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Interprofessional Learning through Shadowing: Insights and Lessons Learned

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Abstract

Background—Interprofessional education (IPE) aims to improve patient outcomes. Interprofessional shadowing improves students' knowledge of different roles and attitudes toward other professionals.

Aim—This study evaluates (1) how pre-clinical medical students describe the roles of the healthcare professionals they shadowed, and (2) whether shadowing can be used to introduce medical students to the benefits of interprofessional collaboration, and if so, in what ways.

Methods—Second-year medical students shadow another discipline and write a reflection on the shadowed discipline's role and collaboration in patient care. A non-proportional stratified random sample of these reflections was coded during an iterative process. Any number of the 13 possible codes could be assigned to each reflection. Codes relevant to the research questions underwent narrative analysis.

Results—The most frequent codes were 'specific function of shadowed discipline (SD)' (88%), 'SD's general purpose' (86%), and 'value of SD's role' (68%). One-third of reflections referenced 'communication,' and one-third mentioned 'teamwork.' Insights gained included an appreciation for interprofessional care and a global perspective on patient care, extending beyond the inpatient encounter.

Conclusion—Through shadowing, students achieve several IPE core competencies and a broader perspective on patient care. Shadowing is an effective pedagogical method for IPE in the pre-clerkship curriculum.

Introduction

Broad implementation of interprofessional education (IPE) in healthcare responds to the recognition that effective teamwork helps to optimize patient care and outcomes. Educating healthcare professionals for collaborative work aims to improve knowledge and appreciation of partners' roles, as well as to improve communication within teams. The World Health

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Organization has defined IPE as “occasions when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” (World Health Organization 2010).

The Interprofessional Education Collaborative Expert Panel has delineated several core competencies for interprofessional collaborative practice. They fall into four domains: “values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork.” As students progress through training, they should be given opportunities to gain the knowledge, attitudes and skills to achieve the competencies in each domain (Interprofessional Education Collaborative Expert Panel 2011).

Previous studies support the use of shadowing as an approach to help students build competencies in interprofessional collaborative practice. Shadowing can introduce students to the roles of other professionals (Fougner 2011, Wright 2012, Rosen 2013, Shafran 2015, Vasset 2015). Students also learn about communication and teamwork through shadowing activities (Fougner & Horntvedt 2011, Wright et al. 2012, Rosen et al. 2013). Additionally, shadowing can bring about attitudinal change. Shadowing increases students’ respect for other healthcare professionals (Shafran et al. 2015). Students who shadow nurses have increased openness to learning from nurses, knowledge about what nurses bring to the team, and respect for the knowledge and skills of nurses (Jain et al. 2012).

Of the four interprofessional shadowing studies involving medical students, two utilized survey data to assess students’ attitudes (Jain et al. 2012, Shafran et al. 2015) with results as detailed above. The other two studies analyzed students’ written reflection papers. One was a study of first year medical students shadowing nurses and included a small group discussion with nursing students (Rosen et al. 2013). This study found several themes among the reflections: recognition of nurses’ knowledge and responsibility, the importance of communication and teamwork and application of basic science information. Some students reported feeling nervous, awkward or humbled by the experience. Another group studied students from a variety of disciplines, including medical students, who shadowed a range of other disciplines (Wright et al. 2012). This study involved a task sheet to guide students’ reflections but did find some unprompted themes including attitudes toward other professionals, power relationships among professionals and the impact of communication.

To further explore what medical students learn from an interprofessional shadowing activity we examined written responses to an open ended prompt about their experiences. This study is unique in that students can choose whom to shadow from an array of professionals, the reflection prompt is open-ended, and written reflections, rather than survey data, are examined. This open-ended approach to data gathering allowed us to collect a wide range of responses from the students. Student essays were analyzed to explore (1) how pre-clinical medical students describe the roles, functions and contributions of the healthcare professionals they shadowed, and (2) whether shadowing can be used to introduce medical students to the benefits of interprofessional collaboration, and if so, in what ways.

Methods

All Baylor College of Medicine first and second year students are required to enroll in an 18-month course Patient, Physician and Society (PPS). The course teaches students basic doctoring skills, including history taking, physical examination and communication skills. Students practice these skills during preceptor sessions with an outpatient preceptor the first year and an inpatient preceptor the second year. Students are thus introduced to the inpatient environment in the fall of the second year in preparation for starting clerkships in January. Since 2012 the second year students have been required to participate in an interprofessional shadowing activity as part of PPS. The goal of this IPE intervention is to increase students' awareness of the roles of other healthcare professionals in caring for patients. There are two learning objectives: (1) explain the role of physical therapists, occupational therapists, speech pathologists, nurses, patient educators and social workers in the care of the hospitalized patient, and (2) describe how physicians can best interact with other healthcare disciplines to optimize patient care. During the session medical students spend two hours in the hospital shadowing a healthcare professional from another discipline, and then write about the shadowing experience in response to the prompt "How does the role of the therapist or nurse you shadowed integrate with the physician's role in caring for the hospitalized patient?" Students are expected to answer the prompt using their own words and receive credit for completing the assignment. Essays averaged one page in length. Students choose which specialty to shadow from a list of available shadowing sessions. There were more opportunities to shadow some disciplines than others, due to the schedules of the individual departments.

The present study was approved by the Institutional Review Board within the context of a larger grant. It examines three cohorts of second year students: 2012, 2013 and 2014. In total 564 students were enrolled in the course across all three cohorts ($n = 188, 191$ and 185 , respectively) with 97.3% completing the assignment. None of the reflections included any demographic variables (e.g., gender or race/ethnicity) beyond cohort.

Data Analysis

The reflections were reviewed for content to determine themes which addressed our two research questions. (1) How do pre-clinical medical students describe the roles, functions and contributions of the healthcare professionals they shadowed? (2) Can shadowing be used to introduce medical students to the benefits of interprofessional collaboration, and if so, in what ways? Two researchers (AK and LS) reviewed a pilot set of 75 reflections (25 from each cohort) to identify themes addressing the research questions. These themes formed the initial code set. The reflections were deemed data rich from this first review. We used a non-proportional stratified random sampling approach for selecting 25% of our reflections giving us a total sample of 172 reflections to code. The sample was stratified by cohort and by shadowed discipline. The total sample was then divided into manageable sized batches of approximately 35 reflections with samples from each cohort.

The initial code set of 21 codes was finalized at 13 codes (Table 2) after coding the pilot set. Some of the 8 deleted codes were similar to or subsumed by other existing codes. Others had

a very low frequency, and we determined that they did not add to our exploration. After the review of the first 75 reflections to create the initial code set, the two authors were joined by a third analyst (TL) to code the reflections independently beginning with the pilot set. The three analysts included a physician, a doctorate-level methodologist and a masters-level research assistant / qualitative analyst. Each analyst, using a coding checklist, identified the shadowed discipline (SD) and whether or not the code was present. The number of codes which could be assigned was not restricted. New codes could be proposed at any stage in the process.

After each batch was coded by each analyst, the second author performed reliability agreement for the shadowed discipline. For the six sets of reflection batches, we had 100% agreement for three batches, 97% for two batches and 91% for one batch. Instances of less than 100% agreement were the result of unclear wording or terminology from the student; however, the physician coder who was also the course director had knowledge which clarified information regarding shadowed discipline and led to resolution.

The codes were also checked for level of agreement across the three coders to guide discussion during the iterative process. If all three coders indicated presence of a code, it was assigned to the reflection. If two of the three coders indicated presence and no issue or question was raised by the third coder for discussion, the code was assigned. If a code was indicated as present by only one coder, it was not assigned unless that coder advocated for it and one or both of the other coders agreed.

Once all the reflections were coded with their final assignments, we performed thematic analyses for specified codes to assess whether and how students were learning about the benefits of interprofessional collaboration. These codes included 'value of the SD,' 'attributes of the SD,' 'communication,' 'teamwork,' and 'lack of collaboration.' Finally the two codes 'learned something new' and 'insights' were also analyzed to determine what specific new knowledge students had gained and any major revelations. We employed Microsoft ACCESS for data management and queries for frequencies. We managed our qualitative data using NVivo Version 11 Pro qualitative software.

Results

Table 1 shows the frequency of disciplines shadowed. Physical therapy (PT) was the most frequently shadowed, followed by social work and then nursing. Table 2 lists the 13 codes, defines them, and includes the frequency with which each code was present. The most frequent code was 'specific function of SD' (present in 88% of responses). This code represented specific tasks the SD performed. For example, a nurse administered medication, or an occupational therapist devised splints. The second most common code was 'SD's general role/purpose' (present in 86%). This code was present if the student included a global description of the SD's role or purpose. For example, physical therapists work to mobilize patients. The 'value of SD's role' was third highest, occurring in 68% of reflection papers. The presence of this code meant that the student commented specifically on the value or importance of the role of the SD.

Three codes specifically addressed the question of how students describe the roles, functions and contributions of the shadowed healthcare professional: 'SD's general role/purpose,' 'specific function of SD,' and 'role differences.' All but one of the reflections (99.4%) included at least one of these codes. Table 3 lists sample student comments on the general purpose and specific roles of the various shadowed disciplines. It also shows how the students contrasted the role of the shadowed healthcare professional with that of the physician.

Value and Attributes

'Value' (68%) was coded if the medical student observed and commented on the importance of the shadowed discipline's role. 'Attributes' (13%) was coded when the student described the shadowed healthcare professional using an adjective or adverb. For 'value,' descriptors included integral, crucial, critical, key, invaluable, the heart of the team, bridge, indispensable, and essential. Descriptors such as compassionate, dedicated, very knowledgeable, proficient, attentive and observant were included in comments for 'attributes.' The descriptors for both 'value' and 'attributes' were applied across all of the disciplines. Overall the medical students found their shadowed disciplines to be highly valuable. They respected the proficiency of these individuals as well as their bedside manner and approach to patient care.

Team/Teamwork

Approximately 33% of reflections mentioned teams or teamwork. The themes which surfaced regarding 'team / teamwork' included interdependence and significant value of each team member and his/her role. Students witnessed interprofessional teamwork in action.

- "Healthcare jobs are very interdependent. For example, the doctor has ordered a medication, relying on the nurse to give it timely and properly. The nurse depends on the pharmacy to approve the medications quickly so immediate orders can be fulfilled."

They gained an understanding of the different facets that go into patient care.

- "Because these patients [patients admitted with a stroke] can require much rehabilitation for many aspects, speech pathologists, physical/occupational therapists and physicians must be able to work in a well-integrated team."

One student described the relationship between physicians and other professionals as "symbiotic."

Communication

Comments regarding the 'communication' code provided additional perspectives on its importance for effective teams and teamwork. Students' comments regarding communication included references to documentation, the importance of listening, and impact on patient outcomes.

- “The therapist can provide critical information not only about the patient’s physical well-being, but they can provide information about a patient’s psychological health and their progress in the hospital setting. Communication between both physician and physical therapist, whether verbally or in patient notes, can not only help the physician with patient care, but can likewise help the physical therapist. When the therapist is fully informed about the patient status, it can further facilitate their exercises and expectations of patient progress.”

Thus the student learned that communication is beneficial to both the physician and physical therapist, who share the ultimate goal of recovery for the patient. This example also shows that healthcare professionals do not simply stick to their silo but treat the patient as a whole, for example, recognizing psychological health. Another student also noted that a physical therapist may “pick up on symptoms/concerns of the patient that the rest of the health care team missed.” This student resolved to “read all the therapy notes...during rotations and...as a physician.”

Students were able to witness both the challenges and the critical nature of verbal communication. One student wrote:

- “Instead of spending more time in the patient rooms, [the nurse] was on the phone, trying to call the pharmacy, page a doctor, or communicate with other nurses who were trying to help. While slow and difficult, this communication was critical on more than one occasion – informing the doctor of a missing order for insulin and catching what could have been the beginnings of a hematoma in a post-cath patient.”

Thus medical students educated in the era of the electronic medical record are introduced to the importance and efficiency of verbal communication.

- “The nurse showed me how she is able to see what the physicians ...order for tests via EPIC. She ... generally will be present for her patients when the internal medicine team rounds in the morning. This she said was the best way to know what changes in care there would be for her patient.”

Lack of Collaboration

While there were very few comments about lack of collaboration between physicians and other disciplines, these episodes provided important learning experiences for the students. Several students commented that doctors were infrequently seen on the wards. A few noted that the majority of communication between doctors and other professionals occurred via the electronic medical record. One student witnessed a physician being dismissive of the occupational therapist.

- The patient’s “grandmother and mother... were clearly distressed and said they had not received any updates from the doctors. At this point, the surgeon entered with her resident and told the patient’s mother and grandmother that he was fine to be discharged the next day. The surgeon had not waited for the report from OT nor taken the time to consult [the

occupational therapist] who was standing next to her in the room. The surgeon did not even acknowledge our presence.”

Students responded variably to these instances of lack of collaboration. The student who witnessed the negative interaction between the surgeon and occupational therapist concluded that the surgeon was unaware of the role or importance of occupational therapy. Some students assumed that doctors were too busy with other patients to be seen regularly on the wards. Others accepted that the majority of communication would occur electronically.

Learned Something New

About a third of students noted that they learned something new during this experience. Increased awareness of the roles and responsibilities of various professions was the most frequently type of specific new knowledge acquired. However, students also learned about attributes of people in other professions, the value of other professions, the importance of communication and the interdependence of the various professionals involved in patient care.

Insights

Approximately 17% of students’ reflections indicated gaining new insights from this experience. Several students gained an appreciation for the interprofessional nature of patient care.

- “The experience overall instilled in me the realization that each member of the care team has a specialty but at the same time each has the responsibility to treat the whole patient... Other team members should be regarded as reliable sources of information about the patient’s status.”

They gained respect for other members of the healthcare team and learned to value their contributions and input. Students expressed a desire to get to know their non-physician colleagues.

Other students described how patient educators, nurses, physical and occupational therapists, social workers and speech pathologists help to ensure that the diagnostic and therapeutic efforts of the physician can be carried from the inpatient setting into the patient’s day to day life.

- “[The patient educator] taught the patient and his wife how to change his colostomy bag. This encounter reminded me that we as physicians can provide the highest quality of care in the world, but if we do not teach the patient how to take care of themselves on a daily basis, they will not have a high quality of life.”

Many of the insights reflected a more global perspective on patient care, for example increased awareness of patients’ lives outside the hospital. They highlighted the importance of a thorough understanding of the patient’s social situation.

- “I think today I saw more how that social history is an important part of medical care that can really affect how the patient does in the long run.”

- “My understanding is that the role of the social worker ensures that all of the health related efforts put forth by the doctor don’t go to waste due to the patient’s life circumstances. This includes transportation difficulties, living situations, access to medication, and a slew of other complicated and diverse factors. If these factors are not adequately addressed, hospital care becomes a very expensive Band-Aid with little lasting benefit for the enormous costs.”

Thus students gained perspective on their role as future physician, how their role fits into patients’ lives, and how other professionals can help ensure that the common goal of patient well-being is sustained.

Discussion

Through interprofessional shadowing, students were effectively introduced to the roles and responsibilities of healthcare professionals from other disciplines. The students were able to identify their unique contributions and cite their value and importance. Not only did medical students gain an appreciation for the benefits of interprofessional collaboration, but they also witnessed the mechanism by which that collaboration occurs – largely through effective communication and teamwork. Students identified the benefits of interprofessional collaboration, especially in terms of patient outcomes. Many students expressed resolutions to work collaboratively with other members of the healthcare team when treating their future patients.

The present study goes beyond prior research on interprofessional shadowing demonstrating improvements in knowledge and attitudes (Fougner & Horntvedt 2011, Jain et al. 2012, Wright et al. 2012, Rosen et al. 2013, Shafran et al. 2015). It shows that shadowing can yield insights for preclinical students that many physicians do not gain until residency or beyond. Students gained a broader perspective on patient care. They were able to see beyond simply diagnosing and treating a disease to contextualizing the patient’s illness within their social situation. They gained an understanding of how life factors and psychosocial support impact patients’ prognoses. Students learned lessons like the importance of a thorough social history. Several students identified habits they plan to develop during their clinical years. These included reading all notes in the chart, getting to know nurses, and communicating verbally with nurses and therapists to learn more about how the patient is doing. Thus, this IPE shadowing activity has the potential to change behavior, though further research is necessary to confirm such a change in behavior (Thistlethwaite 2012).

The interprofessional shadowing activity also reinforced lessons the students learn regarding patient safety. Students were able to witness protocols being followed in the hospital, for example, for blood transfusions or heparin drips. Students also witnessed near misses, where communication with an individual from another discipline helped the physician to avoid a mistake. These real world demonstrations of the importance of respect for colleagues in other professions and communication among various professionals may help to shape the students’ behavior in the future.

Review of the students' reflections revealed that overall the activity's learning objectives were met. Additionally, through shadowing, students made progress toward achieving several of the core competencies for interprofessional collaborative practice: 1. "Explain the roles and responsibilities of other care providers and how the team works together to provide care." 2. "Respect the unique cultures, values, roles/responsibilities, and expertise of other professions." 3. "Recognize one's limitations in skills, knowledge, and abilities." 4. "Recognize how one's own uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare team, contributes to effective communication, conflict resolution, and positive interprofessional working relationships" (Interprofessional Education Collaborative Expert Panel 2011). The last competency was a stretch for students this early in their training, but some students were able to gain a sense of their own uniqueness, in terms of experience level, expertise and culture.

Our interprofessional shadowing activity produced an array of revelations for the students at little cost. The shadowing activity we implemented required the willingness and participation of members from other disciplines to have students shadow them. It required coordination with these departments and the students' schedules. Otherwise, there were no costs in implementing this program, and the time commitment required from the students was minimal.

Our study has a few limitations. It was limited to one institution, and shadowing was conducted at an urban county hospital. Students shadowing in another setting may learn different lessons. It is possible that the content of the students' reflection papers was influenced by the Hawthorne effect, e.g., the students were writing to please the grader. However, students received full credit for completing the assignment, not for their content, which should have mitigated this effect. The nature of the prompt, which implied the merits of interprofessional care, may have influenced results. Since not every reflection was analyzed, it is possible that the sample studied was not representative of the larger group of students. The random nature by which reflections were chosen for analysis should have offset this possibility. The study was also limited by the small amount of time each student spent shadowing and by the fact that each student shadowed only one discipline. The impact of the activity might be broader if the students came together to discuss their experiences in small groups or if the reflection essays were shared broadly with the class. Lastly, our study had no comparison group.

The optimal timing of interprofessional education has been debated in the literature. This interprofessional shadowing activity took place in the second year of medical school with students who would start clerkships in the coming two to three months. One benefit to this timing is that students are at a critical learning period, a time of transition during which they are developing their professional identities (Soo et al. 2016). Goals and resolutions developed before starting clerkships may persist through students' clinical training and may mitigate any negative role models students encounter. Furthermore some have argued that interprofessional education can contribute to professional identity formation and may result in physicians who are better suited to provide patient-centered care (Langendyk et al. 2015). Timing interprofessional shadowing shortly before clerkships also gives students at least one

contact in another field, an individual who may be able to assist them in the course of future patient care.

Given the nature of work in the healthcare professions, interprofessional education would ideally be embedded longitudinally throughout the curriculum. The types of activities should vary based on students' level of training. Shadowing in a clinical setting is more appropriate for pre-clerkship students, while more senior students may benefit from other IPE formats, including experiential learning during clerkships and teamwork simulations with students from other disciplines.

Conclusion

We posit that shadowing is a useful pedagogical method for IPE in the pre-clerkship curriculum. Shadowing gives pre-clinical students a broader perspective on patient care that goes beyond making a diagnosis and initiating treatment. Interprofessional shadowing should be included early in medical student education as part of a broader interprofessional education curriculum with the goal of improving safety and health outcomes for patients. Future research on shadowing as a method for IPE should consider use of a comparison group.

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Declaration of interest:

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Practice Points

- Through interprofessional shadowing medical students gain knowledge of the roles of other professions, respect for other professionals, awareness of the importance of communication and an introduction to teamwork in the clinical setting.
- Interprofessional shadowing can provide students with a more global perspective on patient care.
- Shadowing is a useful pedagogical method for interprofessional education in the pre-clerkship curriculum.

Table 1

Frequency of Shadowed Disciplines

	Cohort			Total
Discipline	2012	2013	2014	
Physical Therapist (PT)	25	25	13	63
Social Worker	5	13	24	42
Nurse	12	6	14	32
Patient Educator	4	3	6	13
Occupational Therapist (OT)	4	1	4	9
Speech & Language Pathologist	3	2	2	7
PT/OT Team	0	3	3	6

Table 2

Definition and frequency of codes

Code	Definition	Number (Percent)
Specific function of SD	Describes specific duties of SD	152 (88%)
SD's general role/purpose	Global description of SD's role/purpose	148 (86%)
Value of SD's role	Specific comment on the value or importance of the SD's role	117 (68%)
Role differences	Student notes how the role of the SD differs from that of the physician	100 (58%)
SD's relationship to physician	Description of working relationship between SD and physician	96 (56%)
Learned something new	Student mentions gaining new knowledge	62 (36%)
Communication	Student references impact or importance of communication	59 (34%)
Team or teamwork	Terms "team" or "teamwork" present in reflection	57 (33%)
Shared goal	Physician and SD are working towards a common goal	39 (23%)
Patient safety	Student notes practices that promote patient safety	34 (20%)
Insights	Major take-home message student learned from the experience that may shape the student's future practice	29 (17%)
Attribute(s) of SD	Student uses adjectives to describe SD	23 (13%)
Lack of collaboration between SD & physician	Instances of disagreement or disrespect between physician and SD	7 (4%)

Table 3**Student Descriptors of Roles and Functions of the Shadowed Healthcare Professionals**

Shadowed Discipline	General Purpose	Specific Functions	Role Differences
Physical Therapist	"The PT's work with patients from every unit of the hospital, mostly focusing on rehabilitating patient's mobility and motor functioning."	"PTs are very important in helping patients with postoperative mobility, which includes sitting up, standing up, balance, walking, and gait."	"While the doctor was involved with the healing of the wound, the physical therapist was involved in helping the patient to learn to walk again."
Social Worker	"Thus, the social worker provides the crucial link between the patient's life and their health, allowing the patient to take care of their social needs so that they can then focus on their health concerns."	The social worker "is greatly involved in the transition to hospice care, which involves extensive conversations with families and location of hospice agencies with the appropriate indigent funding, given that most hospices only have enough resources to financially cover a few new patients at most."	"While the physician takes care of the hospitalized patient's medical needs- medication, treatment, blood tests- the social worker takes care of the patient's emotional and social needs."
Nurse	"Nurses deal much more with the day-to-day care of patients, ensuring that all their needs are met."	"The nurse was responsible for making sure the patient received their medications in a timely manner."	"Unfortunately, due to the high number of people needing medical care in the hospital, the doctor is not always available to their patients. The nurse fulfills this need for constant care and therefore gets to know the patient better than anyone else in the hospital."
Patient Educator	"The patient educator helps prepare the patient and their family for how to take of themselves with their new condition after they are discharged."	"She specifically works with newly diagnosed diabetics and new ostomy patients, educating and demonstrating the techniques they need for survival and overall health once they leave the hospital."	"As a physician you can prescribe all the medicine you would like to help care for a patient; however, if the patient is unable to properly use this medicine or other treatments, it will be of little use in helping them. The patient educator helped fill in the gaps of patient care to make sure that our plan is an effective one."
Occupational Therapist	"Occupational therapists, as well as physical therapists, work closely with patients to improve muscle strength and motor skills in order to improve patients' quality of life."	"Some of the specific services the OT performs include splinting and training the patient to perform [activities of daily living] with the splint, preserve range of motion and prevent contractures in immobilized and non-ambulatory patients, train families and other caregivers to perform range of motion exercises and skin checks, and teach patients strength-building and balance exercises to help give them movement autonomy."	"Unlike physicians, occupational therapists are not qualified to make a diagnosis. Instead, they provide specific therapy tailored to the diagnosis made by a physician."
Speech Pathologist	"Speech pathologists also	"The Speech Pathologist administered liquids of	"The physician's role truly dealt more with trying to

Shadowed Discipline	General Purpose	Specific Functions	Role Differences
	work with patients who have difficulty swallowing.”	various thicknesses and tested what the patient could swallow without risk of vallecular pooling or aspirating. This procedure is critical to determine what types of foods the patient can consume by mouth.”	make the patient’s underlying condition better, whereas the speech therapists role dealt more with making the patients comfortable while they were trying to get better.”