The stress of residency: recognizing the signs of depression and suicide in you and your fellow residents

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Abstract

BACKGROUND: Stress, depression, and suicide are universal but frequently unrecognized issues for women and men in residency training. Stress affects cognitive and psychomotor performance both inside and outside of the operating room. Stress impairs the 2 key components of a surgeon’s responsibilities: intellectual judgment and technical skill. We hypothesized that the recognition of depression, substance abuse, failing personal relationships, and potential suicide is poor among surgeons. If residents can recognize the signs of stress, depression, and suicide among colleagues, we believe it will not only improve their quality of life but also may preserve it.

METHODS: We first determined baseline resident knowledge of the signs of surgical stress including fatigue; burn out; depression; physician suicide; drug and alcohol abuse; and their effects on family, friends, and relationships. We then developed a curriculum to identify these signs in first, second, third, and fourth year surgical residents were identified as the target learners. The major topics discussed were depression; physician suicide; drug and alcohol abuse; and the effects of stress on family, friends, and our goals. Secondary objectives included identifying major sources of stress, general self-awareness, understanding professional choices, and creating a framework to manage stress. Residents participated in an interactive seminar with a surgical facilitator. Before and after the seminar, a multiple-choice test was administered with questions to assess knowledge of the signs of stress (eg, fatigue, burn out, and depression).

RESULTS: Twenty-one residents participated in this study. Seventeen completed the pretest, and 21 participated in the interactive seminar and completed the post-test. The pretest revealed that surgical residents were correct in 46.8% (standard deviation [SD] = 25.4%) of their responses. The post-seminar test showed an improvement to 89.7% (SD = 6.1%, P < .001, paired Student t test = 5.37). The same test administered 4 months later to 17 of the 21 learners revealed 76.9% (SD = 18.7%) correct answers, suggesting that the information had been internalized. Cronbach α was calculated to be .67 for the pretest and .76 for the post-test, suggesting a moderate to high degree of internal consistency.

CONCLUSIONS: Stress is a significant and regularly overlooked component of a surgeon’s life. Because its effects often go unrecognized, stress frequently remains unresolved. To prevent its associated consequences such as depression, substance abuse, divorce, and suicide, educating house staff...
The recognition of stress is crucial to both residency training and long-term career success. Consequently, its understanding and treatment are important challenges for medical educators. However, the recognition of the signs of depression, substance abuse, failing personal relationships, and potential suicide is poor among both residents and faculty. Therefore, the New York University Department of Surgery, New York, NY, developed an instrument to determine the baseline knowledge of the signs of surgical resident stress and then delivered a professionalism module to identify its signs and symptoms. We then determined the effectiveness of this educational intervention both in the short- and long-term.

**Methods**

**Educational goals and objectives**

The goals and objectives of this educational intervention are to increase resident self-awareness of the signs and symptoms of stress, depression, and suicidal ideation and to

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**STRESS OF SURGICAL PRACTICE: How Much Do You Know?**

Please circle: Male Female; R1 R2 R3 R4 R5

1. A colleague of yours seems down as of late. You went with him to medical school and thus have known him for a while. From time to time you meet socially and you've always admired his non-surgical interests. While you are on call with him you have a chance to talk to him for a while. Which of the following statements makes you most concerned about his possible suicide?
   a. I'm so tired these days.
   b. I just don't care about playing the piano anymore.
   c. If I have to scrub with that attending once more, I'll kill myself.
   d. These long hours are driving me crazy.
   e. I'm not sure whether surgery is the right choice for me.

2. A lecture was cancelled which gives you a chance to have a quick cup of coffee with one of your colleague. She tells you that she just found out that she is pregnant and wonders up to how much time she can take without risking her job.
   a. 1 month
   b. 2 months
   c. 3 months
   d. 4 months
   e. To be worked out with Program Director

3. An acquaintance tells you that she recently watched a TV program about physician suicide. She was surprised to learn that physicians are at greater risk than the general population. She then asks you how much greater the risk is for female physicians. What would you answer?
   a. 10%
   b. 40%
   c. 100%
   d. 130%
   e. 200%

4. Of the following what is the most worrisome sign that a resident is suicidal?
   a. Persistent sadness for 5-7 days
   b. Diminished interest in surgery
   c. Ignoring the routine tasks of daily life - grooming, etc.
   d. Picking fights with medical students and staff
   e. Dumped unceremoniously by the “love of your life”

5. In terms of substance abuse, which one of the following suggests an imminent problem?
   a. Seeks exhausted at morning rounds (after a night off)
   b. New risky behavior (e.g. multiple sexual partners)
   c. Seems to be “bulking up” biceps without requisite time at gym
   d. Seems to be on top of every patient detail and never sleeps
   e. At resident interview night, you notice a resident colleague taking three shots

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*Figure 1* The questions and correct answers (underlined) of the signs and symptoms of stress, depression, and suicide administered to the surgical resident learners before the interactive seminar, immediately after the seminar, and at the retest 4 months later.
recognize these signs and symptoms among their colleagues. An interactive seminar using varying educational approaches was designed as the curricular tool.

The major topics discussed were depression; physician suicide; drug and alcohol abuse; and the effects of stress on our family, our friends, and our goals (both personal and professional). Secondary objectives include identifying major sources of personal stress, developing general self-awareness, understanding professional choices, and creating a framework to manage stress. A subtext of the understanding of these behaviors was to teach residents to identify behavioral concerns in their peers. Self-recognition of the signs and symptoms of stress, depression, and suicide can be elusive. However, when armed with a better understanding, peer residents are more likely to recognize these behaviors among fellow residents than faculty and residency leaders are capable of realizing.

**Seminar outline**

To accomplish these goals, a specially trained surgical facilitator used a number of educational approaches including video clips from popular television shows, role playing by standardized patients (actors), and reflection on

6. Chances you as a surgeon will be divorced from your first spouse?
   a. >30%
   b. 30-40%
   c. 40-50%
   d. 50-60%
   e. >60%

7. Red flag for hazardous drinking among men:
   a. 5-7 drinks per week
   b. 8-10
   c. 10-14
   d. >14

8. Red flag for hazardous drinking among women:
   a. 3-4 drinks per week
   b. 5-7
   c. 8-9
   d. >10

9. Is there higher a higher satisfaction level among surgeons in private vs. academic practice?
   a. Yes
   b. No
   c. About the same

10. Surgeons as a group have on average how many different jobs (following residency) during their careers?
    a. 1
    b. 2
    c. 3
    d. 4 or more

11. The Residency Program Director has the right to require any resident to submit to an immediate breathalyzer, urinalysis or blood test if he has any concerns:
    a. Yes
    b. No
    c. He must get concurrence of Department of Surgery Chairman or Director of Graduate Medical Education
    d. Yes, but resident has the right to contact counsel first

12. Paid time off for marriage (yours)
    a. 2 days
    b. 3 days
    c. 4 days
    d. 5 days
    e. Determined after Program Director meets intended spouse

13. Required months of residency service to sit for Boards?
    a. 52 months
    b. 54 months
    c. 55 months
    d. Flexible and determined with consent of Residency Program Director

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**Figure 1** Continued.
their personal experiences. We attempted to accomplish these goals in a 1-hour interactive seminar.

The tone of the seminar was set with a video clip from the television show ER describing the suicide of surgical resident Dr. Dennis Gant. This clip immediately caught the attention of the surgical resident learners who realized that this is a very serious matter and one to which they or their colleagues could personally relate.

The facilitator then reviewed how to identify the signs of stress, depression, suicide, and substance abuse/addiction in themselves and their colleagues. These include the following:

1. Burn out: long-term exhaustion and diminished interest (depersonalization or cynicism) without symptoms of depression or substance abuse and limited to work.
2. Depression: over a period of 2 weeks you or a fellow resident have had little interest or pleasure in doing things and/or felt down, depressed, or hopeless.
3. Signs of impending suicide: more than 2 weeks of sadness (ie, “life is not worth living”), cannot get out of bed or accomplish routine tasks of living, and/or does not derive pleasure from any activity for 2 weeks.
4. Access to firearms: suddenly does not show up to work.
5. Profile of a vulnerable resident: sense of inadequacy, failure to help patients, and/or failure to live up to senior resident/attending expectations; making a mistake that causes a patient’s death (ie, personal guilt); being single and having no children is linked to higher physician suicide rates; and/or being alone in a new high-stress environment with little support.

At the halfway point of the seminar, we engaged a scripted young actor to portray a resident coming on duty and receiving the “handoff of patients” from a surgical resident completing her shift (the learner). The actor was trained to feign being inebriated/hungover. It was hoped that the resident signing out could identify the risky behavior of the actor/resident accepting the handoff of patients.

The statistics of physician suicide are as follows: (1) annually there are 30,000 suicides in the United States (roughly 1 per 8,000 population); (2) physician suicide is 40% higher in male physicians than the general male population and 130% higher in female physicians; and (3) unfortunately, residents/physicians are far more effective in performing suicide than the general population.

Other major topics discussed were (1) the behaviors foretelling possible suicide; (2) the risk of female vs male physician suicide; (3) the most worrisome signs of suicidal ideation; (4) the indications of substance abuse problems; (5) the rate of divorce among surgeons; (6) the indications of hazardous drinking among men and women; (7) the definitions of stress, depression, and suicide; (8) the average number of postresidency surgical positions; (9) the rules for random drug testing; and (10) residency months required to sit for boards vis-à-vis maternity leave.

The following coping strategies were also discussed: (1) early recognition of risks; (2) stopping and standing back; (3) control of self including physical relaxation, self-talk, and leaving the hospital behind; and (4) control of the situation including reassessment, decision making, team communication, and leadership. The final and perhaps most important goal of this 1-hour interactive seminar was for the residents to realize their obligation in recognizing and bringing these behaviors to the attention of those who are professionally trained to help.

**Assessment**

To evaluate learners’ knowledge of the signs and symptoms of stress, depression, and suicide, a 13-question multiple-choice examination covering these topics was designed. The test included questions concerning the nonspecific symptoms of stress (eg, fatigue, burn out, and depression); the knowledge of divorce rates, suicide, and career satisfaction; and whether or not residents knew the rules on maternity leave, substance abuse, and so on. Sample questions included the following: (1) “Is there a higher satisfaction level among surgeons in private vs academic practice?” (2) “What is a red flag for hazardous drinking among men and women?” and (3) “What is the most worrisome sign that a resident is suicidal?” The complete list of questions is listed in Fig. 1.

These multiple-choice questions were administered to the resident learners at 3 different times: just before the educational module, immediately upon completion of the educational module, and 4 months after the module to determine long-term retentive knowledge.

**Participants**

Twenty-one general surgery residents in years R1 to R4 at the New York University School of Medicine were identified as the target learners for this educational module on the stress of surgical resident life. Seventeen residents completed the pretest, and 21 participated in the interactive seminar (4 residents arrived after the pretest but before the seminar and 2 residents were called away during part of the pretest but returned). Twenty-one residents participated in the interactive seminar, and all completed the immediate post-test. Seventeen of the 21 completed the long-term post-test 4 months after the seminar.

**Responses**

Examination response data were collected and aggregated. Statistics were calculated using a paired Student t test to determine if the surgical resident learners improved their knowledge of the signs and symptoms of stress after the interactive seminar and to determine if the knowledge was retained 4 months later. Cronbach α was calculated.
to determine if pre- and post-test responses were internally consistent.

**Results**

The pretest revealed that the 17 surgical residents were correct in only 46.8% (standard deviation [SD] = 25.4%) of their responses, suggesting a significant lack of understanding of stress and related issues. The immediate postseminar test showed an improvement to 89.7% (SD = 6.1%, P < .001, paired Student t test = 5.37). The same test administered 4 months later (ie, the long-term post-test) to 17 of the 21 learners revealed 76.9% (SD = 18.7%) of correct answers (Fig. 2). The detail of the results and their analysis are presented in Table 1. Cronbach α was calculated to be .67 for the pretest, .76 for the immediate post-test, and .68 for the long-term post-test. These alphas suggest a moderate to high degree of internal consistency among the resident responses for all 3 tests.

Resident recognition of stress and associated issues not only significantly improved in the post-test compared with the pretest, but also these concepts were retained when tested again 4 months later. In addition, Table 1 provides more detail of the nature of the 13 questions and the percent of correct responses.

These data imply that a poor understanding of stress and related issues among surgical resident learners can be significantly improved by an interactive professionalism seminar. Furthermore, this new understanding is retained when the learners were retested 4 months later.

An additional important result occurred once these data were brought to the attention of the New York University designated institutional officer for the Accrediting Council on Graduate Medical Education. The designated institutional officer oversees all institutional residency training. A psychiatrist trained in the treatment of stress and its ramifications was engaged and funded by the medical center. This professional is available to any residents in

![Figure 2](image-url) The correct answers given by the surgical resident learners on the multiple-choice test on the signs and symptoms of stress and suicide administered at 3 time points displayed graphically.

**Table 1** Multiple-choice test results and data analysis of learner knowledge of stress, depression, and suicide preseminar, immediately after the seminar, and 4 months after the seminar

<table>
<thead>
<tr>
<th>Resident knowledge of identifying stress</th>
<th>Pretest</th>
<th>Immediate post-test</th>
<th>Long-term post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question topics</strong></td>
<td>Correct</td>
<td>%</td>
<td>Correct</td>
</tr>
<tr>
<td>Most likely indicator of suicide</td>
<td>15/19</td>
<td>78.9</td>
<td>16/21</td>
</tr>
<tr>
<td>Knowledge of rules of maternity leave</td>
<td>5/18</td>
<td>27.8</td>
<td>20/21</td>
</tr>
<tr>
<td>Risk of female vs male physician suicide</td>
<td>5/18</td>
<td>27.8</td>
<td>18/21</td>
</tr>
<tr>
<td>Most worrisome signs of suicidality</td>
<td>16/18</td>
<td>88.9</td>
<td>19/21</td>
</tr>
<tr>
<td>Indications of substance abuse problems</td>
<td>10/18</td>
<td>55.6</td>
<td>18/21</td>
</tr>
<tr>
<td>Rate of divorce among surgeons</td>
<td>2/17</td>
<td>11.8</td>
<td>19/21</td>
</tr>
<tr>
<td>Indication of hazardous drinking among men</td>
<td>5/17</td>
<td>29.4</td>
<td>19/21</td>
</tr>
<tr>
<td>Indication of hazardous drinking among women</td>
<td>8/17</td>
<td>47.1</td>
<td>18/21</td>
</tr>
<tr>
<td>Surgeon satisfaction: private vs academic practice</td>
<td>15/17</td>
<td>88.2</td>
<td>18/21</td>
</tr>
<tr>
<td>Average number of postresidency surgical positions</td>
<td>10/17</td>
<td>58.8</td>
<td>20/21</td>
</tr>
<tr>
<td>Knowing rules for random drug testing</td>
<td>6/17</td>
<td>35.3</td>
<td>19/21</td>
</tr>
<tr>
<td>Knowledge of amount of paid time off for marriage</td>
<td>5/17</td>
<td>29.4</td>
<td>20/21</td>
</tr>
<tr>
<td>Residency months required to sit for boards</td>
<td>5/17</td>
<td>29.4</td>
<td>21/21</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>46.8</td>
<td>6.1</td>
<td>5.37 (immediate vs pre)</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>25.4</td>
<td>18.7</td>
<td>.00017 (immediate vs pre)</td>
</tr>
<tr>
<td><strong>Cronbach α</strong></td>
<td>.67</td>
<td>.76</td>
<td>.68</td>
</tr>
</tbody>
</table>
training who observe any of these concerning behaviors in themselves or peer residents. These interactions are not reportable to the residency leadership.

Comments

The “early warning system” that a resident may be teetering on the brink of depression or suicide must come from those closest to them—their fellow residents. This study found an alarming lack of resident recognition of the signs and symptoms of stress, family problems, depression, suicide, and even the institutional guidelines aimed at combating these issues. This lack of recognition of a possible impending disaster is surprising given that these are highly selected and highly achieving young men and women with a program acceptance rate of 1 of 111 applicants.

Professional and personal stress is a significant and frequently overlooked component of a resident’s life. In addition, residents are at higher risk to develop depression and suicide than the general population. The suicide rate among male physicians is 40% higher than in the general male population. Astonishingly, the suicide rate among female physicians is an amazing 130% higher than in the general female population. Because its effects are often unrecognized, stress often remains unresolved.

The successful completion of a surgical residency does not confer immunity from suicidal ideation on surgeons in practice. One of 16 members of the American College of Surgeons reported contemplating suicide in an anonymous survey in 2008. Even worse, this study reported that only 1 in 4 of these at-risk surgeons sought professional help. Those who did not seek help said their reticence to do so (among other reasons) stemmed from the requirement of some state-licensing boards to report their personal psychological care.

To prevent suicide and its associated issues such as substance abuse, divorce, malpractice litigation, and depression, educating house staff about stress is crucial. Previous studies have shown that therapy for stress can indeed improve performance.

However, despite initiating programs to combat stress and its consequences, the recognition of a resident being “on the brink” must come from a resident coworker. We have shown that a highly selected and highly achieving corps of surgical residents is inadequate for this task before our specific training. Rarely does a resident experiencing stress, depression, or the contemplation of suicide self-identify for help.

Educating residents and raising awareness of stress in residency is the first step toward its prevention and treatment. The second part of this study shows that an interactive professionalism seminar can significantly improve resident understanding of the signs and symptoms of stress and suicide both in the short- and long-term.

Conclusions

As a group, highly selected and highly trained residents are poor at identifying the signs of depression, stress, and potential suicide among fellow residents. This surprising lack of recognition can and occasionally does have disastrous consequences. Because residents who are experiencing stress, depression, and suicidal ideation rarely self-identify, it is incumbent on medical educators to arm residents with the tools to identify emotional and/or psychological impairment among their resident colleagues.

Acknowledgments

This article is dedicated to the memory of A. John Erdmann, M.D., 1942–1980.

References