February 1, 2016

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VIA E-MAIL

This letter is provided on behalf of the Executive Committee of the Thoracic Surgery Directors Association (TSDA) in response to your letter dated December 21, 2015 requesting formal position papers regarding the Accreditation Council for Graduate Medical Education (ACGME) review of resident duty hours and key dimensions of the learning and working environment.

The pursuit of patient safety and improved outcomes should be the endpoint for everyone involved in all medical specialties. This is even more important for those involved in surgical education, as the goal is to produce young physicians whose skills allow them the ability to carry out the independent practice of their specialty.

Leaders in cardiothoracic (CT) surgery have learned much about the educational process over the last few years with the implementation of resident duty hour (RDH) restrictions and the unintended consequences on certain specialties. Mostly, we have learned that the education of CT surgery residents, specifically their ability to ultimately function as independent practitioners, has been negatively impacted.

The “one size fits all” mandate for RDH has resulted in higher mortality and morbidity in high acuity patient care populations related to increased patient handoffs, impeding the patient care process. Additionally, the resident education process is limited by RDH restrictions with regard to disease course follow-through and limited operative experience due to arbitrary and unfounded non-surgical evidence based medicine (Ahmed et al., Ann Surg 2014;259:1041–1053).

The ACGME acknowledges that the need to create a uniform standard has forced the development of rules that cater to the lowest common denominator, rather than allowing each specialty to mold an environment that suits its trainees’ learning needs and ambitions. (N Engl J Med 2012; 367:2044-2049, November 22, 2012).
The broad based mandate of RDH limitations has not had the intended consequences within high acuity resident specialties such as CT surgery and neurosurgery. Residents indicate they are less satisfied with their surgical residency experiences (Ahmed et al., Ann Surg 2014;259:1041–1053). The lack of autonomy and continuity of care has resulted in lower resident satisfaction and lower Board exam pass rates. Residents who feel less prepared for their surgical careers are increasingly entering into “super” or sub-specialty fellowships or engaging in additional training to further prepare themselves for their area of practice.

The intended outcome of restricting RDH was to increase patient safety. However, the implementation of RDH restrictions has not reduced morbidity and, in fact, has resulted in increased morbidity and mortality in high acuity specialties. Cardiothoracic surgery has seen increased costs, decreased efficiency, and lower patient satisfaction scores. More importantly, the opportunity to expose the specialty to general surgery residents for the purposes of providing experiential practice has been limited due to their inability to rotate on cardiothoracic services. Workforce issues have been created due to program directors’ inability or desire to provide this opportunity within RDH. This has also resulted in the need for physician extenders to assume the role that residents previously performed, further limiting their education and ability to care for patients.

Limiting RDH by shift work and reducing the hours associated on a service has not had the intended effect of improved care or resident satisfaction. There is no evidence for improved educational or training experiences as a result of 16-hour duty maximums. A consistent finding across many studies demonstrates that limited shifts resulted in increased patient handovers, poorer team integration, professional dissatisfaction, concern for maturation of clinical skills, and decreased time in the operating room (Hamadani et al., J Surg Educ. 2013;70:296–303).

While not completely devoid of merit, RDH has taught us how to be respectful of resident time and how to compress wasted time into more productive educational opportunities. However, the current system of education and preparation has resulted in a product inferior to that of the previous system. This is demonstrated by the need for additional mentorship during the initial years of practice, and the increase in post-graduate fellowships completed by more than half of all surgical residents. The independent practice of cardiothoracic surgery has been significantly damaged by the arbitrary implementation of RDH with no opportunity for feedback about its effects from those in education.

There have been recent studies about depression among residents and while there is a lower incidence in surgery residents, it is still concerning and prevalent. The major issue associated with the prevalence of resident depression, which is
markedly higher than other professions, is the lack of recognition and resources to deal with these issues. However, it is important to note that this is not a new phenomenon and is likely the same now as it was in 1963 when reports were first generated. The introduction of duty hours has not decreased this rate of depression (Mata et al., *JAMA*. 2015;314(22):2373-2383).

Imposing longer training periods and limiting job satisfaction by reducing duty hours is not a reasonable way to address resident depression. Some studies suggest that RDH restrictions have increased these issues by limiting the autonomy and preparation of residents for the independent practice of their surgical specialty. One of the major factors leading to resident burnout in internal medicine was that of educational debt and being locked into a situation where residents saw no opportunity to change their path. This in and of itself has nothing to do with RDH, and one study demonstrated that the level of burnout was unchanged whether or not RDH restrictions were in place (West et al., *JAMA*. 2011;306(9):952-960).

Resident, and ultimately physician, burnout is a consequence of not only the fact that cardiothoracic surgeons work long hours, but also compensation, bureaucracy, and the lack of recognition for what we do. These factors result in dissatisfaction among physicians in practice that is transferred to their learners. This could lead residents to wonder whether or not they have made an appropriate career choice.

There is no easy answer as to how to improve this issue, but limiting RDH will have no effect if compensation, debt correction for medical trainees, lack of value for work effort, and continued bureaucratic issues are not dealt with in a real fashion. Providing recognition to the problem and providing resources are the answer to these problems, not arbitrary duty hour restrictions that damages the educational process which results in the successful creation of cardiothoracic surgeons who can operate independently.

It is important to realize the mistakes of the current system and a "one size fits all" mentality forced on high acuity specialties has not improved resident education. It has instead contributed to increased morbidity and mortality, which in turn has effected costs to the health care system overall.

In a recent lecture by Dr. John Potts, the current Senior Vice President of Surgical Accreditation (ECU Department of Surgery Grand Rounds, 01/13/16), he stated that we need to return to our past educational values of allowing resident surgeons increasing independence with true graded responsibility. While he recognized this may increase morbidity in some cases, ultimately it would result in improved outcomes overall. Autonomy during the surgical educational experience would improve the ultimate care for patients. While case logs requirements may be met, the experience and ability do not match. Dr. Potts demonstrated the gradual spiral occurring by less and less autonomy, so that the
leap from June 30 to July 1 is so large that most current surgical residents are not able to perform at a level is neither expected nor safe.

The TSDA is the educational representative for cardiothoracic surgery program directors. TSDA’s members have been charged with the preparing all cardiothoracic residents to meet the requirements set forth by the ABTS by providing an educational curriculum that matches these expectations in preparation for certifying exams. The ACGME and RRC have also charged programs with meeting the Thoracic Surgery Milestones and preparing residents for the independent practice of cardiothoracic surgery.

Over the last 90 years, cardiothoracic surgery educators have developed a product and training platform that has worked extremely well to develop new generations of cardiothoracic surgeons. Recent changes in RDH and restrictions placed on education limits the independence among residents, and the lack of knowledge from public opinion about resident education has eroded this process to a concerning level. To this end, cardiothoracic surgery educators have developed another approach to training with the development of integrated six-year programs in an attempt to improve education and preparation for the future. However, the restrictive nature of the current requirements by the ACGME has continued to result in erosion of the specialty both through a decrease in resident satisfaction and an increase in patient safety issues.

It is the recommendation of the TSDA that the leaders in the field of CT surgery education, namely the leaders and members of TSDA, be allowed to develop sound and fair recommendations to the RRC and the ACGME with respect to cardiothoracic surgery education and duty hour requirements. This would allow us the opportunity to provide adequate exposure and clinical experience while taking into account the needs for attention to resident fatigue, depression, and burnout based on more current knowledge and recognition of this problem.

On the matter of specific recommendations regarding standards governing key aspects of the learning and working environment, TSDA’s Executive Committee discussed at length and endorses the recommendations outlined by The Society of Thoracic Surgeons in its response to ACGME’s request on the same subject (attached). Additionally, the Thoracic Surgery Residents Association (TSRA) Executive Committee discussed the issue and expressed support for TSDA’s response.

For high acuity specialties, it is clear from the literature that what we are doing now is not working as demonstrated by higher morbidity and mortality, lower patient and resident satisfaction, higher costs, and lower exam scores.

Please allow TSDA the opportunity to develop our own standards and provide oversight of cardiothoracic surgery education to get us back on track and provide a product that is what we as thoracic surgeons expect for the care of our patients.
and their families. To that end, TSDA would welcome an invitation to participate in the ACGME’s Resident Duty Hours in the Learning and Working Environment Congress, to be held in March.

Sincerely,

Mark D. Iannettoni, MD
President
Thoracic Surgery Directors Association
The Society of Thoracic Surgeons Position Paper
Regarding the ACGME Review of Resident Duty Hours
and Key Dimensions of the Learning and Working Environment

Ara Vaporciyan, MD, Chair

and members of the STS Workforce on Thoracic Surgery Resident Issues

February 1, 2016
The Society of Thoracic Surgeons ("STS" or the "Society"), in response to the ACGME’s request for input to assist in its review of the accreditation requirements for resident duty hours and key dimensions of the learning and working environment, has composed the following position paper specifically addressing the four topics outlined in its request dated December 21, 2015. As the request came over the holidays and necessitated input from various stakeholders within the Society, it was difficult to perform formal impact analyses and obtain broad input in the short time available to us. Therefore, the responses reflect the position STS has on these topics substantiated by supporting literature rather than secondary to direct data collection and analysis.

Your organization’s formal position on the current ACGME resident duty hour requirements, including impact analysis, from your organization’s perspective, on costs and impact of implementation.

Direct Costs - The exact cost of implementation of duty hour requirements is difficult to estimate; however, there have been a number of attempts to do so in literature. Law et al. reviewed the estimated costs reported in U.S. literature, which ranged from $1.1 to $1.6 billion per year. The cost of hiring lower-level or mid-level providers to render services previously performed by residents was estimated to be between $673 million and $1.1 billion per year.1 These estimates were distributed across the entire system of graduate medical education and are not specific to cardiothoracic (“CT”) surgery. However, all elements that were included in this cost estimate pertain to CT surgery, including both direct and indirect costs. Examples of direct costs incurred by our specialty include the personnel costs secondary to hiring physician extenders to provide the continual care to patients in the perioperative period that residents provided prior to duty hour requirements. These extenders are needed to not only cover patient care during the post-operative recovery, but also to assist in the operating room. The level of skill needed to do these tasks is significant and commands a high price to secure and retain individuals who can meet these needs. In the U.S., the median salary is $100,591 (with a range of $79,297 - $137,946)2 for a physician assistant and $76,0003 for nurse practitioners. This is compared to the average salary of a PGY 6, 7 and 8 (the highest paid CT residents) of $61,000 to $66,0004.

Indirect Costs - An additional set of costs that are clearly relevant to CT surgery (as well as other surgical disciplines) is the increased volume and composition of work that is shifted to the faculty due to reduction in resident duty hours. Bandiera et al. reviewed a number of publications which highlighted the changes that occurred both from the perception of the faculty and by the trainees. Faculty clearly anticipated an increase in their work hours. In addition, once duty hour requirements were implemented, the majority of faculty reported a greater role in supervising patient care, which directly impacted the time available for research and resident education. The latter change of reduced time for teaching was confirmed by multiple investigators and validated by learners as well.5 The cost impact of this transfer of responsibility to the faculty is difficult to measure, but it is possible that there is an effect on the number of cases the surgeon can perform secondary to the need to free up time to maintain one’s research and educational commitments.

Exposure to the Specialty – It became quickly apparent that the implementation of duty hour restrictions significantly curtailed the ability of general surgery residents to have opportunities to rotate
on cardiothoracic surgical services during their training. This interaction between junior trainees and CT faculty is instrumental in developing an interest in CT surgery that leads to pursuit of the specialty as a career. CT surgery identified a significant decline in the number applicants in the specialty. Vaportiyyan et al. (Ann Thorac Surg. 2009;87(5):1351-9) surveyed general surgery trainees and identified multiple factors that were at the heart of the reduction in interest CT surgery, including lifestyle issues and concerns about the field’s viability. Another key identified factor was mentorship. The analysis indicated that a respondent’s interest in pursuing CT surgery after general surgery was directly proportional to the time he/she spent rotating on a CT surgical service. Clearly, constraints in rotation structures brought about by adherence to duty hour regulations limits a general surgery program director’s ability and/or desire to rotate his or her residents. In an effort to recapture general surgery interest in the field, STS established the Looking to the Future scholarship program in 2006, which will cost the Society more than $120,000 in out-of-pocket expenses alone this year (setting aside the value of surgeon leadership and staff efforts devoted to this time-intensive initiative). The American Association for Thoracic Surgery offers similar programs. The costs of these programs could be assumed to be indirectly attributable to the duty hour regulations.

**Accountability and Quality of Teaching** - Another impact of implementation is the reduction in accountability of the trainee to the patients and its impact on the quality of their education. This finding is germane to all specialties but is particularly relevant to the surgical disciplines, where knowledge of the intraoperative events is tied directly to the clinical decision making in the postoperative period. It is difficult to learn the subtle changes that can occur in a patient’s clinical picture that are secondary to intraoperative events without maintaining continuity of care. This has been demonstrated in a number of studies focused on surgical specialties. Lindeman et al. surveyed trainees before and after implementation of the July 2011 duty hour regulation. Although they hypothesized no changes in resident education, they identified a significant decrease in residents’ perceptions towards the adequacy of their clinical skill progression and diminished ability to independently evaluate patients’ problems⁶. When examined more broadly across the literature, the overall consensus parallels these findings. Ahmed et al. performed a systematic review in 2014, examining the impact of both the 2003 and 2011 ACGME duty hour restrictions and 16-hour duty maximums on patient safety, resident wellness/fatigue/burnout and resident education. In the area of education, the majority of the studies showed either worse or unchanged measurable outcomes. When reviewing articles that addressed perceptions of duty hour restrictions on education, the results parallel the findings seen with objective measures of educational success⁷.

**Patient Safety** – There are no high quality studies of duty hour impacts on CT surgical patient safety; however, neurosurgery has published extensively in this area. Neurosurgery is similar to CT surgery in the acuity of the patients being managed and, as such, the results have relevance to our specialty. Studies evaluating specific procedures, such as craniotomy for meningioma and spine surgery, used the Nationwide Inpatient Sample (NIS) and consistently identified worse outcomes in teaching hospitals after implementation of the duty hour regulations⁸,⁹. In a more general analysis of all patients undergoing neurosurgical procedures, the NIS data did not reveal a significant impact¹⁰. The systematic review by Ahmed et al. was also inconclusive when they examined objective evidence of patient safety.
Burnout and Fatigue – This is likely the one area where duty hour regulations appear to have had a measurable impact. The general duty hour regulations appear to have improved the quality of life of junior residents, as demonstrated in the systematic reviews by both Harris et al. for orthopedic surgeons and Ahmed et al. for all surgical residents. The data is vaguer with respect to the impact of the 16-hour duty limitations. Hanna et al. reviewed the work performed by a number of investigators and found that while the hours slept per week increased marginally, there were negative impacts in most all other measured areas, including emotional exhaustion and personal accomplishment, both indicators of burnout. Similar findings were reported by Antiel et al., who longitudinally studied university based general surgery residencies in the U.S.

All the factors discussed are relevant to cardiothoracic surgery, although they are also relevant to surgical training in general. All surgical disciplines share the need to train their residents in motor skills that are difficult to teach outside of the operating room. The significant increase in the pursuit of fellowship training after completion of a residency in surgery - and even CT - surgery may be a reflection of diminished confidence by trainees in their surgical competency. While we cannot rest all the blame on duty hour restrictions, we can certainly acknowledge that they bear some of the responsibility, based on the data reviewed above. In addition, surgical disciplines have intraoperative specific factors that impact postoperative clinical decision making. Continuity of care is a vital element to learn how to make these decisions. The impact of duty hour regulations has been therefore acutely felt in surgical disciplines, especially disciplines with high acuity patients whose conditions can change rapidly, i.e., CT surgery, neurosurgery.

Your organization’s formal recommendations regarding dimensions of resident duty hours requirements, and justification (wherever possible) for these recommendations with evidence.

Focus on Outcomes - The primary goal of duty hour regulations is to reduce fatigue and its impact on clinical decision making and hospital errors. Proponents frequently point to the unfortunate case of Libby Zion as a watershed event that provided the impetus to address what was an obvious problem: that of overworked and under supervised trainees. The problem, however, is that the focus has been entirely on duty hours, almost to the exclusion of the outcomes that their regulation was meant to address. In fact, Kenneth Ludmerer’s Let Me Heal describes duty hour limits as the “fiercest controversy in medical education since the Flexner report.”

STS acknowledges the significant importance of burnout and fatigue in surgical trainees. While the majority of the duty hour regulations have improved quality of life for trainees and reduced burnout, the 16-hour duty limitation has imposed some workload compression for interns. While the majority of our trainees enter as fellows in their PGY 6, the availability of integrated CT surgery training pathways beginning after medical school now makes this issue relevant to our discipline as well.

However, our society also has a desire to not significantly lengthen training requirements, to maintain cost-effective training, and to continue to implement solutions that will improve patient outcomes and
reduce errors. The bulk of evidence suggests that duty hour regulations, as they are currently implemented in surgery, appear to address the issue of fatigue but have at best no impact and at worst a negative effect on all other outcomes. Debra Weinstein, a member of the Institute of Medicine who helped construct that organization’s report on GME, provides a commentary on duty hours and, more importantly, the issue of accountability in medical education\textsuperscript{15}. Based on comments such as hers and the data presented above demonstrating the limitations of what the duty hour regulations have achieved, STS proposes the following recommendations:

- Revoke the 16-hour restrictions in surgery. The burnout due to workload compression is real and the benefits appear to be limited.
- Relax post-call restrictions to allow CT surgery trainees to once again take overnight call and remain on duty (assuming they do not demonstrate evidence of fatigue). This would allow trainees the opportunity to remain in the hospital and participate in patient care and education after a relatively mild night of call. Most programs have done away with frequent call since trainees cannot be present the next day to do cases. This forces the program directors to make a choice. Either they have their trainees take call and then miss any opportunity to operate the following day or they have their trainees take home call or night float call and lose the opportunity to observe the development of acute changes in CT surgical patients that frequently occur the evening after major surgery. As case logs are the dominant form of assessment, it is easy to guess which choice most program directors will make.
  - This would require strengthening the consequences of non-compliance with Common Program Requirements VI.C (Alertness Management/Fatigue Management), specifically what the programs must do (VI.C.1.a, VI.C.1.b, VI.C.1.c, VI.C.2).
  - Similarly, there would need to be a strengthening of the consequences resulting from non-compliance with Common Program Requirements VI.D (Supervision of the Residents). Lack of supervision was a key component of the Libby Zion case. Any relaxation in duty hour regulations would need to have a concurrent strengthening of consequences for failing to adhere to the requirements related to supervision.
  - It would also require a slight (10-15\%) increase in the total allowable duty hours per week. However, if the first element is rigidly adhered to, that of monitoring and immediately supporting a fatigued trainee, then the overall goal of reducing errors and maintaining high quality education will be achieved.
- Hold the institutions’ GME departments and residency programs accountable for the measurement of errors and near misses. All hospital systems have a mechanism in place for reporting these events. Since the goal of duty hour regulations is to minimize these events, outcomes should be measured directly rather than assuming that a trainee who is forced to go home will make fewer errors. Part of this accountability would be to ensure that efforts are in place to reduce medical errors through a combination of better faculty supervision and control of resident fatigue. This is in contradiction to the current model of just broadly reducing duty hours and hoping for a reduction in errors.
Internally, the specialty has also incorporated multiple efforts to allay the impact of duty hour restrictions on resident education. New paradigms in training, such as the 4/3 (a form of early specialization in CT surgery) and the integrated 6-year program (beginning CT surgery training directly after medical school), provide increased opportunities for trainer-trainee interaction compared to the conventional 2- and 3-year programs that begin after general surgical training. In addition, the significant growth in the use of simulation training has been undertaken by our specialty (and other surgical disciplines). While this will not likely address all educational deficiencies, it will allow the more limited trainer-trainee interactions to be of greater value by offloading the instruction of more basic skills into the simulation lab. Finally, STS and our discipline are investing heavily in online learning. Again, while this will not address all the educational needs of our trainees, it will allow trainees to develop a base of knowledge independently and thus enhance the value of time spent with a trainer. Increasing the length of training and the utilization of simulation technology has been advocated as a means of addressing work hour restrictions in the United Kingdom\textsuperscript{16}. Of note, each of these efforts adds a significant cost to what is already an expensive and largely unfunded activity\textsuperscript{17} (especially at the PGY 6, 7, and 8 levels).

Your organization’s formal recommendations regarding standards governing key aspects of the learning and working environment, and justification (wherever possible) for these recommendations with evidence.

The following recommendations are offered by STS based on the evidence presented earlier in this document.

- Section VI.A. (Professionalism, Personal Responsibility, and Patient Safety): add specific requirements regarding the monitoring of errors and near misses.
- Section VI.B. (Transitions of Care): no recommendations
- Section VI.C (Alertness Management/Fatigue Mitigation):
  - Require documentation of all episodes when (a) fatigue mitigation processes are activated (VI.C.1.c) or (b) the process to ensure continuity of care when a resident is unable to perform his/her duties due to fatigue is utilized (VI.C.2).
  - Establish a clearly delineated process for how programs will assess residents post call for signs of fatigue that are severe enough that the resident is not fit to remain in house post call (see our recommendations below to section VI.G.4.b).
- Section VI.D (Supervision of Residents):
  - Provide more clear documentation of supervision, including the availability of call schedules for review demonstrating which faculty are supervising each trainee (section VI.D.2).
  - Provide examples of oversight (section VI.D.3.c) similar to how we will request documentation of episodes of when the fatigue management process is activated.
- Section VI.E (Clinical Responsibilities): no recommendations.
- Section VI.F (Teamwork): no recommendations
Section VI.G (Resident Duty Hours):

- Remove the need to apply for and receive an exception for up to a 10% increase for surgical programs (VI.G.1.a). Instead, make it standard that surgical disciplines will have up to 88 hours. The data presented above should justify the educational rationale for surgical programs.
- Remove the 16-hour maximum for PGY-1 residents (VI.G.4.a).
- Section VI.G.4.b: revise the duty hour maximum of only 24 hours to allow residents to remain on duty the following day after call if they
  - do not display any evidence of significant fatigue through a clearly delineated procedure (see our recommendations above at section VI.C),
  - have access to and use alertness management strategies as delineated in requirement VI.G.4.b.(1),
  - engage in activities pertaining to documentation,
  - engage in simulation labs or other scheduled educational activities that do not require patient contact, or
  - meet the requirements delineated in section VI.G.4.b.(4) where an unusual circumstance arises where the resident remains to continue to provide care to a single patient.
- Section VI.G.5 (Minimum Time Off between Scheduled Duty Periods): consider making the requirement be a 10 hour period free of duty between assignments averaged over a month. This more accurately reflects practicing surgeons who will have periods where patient demands are high as well as other periods where demand is low.
- Section VI.G.6 (Maximum Frequency of In-House Night Float): no recommendations.
- Section VI.G.7 (Maximum In-House On-Call Frequency): no recommendations.
- Section VI.G.8 (At-Home Call): no recommendations.

These recommendations are supported by the evidence provided in the preceding two sections and are centered on our desires to increase the accountability of institutional GME departments, to teach faculty and trainees, and to monitor and improve patient safety through zero tolerance of fatigued residents engaged in patient care, while still making every effort to maximize the educational opportunities for trainees.

Your organization’s willingness to participate in a Resident Duty Hours in the Learning and Working Environment Congress, to be held in March 2016 in Chicago, Illinois.

The Society of Thoracic Surgeons would eagerly accept any opportunity to participate in the ACGME’s efforts to evaluate the resident duty hours and learning and working environment elements of the common program requirements.
REFERENCES:


