The Journal of the Association of Veterinary Technician Educators (JAVTE), a peer-reviewed, scholarly journal, is the official publication of the Association of Veterinary Technician Educators (AVTE). Its purpose is to act as an international publication for disseminating scholarly research to people working as educators in the field of veterinary technology. The journal’s emphasis is on encouraging collaboration among veterinary technology educators through scholarly inquiry relating to the understanding and/or improvement of educational processes and outcomes, organizational issues in education, concepts of teaching and learning, and student engagement based upon research, observations, and experience relevant to the field.

Cynthia Grey, Editor
St. Petersburg College
St. Petersburg, FL

Karen Hershberger-Braker
Broadview University - Madison
Madison, WI

Glenn Jackson
University of Nebraska-Nebraska College of Technical Agriculture, Curtis, NE

Bonnie Loghry
Yuba College
Marysville, CA

Oreta Samples
Fort Valley State University
Fort Valley, GA

Christina Tran
Chandler, AZ
Welcome to our Symposium issue of JAVTE! This is really an exciting time for all of us at AVTE. The Symposium is always a wonderful chance to network, recharge, and gain valuable information that you can take back and use – right away! We are so pleased to be able to provide the AVTE Journal in print for our special Symposium edition. I hope that everyone takes some time to review the stellar articles, which I find valuable in a variety of ways!

We have an action- and info-packed symposium planned for you so take some time to enjoy, reflect and gain knowledge and energy from all of those around you. I know this is the one continuing education event that I will walk away with much more than I came with, which always gives me energy as I go back to plan my fall term classes.

My role on the AVTE board will be changing as I transition from President to Past President, but even as Past President, I get to enjoy a few more years on the Board. I have truly enjoyed my time as your President and feel that we have accomplished many things during this time. However, there is always more to do, and know that your Board of Directors is doing their best to continue to provide you with the best resources, continuing education, networking and other opportunities to help you be the best vet tech educators possible!

As I conclude, just a reminder that our editors are always looking for submissions from the membership, so if you have been thinking about publishing, this is a great time to consider it! A variety of material is accepted, so please consider submitting a tip, book review, or manuscript the next time you see the call for articles announced!

Thank you for allowing me to serve you as President and please let any of the Board know if you have questions, concerns or suggestions – we love to hear from you!

Have a wonderful finish to the summer and a productive fall!

Jennifer Wells, DVM
AVTE President

The Journal of the Association of Veterinary Technician Educators
is published by:

FIRM, Inc.
206 South Sixth Street
Springfield, Illinois 62701
www.firminc.com

Copyright © Association of Veterinary Technician Educators 2017. All Rights Reserved 2017.

Published August 2017/2
Cover photo by Shutterstock/Mark Hayes
A s teachers, we are committed to being life-long learners. As working educators, we are grounded in professional development and we understand its importance in improving our professional knowledge, competence, skills, and effectiveness in the classroom.

AVTE recognizes that continuing education is a critical part of our culture as veterinary technician educators, as is evident by the 2017 symposium (25th) and the excellent program of workshops, key note speakers, and presentations. This is also reflected in AVTE’s vision and support of our scholarly professional journal, JAVTE, which is in its third year of publication.

In acknowledging the importance of professional development and providing convenient access to CE credits, AVTE and JAVTE board members are pleased to announce that JAVTE is now approved by AAVSB and the Registry of Approved Continuing Education (RACE). RACE approval means JAVTE will now provide CE credit toward license renewal for veterinarians and veterinary technicians.

For the current issue of JAVTE, as AVTE members, you can earn 1 1/2 CE credits for reading and completing an assessment on:

- A Conversation with Temple Grandin: Mathematical Curriculum for Veterinary Technology Students
- Single Person Rat Jugular Collection
- Enriching the Lives of Program Animals

To receive credit, you will need to take an electronic test and pass with 70%. If you receive the electronic version of JAVTE, you will receive an email with a link to the testing system. Please click on the link and begin answering the test questions. When you are finished, you’ll receive a second email with your certificate. If you only have access to the print version of JAVTE, type the following link into your browser to access the test, http://www.cvent.com/d/k5q4tx

JAVTE will continue to provide RACE approved articles and offer CE credit in future issues. Please consider sharing your expertise in future issues of JAVTE.

Thank you all for your continued support!

Cynthia Grey, DM
Editor, JAVTE
The Math Variable in Veterinary Technology Curriculum

There have been a few skills that were believed to be of universal importance to students of veterinary technology and to veterinary technicians in practice. These skills include students’ ability to address challenges with a positive and professional attitude, their ability to understand their own impact on animal welfare, and...math. The first two are easy for students to understand but the third one can be tough for students to process. Perhaps it is even more so if there is no direct connection between the math curriculum and how it will apply to work in the field.

For a long time, there has been a belief that the successful accomplishment of any rigorous college math course demonstrates an ability to master the mathematical concepts associated with conversions, dosage and fluid rate calculations and other common mathematical tasks associated with veterinary technology. On a purely anecdotal basis, that belief was supported when I compared student success in the trigonometry-based algebra required in our veterinary technology program at York County Community College (YCCC) with the success of those same students in our pharmacology course, the program’s toughest course and the one that requires the ability to apply mathematical concepts. Those who successfully completed this rigorous, required math course were also those who successfully completed pharmacology. The flaw in this thinking may be, however, the belief that the trigonometry-based algebra provided skills leading to the success in pharmacology. Instead it may be that those students who succeeded in both the trigonometry-based algebra and pharmacology classes were engaged in math.

“I hate math!” is one of the most frequent emotional statements instructors hear from students. A common response is telling students that it is okay to struggle with math. If students continue to struggle with math, then instructors need to continue to search for ways to help them succeed. But hating math is a different issue, one that often leads to the suggestion that students should perhaps look to a different career choice, since math is an integral part of most of what veterinary technicians do. As educators, however, we should do our best to deliver math curriculum that is appropriate, relevant and relatable to the work they will be doing in order to avoid causing undue anxiety.

Dr. Grandin’s Concerns: “Get Rid of the Algebra!”

The YCCC veterinary technology program is a relatively new (beginning fall of 2013); so while math and the road block that it causes many students is a frequent topic of conversation for faculty, it did not rise to the level of taking action until I had a conversation with Temple Grandin, PhD and Professor of Animal Science at Colorado State University. Dr. Grandin was contacted to ask for a personal quote for YCCC’s first graduating class. I use the HBO produced movie TEMPLE GRANDIN: Autism Gave Her a Vision. She Gave It a Voice,1 a biopic of Dr. Grandin’s life story, to encourage students to focus on maintaining a positive approach to challenges and to realize the importance of understanding their own impact on animal welfare. Instead of focusing on an inspirational quote for our graduating students, I became engaged in a conversation about appropriate math requirements for students of veterinary technology.

Dr. Grandin shared concerns that trigonometry-based algebra courses simply create an undue road block for many veterinary technology students (T. Grandin oral communication, April 2017). At YCCC, it was common for students to have to repeat the required algebra course once and sometimes twice while others who struggled simply would opt out of the program. Dr. Grandin asked for YCCC to seriously consider changing its math requirement from the trigonometry-based algebra to one that would include concepts that were more relevant to the mathematical skills applicable to the work of veterinary technicians (T. Grandin oral communication, April 2017). Ultimately Dr. Grandin convinced the YCCC Curriculum Committee to change the program requirement to a course that covers topics that include linear equations, proportions and statistics. As a part of making this change, however, Dr. Grandin was asked if she would be willing to share her perspectives about math requirements as unnecessary road blocks for veterinary technology students.

Practical Analysis: Dr. Grandin’s Perspective

Dr. Grandin shared her own perspective on supporting student success in math in the most practical sense stating,
What saved me in college was that algebra was not the required course in 1967. The required class was finite math which had a lot of statistics and probability. Algebra was impossible for me but I was able to do finite math. In the 1950s, I had old fashioned elementary school math. I did well in that. Today I have seen students who can do all the fancy algebra but they cannot find the area of a circle or determine the volume of a container. What matters for a vet tech is math for dosing. These college students thought it was cool when I showed them how to find the floor area of a room. They knew the fancy stuff but they were not able to do the practical stuff (T. Grandin, written communication, April 2017).

In addition to the comments that Dr. Grandin shared with me directly, she pointed out in her book, Thinking in Pictures, “Another reason for changing the math requirement is that some of the students who are poor at algebra may be the BEST at handling animals. My visual thinking mind, that is poor at algebra, helped me understand animals.”

Anecdotal stories of student struggles with college algebra suggest that Dr. Grandin is not unique in her views and considering her recognized achievements in animal science and animal welfare, perhaps some of the movement away from the college algebra requirement may be appropriate.

How Others Approach the Equation

Tracy Blais, Veterinary Technology Department Chair at Mount Ida College in Massachusetts, leads a program with a rigorous math curriculum including algebra and statistics as well as a course in medical calculations. Blais identified that the medical calculations class is her “favorite course and the most helpful” (written communication, January 2017).

Samantha Geiling, a credentialed veterinary technology educator at Windward Community College at the University of Hawaii, agrees with Dr. Grandin’s position, “having more challenging math requirements is an unnecessary road block.” Geiling added that she believes students are sometimes “paying tuition to get through a requirement that doesn’t help them pass the VTNE, doesn’t help them in any other classes, and doesn’t help them after they graduate” (S. Geiling, written communication, January 2017). Like Mount Ida College’s math curriculum that includes a course in medical calculations, Windward Community College students take a math specifically designed for veterinary technology students that focuses on fluid calculations, drug dosage calculation, the metric system and dilutions (S. Geiling, written communication, January 2017).

A specific course in medical mathematics like the one used by Windward Community College at the University of Hawaii seemed ideal. The Hawaii model was shared with Dr. Pete Bill, Assistant Dean for Academic Affairs, Teaching, and Learning at the College of Veterinary Medicine at Purdue University. Dr. Bill shared his own assessment of the tasks veterinary technicians perform and the relevant math skills needed were the following (P. Bill, written communication, March 2017):

- Basic dosage calculations
- Calculation of cost of dispensed medications
- Percentage solutions - changing concentrations
- Temperature conversions (F to C and vice versa)
- Metric system conversions
- Other measurement system conversions (e.g., tablespoons to mL)
- Dilutions - changing concentrations
- Drip rates for IV fluids
- Determination of fluid loss replacement
- Blood loss calculation and replacement

“If we use these as our outcomes and trace backward the type of mathematics necessary to accomplish these tasks in a reliable manner, then we can justify the type of math needed” (P. Bill, written communication, March 2017). Dr. Bill noted that none of these topics require advanced algebra, trigonometry or graphing.

Scott Keller, DVM and past AVTE President, has seen his own program move from an intermediate algebra requirement to elementary algebra because of the challenges experienced by students. However, Dr. Keller’s (written communication, January 2017) concern is the recognition that math skills are important in many ways for veterinary technology students and success in this area is important in order to understand fundamental concepts such as “where the tenth place of a decimal is, understand what a mixed fraction is, or even know how many quarts are in a gallon, let alone what a liter is.” Dr. Keller pointed out, “Maybe the question shouldn’t be about what upper level math we should be teaching, but rather how do we stop having to teach developmental math in college?” (S. Keller, written communication, January 2017).

Dr. Anne Hermans, Program Coordinator for the veterinary technology program at Norwalk Community College in Connecticut, shares Dr. Keller’s concerns. “I find that too many of our students come to the program intimidated by math, disliking it, not understanding its value, and not able to do very basic arithmetic, setting up ratios and proportions, or conceptualization” (A. Hermans, written communication, January 2017).

At the Root of the Problem

It is nearly impossible to talk about concerns associated with college math success without considering the issue of the need for and success of remedial education needed to prepare high school graduates for college level work. According to a 2016 American Public Media(APM) Report, more than 40% of college students “will end up in developmental math and English classes…and many of them have a worse chance of eventually graduating.” The report also identified an annual cost of over $7 billion for these developmental programs.3

In addressing this concern, YCCC is engaged in the construction of a developmental math lab hoping to overcome these challenging odds for students. For context, it is important to note that concerns with student struggles with college algebra are not new. In 2002, the Mathematical Association of America, presenting on this topic to the US Military Academy, said of college algebra that it “is a cash cow that many mathematics departments do not want to tamper with, especially if it means smaller classes and higher costs. If this attitude is maintained too long both the cash and the cow may disappear as students opt for useful and interesting quantitative literacy that teaches them how to solve problems, they will encounter and be paid to solve.”4rove
In order to fully explore Dr. Keller’s question regarding how colleges can stop having to deal with developmental math concerns, educators will need to find ways to alleviate the anxiety associated with math. According to a study by Andrew and Brown as reported in the journal, Education, the literature is outdated and needs “contemporary insight to the overwhelming problem of math anxiety and avoidance in STEM-related degrees across college campuses in the United States.”\(^5\) They conclude that if “educators can help students get through the road block of mathematical inferiority and anxiety and gain confidence in their ability to apply math skills successfully, students can begin to face the challenges associated with math and move forward rather than avoid such challenges.”\(^5\), p. 369 Their study suggests that difficulties with math anxieties begin as early as middle school, indicating efforts should be made to minimize assessments that contribute more to the onset of anxiety than the instruction of math.\(^5\)

### Summing It Up

It has, at times, weighed heavily on my mind, as I am sure has been of concern to other instructors, that some of the best student candidates may get lost in the battle with potentially irrelevant math curriculum. Dr. Grandin’s thoughts certainly suggest that this may be true. Feedback provided by other accomplished veterinary technology educators supports developing curriculum that is more practically and directly designed to support the tasks performed in practice. However, adequately preparing them to apply these concepts in the face of time and credit limitations is no simple task. The challenges of assessing prior knowledge, providing remediation and reducing math anxiety are unlikely to go away any time soon. Perhaps veterinary technology educators (or all college educators) should consider becoming more involved with conversations about the math curriculum at the elementary and secondary levels in order to save money spent on developmental math programs and to improve student success. On the college level, veterinary technology programs should assess their current math requirements and move to modify their math content to assure a focus on those math skills that will be applicable to the real world practice environment.

### References

1. Temple Grandin. 2017. DVD
As a relatively new teacher, I love ideas that move away from lecture-based, teacher centered learning, and that focus more on the instructional power of student-centered learning. Austin Community College encourages alternatives to lecture-based teaching and provides helpful, interactive courses for faculty to learn more about educational activities that engage students. One such course is based on the book *Teaching for Learning: 101 Intentionally Designed Educational Activities to Put Students on the Path to Success* by Major, Harris, and Zakrajske that focused on “Peer Teaching & Academic Games.”

A fun class activity discussed in the course was the icebreaker game “Who Am I?” where the name of a famous person is taped to the back of each participant. As players mingle around the room, participants ask yes or no questions of other members of the group, trying to obtain enough information to ‘figure out’ who they ‘are.’

In adapting this game to a learning activity and applying it as a review tool for the midterm exam for Canine and Feline Clinical Management, instead of a famous person, students have a disease or condition that the class has been studying taped to their backs. Instead of mingling, students form a circle so everyone can hear (and answer) the questions. One-by-one, each student will turn around so everyone can see the disease or condition they were provided. The students turn back around, facing the center of the circle. The first approach is to ask for volunteers to start and then play moves to the left around the circle. Each student asks up to 3 questions to help them identify their disease/condition. After 3 questions, the player can venture a guess or pass to the next player. Questions usually start out with something like “Am I an infectious disease?” or “Do I involve the urinary system?” It usually takes a few rounds before students feel confident with having enough information to guess. A little incentive is added to the game by providing prizes such as a travel cup for the first student who successfully identifies “What Disease He/She Is.” The students love the activity!

**References**


---

**QUICK TIP**

**What Disease Am I?**

*by Regina Bohmfalk, DVM*
**Single Person Rat Jugular Collection**

by Stacey Schumacher and Neil Deering

An alternative method of blood collection from rats, termed **Single Person Rat Jugular Collection**, may be useful for this AVMA-required essential skill. This method has been shown to reduce the stress-level exhibited by rats, while decreasing the mortality rate and resulting in no obvious differences in sample collection results.

**Introduction**

Blood collection is a common and important procedure in conducting research. In many cases, multiple blood draws are an essential part of collecting and analyzing research data. Rat jugular sample collection is a standardized, reliable, and repeatable (non-terminal) blood collection in the Contract Research Organization (CRO) industry. For veterinary technology educational institutions, the restraint of rats and intravenous blood collection from rats are both AVMA required essential skills.¹

One method of blood collection from the jugular vein of rats that has been widely used in the CRO industry is termed the **Board Method**, which utilizes a board and physical-restraint technique. This method requires a high degree of competence to avoid moderate or significant harm to the rat.² Although the Board Method of jugular collection has been widely used, it does not come without risks.

For the Board Method, the rat is restrained in an unnatural position, which can cause stress.³ The ties used to hold the forepaws can cause damage to the limbs and nerves in this area, causing lameness and swelling issues.³ Because of a rat's biology, when the rat is restrained on a board for jugular bleeding, it is a **blind stick** into the jugular. There is a nerve and artery that are in this region that can be damaged during the venipuncture attempt, which can lead to issues with the collection and accidental deaths.

Always wanting to strive for the best animal welfare, industry leaders like Covance® adapted an improved and alternate method of collection, commonly referred to as the Single Person Rat Jugular Collection, which has been shown to reduced accidental death because of sample collections from 1% to as low as an average of 0.06% per year, per Covance® (Laboratory Corporation of America® (LabCorp)) data (T. Smith, email communication, May 2017). Teaching veterinary technology students this alternative method may be useful when completing essential skills on rats.

**Benefits of the Single Person Rat Jugular Collection**

- Restraint is a more natural position (upright) for the rat than the Board Method (tied down on back).
- Significantly reduces animal stress levels, as evident by the decrease in vocalization compared to the Board Method. The Board Method, though short in time duration, usually causes the rats to vocalize. In this method, the rats are less likely to vocalize.
- Decreases the likelihood of injury to technicians, specifically from rat bites as a result of being physically restrained using the Board Method.
- Reduces mortality resulting from blood collection.

- Reduces the number of staff/technicians required for sample collection events.

**Limitations/Drawbacks of the Single Person Rat Jugular Collection**

- Harder on the technician's non-dominant restraint hand, until muscle and finger strength is sufficient.
- Largely based on body weight of an animal. Some technicians can hold larger rats.
- As rats are not tied down, animals are more prone to moving/jumping around due to excessive noises or activities in the collection room that may startle them.

**Materials for the Single Person Rat Jugular Collection**

- 23g x ¾” needle with appropriately sized syringe for collection (e.g. 1.0 mL or 3.0 mL syringes).
- 2” or 4” cotton gauze to be used to hold off the collection area with finger pressure.
- Clean paper towel or area for placement of sample collection syringe post-collection (before placing into collection tube while holding off animal).
- Latex (sticky) glove on the restraint hand to better restrain the animal.

**Methods used for the Single Person Rat Jugular Collection**

1. Using your dominant hand, restrain the animal around the abdomen (referred to as the “ice-cream cone” grip).
2. Using the thumb and index finger on your non-dominant (restraint) hand, form a “C” and gently sweep the rat’s front paws behind the animal so its wrists are touching behind the animal (See Image 1).
3. Using the pointer finger of your non-dominant hand, place the finger tip on the top of the animal’s head (about halfway between the eyes and the ears) and pull down into the fingers restraining the arms/wrists so that the head extends directly upwards. After extending the head, the pointer finger will be caudal to the rat’s ears. Make note to not lift the rats shoulders up, and the wrists should move back in a neutral position (See Image 2).
4. Ensure that the rat’s arms are directly behind the animal, and symmetrical, as the landmarks will not appear correctly if not restrained properly.
5. Look for landmarks that appear on the front shoulders of the animal, a hairless-cowlick on each shoulder, the hairline that runs between those 2 points, and the center of the rat’s chin (See Image 3).
6. With the bevel up and using the appropriately sized needle and syringe, carefully insert needle approximately 2-4 mm towards the centerline (from the shoulder marks) of the animal at approximately 10 to 45 degree angle from the body. Begin drawing back as soon as the bevel of the needle breaks the skin as the jugular vein is just below the skin and superficial at this point (See Image 4).
7. Draw back slowly as to not create too much of a vacuum in the syringe to collapse the vein prior to collection. The needle
8. Remove the needle from the syringe (if appropriate), discard appropriately, and place collected blood sample into the appropriate blood tube for that particular animal.

Results (CP results from Covance® in-house study 8311-821)²

Clinical Chemistry
Although trends toward minimally lower glucose and potassium concentrations for animals bled using the Single Person Rat Jugular Collection suggested the possibility the technique may have elicited slightly less catecholamine response and muscle activity than the traditional restraint method, the Board Method, results of other parameters normally affected by catecholamine release (e.g., hematocrit and absolute neutrophil count) did not exhibit changes to support such a conclusion.³

Coagulation and Hematology
No obvious or toxicologically relevant differences for coagulation or hematology test results were apparent between animals bled using the two different restraint techniques³, the standard clinical pathology blood restraint technique, Board Method, versus the Single Person Rat Jugular Collection technique. This method and the Board Method can be used interchangeably in blood collection without any impact on data collected for the CRO industry.³

It is recommended that veterinary technology educators incorporate the Single Person Rat Jugular Collection method into their laboratory animal curriculum.

Acknowledgments
Matthew Schroeder (PhD) and Ellen Raschke (MS) for their work with the 8311-821 validation study at Covance®.

Images provided by and used with the permission of Covance® Laboratories.

References
3. Covance® In-House Study 8311-821. Validation of Clinical Pathology Samples Using the Single Person Rat Jugular Vein Collection Technique
Environmental enrichment involves the addition of one or more factors to an animal’s environment in order to improve the animal’s behavioral, psychological, physical, or physiological well-being. It can alleviate boredom, stimulate the brain, provide exercise, prevent behavioral problems, improve current behavioral problems, and provide enjoyment. Environmental enrichment may be physical, such as the addition of a toy, or social, such as the addition of a conspecific. It may involve changes in housing design, management, and/or husbandry such as added complexity, shelves, and hiding locations. Environmental enrichment can also stimulate the animal’s auditory, gustatory, olfactory, tactile, and/or visual senses. Some examples of this type of enrichment include a view of the outside, a television or radio, natural sounds and odors, essential oils, brushing, massage, and feeding devices.

There are several factors to consider when selecting the type of enrichment to be used including the animal’s housing, species, age, gender, temperament, behavioral history, health status, purpose of the animal, and the outcome goals of the intervention. The money, resources, space, and time required to design, implement, and maintain the enrichment item are also critical considerations when implementing an enrichment plan. The items should be effective, easy to maintain, and non-toxic. Ultimately, the type selected should occupy the animal’s time, provide a source of stimulation, and encourage naturally occurring rewarding behaviors.

Discussion
If a veterinary medical technology program elects to house animals so their students can utilize them to learn handling, husbandry, and techniques, it is vital to follow USDA regulations and to include enrichment as part of their welfare plan. The enrichment plan does not need to be costly and a little creativity goes a long way. It can be as simple as co-housing compatible animals. There are also numerous ways to actively involve students in the enrichment for program animals. The veterinary medical technology (VMT) program at Wilson College houses animals and have successfully incorporated enrichment ideas.

There has been a lot of research conducted on the effects of environmental enrichment on laboratory animals. Environmental Enrichment for Laboratory Rodents and Rabbits: Requirements of Rodents, Rabbits, and Research by Vera Baumans in Institute for Laboratory Animal Research is a good reference for additional information. For laboratory species such as rats and mice, Wilson College has found that simply saving paper towel rolls and stuffing them with hay provides an engaging environment. The rodents will roll them around, pull the hay out, and chew on the paper. An empty tissue box makes an excellent house that will allow them to chew all the entrances and exits they desire. They can make nests out of plain tissue paper or paper towels. For more intense chewing purposes, a cow hoof or Nyla bone are good options. For house rabbits and guinea pigs, stuff wire whisks with hay or give them whiffle balls with or without baby carrots placed in the holes. These simple additives allow them to mimic their natural behaviors of making nests, foraging and chewing.

There are multiple options for cats such as cage complexities including shelves for height. The Animal Welfare Act, U.S.C. 54 provides guidelines for educational institutions that house cats. Cats must be provided at least one elevated resting place. Environmental enrichment for cats can be enhanced by providing cardboard boxes for hiding. A scratching device should be available. There are a wide variety of toys on the market including various sizes and of balls and mice. However, you can make your own balls by simply rolling up paper and covering it with tape. Larger bottle caps and drawstrings from hooded sweatshirts provide increased engagement.

Another great opportunity for enrichment for cats is food enrichment. Make cats work for their food. Just keep in mind
cats like to use their feet and eat in small meals. A wide variety of commercial feeding devices are available or you can make a homemade device. Paper towel rolls cut to a variety of lengths and then attached standing on their ends to a piece of cardboard works great. A few pieces of dry food are dropped in each tube and the cat uses its’ paw to reach in and pull out the food. Simply hiding small amounts of dry food in their enclosure and making them find it works as well. Lastly, consider the addition of soft music in the housing area such as Through a Cat’s Ear. Through a Dog’s Ear

There are also many options for dog enrichment such as time outdoors, group play sessions, toys and bones. Time outdoors is also regulated by the USDA dependent on cage size and if the dog is housed alone. It is important to make sure the toys and bones selected are safe for the dog based on its size and chewing intensity. Feeding enrichment is also fun for dogs. Enrichment feeding devices can be purchased or homemade. One example is a two liter soda bottle with holes cut in it. The dog rolls it around causing the kibble to fall out. Another popular option is stuffing KONG® toys with bread, dog food, or plain yogurt and freezing them. The dogs will spend hours playing with the KONG® trying to get the food out. In addition, toys should be rotated to provide the dogs a variety, and an opportunity for the toys to be cleaned. Consider Through a Dog’s Ear as a musical option for dogs.

Wild birds spend 67% of their active time foraging and feeding, so it is important to provide foraging opportunities for birds. Enrichment devices can be made from untreated hardwoods and softwoods, vegetable dyed hardwoods and softwoods, untreated leather, cotton ropes, and rawhides, uncoated steel, stainless steel, or hard plastics. It is important to select appropriately sized toys, avoid toys that can wrap around the bird’s neck or legs and soft plastics or galvanized steel toys because they can contain lead. A washed cotton mop head with knots tied in it also makes a nice toy for birds. They can spend time preening the mop head and untying the knots. Food enrichment for birds is inexpensive and easy to implement. Food can be hidden on the bottom of their cage under branches or crumbled up piece of paper or in a closed paper towel roll.

Large animal such as pigs, cows, sheep, and horses should not be forgotten when incorporating environmental enrichment. It is a little harder to make durable enrichment items for these species, but it can be done. A heavy duty orange juice container with holes and special treats inside can be used for horses. In addition, there are commercial hay, pellet, and veggie balls available for these species. Pigs like to shove larger durable balls around with their noses; whereas, horses like ones with handles that they can pick up and swing around. Goats and sheep like to have things to climb and jump on.

Student Engagement

Wilson College has found that incorporating student projects into course work where learners design and implement animal enrichment plans after learning about the species’ natural behaviors is a great learning opportunity for the students and also provides the animals’ mental and physical benefits. Students can design a toy or feeding device. Incorporating a contest into the activity where judging is based upon which homemade device the animal likes best adds fun and further engagement for students. They can collect data on the amount of time the animal interacted with the device and then, if needed, modify the device to see if the changes resulted in increased animal interaction time. The students can demonstrate their device and present their findings to the class.

Another student centered project is training. Students can hold dog training classes which will provide mental stimulation for dogs. The rats can also be trained to perform tricks.

Conclusion

It is important to select a form of environmental enrichment that presents the animal with challenges that match its cognitive, physical, and sensory capabilities. The selected enrichment should introduce new experiences, provide opportunities to learn, and encourage the expression of natural species-specific behaviors. The possibilities are endless.

References

IMPLEMENTING LOW STRESS HANDLING INTO THE ACADEMIC SETTING
by Amy J. Staton, EdD, LVT

Low stress handling is becoming a common practice in veterinary clinics. In order to prepare students for the profession, teaching institutes must provide an environment that allows students to understand and implement methods of handling while decreasing the stress and anxiety of animals. It is important for veterinary technician educators to provide training on strategies to create and implement a low-stress environment for animals. It is equally as important for those institutions housing animals to apply low stress techniques when working with housed animals.

Enrichment
The comfort of an animal is crucial while being housed at your facilities. It is important to provide a kennel environment where the animal feels safe, secure, and comfortable regardless of whether the animal will be housed for one day or an entire semester. Bedding should be provided for every patient. Raised beds are a recommended bedding option for dogs and fleece blankets are preferred by cats.1 Fearful animals should have a hiding place available within the cage. Pet carriers or cardboard boxes offer a safe haven for these animals. Carriers/boxes should be placed at the back with the entry facing the side or rear of the cage. Food and water should be placed near the entrance of the hiding box. Fearful animals will be more likely to eat when food is near their hiding box rather than at the front of the cage where they feel more vulnerable. Fearful animals should be housed on the same side of the room if possible.2,3 Towels or barriers can be placed across kennels of fearful animals to decrease visual stimuli, thus decreasing stress and anxiety.3

Morehead State University Veterinary Technology Program (MSU VTP) faculty/staff have found that providing animals with additional forms of enrichment such as food puzzles, daily walks, group play, quiet time, calming music, aerosolized scents, and calming pheromones promote natural behaviors of each animal and creates a more enjoyable stay.

Rewards
Providing high value treats for good behavior has been shown to decrease the fear and anxiety of animals housed at MSU VTP. Treats such as peanut butter, turkey, cheese, marshmallows, baby food, tuna, cheerios, fruits, and vegetables are all high-value treats that can be used to encourage trust and cooperation on behalf of the animal.

NPO
When animals are going to be used in laboratories, food should be withheld until procedures are completed. Animals that have an empty stomach will be more likely to accept the high-value treats during procedures. Even if the animal does not accept the treat, the presence alone decreases stress and anxiety.4 An anticipated ten to twenty treats per minute should be provided to the animal during procedures.5,6 Treats should be no larger than the size of a blueberry.6

Single Patient Rooms
Having one laboratory full of animals and students may be more convenient for the instructor, but it can be more stressful for the animals. MSU VTP attempts to place one animal per room during laboratory sessions if additional supervision is available. If there are not enough exam rooms or supervisors, creativity is sometimes needed. Use the radiology rooms, exam rooms or treatment areas. Remove any visual stimuli that could potentially have a negative reaction on behalf of the animal. MSU VTP faculty/staff have noted increased compliance of the animal in these areas with decreased visual stimuli.

Exam/Procedural Room
To reduce anxieties consider making your exam rooms or procedure rooms more appealing to the animals. Stabilize the temperature of the room to be warm and cozy for your feline patients. Plug in calming pheromone diffusers and have calming music playing in each room.6,7,8,9 Turning down the lighting is effective. Provide non-skid mats for dogs and fleece blankets for your cats. Allow the animal to become familiar with the room (ten minutes for felines and five minutes for canines) before handling the animal.4,6 Have students talk in a quiet, calm voice, moving slowly throughout the exam or procedure.10 MSU VTP faculty/staff have found that providing the animal with the opportunity to smell and explore all tools that will be used such as the thermometer and stethoscope also help with reducing anxiety.

Positional Compliance
The goal is to make the animal more comfortable. Positional compliance will be different for every animal. Some animals will favor the floor versus the exam table. Some will prefer to sit in the restrainers lap. Some may want to lie on the floor rather than stand. Cats and small dogs may more than likely prefer to stay in the pet carrier because this is their safe haven. Simply remove the top half of the carrier slowly and allow the animals to remain in the bottom half throughout the exam and procedures.2

Injection Experience
It is recommended that the animal does not see the needle and syringe. Draw the vaccines or medication up in the syringe outside of the room.7 Allow refrigerated products to warm to room temperature before administering. This will decrease the level of discomfort for the animals. Hide the syringe in your scrub pocket, folder, or slide it under the blanket or towel that is on the table. MSU VTP has found that giving medication slowly while distracting the animal with high-value treats or another form of rewards such as a laser.
pointer or tennis ball is effective as a method to divert the animal’s attention.

**Sedation**
When working with extremely fearful or aggressive animals where safety of the animal and medical staff is of high concern, sedation is often recommended. Do not wait until the animal is overly stressed and anxious. These animals should be examined and found to be sound enough to handle sedatives before administration. MSU VTP wants to lower the amount of fear and anxiety these animals are exposed to as much as possible so the animals leave the facility with a positive experience rather than a negative one.

Low stress handling not only lowers the stress level of animals, but that of the faculty, staff, and students. MSU VTP Students no longer fight with the animals to complete their tasks. Instead, they take the time to understand and assess the animal’s body language and needs of each animal. Students become more compassionate and animals become more trusting and compliant.

**Reference List**

1. Radosta L. Fear Free techniques: Clinical behavioral evidence that they work. Symposium conducted at the CVC, Kansas City, MO. 2015
2. Yin S. Low stress handling, restraint and behavior modification of dogs and cats. Davis, CA: CattleDog Publishing; 2009
7. Becker M. Fear Free tools to transform patient interactions, boost visits, and enhance your practice. Symposium conducted at the CVC, Kansas City, MO. 2015
8. Bloom J. Fear Free, low stress handling – understanding the art, design, and feel of this fashion technique. Symposium conducted at the CVC, Virginia Beach, VA. 2016
9. Becker M. The top 10 ways to get started with fear free practice. Symposium conducted at the CVC, Virginia Beach, VA. 2016
This 280 paged, spiral bound book is one of interest as it is written simply and concisely. It is not only easy for instructors to utilize, it is written in language that students can readily understand the concepts being presented. Made up of 18 chapters that are both thorough and targeted in their discussion of specific radiographic techniques, it is also a book that one can quickly ‘thumb through’ when looking for specific information without having to wade through reams of text.

The organization of the book is appealing as it follows the logical organization that might be found on the syllabus of any veterinary technician radiology course. It begins with the concepts of what makes up radiology, addresses the equipment and supplies that are to be utilized, provides a well thought out safety chapter complete with review questions suitable for classroom discussion, and beautifully done pictures. Other chapters include topics on film types, the darkroom, digital radiography, quality assurance, and finally chapters devoted specifically to regions of the body such as abdominal and thoracic imaging. The book concludes with a glossary as well as an index that is helpful to locate concepts quickly.

Each chapter has Learning Objectives, Key Terms, Key Points and Review Questions to help students learn and retain important concepts. While students will enjoy the modern, sleek look of this book, educators will enjoy using the books charts, pictures, and step-by-step instructions to aid them in teaching radiography whether they are involved in a technical education program or a collegiate program. The reviewer urges all to take a second look at this book as a new addition to courses of radiography.
Veterinary Education Simulation Solutions
Empowering and supporting veterinary educators with the most realistic and cost effective learning platforms for:

Canine Vascular Access Training

Equine Clinical Skills Training

Surgical & Suture Training

See our products at the 2017 AVTE Symposium Booth #16

SurgiReal Products, Inc. 995 N. Wilson Avenue Loveland, CO 80537 970.818.7060
www.surgireal.com