


Accreditation Council for Graduate Medical Education 

## The Common Duty Hour Standards: Pooling Knowledge about the Effect on Healthcare and Resident Learning

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2008 ACGME Educational Conference  
Grapevine, Texas

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Experience: that most brutal of teachers. But  
you learn. My God do you learn.

- C. S. Lewis

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## Learner-Centered Objectives

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Explain the effect of the common duty hour standards on  
programs and sponsoring institutions.

Provide insight into the residency education community's and  
public's perception of the positive and negative  
consequences of limiting resident duty hours, including  
their effect on continuity of care and overall resident well  
being.

Provide suggestions for areas of improvements.

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## A very brief history

1971: Friedman et al. finds post-call residents more errors in reading standard electrocardiograms

1981: ACGME mentions "time for rest" in its requirements

1984: Libby Zion dies in a NY teaching hospital

1988: New York institutes 405 statute setting an 80 hour limit

1989/90: ACGME sets 80-hour limit in several specialties, limits requires limits on in-house call, one day off in all specialties

2001/02: ACGME Develops Blue Print : Public Citizen/AMSA/CIR petition OSHA for work hour limits for residents, Representative Conyers/Senator Corzine introduce bills in both houses

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## Duty Hours not a "New Issue" in 2001/02

**Effect of sleep loss known for the past 30 years**

2002: Two reviews of studies of residents found consistently negative effect, smaller effect related to "study factors"

Effect is not related to intelligence, motivation, professionalism

**Medicine depends on cognition, memory, vigilance**

Attention to system safeguards still in an early phase

**Patient Safety and resident well being**

Growing clinical demand, inefficient support systems

Framed both by an interest in patient safety and a political environment

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## The Standards and Aims

80 hours and 10 hours rest between duty shifts – aim: address chronic partial sleep loss

24 + up to 6 hours – aims: address acute sleep deprivation, avoid driving at the circadian nadir (~8 am), ensure continuity of care and learning

In house every third night – aim: adequate time for rest and recovery

In-hospital hours during call from home counted – aims: limit total hours, avoid inappropriate use of home call, preserve continuity of care

In-house moonlighting counts – aim: guard against hospitals using moonlighting to replace hours reduced via the limits

Intent: Refine in the future using data on effect on learning and safety

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## Substantial Compliance

"Substantial compliance" is determined by peer professionals against the total set of accreditation standards, in an continuous improvement model

Expectation is that a program/sponsoring institution is in compliance with all standards, or with the vast majority of standards, with some opportunities for improvement

Non-compliance with a standard produces a citation, with the expectation that the program corrects the deficiency

Less than substantial compliance results in an adverse action, such as probation, with the ultimate threat of removal of accreditation

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## Accreditation Summary

Between July 2003 and December 2007 ACGME cited 742 (8.8% of the 8,473 accredited programs) for duty hour violations

56 of these were cited more than once, outcomes included probation and withdrawal for some programs

Aggregated by sponsoring institution, citation rate appears higher (46% of all institutions). Given the accreditation focus on individual programs, this information is misleading

Citations for duty hours make up ~3% of all citations. In contrast, more than 50% of all citations relate to other elements of the educational program (supervision, curricula, patient volume/variety)

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## Accreditation Response: Duty Hour Citations Shorten Cycle Length

Year	Total Programs Reviewed	# Programs with DH citations	Average Cycle Length of DH-cited programs	Average Cycle Length of Non DH-Cited Programs (1)
2005-2006	2,363	187	3.29	3.42
2006-2007	2,589	227	3.35	3.61

(1) Programs with prior findings on the resident survey suggesting "no duty hour violations" had an average cycle length of 4.19 years.

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### ACGME Resident Survey

The ACGME resident survey is a large, representative and efficient way to collect information on the current state of GME

Besides duty hours, it includes information on supervision, curricula, faculty interaction, and other aspects of the learning environment

2004-06, ACGME surveyed all residents in accredited programs

The 2007 survey encompassed 3,025 programs (36% of total), 58,602 residents (55 % of all resident in accredited programs)

Very large sample, very good response rate: in 2007 52,185 residents (89%) completed the survey

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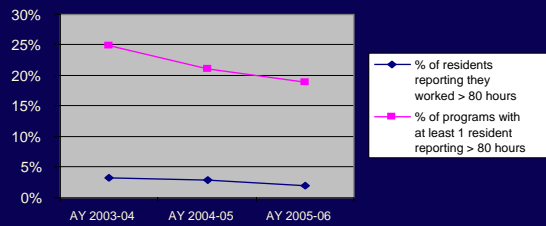
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### ACGME Resident Survey: Residents Reporting >80 Weekly Hours 2004 - 2006



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### 2007 ACGME Resident Survey: Duty Hour Compliance

Most residents report adhering to the duty hour standards

Approximately 94% of residents said they always or usually meet the ACGME's weekly duty hour standard, and less than 1% said they rarely or never met this requirement

The standard with the highest number of responses suggesting non-compliance is the 24+6 h requirement:

89% reported always or usually meeting that requirement

7% reported meeting this standard sometimes, rarely or never

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### ACGME Resident Survey: Duty Hour "Outlier" Programs

115 of 3,025 (3.8%) programs were identified at "outliers", of these 25 programs (<1%) were identified as non-compliant for 2 or more years

"Outlier" programs receive follow-up:

- (1) ACGME requests information on how duty hour problems are being addressed
- (2) repeat survey the following year

If response not satisfactory, or if non-compliant for 2 years, site visit date is moved up

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### Duty Hour Issues Identified on the survey Relate to Other Issues WITHIN the Survey

Positive correlations (P=.0001) between residents' identification of duty hour issues and other problems in the educational program (lack of teaching, supervision, emphasis on education)

The 115 programs with substantial duty hour non-compliance were likely to have residents reporting other problems

- 1.7 times more likely for issues with faculty teaching
- 1.6 times more likely for problems with intimidation;
- 1.9 times more likely for issues with service obligations

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### 2004 Resident Survey Data, Grouped by Compliance with the 80 hour Standard

Residents reporting "No" or "To a limited extent" to the questions below	Programs with <15% reporting they worked beyond 80hrs (N= 23,384)	Programs with 15% or more reporting they worked beyond 80hrs (N = 317)
Program emphasizes patient safety	6%	19%
Residents perform support services	78%	55%
Educational environment is satisfactory	14%	39%
Supervision is adequate and prompt	9%	24%
Education about fatigue and performance	55%	86%
Residents participate in scholarly activities	42%	62%

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### Duty Hour Issues Identified on the survey Relate to Other Issues OUTSIDE the Survey

There are significant ( $P=.0001$ ) correlations between non-compliant responses on hours per week and the number of total citations for the educational programs

When prior resident survey data for programs with "educational program" citations are reviewed, 91% were in the most non-compliant quartile for duty hours

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### Patterns of Response to the Standards

**Common response: Scheduling strategies to reduce in-house call, reduce continuous duty period**

There are limits to increasing resident efficiency

**Popular but costly: Replacement strategies**

Faculty, hospitalists, NPs, PAs – different skill sets, professional expectations

**Still rare in 2007: New Models for education and patient care**

Efforts are time- and resource-intensive

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### Effect of the Duty Hour Limits: Resident Well-Being +

Findings on resident well-being mostly positive:

- Sleep does not appear to increase under restricted duty hours
- Residents report positive effect of limits on well-being
- More reported self-learning, more personal time
- Residents concerned about compression of activities resulting in higher intensity of hours

Concerns about the adequacy of the limits in preventing post-call motor vehicle accidents (Barger et al., 2005)

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### Effect of the Duty Hour Limits: Patient Care §

Assessment of effect on patient care shows continued heavy reliance on residents for clinical care

Resident's clinical contribution difficult and costly to replace, variable institutional resources and ability to do this

Extensive use of short call/night float to reduce continuous hours produces more frequent hand-offs and higher work intensity

Local adaptation may be intelligent or may violate key goals

Reduced continuity of care

Highlights larger inefficiencies/need for improvement in the clinical environment in teaching hospitals

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### Effect of the Duty Hour Limits: Education ?

Effect on education largely unknown:

Decreased formal educational time

Comments on the effect on educational outcomes mainly focused on "reduced resident professionalism"

Some evident of reduced resident learning opportunities in surgical specialties (less ambulatory care, peri-operative continuity to preserve operative volume)

Relatively little scientific knowledge on the function of time/hours in the acquisition of physician competence for independent practice

Proxies from other disciplines (musicians, athletes, Ericsson 2004)

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### Effect of Duty Hour Limits on Operative Volume for Surgical Residents

Examination of the case log data since implementation of duty hour requirements show no consistent patterns.

General and plastic surgery case logs have shown no downward trend in the number of cases

Urology cases per resident have increased since 2000-2001

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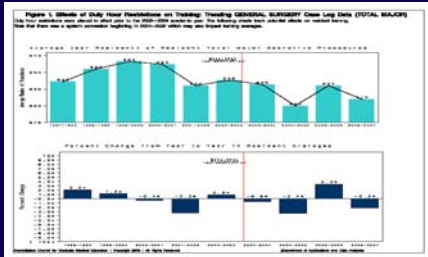
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### Case Logs for General Surgery (Total Major Cases)




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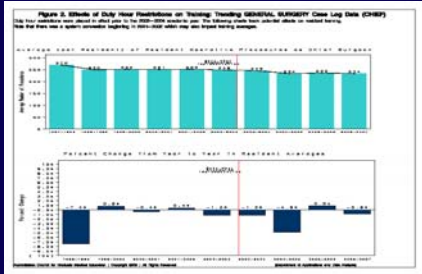
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### Case Logs for General Surgery (Cases Chief Resident)




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### Thoughts about Hours, Operative Volume and the Acquisition of Competence

Hours in operative training: 3,963 hours (21%) of 19,200 hours (5 yrs @ 80-hour weeks) spent as chief surgeon, 272 hours as assistant, 938 hours in peri-operative care (Chung 2005)

Limited number of articles on relationship between volume and the acquisition of competence

Many focus on the acquisition of competence for new procedures such as laparoscopic surgery

Some focus on proxies from other sectors such as professional sports, chess, musicians (10,000 hours for "international-level performance")

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## Experience with the Common Duty Hour Standards

ACGME set standards in 2003, GME community responded, and programs and institutions made major changes to reduce hours

Four years of experience highlight need for refinements, suggested by information that one size one size may not fit all

Differences among

- 1) Specialties
- 2) Year of training (1<sup>st</sup> year vs. chief resident)
- 3) Extent to which activities important to attainment of competence can occur during "off-duty" hours (reading vs. surgical practice)

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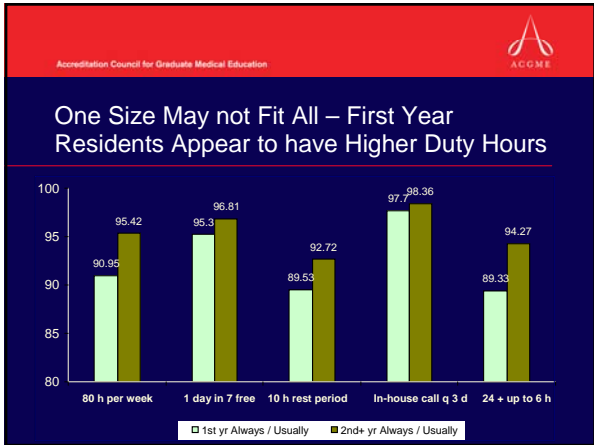
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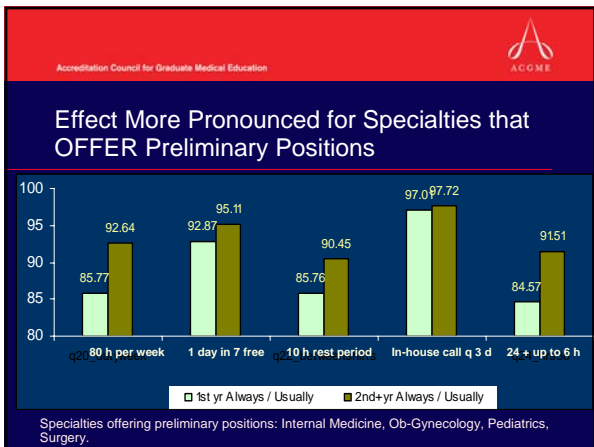
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## The Link to Patient Safety: Errors May Occur Under Conditions Familiar to Residents

Reduced sleep, but also:

- Stress and heavy workload, time pressures
- Lack of expertise, lack of appropriate training or experience with complicated tasks like running a code
- Errors and omissions in the transfer of information
- Duty hour limits positively affect alertness, may have a negative effect on others

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## Selected Data from the Literature

Volpp et al. (JAMA 2007), VA data: ACGME duty hour reform was associated with significant improvement in mortality for patients with 4 common medical conditions in more teaching-intensive VA hospitals, no associations for surgical patients.

Volpp et al. (JAMA 2007), Medicare data: ACGME duty hour reform a small, statistically non-significant positive effect for surgical patients, no positive or negative effect for all other patients

Myers et al (Acad Med 2006): residents believe errors due to continuity of care have increased, errors related to fatigue have decreased, quality overall decreased

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## A Potential Alertness vs. Continuity” Trade-off: Classifying Patient Safety Indicators

T=technical, C= affected by continuity of care

Patient Safety Indicator	T vs. C	Physician Sensitive		Nurse Sensitive
		Surgical	Medical	
Death in low-mortality DRGs	T>C	X	X	
Failure-to-rescue	T>C	X	X	
Foreign body left during procedure	T	X		
Iatrogenic pneumothorax	T	X	X	
Selected infection due to medical care	C	X		X
Postop hemorrhage/hematoma	T	X		
Postop physiologic or Metabolic Derangement	C	X		
Postop thromboembolism	C	X		
Postop septicemia	C	X		
Postop abdominopelvic wound dehiscence	T	X		
Accidental puncture or laceration	T	X	X	

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## Efforts to Refine the Standards and Compliance and Assess their Effect on the Learning Environment

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## ACGME Activities to Assess the Effect of the Duty Hour Limits

*Recommendation:*

Assess the effect of the common duty hour limits on the patient care and resident education, focusing on specific hypotheses how the standards affect resident learning and engagement in clinical care in particular specialties.

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## Questions under Consideration

Positive/negative effects of the limits on patient care, learning and resident well-being?

Do these relate to the standards or programs'/institutions' response?

How to better educate residents about the importance of rest and alertness for patient safety?

What standards may benefit from refinement?

Opportunities to improve the accreditation process related to duty hours?

What other factors promote resident learning and participation in care in a safe, high-quality clinical environment?

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## ACGME Efforts to Refine the Duty Hour Limits

*Recommendation:*

Use pilots at the Review Committee level to test changes to the common duty hour standards prior to broad implementation, to ensure that additional changes are based on valid and “actionable” evidence on their effect on the safety and effectiveness of care and on resident learning and resident well-being.

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## 6 Duty Hour Pilots

1. Mandatory Sleep Period Through Pager Sign Out (could be combined with #4)
2. Extend Hours for Surgical Chief Residents to Reflect Practice
3. Achieving Continuity of Care and Education with 14-hour shifts (could be combined with #4)
4. High Educational Value Night Float with Educational Debriefing (could be combined with #1 and #3)
5. Change the Rest Requirement to “must be 8 hours”
6. Limits on Residents’ Admissions and Total Patients

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## The Perspective: Duty Hours as one Element of the Learning Environment

Duty hours cannot be treated as a stand-alone issue

ACGME effort must expand to other standards that collectively promote safe patient care and high-quality learning

Approach must:

- Be informed by the public attention focused on duty hours.
- Fit within the greater focus on health care quality and safety.
- Be sensitive to the role of residents as learners.

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## Real Learning for Safe Health Care

Learning a Clinical Specialty in Residency benefits from

- Appropriate limits on duty hours
- Preparation away from the patient, and deliberate practice and rehearsal
- Requires knowledge, skills, and socialization into a profession
- ...that cannot be achieved without residents' real-life, full participation in high-performing teaching institutions and clinical micro-systems designed to achieve the best possible patient outcomes

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## The Importance of Clinical Knowledge vs. Competence

<u>Knowledge</u>	<u>Competence</u>
Science	Art and science
Rules	Values
Easier to measure	Hard to measure
Evidence-based	Context and evidence-based
Present or absent	Continuum
Stacey control zone	Stacey control, complex, and chaos zones
"In the head"	"In the work, in the world"

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## Tying it all Together: Beyond Duty Hours

A safe and high performing teaching setting requires focus on:

- Development of clinical skills in a setting that promotes safe and effective care
- Role of technology and context
- Effect of learning and working conditions resident learning and individual and team performance
- Reducing reliance on the individual resident as the glue to hold the system together
- Understanding the attributes of high-performing clinical micro-systems and how duty hour limits fit into this

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## The Goal

To produce competent physicians who are trained in a specialty and who are prepared for the safe, effective, and independent practice of medicine.

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