

A Conceptual Model of Medical Student Well-Being: Promoting Resilience and Preventing Burnout

Laura B. Dunn, M.D., Alana Iglewicz, M.D., Christine Moutier, M.D.

Objective: *This article proposes and illustrates a conceptual model of medical student well-being.*

Method: *The authors reviewed the literature on medical student stress, coping, and well-being and developed a model of medical student coping termed the “coping reservoir.”*

Results: *The reservoir can be replenished or drained by various aspects of medical students’ experiences. The reservoir itself has an internal structure, conceptualized as consisting of the individual’s personal traits, temperament, and coping style. The coping reservoir metaphor is used to highlight the dynamic nature of students’ experiences, with potential outcomes including enhanced resilience and mental health versus distress and burnout.*

Conclusion: *Medical student well-being is affected by multiple stressors as well as positive aspects of medical training. Attention to individual students’ coping reservoirs can help promote well-being and minimize burnout; formal and informal offerings within medical schools can help fill the reservoir. Helping students cultivate the skills to sustain their well-being throughout their careers has important payoffs for the overall medical education enterprise, for promotion of physician resilience and personal fulfillment, and for enhancement of professionalism and patient care. This and other models of coping should be empirically validated.*

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Received August 15, 2006; revised January 7, February 8, and March 23, 2007; accepted May 2, 2007. Dr. Dunn is affiliated with the Department of Psychiatry and Helen Diller Family Comprehensive Cancer Center, University of California, San Francisco. Dr. Iglewicz is affiliated with the Department of Psychiatry, University of California, San Diego. Dr. Moutier is affiliated with the Department of Psychiatry and the School of Medicine Office of Student Affairs at the University of California, San Diego. Address correspondence to Christine Moutier, M.D., UCSD School of Medicine, Medical Teaching Facility Room 180, 9500 Gilman Drive, 0606, La Jolla, CA 92093-0606; cmoutier@ucsd.edu (e-mail).

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When health is absent,
wisdom cannot reveal itself,
art cannot manifest,
strength cannot fight,
wealth becomes useless, and intelligence cannot be applied.
—Herophilus, 300 B.C., Greek physician and pioneer
of anatomy

The roots of physician well-being are formed early. While medical school lays a firm foundation for the essential knowledge physicians must possess, it should also inculcate and promote the ideal characteristics of compassion, integrity, empathy, professionalism, and commitment to service and lifelong learning (1). These qualities will flourish when they receive nourishment from solid mental health.

Yet many students face challenges to their well-being during medical training (2). Stress and dysphoria are highly prevalent during medical school; studies of depression, “burnout,” substance abuse, and suicidal thinking and behavior have found striking results (3–17). Students begin medical school with similar rates of depression as their nonmedical peers (18, 19). Unfortunately, numerous studies suggest that students’ mental health worsens throughout the course of medical school (17–30). Prevalence rates of depressive and anxiety symptoms, depending on the study and methods, may reach as high as 25% (24) to 56% (2, 3, 28)—rates exceeding those of students’ age cohort as well as the general population (2). Some students experience a deterioration of optimism and empathy; for some, cynicism or burnout results (3, 31, 32). For many students, mental distress continues throughout medical school and into their postgraduate training (19, 23–29, 33).

Students, residents, and physicians appear to be at increased risk for suicidal thoughts (17) and actual suicide (34–36). One-third of physicians do not seek regular health care for themselves (37), suggesting that physicians’ self-care and health maintenance habits might be improved. The data on physician suicide, mental distress, and self-care highlight the need for both early attention to and en-

hancement of medical student well-being. Ideally, students would learn and practice methods of caring for themselves in addition to developing medical and professional competencies.

Stable, healthy, and resilient physicians are also better equipped for the emotionally and physically demanding tasks of providing care, comfort and hope to patients (38, 39). Notably, physicians who are proactive about their health more regularly discuss health promotion with patients (40).

We posit that good mental health is necessary for the development and maintenance of those gratifying qualities of medical professionalism: compassion and empathy for our patients, altruism, and dedication to the rigorous aspects of medicine. Medical student well-being, as the precursor to physician well-being, represents a critical aspect of medical training. Here, we propose a novel conceptual model, the “coping reservoir,” of medical student well-being. We describe and illustrate this model, discuss scenarios typical of students with academic difficulties or affective disturbances, and present one institution’s programs targeting students’ well-being.

The “Coping Reservoir”: A Conceptual Model of Medical Student Well-Being

Simply put, an array of inputs, both positive (filling or replenishing the reservoir) and negative (draining the reservoir), combined with the structure of the reservoir itself, can lead to positive or negative outcomes, including resilience and enhanced mental health, or burnout and cynicism (Figure 1).

Internal Structure of the Reservoir

The reservoir itself has an internal structure: students’ own personal traits, temperament, and coping style. These

serve dynamically to replenish or drain the reservoir, as students use both adaptive and maladaptive coping strategies. These are described in greater detail below. Developmental tasks of young adulthood (e.g., individuation from one’s family of origin, starting one’s own family, cultivating a professional identity) also contribute to the internal structure, but have been minimally studied with respect to medical student well-being, and only recently examined among residents (41). Gender-specific issues and cultural/ethnic role expectations affect the internal composition of the reservoir.

Internal Characteristics

At matriculation, some individuals have more coping reserve than others: some students are inherently more resilient, with greater buffering ability; others are more susceptible to anxiety or depression. The latter group of students may experience even small stressors as major threats or crises. Recent data confirm that medical students with higher levels of anxiety and depressive symptoms are likely to rate their own performance more poorly (42). Personality traits of obsessiveness and compulsiveness can affect students’ sense of expectation and vulnerability. Gabbard describes a “compulsive triad” of “doubt, guilt feelings, and an exaggerated sense of responsibility” (43) as central personality characteristics of many normal physicians. The compulsive triad and obsessiveness can manifest both adaptively and maladaptively (42, 43), and form important parts of the coping reservoir structure.

Depleting Factors

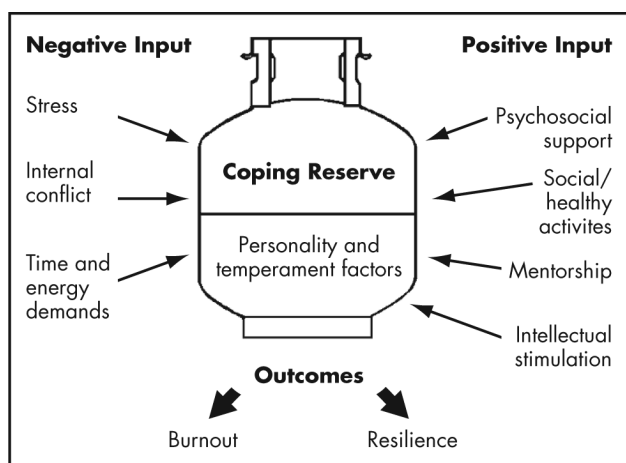
Negative inputs include stress, internal conflict, and time and energy demands, all of which may diminish students’ coping reservoir for handling medical school challenges.

Stress

Stress can arise from many sources. In our model, the curriculum, psychosocial stressors, and students’ unique, internal characteristics (traits, temperament, coping style) can all lead to increased stress.

Typical medical students are accustomed to being at the top of their class throughout their prior academic careers. For many students, the transition to being part of a medical school class—consisting of many other extremely bright and accomplished individuals—represents a major shift. Students often have difficulty adjusting to the possibility of not being among the best in their class, provoking anxiety. In some susceptible students, black-and-white thinking may be triggered: performance is “all or nothing,” “good

FIGURE 1. Conceptual Model: Coping Reserve Tank



or bad.” For some, “panic mode” emerges, as they find themselves in psychologically threatening territory. When high self-expectations are not completely met, these students fall prey to new or increased anxiety or depression. Students in jeopardy of failing almost invariably experience symptoms of depression or anxiety.

Curricular stress also arises in relation to aspects of the curriculum that often are a great source of strain to students. This may be an underrecognized contributor to student stress. Students often feel that they are giving 150% to their school efforts. In contrast, when professors provide disorganized lectures or poorly prepared or confusing syllabi, a sense of discord may arise; more perfectionistic students may experience more discord with regard to such areas as disorganization. A negative cycle often results: when students express dissatisfaction, faculty may perceive the students as entitled or even lazy, whereas the students perceive the faculty as not being sufficiently invested in their education. Faculty may have difficulty empathizing with these student concerns. The curriculum and its operationalization can thus negatively impact student stress levels and ultimately diminish coping reserve. Minimal research has been conducted, however, exploring this putative relationship (3, 33).

For some students, this same stressor may actually increase resilience. These students may become more self-reliant in their study habits, time management, and self-directed learning in reaction to a perceived lack of curricular support or organization. Thus, individual differences surely account for some of the variance in response to curricular stress. Empirical work is needed to ascertain whether our model accurately reflects the role of curriculum and faculty in students’ experience of stress.

Students’ lives take place in real time; however, in their academic life they are required to assimilate large volumes of information at a very rapid pace. Psychosocial stressors can negatively affect coping reserve. In a multicenter survey of medical student burnout, a higher number of negative personal life events (personal/family illness, death of a family member, or divorce) in the prior year was associated with an increased risk of burnout (3).

A common occurrence is the event of a family crisis, sickness or death, or break-up of a relationship that causes a deterioration of usual healthy coping, dysphoria, and lack of focus. Diminished academic performance often results. The cycle often continues with consequential heightened anxiety or depression. With such a rapid pace of learning and large volume of information, serious academic problems can ensue with any detriment to students’ focus. The

academic problem is then the secondary, but very real, “insult” to the system, adding to the original psychosocial problem that started the cycle. This compounding of the emotional burden can be overwhelming. Medical schools’ administrative and advising structures must work with students, first, to acknowledge directly the reality that these stressors can and will occur, and second, to assist as much as possible with handling such crises when they do arise.

Another scenario is the student who plays a role in his or her family of origin that is inconsistent with life as a medical student—e.g., the student whose family continues to expect him or her to manage the family business during medical school. These students must confront not only the academic rigors of medical school, but also the often daunting task of establishing new boundaries within the family.

Internal Conflict

Frequently, students experience ambivalence, conflict, and even dysphoria about their chosen career path. This can be fueled by academic difficulties and by symptoms of depression or anxiety. Experiencing negative feelings during one’s education can “confirm” the feeling that one has made an “incorrect” choice. This type of “emotional reasoning” (“I feel it, so it must be true”) (44) can create a vicious cycle for some students. The more the student suffers, the greater the sense of doubt becomes. Numerous other examples of internal conflict could be cited. Such conflict consumes precious emotional resources needed to cope effectively with medical training and encourages the use of unhealthy defenses.

Time and Energy Demands

The stress of multiple, onerous demands on students’ time can also drain the reservoir. Students spend many hours in lectures, labs, review sessions, and independent study. Many students consequently spend less time in health-promoting activities, such as exercising and socializing. Those with family demands often experience guilt regarding their decreased availability for loved ones.

Students’ coping reserve can be diminished by the physical and mental fatigue and sleep deprivation that are almost universally experienced by medical students. A mandate from the Liaison Committee on Medical Education (LCME) in June 2005 requires that all U.S. medical schools monitor student fatigue and duty hours. Thus, while medical students were not included in the duty hour requirements for residents instituted in July 2003 by the Accreditation Council for Graduate Medical Education

(ACGME), many medical schools have recently initiated duty hours policies that mimic the rules set out by the ACGME for residents due to the recent LCME mandate.

Time management skills, understanding when and how to delegate, and the ability to recognize when one needs to rest and recharge, are critical for professional development and personal fulfillment as a physician, yet are rarely formally taught in most medical schools. Instead, students experience role modeling; some role models may be excellent at handling these demands but many are not. The “life style” appeal of many specialties can often be traced to students’ concerns about how they will balance important aspects of their lives in the future.

Replenishing Factors

The reservoir receives replenishment from multiple inputs, including psychosocial support, social activities, mentorship, and intellectual stimulation.

Psychosocial Support and Social Activities

Psychosocial support can come from family, friends, peers, the medical school administration, therapists, and religious affiliations. Social activities occur both within and outside medical school. Spontaneous socializing occurs among medical students and with residents. Structured social activities are also offered through the medical student administration.

The way we conceptualize “psychosocial support” may need to be shifted, given the realities of many students’ multiple demands. “Social support” can paradoxically result in negative outcomes, particularly for women. Higher levels of social support outside of medical school are associated with worse academic performance among women, yet with lower stress among men (45). Women, particularly those juggling both family demands and medical school, may be at particular risk—at least with respect to their academic work—as a result of role stress. This interesting finding may actually reflect womens’ conscious choices regarding their life priorities. This topic deserves further study in order to determine the relative influences of gender, role stress, coping strategies, and support on academic performance and overall well-being.

Mentorship

Mentorship can include clinical preceptors, research mentors, and assigned faculty mentors. Peer mentorship (“big siblings”) and senior student mentors are assigned to first and second year students at UCSD. Deans also serve as mentors and role models to students. Each Dean brings his or her own personality and style to relationships. Some

Deans are more comfortable disclosing personal information or factors affecting their own lives and professional development. Traditionally, many Deans and faculty are more formal in their approach to mentoring students. Today’s medical students—who are particularly attuned to issues of striking balance in their lives—may actually benefit from more personal disclosure from a mentor. We would argue that some degree of personal self-disclosure (i.e., discussing one’s internal experiences along the route of medical training, describing one’s own methods of dealing with competing demands) is not only appropriate but beneficial. One author (CM), in her role as Assistant Dean for Student and Curricular Affairs, actively discusses the challenges of balancing her multiple roles of wife, mother, and academic physician with research, teaching, clinical, and administrative activities. Finding one’s personal comfort zone with disclosure to medical students is an important task for medical school faculty and administrators.

Intellectual Stimulation

The intellectual stimulation of medical school is a major positive input to the reservoir, ideally, “filling the reservoir” repeatedly and often. Most students, particularly when they begin to appreciate clinical correlates of the basic sciences, experience a great sense of excitement (46). As noted above, empirical research on the role of curricular aspects of training on student well-being can help address key questions—e.g., what types of curricula have what types of impact for which students? How can schools help students enhance and maintain their enthusiasm in the face of concomitant stress?

Dynamic Nature of the Coping Reservoir

The coping reservoir is drained and filled repeatedly as students confront the many competing demands for their time, energy, and cognitive and emotional resources. The process is dynamic, not static. During any given day, week, block, or quarter, demands ebb and flow. The end outcome (while clearly not dichotomous) can nevertheless be conceptualized as either positive or negative. When students and medical schools are not as successful at replenishing and shoring up the reservoir, negative outcomes such as professional burnout, cynicism, pessimism, and frustration can result, leading to diminished mental health and compromised patient care. Some students will experience an increased risk of depression and anxiety, increased interpersonal difficulties, and an increased risk of suicide. In contrast, when the student and school keep the reservoir replenished, the natural process of resilience can blossom.

Downstream, the development of resilience has multiple benefits.

In summary, the coping reservoir reflects the competing demands for students' resources and the way students handle these demands. The characteristics of individual students' reservoirs should be considered in evaluating each student's coping reserve—how strong is the reservoir, how full, how “leaky” or likely to spring a leak, how quickly depleted, how aware is the student of the need to replenish it when depleted, how viscous is the fluid (how easily is the student buffeted by demands and stressors of life and training), and so forth.

Typical Scenarios of Depleted Coping Reserve

Various personal or academic difficulties arise during medical training for many students. Typical scenarios include the development of academic problems, depression, anxiety, eating disorders, substance abuse, family crises, and relationship troubles. As outlined in Table 1, whether or not medical students have experienced academic or mental health problems in their past helps dictate how they most typically present with their current concerns. When faced with academic difficulty, students with no history of academic problems, depression, or anxiety may present differently from those who have experienced academic difficulty in the past. The former group with no prior history of academic or mental health problems often presents in the context of first time academic difficulties, leading to new onset anxiety. When the latter group with relative academic risk encounters academic problems, their sense of confidence in their own abilities and/or aspirations to become a physician can be shaken, and they may present with self-doubt. Students with a history of depression or anxiety experiencing either academic difficulty or a personal crisis will often experience a recurrence of their depressive or anxiety symptoms. Awareness of a student's prior mental health history, while confidential and completely up to the student to disclose, can be extremely useful in guiding the adviser's recognition of a normal reaction to stress versus an impending relapse in a mood or anxiety disorder. Taking this pattern into account helps determine how best to support students in times of need.

Approaches to Handling Depleted Coping Reserve

The proposed model helps us conceive of the unique ways students will handle adversity during their rigorous training. When a student comes to a Dean or Student Affairs Adviser with a personal or academic need, an assessment of the student's internal state and coping reserve—

and how these may be affecting resilience or burnout—is needed. Combining the current model with Basch's “developmental spiral” (47) helps us best determine how to bolster students' reservoirs in order to foster resilience and well-being. In Basch's description of the development of competencies and self-esteem, an individual's decisions lead to behavior, which leads to increased competence, and, finally, self-esteem. When people experience decreased self-esteem (as often occurs in the medical school setting), the therapy involves identifying the strengths of the individual that can be harnessed to help the person regain his or her footing on the developmental spiral. Thus, by focusing on the unique strengths of each student's internal structure—coping style, personal traits, and temperament—while providing and helping students identify supportive inputs that help replenish the reservoir, we can foster greater resilience. Table 1 further summarizes typical methods for handling students' difficulties and suggestions for faculty aimed at integrating these two models.

Differentiating Between Normal and Clinical Presentations

When students present to the Dean's Office for assistance or are referred for evaluation, taking an empathic, supportive approach is fundamental. However, taking such an approach will not necessarily foster resilience. It is often difficult, but vital, to determine whether the symptoms of depression or anxiety are a normal reaction or whether they constitute a clinically diagnosable psychiatric condition. Practical guideposts are used by the third author to distinguish these two possibilities. Severity of symptoms, pervasiveness of symptoms, and the symptoms' impact on the rest of the student's life are all critical to consider. The ability to not only feel relief, but to reengage in activities and relationships and feel pleasure when the stressor passes is a positive indicator that the symptoms most likely constitute a normal, transient reaction to the acute academic or personal stressor. In contrast, when the symptoms appear to be continuing beyond the acute stressor, or appear to be “taking on a life of their own” or “running the show”—e.g., driving the student's mood or affect when away from school, pervading his or her thoughts throughout the day, or negatively affecting academic performance due to difficulties with concentration—a treatable anxiety or depressive disorder is more likely present. Students in the latter category are referred for professional treatment and screened for suicidal ideation. Additionally, periodic follow-up contact between the student and a faculty adviser or dean should be arranged. If the academic difficulties

or depressive symptoms persist in a severe state, consideration should be made for a leave of absence. It is essential to educate students regarding their confidentiality surrounding personally disclosed information as it pertains to their academic file, as misconceptions about confidentiality can prohibit students from seeking appropriate help. Students may fear detrimental effects on their careers. This misconception, with its potentially grave consequences, highlights the value of informing the student body which, if any, personally disclosed information will appear in their academic record.

Programs Targeting the Coping Reservoir

Medical training creates a journey in which coping, support, mentorship, and resilience play essential roles in allowing students to become optimally healthy people and good physicians. Shoring up the coping reservoir is an appropriate and necessary role for medical schools. Tangible ways to help students develop positive inputs to their coping reserve—helping reorient them on their upward developmental spiral—are being actively explored by numerous medical schools.

Schools of medicine can target multiple “inputs” into the coping reservoir with specific formal and informal programs. The Student Affairs Office at the University of California, San Diego, School of Medicine (UCSD SoM, a public medical school with approximately 122 medical students in each incoming class), has made specific efforts to provide support for students (please contact the authors for examples from the UCSD SoM). For instance, the Healthy Student Program includes such offerings as yoga, soccer, healthy snacks on exam days, seminars on Coping with Stress, and social events. The implicit goal of all of these programs is to optimize the coping reserve of students. Another recent offering is a mindfulness-based stress reduction (MBSR) course, which has been incorporated on an elective basis at UCSD. At one medical school, an elective MBSR program (offered both to pre-medical and medical students) demonstrated positive effects on students’ empathy and well-being (including mood and anxiety), which carried through the exam period (48).

Although these well-intentioned programs are welcomed by students in theory, their actual time available for activities outside the academic curriculum is scarce. Attendance is often limited. Medical schools offering stress-reduction oriented programs should thus collect data documenting which activities have the most impact on students’ well-being, so that efforts can be focused on activities with the most potential for enhancing coping reserve.

Mentorship is another key ingredient for students’ personal and professional development (49–52). At UCSD SoM, mentorship systems are in place, both between students and faculty, and students and their more senior peers. Further research areas regarding mentorship as a solution to problems of dysphoria, anxiety, and disillusionment in medical training exist: studying the effects of mentorship, training mentors in how to provide effective mentorship, and providing comprehensive programs that extend the benefits of mentorship beyond the preclinical and clinical years (53).

Certain activities will be very helpful for individual students while others may have minimal impact. The individual approach to the student’s reservoir creates a culture that promotes a sense of true community and support. Activities promoted by our programs are designed to help us help one another, through physical, cognitive, and social venues.

The Coping Reservoir and the Developmental Model

The current model helps elucidate the demands placed upon medical students and the role that medical school administrators and faculty can play in ensuring medical students are best able to cope with these demands. Medical students’ “reserve” is continuously at risk of becoming markedly diminished. Students must learn an enormous amount of material at a breakneck pace, leading to a high level of stress. Substantially less time and energy is available for self-care and interpersonal relationships, and life events (sometimes crises) unfold in real time.

Life is more complex than simply inputs that either replenish or deplete one’s coping reservoir. By considering Basch’s developmental model, as noted above, when viewing the current model, we are better able to see the fluidity of the reservoir model. Medical school administrations—through role modeling, curricular activities, extracurricular programs, and the creation of a supportive “cultural” environment—can buttress the internal structure of students’ reservoirs. By strengthening the internal structure, we promote resilience and personal growth. The skills learned extend beyond the current adversities, facilitating the development of professionalism and fulfillment.

The Culture of Academic Medicine

The current framework exists within the overarching culture of medicine. Within this culture a dichotomy persists between those who provide care and those who receive it. Seeking help is often viewed as a sign of weakness

TABLE 1. Typical Presentations of Medical Student Difficulties and Distress

Scenario	Typical Presentation	Typical Method of Handling	Suggestions for Faculty
Student with no history of academic problems; no history of depression or anxiety	First academic difficulty → new onset anxiety	<ol style="list-style-type: none"> Investigate what occurred (e.g., Did a distracting problem, such as health issue in family member, occur?) Analyze situation collaboratively with student <ul style="list-style-type: none"> Time management Outside factors (e.g., family obligations) Potential role of mental state affecting concentration and social decision-making Reassurance that SoM¹ supports the student and will help find ways to investigate source of difficulty and provide help academically and psychologically, if necessary 	<ol style="list-style-type: none"> Acknowledge that a first-time academic difficulty can feel uncomfortable and ego-dystonic Help shore up student's resilience by working collaboratively with student to develop plan for academic improvement; develop a study strategy: <ul style="list-style-type: none"> Group study Tutorial study help Organizational and time management plan for coursework Inquire about student's needs; ask open-ended questions
Student at "higher academic risk"; no history of depression or anxiety	Academic difficulty → self-doubt	<ol style="list-style-type: none"> Make sure student is accessing available resources <ul style="list-style-type: none"> Tutorial help Learning skills expertise for study strategies Faculty mentor and peer mentors Analyze situation collaboratively with student <ul style="list-style-type: none"> Time management Outside factors (e.g., family obligations) Potential role of mental state affecting concentration and social decision-making Investigate extent of self-doubt and anxiety: e.g., sleep, concentration, appetite affected? If so, make referral to psychological and counseling services Provide reassurance that SoM¹ supports the student and will help find ways to investigate source of difficulty and provide help academically and psychologically, if necessary 	<ol style="list-style-type: none"> Provide empathy and support for student's struggles Role model healthy attitudes and choices, e.g., "I recognize that I have strengths and weaknesses and am open to feedback for my own personal and professional growth."

<p>Student with history of depression or anxiety</p> <p>Academic difficulty → recurrence of depressive/anxious symptoms</p>	<p>1. Ensure student has adequate support system, e.g., senior mentors, big siblings, faculty mentor, family support when appropriate, and tutorial staff help.</p> <p>2. Make referral to psychological and counseling services and screen for suicidal ideation</p> <p>3. Initiate periodic follow-up contact between student and dean or advisor</p> <p>4. Consider leave of absence if academic difficulty or depressive symptoms severe</p> <p>5. Educate student regarding SoM¹'s policies regarding confidentiality and separation between personal information disclosed and academic file</p>	<p>1. Provide support for the student</p> <p>2. Ensure that student is following up on referral to psychological and counseling services</p> <p>3. Communicate with medical school advisors and deans when appropriate</p>
<p>Student with history of depression or anxiety</p> <p>Personal crisis (e.g., family illness or relationship break-up) → recurrence of depressive/anxious symptoms → academic difficulty → increased depressive/anxious symptoms</p>	<p>SAME AS ABOVE</p>	<p>SAME AS ABOVE</p>

¹SoM = School of Medicine

rather than an empowering act (43). Moreover, the overarching medical culture lives within a larger rubric of deeply rooted societal stigma toward mental illness. The success of the recommendations suggested by this model for promoting resilience is intertwined with the need for larger-scale changes.

Despite the stigma and pressures, most students display tremendous resilience in the face of great demands on their inner resources, time, and energy. The medical school preparation and selection process may select reasonably well for traits likely to be associated with greater resilience in medical school. Perhaps those people attracted to medicine are more likely to possess the necessary resiliency. In one study, both preclinical grades and clinical performance were predicted as well by psychosocial characteristics as by Medical College Admissions Test scores (54). More surprising, psychosocial characteristics better predicted clinical competency than did admissions test scores (54). Many students suffer either because they lack the psychological resources to cope effectively, or because those resources are limited and begin to show strain or to buckle under the load of new stressors. Vulnerable students are often not adequately recognized or supported, nor are their resources enhanced by our present system of medical education.

CONCLUSION

There is growing acknowledgment that becoming a good physician requires the mental health and internal resources to cultivate and increase empathy, professionalism, and frustration tolerance. Students must be given the resources and opportunities to become more aware of their own health and well-being during training and to develop lifelong abilities to keep their reservoirs full. In this way, their development as professionals competent to care for both themselves and others can continue on an *upward* spiral.

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