU

Pre-NF

Positive expectations of improved presence on CTU, ownership over patients but concerned about cumulative burnout

‘I think it [night float] is a more slow caustic burn as opposed to our call now which is acute, it hits you on the head and then you get a day to recover.’ [PGY1]

Post-NF

Unanimously positive experience, improved role as learner, teacher and in dynamics with daytime house-staff

‘I actually got to know my daytime team really well. I got to know their strengths...during the day, on CTU, I felt in control of my team. I really felt in control of my juniors and my clerks.’ [PGY2]
Handover

Pre-NF

Very concerned about frequency, consistency and accuracy of handover; anticipated to effect SMR on-call experience

‘The staff would hand over to the bridge and the bridge would hand over to the night float...the second-hand handover is going to be less than adequate.’ [PGY2]

‘It is going to be you inheriting so much chaos happening right away.’ [PGY1]

Post-NF

Numerous negative experiences with handover and patient’s evolution, related to ‘near misses’ and patient safety

‘I would say that if you had to pick a time where you would be more concerned about patient safety, it would be the time in between bridge, handing over the patients to the night float SMR, because these are patients who...still may be declaring themselves...you never knew the patients as well as you do when you first saw them.’ [PGY2]
Quality of Life

**Pre-NF**

Predicted worse experience for SMR on CTU, and uncertain of cumulative fatigue of NF blocks; optimistic about improvement in personal life

‘CTU will be worse. You’ll still be tired, but less sleep deprived. But in terms of sheer hours, it’s going to feel like you’re there longer.’ [PGY2]

‘That’s more exhausting than just getting it all over with...you don’t get any days off for 10 days...it sounds exhausting.’ [PGY2]

**Post-NF**

Difficulty with circadian rhythm change, ‘pressure to sleep’ on NF, cumulative fatigue, but improved perceived quality of life outside of NF blocks

‘It was the grind of the feeling of coming back and switching your circadian rhythm.’ [PGY2]

‘You’re barely getting home to sleep [post night float]...getting up just in time to go back to work and repeat.’ [PGY2]
Limitations

• Self-reported data
  » Recall bias and over/under-estimations of clinical scenarios, experiences on call, patient flow etc.

• Sample size
  » One third of each PGY cohort participated in focus groups
  » Does not reflect all residents’ experiences in night float

• Resident-driven thematic analyses/interpretation
  » Interpreted through lens of current residents, experiencing NF system themselves
  » Authors had own expectations/perceptions
Conclusions and Future Directions

• Night float models can be a useful transition for Internal Medicine post-graduate programs
  » Improvements in SMRs’ CTU experience
  » Modifications needed to protect subspecialty rotations
  » More structured tool for handover, patient flow/safety needed

• Night float model modified in July 2014
  » Two week block with 1 in 2 call from 5:00PM-10:00AM
  » Early anecdotal evidence among residents is positive

• Preliminary quantitative data demonstrates no significant change in CTU length of stay, indicators of patient flow
Acknowledgements

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• Research supervisors
  » Dr. Parveen Wasi and Dr. Shariq Haider

• Resident co-authors
  » Dr. Diana Ulic R3 and Dr. Serena Gundy R4

• Methodological experts
  » Dr. Meredith Vanstone and Dr. Kelly Dore

‘I’m optimistic about being part of the growing pains of process. It’s inevitable that it will change - I’m optimistic about making it a better system, optimistic about getting to better patient care and reducing resident fatigue.’
References


Thank you!

Questions or Comments?
Help us improve. Your input matters.

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• Visit the evaluation area in Pre-function Hall B, near Registration, or

• Go to: http://www.royalcollege.ca/icreevaluations to complete the session evaluation.

You could be entered to win 1 of 3 $100 gift cards.

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• Téléchargez l’application de la CIFR

• Visitez la zone d’évaluation, au vestibule de la salle B, près du kiosque d’inscription, ou

• Visitez le http://www.collegeroyal.ca/evaluationscifr afin de remplir une évaluation de la séance.

Vous courrez la chance de gagner l’un des trois chèques-cadeaux d’une valeur de 100 $. 

You could be entered to win 1 of 3 $100 gift cards.
Appendices
More details on NF model vs. Traditional 24+2 Model
24 hours on the CTU...

7:30am-10:00am: Handover
- NF team leaves by 10:00am
- Staff in ED from 8:00am-2:00pm alone

2:00pm: ML resident arrives

5:00pm: CTU SMR begins shift (double coverage from 5:00-10:00pm with ML Resident)

9:00pm: NF resident arrives for handover. SMR and ML resident leave by 10:00pm

NF Resident overnight until handover
Call to staff if concerns re: volume
<table>
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<tr>
<th>Week</th>
<th>Call Team:</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<td>SMR A</td>
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<td>8am-5pm</td>
<td>Staff A</td>
<td>Staff D</td>
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<td>Staff B</td>
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<td>5pm-10pm (bridge)</td>
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<td>SMR C</td>
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<td>NF3</td>
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Comparison of Duty Hours

<table>
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<tr>
<th>Block/rotation</th>
<th>Call hours - Night Float</th>
<th>Call-hours - Traditional system</th>
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<tbody>
<tr>
<td>Block 1 - CMR</td>
<td>53h</td>
<td>74h</td>
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<tr>
<td>Block 2 - CMR</td>
<td>53h</td>
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<td>Block 3 - JA</td>
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<td>Block 5 - Endocrinology</td>
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<tr>
<td>Block 6 - ED consults* NF block</td>
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<td>58h</td>
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<td>Block 7 - GIM community</td>
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<td>Block 8 - CCU</td>
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<td>Block 10 - Palliative* NF block</td>
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<td>58h</td>
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<td>Block 11 - ICU</td>
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<td>Block 12 - Clinics* NF block</td>
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<td>58h</td>
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<td>Block 13 - ID</td>
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<tr>
<td>TOTAL:</td>
<td>358h on call</td>
<td>554h on call</td>
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Additional Themes in Qualitative Analyses
2:00-4:00AM Phenomenon

**Pre-NF**

Agreement that 2:00-4:00AM is more tiring period, but patient safety rarely related to fatigue alone

‘The most times I have felt uncomfortable, but never really unsafe, is when you are dealing with multiple issues at once’ [PGY1]

‘And if I look at my management at 7:00 pm and at 3:00 am, there is definitely a difference but not to a degree that would be dangerous.’ [PGY2]

**Post-NF**

Improvement in 4:00AM fatigue, but worsened cumulative fatigue; perceived themselves as better teachers, leaders

‘...by the 6th or 7th night of night float, it’s really specific...but looking at an ECG for subtle ST elevations or depression, it’s actually very difficult for me to do that.’ [PGY2]
Subspecialty Experience

Pre-NF

Concerned about GIM-heavy PGY3, loss of >2 subspecialty rotations in core training years, being pulled back to CTU during NF blocks

“So you are on the [subspecialty] rotation but then you leave for a week to go and do night float...you can’t follow anything clinically for that week.’ [PGY1]

“If you’re on a night float week on a subspecialty...you might have been wanting to actually learn something you didn’t do throughout your 2 years and now you get a week less.’ [PGY2]

Post-NF

Loss of allocated subspecialty rotations, PGY3 year GIM heavy, concern around RC boards, ML rotation similar to SMR call

‘The 2 more GIM [ML blocks] that we had to do, I felt like I could have done another subspecialty. Looking down the barrel of the Royal College, I would have liked to have a bit more experience in other subspecialties.’ [PGY3]
Quantitative Analyses
Results – Quantitative

- CTU and ER-based clinical indicators collected pre-NF and post-NF as markers of patient safety and outcomes in two major teaching hospitals and combined in a composite analysis.
- CTU-based monthly clinical indicators included number of discharges and length of stay variables.
- Disease-specific CTU clinical indicators were also collected, specifically admissions secondary to ACS, CHF, and COPD. These reported on number of discharges and length of stay as well.
- “ER flow” variables included timing of acceptance by medicine and timing of admission and subsequent transfer out of the ED.
- Aim was to determine whether implementation of NF had impact on patient outcomes and flow within CTU and ER.
Results: CTU Overall Length of Stay

HHS CTU Length of Stay Comparison
Pre-NF and Post-NF (September-March)

Mean Number of Days

CTU Length of Stay Indicators

Avg total length of stay (days)

Avg acute length of stay (excludes ALC days)

Pre-NF Sept12-Mar13
Post-NF Sept13-Mar14
Results: CTU Discharges

Pre-NF vs. Post-NF Number of HHS CTU Discharges
September-March

Pre-NF CTU discharges Sept 2012-March 2013
Post-NF CTU discharges Sept 2013-March 2014
Results: CHF Length of Stay

Comparison of HHS CTU Length of Stay for CHF Admissions, Pre-NF vs. Post-NF

- Avg total length of stay (days)
- Avg acute length of stay (excludes ALC days)

Mean Duration (days)

Length of Stay Indicators

Pre-NF Sept12-Mar13
Post-NF Sept13-Mar14
Results: COPD Length of Stay

Comparison of HHS CTU Length of Stay for COPD Admissions, Pre-NF vs. Post-NF

- Avg total length of stay (days)
- Avg acute length of stay (excludes ALC days)

Length of Stay Indicators

Pre-NF Sept12-Mar13
Post-NF Sept13-Mar14
Results: ER Flow – Consult Acceptance

Comparison of Medicine Consult Acceptance Timing in the HHS ERs
Pre-NF vs. Post-NF (Sept-March)
Results: ER Flow – Admission Timing

Comparison of Medicine Admission Timing in the HHS ERs Pre-NF vs. Post-NF (Sept-March)

- Arrive-Admit (hrs)
- Admit-ED depart (hrs)

Mean Time (hours)

Pre-NF Sept12-Mar13
Post-NF Sept13-Mar14