

## Supplemental Digital Table 1

Teaching strategies used by excellent residents, described by 37 medical students, from a multi-institutional, qualitative study of student learning, 2012 (228 comments)

Domain (no. of comments)	Theme (no. of comments)	Representative comments
<b>Description</b>		
Role Modeling (63)		
Sets an example through behaviors and actions		
	Role Modeling/By Example-Generally (47)	<p>-“It was modeling, mostly. I watched them. My presentations changed within a week just because I was, ‘Well, they’re not saying this, and this isn’t being done.’ I literally would adapt.”</p> <p>-“Watching them has taught me a lot about what to do and how to behave.”</p> <p>-“They are some very good role models, where you can look to them and what they do and say, ‘Oh well, this is how I should handle a particular situation’.”</p> <p>-“They taught by example, like what to do with patients and attendings.”</p>
	Admitting Limitations (7)	<p>-“If you’re comfortable with yourself, if you’re honest with your students about what you know and what you don’t know.”</p> <p>-“Self confidence to be able to not know something and be okay with that is a really important trait.”</p> <p>-“When people said that they didn’t know the answer or what to do.”</p>
	Applying Knowledge to Clinical Care (5)	<p>- [The resident] “presented from the patient perspective or from the symptom [which] helped us apply what we learned in the first two years.”</p> <p>-“He’d guide me and say ‘Study this tonight. Focus on this one thing’ and then the next day we’d talk about it and try to apply it to the patient.”</p> <p>-“There were some who said, ‘I’m going to make two or three points, and I want you to remember these two or three points from this patient’.”</p>
	Advocating for Patients	- [The resident said] “We’re going to take the steps to go and get these things and

	(4)	do it for the patient.” -“I saw my residents play different roles. Like pushing to get something done [for the patient] even when the other person on the phone clearly didn’t care.”
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Focusing on Teaching (49)		
Is deliberate about and demonstrates a commitment to and interest in teaching		
	Finding Teachable Moments (24)	- [The resident would say] “Hey let’s discuss this for a moment, this person had this finding, what do you think of that?” -“Going through the patients that you have, that you’re working on...going through some of the decision points and asking, ‘If this patient had this finding, then what would we have done?’” -“One who talks through what they’re doing when there’s a student in the room.” -“They find something to teach even while they are working.” -“They’ll be, ‘I’m ordering a cephalosporin. Why am I doing that?’ as they’re typing in the cephalosporin.”
	Taking Time to Teach (16)	-“I think those [residents] who make a consistent effort to specifically set time for teaching give you consistently better teaching.” -“And they just sat down with us, and it was just one of the senior residents and us...just setting aside that time in their schedule and making sure we set it aside in ours.” -“They would still [even though they were busy] kind of set aside some time to teach you something.”
	Showing Interest in Teaching (9)	-“Someone who sees part of their role as teaching the medical student.” -“Residents who are enthusiastic are better teachers.” - “[Those who] actually care to want to teach you a little bit.” -“The resident who takes the initiative to teach the student.”
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Creating Safe Learning Environment (44)		

Actively facilitates an atmosphere that is non-threatening, open and conducive to learning

Offering Opportunities for Safe Practice (14)

-“I think it helps so much when you sit down, right before you leave the night on call and you just talk out real fast what’s really important to help in attending rounds tomorrow morning.”  
 -“It felt safe with her because practicing before-hand let us test stuff out and then feel more secure later. She made trial and error okay and it gave me a true sense of her skills as an educator. Who doesn’t want to practice to get better and not get chewed out when it is about patients?”  
 -“She was like ‘Okay, every morning before you present to the group, just run it by me and we’ll talk’.”  
 -“It’s almost exactly like learning a foreign language, where you have to start speaking in situations where you can’t say it right now. And then you get it wrong and someone’s, ‘I have no idea what you’re talking about.’ You feel a little silly, but only by getting it wrong in a safe space do you get it right eventually.”

Establishing Rapport with Students (10)

-“They were kind of quietly looking out for you and setting you up for success. And I think that kind of just goes to treating people with respect and dignity.”  
 -“I have residents who also would have us introduce ourselves as med[ical] students, talk about where we were from, what we like, and actually wanted to get to know us as people. That made me realize that, okay, maybe residency won’t crush your human spirit so much where you’re not even interested in other people anymore.”  
 -“And to me the best residents are those that actually are interested in your life. It’s not like they need to be your best friend, but they care, and they’re people.”

Offering Reassurance (8)

-“I’ve had residents ask me a question that seemed basic and me not know the answer, and they’ll be, ‘It’s okay. I didn’t know the answer last year either, but it’s important for this clerkship, and this principle underlies everything else we’re doing, that x...’ and you don’t feel like an idiot, it helps.”  
 -“.... it’s like moral support but it also gives you more confidence to do it next time without being so wishy-washy about it.”

		<p>-“But it’s the residents who make you feel like you’re doing something, and that you have potential, and that it’s okay where you’re at, and you’re going to improve and learn, and we’ve all been there. And it sort of makes you trust the system.”</p> <p>-“A lot of the time people are just, ‘Oh, I was so much better than this...better at this at your level’...especially attendings have said that a bunch of times. But the residents say, ‘Oh, no. I was worse. We all started from nowhere. Everyone had their first day on rotation.’”</p>
	Creating a Sense of Team (6)	<p>-“Another element for a good resident, and that’s creating a sense of a team.”</p> <p>-“They’d have these really sick patients and they’d figure out who needed to do what early in the day. It was really cool to come back together at some point and all of us would say what we did and the whole thing would come together.”</p> <p>-“I think part of being in the team for me was when the resident would tell me about all the patients that we were in charge of, instead of just my patient.”</p>
	Being Open to Questions (5)	<p>-“Because I think it’s not just them telling you about things, but it’s also them prompting you to think by being open to questions.”</p> <p>-“Another great quality for me is approachability.”</p> <p>-“You’re more comfortable going to residents with questions because you know they weren’t too far from your shoes and they can like understand some of what you would consider stupid questions.”</p>
	Using Humor (1)	-“Those that used humor.”
Providing Experiential Learning Opportunities (26)		
Offers opportunities for meaningful, active participation and supervised practice		
	Providing Experiential Learning Opportunities- Generally (12)	- [The resident would say] “‘Have you ever put a Foley in?’” “‘Yes,’” and they’d say, “‘Okay, well let’s do it together,’” or, “‘Have you ever done a running subcuticular stitch?’” And you say, “‘Yes,’” and so they’d say, “‘Okay well let’s do it together’”.”

	-“I learned a lot more from being allowed to do something, by working it out by myself rather than just being told how it happens. Residents let me try and that learning really stuck.” -“How to do literature searches and how to find information that you don’t have then and there when you need it. You know, you have sessions in the library in first and second year but until you’re actually there looking at the problem, and you’re not sitting with someone that’s next to you on a computer, you don’t really get the sense of it.”
Giving Opportunities for Ownership of Patients (7)	-“When they give you more responsibility and ownership of a patient I think it’s great.” -“Giving opportunities for participation and giving opportunities to take ownership for patients, for learning.” -“Giving you ownership of that patient...giving you the responsibility...you feel the motivation to think about, what do I want for this patient? Maybe I don’t know exactly what he needs, but what would I want?”
Involving Student in the Team (7)	-“I think the best resident teachers think about how to involve a student in the team.” -“I also think that the best teaching residents give a medical student a defined role and defined responsibilities in what they should do as part of a team.” -“I think learning can occur much more naturally when the student is made to feel welcome and a part of the team.”
Giving Feedback (23)	
Provides specific positive and constructive feedback	
Giving Feedback (23)	-“They are able to pinpoint things that may have been completely outside of your radar but when they point that out to you, you start to think about things differently and your approach to the problem becomes different and your way of presenting becomes different.” -“I think a good resident provides feedback on your performance...because I think feedback is absolutely crucial at our point.” -“Residents who took the time to think about my work and performance and give

		me specific feedback on what I am doing well and what I could improve on.” -“The best residents I’ve had convey, “You did this well. You’ve got to work on this,”” and nobody’s feelings get hurt. It’s data. It’s feedback the way it should be.”
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Setting Expectations (12)		
Sets and clarifies roles, responsibilities and standards of performance		
	Setting Expectations for Student Performance (8)	-[One resident said] “I want you to arrive about this much time ahead of me and by the time I see you in the morning, I want you to have found out this about someone”.” -“I also knew what was expected of me.” -“I liked it when they.....expected a great deal from me, just as I do from them, because it inspired me to perform.”
	Explaining Student Role Explicitly (4)	-“I also think that the best teaching residents give a medical student a defined role.” -“Somebody who...describes to you your role.” -“They know that if we learn how things work and what our role is then their life is easier. It helps us and it helps them.”
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Stimulating Learning (11)		
Encourages learners to be self-directed and take control of their learning		
	Challenging Students to Learn (8)	-“I had a couple of interns in medicine who would ask me what I wanted to order every day for the patients that I was following. That was, I thought, really good because it challenged me to think not only about what’s going on with the patient but what the next steps are and should be and what I needed to learn about.”

	<p>-“I had one resident who got me to see a patient and do a whole history and physical and plan, and then also propose the medications, routes and the IV fluid doses. It felt a bit beyond my level. But then I’d try to do it and research it and carry it as far as he asked me to.”</p> <p>-“The residents really pushed me. Before one family meeting, my resident asked me what my questions would be and what I’d say in the meeting. I told him what I thought and he pushed me for more. I only knew what I’d learned in a lecture about that topic.”</p>
Directing Students to Seminal Literature (3)	<p>-“Giving me a head up about what else I might want to review and learn when I had a certain presentation.”</p> <p>-“My residents pointed me toward a lot of seminal literature, which I guess I wasn’t fully aware of before I got there...they’d say, “these are what you should know””.</p>

## Supplemental Digital Table 2

Knowledge and skills learned from residents, described by 37 medical students, from a multi-institutional, qualitative study of student learning, 2012 (197 comments)

Domain (number of comments)	Theme (number of comments)	Representative comments
Patient Care (52)	Linking Knowledge to Clinical Care (16)	<p>-“Medical knowledge that is useful and related to clinical cases.”</p> <p>-“Linking things to patient care....to have a patient in front of you and then teach based on that patient.”</p> <p>-“They realize that there are steps missing in between the things we read about and that we don’t know how to actually do things, so they help you take those intermediary steps. It’s like connecting the dots for us between what we learned in first and second year and the actual patient.”</p> <p>-“They taught me how to explain findings and link my formal knowledge of pathophysiology to the clinical case.”</p>
	Clinical Reasoning (9)	<p>-“What things should you check for this patient based on what the differential is and what tests you should order first.”</p> <p>-“Starting big but then really taking the information and really being rational about why you do certain tests and why you go down certain paths with the information you’re given.”</p> <p>-“How they were thinking through a case...you really get to hear them reasoning through stuff. I learned tons from that and no book could teach me that.”</p>
	Managing Patients (8)	<p>-“What steps are needed for [patient] management on a daily basis.”</p> <p>-“Actually how to take care of patients.”</p> <p>-“Wow to manage patients that you are following.”</p>
	Physical Examination Skills (7)	<p>-“I think physical exam findings are huge.”</p> <p>-“‘You said they had crackles, well you said they have this type of crackles but they’re also rhonchorous too.’ And this is the difference between that or [they] give you something to compare it to.”</p> <p>-“There was one resident who...would pick a different part of the physical exam and with</p>



		all the medical students on the team, go to that patient's bedside and do the physical exam.” -“I want to say there is a systolic murmur but I also might be crazy...so she like listened and she said, ‘Yes that’s definitely it,’ and she listened again and [said] its probably classified as this, this, and this.”
	Prioritizing (7)	-“You know that doesn’t make sense, here’s why and let’s wait on that,’ and you learn how to prioritize.” -“Prioritizing and becoming efficient I would say.” -“I feel like the residents really have taught me what matters, sort of, in medicine, day to day...’What’s the priority right now, in the moment? What’s the most pressing, urgent issue?’...whether it’s attending rounds or whether it’s going and asking the patient what insurance they have...how to sort of prioritize day-to-day, minute-to-minute decisions.”
	Logistics of Doing Procedures (3)	-“I knew about the ankle-brachial index and I said, ‘All right, this is what I would do.’ And they were, ‘Okay, how do you actually do that and what are the steps?’” -“You learn more hands-on things...we learned, oh, we need an ABG because this person’s desatting. Before, that process of, oh, we need an ABG would kind of just be in a question you would fill out the answer to...not ever learn the logistics...not to get the materials, assemble it.”
	History-Taking Skills (1)	-“Interviewing skills, ways to ask specific questions.”
	Reassurance and Empathy Toward Patients (1)	-“Empathy in the sense that they’re good with like patients.”
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	Communication (42)	
	Interacting with Others (22)	-“I didn’t realize as an early medical student how much of a doctor’s job is just communicating, speaking to other doctors, speaking to patients. It’s all about oral communication.” -“Learning how to interact with other professionals, including nurses.” -“I learned a lot of ways to interact with other people on this service...like staff, other teams, family members... physicians, all the people on the team...and other residents.” -“You never really know your place as a medical student what you’re allowed to say to the patient and when the family members ask you in the hallway and you have information, you never really know what you’re allowed to say. I always depended on...probably the

		interns, actually...to know what was socially appropriate.” -“How the residents interact with one another, both at their own level but also at higher levels, and then how they interact with members of different teams who are all coming together to provide care for the same patient. Those dynamics are complex, and incredibly important in delivering patient care, and you have to learn how to navigate those dynamics.”
	Presenting Cases (9)	-“What’s important versus what’s not important in presentations.” -“Learning how to do a presentation.” -“How to present.” -“Residents helped me increase the efficiency of my verbal presentations and how to really narrow down what’s clinically relevant to a presentation.”
	Calling for Consults (5)	-“Trying to work with consult teams...just how to frame the patient.” -“How do you call a consult?” -“Calling consults, especially. There’s always a certain skill in getting a good response on a consult, and I think residents have been great about teaching us how to do that.”
	Writing Patient Notes (4)	-“I think the one thing I’ve learned from residents is how to write notes.” -“I think I’ve learned a lot of practical things, in terms of ...not knowing how to write notes. Residents were really good about taking the time, teaching you those things.” -“They helped me a lot with my notes”
	Giving Sign-Out (2)	-“Sign-out...is really a great lesson I’ve learned.”
<b>Navigating the System (30)</b>		
	Getting Things Done on the Floor (14)	-“You take the patient into the OR and you have to be with them the whole time and then...you walk them to the recovery room...you are the person that’s doing all this stuff, and you put the Foley in and you put their compression boots on.” -“Just how to get stuff done on the floor. I had never been on a floor. I didn’t really know.” -“I think I’ve learned a lot of practical things, in terms of not knowing my way around, not knowing how to do things.”
	How the System Works in the Hospital (7)	-“I’d like to add that my residents showed me how to efficiently move through the system [in the hospital].” -“I think helping us get acclimated to working in the hospital has been the most important

		<p>thing for me...just how things run.”</p> <p>-“They taught me how the system at each hospital really worked.”</p>
	Understanding the Hierarchy (5)	<p>-“Orientation of the team structure.”</p> <p>-“We learned about the hierarchy of the team.”</p> <p>-“I’d look to the residents just to understand that hierarchy and rules.”</p>
	Who To Approach (4)	<p>-“Who to involve to put together that story so that you could answer the question in the end.”</p> <p>-“Who to ask a certain question of.”</p> <p>-“Who to ask questions of...who is going to be helpful if you go and talk to them on the floor.”</p>
<b>Adaptability (22)</b>		
	Balancing Work and Life (7)	<p>-“You see...how they balance their lives during residency and you see that they still sometimes go out and have fun and things like that.”</p> <p>-“How to manage your time and balance work with your own personal life.”</p> <p>-“In the end, you need to weigh the responsibilities of your profession with the things that keep you in balance and that maintain your sanity. Because you could very easily spend all your time trying to impress your supervisors, your chiefs, your attendings, and then you would leave no time for yourself.”</p> <p>-“One of the things that it seems that residents try to instill in you is how to participate in those life- and family-sustaining things.”</p>
	Responding to Stress (6)	<p>-“How they deal with stressful situations.”</p> <p>-“So seeing that they stress out when they’re in the OR and they break a knot or if they don’t know a question. Then seeing them afterwards and how they brush it off and know that there’s more work to do and it’s not the end of the world. That was very therapeutic to know that I’m not going...there’s no way you can impress everyone all the time. So, seeing them stressed out and how they responded was actually good for me.”</p> <p>-“They’d have so much to do and they’d stop to laugh and kid around. I thought that was amazing because otherwise the stress would get to you for sure. I totally appreciated that this is a skill they don’t teach you in medical school.”</p>
	Responding to Criticism and Feedback (4)	<p>-“Times when they did something that was positive and that was interpreted not that way by the chief or by an attending, and seeing them sweat and still come out ok. I felt for them, and learned a lot from that.”</p>

		<p>-“I’ve seen a bunch of times, especially on surgery, residents get completely chewed out by attendings. And then the attending leaves, and the residents are like, “Oh, it’s okay. It’s just because he loves me.” Or like, “It’s because it’s going to better my career, or because they actually care.” I learned how to graciously accept that criticism...not to take it personally.”</p> <p>-“So the way they respond to feedback can actually serve as a model for how you might be able to take it, or respond to it. That helped me.”</p>
	Thinking and Responding Quickly (3)	<p>-“How to think fast and in the moment.”</p> <p>-“How to think on your feet.”</p>
	Developing and Modifying Routine (2)	<p>-“How they do things routinely and how they have to modify their routine.”</p> <p>-“They showed me how to adapt to different situations.”</p>
<b>Functioning as a Student/Resident (19)</b>		
	Roles and Expectations of Students (9)	<p>-“Residents explained to me what my role should be.”</p> <p>-“Learning my role as a medical student.”</p> <p>-“[The resident would say] ‘This is what the attending expects you to do. So, this is what you’re doing now’.”</p> <p>-“What do they expect with their presentations? What do they expect when the patient comes in the room? Are you supposed to wait or are you not?”</p>
	How to Function as a Resident (8)	<p>-“The stuff that we’re going to need to know come intern year.”</p> <p>-“How to function as a resident, because that’s what you’re going to be doing.”</p> <p>-“They also gave me advice that taught me how to function like a resident, even though I’m still only a student.”</p>
	Transitioning from Preclinical to Clinical Environment (2)	<p>-“I’ve also learned about transitioning from pre-clinical to clinical. I think that’s one of the skills that the residents remember better than anyone else, and so they’re able to speak in the manner of, you know, ‘When I did this transition...’ or, ‘When I was on my surgery clerkship this is what I did’.”</p> <p>-“You can’t start accessing higher level knowledge and higher level analysis. So the interns really help bridge that gap and make it a little bit smaller.”</p>
<b>Life-Long Learning (9)</b>		

	Self-Directed Learning (4)	<p>-“I also learned how they learned new stuff. We had a case that looked like something the residents had seen before and we all went about treating it as per usual. But then the patient got sicker, not better, and the intern had to think long and hard about what happened and what to do about it. She curbed-sided a bunch of people and kept trying to figure out why this case was different.”</p> <p>-“How to be professionally curious.”</p> <p>-“How to do literature searches and how to find information that you don’t have then and there when you need it.”</p>
	Technology to Use at the Point of Care (3)	-“The use of tech. They would teach you how to look things up on your phone, and what apps are good, how to down load them and how to use them.”
	Reading the Seminal Literature (2)	-“My residents pointed me toward a lot of seminal literature.”
General Comments (9)		
	What Not To Do (5)	<p>-“Then there are residents that are...not good with patients. I was like okay I’m not going to be like that. I will be the opposite of that.”</p> <p>-“What not to do.”</p> <p>-“If I see a resident do something I really don’t like, I can say, “I don’t to ever do that. I don’t want to ever talk to a patient that way.””</p>
	What To Do (4)	<p>-“A lot about what to do and how to behave.”</p> <p>-“There were behaviors I learned...that I want to emulate.”</p>
Career/Professional Development (7)		
	Career Development (4)	<p>-“The myths and truths about residency especially in regards to choosing programs.”</p> <p>-“General career guidance...the way I look at it, knowing what your eventual career is like is sort of like a step-wise process where it becomes gradually clearer. So the residents have one clearer step than us...like what our lives are actually going to be like when we finish school. So it’s good to get perspective from around the bend that you might not otherwise have.”</p>
	Culture of Different Fields	-“Learning the actual cultures of different specialties. You hear about stuff like that before you start but you don’t really know it until you see it and hear it.”

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(3)	-“I heard surgery was so-and-so and ped[iatric]s was filled with kind, understanding people and how so and so specialty thinks this of another specialty.”
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Medical Content (7)	
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Basic Knowledge (7)	-“Content type teachings.” -“General antibiotic review, just major classes and major illnesses.” -“Like the little shortcut diagrams for lab values.” -“Helping me interpret lab values or basic things like that.”