INVEST PROGRAM
2014

FRIDAY FEBRUARY
28th

Time	Presenter	Presentation Title	Location
10:00am – 2:30pm	**Sarah Baillie, BSc, BVSc, MSc, PhD, RCVS Cert** **Kent Hecker, Phs, MSc, BSc**	Pre – conference workshop: Design of Educational Research Projects in Veterinary Education	Marriott resort – TBA
3:00pm – 5pm	Poster boards and easels available for poster set up in conference hall – Marriott Resort		SABA Room at the Marriott Resort – Ross students will be available to help

SATURDAY
MARCH 1st

Time	Presenter	Presentation Title	Location
7:00 – 8:30am	Poster boards and easels available for poster set up in conference hall – Marriott Resort		SABA Room at the Marriott resort – Ross Students will be available to help
7:45 – 8:30am	Coffee, light breakfast and registration		Grand Ball Room Marriott Resort
8:30 – 8:45am	Welcome and opening remarks		Grand Ball Room Marriott Resort
	Oral presentations	Theme – Simulation and clinical skills	Grand Ball Room Marriott Resort
8:45 – 9:30am	**Key Note –** **Dean A. Hendrickson, DVM, MS, DACVS**	InVeST: The Past, Present and Future	
9:30 – 10:00am	**Dave Pederson, BS, M.Ed**	Looking Back and Leaping Forward in Simulation Based Teaching	
10:00 - 10:30am	Break		
10:30 – 11:00am	**Sarah Baillie, BSc, BVSc, MSc, PhD, RCVS Cert**	Tips for Success: Setting up a Clinical Skills Lab and Program	
11:00 – 12:00pm	Poster Session I : 5 minute presentations	Theme - Models	Grand Ball Room Marriott Resort
	Bea Biddinger, LVT, VTS(ECC)	Using silicone to develop simple teaching models	
	John Dascanio, VMD, ACTABVP Eric Bauman, PhD, RN, Paramedic Dave Pederson, BS, M.Ed Andrew Knight, BSc, BVMS, DipECAWBM (AWSEL), PhD. Reid Adams	Creation of a model for teaching bovine obstetrics using 3-D printing technology	

	Jason W Johnson, DVM, MS, DACT John Dascanio, VMD, ACT, ABVP Julie Williamson, DVM Jerry Roberson, PhD, DVM, ACVIM, ABVP Lebow, Pb	The development of teaching models for theriogenology	
	Maire O'Reilly, RVN DipAVN (Surgical) Deidre Kellvet, VN Karolina Jankowska, DVM Eoin G. Ryan, MVB, MVM DipECBHM	Simulated milking cow teats and milking system in a life sized model cow for the purpose of self-directed learning in the veterinary clinical skills laboratory	
	Hannah Giese, DVM Johanna Hilke, Student J. Rosenthal, Engineer M. Dilly, DVM, PhD	Development and evaluation of a bovine vascular access model to teach students a technique for placing catheter in the auricular vein of calves	
	Tamy Frank-Cannon, DVM, PhD	Intravenous injection and catheter placement teaching models	
	Julie Williamson, DVM Robin Fio Rito, DVM	Development of large animal vascular access training models	
	Rikke Langebæk, DVM, PhD Mette Berendt, DVM, PhD James Miles, DVM, PhD Hanne Kortegaard, DVM, PhD Thomas Eriksen, DVM, PhD	Low cost, 'build-it-yourself' model for novice training of the deconstructed surgical skills in canine ovariohysterectomy	
	Tatiana Motta, DVM, MS Joshua Yoo, Veterinary Student Bradley Hittle, BS, PhD Don Stredney, BS, MA Matthew Allen, BA, VetMB, PhD	Development of a virtual reality simulator for teaching canine arthroscopy	
	Tatiana Motta, DVM, MS Elena Sweazy, Veterinary Student Benjamin Carter, Veterinary Student Lawrence Hill, DVM, DABVP Mary McLoughlin, DVM, MS, DACVS	Development and Validation of a Low-Fidelity, Low-Cost Surgical Simulation Model to Teach Canine Celiotomy	
	Julie Williamson, DVM Robin Fio Rito, DVM	Development of a small animal thoracocentesis and chest tube thoracostomy model	
	Belle Nibblett, DVM, MVSc, MEdTech, DACVIM	Development of a canine fundoscopic eye model	
	Andrew Knight, BSc, BVMS, DipECAWBM (AWSEL), PhD Reid Adams Dave Pederson,BS, M.Ed	The birth of 'SimDonkey': the develop of a high fidelity donkey patient simulator	

	Eric Bauman, pHD, RN, Paramedic		
12:00 - 1:15pm	Lunch		
1:15 – 5:00pm	Oral Presentations	Theme: Simulation Technology	Grand Ball Room Marriott Resort
1:15 – 1:45pm	**Dan Fletcher, PHD, DVM, DACVEC**	Pulling it together: immersive simulation for veterinary training	
1:45 – 2:15pm	Towle Millard HA, DVM, MS, DACVS Millard RP, DVM, MS Constable PD, BVSc(Hons), PhD, DACVIM, DACVN(Honorary) Freeman LJ, DVM, MS, DACVS	Video-gaming ability is predictive of laparoscopy skills in third year veterinary students	
2:15 – 2:45pm	Andrew Corbett, PhD Paul D. Pion, DVM, DACVIM(Cardiology)	Progress and challenges in developing a computer-based virtual veterinary clinic	
2:45 – 3:15pm	Dee McGonigle, PhD, RN, CNE, FAAN, ANEF	Virtual Simulation Center: Day-to-day operation of an innovative, dynamic virtual learning environment	
3:25 – 3:45pm	BREAK		
3:45pm – 4:15pm	Robert Malinowski, DVM, MA, PhD	The Use of Virtual and Printed 3D Models in Veterinary Medical Education	
4:15 – 4:45pm	Robert Keegan, DVM, DACVA	Improved Learning and Retention of Health Science Concepts Through the Use of a Just-in-Time Teaching, Mobile Device Simulation.	
4:45 – 5:15pm	**Eric Bauman, PhD, RN, Paramedic**	Apps and robotics	

5:15 -6:05pm	Poster Session II: 5 minute presentations	Theme: Teaching, learning and assessment	Grand Ball Room Marriott Resort
	Bernard Grevemeyer, DMV, DECVS Andrew Knight, BSc, BVMS, PhD	The development of a clinical skills laboratory at Ross University School of Veterinary Medicine	
	Isabel Cristine Costa Szupszynski, Veterinary student Elsylene Lega Palazzo, MSc, DVS Rosangela Kiyoko Jomori Bonichelli, MSc, PhD	The viability of alternative methods on veterinary medicine for the study of seminology and surgical techniques: an experience at Fundacao Educational De Ituverava	
	Marton Balogh, DVM	Recipe for improved teaching: What are the main ingredients of an ideal case based learning software?	
	Andrea Vallevand PhD, Emma Read BSc, DVM, MVSc, DACVS Serge Chalhoub, DVM, DACVIM (SAIM) Doug Whiteside, DVM, DVSc, Dipl. ACZM Jacob Thundathil, DVM, MVSc, PhD	Steps for establishing a Minimum Performance Level (MPL) for computer-based Virtual Animal Patient assignments	
	Dee McGonigle PhD, RN, CNE, FAAN, ANEF	Paradigm Shift: Bringing the library to the students virtually	
	Steve Thompson, DVM, DABVP	Metric reports for primary care clinical student rotations evaluating case load dynamics and case load economics available for student instruction	
	Bobbie Merica, AA, Author	Moulage – Bridging the gap in veterinary training exercises	
	Dean Hendrickson DVM, DACVS, MS; Donna Shettko DVM, DACVS, MSN	Use of a simulation model educational program to teach surgical skills to veterinary medical students	
	Emma Read BSc, DVM, MVSc, DACVS Andrea Vallevand, PhD	Developing a simulator to teach and assess equine abdominocentesis clinical skills within the veterinary curriculum. Using an informed and structured approach to address fidelity issues in simulator design and assessing outcome measures of performance using an Objective Structured Clinical Examination (OSCE)	
7:00pm	Opening reception		Marriot Resort

SUNDAY MARCH 2nd

Time	Presenter	Presentation Title	Location
8:00 – 8:30pm	Coffee, light breakfast		
	Oral Presentations	Theme: Teaching, learning and assessment	Grand Ball Room Marriott Resort
8:30 – 9:00am	**Kent Hecker, Phs, MSc, BSc**	Does your simulation enhance learning? How to develop a program of Enquiry	
9:00 – 9:30am	Andrea Vallevand, PhD Darlene Donszelmann, BSc, DVM	The use of quality assurance (QA) protocols to review Objective Structure Clinical Examination(OSCE) stations: establishing station reliability and identifying potential sources of error	
9:30 -10:00am	**Emma Read BSc, DVM, MVSc, DACVS**	Comparison of Inter-rater and Intra-rater Reliability for Specified Objective Structure Clinical Exam(OSCE) Station at Two Different Veterinary Schools	
10:00 -10:30am	Break		
	Oral Presentations	Theme: Teaching, learning, and development	Grand Ball Room Marriott Resort
10:30 – 11:00am	Jason Coe, DVM, PhD	Integrating clinical reasoning, medical problem solving and clinical communications for second-year veterinary students using case based client simulations	
11:00 -11:30am	Tatiana Motta, DVM, MS Benjamin Carter, Veterinary Student Elena Sweazy, Veterinary Student	Development and Validation of a Low-Fidelity, Low-Cost Surgical Simulation Model to Teach Canine Orchiectomy	
11:30 – 12:30pm	Lunch		
12:30 -1:00	Buses to Ross		
1:00-2:30	Workshop session I	Choose 1 of the following	Ross University School of Veterinary Medicine Campus
	Dan Fletcher, PHD, DVM, DACVEC	Pulling it all together: Immersive simulation for veterinary training	Classroom 1
	Julie Williamson, DVM	Model making Buffet	Theriogenology Skills Lab
	John Dascanio, VMD, ACT, ABVP	The classroom response system: Implementation of its use from the classroom to the barn	Upper Auditorium
	Jennifer Moffet, BVetMed, Dip MarComm, MSc	Small group facilitation skills: Challenges and solutions	LAT Conference room 1
	Dean A. Hendrickson, DVM, MS, DACVS	Designing surgical training programs: What outcomes assessments should we use?	Classroom II
	Cindy Adams PhD, MSW Elpida Artemiou, MSc, PhD	Simulation in Teaching and Learning Communication Skills: The	Simulation Laboratory

	Beth Dronson, VMD (sponsored by Zoetis)	benefits of using simulated clients	
2:45-4:15	Workshop Session II	Choose 1 of the following	
	Dan Fletcher, PHD, DVM, DACVEC	Pulling it all together: Immersive simulation for veterinary training	Classroom I
	Julie Williamson, DVM Robin Fio Rito, DVM	Model making potluck - designs, materials and methods	Clinical Skills Laboratory
	John Dascanio, VMD, ACT, ABVP	Model Buffet	Theriogenology skills laboratory
	Jennifer Moffet, BVetMed, Dip MarComm, MSc	Small group facilitation skills: Challenges and solutions	LAT conference room 1
	Dean A. Hendrickson, DVM, MS, DACVS	Designing surgical training programs: What outcomes assessments should we use?	Classroom II
4:15pm – 4:45pm	Buses to Marriot		
6:30pm	Buses to Spice Mill		Marriot Lobby – front entrance
7:00pm	Dinner at Spice Mill		

MONDAY MARCH 3rd

Time	**Presenter**	**Presentation Title**	**Location**
8:00 – 8:30am	Coffee, light breakfast		
	Oral presentations	Theme: Teaching, learning and assessment	Grand Ball Room Marriott Resort
8:30 -9:00am	**Robin Fio Rito, DVM**	The use of formative assessments in clinical skills training	
9 - 10:00am	Catriona E Bell, BVetMed, PhD MRCVS	Peer Assisted Learning in Clinical Skills Training – the Student Perspective	
10:00 - 10:30am	**Emma Read BSc, DVM, MVSc, DACVS**	Evaluation of Surgical Skills Training of Vet Students Using a Canine Ovariohysterectomy Model	
10:30 – 11:00am	Break		
11:00 - 12:15pm		Panel Discussion: Clinical skills program development and sustainable management	Grand Ball Room Marriott Resort
12:15pm	Closing remarks		

TUESDAY MARCH 4th Travel Day

Note: Presenters represented in bold letters are invited guest speakers.

ABSTRACTS

POSTER SESSION I - Models

Silicone used to make teaching models increases the realism of simulated tissue and helps veterinary students learning basic clinical skills.

Bea Biddinger LVT, VTS(ECC)
Small Animal Clinical Sciences Teaching Lab Manager, Michigan State University College of Veterinary Medicine, East Lansing Michigan 48824

Introduction

Historically vet students learn simple tasks such as injections and suture placement using stuffed animals, foam pieces, or a real patient but the lack of realism or the high anxiety scenario can severely detract from an optimal learning situation. Models made of silicone provide higher quality teaching aids with realistic tissue feel, and they allow students ample practice in low-risk scenarios to develop the necessary motor skills required for simple clinical procedures.

Model Design and Function

At MSU, teaching models have been designed using various silicone formulations that offer different textures and resistance to finger pressure and needle puncture. Simple, economical, and reusable models were designed for the purpose of bovine tail venipuncture, canine midline anatomy suturing, intramuscular and subcutaneous injection, fine needle mass aspiration, and cystocentesis. The various layers of silicone simulate different tissue densities that respond quite similarly to real skin. The injection models accept fluid deposits and the water tight bladder offers a genuine cystocentesis experience. These models have withstood multiple suture line placements and needle punctures.

Current Use and Future Plans

The silicone models are utilized in several teaching courses for both veterinary and veterinary technician students, and they are available on demand for students to practice at their convenience. Feedback from both the students and teaching faculty has been overwhelmingly positive. These models were designed by the author and are currently under evaluation for potential patenting and marketing. The plan is to continue design and development at least within the college.

Creation of a model for teaching bovine obstetrics using 3-D printing technology

Dascanio J, Bauman E, Pederson D, Knight A, Adams R.
Devry Education Group, Ross University School of Veterinary Medicine, St. Kitts, West Indies

Models are used in veterinary medicine to alleviate the need for the live animal, to allow for repeated use in development of motor skills and to allow students a relaxed atmosphere without the need for animal restraint. Most veterinary schools would obtain deceased calves for obstetrical laboratories, but on St Kitts the number of cadaver models is not adequate to meet instructional needs, thus the need for model development. At the Ross University School of Veterinary Medicine we have used polyvinylchloride pipes to simulate the calf's leg for obstetrical chain placement. The overall size of the leg, the lack of proper joint size relative to long bone size, the inability to flex joints

and the lack of an anatomically correct hoof make this low fidelity model less than ideal as an obstetrical model. A team of individuals was put together including members from the Center for Excellence in Simulation Education at DeVry to create a medium fidelity model. Digital jpeg images of a real calf's leg were obtained from all angles distal to the forearm. The images were converted using Geomagic Studio® software into a 3-D image. Joint mobility was added to simulate the motion of a real calf's leg. The 3-D image was then subsequently printed using a 3-D printer. 3-D printing resulted in an anatomically correct model that will provide an enhanced learning experience for our students. The teaming of teaching faculty, simulation experts, software engineers and 3-D printing technologies resulted in the production of an excellent teaching model.

The Development of Teaching Models for Theriogenology

Johnson J[a], Dascanio J[b], Williamson J[b], Roberson J[b], Lebow P[b]
[a]Lincoln Memorial University College of Veterinary Medicine, Harrogate, TN USA
[b]Ross University College of Veterinary Medicine, St Kitts, West Indies

Models have been used for clinical skill training in human medicine for many years, and there are ample manufactured models available. However, availability and utilization of veterinary clinical skill models have historically lagged behind the medical profession. Veterinary educators today are embracing the use of models in theriogenology curricula to impart sound clinical skills, and as such, safeguard from animal overuse, provide a controlled environment for technical instruction, enhance systematic learning and provide resources to administer objective assessments.

We have developed numerous models for teaching theriogenology laboratories aimed to develop psychomotor skills and to teach dystocia diagnosis/management/correction, principles of fetotomy, vaginal prolapse repair and uterine torsion diagnosis/treatment. While typical curricula have used cadaver models for these types of laboratories, our models do not utilize animal tissues. Our innovative models employ readily available resources amalgamated with parts from veterinary simulation companies. An example would be our dystocia model which consists of a uterus model from California, a calf model from Canada, along with an in-house designed pelvis/abdomen to house the model. Another example is our fetotomy model which is completely derived from hardware store parts and uses polyvinyl chloride pipe as an easily replaceable resource for students performing fetotomy cuts.

This paper will describe the resources required to duplicate the models used in our curriculum and the process of further development of these models from low fidelity to medium fidelity to deliver theriogenology clinical skills.

Simulated milking cow teats and milking system in a life sized model cow for the purpose of self- direceted learning in the Veterinary Clinical Skill Laboratory

Maire O'Reilly[1] Rvn DipAVN (Surgical), Deirdre Kellett VN[2], Karolina Jankowska DVM, Eoin G. Ryan[3] MVB MVM DipECBHM
UCD, Ireland

To create a novel milking system with synthetic teats to optimise the use of an existing life-sized fibreglass model dairy cow in order to facilitate the teaching of practical skills considered to be 'day one' competencies for veterinary graduates, including those that are examined in final year Direct Observation of Practical Skills (DOPS) examinations. Teat measurements were taken from a sample number of twenty Holstein/Friesian milking cows to simulate natural teat texture, the mechanics of hand-milking and size. The teat was sculpted in clay and a rubber mould made in which to cast the flesh-tinted silicone models. A specialised silicone used in film make up and prosthetics creates a life-like feel and is

safe and durable. The original fibreglass teats were sawn off the model cow to create a smooth opening. The clay sculpture incorporated a wide flap at the proximal end resulting in teats with a wide silicone flap to sit snugly and securely inside the original udder. The teats connect via modified garden hosing to a large bag which hangs on an iron hook inserted within the model. This bag can be filled with liquid to simulate the milking process Students will be facilitated in developing a number of clinical skills, including: (i) optimal hand-milking technique; (ii) California Mastitis Testing; (iii) sterile milk sampling; (iv) regional anaesthesia of the teat; (v) teat amputation techniques; (vi) teat laceration repair; (vii) use of Hudson's knife and other teat instruments.

Development and evaluation of a bovine vascular access model to teach students a technique for placing catheter in the auricular vein of calves

H. Giese, J. Hilke, J. Rosenthal and M. Dilly
University of Veterinary Medicine Hannover, Foundation

In cattle as well as in calves continuous intra venous (i.v.) drip infusion can be administered through catheter placement into the ear veins. This way of catheterization guarantees a safe fit and can be used over several days even to infuse larger amounts of fluids in dehydrated patients (Rosenberger, 1990). For the training of clinical skills in small animal practice a lot of excellent training models are available and broadly used (Lee, 2013; Lumbis, 2012). Models and simulators for veterinary training in livestock animals are limited. Nevertheless, students have to perform and train clinical procedures in large animals. For that reason we created a training model for catheter placement into the auricular vein (*Vena auricularis).*
The bovine calf model consists of a sculpted calf head containing two replaceable ears. Each ear is equipped with simulated auricular veins covered with silicone "skin". It can be used to teach students fluid and drug administration, and the fundamentals of catheterization in bovine calves. An evaluation questionnaire regarding general handling, haptic features and use of model in education was designed. The suitability of the model was validated by experienced bovine veterinarians and veterinary students. The overall feedback was positive; especially the suitability for teaching purposes was highly valued by the students.
In the future, the model can be used to assess student performance in an objective structured clinical examination (OSCE) station.

References:

S. Leea, J. Leeb, A. Leea, N. Parka, S. Leea, S. Songa, A. Seob, H. Leeb, J.-I. Kimb, K. Eoma Augmented reality intravenous injection simulator based 3D medical imaging for veterinary medicine. The Veterinary Journal, 2013.

R. Lumbis, S. Gregory und S. Baillie. Evaluation of a Dental Model for Training. Journal of veterinary medical education, 2012. doi:10.3138/jvme.1011.108R

G. Rosenberger . Die klinische Untersuchung des Rindes [Book], 1990. Stuttgart, Paul Parey.

Intravenous injection and catheter placement teaching models

Tamy C. Frank-Cannon, DVM, PhD
Texas A&M University

We created low, medium and high fidelity models of the canine cephalic vein and utilized them to instruct first year veterinary students in proper techniques for intravenous injections and catheter placement. The low fidelity model can be easily made without the need for specialized equipment. The medium fidelity model utilizes items obtained from local craft stores applied to the osseous frame work of the canine thoracic limb. The high fidelity model utilizes the osseous frame work of the thoracic limb with silicone techniques to create a replica of the thoracic limb. The models utilize tubing hidden under a skin replica, requiring the student to palpate, visualize, and stabilize the vein as they practice proper syringe and needle or catheter handling. The tubing is connected to an IV fluid bag containing simulated blood, providing the student immediate feedback on their success in locating the vein. The medium and high fidelity models add the benefits of simulating body position and proper anatomical location for the vein. Students are also able to practice securing a catheter to the limb after placement. These models allow novice students to focus their learning on the proper steps and manual dexterity associated with venipuncture and catheter placement and eliminates student concern about causing discomfort to a live canine patient. In addition, they have the ability to practice the tasks multiple times. The models also provide a means for instructors to assess a student's readiness to move to the next step and do these skills in live animals.

Development of Teaching Models for Large Animal Vascular Access

Williamson J, Fio Rito R
Ross University College of Veterinary Medicine, St Kitts, West Indies

Vascular access training models are routinely used in human medicine and are increasingly being incorporated into clinical skills training centers in veterinary education. Because of the variety of species treated and the number of veins available for blood collection and catheterization in each species, a number of diverse models are required to train students adequately in these techniques. While some models have been developed both commercially and in-house by veterinary educators, there remains a paucity of models available for teaching large animal vascular access.

This poster will detail the development of a bovine coccygeal vein model for venipuncture and an ovine jugular vein model for venipuncture and catheterization. These low fidelity models can be recreated by veterinary educators worldwide. Vascular access models such as these allow students to achieve repetitive practice in a low-stress environment and to attain proficiency without compromising animal welfare.

Low cost, 'build-it-yourself' model for novice training of the deconstructed surgical skills in canine ovariohysterectomy

Rikke Langebæk, DVM, PhD, Assistant Professor, Mette Berendt, DVM, PhD, Professor, James Miles, DVM, PhD, Assistant Professor, Hanne Kortegaard, DVM, PhD, Senior Veterinarian, Thomas Eriksen, DVM, PhD, Professor
Department of Veterinary Clinical and Animal Sciences, University of Copenhagen

Practical and ethical considerations have led to an increased use of artificial substitutes to live animals for skills training in veterinary surgery. However, commercially produced models are expensive and home-made models often require full-time staff in order to produce sufficient models for training large groups of students. At the Department of Veterinary Clinical and Animal Sciences, University of Copenhagen a low-cost 'build-it-yourself'-model (the OVHX-model) was developed for novice training of the deconstructed surgical skills in canine ovariohysterectomy. The primary aim was to implement a model which at the same time could increase the students' understanding of the anatomical structures and support their training of basic surgical techniques involved in ovariehysterectomy. Thereby the students prepared for live animal patient surgery on a model stimulating learning by visual, tactile, motoric and creative stimuli. A secondary benefit of this model was the reduced use of trained technical staff and high-cost specialized supplies. Students have reacted positively to this alternative training of core surgery skills. Within a limited timeframe students are able to build their own models, and they seem to be highly motivated by the creative element associated with the building process. Furthermore, this concept allows the teachers to spend more time on interacting and assess novice students in a low-stress environment. This build-it-yourself principle using commercial and inexpensive materials can easily be implemented in any veterinary training environment worldwide.

Development and Validation of a Low-Fidelity, Low-Cost Surgical Simulation Model to Teach Canine Celiotomy

Tatiana Motta, Elena Sweazy, Benjamin Carter, Lawrence Hill, Mary McLoughlin
College of Veterinary Medicine, The Ohio State University, Columbus, Ohio 43210

Financial and ethical constraints have created a need for model use in surgical training of veterinary students. The aim of this study was to evaluate veterinary students' perception of a low-fidelity canine celiotomy model and to determine the model's validity.

A low-fidelity, low-cost surgical model for celiotomy was created using silicone and different fabrics. Twenty four first or second year veterinary students participated in this study. All students received instructions (lecture, videos, and handouts) on performing a celiotomy. Half of these students received the celiotomy model and an hour of training with the model (simulation group) while the other half received no additional training (control group). All students answered a questionnaire indicating their perception regarding performance, stress, and confidence levels. Students were recorded performing a celiotomy on a cadaver. Surgical time was documented at ten different steps.

Videos of the surgery are being graded by three faculty members according to a detailed rubric created for this study. Current results include surgical time and questionnaire answers. The simulation group was quicker than the control group at incising the skin and using hand ties for hemostasis (9.5min verses 15min, $p=0.003$). Increased stress was self reported more often by students in the control group (33% verses 8%) as well as poor performance (58% verses 0%). Invested time in self-guided training with the simulator (4.3h) was higher than time invested with any other resource (0.6h - 2.3h). We anticipate that scores from live recording will be significantly better for the simulation group.

Development of a small animal thoracocentesis and chest tube thoracostomy model

Williamson, J. Ross University School of Veterinary Medicine; FioRito, R. Ross University School of Veterinary Medicine

Thoracocentesis and chest tube placement are challenging skills to learn, and veterinary students require adequate opportunities to practice these tasks to become proficient. While there are a number of thoracocentesis and chest tube thoracostomy models available for the training of medical practitioners, only one commercially available veterinary thoracocentesis model currently exists. The widespread use of this model in veterinary education is hampered by its high cost ($1,845 USD) and large storage space requirement.

This poster describes the development of a compact and cost efficient model for training veterinary students to perform thoracocentesis and chest tube placement in small animals. The reusable model utilizes a half bucket with rib spaces cut into it. A covering constructed of faux fur and silicone skin allow the student to palpate and recognize anatomic landmarks. The bucket is filled with an expansile foam matrix to simulate lungs and support a latex bladder which can be filled with air or fluid to simulate pneumothorax or pleural effusion. Replacing the bladder with a solid piece of silicone simulates a negative pressure aspiration.

Utilizing the model for chest tube placement requires that the silicone skin be replaced after several placement attempts. Alternatively, the outer covering of the model could be removed and replaced with cadaver skin to facilitate chest tube placement without damage to the model.

This thoracocentesis and chest tube placement model can be recreated by veterinary educators worldwide, requires only about 0.5 cubic meters of storage space, and costs approximately $80 USD per model.

Development of a canine fundoscopic eye model

Belle Nibblett, Ross University School of Veterinary Medicine, St. Kitts, West Indies

Introduction: A teaching model for canine fundoscopic examination was sought as a replacement to using live dogs. Teaching this skill using live dogs was challenging as students required more time than was tolerable by the live dog (presumably due to the intensity of the light source). Fundoscopy, particularly indirect, requires development of hand eye coordination over time such that the practitioner can quickly and reliably visualize the fundus. The goal was to create a model that would allow practice of the hand eye skills required to perform indirect ophthalmoscopy.[1]
Method: A search for other ophthalmic teaching models was undertaken. No veterinary species fundoscopic model was found in literature and no commercially available model was found though there was literature describing human models as well as commercially available models. These human models were examined carefully. To aid in creation of a canine model that would meet its purpose, indirect ophthalmoscopy was broken down into the following steps and associated considerations for the model:
1. Dog restrained on examination table facing examiner; model ~20”off exam table surface.
2. 20 diopter lens held between thumb and index fingers of non-dominant hand; need lens
3. Brace tips of pinky, ring and middle fingers of non-dominant hand dorsal and to side of eye to be examined (to left side of eye if right handed) with wrist rotated externally such that lens is not in front of the dogs eye; model must have a place for fingers to rest.
4. Back away from dog such that non-dominant arm is fully extended; space in front of model.
5. Turn on and hold a Finoff transilluminator in dominant hand at temple or directly in front of examiners nose, directing light beam toward pupil to be examined; need Finoff transilluminators.
6. Crouch down or sit on an adjustable height wheeled stool such that light enters pupil at 5 to 20 degrees above horizontal until the yellow/green tapetal reflex is visualized: model must have pupil and anatomically correct placement of tapetum lucidum and adjustable height seating.
7. Place hand held lens directly in front of canine eye such that it perfectly transects beam of light from the transilluminator and look through handheld lens to visualize fundus; consider optics and intraocular anatomy

After break down of steps, and review of ophthalmic teaching models used in human medicine, a ping pong ball model was identified that could be readily adapted by use of a dog silhouette (versus human) and inclusion of a reflective tapetum[2]. Blending with another model design, the optics of the model was further improved by addition of a 20 diopter hard contact lens.[3]
Result: A ping pong ball has an 10mm hole drilled as pupil and is cut in half and painted black inside. Reflective tape is applied as a reflective tapetum. A 4mm circle placed as optic disc and red paint used to add retinal vessels. The ball is resealed and a 20 diopter hard contact lens placed 5mm behind the pupil. The ball is mounted on a side bracket of a plywood dog head silhouette on a 20 inch stand resulting in a low cost model.
Future directions: Validation of the model via evaluation by ophthalmologists, added ophthalmic examination skills to the model (tonometry) and integration of the model into a core teaching laboratory.

References:

1. duBoulay, C., Medway, C., The clinical skills resource: a review of current practice. Medical Education, 1999, Mar:33(3):185-191
2. Kumar, KS, Shetty, KB., A new model eye system for practicing indirect ophthalmoscopy, Indian J Ophthalmol 1996 Dec:44(4):233-4
3. Welch Allyn Inc., Skaneateles Falls, NY, USA

The birth of 'SimDonkey': the develop of a high fidelity donkey patient simulator

Andrew Knight (1), Reid Adams (2), David Pederson (2), Eric Bauman (2)
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2. Institute for Research and Clinical Strategy; Center for Excellence in Simulation Education. DeVry Education Group, Highland Landmark V, 3005 Highland Parkway - 5th Floor, Downers Grove, IL 60515-5799, US.

High fidelity human patient simulators (HPSs) provide medical students with opportunities to develop important clinical competencies, including technical skills, clinical reasoning, teamwork and communication, within environments which are reasonably realistic, yet comparatively free of stress. However, very few high fidelity animal patient simulators have been developed for use by veterinary students. Accordingly, we transferred working parts from 'SimMan' – a high fidelity HPS - into an animal mannequin. We chose a donkey – subsequently named 'SimDonkey' - for several reasons. The size of the HPS circuit boards and equipment precluded the use of a smaller mannequin. Additionally, we make significant use of donkeys in our clinical training program, and there remains a dearth of simulators for teaching equine clinical skills. Our SimDonkey has a range of cardiovascular and respiratory features derived from the HPS, including bilaterally palpable pulses in the regions of the carotid arteries and front legs, an airway that can be intubated, with or without a range of intubation problems, spontaneous chest excursions to simulate breathing, auscultable heart and breath sounds, with a range of pathologies available, and ECG and defibrillation connection points - although the internal structure of this mannequin, including its potentially inflammable components, preclude the use of a defibrillator in the current version. SimDonkey is currently being assessed by appropriate faculty members, including those with equine, clinical or anatomical specializations, who are investigating potential for use in clinical teaching, and the anatomical and functional modifications that will be incorporated into the next version of SimDonkey.

ORAL PRESENTATIONS – Simulation Technology

Video-Gaming Ability Is Predictive Of Laproscopy Skills In Third Year Veterinary Students

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Objectives:
Determine the association between video-gaming ability and laparoscopic, spatial orientation, and traditional surgical skills.
Design:
Prospective, randomized, controlled study utilizing a convenience sample.
Sample Population:
Twenty-nine volunteer (17 female, 12 male) Purdue University third year veterinary students (IRB#1208012553).
Methods:
None of the test subjects had previously played the test video games or had laparoscopy experience. Subjects played 3 video games; scores were recorded for each game. Three procedures that simulated laparoscopic surgical skills were evaluated using box trainers. The Purdue University Visualization of Rotations Spatial Test was used to evaluate 3D skills. Four traditional surgical skills were evaluated by recording the time for successful completion. Associations between summary scores were analyzed using Spearman's rank correlation coefficient (r_s) and $P < 0.05$ was considered significant**.**
Results:
A positive correlation between the summary score for the 3 video games and the summary score for laparoscopic skills ($r_s = +0.40$, $P = 0.031$) was found. In contrast, summary scores for traditional surgical skills were not associated ($P = 0.61$) with video game performance. Spatial analysis skills were positively ($r_s = +0.30$), but not significantly ($P = 0.11$), associated with video game performance. Traditional surgical skills were not associated with laparoscopic skills ($r_s = +0.25$; $P = 0.19$) or spatial analysis skills ($r_s = -0.03$; $P = 0.88$).
Conclusions and Clinical Relevance:
Video game aptitude is predictive of laparoscopic skill, but not traditional surgical skills, in third year veterinary students. This finding suggests that laparoscopic skills can be improved by video game training.

Progress and challenges in developing a computer-based virtual veterinary clinic

Andrew Corbett, Ph.D. and Paul D. Pion DVM, DACVIM (Cardiology)
Veterinary Information Network, Davis, CA

The Veterinary Information Network is developing a suite of virtual veterinary patients called the VIN Virtual Clinic. Our objective is to support veterinary students and new graduates in their growth from student to practicing clinician.
A pilot version undergoing evaluation contains patients presenting with acute hemorrhage, suspect hyperadrenocorticism, and patients under surgical anesthesia. Additional clinical challenges are in development involving heart failure, poisoning, pancreatitis, and anemia. Our focus in this next phase is first-opinion cases.
An experienced clinician guides the creation of each case ensuring medical accuracy. To facilitate creating a rich variety of clinical problems and presentations, we have developed a modular programming framework that enables multiple virtual patients to be created from a common set of building blocks.
The user experience has been designed around principles that are known to enhance learning outcomes in computer-based training. A virtual mentor provides feedback immediately as the user cares for the patient. The user's performance on a patient is saved, enabling self-corrective learning. This will also enable analysis of clinical performance across users.

Users are invited to complete a questionnaire after treating a patient, generating data with which to evaluate user experiences. We are holding focus-groups with veterinary students to assess usability. As usage of the virtual clinic expands, and the variety of patients grows, we anticipate evaluating how treating these virtual patients affects the veterinarian's future clinical experience. We have a growing list of users volunteering to participate in such follow-up studies.

Virtual Simulation Center: Day-to-Day Operation of an Innovative, Dynamic Virtual Learning

Dee McGonigle PhD, RN, CNE, FAAN, ANEF, Carole Eldridge DNP, RN, CNE, NEA-BC, Julie McAfooes MS, RN-BC, CNE, ANEF, Chamberlain College of Nursing

Topic and its importance or relevance
The topic for this presentation is the day-to-day operation of an innovative, dynamic virtual learning environment. The intended audience includes academicians who are using virtual learning environments or want to explore the possibility of adding innovative virtual learning environments for their learners.

Objectives
Compare the innovative, dynamic virtual learning environment to manikin-based simulation laboratories.
Explore daily, monthly and annual expenses associated with course delivery via Second Life.
Assess the cost per student/per session.

Background or purpose
The innovative, dynamic virtual learning environments we create require us to be quick change artists who sculpt the learning props into setting backdrops based on the learner's needs. Students in the undergraduate (BSN and RN to BS) and graduate (MSN, FNP, DNP) nursing programs have different requirements. As learning needs change, the environment must be transformed to facilitate each learner's success. The day-to-day operational considerations require planning, financial, logistical and maintenance decisions. This presentation will provide a behind the scenes glimpse, sharing what a director's life is like in the changing virtual learning landscape known as Second Life.

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The Use of Virtual and Printed 3D Models in Veterinary Medical Education

Robert Malinowski, DVM, MA, PhD
College of Veterinary Medicine, Michigan State University

Recent advances in technology have simplified the process for creating three-dimensional teaching models. Objects can be assembled from clinical data, such as CT or MRI images, constructed from a series of "stitched" two-dimensional digital images of a physical item, or acquired using inexpensive 3D scanners. It is also possible to model a completely virtual object using 3D software packages available on the market today.

Once the model exists, there are several delivery formats that can be utilized to incorporate these resources into the veterinary curriculum. In addition to basic video animations, content can be completely web-based, giving students total control of the models with the ability to rotate and zoom as desired. Objects can be embedded into popular file formats, such as PDF, allowing integration will supportive contextual information such as text, images and videos. Models can also be exported as tangible physical objects, using inexpensive 3D printers, for use in low-fidelity simulations.

This presentation will highlight how the MSU College of Veterinary Medicine has been using 3D models in the curriculum and will give valuable insight regarding the specific acquisition techniques and delivery methods that have been most successful. First impressions and experience using 3D printing technologies, such as the MakerBot Replicator 2X, will also be given. Finally, plans for future incorporation of these resources into simulation and training activities will be discussed.

Improved Learning and Retention of Health Science Concepts Through the Use of a Just-in-Time Teaching, Mobile Device Simulation.

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Research convincingly demonstrates that pre-class activities introducing new material can increase student performance compared with traditional lectures. The combination of pre-class exercises with an active learning pedagogy in a traditional classroom setting is a proven educational strategy known as Just-in-Time Teaching (JiTT). Unfortunately, student compliance with pre-class reading and the faculty time investment required to review pre-class assignments have combined to limit the use and benefits of JiTT pre-class learning. In an effort to capture the demonstrated benefits of JiTT while avoiding barriers to implementation we have developed a mobile device implementation of a pre-class clinical simulation activity. One hundred twenty one nursing students enrolled in a electronic fetal monitoring (EFM) course will be studied to evaluate the acceptance and learning efficacy of the pre-class mobile simulation. Prior to the start of the study all students will attend an introductory lecture on EFM. Students will be assigned to either complete a pre-class reading assignment on EFM (READ) or to work through a series of EFM clinical scenarios on the mobile simulation (SIM). Following completion of the pre-class exercise all students will attend a lecture on EFM waveform interpretation and treatment. Quantitative data will consist of the same written examination administered to students in both treatment groups following the EFM waveform lecture. Qualitative data will consist of a survey of student perception of the simulation and of the pre-class reading assignment. We expect that students in the SIM group will have higher written exam scores compared with READ group students.

POSTER SESSION II – Teaching, learning and assessment

The development of a clinical skills laboratory at Ross University School of Veterinary Medicine

Bernard Grevemeyer Dr med vet, DiplECVS, Professor of Large Animal Surgery; Andrew Knight DipECAWBM (WSEL), PhD, MRCVS, FOCAE, Director, Clinical Skills Laboratory; both at Ross University School of Veterinary Medicine, St Kitts.

Abstract

Several trends have altered the teaching of clinical skills to veterinary and medical students in recent years and decades. These have included increasing recognition of clinical errors as a cause of adverse patient outcomes, subsequently increased focus on patient safety, the evolution of clinical skills educational research and theory, increasing class sizes, budgetary constraints, and increased focus on alternatives to animal use, for humane and ethical reasons. Accordingly, medical and veterinary schools internationally have increasingly established dedicated laboratories for teaching clinical skills, using models, mannequins and simulators. These have been established in medical schools for more than two decades, but their incorporation within veterinary curricula has occurred much more recently.

In 2007 a decision was taken to establish a clinical skills laboratory (CSL) at Ross University School of Veterinary Medicine. We visited two established, successful CSLs, at the University of Toronto and Louisiana State University. We then considered the range of skills we wished to teach, the physical space and equipment required storage and air conditioning requirements for our models, facilities to deliver PowerPoint presentations and case simulations, and others to handle cadaver specimens. We selected an appropriate campus building, converted it to our needs, hired teaching staff, and started to source models and mannequins for teaching veterinary clinical skills.

Our CSL has developed considerably since those early days, and currently offers instruction in a diverse array of surgical, medical and other clinical skills. We hope this description of our experiences may assist others embarking on similar projects elsewhere.

The viability of alternative methods on veterinary medicine for the study of seminology and surgical techniques:
An experience at the Fundacao Educational De Ituverava, Dr. Fancisco Maeda – FAFRAM

Isabel Cristine Costa Szupszynski, undergraduate student of Veterinary Medicine at Fundação Educacional de Ituverava, Dr. Francisco Maeda – FAFRAM, located at Ituverava, São Paulo, Brazil (South America); Supervisors: Dr. Elzylene Léga and Dr. Rosangela Kiyoko Jomori Bonichelli.

The aim of this present study is to analyze the opinions and acceptability of all undergraduate students of the Veterinary Medicine degree course at Fundação Educacional de Ituverava Dr. Francisco Maeda - FAFRAM, located at Ituverava, in São Paulo state, Brazil, regarding the use of alternative methods for the study of semiology and surgical techniques available in the field so far.

This research is carried out with the use of the canine mannequin *Critical Care Jerry*®, borrowed from the *InterNICHE*® network, and a few alternative items from the *Rescue Critters*® brand.

In order to analyze the students' opinions, a questionnaire was created and divided into two parts. Firstly, students attend a presentation about alternative methods available in the field at present, then, answer the first part of the questionnaire. Students are then invited to practice some medical procedures on the mannequin *Critical Care Jerry*® for

an allocated period of time. Finally, students are then invited back to their seats and the second part of the questionnaire is given. The aim of the questionnaire is to collect the students' opinions about the viability of alternative methods on veterinary medicine for the study of semiology and surgical techniques by firstly watching a demonstration and secondly, by having the chance to have hands-on experience on this new type of methodology.
The use of alternative methods on the teaching of veterinary medicine has been growing worldwide. Animal welfare is an important matter that needs to be taught to students, not only in theory but also during practical lessons whenever it is available.
Key words: animal welfare, canine mannequin, alternative teaching methods.

Recipe for improved teaching: What are the main ingredients of an ideal case based learning software?

Marton Balogh, DVM, A. Plisko, SzIE-ÁOTK, Budapest, Hungary

With the recently started blooming of virtual patients in veterinary medicine it is extremely important to know what traits differentiate between a popular and well used software from an initially appealing, but later unused one. The aim of this presentation is to create a review of the results of a study done in 2013, with 20 students, who tested different methods of case based learning, and were asked to grade and review them. With the analysis of these reviews, we gained useful information on what the students were missing from these methods, and what parameters they were satisfied with. Creating a list of features with the highest demand helped us to create the blueprint of an ideal case based teaching method, which would promise prolonged interest and usage from the side of the students. During the presentation we will examine which features are needed, and which ones are just welcomed by students, and as well compare the different presentation methods and their effects on the students' satisfaction.

Steps for establishing a Minimum Performance Level (MPL) for computer-based Virtual Animal Patient assignments

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Background:
Computer-based, virtual animal patient (VAP) simulations are used at the Faculty of Veterinary Medicine, University of Calgary (UCVM).
Introduction:
Instructors with the Clinical Presentations (CP) course were approached to develop a VAP simulation, scoring rubric, and establish a minimum performance level (MPL). The purpose is to create an expert judgment, simulation-specific MPL rather than relying on an arbitrary passing score.

Methods:

Simulation examples include Cushing's Disease (adrenal versus pituitary dependent), chronic cough (respiratory versus cardiac), and capture induced myopathy (CIM) (acid-base disturbances).
The scoring rubric is based on lecture content and in-class clinical examples. The Ebel method was used to rate each rubric item on importance (essential, important, marginal) and difficulty (easy, moderate, hard).
Results:
Cushing's (49 items, MPL = 76%). The MPL was exceeded by 23 of 30 students (77%). Mean simulation score = 80.0% (SD = 8.4%, Min = 56%, Max = 92%).
Chronic cough (22 items, MPL = 73%). The MPL was exceeded by 21 of 30 students (70%) (Mean simulation score = 79.9% (SD = 8.7%, Min = 64%, Max = 96%).
CIM (40 items, MPL = 63%). The MPL was exceeded by 29 of 30 students (97%). Mean simulation score = 79.7% (SD = 9.1%, Min = 59%, Max = 94%).
Discussion:
Educational measurement specialists caution against using an arbitrarily set passing score. Results demonstrate that VAP MPLs are simulation topic and expert-judgement specific. Future research will be directed at establishing the relationship between VAP simulation performance, the MPL score, and student performance in subsequent examinations.

Paradigm Shift: Bringing the Library to the Students Virtually

Dee McGonigle PhD, RN, CNE, FAAN, ANEF
Chamberlain College of Nursing, Professor/Director, Second Life (Virtual Learning Environments)
Lisa Blackwell MLS, Chamberlain College of Nursing , National Director of Library Services

Topic relevance
The topic for this presentation is how to enact the paradigm shift in bringing the library to the student in Second Life. As evidence based practice and safety issues are paramount in nursing practice, students must have access to timely resources when they need them. The intended audience includes academicians who want to explore this paradigm shift and provide access to scholarly literature and information for their learners.

Background
The old paradigm of going to the library to seek information and knowledge has changed in this technologically infused era. The new paradigm is to bring the library to the users; this is being accomplished on our islands in the Second Life (SL) virtual world. SL is a fully interactive application that mimics the real world and allows you to engage with the environment and other people.

Methods or practice used
All of our SL users are able to access any of our college's library resources from anywhere at any time in SL. The library resources are available using heads up displays (HUDs) that the student has access to when they enter their virtual learning space. This is extremely important for graduate nursing students. They can chat with a "live" librarian, search, order articles and resources or read immediately upon access.

Findings
Data collection is underway and preliminary research findings regarding this paradigm shift in the virtual simulated environment will be shared during the presentation.
Conclusions or implications
This truly is a paradigm shift that puts information and knowledge at the fingertips of our nursing students and supports evidence based collaborative practice. This presentation will demonstrate the HUD and describe the collaborative effort, resources, and outcomes from enacting this new paradigm in SL.

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Metrics reports for primary care clinical student rotations evaluating case load dynamics and case load economics available for student instruction.

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A metric report was developed to allow rapid feedback to students on their caseload dynamics and economic awareness during their companion pet primary care rotation. Rotations are 3 weeks and include expectation to discuss economic costs for at least two primary care appointments as a requirement for passing the clinical year. Primary care caseload was divided by problem or wellness visits, as well as the ability to separate feline, canine and exotic pet caseload. Economic reports include gross income as well as actual cost paid after any staff/student/employee discounts and teaching subsidies. Metrics for the classes of 2012 and 2013 (N = 112) revealed an individual student average of 19 problem cases (range 8-31) and 20 wellness cases (range 9-37) for total caseload responsibility over the rotation of 39 patients (range 23-54). Students also had referral cases with the behavior and dermatology service. Each student spent a combined time of 3-4 days with these specialty services and this data was not included. Average Client Transactions (ACT) and actual income generated were tracked to allow students to compare to private practice externships and during career interviews. Student ACT averaged $138 (range 80-191) and actual income averaged $5480 (range $2813 - $9757). Variation of income during the year was assessed comparing individual student ACT to the Community Practice ACT during each month and allowed comparison of percentages with seasonal variation in caseload. When the individual ACT was compared to the Community Practice ACT as a percentage, the student ranges were 71- 146%.

Use of a simulation model educational program to teach surgical skills to veterinary medical students

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Introduction: Surgical skills such as suturing, knot tying and tissue handling are important skills for veterinary medical students to master during their education. There is a need for the students to build a framework of basic surgical skills before carrying out surgical procedures on live animals. Simulation provides the opportunity for the acquisition and continued practice of these skills. An educational modular curriculum has been developed around the use of specialized simulation models that provide texture, vessels that require hemostasis and tissues that mimic the holding strength of skin to allow the opportunity to master the surgical skills.

Goal: The goal is that the simulation model educational program will teach veterinary medical students introductory surgical skills including; suturing, knot tying, making an incision, hemostasis, tissue handling and instrument handling.

Methods: The surgical skills curriculum is divided into several instructional modules. The modules are designed for the participants to progress through a continuum of surgical skills beginning with the foundational skills (basic suturing and knot tying) and progressing through higher skill levels such as surgical incisions, tissue handling, and hemostasis.

Conclusion: The use of simulation models in the modular curriculum provides an alternative method to achieve competency of surgical skills. The simulated educational process provides an efficient, knowledge building process allowing for the transition to the live surgery patients in a less stressful environment and a less dependence on live animals. Future directions include a rigorous evaluation of the students on cognitive and procedural competency.

Developing a simulator to teach and assess equine abdominiocentesis clinical skills within the veterinary curriculum. Using an informed and structured approach to address fidelity issues in simulator design and assessing outcome measures of performance using an Objective Structured Clinical Examination (OSCE).

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Background

Teaching and assessing clinical skills provides unique challenges such as ensuring veterinary student safety and the ethical treatment of animals. Designing a simulator that meets training and assessment needs requires a deliberate approach.

Introduction

Physical fidelity describes how closely the simulator reproduces its real-world counterpart. Psychological fidelity refers to whether the simulator “feels right” to the user, and functional fidelity describes whether the simulator “acts” in the same manner as its real-world counterpart. The purpose of this presentation is to describe the evolution of a simulator for training and assessing equine abdominocentesis clinical skills.

Methods

Learning objectives were identified and a task-analysis undertaken. Physical fidelity was addressed by creating an anatomically accurate, life-sized horse model. Students having to work underneath the model met the psychological fidelity requirements, while functional fidelity necessitated that the skin and muscle block, stab incision, and teat cannula insertion locations have the same “clinical feel”.

Simulator efficacy was assessed in a second-year OSCE station (duration eight minutes). Performance was evaluated using a 15-item checklist (yes/no) worth 23 points.

Results

Statistically significant differences were found between three DVM cohorts ($F[2,77] = 11.995$, $p. < .001$). Mean (SD) scores equaled 16.2 (2.3), 18.0 (2.4), and 18.8 (1.2) points (DVM2012, DVM2013, and DVM2014, respectively). Statistically significant differences on seven procedural items occurred (e.g., selected the correct tube for fluid capture).

Discussion

The equine abdominocentesis simulator provided a functional training environment and did not appear to distract student performance during assessment. Training protocols emphasizing deliberate practice were established based on OSCE results.

ORAL PRESENTATIONS– Teaching, learning and assessment

The use of quality assurance (QA) protocols to review Objective Structure Clinical Examination (OSCE) stations: establishing station reliability and identifying potential sources of error

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Background:
OSCEs are used at the Faculty of Veterinary Medicine, University of Calgary to assess clinical skills.
Introduction:
DVM Year 1 OSCEs are comprised of 9-10 stations (duration five minutes per station). Three tracks are run concurrently (10 to 11 students per track). Three veterinarian examiners are assigned to every station. Examiners use a station-specific checklist to assess performance with items scored on a yes/no basis.
Purpose of presentation:
To present QA results on stations slated for a subsequent OSCE.
Results:
Eighteen stations were reviewed. Items per station checklist range from 9 to 34. Internal consistency measures range from 0.179 to 0.841. Statistically significant differences between raters on the mean checklist score occurred in seven stations (39%).
Frequency analysis revealed 14 stations (78%) where at least 25% of students did not address an item (range 1 to 6 items per station) and six stations where 50% or more of students did not address an item (1 to 4 items per station).
Cross tab results revealed 16 stations where statistically significant differences occurred on how the three raters scored a specific item (range 1 to 5 items per station).

Discussion:
QA reviews can identify where measurement error may be occurring as well as detect where station components are well designed, administered effectively, and reliably measure student performance.
Instances where several students miss an item could be reflective of training issues or problems with rater preparation (differences in rater expectation of performance).
A QA review can help direct where error, in subsequent station use, might be averted.

Integrating clinical reasoning, medical problem-solving and clinical communication for second-year veterinary students using case-based client simulations

Coe, JB. Ontario Veterinary College, University of Guelph, Guelph, Canada

Integrating the broader veterinary curriculum into clinical-communication training can be challenging. This challenge exists particularly in early phases of veterinary curriculum when students often lack medical knowledge needed to clinically reason or medically problem-solve in the immediate moment of a client interaction.
This presentation describes an approach, involving simulated clients, developed to integrate clinical reasoning, medical problem-solving and teaching of clinical communication for second-year veterinary students. The approach involves a series of three tutorials centered on a single case-based clinical scenario where groups of 6 to 8 students jointly conduct

tasks of a clinical interview. Tutorial one focuses on initiating the session and gathering information from the simulated client. Following the tutorial, students receive clinically relevant information (i.e., physical exam findings) and as a group independently work through the diagnostic process of the case (i.e., clinical reasoning and medical problem solving) based on information gathered. Tutorial two includes working on communicating physical exam findings, differential diagnoses and negotiating next steps with the simulated client. During each tutorial, the simulation is paused to discuss in-the-moment integration of clinical reasoning and medical problem-solving with the process of clinical communication (e.g., shared decision-making, informed-owner consent). Prior to tutorial three students receive diagnostic results and a definitive diagnosis for the case. Throughout the tutorials each group is required to maintain a problem-oriented veterinary medical record which formally tracks the group's clinical reasoning and problem-solving thought processes. Overall student feedback is positive, with 84% of students rating the tutorials useful to their learning last year.

Development and Validation of a Low-Fidelity, Low-Cost Surgical Simulation Model to Teach Canine Orchiectomy

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At The Ohio State University College of Veterinary Medicine, minimal hands-on experience during the first two years leads to lack of experience and high stress levels for many students during the third year. In this study, we aimed to test the hypothesis that low-fidelity surgical simulation models can help to increase skill level and confidence, while decreasing students' perceived stress and anxiety.

To investigate this, a low-fidelity, low-cost surgical simulator for orchiectomy was created. This model allows students to practice a number of surgical skills commonly needed during an orchiectomy. Twenty-four students volunteered to participate in this study. All were instructed on performing an orchiectomy using lecture, videos and handouts. Twelve students were randomly chosen to receive the model and 30 minutes of training on using the model. A quiz and questionnaire were utilized to evaluate the perceived benefits of the model. All students then performed the procedure on a cadaver and were graded by faculty using recorded video and a rubric created for this study.

All students indicated that the use of the model improved perceived performance, increased confidence, and decreased stress. The rubric scores were significantly higher for students given the model in the areas of spermatic fascia disruption ($p=0.041$), and clamping and ligation of both the first (score, $p=0.0032$; time, $p=0.0086$) and second ($p=0.024$) testicles. Our findings strongly indicate that the use of a low-fidelity model is highly beneficial in developing fundamental skills during early stages of surgical training.

WORKSHOP DESCRIPTIONS

1. Small group facilitation skills: Challenges and solutions - Jennifer Moffett, BVetMed, DipMarComm, MSc

Your scenario is in place, your model is ready to go: how best do you manage a small group session so that you bring meaning to your simulation for learners? This workshop focuses on small group facilitation skills that can be used to support effective learning in the simulation setting.

Components of the workshop include:

- The role of the facilitator in simulation sessions
- Practical points on briefing and debriefing

- Facilitating group interactions
- Specific feedback methods e.g. Debrief with “good judgment”

This workshop it suitable for educators that wish to build, or refine, their small group facilitation skills in the simulation setting.

2. Clinical Skills Model Buffet Workshop – Julie Williamson, DVM

This workshop is suitable for conference attendees who would like to try multiple clinical skills teaching models developed at Ross University. Participants will experience a wide range of teaching models and have the opportunity to pick up plans for construction. Participants will be encouraged to test in particular, the models that best represent skills that they have done on a regular basis and will be asked to provide feedback on the models’ usability and realism.

List of models

Theriogenology simulators for fetotmy, uterine torsion, vaginal prolapse, and limb dystocia; Vascular access models for venipuncture of the bovine coccygeal vein, ovine jugular vein, and canine and feline cephalic veins; Injection models for subcutaneous fluid administration, canine intramuscular injection, and large animal intramuscular injection; and simulators for thoracocentesis, canine limb bandaging, and direct and indirect fundoscopy.

3. Model Making Potluck Workshop – Julie Williamson, DVM /Robin Fio Rito, DVM

This workshop is suitable for conference attendees who are developing or are interested in developing clinical skills training models. Each participant will be asked to bring a model and/or material and/or model recipe (template to be provided) that he/she has developed or used to the potluck. The first part of the workshop will be dedicated to introductions and descriptions of the models or materials from each participant. The second part of the workshop will be dedicated to the process of validating a model for its use in teaching and assessment.

4. Simulation in Teaching and Learning Communication Skills:
The benefits of using simulated clients. – Cindy Adams PhD, MSW, Elpida Artemiou, PhD, Dr. Beth Dronson

Clinical communication is a core clinical competency that can be effectively taught through experiential, small-group approaches that incorporate simulated clients and are supported by facilitated discussions and feedback. With a focus on the link between communication and clinical reasoning, the workshop will engage

participants in small and large group practice and discussions. In small groups, participants will process two contextualized simulations with a simulated client and a facilitator. Participants will gain considerable experience and skills that can directly be implemented in practice as well as in teaching/training of communication skills for students, faculty, clinicians etc.

5. Designing surgical training programs: What outcomes assessments should we use? – Dean Hendrickson, DVM, MS, DACVS

This workshop is designed to gather information to identify the most strategic evaluation outcomes for surgical training programs. The view will be to a consistent and seamless surgical training program with assessments at regular intervals.

6. Pulling it all together: Immersive simulation for veterinary training – Dan Fletcher, PhD, DVM, DACVEC

Immersive simulation scenarios provide opportunities for learners to practice clinical decision making, technical skills, and communication skills in a real-time, high-stakes but safe environment. It provides an excellent bridge between pre-clinical training and clinical rotations for veterinary and veterinary technician students, increasing their confidence and enhancing their experiences on clinical rotations. It also offers unique and powerful opportunities for assessment of core competencies.

Developing clinically relevant, educationally sound, and outcomes-focused scenarios can be challenging. This workshop will cover a basic approach to developing immersive simulation scenarios using a case example to demonstrate this methodology. The example case will then be managed by group of students using a canine simulator. A debriefing session to address the learning objectives of the simulation will follow. Options for implementing immersive simulations using low-cost tools as alternatives to the high-fidelity simulator will be discussed, and suggestions from the audience for alternative approaches encouraged.

7. **Classroom Response System: Implementation of its use from the classroom to the barn- John Dascanio, VMD, ACTABVP**

This workshop will feature an audience response system (ResponseCard student clicker) using TurningPoint Technologies®. Three different uses for the system will be presented: Classroom questioning, practical laboratory examination entry and collection of data for educational research when located in the barn. Participants will use the clickers during the session, with examination of the data collected using Microsoft Excel. Participants should leave the session with the ability to integrate/adapt this technology directly into their own educational programs.

ORAL PRESENTATIONS – Teaching, learning and assessment

Peer Assisted Learning in Clinical Skills Training – the Student Perspective

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Peer Assisted Learning (PAL) methodologies have been used for clinical skills training at the Royal (Dick) School of Veterinary Studies, Edinburgh since 2009. A 'near peer' PAL format is used in which 4th year veterinary students are given training by faculty on how to design and deliver a teaching session for first year students.

The format of these PAL sessions was presented at INVEST 2012, and this study builds further on the work to outline the student perspective regarding the use of PAL methodologies in the veterinary curriculum.

Quantitative and qualitative data have been gathered from both PAL tutors and tutees. Several consistent themes have emerged from early data analysis, which include: PAL activities were received extremely favourably by both PAL tutors and tutees; tutors perceived that PAL had improved both their clinical and communication skills, and had been enjoyable; tutees perceived that PAL had improved their clinical skills, provided a low stress learning environment for asking questions and clarifying misunderstandings, and also provided a valuable opportunity to meet peers in higher years who could answer questions about forthcoming courses and assessments and, importantly, had 'recently been in their shoes'.

The early themes emerging from this study are largely consistent with those in published literature regarding PAL, and also add to the extremely limited published evidence currently available regarding the use of PAL in veterinary education.

Assessment of a Novel Method for Teaching Veterinary Parasitology

M Mauldin Pereira, K Yvorchuk- St Jean, C Wallace and RC Krecek

A student centered novel method of teaching Veterinary Parasitology was launched and evaluated. Parasitology is a required course for 2nd semester veterinary students at Ross University School of Veterinary Medicine (RUSVM) on St. Kitts. A novel method, named Iron Parasitology, compared lecturer-centered teaching with student-centered teaching and the retention of Parasitology knowledge of 2nd semester students and again when they reached 7th semester. Members of 5 consecutive classes chose to participate in Iron Parasitology with the opportunity to earn an additional 10 points towards their final grade by demonstrating their knowledge, communications skills, clarity of message and creativity in a Parasitology tool. The participants and non participants were assessed using 7 parameters. The initial short term study parameters used to evaluate lecturer versus student-centered teaching were: age, gender, final Parasitology grade without Iron Parasitology , RUSVM overall Grade Point Average (GPA), RUSVM 2nd semester GPA, overall GPA before RUSVM and pre requisite GPA before RUSVM. The long term reassessment study assessed retention of Parasitology knowledge with members of the 7th semester class who had Iron Parasitology as a tool in their 2nd semester. These students were invited to complete a Parasitology lecture final examination during their 7th semester. There were no statistically significant differences for the parameters measured in the initial study. In addition, Iron Parasitology did not have an effect on the retention scores in the reassessment study.

http://jvmeonline.metapress.com/content/j14wvl970j1414gg/fulltext.pdf