

Critically Important Critical Thinking Skills
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Critical thinking involves putting together all knowledge sources to lead to a decision. It involves book and school knowledge, asking intelligent questions of those you work with, and thinking through past experiences. One who thinks critically can adapt to new situations and puzzle out answers even when faced with unfamiliar information. Critical thinking is not something that we are born with--it is a skill that must be taught and practiced. In school, many of us are taught to memorize facts and regurgitate them on a test. With real patients, the answer is never that simple: it requires thought. In medicine, critical thinking is a vital skill that technicians should be practicing and perfecting every day.

Veterinary technicians enter the field with an excitement to learn the technical aspects of our duties. Placing IV catheters, drawing blood, advancing to arterial catheters, central lines, urinary catheters, feeding tubes, perfecting radiographs and learning new dentistry techniques are obviously vital to the practice, and they are also the "fun" part. Fewer want to put in the continued work and study required to cultivate the understanding and mastery of physiology, pharmacology, understanding disease processes, and learning to look for subtle changes in the patient. These skills are what set stellar veterinary technicians apart from merely good ones. Anyone can be taught to place an IV catheter in an afternoon. Not everyone understands the progression of parvovirus, the signs of sepsis, and how to manage hypotension in a puppy. Committing to continued learning contributes a large portion to the ability to think critically.

The nursing process, well-defined in human nursing, is a great model for veterinary technicians to follow as they learn to think more deeply about the cases they are treating. The entire nursing process requires critical thinking at every step as technicians must have a basic understanding of medicine as well as technical skills and knowledge to complete veterinarian orders. They need to understand diagnostic equipment, catheter placement, how to collect vitals, and how to administer medications. Nursing also requires interpersonal skills and their development as one interacts not only with fellow technicians but also veterinarians, assistants, client services, and especially pet owners. Participating in the nursing process will help to develop all of these skills and is as follows:

- **ASSESS** is the first stage in the nursing process and is simply data collection. In a hospital environment, data is gained from many sources including the initial triage phone call, history taking with the client, through hospital rounds, and through a physical exam on the patient. Technicians must always remember to perform a physical exam on their patient each and every time they contact the animal, as the assessment phase can bring new information to light with each interaction.
- **ANALYSIS** is where all of the information gained is brought together to aid in the diagnosis. While veterinary technicians cannot make a diagnosis, the information we provide is vital to the diagnosis process. Palpating a large, turgid bladder on a male cat that is straining in the litterbox allows the technician to think ahead to the potential emergencies that can occur and how they can either be mitigated or monitored. A golden retriever that presents after collapsing at home and has pale gums can lead the team to prepare monitoring and diagnostics before being asked by the veterinarian.
- **PLANNING** allows the technician team to participate in prioritizing diagnostics and treatments. A dog that presents to the hospital in hypovolemic shock is ordered to receive pain medication, survey radiographs, IV fluids, an IV catheter placed, and a minimum database of blood work drawn. These tasks must be prioritized for the best care of the patient and critical thinking and experience will aid in this step. Patients in the ICU setting will also have multiple treatments due or multiple patients requiring treatments at the same time. The managing technician for these

cases will need to think through the competing priorities to determine which treatment or which patient needs to be completed first. As information becomes available, these priorities may change. That same dog that presented in hypovolemic shock is receiving his IV fluid bolus when the blood results return showing hyponatremia, hypochloremia, hyperkalemia, hypoglycemia, and azotemia. Suddenly the need for radiographs decreases and the need to supply dextrose support and continued IV fluid therapy moves back to the top priority. Critically thinking technicians must be aware of changes and remain flexible. They must always be thinking ahead to potential problems that may occur and have a plan for how they will respond. How will it be determined that the patient is worsening? What can be done to confirm the concerns? This step in the process is beneficial for case studies and quizzing as it requires understanding and forethought.

- IMPLEMENTATION is exactly that – implementing the plan in the order deemed appropriate: placing the catheters, drawing the blood, administering the anesthesia, taking the dental radiographs. This step will change with the planning step as more information becomes available and the patient status changes.
- EVALUATION is an important step and one that should be carried out along with the veterinarian. Is the patient improving? Is the information being received as planned? What has changed? What needs to change? Each body system must be evaluated, and each hospital system must be evaluated as well. How long did it take the lab work to come back? Is the team properly trained on taking dental radiographs? How are the treatment sheets communicating with the team? Was the client kept apprised of the changes with the plan? The technician team is critical to all aspects of patient care and the nursing process must reflect this, along with examining all areas of the hospital the technician team affects.

Fully implementing the nursing process may seem tedious at first and take more time than you may have available. The more you think through the process, the more second nature it becomes. Each step is an opportunity for learning, and each new skill learned or disease process better understood adds to the bank of knowledge to be accessed with additional patients. This process can be discussed during technician rounds, even if it is just utilized for one or two patients, to showcase the importance of critical thinking.

In order to think critically, one has to understand both the problem and how to solve that problem. It is not enough to simply know that anaphylaxis can occur due to vaccines in a puppy; one must understand why and how and what to do to save that puppy's life. In order to learn, questions must be encouraged. Many hospitals perform rounds, whether formal and structured or informal and conversational, and these rounds are a good opportunity to quiz employees and foster learning. The goal is not to embarrass employees and point out what they do not know, but to lead them through a case or disease process asking pointed questions along the way. These questions should be evidence based and journal reading encouraged for research. As employees grow accustomed to these question and answer sessions, they will soon see them not as punishment, but look forward to the opportunity to learn and grow in their jobs.

If rounds are not regularly occurring, critical thinking exercises can be done in a group setting in the hospital. Hypothetical case studies are the best way to learn, as these questions will have a natural conclusion and employees can see the benefit as they are discussing. Start simple with a commonly occurring patient type in your hospital. Begin with a phone call from a client stating that their dog just ate two weeks of chewable carprofen. What questions should be asked? Is this an emergency? What will happen when the dog arrives? What should be set up? Is everyone comfortable with the math involved in calculating drug dosages? What can happen if the dog is not treated? What is the physiology behind the toxicity? What treatments may be needed in the hospital for the dog? What medications may be used? Why? How are they administered? What are potential problems that may arise while in the hospital? What nursing concerns does the team have? What monitoring will be required? Most staff will be comfortable

with what needs to be done for this patient, but few will understand why. The best critical thinkers are not satisfied with simply knowing what to do--they are searching for the why.

Do not allow yourself to fall into the trap of cookbook medicine. 'Because I was told' is never a good enough reason to perform a treatment on an animal. As veterinary technicians it is in the job description to carry out veterinarian orders; but, perform that treatment because you understand the motivation. What is happening in that patient that requires this medication? Why is it happening to that patient? How does this treatment or medication help this pet's situation? Why was this treatment chosen now? Knowing the answers to these questions will help you become a better technician and enrich your experiences with your patients. Critical thinking will lead you to the "most right" answer. Medicine is complex, often without a singular right answer; utilizing critical thinking skills can help you wade through the potentials to understand the best answer at that time.

In veterinary medicine, technicians are expected to closely monitor patients and alert the veterinarian to minor changes; they should also be aware of complex disease processes and know the signs of change. Understanding sepsis can help an alert technician to ask if the blood glucose should be measured in the patient with declining mentation. Understanding SIRS can help a technician look closely at each treatment time for signs of early respiratory compromise or a coagulopathy. Critical thinking involves planning ahead for procedures and keeping one step ahead of the receiving veterinarian during a busy emergency shift.

Test your critical thinking skills by anticipating results. Look at the presenting complaint, medical history and physical exam results on a sick patient and anticipate their blood values. Anticipate what you may find on radiographs. Were you right? If not, why? Did you learn something new? Anticipate the results of vital signs every time treatments are performed on a hospitalized patient. If a post-operative gastrointestinal foreign body dog is sleeping soundly and breathing comfortably you might anticipate a heart rate of 70bpm and a normal blood pressure. If his heart rate is 140bpm and his blood pressure is elevated, something is wrong. Maybe a different blood pressure cuff was used or a different machine than the last treatment time. Maybe the dog should go out to urinate and then recheck his vitals. If his heart rate and blood pressure are still elevated those will be reported to the doctor, but at least you have thought through some potential simple causes and are confident in the results. Simply writing the results in the record and moving to the next patient is not utilizing your skills and knowledge to their potential, as well as not benefiting the patient or the veterinarian.

As a technician, you may not have the authority to change orders, add medications, or make a diagnosis, but those limits do not mean that you should not educate yourself in all of those areas. When medical orders are made, ask yourself why? Why are we using this antibiotic over that one? Why is this patient having an arrhythmia now? Why is the blood pressure dropping in this situation and can I do anything about it? Why are we giving a fluid bolus now? As you learn more you will be better about anticipating these changes in the next patient that you treat, and you will be prepared. When the doctor orders that fluid bolus you will be ready. You will know that the blood pressure is dropping and be ready with the treatment.

It is important to remember that even though you may have advanced monitors and tools to tell you how a patient is doing, it is still important to use your skills of observation. You, the technician, can anticipate what is coming next. A monitor can only tell you what is happening right now. As you progress in your career, remember what has happened in the past. Collect anesthesia records and case reports of interesting diseases and experiences to help you remember them. Rely on your observations. Are the gums less pink than they were an hour ago? Do those pulses feel weaker than when the dog came in? Is that

breathing pattern different? These are clues that no monitoring equipment will be able to detect. A skilled technician can never be replaced if they are using their critical thinking skills.

Critical thinking is open thinking, and it does not allow for remaining in one place. "This is how we've always done it" is the death toll for critical thinkers. Medicine evolves, patient status changes, and circumstances in veterinary medicine call for creativity and outside the box thinking. Do not allow yourself to be limited by the past or even by the tools on hand. Think through creative ways to get patients to eat, to help clients adhere to a complicated medication schedule, or keep a ferret from tangling his IV fluid lines. Veterinary technicians are a creative group and can fix anything with white tape and some vet wrap; encourage that creativity around the hospital to encourage advancement.

Teaching critical thinking in the hospital is vital to the job satisfaction of the nursing staff. Critical thinking allows technicians to become proactive, not reactive, in their job thereby making them an indispensable part of the team. Technicians should be empowered to think globally, plan ahead, anticipate need, and keep the hospital floor moving. This skill is often present in more senior technicians but can be taught and fostered in technicians at every level.

Encourage senior staff members to participate in the critical thinking process. Often, if one person starts the conversation, others will be happy to join in. Quizzing a technician often brings the veterinarians over to listen and they often take over the quizzing, excited to see the learning occurring in their staff. Getting the veterinarians involved can help them teach better history taking, better procedure preparation, and help the nursing staff anticipate veterinarian needs better. Communication lines are opened when questions are encouraged and the technician staff no longer has to guess what is wanted of them.

One of the benefits of being a veterinary technician and nurse is the focus on practicality. Nothing a nurse does is wasted energy. Every interaction with a patient, even cleaning up diarrhea from that patient, is for their benefit. TLC is one of the 20 most important thoughts to have when evaluating a patient and it is almost solely performed by the technician team. Every snuggle in a kennel is an opportunity to evaluate pain scores, respiratory status and patient mentation. Every trip outside is an opportunity for patient enrichment and to quantify urine output and character. Charting gives the opportunity to record important bits of information for the next shift to remember and to keep continuity of care. No minute throughout the day is wasted, every task is an opportunity to better the patient and learn more information about them and their status. Take pride in that work and what it means to the patient, the client, and the veterinarian. Technicians contribute every minute of every day.

Even if you have been a technician for years you can still challenge yourself and learn more. Pick a disease process or type of cancer and learn all that you can about it. Choose a breed of dog and learn about their inherited diseases. Study cytology and improve your cell identification skills. The more you learn the more you will have to draw from when the need arises. Learn from those around you. Ask questions, participate in case rounds, attend as much continuing education as you can. Resist the temptation to do it just because you were told. Technicians are vital to a practice because of our brain and our ability to think. Cultivate your critical thinking skills and you'll be a valuable resource in your practice.

Discussion of Case Studies