Intensivist/Patient Ratios in Closed ICUs: A Statement From the Society of Critical Care Medicine Taskforce on ICU Staffing

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Objectives: Increases in the number, size, and occupancy rates of ICUs have not been accompanied by a commensurate growth in the number of critical care physicians leading to a workforce shortage. Due to concern that understaffing may exist, the Society of Critical Care Medicine created a taskforce to generate guidelines on maximum intensivists/patient ratios.

Data Sources: A multidisciplinary taskforce conducted a review of published literature on intensivist staffing and related topics, a survey of pulmonary/Critical Care physicians, and held an expert roundtable conference.

Data Extraction: A statement was generated and revised by the taskforce members using an iterative consensus process and submitted for review to the leadership council of the Society of Critical Care Medicine. For the purposes of this statement, the taskforce limited its recommendations to ICUs that use a "closed" model where the intensivists control triage and patient care.

Data Synthesis and Conclusions: The taskforce concluded that while advocating a specific maximum number of patients cared for is unrealistic, an approach that uses the following principles is essential: 1) proper staffing impacts patient care; 2) large caseloads should not preclude rounding in a timely fashion; 3) staffing decisions should factor surge capacity and nondirect patient care activities; 4) institutions should regularly reassess their staffing; 5) high staff turnover or decreases in quality-of-care indicators in an ICU may be markers of overload; 6) telemedicine, advanced practice professionals, or nonintensivist medical staff may be useful to alleviate overburdening the intensivist, but should be evaluated using rigorous methods; 7) in teaching institutions, feedback from faculty and trainees should be sought to understand the implications of potential understaffing on medical education; and 8) in academic medical ICUs, there is evidence that intensivist/patient ratios less favorable than 1:14 negatively impact education, staff well-being, and patient care. (*Crit Care Med* 2013; 41:638–645)

Key Words: ICU; intensivist; rationing; ratios; staffing; workforce

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Since their inception in the 1950s, the number and size of ICUs have grown steadily in the United States. More recently, their growth has begun to outpace that of many other sectors of medicine. A 2004 study showed that from 1985 to 2000 the number of U.S. hospitals decreased by 9% and the number of hospital beds decreased by 26%, but the number of ICU beds increased by 26% (1). In a follow-up study, the authors demonstrated further growth of critical care services in the United States. Critical care medicine beds increased by 6.5% from 2000 to 2005, even though the number of hospitals declined and the percentage of hospitals with ICUs continued to decline. ICU days, occupancy rates, and annual critical care expenditures also increased significantly (2).

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This expansion of critical care services has not been accompanied by a commensurate increase in the number of critical care physicians. Although delineating the precise number of intensivists needed is difficult, the growing shortage and aging of critical care trained physicians available to work in these ICUs have been well recognized (3,4). Other factors also serve to worsen the strain on the critical care workforce, including the national efforts to staff ICUs around the clock with intensivists (5) and duty-hour restrictions for physicians in training (6), which in academic medical centers may shift the burden of staffing the ICU away from trainees onto attending physicians.

The unstated implication of the expanding demand for critical care in the face of a static workforce is that individual intensivists will increasingly be required to care for greater numbers of patients. This issue is of great concern to the Society of Critical Care Medicine (SCCM), an organization whose mission is to secure the highest quality care for all critically ill and injured patients. In recent years, the SCCM became aware through its membership of a perceived need for guidance regarding the ideal number of patients a critical care physician should care for at any one time. Given the paucity of data pertaining to intensivist/patient ratios, the SCCM convened a multidisciplinary taskforce to better address this problem. The taskforce's stated mission was to provide recommendations for intensivists and hospitals regarding maximum patient workloads based on existing data and expert opinion.

METHODS

An SCCM taskforce was established to review the literature and develop recommendations about intensivist physician/patient ratios in ICUs. Members of the committee included ICU physicians, nurses, pharmacists, and nurse practitioners (NPs) from academic and community settings as well as hospital quality assurance officers and medical and surgical Critical Care fellowship program directors. Along with their knowledge of critical care medicine, members were chosen for their expertise in the fields of health services research, medical ethics, health care rationing, telemedicine, and quality improvement research. The group generated a statement based on examination of multiple data sources, including 1) a comprehensive review of published literature on ICU physician staffing and other related topics; 2) a national survey of pulmonary/Critical Care fellowship program directors about workload and staffing concerns; and 3) a multidisciplinary expert roundtable conference tasked with generating specific recommendations.

For the purposes of this statement, the taskforce limited its recommendations to ICUs that use a "closed" model where the intensivists control triage and patient care. We chose to exclude the "open" model because intensivists are not necessarily assigned to a defined number of patients in an open model. In addition, in open ICUs, multiple outside providers care for patients and the physician supply will adjust as volume increases. The taskforce further recognizes that there are currently many different ICU staffing models (combinations of intensivists, fellows, house staff trainees, hospitalists, NPs and physician assistants [PAs], and telemedicine coverage programs). Therefore, we sought to make recommendations that would have applicability to all kinds of ICU practices, analyzing "universal" issues common to all such as patient care, burnout, staffing, and hospital expectations. We also chose to limit our focus to the ratio of attending intensivists of record to patients in adult closed ICUs with the understanding that each intensivist may have multiple assisting providers or none. Finally, recognizing that many ICU services cover patients outside of their physical ICU, we focused on intensivist/patient ratios and not intensivist/bed ratios.

Literature Review

An initial focused literature search was conducted using PubMed and Google Scholar through November 2010; updated searches were conducted through September 2011. Major subtopics included physician/patient ratios, nurse/patient ratios, critical care education, ICU workforce, burnout syndrome, and the use of telemedicine and advance practice providers to staff ICUs. Taskforce subgroups were assigned specific topics, asked to review all pertinent literature as it pertains to intensivist/patient ratio, and prepare a report. In addition, taskforce members conducted a review of national and international critical care organizations, hospital (inpatient) medicine organizations, and other related professional organizations' administrative and staffing recommendations, including nursing groups. Taskforce subgroups were asked to review all significant literature on subtopics and create a summary report with emphasis on how the literature pertains to optimal physician staffing in ICUs.

Survey of ICU Physicians

A taskforce subgroup conducted a mixed mode survey (e-mail and paper) of the membership of the Association of Pulmonary and Critical Care Medicine Program Directors soliciting information about their current ICU workloads and hospital duties as well as their perceptions of workplace stress, workforce issues, patient care, and teaching environment of their ICUs. The results from this survey showed that physician/patient ratios correlated with perceptions of stress, patient care, staffing, and training problems. These results were distributed to the rest of the taskforce and published separately (7).

Multidisciplinary Expert Roundtable Conference

In January 2009 and January 2010, members of the taskforce met in person at the SCCM Annual Congress. At these meetings, taskforce members discussed the findings of the literature, reviewed recommendations and guidelines from related professional societies, and assessed the results of the program directors' survey. The taskforce leadership then drafted a statement based on the discussions at the in-person meeting. The document was revised by the taskforce members using an iterative consensus process in which successive versions of the document were edited by the taskforce members, circulated for review, and then reedited based on additional feedback. The statement was then submitted for review to the leadership council of the SCCM, which approved the final manuscript and recommendations.

RESULTS

Does the Intensivist/Patient Ratio Matter?

There is a strong conceptual rationale for why the ratio of physicians/patients should impact the quality of intensive care. Rules that address maximal work assigned to an individual exist in many other professions, and generally conclude that excessive work demand can have both short- and long-term negative effects. Previous policy statements and guidelines from several other related medical organizations (including noncritical care), as well as two previous SCCM statements on ICU management, support this notion (8–15). These statements all discuss the importance of appropriate staffing, although none made specific recommendations except the American Academy of Emergency Medicine (15). The European Society of Intensive Care medicine has published very specific and detailed recommendations on many aspects of ICU staffing and organization, but their statement does not address intensivist/patient ratios, saying only that they assume a unit to be no larger than eight beds (11, 12). Substantial indirect evidence from the available literature suggests that physician/patient ratios are a significant factor in insuring quality care, training of future physicians, and maintaining a stable workforce for ICUs.

Review of Literature on Intensivist/Patient Ratio and Outcomes in Critical Care

There is paucity of conclusive data about ICU physician staffing, including intensivist/patient ratio. Although ICU physician staffing has enormous impact on health care cost and patient outcome, it is not amenable to study through random assignment of individual patients (16). The majority of literature on ICU physician staffing relates to the percentage of time an intensivist is present or available to the ICU. Although most people agree that intensivists should provide care to the critically ill, the optimal intensivist/patient ratio is unknown (16). The intensivist/patient ratio is likely to be influenced by several factors: the patients' acute severity of illness and comorbidity, case mix, the available human support (other physician specialists and nonphysician health care providers), and nonhuman resources (medical equipment, information technology).

In a study from a medical ICU, Dara and Afessa (17) evaluated the impact of 1 to 7.5, 9.5, 12, and 15 intensivist/bed ratio. There were no statistically significant differences in mortality between the four groups. However, 1:15 intensivist/bed ratio was associated with longer ICU length of stay. The study highlighted the need to avoid assigning too many critically ill patients to one intensivist. However, because the study was performed in an ICU that was staffed with in-house critical care fellows and internal medicine residents 24/7, the findings are unlikely to apply to other settings. In addition, several studies of adult and neonatal ICU staffing suggest that while high-volume ICUs may perform better, some poor outcomes, including individual mortality, increase with staff workload at the time of admission (18–20). A study by Iwashyna et al (21) in 2009, however, showed no effect on outcomes by census on day of admission.

Almost all respondents of our survey expressed some concern about their current patient burdens. Respondents who cared for more than 14 patients (perceived average weekday census) per attending reported significantly more problems with patient care, teaching, stress, and staffing than those caring for fewer patients (7). Based on these data, the taskforce concluded that while available data do not support recommending any specific intensivist/patient ratio, it is likely that higher numbers of patients per intensivist may have some negative impacts on patient care and should be avoided.

Consequences of Work Overload. In our survey of Pulmonary/Critical Care fellowship directors, we compared more heavily burdened (low intensivist/patient ratios) to lower burdened (high intensivist/patient ratios) staffing models and found a clear correlation to perception of quality of care delivered. Heavily burdened intensivists more commonly experienced conditions such as patient loads being too high, rounds taking too long, and some tasks not getting done as a result of high patient loads (7). This occurred despite there being similar ratios of total non-nursing health care personnel in both groups.

Review of data from allied health care workers such as nurses and pharmacists also suggests that higher patient loads confer risk for bad outcomes, and some other countries have established staffing rules based on published data (22). Research has identified an association between nurse staffing and hospital mortality in surgical patients and in some subgroups of hospitalized patients (23, 24). Other studies have found associations between nurse staffing and hospital-acquired pneumonia, sepsis, shock, cardiac arrest, mortality, and longer than expected length of stay (23–28). Recent comprehensive literature reviews have further validated the relationship between ICU nurse staffing and patient outcomes confirming that a higher number of registered nursing staff/patient ratio (1:1 or 1:2) relates to improved safety and better outcomes for patients (29, 30). Similar data have been published showing a relationship between pharmacist staffing and ICU outcomes (31).

Effects on Teaching. The Accreditation Council for Graduate Medical Education instituted new trainee work-hour restrictions that went into effect in July 2011. These restrictions significantly reduce the time residents and fellows are in the hospital. Potential negative consequences of these changes will include decreased trainee availability and increases in the number of patient care transitions (32). Rounding time may also be increased unreasonably as attendings try to teach during morning rounds when the most trainees are available (33). In addition, our survey of Pulmonary/Critical Care fellowship directors (the largest source of new intensivists) found that increasing the intensivist patient workload had a significantly negative effect on many aspects of training including shortening time available for teaching, attending stress, and perceived trainee dissatisfaction (7). These factors may negatively impact the ability to hire teaching staff and at the same time negatively influence the desire of fellows to enter the workforce further exacerbating our ability to address the ongoing intensivist shortage.

Physician Burnout. Concern about burnout syndrome in physicians has grown due to the heavier caseloads placed on physicians because of workforce shortages and financial constraints limiting hiring. Seventeen recent studies have shown a high prevalence of ICU staff burnout. Risk factors for burnout include many continuous shifts (34), long shifts, night shifts (35), "feeling overloaded" at work (36), and poor workplace organization (37). Consequences of burnout include decreased job performance and quality of patient care (38), absenteeism (39), reduced commitment to the job (40), and a desire to leave the field (35, 37, 41). Based on these data, the taskforce concluded that physician burnout is a significant concern for both quality of care and workforce stability and should factor into institutions' staffing models.

Factors That Might Influence the Optimal Ratio

The taskforce recognized from its inception that determining optimal or maximum intensivist/patient ratios is a complex task that must allow for multiple variables including patient acuity and turnover, duties outside the ICU, educational responsibilities, and the availability of other forms of provider support. Most of these variables differ by hospital and, in the case of patient acuity, can differ by day. Recognition of these other duties and the variability of demands is essential for creating proper staffing.

Case Mix and Turnover. ICU patients can vary significantly in their severity of illness. While many are admitted for multiple organ failures, many others are admitted for observation to prevent further decline. One critically ill patient can occupy the time of an intensivist for a large fraction of the day. In nursing, scoring systems such as the Nine Equivalents of Nursing Manpower Use Score (42) are used to aid in staffing but, other than conventional severity scores, no such tool exists for physician staffing. If ICUs are staffed only to meet the average daily workload and additional buffer time is not factored into the workday, care for one high-intensity patient must come at the expense of time spent on other patients or on other duties. In addition, the case mix can change daily or with season. ICU services may expand in times of high demand and this may happen without additional staffing. In our survey, 33% reported that when service size grew larger they were covering patients outside their physical ICU and 26% reported no upper limit on service size (7).

Finally, high demand for the ICU often results in high rates of patient turnover (admission and discharge), which can consume extra personnel time. Surge capacity, either for case mix or service size, is an important component of any staffing strategy. An ideal operations model would recognize that these high-volume days occur with some frequency and be able to handle the increased workload without significant compromise in patient care. Staffing only for average daily census means that ICUs will be understaffed at times of peak demand.

Other Duties. Duties outside of the ICU or not related to direct patient care can also impose large time demands on ICU physicians. Outside the ICU these may include triaging, code teams, rapid response teams, and consultations. In the ICU, procedures, review of patient data, communicating with consulting doctors, teaching staff, and administrative duties can also occupy much of the work shift. Family meetings, especially end-of-life discussions, have become an integral component of modern ICU care but can require a lot of time to arrange and conduct. In both academic- and community-based ICUs, quality improvement (including the development, implementation, and monitoring of treatment guidelines and care protocols) can also command a tremendous amount of time from ICU physicians—who often double as ICU administrators. Documentation of these activities consumes significant time as well. In our survey, 91% of intensivists had at least one duty outside the ICU (such as code team or triaging) and 52% had two or more (7). ICU staffing models, therefore, need to consider time spent in duties beyond ICU patient care.

Physician Support With Trainees and Other Medical Professionals. In an academic setting, intensivists may have a variety of trainees working with them, including students, residents, and fellows. On one hand, this additional manpower may improve intensivist efficiency, allowing coverage for more patients. On the other hand, the additional demands for teaching and monitoring the trainees can slow down the intensivist and take time away from patient care. Because billing for critical care services is based on time devoted to patient care, exclusive of teaching time, the academic intensivist must address the dilemma of seeing fewer patients or decreasing teaching time. Limiting time for education could easily impact the ability for fellowship programs to fulfill the needs of critical care trainees (43). In our survey of program directors, having additional trainees (residents and fellows) did not seem to reduce intensivists' perceptions of feeling overburdened. This finding suggests that the support of trainees may be offset by their educational needs.

The integration of NPs, PAs, and hospitalists into the ICU team may represent one solution for meeting the physician workforce shortage. Multiple studies have shown the benefit of NPs and PAs in improving continuity of care, increasing adherence to best practice guidelines, and enhancing communication, collaboration, and education in the ICU (44–51). A recent large study looking at greater than 5,000 admissions over 3 years comparing a PA-staffed ICU with a resident-staffed ICU in the same institution showed that quality of care was the same in almost all outcomes measured (52). In our survey of closed academic ICUs done in 2008–09, 22% reported using NPs or PAs in the ICU at the time of the survey; this number will likely grow significantly in the future (7).

Many hospitalists, as well, are staffing ICUs in the United States (53) and the number is reportedly increasing (54). A national survey conducted more than 10 years ago showed that 83% of physicians identifying themselves as hospitalists provided care in the ICU (55). The Society of Hospital Medicine and others have begun exploring how hospitalists and intensivists should collaborate (56). A recent study in a community hospital showed similar outcomes between an ICU-staffed predominantly with hospitalists and a companion ICU with an intensivist model (57). As of now, there is little more published information regarding the role of hospitalists in ICUs.

The taskforce concluded that NPs, PAs, and hospitalists could make a significant contribution to the critical care work-

force in the years to come, possibly easing the burden on the intensivists. However, they must have adequate training in the management of ICU patients, be credentialed and privileged, and work in collaboration with the multidisciplinary team, as they cannot replace all direct care by an attending intensivist.

Physician Support With Technology. Advances in medical informatics and other technologies will undoubtedly make the practice of critical care more efficient in the years to come and may alleviate some of the workforce problems. Within ICUs, technology can significantly assist ICU coverage by providing comprehensive dashboard information and alarms to the intensivists. Remote monitoring through telemedicine programs is another approach to providing medical coverage by remotely located health care providers. Telemedicine models vary in covered time and beds, and clinical responsibilities of the telemedicine team. Contractual arrangements take into account technology and personnel capabilities and fiscal resources. Currently, more than 40 U.S. health care systems and more than 4,900 adult ICU beds have instituted active telemedicine ICU programs in the United States (58). In many of these systems, a single intensivist oversees up to 150 patients with the telemedicine critical care nurses observing 35–40 patients. There are no published guidelines on maximum numbers of patients a telemedicine physician should care for.

The outcome benefits of telemedicine programs are still unclear despite multiple studies (59–62). Ultimately, the relative utility of telemedicine as a way to extend the intensivist workforce will depend on each individual ICU's current staffing model, the intensivist needs of particular hospitals, and the degree to which ICU telemedicine functions as a workforce extender (i.e., a way to increase the efficiency of the current workforce) or a workforce substitute (i.e., a care model that extends the reach but not the capability of an intensivist). ICU telemedicine may be an effective means of providing additional physician coverage to ICUs, but has not been tested against alternatives in terms of burnout or other nontechnological strategies for improving quality. It is also worth considering that telemedicine may extend the work life of intensivists by enabling them to apply their skills and experience on a part-time basis, although there are no empiric data for this.

Recommendations

It is clear that determining optimal or maximum provider/patient ratios is a complex task that must allow for multiple variables. The taskforce further recognized that any physician staffing model may still get overwhelmed in times of high patient volume or acuity and may, at other times, seem to be overstaffed. There is clearly a need to develop tools to better predict both the regularity and the severity of surges and such modeling has already been proposed by some (63). Nevertheless, a good staffing model would recognize that these high-volume days occur with some measurable frequency and be able to handle the increased workload without significant compromise in patient care.

The taskforce further concluded that while insufficient data exist in the medical literature to provide specific numbers on maximum intensivist/patient ratios, some common-sense staffing rules can apply based on a simple analysis of the expectations of intensivists' duties. For example, if one intensivist is covering 20 critically ill patients in a 12-hr shift, that physician can only average 36 mins with each patient. Other essential nonpatient care duties will reduce that time further. If some patients require more attention, the others will necessarily receive less than 36 mins of direct care from that intensivist, which may be deemed unacceptable.

A calculator tool developed by the taskforce is available in Appendix 1 and also at http://www.sccm.org/ that can assist in staffing based on specifications of individual ICUs. It does this by making explicit what are usually implicit assumptions about staff workload and time allocation. This tool cannot determine the ideal intensivist/patient ratio but can identify when there is a mismatch between an institution's expectations and its actual staffing. This tool may be useful in institutional discussions about the number of physician staff need for a given ICU. Based on our analyses, the taskforce reached consensus that these important principles and practices should be followed in developing an institution's individual physician staffing policy.

1. Appropriate staffing of ICUs with intensivists impacts the quality of patient care, patient safety, education, and intensivist and staff well-being. Individual ICUs should be aware of their current intensivist/patient ratios and monitor these ratios to ensure staffing ratios are commensurate with the institution's expectations for patient care and other duties.
2. Caseloads should allow daily rounds to conclude in an amount of time that is acceptable in accordance with other valued duties, including teaching, non-ICU duties, and administration.
3. Staffing policies should factor in surge capacity and nondirect patient care duties, such as family meetings, procedures, consultations, duties outside the ICU, and teaching.
4. Institutions should regularly assess the appropriateness of their ICU staffing models via objective data. Assessments of staff satisfaction, burnout, and stress should be part of the data collected. (Reference to internal standards or national benchmarks are appropriate.)
5. High staff turnover or decreases in quality-of-care indicators in an ICU should be viewed as potential markers of overworked staff and should prompt ICUs to evaluate their intensivist/patient ratios.
6. The addition of telemedicine, advanced practice professionals, or nonintensivist medical staff may be useful ways to alleviate overburdening the intensivist covering an ICU, but their introduction into the ICU should be predicated by needs assessments and evaluated using rigorous assessment methods.
7. In teaching institutions, feedback from faculty and trainees should be sought to understand the implications of potential understaffing on medical education. The tradeoffs between patient care and education must we weighed objectively and explicitly when expanding the intensivists' clinical duties. Reduction in the quality of education that

accompanies increased workload may be acceptable if they are anticipated side effects, but are not acceptable if they are unforeseen unintended consequences.

8. In academic medical ICUs, there is evidence that intensivist/patient ratios less favorable than 1:14 negatively impact perceptions of quality of teaching, stress, patient care, and workforce stability

CONCLUSIONS

The taskforce concluded that, while advocating a specific maximum number of patients cared for by a single intensivist is unrealistic, a common-sense approach (see Appendix 1) is essential. Important principles must be followed to prevent the deterioration of patient care, staff well-being, and education that likely will accompany uncritical expansion of intensivist workload. If hospitals continue to expand the ICU bed supply without a significant increase in intensivist number or support, the overall quality of care in ICUs could suffer, especially in closed model ICUs. It is our hope that hospitals will regularly assess and reassess indicators of staffing supply and demand. Finally, we feel that further research on this topic would be of great benefit.

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APPENDIX 1. Intensivist/Patient Ratio Staffing Tool* (Reference Model on SCCM Web Site)

As an example of how one might determine if any ICU is understaffed with physicians, we show the following distribution of time and activities and how this would influence our ability to care for a certain number of patients. This is intended as an example only and is not based on any validated instrument or evidence. It is a device for determining if there is a mismatch between institutional demands and the available staff based on site-specific assumptions of ICU service census, case mix, shift length, physician duties, and so on. The inputs need not be precise and they may be added or subtracted based on local characteristics.

1. Determine appropriate *time per patient* (T) for direct patient care (i.e., examination, data collection, procedures, note writing) for three levels of patient acuity
   a. Severe acuity patients = T_s
   b. Moderate acuity patients = T_m
   c. Low acuity patients = TL
2. Determine the average percentages of each patient group in the ICU
   a. Severe = *S*%
   b. Moderate = *M*%
   c. Low = *L*%
3. Establish the typical size of the ICU service = average census (*census can be calculated as the number of occupied beds at a given time or, to reflect turnover, can be the total number of patients typically seen by service per day).
4. Establish the duration of normal work shift = work shift.
5. Calculate the approximate time for nondirect patient care activities expected such as family meetings, admissions and discharges, consultations, triaging, teaching, staff education, administrative time, sign-out, and personal care per shift = *NPtime* (*alternatively, family meetings can be incorporated as Direct Patient Care time).
6. Multiply each percentage of acuity by the ICU service size to determine the minimum amount of time needed per day for direct patient care. We recommend that this time should not exceed half of work shift.

7. Add the time needed for nondirect patient care activities.
8. If that time duration exceeds the normal work shift, the intensivists/patient ratio needs to be adjusted. Additional time for high-volume (admissions/discharges) or high acuity days should also be factored in to this calculation as well.

Example: (numbers are for illustrative purposes only)
ICU size = 18 beds, work shift = 10 hrs
Average census = 16 patients
T_s = 60 mins/patient, T_m = 40 mins/patient, TL = 30 mins/patient
S% = 0.20 (3.2 patients) *M*% = 0.50 (8.0 patients) *L*% = 0.30 (4.8 patients)
3.2 × 60 mins = 192 mins; 8.0 × 40 mins = 320 min; 4.8 × 30 mins = 144 mins
Total direct patient care time = 10 hrs 54 mins
Other Duties

[Family meetings: 60 mins/shift, triaging: 20 mins, teaching of staff: 20 mins, consultations: 30 mins, administrative: 30 mins, personal time: 30 mins, sign-out: 20 mins, emergency time: 20 mins]
Nondirect patient care time = 3 hrs 50 mins
Total expected work time = 14 hrs 44 mins: by these calculations, a single intensivist in this ICU would not typically be able to meet all daily expectations for a normal shift and is unlikely to be able to finish rounding by half way through the shift. Furthermore, there is no significant time allowance for high-volume or high acuity days. The institution should consider additional staff or decreasing the patient load for this ICU.

APPENDIX 2. Members of the Society of Critical Care Medicine Taskforce on ICU Staffing

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