

Beyond Duty Hour Reform: Redefining the Learning Environment

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Post Bell Commission Learning Environment

- A meta-analysis of 16 studies including over 1000 residents in 6 specialties revealed the residents spend their effort as:
 - 36% in direct patient care
 - 15% in organized teaching activities
 - 35% in activities with little or no educational value
- Conclusion: educational content of resident work must be considered in addition to hours worked when considering residency reform.



Post ACGME Reform Learning Environment

- Cross sectional mail survey of Chief Medical Residents outside of NY examining effects of work hour reform in IM clinical experience and didactic education.
- Results:
 - 72% reported no change in ADC/intern
 - 48% redistributed adms throughout call cycle.
 - 36% programs increased inpt responsibilities.
 - 34% programs increased float time and decreased elective time.
 - 56% programs reported decreased conf attendance.



Every Learning Environment is different....

- BUT, an inverse relationship exists between resident workload and education.
 - Factors that increase resident work and decrease time available for education.
 - Factors that decrease resident work and increase time available for education.



Factors that Increase Work

- Hours per week
- Continuous hours
- Number of nights or transitions from night to day
- Number of admissions (acuity)
- Number of patients ie census (acuity, turnover)
- Amount of “scut” work
 - Transporting, IV services, phlebotomy, making follow up appointments, completing paperwork



Factors that Decrease Work

- Percentage of patients geographically grouped
- Existence of reliable, user friendly CPOE and EHR
- Quality and availability of transport, phlebotomy, IV services, clerical support, consultants
- Non-teaching services to manage surges in patient volume
- Standardized sign out protocols



Resident Work Formula

$$\begin{aligned} \text{RWP} = & \frac{(\text{Number of admissions} \times \text{Census})^{\text{Case Mix Index}} \times \text{percentage of out of title work} \times \text{night-day cycles} \times (\text{\# clinic sessions})^{\text{coinciding with call}} \times \text{turnover on svc}}{(\% \text{ of non-teaching admissions})^{\text{Faculty to resident ratio}} \times \text{percentage of geographic patients} \times \text{number of automated services (EHR, CPOE, Rx, Std Sign Outs, etc)} \times \text{beeper management to protect learning} \times \text{systems to obtain consults, transport, IV, phlebotomy}} \end{aligned}$$





Reforming hours is not enough...

- Entire learning environment must be redesigned
- Simply limiting hours without redesign creates **work compression** that might be more dangerous than unlimited hours alone



Beyond Duty Hours: Additional Factors

- Work compression
- Clerical tasks
- Inefficiency
- Inadequate supervision
- Lack of basic sleep hygiene



APDIM: Leaning Environment Task Force

- Principles for change
 - Decrease work intensity
 - Enhance time at the bedside
 - Improve conference attendance
 - Promote daily reflection
 - Reduce errors
 - Increase efficiency
 - Improve transition of care



LETF: Recommendation 1

- Admission and census caps must reflect the resident work product for any given service.



LETF: Recommendation 1

- A cap of 10 patients per intern is acceptable if:
 - the patients are geographically concentrated and,
 - the interns are supervised by senior residents and,
 - the CMI is less than 75thile.
- Lower caps can be justified on an annual basis.
- Particular consideration should be given to services with high turnover or when there are large cross cover responsibilities.



Extended to all specialties.....

- The following workload limits must be established in every discipline:
 - Census
 - Cross coverage
 - Admissions



Beyond Duty Hours: Additional Factors

- Work compression
- Clerical tasks
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LETF: Recommendation 2

- Residents must not be required to schedule **ROUTINE** tests and procedures for inpatient and outpatients nor should they be required to schedule patient appointments.



Case Study 1

Use of a Medical Team Assistant to Restructure Intern Tasks

- Time motion analysis of interns during the weekday:
 - average of 187 mins a day on the phone v. 38 mins with patients.
- Medical team assistant (MTA) was added to a team.
- MTA tasks included calling physician offices, obtaining outside records, arranging inpatient diagnostic procedures, coordinating care with social work and care coordination, and arranging for discharge follow up visits.
- Over a recent 3 month period, teams with and without a MTA were followed by a trained observer on their on call day. The time and type of intern activities were recorded using a time in motion format.



Use of a Medical Team Assistant to Restructure Intern Tasks

Activity	Without MTA (min)	With MTA (min)	P value
Morning Rounds	86.8	87	0.99
Conference	113	164	0.19
Time with patients	45	34	0.22
Time on Phone	91.4	41	0.014
Time on computer	112	64	0.24
Time charting	117	73	0.35
Other	22	23	0.84



	Without MTA		With MTA	
	Range (min)	Mean (min)	Range (min)	Mean (min)
Calling Offices	0-25	15.2	0-10	2
Calling Social Work	15-35	24.8	10-25	16



Case Study 2

Use of Inpatient Appointment Service to Decrease Intern Phone Time

- In 3/07, we examined post discharge follow-up process on a busy general medicine ward.
 - 1,256 total discharges
 - an audit of 268 revealed that 396 follow-up appointments were needed, an average of 1.5 appointments/discharge.
 - 62% had an appointments scheduled prior to discharge and 38% self scheduled post discharge.
 - Average amount of time for an intern to discharge a patient was 26 minutes.



Use of Inpatient Appointment Service to Decrease Intern Phone Time

- 3 month trial using Penn Health Referral Service (PHRS) to schedule post discharge appointments for 4 interns.
- Control group = 4 interns without PHRS support.
- Results:
 - **Duty hour violations: 12 control v 0 in PHRS**
 - NO significant differences in:
 - Reduction of the rate of cancellations and no-shows
 - Reduction in readmission rates and ED visits post discharge.
 - LOS
 - Discharge time of day



Case Study 3:

Use of Health Technicians to limit nonclinical activities of surgical interns

- Over a 2 week period, daily data cards were collected from 3 interns and 8 HT's at a VA on hrs spent in work, OR, clinics and conferences.
- Interns with HT's:
 - worked 4 and 2 hours less each weekday and weekend day respectively.
 - increased time in the OR by 6.5 hours per week.
- HT's performed an avg of 20.25 tasks per day.



Beyond Duty Hours: Additional Factors

- Work compression
- Clerical tasks
- **Inefficiency**
- Inadequate supervision
- Lack of basic sleep hygiene



LETF: Recommendation 3

- Programs must have a standardized signout process that at a minimum includes a standard template for sign out and face to face handoffs.
- The quality of the sign out should be assessed at regular intervals by supervising physicians.
- Consideration should be given to computerized signouts that integrate with medications and electronic notes.



LETF: Recommendation 4

- Programs must have a paging policy that specifies the paging parameters for paging.
- Consideration should be given to having 2 way communication devices to promote safe and efficient patient care.



LETF: Recommendation 5

- Programs must have a transition of care policy that specifies the type of communication required when a patient moves from 1 level of care to another.



LETF: Recommendation 6

- Programs should have clinical decision support systems available for patient care.
- This may include but is not limited to CPOE, order sets or clinical practice guidelines.



Beyond Duty Hours: Additional Factors

- Work compression
- Clerical tasks
- Inefficiency
- **Inadequate supervision**
- Lack of basic sleep hygiene



Bell Commission Conclusions

- specific limits on residents' work hours
- stricter rules regarding their supervision

An experienced supervising physician must be in the hospital at all times or, in certain cases, no more than 30 minutes away from the hospital.



Beyond Duty Hours: Additional Factors

- Work compression
- Clerical tasks
- Inefficiency
- Inadequate supervision
- Lack of basic sleep hygiene



LETF: Recommendation 7

- Sleep hygiene should be incorporated into the duty hour language of the program requirements.
- Specifically, fatigue management strategies such as napping should be included for programs using extended duty periods.



Mandatory Naps

- 2 groups of interns:
 - Uninterrupted 4 hour nap on call
 - Traditional 24 + 6 schedule with no nap
- Naptern group slept:
 - a median of 3.2h vs 2.0h/ on call period.
 - a mean of 36-50 hrs/wk vs 30-42 hrs/wk.



LETF: Recommendation 8

- Formal sleep education must be included in each year of training including the effects of fatigue and fatigue management.



LETF: Recommendation 9

- For rotations that require night shifts, shifts should be grouped so that they occur consecutively to enable acclimation to night work.
- Programs with varying hours of night shifts should sequence the shifts so they move forward in time.
- Programs must not regularly require single night shifts spread out in time.



LETF: Recommendation 10

- Programs should have a transportation plan in place as well as space for prophylactic napping for individuals completing shifts longer than 16 continuous hours.



LETF: Recommendation 11

- Programs should have at least 3 months per year with overnight duty periods limited to no more than 2 per month.



Beyond Duty Hours: The NEW Learning Environment MUST:

- Set work load limits
- Reduce clerical tasks
- Be adequately supervised
- Incorporate sleep science

