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Pre-Anesthetic Evaluation:

A Needs Assessment of Student Registered Nurse Anesthetists Transitioning to Clinical Practice

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Abstract

The pre-anesthetic evaluation (PAE) is a critical part of providing anesthesia, and an important component of patient safety. Student registered nurse anesthetists (SRNAs) are often required to independently perform the PAE upon entering their clinical training. Stress, anxiety, doubt, a novel environment and time constraints can lead to a lack of confidence and competence at this time. These barriers can result in an inefficient and inadequate assessment. The purpose of this qualitative study was to conduct a needs assessment to determine the overall readiness of SRNAs to independently perform a thorough PAE upon entering clinical residency. A focus group was conducted and qualitative data software was used for thematic analysis. Four main themes were identified from the focus group data. These were barriers to performing the PAE, emotions experienced, facilitators for performing the PAE, and the SRNA's experience of their role transition. The ability to practice the PAE prior to entering clinical residency as well as using a reference guide are beneficial to SRNAs as they start their clinical residency. These tools can help decrease stress and anxiety allowing for a more consistent, thorough, and efficient PAE.

Keywords: student registered nurse anesthetist, clinical residency, pre-anesthetic evaluation, preparedness, barriers

Introduction

The pre-anesthetic evaluation (PAE) is defined as the "process of clinical assessment that precedes the delivery of anesthesia care for surgery and non-surgical procedures".¹ It is a critical part of providing anesthesia and an important component of patient safety. Determining the patient's readiness for surgery, as well as establishing an appropriate anesthesia plan, are accomplished by thorough review of the patient's medical history and physical assessment. Necessary components of the pre-operative assessment include: a review of anesthesia and medical history, including medications; a directed physical exam; a review of diagnostic data, and assignment of American Society of Anesthesiologists (ASA) physical status score.¹

Thorough PAE has been shown to reduce morbidity and mortality.^{2,3} The physical assessment and review of physiologic systems may uncover issues that need to be managed medically in order to minimize anesthetic and operative risks. During the pre-operative period, time constraints often hinder the ability to perform an adequate PAE, as well as establish a provider-patient relationship.⁴ These barriers may be magnified for the inexperienced anesthesia provider.

Previous studies have shown that the student's transition from didactic to clinical education is a period of increased anxiety and decreased self-efficacy.^{5,6} These factors can have a negative impact on clinical performance.^{7,8} One of the initial expectations of the student registered nurse anesthetist (SRNA) as they start their clinical residency is to perform a PAE of their patient. Stress, anxiety, doubt, a novel environment and time constraints can lead to a lack of confidence and competence at this time. These barriers can result in an inefficient and inadequate assessment. The purpose of this qualitative study was to conduct a needs assessment

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to determine the overall readiness of SRNAs to independently perform a thorough PAE upon entering clinical residency.

Literature Review

No studies were found that explored the experiences of SRNAs' readiness to perform the PAE and there was limited research on the perceptions of SRNAs' readiness to enter their clinical residency. The articles included in this literature review can be categorized into two main topics: student-related factors during transition into clinical practice, and the PAE.

Student Transition into Clinical Practice

Previous research supports the fact that students in medical professions experience high levels of stress and anxiety as they transition into the clinical portion of their education. A crosssectional study by Shah and Ahmed⁶ found that medical students beginning their clinical residency experienced increased anxiety during this time.⁶ A qualitative study by Godefrooij, Diemers, and Scherpbier⁵ explored medical students' experiences with stress during their first clinical year. Students found it difficult to identify their role and acknowledged feelings of ignorance and depression. A self-perceived lack of knowledge combined with inexperience made the entrance to clinical practice shocking.⁵ Similarly, a qualitative study by Chipas et al⁹ explored the sources of stress specific to the SRNA. When graded on a scale of 1 to 10, the mean level of stress among SRNAs in this study was 7.2. Some sources of this stress included a novel environment, information overload, role ambiguity, and first-time clinical experiences. Overall, they found a significant correlation between level of stress and negative student outcomes, including decreased health and depression.⁹

Student anxiety levels can lead to decreased confidence and these factors can negatively impact clinical performance. Many studies have shown the utility of pre-clinical interventions in

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reducing students' anxiety and increasing their self-efficacy. A descriptive study by Imus, Burns, Fisher, and Ranalli⁷ found that a pre-clinical skills intervention was effective at reducing anxiety and increasing confidence of SRNAs. These students expressed difficulty maintaining didactic material without immediate clinical application. The program modified their curriculum to include an early clinical experience in the operating room during the first year of didactic education. This intervention helped reduce the anxiety and apprehension students felt upon entering their clinical rotations.⁷

Littlewood et al¹⁰ performed a systematic review examining the effects of early clinical experience in medical students. The traditional model of medical education includes classroom learning before practical application. However, students in programs which included an early clinical experience had more motivation to learn, greater satisfaction with their studies, better understanding of the subject matter, more confidence in their knowledge, and an improved sense of self-awareness in the clinical setting.¹⁰ The benefit to learning from real human interaction was also studied by Bell, Boshuizen, Scherpbier, and Dornan.¹¹ Over five hundred medical students were asked to rate their teaching and learning experiences during their first year of clinical residency. Having real patient encounters helped the students solidify their theoretical knowledge, made the learning more relevant, and helped them acquire complex skills.¹¹

The effectiveness of pre-clinical interventions has been shown in nursing students as well. Watt, Murphy, Pascoe, Scanlon, and Gan⁸ studied the impact of a structured learning program on nursing students' level of anxiety and self-efficacy. This program consisted of three days of group learning and clinical simulation activities during the students' first week of clinical rotations. The results showed a statistically significant reduction in self-reported levels of anxiety and increase in self-efficacy.⁸

Pre-anesthetic Evaluation

The PAE is a critical part of anesthesia care and an important component of patient safety. According to the American Society of Anesthesiologists (ASA)¹, the pre-anesthesia assessment should include an evaluation of the patient's medical records including pre-operative testing, a patient interview and physical examination. Determining the patient's readiness for surgery and establishing an appropriate anesthesia plan are accomplished by thorough review of the patient's medical history and physical assessment. The review of systems may uncover morbidities that need to be managed medically in order to minimize anesthetic and operative risks. In a national database review by Kluger, Tham, Coleman, Runciman, and Bullock³, the Australian Incident Monitoring Study found that 11% of all anesthesia-related incidents were attributed to inadequate or incorrect preoperative assessment. Some of these resulted in ICU admission and/or death. Many of these incidents were rooted in improper pre-operative airway assessment and insufficient patient evaluation. Notably, they found that only five percent of all the reviewed incidents were unpreventable. Factors that contributed to these incidents included limited time between cases, pressure from surgeons to proceed with the operation, and lastminute add-on cases.³

A study by Hawes, Andrzejowski, Goodhart, Berthoud, and Wiles⁴ further explored the variables that impact the amount of time required to perform the pre-operative assessment. These factors included the patient's age, ASA physical status, type of surgery, and the individual assessor. The factor which had the most impact was the designated ASA physical status.⁴ A literature review by Halaszynski, Juda, and Silverman² explored the essential features of the pre-operative assessment, with particular emphasis on high-risk patients who are more likely to experience perioperative complications related to their co-morbidities. They emphasized the

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importance of pre-admission testing centers in optimizing preoperative conditions in order to reduce postoperative mortality.²

The complexity and amount of information that must be obtained during the PAE allows the possibility of missing important data. Ausset, Bouaziz, Brousseau, Kinirons, and Benhamou¹² examined the utility of a standardized form in reducing omission errors in the pre-anesthetic visit. They found that overall quality indicators were significantly higher when standardized forms were used.

The PAE is also an important time to establish the provider-patient relationship. In a single group observational study by Carnie,¹³ patient feedback was collected on anesthetists' performance of the pre-operative visit in terms of the anesthetists' demeanor, discussion of complications, and proposed anesthetic procedure. The dissatisfied results all had to do with lack of communication and inadequate time given to the pre-operative visit.¹³

In summary, literature supports the problems of student anxiety, lack of confidence and self-efficacy when entering clinical practice. These issues, when combined with the critical nature of the PAE, and time constraints not unique to students, can lead to suboptimal patient outcomes. The absence of research exploring these concepts as they relate to the student nurse anesthetist supports the need for future research.

Methods

A qualitative, semi-structured focus group design was chosen for this study to explore the SRNAs' experiences performing the PAE as they transitioned to clinical practice. With limited previous data addressing this topic, qualitative methodology was chosen as the best approach to capture the feelings and opinions of those who have recently experienced them. A focus group provides social interaction which can trigger the participants' memories, generate a broader set

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of data, and even uncover topics that may not have been a part of the original research question.^{14,15}

Prior to initiation of this study, Institutional Review Board approval was obtained from DePaul University and NorthShore University HealthSystem. Study participants included a purposive sample of novice SRNAs from NorthShore University HealthSystem who had recently transitioned from didactic to clinical education. A recruitment email with study information was sent to these potential participants which outlined the purpose and format of the study.

A semi-structured focus group was conducted following a local conference which all participants attended. An initial questionnaire was distributed to participants to collect demographic information. The focus group followed a semi-structured interview guide which was developed to address the concepts of interest. The interview began with an initial set of open-ended questions addressing the SRNAs' general perceptions and experiences performing the PAE at the start of their clinical residency. Unstructured, discussion-guided probing questions were used to further explore the participants' responses. Additional questions addressed specific needs of an educational tool to help SRNA proficiency with this skill. The interview was audio recorded and uploaded to a secure cloud on a password protected computer and account in order to protect the participants' privacy. The focus group lasted just under sixty minutes. The audio transcription service, Rev, was used to transcribe the interview. Both principal investigators (PIs) then verified the accuracy of the transcription

The focus interview guide was reviewed and approved by committee members whom also serve as content experts. The questions were deemed appropriate to assess the concepts of interest. Internal validity of the data was strengthened by the structured portion of the interview. Internal validity was further strengthened by qualitative data software which helped identify

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common themes from the data.¹⁶ Recording the interview provided descriptive validity as it protected against misinterpreting or omitting pieces of information. The researchers were able to corroborate data by listening and transcribing the content into qualitative software. This helped identify common themes and give the data interpretive and evaluative validity.¹⁶ External reliability was reinforced by having a well-defined study methodology that is replicable in diverse settings. Having an interview guide with structured questions strengthens the external reliability of this study.

The quantitative demographical data were transferred to Microsoft Excel and analyzed through SPSS descriptive statistics. The qualitative focus group data were transcribed and entered into NVivo qualitative data software. Thematic analysis was performed by both PIs which allowed for the identification of the main themes within the qualitative data.¹⁷ Consensus-building took place with both PIs and committee members to corroborate the findings.

Results

A total of ten SRNAs participated in the focus group. All participants were in the same cohort of one nurse anesthesia program. There were 8 females (80%) and 2 males (20%). Sixty percent were between the ages of 20-29 years while the remaining 40% were between the ages of 30-39 years. Eight of the ten participants identified as White (80%), one as Asian/Pacific Islander (10%), and one as Mixed Race (10%). Half of the participants (50%) had been Registered Nurses for 5-6 years, 30% for 7 or more years, and 20% for 3-4 years. As far as ICU nursing experience, 30% had worked in the ICU for 1-2 years, 30% for 3-4 years, 20% for 5-6 years, and another 20% had worked in the ICU for 7 or more years. Eighty percent of the participants had a Bachelor's Degree as their highest level of education, while 20% also had a Master's Degree.

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Four main themes were identified that related to the pre-anesthetic evaluation (PAE) among SRNAs transitioning into clinical practice. After consensus-building the strongest responses for each theme were identified and documented as illustrative quotes (Table 1). The four themes identified included: barriers to performing the PAE, emotions surrounding the performance of the PAE, facilitators, and role transition of the SRNA entering into their clinical practice. In many instances, there was overlap between one or more themes. Barriers. Several barriers were identified amongst the participants of the focus group. "Barriers" are defined as any factor that created an obstacle for the SRNA completing the PAE. First, it was identified that there were differences in what was expected of students depending on their clinical location. Many participants agreed that "expectations [for the preop assessment] definitely var[y] at different [clinical] sites." (Q1). In addition, several of the participants felt that interruptions (Q3) and the disruption of workflow created a barrier to completing the PAE: "Once my flow gets changed, because a CRNA has his or her flow [i.e. interview process] going, it's like, oh shoot, now what?... And, I think you tend to make mistakes when you ... stray away from your own practices" (Q6). Time constraints also posed a major barrier discussed among the focus group (Q4). One participant expressed, "There was additional pressure... you're just trying to get everything done before [your preceptor] show[s] up. Like, God forbid they show up in the middle of your interview. Then... if you miss something that they thought was important, it kind of sets the tone for the rest of the day" (Q2). Finally, feeling overwhelmed with preparing for all aspects of starting their clinical practice led some of the SRNAs to put less emphasis on preparing for the PAE (Q5). *Emotions*. "Emotions" are defined as feelings and mental states experienced by the SRNA in response to performing the PAE at the start of their clinical residency. This theme was

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recurrent throughout the interview. The responses were varied and many expressed emotions such as fear (Q10) and nervousness (Q8). Several participants expressed feelings of self-doubt and worry that they would "miss something" (Q9) in the PAE and appear incompetent. Many expressed feeling overwhelmed (Q11) and anxious within a novel environment (Q13). There was a self-imposed pressure to perform perfectly under close supervision (Q12). One participant expressed, "I felt like I was a little bird getting kicked off a tree. And... you either learn how to fly now, or you're gonna send me home for the day" (Q7). It should be noted that many of the emotions expressed by the SRNAs also acted as obstacles or barriers to performing the PAE.

Facilitators. "Facilitators" are defined as something that did help, or would have helped, the SRNAs conduct the PAE during the start of their clinical residency. The focus group was asked if they did anything to help them prepare for the PAE, or if they thought anything would have helped them overcome some of the barriers they faced. Several SRNAs mentioned using the electronic form from their program's hospital as a template to guide them through the PAE (Q16). Some of the participants had a unique experience at their clinical site in which they had to perform the PAE on each other in front of their clinical coordinator. These students felt this "mock interview" or "practice run…was nice 'cause it helped you at least identify things that you were forgetting on the first time" (Q14). Many of the students agreed that having an opportunity to rehearse the PAE would have been helpful: "maybe if we just had some time during class [to] run through [the interview] on each other, like partner up and run through it" (Q17).

Role Transition. The theme of "role transition" refers to the SRNAs' feelings upon reentering the clinical environment with the new role of SRNA in place of their previous

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identity as ICU nurses. This theme was discussed in depth. It was mentioned that "we aren't new clinicians. We're experienced clinicians, just playing a different role" (Q20). The participants were in agreement that "one of the main struggles with us having been nurses is that, we were the leaders on our floor. We were the nurse leaders. We were extremely competent, and then all of a sudden, we're put in a situation where we're primed to feel insecure. And, to feel... as if our previous skills are no longer good enough" (Q22). The topic of how to introduce themselves to the patient was a common issue discussed. In fact, introducing oneself to a patient as a novice anesthesia provider seemed to be the "hardest part of the assessment" (Q23). One participant stated "[In] the beginning, you dread... starting the day, interviewing the patient, having to introduce yourself as, like, a student" (Q18). Much of the discussion about role transition overlapped with the themes of emotions and barriers to performing the PAE.

Discussion

A focus group examining SRNAs readiness to independently perform the PAE revealed four main themes with some cross over amongst them. The themes included barriers to performing the PAE, emotions experienced, facilitators, and the SRNA's experience of their role transition.

Many of the barriers identified in this study are consistent with barriers discussed in previous literature. During the focus group, time constraint was a common obstacle. Numerous interruptions and disruption of flow while performing the PAE were other barriers heavily discussed. These obstacles can lead to an incomplete PAE. Research supports the importance of obtaining a thorough PAE as a critical part of anesthesia and an important component for patient safety.^{1,4} Other studies have shown that time-pressured situations have

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contributed to preventable incidents related to insufficient pre-operative airway and patient evaluation.³ Variable patient factors can also impact the amount of time necessary to complete a thorough evaluation.⁴ The participants also discussed how differing expectations between their clinical sites led to uncertainty and stress which acted as another barrier to performing the PAE. This finding is consistent with those of Godefrooij, Diemers & Scherpbier⁵ who found that medical students have similar experiences during their first year of residency. Several of these barriers affected the performance of the PAE as well as the emotional state of the SRNA at this time.

Many of the emotions experienced when beginning clinical residency had a negative connotation such as feeling high levels of stress, nervous and overwhelmed. Literature supports the fact that students in medical professions experience increased stress and anxiety as they transition into the clinical portion of their education.⁶ Much of the stress and anxiety experienced by the SRNAs in this focus group was related to being in a novel environment. This is consistent with findings by Chipas et al⁹ where SRNAs entering clinical practice experienced information overload, role ambiguity, anxiety and stress related to their new surroundings. Godefrooji, Diemers & Scherpbier⁵ corroborated that medical students entering clinical residency also had feelings of ignorance and depression related to their self-perceived lack of knowledge which correlates with the verbalized emotions from this focus group.

During discussion of facilitators for the PAE, several SRNAs mentioned the utility of a template they could follow to ensure they included all components of the PAE. Previous literature has supported that use of a standardized form helped reduce omission errors in the pre-anesthetic visit.¹² Some students mentioned how a simulation or mock interview was helpful, or would have been helpful, in strengthening their own PAE. A study by Imus et al⁷

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described how a pre-clinical intervention helped SRNAs overcome the anxiety and apprehension they felt upon beginning their clinical residency. This pre-clinical experience helped the SRNAs incorporate their didactic knowledge into clinical self-efficacy.⁷ Other studies have supported the utility of pre-clinical interventions and simulations in improving students' level of confidence and anxiety prior to clinical residency.^{8,10,11}

Role identity was a heavily discussed theme within the focus group. As the SRNAs began their clinical residency there was concern about their own self-identity as a clinician. All SRNAs had previous experience as ICU nurses, with high levels of clinical competence, confidence and leadership. However, as a new anesthesia provider they found themselves at the other end of the spectrum. Their inexperience with this new role contributed to increased anxiety and insecurity. Godefrooji, Diemers, and Scherpbier⁵ describe how medical students in their first year of residency can find it difficult to identify their role, the expectations and how to act as a result of their self-perceived lack of knowledge and inexperience. These symptoms have been described by Boshuizen¹⁸ as a "shock of practice".

Limitations

One limitation to this study was the small sample size of ten students. In addition, all the participants were among the same cohort of students at one nurse anesthesia program. Additional studies could include more focus groups with students from other nurse anesthesia programs. This would allow for comparison between student experiences. Another potential limitation to this study was the lack of anonymity that accompanies focus groups. All participants knew each other, as well as the investigators which could have influenced their responses. Some students may have been reluctant to share their experiences for fear of

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judgement by their peers. However, knowing one another could be considered a strength, as all participants may have felt comfortable sharing ideas with their peers.

Recommendations

The findings of this study have described some major themes surrounding the SRNA's experience with the PAE upon entering clinical residency. This needs assessment can help guide development of future interventions. Adding a simulation component or mock interview to the didactic education for PAE would allow SRNAs the ability to practice prior to entering clinical residency. In addition, it may be helpful to carry a pocket-sized reference card which includes all the necessary components for the PAE. Several participants mentioned the utility of a template. Having a quick reference available could help them establish a flow and fine-tune their PAE. This would ensure that all vital components of the PAE are addressed. An example of such a reference is given in Appendix A. Implementation of these interventions with a pretest-posttest would help evaluate their efficacy. Future research should include a larger sample size with a more diverse population.

Conclusion

This qualitative study identified four main themes surrounding the performance of the PAE among SRNAs transitioning into clinical practice. These themes included barriers to performing the PAE, emotions surrounding the experience, facilitators and the SRNA's experience of their role transition. It illuminated topics to address for educators and students as they prepare to enter the clinical portion of their education. The ability to practice before clinical residency and using a reference guide can help decrease stress and anxiety related to performing the PAE. This can result in a more consistent, thorough, and efficient PAE which optimizes patient safety and outcomes.

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Table 1

Theme	Illustrative Quote		
Barriers	Q1	"Expectations [for the pre-op assessment] definitely var[y] at different [clinical] sites."	
	Q2	"There was additional pressure you're just trying to get everything done before [your preceptor] show[s] up. Like, God forbid they show up in the middle of your interview. Then if you miss something that they thought was important, it kind of sets the tone for the rest of the day."	
	Q3	"We get lots of interruptions."	
	Q4	"You're in a time crunch. So, at most you get three minutes to do a full pre-op assessment."	
	Q5	"I just felt like so overwhelmed I was cramming to review drugs and procedures, and other things that at the time I felt were more important, which is then also why I still didn't know how to clearly evaluate someone until my second rotationIn my head, that was at the bottom of the list. I was just like, whatever. I'll figure it out."	
	Q6	"Once my flow gets changed, because a CRNA has his or her flow [i.e. interview process] going, it's like, oh shoot, now what? And, I think you tend to make mistakes when you stray away from your own practices."	
Emotions	Q7	"I felt like I was a little bird getting kicked off the tree. And you either learn to fly now, or you're gonna send me home for the day."	
	Q8	"Certainly nervous."	
	Q9	"I was worried I was gonna miss something, and then be questioned about it and [look] like I didn't know what I was doing."	
	Q10	"I was scared."	
	Q11	"I just felt so overwhelmed with starting clinicals."	
	Q12	"We've put this pressure on ourselves to be perfect. Because, we are under a microscope but we also think it's way worse than it is."	
	Q13	"I think overall, [in] the beginning, just not knowing what to do. It's just very awkward. And switching sites, that's how I always feel how am I gonna get to the locker room? How do I get my scrubs? How do I get my drugs? Simple things that we all know how to do. But, that gives me so much anxiety."	
Facilitators	Q14	"Mock interview so that it was a practice run before you did one on your first patient. Which, was nice 'cause it helped you at least identify things that you were forgetting on the first time."	
	Q15	"Repetition, and just becoming more comfortable with yourself."	
	Q16	"Heavily relying on the template."	
	Q17	"Maybe if we just had some time during class [to] run through [the interview] on each other, like, partner up and run through it."	

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Role Transition	Q18	"[In] the beginning, you dread starting the day, interviewing the patient, having to introduce yourself as like a student."
	Q19	"I hate when you're conducting your interview you just see the patient's eyes go down to your badge just staring at it."
	Q20	"We aren't new clinicians. We're experienced clinicians, just playing a different role."
	Q21	"Going in [for the interview], and [the patient] see[s] that you're just a student or [an] SRNA and they ask "What does that mean?" And then, you're figuring out, how do I even introduce myself at the beginning of this interview?"
	Q22	"I think one of the main struggles with us having been nurses is that, we were the leaders on our floor. We were the nurse leaders. We were extremely competent, and then all of a sudden, we're put in a situation where we're primed to feel insecure. And, to feel as if our previous skills are no longer good enough."
	Q23	"It's almost comical that like, the hardest part of the assessment is the introduction."

PRE-ANESTHETIC EVALUATION: A NEEDS ASSESSMENT OF STUDENT REGISTERED 1 NURSE ANESTHETISTS

Appendix A

Pre-Anesthetic Evaluation Pocket Guide

Name, DOB, why are you here?

Allergies? Previous anesthesia? Problems? (PONV) Family problems with anesthesia?

Medication review? (what did you take this morning?)

NPO status?

Medical History:

- CV: HTN, HLD, CHF, angina, irregular rhythm, METs
- Respiratory: asthma, COPD, OSA, recent cold/cough?
- GI/Hepatic: GERD, hiatal hernia diverticulitis, liver disease
- Renal/endocrine: DM, thyroid, kidney disease
- Neuro/Musculoskeletal: strokes, seizures, paralysis/neuropathy, arthritis
- Misc.: bleeding/clots, cancer, sickle cell
- Pregnancy status

Social history: alcohol, smoker, drugs Steroids in last 6 months?

Physical exam: lungs, heart

Airway assessment:

- Mallampati, mouth opening, neck mobility, TMD
- Dentition (loose/missing teeth? dentures/partials?)

Explain Anesthesia plan: GA, MAC, Regional (risks & benefits)