

Editorial

You Either Pull Freight or You are Freight—Admonition #1 for Third Year Medical Students on a Surgery Service

Curt Tribble^{1,*}

¹Division of Cardiac Surgery, University of Virginia, Charlottesville, VA 22901, USA

*Correspondence: ctribble@virginia.edu (Curt Tribble)

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will drill down primarily on advice and strategies for students as they participate in the various areas of their surgical services, including the operating room, the clinics, and the wards [2].

The Rules of Engagement

One of the most important tenets of being a successful third year medical student on a surgical service is to realize that you can be of significant help to your team. Various sets of ‘rules’ have been espoused to guide the younger members of the surgical teams providing care to their patients. These rules are generally some combination of pithy, funny, and accurate [3,4].

First and foremost among such rules, is that everyone on the team needs to ‘pull freight’, which means that everyone can, and should, help with the efficient and effective delivery of care to their patients. And, in the midst of providing this care, everyone, will also, of course, be learning, though, for most, that learning will happen in a manner that is considerably, maybe even radically, different from the students’ prior educational environments. Gone, for the most part, will be lectures, notetaking, and frequent multiple-choice tests. That familiar educational pattern will shift, inexorably, to ‘learning on the go’ and ‘learning by doing’ which will involve participating in real patient care. When I was myself starting into the clinical rotations in medical school, we were told “to live the life of the house officers” to whom we were assigned. I, and many of my classmates, were mystified by this admonition, though it did turn out to be more accurate than we had initially thought.

I have been involved in medical education for over four decades, not counting the years of my own education. Recognizing that the educational environment for students starting into their clerkship rotations is always remarkably different from most, if not all, of their prior educational experiences, I have done my best to help students prepare for this new educational paradigm. We will review some of the concepts that will be helpful in optimizing both the education of, and the contributions by, the medical students working on surgical teams.

At the institution in which I trained, there were, at the time, two primary surgical services in The Department of

Introduction

Start where you are. Use what you’ve got. Do what you can.

Arthur Ashe, Wimbledon & US Open Tennis Champion [1].

Everyone who has made the transition from the second year to the third year of medical school is aware that this ‘promotion’ encompasses what is likely the biggest paradigm shift in their educational trajectory up to that point. While this change brings with it the excitement of finally, after many long years of study and preparation, starting to experience and learn clinical medicine, the mindset required for succeeding in this new educational realm is often not immediately apparent to the newly minted third year medical student.

Every medical student will feel the pride and exhilaration of putting on their white coat and joining a clinical team, to begin learning how to care for actual patients. However, there is virtually always an accompanying consternation felt by these new third year medical students about what the rules of engagement on their clinical teams should be and about how they will learn what they will be expected to know and how they can help their clinical teams, as the clinical rotations progress. As each type of clinical service presents somewhat different challenges, we

Surgery, which were named after the school colors, which are orange and blue. It turned out that one of these services, The Blue Surgery Service, was a bit more ‘measured’ and predictable, while the other, The Orange Surgery Service, was considerably more hectic and unpredictable. The rules for managing that service evolved over the years, and these rules were appropriately dubbed ‘The Orange Surgery Rules’.

The set of rules that gradually developed, inspired by this somewhat edgy and, at times, unpredictable surgical service, were memorable and at least somewhat helpful to both students and residents [Appendix]. The very first Orange Surgery rule was “we will not be slaves to logic or reason”, which, at least at the time, needed no further explanation. Another of these rules, intended to be a summary of what was expected of the medical students assigned to that service, was (and still is) “You either pull freight or you are freight”. While this aphorism was thought to be both accurate and self-evident, at least by the house officers, it often felt more arcane to the medical students, who rotated on and off the service at intervals shorter than those of the residents. Thus, it was evident that some explanation of this rule for the students was in order. Therefore, in this treatise I will attempt to bring some clarity to this rule and will offer some suggestions about how to put this rule to good use for all concerned.

While a medical student may be jokingly described as “a wedge” (sometimes defined as “man’s simplest tool”), the fact is that medical students can actually be of significant help to the smooth functioning of their clinical teams. Everyone on a clinical team matters, and medical students are no exception. So how can a medical student ‘pull freight’ on a surgical service? There are many ways that even a relatively inexperienced medical student can help their clinical team function efficiently and optimally. At the most basic level of patient care, a med student can help gather information, such as lab, radiology, or pathology reports. They can also change or reinforce dressings and remove stitches or staples when appropriate. Students can spend time with and talk to patients and their families. They can also do ‘small stuff’ like rearranging pillows and blankets or getting their patients something to drink (assuming that they’re allowed to have water or juice). And, it’s all small stuff. Stuff that is good for all concerned.

The Top Ten Reasons You, as a Patient, Want Students Involved in Your Care

I have often had my patients or their families tell me during a preoperative conversation that they did not want any students involved in their care. I would then have a brief conversation with them about why having a med student could actually be good for them. I like to rattle off some version of the following ‘top ten reasons you want medical students helping with your care’:

- It’s well known that patients get better care at teaching hospitals. Having students around is one of the reasons.
- By definition, medical students are some of the smartest people in the world. It cannot be a bad thing to have them thinking about you and your care.
- They might see or notice things that everyone else has missed, since everyone involved will have a different view or perspective.
- The students keep us all young. They read and keep up with all ‘the latest developments’, while their residents and faculty mentors rely more on their experiences to manage patients. It’s good to have a balance of both.
- Similarly, they generally know the latest fashions and the best popular music, which can help their mentors stay, at least to some degree, caught up with modern culture.
- Students keep us on our toes. They ask questions that sometimes make us rethink basic tenets, while the residents and the faculty surgeons rely more on their experiences when providing patient care. Patients benefit from having a combination of all that.
- Students are the ‘thumbs up’ folks on our teams. That can be like having fans cheering at a game, creating ‘a home field advantage’.
- They will talk to you, the patient. And, that is a good thing. They are caring for fewer patients than their residents and, therefore, have more time to listen and talk to their patients, especially on surgical services.
- You must admit, it’s more fun to be around young, smart, idealistic, energetic, and enthusiastic people who bring everyone’s energy level up.
- And, finally, they’re much ‘easier on the eyes’ than us older folks, right??

Not infrequently, after contemplating these points, my patients would ask “Can I have two of them?”. When the patients and their students ‘connect’, it’s good for all concerned.

With that introduction, I will drill down on ways that you, as a medical student, can help your team care for patients in the clinics, in the operating rooms, and on the wards after their operations. And, we will touch on how you can also enhance the educational environment for yourself and for others on your clinical teams.

Helping in all Clinical Areas

As noted above, a benefit of having students involved in the care of the patients on the clinical services is that they may see or sense something that others have missed. A story that illustrates this principle comes from a time when I was running the Burn Unit at our hospital as a senior resident. We were caring for a child who had been scalded when he pulled a pot full of hot coffee off of a counter and on to himself. The child developed an infection in the burn wound on his chest. My medical student thought that the

wound did not look like other burn wounds he had seen, and he noticed that the child's mother had a fever blister on her lower lip. We obtained a viral wound culture of the child's burn wound, and that culture did indeed reveal that it was a herpes simplex viral infection. We then cultured the mother's fever blister as well, which revealed that both the child and the mother were infected with the same viral phage type. We successfully treated them both with acyclovir. This case resulted in a publication in a prominent journal [5]. Most importantly, this diagnosis might not have been made without the observations made and the questions asked by a third-year medical student.

Another similar story involved a patient who had been shot and who was transported by ambulance to our hospital. She had six bullet wounds in her anterior torso. The patient was stable on arrival and radiographs of the chest and abdomen were obtained. Those images showed no bullets or bullet fragments. Everyone was baffled, as we were expecting to see six bullets, or bullet fragments, lodged in her chest and abdomen. The medical student present asked, "what if she had ducked when the shooting started, and a single bullet then went through her breast into a roll of adipose tissue in her upper abdomen and then through another roll on her lower abdomen, with the bullet exiting between her legs?". The patient had been rushed to the hospital by ambulance, so there was a lag time before her family arrived. When the family did arrive, they described how our patient had been standing on a porch when the shooting spree started and how she had instinctively ducked forward. This additional history put the whole story together, and it became clear that the best diagnostician on the team correctly figured out what had happened. And, that person was the medical student.

Another example of a lesson learned by a medical student contributing to potentially saving a life involved a patient with a fungal burn wound infection. Every time the antifungal agent, amphotericin, was administered, the patient's blood pressure would drop. The student recalled seeing a desensitization protocol used for penicillin allergy earlier in her medical school, trajectory. This protocol called for administering the drug by continuous infusion, gradually increasing the concentration, rather than administering the drug in intermittent boluses. The suggestion by the medical student to use a continuous infusion of the drug worked, and the patient tolerated the administration of the drug in this manner, gradually cleared her infection, and eventually survived.

Helping in the Clinics

Kindness is like snow. It beautifies everything it covers.

Kahlil Gibran [6].

Every surgical service will, of course, have clinics where patients are seen to consider the possibility of an

operation, to see them after an operation has been performed, or to provide more longitudinal follow-up. Those who run such clinics try their best to make the workflow run smoothly. While I and my own clinic teams would always do our best to construct the clinic schedule in a practical manner, interspersing the longer new patient visits with the usually shorter follow-up visits, those 'best laid plans' would often end up in disarray, especially when a patient or two had issues that we were unaware of prior to a particular visit. One reflection I had in my many years of running these clinics was that the patients and their families seemed to have a sort of 'biological timer' running that took into account how long someone on our team was with them in their clinic room. This observation led me to think of how we could use the available 'person power' to give the patients at least some attention even prior to my being able to personally engage with them. These ancillary folks included our nurses, residents (when available), and students. These team members can often get a lot accomplished, including getting the patients into the state of 'dress or undress' needed for a given clinical situation, obtaining a brief history, recording medications or other information, and, when appropriate, removing dressings, stitches, or staples. And, students can very often be of considerable help in accomplishing these tasks. I would also often ask the students helping me to take notes that I could use to create a record of the clinic visit, including recording medication lists, allergies, and concerns of the patients or their families. I liked to tell the students that one of their assignments was to 'soften up' the patients and their families prior to my arrival. While some of these patients would fuss at me a bit for being 'behind schedule', I almost always sensed that they enjoyed the attention of our younger colleagues, including the medical students. There is obviously also a lot to be learned by our students when they participate in clinics, given that they will come to understand the usual history, exam, studies, and decisions being made in these clinics [7].

Helping in the Operating Room

Everyone in this room will have, by definition, a different view. If you see something, say something.

M. C. Wilhelm, MD [8].

As a student planning to participate in an operation, you should do your best to be prepared for the case that you will be helping with. When you know what case you will be assigned to, you should try to learn about the patient, review the available imaging, and read about the planned operation, paying particular attention to reviewing the pertinent anatomy.

You should strive to be in the operating room prior to the patient's entry so that you can pay attention to helping position the patient and to keeping the patient warm. At that point, the patient will often be awake, and you can talk

with them a bit. After all, an old adage is that one of the best sedatives is the calm, caring human voice. It is pertinent to point out that one of the skills to be learned by students on a surgical rotation is the care of the unconscious patient, so you can help with positioning and padding of (or, padding around) potential pressure points. You can also help by pulling up pertinent images on a computer or finding the relevant studies in a film jacket and hanging them on a view box in the operating room.

As a student, you can also be of considerable help in many operations, by assisting with exposure and by paying attention to what is being done, since you may see something no one else sees. After all, everyone around the patient will have a different view of what is happening. I like to recall an analogous story of the value of ‘fresh eyes’ which occurred when my family and I were driving on some back roads in the Virgin Islands during a vacation. Since one must drive on the left side of the road there, I told my wife and three boys to be vigilant about helping me stay on the left, especially if we turned around or went through a traffic circle. After missing a turn, we turned around to backtrack to that road, and I inadvertently pulled into the right lane. The only one of the five of us who noticed that error was our youngest son who was, at the time, the only non-driver in the group, which was a great example of the value of ‘fresh eyes’!

You should do your best to understand the operative plan for the patient whose operation you will be helping with, recognizing that there will be times when asking questions may actually help the surgical team. And, not infrequently, you can also provide meaningful assistance. As an old saying goes, sometimes the best stabilizer in the world during an operation is a human hand. During heart operations, when we need a student to hold the heart to provide optimal exposure, we like to say to them “Now, that is the most control of a person’s heart that you will likely ever have in your entire life!”.

When operations have concluded and the patient is being moved to the recovery room or to an intensive care unit, you, as a student can help by being vigilant, as all of these transitions are potentially dangerous, since lines can be pulled out, extremities may be injured, or the patient’s hemodynamic status might change. And, you may be the only person on the team to notice these issues if they arise.

Finally, after the operation has concluded, at least one of the members of the operative team will meet with the patient’s family to tell them what has been done and how their family member is fairing at that point. You should try to participate in those meetings, if at all possible. Not only will you learn a lot about how those conversations are conducted, but you may also get some ‘street cred’ with the family, who you will likely interact with after the operation [9].

Helping on the Wards

I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.

Maya Angelou [10].

The ‘main doctor concept’ is important during the postoperative phase of the patient’s care. That concept entails having each student be assigned to a handful of the patients on the service. Everyone on the clinical team, including the students, can introduce themselves to their patient and to the patient’s family by saying some version of “I am Joyce Smith and Dr. Jones has asked me to help him with your care”. This simple statement, in fact, establishes what role the speaker is expected to play in the patient’s care and no further questions really need to be asked by the patient or family. I like to suggest, when the students introduce themselves to their patients, that they tell them that they are that patient’s ‘private medical student’. The students can also say “if you need anything, like a blanket, or something to drink, I can get that for you”. These offers to help will always be appreciated by the patient.

Having the medical students offer their cell phone numbers to the patients and their families has been suggested, so that the patient or the patient’s family can ask that ‘their medical student’ come by to check on the patient. A practical way to manage this issue can be to have the student leave their cell phone number at the front desk on the surgical ward (rather than with the patient) and to tell that the patient or the patient’s family to ask that a message be sent to ‘their student’ via a text, to avoid having that student’s phone ringing while they are in the operating room or participating in a conference.

One of the most important questions that anyone, including a medical student on a team caring for patients, can ask a patient is “what will you do when you are well again?”. This question, of course, implies that the team expects a good outcome. Patients will almost always have an answer to that question. The student could consider writing the patient’s answer to that question on the whiteboard in their room so that others caring for the patient can also engage the patient in conversations about their aspirations. These conversations can be good for everyone involved [11].

No act of kindness, no matter how small, is ever wasted.

Aesop [12].

You should stop by every day to see your patient so that you can ask how they’re doing and offering to get things for them like ice or water. And, since virtually every patient in a hospital bed is at least somewhat uncomfortable in one way or another, you can rearrange their pillows and blankets or get an extra blanket for them, if they say that they

are cold. These seemingly small things will always be appreciated.

Touch comes before sight, before speech. It is the first language and the last, and it always tells the truth.

Margret Atwood, 2000 [13].

You should examine your patient each time you check in on them. I can still remember one of my own teachers emphasizing that patients want to be touched. This type of ‘focused’ physical exam should concentrate on the patient’s specific issues, such as their surgical wound, their lungs, and evidence of their fluid status, while remembering that fluid will accumulate in the most dependent areas of the body, which will be over their lower back and sacrum, rather than in their lower legs and feet, especially in patients who are in bed.

There are two kinds of residents [or medical students], those who write things down and those who forget.

Hermes Grillo, MD. Thoracic Surgeon, Mass General Hospital [14].

You should consider the gathering of clinical information such as vital signs, pathology reports, or lab results to be part of your job as a medical student on a surgical team. While some houseofficers and students call this type of work ‘scut’, I have never liked that word, because ward work is patient care. I have told generations of my students and residents that this type of patient care is ‘the work of angels and saints’. It’s a privilege to do. It’s fun. It’s necessary for the care of patients. If you call patient care ‘scut’, you won’t do it [15].

The good physician treats the disease. The great physician treats the patient who has the disease.

Sir William Osler [16].

You can also help by answering questions for your patients or their families. There are three ways to answer these questions:

- I know and here’s the answer...
- I think I know and here’s what I think the answer is...
- I don’t know, but I’ll find out and let you know.

You can also help your team with the creation of progress notes for your patients, representing the team’s assessment of the patients’ issues. Since these notes need to be entered in the electronic medical record (EMR) by the houseofficers, as a student you can help by sending a draft of a progress note, via email, to your house officer, who can cut and paste it into the EMR, after editing and signing it. Or, you can just provide a handwritten list of bullet points to your resident, who can then flesh them out in their own notes in the medical record. These notes should always be written in the problem-oriented format, rather than in ‘the stream of conscious’ manner or in ‘the cut & paste data dump’ manner [17].

Failure to Rescue

What they proved to be really good at was rescuing people when they had a complication, preventing failures from becoming catastrophes.

Atul Gawande, MD [18].

An important tenet in caring for hospitalized patients is the concept of ‘failure to rescue’, which carries the implication that the more people who are looking at and thinking about hospitalized patients the more likely it is that someone will notice a change in clinical status that may, at times, be fairly subtle, at least in its early stages. The eyes and ears of medical students can, most certainly, be part of ‘an early warning system’ for patients who may be experiencing some concept of ‘failure to rescue’ that was provided in an article in The New Yorker written by the prolific author, Dr. Atul Gawande [18].

And, in a study published not long after Dr. Gawande’s essay, Dr. Richard Prager (my own medical school advisor) and his collaborators in The Michigan Society of Thoracic and Cardiovascular Surgeons found that the characteristics of low mortality hospitals with superior rates of ‘rescue’ included being teaching hospitals. These authors noted, not surprisingly, that timely recognition of a complication contributed to the expeditious management of that complication. Obviously, the learners in those teaching hospitals contributed to the early identification of changes in status of their patients. And, you, as a medical student, can be a valuable contributor in making those observations about the patients for whom your team is caring [19].

Learning on the Go: Enhancing Your Educational Environment

If you don’t know anything, it’s hard to learn anything else.

ED Hirsch [Cultural Literacy, 1988] [20].

While we will do a deeper dive, in another essay, into optimal ways to learn in the educational environment of your clinical rotations, a treatise on ‘pulling freight’ during these rotations would not be complete without at least mentioning some of the new and different learning strategies you will need to employ while making your way through the final two years of medical school, as well as the rest of your career. Obviously, you will be both working to help your clinical teams and learning while doing so. Much of your education prior to the third year of medical school will have been fairly structured and, at least somewhat passive, consisting of lectures, taking notes, reading, and reviewing to prepare for tests of one sort or another, with the vast majority of those tests being multiple-choice tests. You’ve been good at learning and at being tested, throughout your

educational trajectory, including the first two years of medical school [21]. However, as you enter the third year of medical school, that learning paradigm must shift, forever. The learning style of all clinicians, which now includes you as a third-year student, involves, at least mostly, learning:

- On the go.
- By doing things.
- From actual patients [22].

Education is not the learning of facts, but the training of the mind to think.

Albert Einstein.

And, you can enhance your own learning by:

- Keeping a small pocket notebook with you to note things to look up.
- Writing things down (as writing ‘lights up’ three parts of your brain).
- Looking up things you don’t completely understand.
- Teaching others what you’ve learned (as to teach is to learn twice).
- Creating a system of saving information so that it can be accessed later [23].
- Remembering how things felt and the emotions involved.
- Optimizing the limited, and often interspersed, learning moments.
- Realizing that what you learned today might save someone’s life later.

A Sustainable Design

Ships don't sink because of the water around them. Ships sink because of the water that gets into them. Don't let what's happening around you get inside you and weigh you down.

Lane Kiffin, Football Coach at the University of Mississippi [24].

You will also need to develop what has been described as ‘a sustainable design’ in which you must learn to manage your energy while helping care for patients, sometimes giving that energy away while at other times replenishing it. This is a useful concept in ‘pulling freight’ because, most of the time, when you pull freight, you’re just giving away energy, but a lot of things you will do as a physician, or even as a medical student, will actually generate energy. You will need to get to the point where you consciously manage the ebb and flow of your energy and resilience [25].

Conclusions

I was born for this moment and for all the days ahead. I expect to live intensely.... But I have, I hope, no illusions. I expect an ordeal, an ordeal of grandeur.

Webb Chiles, 1977 [26].

As you enter the clinical years of your medical education, you will be shifting from preparing to study medicine to preparing to be a ‘full-on thinking doctor’. As you move into this new realm, pay attention to the energy you get back from the things that you are doing and from the patients for whom you will care. Your medical education and training will indeed be an ordeal, but it can, and should be, an ordeal of grandeur.

Summary

It's a privilege to be here.

Mantra of The Blue Angels [27].

Caring for patients is, indeed, a miracle and a privilege. And it is worth reminding ourselves, on a regular basis, of this truth. We can, and should, get as much energy from the care we provide as we expend in that process.

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Appendix

The story behind the train picture

I have included a picture of a freight train to emphasize the title and, more importantly, the primary theme of this essay. This picture has particular significance to me because I was nearly hit by a train just like the one in the

picture on that very same bridge. That train bridge spans the Broad River very near where I grew up in Columbia, South Carolina. When I was about 12 years old, some pals and I thought we would walk out on that bridge one summer evening with the goal of nailing a sign on it, supporting our school's football team, so that it could be read from the interstate highway bridge nearby. That plan seemed like a good idea at the time. Famous (nearly) last words. We walked carefully on the fairly widely spaced railroad ties out to the spot we had selected to attach our sign. As we got to that spot, I looked up and saw the headlight of a train sweeping through the trees not far away from the bridge. We immediately realized that we might well be doomed. The river 30 feet below us was full of rocks, so the prospect of jumping off seemed to be quite unwise. Therefore, we started running toward the end of the bridge away from the direction of that oncoming train. We quickly realized that we were not going to make it off the bridge in time. Suddenly, we saw a tiny platform, which we had not noticed before, sticking out from the regular railroad ties on the bridge. Assuming that it had been built there for just this purpose, my two pals and I squeezed onto it, while hoping against hope that there would be enough clearance between us and the train to save our skins. We were, needless to say, terrified, but we had no choice other than to stand on the platform and hope for the best, as the train roared towards us. The engineer, seeing us as the train's light came to shine on us, laid on his train horn, hoping, I am sure, to scare us nearly to death. We did not jump nor did our hearts stop, as the train passed us by, with surely less than two or three feet of clearance. None of us ever ventured out on that, or any other, train bridge again. Fast forward about 30 years, when I saw the attached picture on the cover of a local magazine. I contacted the editor, told her my story, and asked if I could have a copy of that picture. She agreed, on one condition, to send me that picture. That condition was that I write a short article for a subsequent issue of her magazine, telling this story of our memorable summer evening on that bridge. She did, indeed, publish my story in her magazine. Astonishingly, a number of my friends and family members saw this story and, of course, gave me a LOT of flak about that escapade. As noted, I have never set foot on a train bridge again! [SC Wildlife]

Selected Orange Surgery Rules

We will not be slaves to logic or reason.
 You either pull freight or you are freight.
 All bleeding stops.
 Perfection is the enemy of good.
 Never let them see you sweat.
 A chance to cut is a chance to cure.
 The best chemotherapy is a big jar of formalin.
 No autopsy, no foul.
 Never let the skin stay between you and the diagnosis.
 Any operation worth doing once is always worth doing

twice.

The Orange Surgery theme song is 'Stairway to Heaven' by Led Zeppelin.

You can't make chicken salad out of chicken 'excrement'.

Nice people get bad diseases.

Always remember who's wearing the pajamas...

If you can't run with the big dogs, stay on the porch.

Every day above ground is a good day.

I might have ridden in on the watermelon truck but I didn't pick 'em.

It's better to have a live dog than a dead lion.

He who expects no gratitude shall never be disappointed.

(Note: I have labeled this list as 'selected rules' because some of the original rules are just not suitable for all potential readers. I will leave it to the imagination of the reader to guess what some of those other rules might have been!).

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