



# North American Veterinary Medical Education Consortium

## Meeting 2: Report Veterinary Education Models

Kansas City, Missouri  
April 29 – May 1, 2010

<http://www.navmec.org>

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Report prepared by Harriet Gorham

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## 1.0 Executive Summary

### Introduction

The North American Veterinary Medical Education Consortium (NAVMEC) was launched in 2009 by the American Association of Veterinary Medical Colleges (AAVMC) “to ensure that veterinary medical education meets the needs of our changing society.” At NAVMEC #1, the Consortium’s first meeting in February 2010, participants explored what society will need from the veterinary profession over the next 5-10 years, and subsequently defined the foundational veterinary skills/competencies needed to meet those societal needs. They also discussed that implementation of the recommendations included in the final NAVMEC report is critical for the NAVMEC initiative to be considered successful.

More than 160 veterinary professionals and other stakeholders participated at the second NAVMEC meeting, which focused on evaluating enhanced veterinary education models (VEMs) that will graduate veterinarians with the skills, knowledge and competencies to meet the changing needs of society. During the opening session, Dean Bennie Osburn, DVM, Ph.D., University of California, Davis School of Veterinary Medicine and Chairman of the NAVMEC Board of Directors, acknowledged numerous requests made by NAVMEC participants that the Consortium develop a plan to *implement the recommendations* resulting from the three National Meetings. He announced that the NAVMEC Board *will* include a recommendation on implementation in the Consortium’s final report to be submitted to the AAVMC Board of Directors in the fall of 2010.

NAVMEC #2 began with an overview of previous initiatives and studies (Pew 1989, KPMG 1999, Brakke 2000, AVMA-Pfizer 2005, AAVMC Foresight 2007). The following are highlights from these presentations:

- The Foresight Report was a call for change. The launch of NAVMEC is the first step in developing an actionable national plan to ensure that veterinary medicine continues to meet the needs of a changing society.
  - The Foresight Report advocated expanding the contributions of veterinary medicine in food supply veterinary medicine, biomedical research, and public health (possibly ‘One Health’) – this was suggested to be achieved through an integrated network of Centers of Excellence/Emphasis.
  - There is need for a renewed focus on animal health, a core of biological expertise with elective specialization, and the inclusion of public sector veterinary needs in the curriculum
  - There is urgent necessity to address the economic challenges facing colleges/schools of veterinary medicine and the debt load of new graduates, along with the viability of veterinary medicine, particularly in the private practice environment (the KPMG Mega-Study resulted in the formation of NCVEI)
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### **Focus on Core Competencies**

During NAVMEC #2, the core or foundational competencies needed by all veterinary graduates identified at NAVMEC #1 were reinforced as the drivers. These competencies were identified as follows:

1. Multi-species clinical expertise
2. Interpersonal communication and education
3. Collaboration
4. Management (self, team, systems)
5. Public health/One Health
6. Lifelong learning/scholarship
7. Ethical professional leadership

### **Environmental Scan**

The majority of Day #1 of NAVMEC #2 was designated as a 'conference day', with multiple knowledge-based presentations informing participants on a spectrum of educational topics, such as, on adult education, technology advancement and change management (the "how" of education). Other presentations provided opportunity for insights from other health professions, including an example of how dental education curriculum reform has been based on the Association of Dental Educators' CCI-defined Competencies for the new General Dentist. The dental competencies echo and confirm the seven (7) core/foundational competencies defined during NAVMEC #1. Michigan State University College of Human Medicine takes the same outcomes-oriented approach to curricular reform that surfaced during NAVMEC #1. A presenter from the National Board of Medical Examiners provided perspectives on ways to improve licensing examinations. He explained that human medicine has adopted a multi-step assessment program with the first exam at the end of year 2 in medical school (pre-clinical training) with the second exam (assessing clinical skills) taking place during the 3<sup>rd</sup> or 4<sup>th</sup> year. He also indicated that there was no likelihood of moving toward limited licensure in human medicine for the foreseeable future.

Presenters challenged participants to innovate and quickly adapt to changing environments. Different methodologies and technologies included:

- Hybrid instruction – blending technology with human interfacing. Focus on learner-centered instruction ('digital natives')
  - Using outcomes assessments for acquisition of skills, knowledge, and aptitudes (SKAs)
  - Expanded application of problem-based learning and case-reinforced learning
  - Use of technology to build collaboration among learning communities, empower learners, and increase the flexibility of curricula (including integration of paraprofessionals)
  - Increased sharing of learning materials among CVMs ('recycling'), enabled by technology (e.g. webcasts and podcasts)
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### **Veterinary Education Models (VEMs)**

The conference day continued with descriptions of eight current Veterinary Education Models, including how these models have been adapted to meet changing technological, societal and economic conditions. Successful elements in these current educational models included:

- Increased emphasis on non-clinical skills and teamwork throughout the curriculum, starting in year #1
- More flexibility and innovation in defining pre-veterinary and pre-clinical options
- Curriculum design driven with 'the end in mind'
- Focus on graduating veterinarians who have acquired the valued day #1 technical and non-technical competencies for their selected career paths
- Partnerships with industry and other stakeholders
- Exposure to animals and animal health in year #1 – hands-on, outside the lecture hall
- Use of specialized teachers vs. specialized veterinarians
- Integrated courses forming a more understandable curriculum and body of knowledge – learning in parallel, not in series

Additionally a new conceptual model was presented and discussed. Its primary attributes were:

- Streamlined pre-veterinary education
- Accelerated, learner-centered veterinary curriculum, with the possibility of reducing the cost of education (and potentially reducing student debt)
- More exposure to underserved and non-traditional career opportunities
- Increased collaboration among CVMs, supported by distance-learning technologies
- Post-NAVLE training and assessment in specialty areas

Following stimulus presentations on the second day covering communications, adult learning, Veterinary Internet Content Exchange (VetICE) and SKAs, participants formed Innovation Teams to analyze the strengths and weaknesses, create improvement concepts, and re-construct their designated VEMs: Tracking, Non-Tracking, Caribbean, European, US and Canadian Distributive, 2+2, Veterinary Teaching Hospital, and New Concept.

After reviewing these diverse Veterinary Education Models, it became clear that once the foundational competencies of the veterinary graduate are clarified and finalized, multiple methods, approaches, and educational techniques will allow institutions to embed those competencies into the curriculum regardless of the model chosen. By doing so, an outcomes orientation would be in place through which foundational competencies could be assessed, and graduates would be better prepared to face the multiple demands which society expects of the profession.

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### **Veterinary Education Models (Re-Modeled)**

On the meeting's third day, each Innovation Team presented an overview of its improved VEM. Details of these analyses are included in the full Meeting Report; successful elements/improvement concepts which appeared in multiple VEMs include:

- Consideration of Problem Based Learning (PBL) and learner-managed, self-paced delivery
- More visibility on the importance of non-private practice areas of specialty
- Non-technical and technical skills to be more integrated, not considered as separate discrete courses
- There was some discussion on selection of students with 'desirable' SKAs on admission – although evidence from human medicine does not confirm the efficacy of this strategy
- Increase the teaching competencies of faculty, particularly in the use of technologies in the 'blended' learning environment
- More emphasis on primary care and wellness
- Use of distance learning, specifically to accelerate and reduce the cost of completing pre-requisites
- Student team selection based on learning styles
- Mini-sabbaticals to refresh and develop faculty
- Placing greater value on teaching outcomes in evaluating the performance of faculty and CVMs. (However, concern was raised if emphasizing teaching would result in weakening the research role of CVMs)
- Flexible programming to allow for career changes and second career students
- Standardized pre-requisites and entrance exams in North America
- Broader adoption of Vet ICE concepts
- Increased use of stakeholder partnerships (e.g. industry, state VMA's)
- In most cases:
  - Costs of delivering most re-modeled VEMs were perceived to be somewhat higher, due to faculty training and technology investments, and the length of the educational process was unchanged in many examples.
  - Teams recommended that changes be implemented incrementally, suggesting that CVMs would be unlikely to completely switch over to a new model

Finally, at the close of the meeting, a presentation on Human Medical Education identified some parallels and offered some suggestions for Veterinary Medical Education:

- Ensure stakeholder participation in the design of assessment systems
  - Consider a single pathway for licensure for NA and international graduates
  - Consider multi-step NAVLE exams, to accommodate early foundation and late specialization
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## Conclusion

NAVMEC #2 demonstrated that while there is consensus among stakeholders that veterinary medicine will need to continue to evolve to meet the needs of a changing society, there are many different methods, technologies, and curricular approaches to consider. The competencies or roles approach explored at NAVMEC #1 will need to be revisited in NAVMEC #3 in order to synthesize the conclusions being reached by the Consortium and to move forward with an action plan based on core competencies/roles, applied across the veterinary continuum.

At NAVMEC #3 in Las Vegas (July 14-16, 2010), participants will review and discuss the relationship between education, accreditation, testing and licensure. They will identify specific recommendations for education curricula and delivery model, testing/licensure and accreditation that will advance veterinary medical education in meeting future societal needs. The July 2010 meeting will provide an opportunity for participants to develop a plan for how the recommendations in the final NAVMEC report could be implemented.

*Dr. Ken Andrews  
NAVMEC Facilitator  
28 June 2010*

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## 2.0 Introduction

### ***2.1 About NAVMEC***

In 2009, the American Association of Veterinary Medical Colleges (AAVMC) launched the North American Veterinary Medical Education Consortium (NAVMEC) “to ensure that veterinary medical education meets the needs of our changing society.”

NAVMEC’s overall objective is to develop a “road map for education, accreditation, and licensure” that is:

- Responsive to society
- Flexible
- Builds on the strengths of colleges
- Encourages partnering and collaboration among colleges

NAVMEC has launched a consultative process (consisting of three national meetings) to offer stakeholders and beneficiaries of veterinary medical education and other interested parties the opportunity to discuss the skills and competencies needed by tomorrow’s veterinarians. Participants will explore new educational models to meet the educational goals identified, and the relationship between education, accreditation and licensure.

NAVMEC’s final report will include a recommendation to the AAVMC Board regarding an implementation plan (NAVMEC 2).

Further information on NAVMEC is available at <http://www.namvec.org>

### ***2.2 A Sense of Urgency – Educating for a Changing Profession***

NAVMEC participants have expressed a sense of urgency for the veterinary medicine education system to change to meet growing pressures in the profession in the following areas:

#### **Reasons for Change**

- *Better meet changing societal needs (e.g. diversity)*
  - *Provide better business skills – means higher income for graduates*
  - *Address the student debt issue*
  - *Increase competencies in core programs (graduates to be better prepared for private/public practice)*
  - *Enhance communication skills to promote veterinary medicine to the public*
  - *Opportunities to increase revenues to veterinary medical education (e.g. veterinary teaching hospitals)*
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### ***An Invitation To Provide Input***

During NAVMEC Meeting #3 (Las Vegas, July 14-16, 2010) current processes for testing/licensing and accreditation will be explored and synthesized to bring together participants' recommendations on societal needs, veterinary competencies, new veterinary educational models and accreditation/testing/licensure standards. The meeting is expected to lay the foundation for NAVMEC's recommendations to the AAVMC and a proposed implementation plan. Interested parties are urged to participate in this meeting and to contribute their ideas towards the future of veterinary medicine education.

### ***2.3 About this Report***

This report summarizes key discussions and findings from NAVMEC's second national meeting held in Kansas City, April 29 to May 1, 2010.

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### 3.0 Meeting Overview

NAVMEC Meeting #2 was held in Kansas City, April 29 to May 1, and featured the active participation of over 160 representatives of the veterinary profession and veterinary medicine education community from across North America, South America, the United Kingdom and the Caribbean.

NAVMEC Meeting #2 consisted of three parts:

#### **Day 1: Conference Day**

- Participants listened to presentations on a wide range of new curriculum and teaching models from inside and outside the veterinary profession. A series of content experts also outlined the key characteristics of nine innovative Veterinary Educational Models currently in use in the United States, Canada, the United Kingdom and the Caribbean.

#### **Day 2: Build Your New VEM Day**

- Participants divided into nine, self-selected innovation teams to create nine new, improved Veterinary Educational Models that could be implemented in North America. Each group included a facilitator, a content expert and a NAVMEC board member. Team members were asked to follow a similar process:
  - Analyze the strengths and weakness of their current VEM
  - Brainstorm and identify improvement ideas that would strengthen the current VEM (responding to the changing needs of students, faculty, CVMs, society and the veterinary profession)
  - Create a presentation to describe the highlights and potential impact of their new VEM

#### **Day 3: Presentations and Plenary Discussion**

- Each breakout group presented their new VEM to the plenary and answered relevant questions
  - A plenary discussion to identify further innovative ideas on how the veterinary medicine education system can better meet society and the profession's emerging/future needs
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## 4.0 Conference Day Presentations

Day 1 presentations area available at the NAVMEC website (Meetings and Reports) at <http://www.navmec.org>.

### **Stimulus Presentations**

Overview of Prior Studies  
Technologies for Delivering Education  
Oversight of the Foresight Report  
Bayer Communications Program (focus on diversity)  
Innovations in Human Medicine  
VetICE  
Drivers of Curriculum Change  
SKAs Drive Professional Success  
Change & Innovation in Dental Education  
Nottingham Veterinary School  
Adult Education – New Directions  
Medical Education and Licensure in the United States

### **Veterinary Educational Model Presentations**

Tracking – Purdue University  
US Distributive – Western University  
Non-Tracking – Michigan State University  
2+2 Iowa State University/University of Nebraska  
Caribbean Model - Ross University  
Univ. of Illinois - Veterinary Teaching Hospital  
European Model – Glasgow University  
Canadian Distributive – University of Calgary  
New Concepts for Educating Veterinarians

### **Innovative Program Presentations**

Development of a Shelter Medicine Program  
Agricultural Emergency Response Training  
Curricular Change: Conception to Implementation  
Introducing Psychomotor Skills to the Veterinary Curriculum  
Correlates IV: Clinical Problem Solving  
Non-technical Competency Development

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## **5.0 New Veterinary Education Models (VEMs)**

## 5.1 Traditional Veterinary Teaching Hospital

This group focused on the University of Illinois Veterinary Teaching Hospital as a starting point for their discussions.

### CURRENT MODEL: Traditional Teaching Hospital

Team VEM: [Traditional Teaching Hospital](#)

Top-3 Areas for Improvement:

- Increased focus on /assessment of non-technical skills throughout
- Balance faculty resources with curriculum change/establish metrics to recognize faculty effort
- Refine admissions criteria to achieve diversity to reflect societal needs

### Strengths

- Early clinical exposure creates context for students, comfort with hospital setting & relevance for basic sciences
- Milestone exams – across the range of subjects to test teaching/learning
- Student interview included in admissions process
- Fourth-year peer teaching develops communications skills
- Exposure to/appreciation of RVT coaches/value
- Should train better practitioners & clinicians
- Improved communications skills

### Weaknesses

- Increases burden on clinical faculty
- Little exposure to non-clinical careers, e.g. public health, research
- Little unstructured time for reflection
- Lacks SKA focus in years 1-3
- Shift away from the basic sciences results
- Less ability to attract research grants
- Less face time with faculty

### NEW MODEL: Experiential Integrated Curriculum

#### New/Improved VEM: Overview

- Early and continuous clinical exposure
- Progressive evaluation of competencies
- Curriculum flexibility/integrated approach
- Professional development – remediation OR retraining
- Increased time for self-study/reflection

### Improvement Ideas (Brainstorming)

The Traditional Teaching Hospital group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (Experiential Integrated Curriculum)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Ensure core is taught – have non-specialists review the core content</li> <li>▪ Assign teaching time allocations flexibly to meet needs of the subject</li> <li>▪ Vertical integration</li> <li>▪ Increase focus on animal behaviour</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Integrate elements early on into clinical positions</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Increase flexibility in options – especially in 1<sup>st</sup> &amp; 2<sup>nd</sup> year</li> <li>▪ Ensure 1<sup>st</sup> year students are respected/integrated</li> <li>▪ Increase free time in curriculum</li> <li>▪ Electronic textbooks, using actors to teach communications skills</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Use e-learning methods to supplement basic science</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Pre-admission requirements for some basics</li> <li>▪ Increase attention to diversity – across all issues (ethnicity, gender, culture, profession, etc.)</li> <li>▪ Research into different admissions criteria &amp; impacts</li> <li>▪ Sponsored loan repayment programs for certain practice areas</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Decrease core for undergrads</li> <li>▪ Use distance-based education to take strain off faculty</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Expose students early on to alternative practice options – in a hands-on setting</li> <li>▪ Expand shelter medicine exposure/animal cruelty</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Communications facilities/larger 'rounds' room</li> <li>▪ Integrated faculty</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Team approaches, videoconferencing</li> <li>▪ 2+2 – using instate tuition to decrease student costs</li> <li>▪ Collaboration with animal science departments</li> <li>▪ Exposing students to HazMat courses</li> <li>▪ Opportunities for clinical rotations across US</li> <li>▪ Rotate students throughout universities</li> <li>▪ Links to global community</li> </ul>

### Improvement Decisions (Developing the New VEM)

The Traditional Teaching Hospital group then made choices about which improvement ideas to apply to their new VEM.

Focus Area	Improvement Decisions (Experiential Integrated Curriculum)
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Enhance early clinical exposure by integrating non-technical elements, including communications</li> <li>▪ Extend colloquia to third year</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Increase shelter linkages/exposure</li> <li>▪ Increase time to inform students re: non-practice options (e.g. public health, research etc., government, pathology, diagnostics)</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Balance faculty resources with increased student load</li> <li>▪ Establish metrics to value faculty efforts</li> <li>▪ Assess &amp; provide appropriate technical staff</li> <li>▪ Balancing teaching/research to sustain ability to generate grant money</li> <li>▪ Create limits on structured learning time – allows for self-study</li> <li>▪ Ensure access to e-learning resources</li> <li>▪ Milestone/QE/OSCE combined testing (high stakes) leading to summer remediation opportunities</li> <li>▪ Progressive evaluation of competency</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Create physical environment for self-study &amp; innovative learning</li> </ul>
<b>Admissions Criteria</b>	<ul style="list-style-type: none"> <li>▪ Test innovative admissions criteria</li> <li>▪ Reconstruct criteria to deal with diversity &amp; non-practice options/intensive screening/stream to strengths</li> <li>▪ Explore mechanisms to standardize pre-requisites &amp; minimize time to satisfy pre-req's</li> <li>▪ Ensure pre-requisites are essential</li> </ul>
<b>Professional Development</b>	<ul style="list-style-type: none"> <li>▪ Reinforce non-technical skills</li> <li>▪ Adapt to accept post-grads for professional development</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Increased problem-based, intentional, critical-thinking learning</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Use collaborative mechanisms to address faculty deficits</li> <li>▪ Deploy certificate program online to teach business &amp; non-technical skills</li> <li>▪ Establish MOUs with other colleges to fill specialization gaps</li> <li>▪ VetICE</li> </ul>

## CURRENT VS. IMPROVED VEM

### Key Comparisons

The Traditional Teaching Hospital team identified some of the key differences between their original VEM and the new model they had created.

#### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	Typically 7- 8 years	Minimum 6 years
Education Delivery	No 'trip wire' milestone examinations	Trip wire exams with remediation
Admissions	Traditional use of GRE/GPA as cut off	Broader admissions criteria
Non-technical curriculum	Little non-technical skills emphasis	Increased non-technical emphasis early and persistently

#### Comparison Old vs. Improved VEM (contd.)

Focus Area	Current VEM	Improved VEM
Adult learning	Limited scheduled self-study	Less structured content delivery
Adult learning	Limited critical thinking exercises	Problem-based, intentional critical thinking and learning
Adult learning	Limited infrastructure to support adult learning	Create a physical environment for self study
Societal needs	Electives for non-practice options	Increased exposure to non-practice options: research/government/public health/diagnostics, etc.



**Potential Impacts**

The Traditional Teaching Hospital group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

**Responses to Impact Questions**

	Topic	Response
Q1	Competencies & Assessment	Curriculum flexibility, integrated approach and early exposure to clinical work. Progressive evaluation of competencies: milestones/QE/OSCE
Q2	Implementation	Incrementally (by class) e.g. Start with class of 2013 and implement improvements annually, classes of 2014, 2015, etc.
Q3	Expense Areas	Expansion of clinical skills infrastructure and associated clinical operating costs. Infrastructure for student-centered learning. Additional faculty/IT/technical staff.

**Responses to Impact Questions**

	Topic	Response
Q4	Significant Changes	Cultural changes to accommodate team teaching and testing.
Q5	Biggest Impl. Challenges	Faculty buy-in and scheduling logistics. Maintaining an adequate case load.
Q6	Greatest Benefits	Produces better veterinarians: <ul style="list-style-type: none"> <li>- Superior clinical and non-technical abilities</li> <li>- Initiates/maintains student engagement through extended clinical exposure.</li> </ul>

## OTHER CRITICAL INFORMATION

The Traditional Teaching Hospital team shared several additional points they felt would expand understanding of their new model.

## Other Critical Information

- Integrate outcomes assessment into admissions criteria
- Expanded role for shelter medicine/community outreach
- Increased community-based partnerships
- Increased opportunity for collaborative experiences
- Colloquia provide increased exposure to non-technical skills and societal issues, eg. Animal welfare & communications

## 5.2 Tracking

This group focused on the Tracking model used by Purdue University as a starting point for their discussions.

### CURRENT MODEL: Tracking

#### Team VEM: Tracking Model

Top-3 Areas for Improvement:

- Technical curriculum
- Non-technical curriculum
- Add post-graduate re-tracking



#### Strengths

- Fosters practice-ready graduates/higher salaries/less debt
- Some freedom of choice increases student engagement and satisfaction
- Student appreciation for this education path enhances teacher appreciation
- Conducive to post graduate re-entry
- PBL works well

#### Weaknesses

- Inflexible. Not conducive to change
- Little emphasis on wellness, prevention, public health, epidemiology or research
- Not enough horizontal or vertical integration of basic core classes
- Not enough course selection for students with broad interests
- Faculty cost & training for PBL/students get burned out on PBL
- Not enough training in business, communications & non-technical skills

### NEW MODEL: Common Core w/Tracking (CCwT)

#### New/Improved VEM: Overview

- Technical training:
  - Incorporate wellness & preventative care during core, PBL & clinical rotations, to better prepare students for practice
  - Include public health, food safety & epidemiology in PBL
  - Require a research project/paper
  - Find ways to enhance surgical skills, perhaps outside the VMTH (collaborate), or by giving the option of starting clinics early
- Non-technical training
  - Incorporate more business skills & communication, SKAs
  - Select students w/ desirable innate SKAs
  - Good place to introduce some web-based programming (vetICE)
- Post-graduate re-tracking
  - Tracks could be used for re-training veterinarians who want to change their focus after graduation
  - Web-based modules could be opened for post-graduation CE as well

### Improvement Ideas (Brainstorming)

The Tracking group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (Common Core with Tracking)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Core curriculum required of all students; assuring competence in health, wellness/preventative medicine, public health &amp; research</li> <li>▪ Integrate wellness &amp; prevention into core coursework &amp; in clinics.               <ul style="list-style-type: none"> <li>○ When teaching genetics, discuss breed specific wellness (e.g. testing Wheaten terriers for GN each year/screening Dobermans for DCM &amp; Von Willebrand's)</li> <li>○ In clinics, discuss how a Dz process could be prevented or diagnosed earlier along w/SOAPing the case (e.g. preventing OCD w/proper diet so dog doesn't need arthroscopy)</li> <li>○ Increase competencies in basic surgical skills (e.g. partner/use distributive hybrid model to provide external teaching opportunities to teaching hospital)</li> </ul> </li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Enhance non-technical skills/integrate throughout curriculum/not stand-alone</li> <li>▪ Business education is core material for all/reinforced with external practice training (business analysis of externships)</li> <li>▪ Require a research paper/experience to increase student exposure to research fields</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Careful scheduling of tracking 'modules' that would allow easy re-entry into the curriculum for CE and re-training</li> <li>▪ Use VetICE or other web-based programming to increase students' training in business &amp; communications skills</li> <li>▪ Increase use of technology in classrooms/record lectures for future use by students</li> </ul>
<b>Admission Criteria</b>	
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Provide access audio/video lectures to post-graduates or for purchase to offset costs</li> </ul>

### Improvement Decisions (Developing the New VEM)

The Tracking group then made choices about which improvement ideas to apply to their new VEM.

Focus Area	Improvement Decisions (Common Core with Tracking)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Enhance technical curriculum with improvement ideas above</li> </ul>
<b>Non-technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Enhance non-technical curriculum with improvement ideas above</li> </ul>
<b>Post-graduate Training</b>	<ul style="list-style-type: none"> <li>▪ Introduce post-graduate training/re-training (using tracking and modules)</li> </ul>

## CURRENT VS. IMPROVED VEM

### Key Comparisons

The Tracking group considered the modularity of the curriculum to be most significant difference between their new and old VEM. This will enable graduates to return for retraining, and to bring new revenue to the CVM.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	6-8 yrs	No change
Post-graduate training	None	Exists/implemented
Technical & non-technical training		Enhanced, integrated & "rebalanced"

### Comparison Old vs. Improved VEM (contd.)

Focus Area	Current VEM	Improved VEM
Wellness & prevention	35% of adult cats are overweight. Only 1.4% of clients are told their cats are overweight. Only 5% of pets who could benefit from a prescription diet are eating one.	Client education on obesity mgt & prevention > decreased incidence of OCD, DBM, arthritis, etc. Client education on nutrition > better pet health, more income for the practice.
Chronic disease mgt	87% of DVMs do senior wellness testing on their own pets, yet only 9% offer it to their clients. Poor mgt of chronic Dz.	New grads offer wellness screening & know what to do when the ALT comes back at 400 or the creatinine is 3.0.
Public Health	Not emphasized	Highlighted

### Potential Impacts

The Tracking group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

### Responses to Impact Questions

	Topic	Response
Q1	Competencies & Assessment	More time will be spent learning in focused areas. A curriculum map would be developed to indicate in which courses individual competencies will be assessed, either formally or informally.
Q2	Implementation	Incrementally, unless it is implemented in a new school. How & how quickly would depend on a school's current programs.
Q3	Expense Areas	PBL requires more faculty/more emphasis on teaching by faculty. Faculty training for PBL & to integrate disciplines Investment in web-based technologies Marketing post-graduate certificate & CE programs

### Responses to Impact Questions

	Topic	Response
Q4	Significant Changes	Space reconfiguring for small group learning Faculty time, effort & training
Q5	Biggest Impl. Challenges	Financial cost Faculty buy-in
Q6	Greatest Benefits	Tracking creates a manageable amount of learning for students Students graduate w/ more skills specific to their career path Graduates of this model are half as likely to go on to internships – they hit the ground running & can generate more income their first year after graduation (decreased debt) Meeting society needs for specific skill sets for both students & post-grads (who would bring in income)

## OTHER CRITICAL INFORMATION

The Tracking group shared several additional points they felt would expand understanding of their new model.

## Other Critical Information

- Although tracking can be done without PBL, we thought it was an important & integral part of this school's program, & enhances the usability of the information students receive – so we left it as part of the model w/ the caveat that 2-3 of the cases be changed to ones emphasizing public health, wellness & chronic care (e.g. CRF vs. ARF)
- In order to incorporate new technologies & non-technical subjects, the curriculum would need to be “re-balanced.” This might mean decreasing time spent on courses or rotations that are outside the student's core focus areas or not within a school's areas of clinical excellence.
- Schools using this model do not do as much integration outside of the PBL courses. We saw this as an area where focus could be shifted to emphasize wellness, public health, etc. For example, when learning about genetics, incorporate breed-specific wellness.
- None of the changes we wanted to make preclude centers of excellence or distributive options.

## 5.3 Non-Tracking

This group focused on the Non-Tracking model used by Michigan State University as a starting point for their discussions.

### CURRENT MODEL: Non-Tracking

#### Team VEM: Non-Tracking Model

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Top-3 Areas for Improvement:

- Increase primary care skills through increased opportunity in community practice, surgery (elective/basic)
- Increase adult learning techniques earlier in the pre-clinical curriculum with specific professional development for faculty on how to use these techniques.
- Invest in technology (human resource, soft/hardware) to enhance delivery of material.



Non-Track

1

#### Strengths

- Flexibility for student-driven/active learning
- Broadly trained graduates
- Efficiency in pre-clinical curriculum delivery
- Discipline/systems hybrid approach
- Rotation design
- Team building, clerkships build relationships
- PBL & learning assessment/non-technical skills emphasis
- External collaborations (within the CVM, other CVMs, international, VMA)
- Faculty competition (strength & weakness)

#### Weaknesses

- No adult learning training for faculty
- Wellness vs. primary care vs. referral care exposure
- Insufficient funds to meet needs ⇐ possible lack of expertise
- No community practice
- Need a curriculum plan for competencies & outcomes assessment
- No animal behaviour/limited dentistry, labs in animal medicine, didactic electives & exposure to exotics
- Room for improvement in Day 1 surgery
- Possibly inconsistent student presence in rotations

### NEW MODEL: Flex Track

#### New/Improved VEM: Overview

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- Non-Tracking
- Flexible clinical opportunities that allow students to have areas of focus
- Hybrid: There is a VTH and external experiences provided through collaborations with other entities
- Vertically integrated for adult learners, producing clinically relevant and problem based learning experiences
- Graduates veterinarians who will be successful



Non-Track

2



### Improvement Ideas (Brainstorming)

The Non-Tracking group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (Non-Tracking: Flex Track)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Get a shelter medicine program (cost/benefit)</li> <li>▪ Clinical modules available for retraining</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Additional Dual Degree opportunities (Masters in Business &amp; Science)</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Better technology utilization               <ul style="list-style-type: none"> <li>○ Integrate clinical correlates into earlier didactic program</li> <li>○ Increase active learning</li> <li>○ Professional development for faculty</li> </ul> </li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Better technology utilization</li> <li>▪ Continued face-to-face time for engagement - evolution?</li> <li>▪ Shift some course work (basic science &amp; non-science) to undergraduate</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Holistic admissions model (&amp; interview?)</li> <li>▪ Pre-admissions requisites are attractive to broad group?</li> </ul>
<b>Education Cost &amp; Delivery</b>	<ul style="list-style-type: none"> <li>▪ Shelter medicine cost/benefit?</li> <li>▪ Share resources across CVMs (regional/national)</li> <li>▪ Promote Center of Excellence</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Consumer &amp; other end-user feedback (collect &amp; use) (&amp; alumni)</li> <li>▪ Centers of Excellence</li> <li>▪ Addressing client diversity (language/cultural issues)</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Increase non-tenure, adjunct faculty, House Officers</li> <li>▪ 2+2/Distributive: outsource activities to stakeholder/end-user</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Increase collaboration with other programs (broadly)</li> <li>▪ Strengthen international program by integrating into curriculum</li> </ul>

## Improvement Decisions (Developing the New VEM)

The Non-Tracking group then made choices about which improvement ideas to apply to their new VEM.

Focus Area	Improvement Decisions (Non-Tracking: Flex Track)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Community practice, e.g. elective/basic surgery</li> <li>▪ Better preparation for primary care skills</li> <li>▪ Experiential/multi-skill exposure</li> <li>▪ One vehicle for One Health/community health</li> <li>▪ Adult learning opportunities</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Professional development for faculty in adult learning techniques, with REWARDS!               <ul style="list-style-type: none"> <li>- Teaching track &amp; evaluation</li> </ul> </li> <li>▪ Preclinical PBL</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Technology utilization/invest in tools</li> <li>▪ Leverage House Officers &amp; clinical faculty in experiential learning</li> </ul>
<b>Cost</b>	<ul style="list-style-type: none"> <li>▪ Evaluate pre-clinical curriculum learning objectives</li> <li>▪ Drill down into curriculum</li> <li>▪ Share resources &amp; collaborate across institutions (expertise &amp; curriculum delivery)</li> <li>▪ Invest in delivery systems (technology) to increase access to offsite expertise</li> </ul>

## CURRENT VS. IMPROVED VEM

### Key Comparisons (Tracked vs. Flex Track)

The Non-Tracking group identified some of the key differences between their original VEM and the new model they had created.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	6-8 years	6-8 years
Adult Learning	Limited, discipline based in pre-clinical years Teacher centered with a traditional transmission style	Learner centered, more interactive, active learner oriented, self directed, integrates teams, clinically relevant
Technical Competencies	Emphasis & reliance on referral/tertiary care	Increased emphasis on primary care and wellness

### Comparison Old vs. Improved VEM (contd.)

Focus Area	Current VEM	Improved VEM
Cost	High, unsustainable	(Higher?) Increased/leveraged resources and collaborations Outsourced areas to external collaborators Leveraged technology (e.g. VetICE)
ED Delivery	Traditional, lecture lab/didactic delivery	Interactive, integrated with enhanced skill building in non-technical skills
Assessment & Measurement	Traditional clerkship & grading	Minnesota assessment for non-technical skills Real time, layered evaluations Day 1 Employability Year 1 success with external and self assessment

### Potential Impacts

The Non-Tracking group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

### Responses to Impact Questions

	Topic	Response
Q1	Competencies & Assessment	Stakeholders are getting what they need—the basics, this will enhance the existing competencies Experiential learning will create more “grounded” graduates.
Q2	Implementation	Incremental with short term successes such as the development of a community practice focusing on wellness and primary care.
Q3	Expense Areas	High costs associated with investments in human resources, technology acquisition. Possibly reduced needs in capital expenditures.  Expense as a barrier: Getting faculty buy-in in a change resistant culture.

### Responses to Impact Questions

	Topic	Response
Q4	Significant Changes	Large scale changes in technology utilization, tech investments and staff with a knowledge base to support and train faculty and staff on proper tech use.
Q5	Biggest Impl. Challenges	There is a challenge in keeping faculty engaged in leading and developing new programs that “fill in” for things that are not offered at the VTH. Getting faculty buy in Resources for new technology and support for training on tech use Faculty time required to develop materials for tech integration
Q6	Greatest Benefits	Flexibility Customer (students, employer, end user) satisfaction Grounded, broad based graduate Improved animal health Clinical relevance with flexibility to meet changing environmental needs

## OTHER CRITICAL INFORMATION

The Non-Tracking group shared several additional points they felt would expand understanding of their new model.

## Other Critical Information

- These are ideals; “There’s only so much you can pour into a cup.”
- Make it count—there is a need/desire to create a life long learner
- This is the next generation of a proven model; it is built on something that works.
- There is a need to reevaluate every 4 years
-

## 5.4 Caribbean

This group focused on the Ross University School of Veterinary Medicine as a starting point for their discussions

### CURRENT MODEL: Caribbean

#### Team VEM: Caribbean Model

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Top-3 Areas for Improvement:

- Universally agreed upon parameters that opens up options for students to attend CVMs / specialty practices/ other approved facilities
- Incorporate VetICE
- Ensure model meet accreditation standards for research



### Strengths

- 'Beginning with the end in the mind' was a strong focus
- Comparative/integrative approach
  - Relevance/practical/Clinical faculty involved early
- Students: motivated, enthusiastic, strong communication skills
- Center for Learning Excellence specific design for skill development
- Admission "pressure valve" for entry into the profession
  - High volume throughput/start at many times of the year

- Faculty teach 3x year allows for debrief/adjust

### Weaknesses

- Possible saturation of capacity at teaching hospitals
- Licensure process / accreditation
- Costs – prohibitive to some students
- Multiple requirements to send students out to 22 CVMS
- Challenge to CVMS tracking Ross students
- Less exposure to alternate career paths
- Less opportunity to train exceptional focused students
- Disadvantaged when entering new program "last chance of electives"
- Faculty burnout

### NEW MODEL: CPR – Center for Pedagogical Research

#### New/Improved VEM: Overview

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- Model that focuses on teaching and learning that is flexible enough to adapt to newly identified competencies
- Does this in an environment that exposes students to primary care and entry level practice, especially in year 4
- Rewards translational research in the area of veterinary medical pedagogy
- Center for pedagogical research
- Better utilization of facilities (year round)
- Students spend less time in educational system and get into workforce sooner



### Improvement Ideas (Brainstorming)

The Caribbean group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (Caribbean: Center for Pedagogical Research)
Technical Curriculum	<ul style="list-style-type: none"> <li>▪ Universally-accepted parameters for core clinical year</li> <li>▪ Options in Year 4 for students to attend CVMS or specialty practices/approved facilities</li> <li>▪ Clinical year is 'tracking' with option to attend 'Centers of Excellence' in other CVMs</li> </ul>
Non-Technical Curriculum	<ul style="list-style-type: none"> <li>▪ Include teaching pedagogy as components of research</li> </ul>
Adult Learning	
Education Delivery	<ul style="list-style-type: none"> <li>▪ Incorporate Vet-ICE</li> <li>▪ Convert to complete distributed model (with option to go to Center of Excellence/Title IV)</li> </ul>
Admission Criteria	<ul style="list-style-type: none"> <li>▪ Introduce European models to bring students to program earlier</li> </ul>
Education Cost	<ul style="list-style-type: none"> <li>▪ Seek additional/alternative sources of funding</li> </ul>
Meeting Societal Needs	
Infrastructure	
Collaboration	
Accreditation	<ul style="list-style-type: none"> <li>▪ Ensure model meets accreditation standards for research</li> </ul>
Prerequisites	<ul style="list-style-type: none"> <li>▪ Move some course work into pre-vet curriculum</li> </ul>

**Improvement Decisions (Developing the New VEM)**

The Caribbean group then made choices about which improvement ideas would most enhance their new VEM.

Focus Area	Improvement Decisions (Caribbean: Center for Pedagogical Research)
<p><b>Possible saturation of capacity at teaching hospitals</b></p>	<ul style="list-style-type: none"> <li>▪ Send 4<sup>th</sup> yr to practice vs. CVMs                             <ul style="list-style-type: none"> <li>- Complete distributive model (Note: Title IV requires 1 yr at CVM)</li> </ul> </li> <li>▪ Increase capitalization to hosting institution</li> <li>▪ More collaboration</li> <li>▪ Curricular tracking</li> <li>▪ Title IV</li> <li>▪ Utilize specialty practices</li> <li>▪ Decrease operating costs/increase class size</li> </ul>
<p><b>Licensing/accreditation</b></p>	<ul style="list-style-type: none"> <li>▪ Ensure school is accredited (licensing issue goes away)</li> <li>▪ Focus research on teaching pedagogy (would AVMA accept?)                             <ul style="list-style-type: none"> <li>- Dept. of Ed fund research</li> </ul> </li> <li>▪ CVMs → Centers of Excellence for clinical year</li> </ul>
<p><b>Costs</b></p>	<ul style="list-style-type: none"> <li>▪ Move more of requirements to pre-vet to minimize</li> <li>▪ European model – bring students in earlier</li> <li>▪ Alternate funding: grants/under-privileged</li> <li>▪ Use VetICE</li> <li>▪ Universally agreed upon parameters: open up options for yr 4<sup>™</sup> CVM, specialty practice, etc.</li> <li>▪ Buy teaching hospital(s)                             <ul style="list-style-type: none"> <li>- Geographically separated</li> </ul> </li> </ul>



## CURRENT VS. IMPROVED VEM

### Key Comparisons

The Caribbean group identified some of the key differences between their original VEM and the new model they had created.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	3.5 yrs	3.5 yrs
Teaching	Traditional assessment	Center for pedagogical research
VetICE	No	More access/ more use of technology / meets requirements for the future
4 <sup>th</sup> year	Traditional clinical core At CVMs	New opportunities to map out customized clinical program guaranteed to please (centers of excellence)

**Potential Impacts**

The Caribbean group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

**Responses to Impact Questions**

	Topic	Response
Q1	Competencies & Assessment	Critical thinking with flexibility to allow it to enhance most competencies as well as to adapt to new ones
Q2	Implementation	Incremental
Q3	Expense Areas	Personnel and facilities

**Responses to Impact Questions**

	Topic	Response
Q4	Significant Changes	Position descriptions for faculty and option not to have a Teaching Hospital. Determining core
Q5	Biggest Impl. Challenges	Faculty buy-in
Q6	Greatest Benefits	Focus on teaching and flexibility

## OTHER CRITICAL INFORMATION

The Caribbean Group shared several additional points they felt would expand understanding of their new model.

### Other Critical Information

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- Multiple entry points
- Transparency: students see the relevance of material
- Translational pedagogical research

## 5.5 European Model

This group focused on the Faculty of Veterinary Medicine, University of Glasgow as a starting point for their discussions.

### CURRENT MODEL: European

#### Team VEM: European

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Top-3 Areas for Improvement:

- Early career decision / No “second career” option
- Curricular overload
- Lack of business training

### Weaknesses

- Students must make early decision on career
- Curriculum overload
- Lack of business skill training
- Quality control of private practitioners/trainers
- Less financial resources to run college professional program
- Balance between food safety & traditional curriculum
- Not assessing global community skills/leadership

### NEW MODEL: International Hybrid (Imported)

#### New/Improved VEM: Overview

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- 1 + 5 yr veterinary degree program;  
or passing entrance exam (content? readiness?)
- Flexible entry age (post high school + )
- Relevant, efficient, effective integrated curriculum (ala Ross / Nottingham)
- Balanced Private Practice / CVM clinical training  
(Hybrid VMTH / Distributive model)

### Strengths

- Lower total cost of education (potential)
- Entire post-high school curriculum controlled by CVM ← more relevant
- Faculty trained to be teachers
- Exposure to real world/private practitioners deliver training
- Simulator/actor communication training
- Greater emphasis on animal welfare
- Professional development plan

### Improvement Ideas (Brainstorming)

The European group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (European: International Hybrid)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Streamline curriculum</li> <li>▪ Better integration</li> <li>▪ Integrate basic/clinical concepts</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Increase business training</li> <li>▪ Business assignments to increase understanding</li> <li>▪ Preceptorships</li> <li>▪ Identify outcomes</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Increase use of models from the beginning</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Increase support for private practitioner hosts</li> <li>▪ More assessments of target outcomes</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Admission path for older students/second career</li> </ul>
<b>Education Cost &amp; Delivery</b>	<ul style="list-style-type: none"> <li>▪ Finding unique funding sources</li> <li>▪ Industry funding of positions</li> <li>▪ Endowments</li> <li>▪ Better understanding of education costs</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Career retooling/retraining</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ System to evaluate private clinical practices</li> <li>▪ Formalizing (cementing) relationships between private clinics/CVM</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Increase course sharing</li> </ul>

### Improvement Decisions (Developing the New VEM)

The European group then made choices about which improvement ideas should be applied to their new VEM.

Focus Area	Improvement Ideas (European: International Hybrid)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Pre-clinical courses taught in clinical context/integrated/would cease as stand-alone –</li> <li>▪ Integrate private/public practitioner when developing &amp; delivering curriculum (talk to the customer)</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Add business courses</li> <li>▪ Applied opportunities during externships (e.g. Purdue)</li> <li>▪ Team skills working to create successful models</li> <li>▪ IT programs where you buy/sell (e.g. “Rich dad/poor dad”, interactive games/simulation)</li> <li>▪ Utilize NCVEI tools</li> </ul>
<b>Adult Learning</b>	
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Truly integrated curriculum with minimal duplication &amp; appropriate reinforcement &amp; justifiable content</li> <li>▪ Alleviate curriculum overload</li> <li>▪ Standardization of expectations of preceptorship experiences</li> <li>▪ Standardized, centralize curriculum core</li> </ul>
<b>Admission Criteria</b>	
<b>Education Cost</b>	
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Curriculum needs flexible &amp; revised yearly</li> <li>▪ Feedback from veterinarians (private &amp; public practice)</li> <li>▪ Students</li> <li>▪ One year post graduation survey</li> <li>▪ New graduate employer survey</li> </ul>
<b>Infrastructure</b>	
<b>Collaboration</b>	

## CURRENT VS. IMPROVED VEM

### Key Comparisons

The European group identified some of the key differences between their original VEM and the new model they had created.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	5 for UK 3 + 5 (US)	Prerequisite exam (all) 5 yr professional program 1 yr pre-vet / 5 yr prof
Non-tech curriculum	Very little business skills training	Significant business skills training
Technical curriculum	Bloated, inefficient delivery of curriculum	Integrated, clinically relevant delivery of curriculum

### Comparison Old vs. Improved VEM (contd.)

Focus Area	Current VEM	Improved VEM
Education delivery	Not flexible for career change (retooling) or 2 <sup>nd</sup> career (older entry)	Allows for career changes and 2 <sup>nd</sup> career students
Technical Curriculum / Education delivery	Little input/involvement from future employers	More input/involvement from future employers

## Potential Impacts

The European group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

### Responses to Impact Questions

	Topic	Response
Q1	Competencies & Assessment	<ul style="list-style-type: none"> <li>• Unpacking, uncluttering and requiring justification and clarification of in a "clinically-oriented" curriculum</li> <li>• Address need for business training</li> </ul>
Q2	Implementation	<ul style="list-style-type: none"> <li>• Immediately add business training</li> <li>• Major changes need stakeholder and regulatory input/buy-in</li> <li>• Major changes to be done incrementally</li> </ul>
Q3	Expense Areas	<ul style="list-style-type: none"> <li>• New IT for business courses</li> <li>• Stakeholder meetings</li> <li>• Developing and delivering standardized entrance exam</li> <li>• Faculty / administration time for developing and implementing curriculum changes</li> </ul>

### Responses to Impact Questions

	Topic	Response
Q4	Significant Changes	<ul style="list-style-type: none"> <li>• May increase or decrease faculty numbers</li> <li>• Entrance exam most efficient if "universally" utilized</li> </ul>
Q5	Biggest Impl. Challenges	<p>Faculty</p> <ul style="list-style-type: none"> <li>• "Threat" to nonclinical faculty?</li> <li>• Less control</li> <li>• Job security</li> <li>• More work</li> </ul> <p>Accrediting body – justifying change Applicant pool during transition period</p>
Q6	Greatest Benefits	<ul style="list-style-type: none"> <li>• Modification of existing model – keeps strengths (animal welfare and food safety), but streamlines educational process to focus on relevant information without losing broad principles; reduced cost?</li> </ul>

See also Appendix (B): PROFESSIONAL QUALIFICATIONS (United Kingdom)



## 5.6 US Distributive

This group focused on the College of Veterinary Medicine at the Western University of Health Sciences as a starting point for their discussions.

### CURRENT MODEL: US Distributive

#### Team VEM: US Distributive

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Top-3 Areas for Improvement (Weaknesses):

- On-the-job faculty training in PBL
- Faculty retention
- Outcome assessment

#### Weaknesses

- Need to train faculty in PBL
- Hard to recruit & retain qualified faculty
- Need better outcomes assessment
- Early integration (lack of student foundation & confidence)
- If student gets sick, must repeat entire year
- Limited surgical expertise at graduation
- Enough time for faculty research work?
- Not expanding clinical knowledge

### NEW MODEL: AVETAR (Advancing Veterinary Education & Training with Active Learning Remotely)

#### New/Improved VEM: Overview

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- Student-centered learning in rotating teams
- Problem-based & patient focused
- Distributive model for clinical training
- Center of Excellence for adult learning
- Use of distance learning and avatar training to obtain prerequisites and at early stages of program

#### Strengths

- Teaches self-learning & life-long learning
- Early integration of clinical
- Employers find new grads productive 2x sooner
- Early PBL/self-directed
- Teamwork
- Students learn to value their knowledge, know their gaps & how to access info to fill
- Values collaboration/professional socialization
- Early ID of student problems/close relationship with faculty

### Improvement Ideas (Brainstorming)

The US Distributive group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (US Distributive: AVETAR)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Curriculum mapping, starting with the end user in mind (i.e. Nottingham)</li> <li>▪ Focus on basics</li> <li>▪ Students study base &amp; then specialize</li> <li>▪ Use preceptors to deliver</li> <li>▪ More training of faculty in PBL</li> <li>▪ More research rotations</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Train students in business sense, conflict management, ability to search databases for new information</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Training for SKAs integrated across curriculum</li> <li>▪ Cultural competencies</li> <li>▪ Students identify their different learning skills</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Critical evaluation of data</li> <li>▪ Shared web-vet database</li> <li>▪ Vet-ICE – expand/use</li> <li>▪ Selected modules aimed at generating next generation of faculty (e.g. anatomy, physiology)</li> <li>▪ NIH funding for research</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Search for 'intuitive' personalities</li> <li>▪ Link with outcomes – who succeeds?</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Offer some self-directed learning through distance/off-campus opportunities</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ CVMs share resources/faculty/preceptors (e.g. NB/Iowa 2+2 model)</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Create Center of Excellence for Critical Reasoning, PBL</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Use electronic media to share resources with other CVMs</li> <li>▪ Use resources from Faculty of Education (e.g. Cornell)</li> </ul>
<b>Preceptors</b>	<ul style="list-style-type: none"> <li>▪ Invest more \$ in preceptor training (all schools)</li> </ul>

## Improvement Decisions (Developing the New VEM)

The US Distributive group then made choices about which improvement ideas should be applied to their new VEM.

Focus Area	Improvement Decisions (US Distributive: AVETAR)
<b>Faculty Attraction &amp; Retention</b>	<ul style="list-style-type: none"> <li>▪ 'Grow your own' residents</li> <li>▪ Center of Excellence for PBL/training center for VEM PBL</li> <li>▪ Strategic partnerships</li> <li>▪ Hire 'teacher-focused' faculty</li> <li>▪ Use visiting faculty/become ambassadors for program</li> <li>▪ Offer faculty &amp; annual 'mini' sabbaticals/professional development</li> <li>▪ Dual residencies</li> <li>▪ Higher salaries</li> <li>▪ Offer preceptors 'mini' sabbaticals &amp; professional development</li> </ul>
<b>Student Centered Learning</b>	<ul style="list-style-type: none"> <li>▪ Use technology to enrich self-assessment               <ul style="list-style-type: none"> <li>○ Avatars (virtual patients with self-assessment capability)</li> <li>○ PDAs with curriculum etc.</li> </ul> </li> <li>▪ Web conferencing for 'rounds'</li> <li>▪ Enrich case studies</li> <li>▪ Link students at different sites to share experience (Adobe Connect Pro) (Vet ICE)</li> <li>▪ Students &amp; facilitators negotiate learning objectives together</li> <li>▪ 'General practice' rotations in 3<sup>rd</sup> &amp; 4<sup>th</sup> year (with intentional redundancy)</li> <li>▪ Rotations in 'hybrid' practices</li> <li>▪ Early curriculum mapping (shared with student)</li> <li>▪ Alumni act as mentors to students</li> </ul>
<b>Reverence for Life</b>	<ul style="list-style-type: none"> <li>▪ Avatars</li> </ul>
<b>Outcomes Assessment</b>	<ul style="list-style-type: none"> <li>▪ Measure increased incomes/costs/motives of preceptorships with grads in place (measure what say &amp; do)</li> <li>▪ Measure employer satisfaction</li> <li>▪ Use ethnography</li> <li>▪ Use industry data</li> <li>▪ Use secret shoppers to assess client/end-user satisfaction</li> <li>▪ Apply industry Quality Assurance tools/assessment to smaller operations</li> <li>▪ Collect data on client retention of grads ⇐ feedback data to institution and students</li> </ul>
<b>Strategic Partnerships</b>	<ul style="list-style-type: none"> <li>▪ Offer pathology services (community service/generate income)</li> <li>▪ Allow/build relationships with ABVP-certified preceptorships</li> <li>▪ Create Office of Strategic Relations to refresh &amp; retain partnerships</li> <li>▪ Share cost of Avatar development with other CVMs</li> <li>▪ Offer benefits to preceptorships</li> </ul>

Focus Area	Improvement Decisions (US Distributive: AVETAR)
	<ul style="list-style-type: none"> <li>○ Professional development</li> <li>○ Access- to e-library</li> <li>○ Facilitate participation in larger professional community (GIFTS)</li> <li>▪ Office of Alumni Affairs cultivates grads as preceptors/student mentors (already know the program)</li> </ul>
<b>Faculty Training in PBL</b>	<ul style="list-style-type: none"> <li>▪ Ongoing training/enriching in communications/facilitation/leadership</li> <li>▪ Training in learner group traits/mixes</li> <li>▪ Outcomes assessment</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Use distance learning in early stages to shorten time in school ⇐ student can work</li> <li>▪ Still 3-years of prerequisites (did not have time to analyze to see if could reduce)</li> </ul>
<b>Business Skills</b>	<ul style="list-style-type: none"> <li>▪ Avatars – each student has own Avatar practice (with profit margin, manage staff, pay self etc.)</li> </ul>
<b>Students</b>	<ul style="list-style-type: none"> <li>▪ Better grouping of students (learner group traits/mixes) in teams &amp; rotations</li> </ul>

## CURRENT VS. IMPROVED VEM

### Key Comparisons

The US Distributive group identified some key differences between their original VEM and the new model they had created.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.	7 years	6 years ?
Applic. of tech.	Variable technology enhanced, problem-based and clinical models	Technology maximized for case-based, patient-focused learning and assessment
Faculty development	PBL is on-the-job training	On-going PBL training and Center of Excellence
Student PBL teams	Random groups	Chosen on basis of learning styles

### Comparison Old vs. Improved VEM (contd.)

Focus Area	Current VEM	Improved VEM
Outcome assessment	Surveys (indirect)	Direct, performance-based. Industry and client interview data
Clinical faculty retention	Limited practice of specialty, time for research, and compensation	University practice partnership with shared specialists and advanced training programs. Annual mini-sabbaticals
Strategic partners	Preceptors are paid, and minimal recognition	Professional development for preceptors and involvement in larger professional community. Cultivate alumni as preceptors

**Potential Impacts**

The US Distributive group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

**Responses to Impact Questions**

	Topic	Response
Q1	Competencies & Assessment	Additional use of PBL highly flexible for teaching new competencies. Behavioral performance measurement (avatars)
Q2	Implementation	Incremental, adapted to local circumstances
Q3	Expense Areas	Faculty hiring and training. Avatar development Partnership development

**Responses to Impact Questions**

	Topic	Response
Q4	Significant Changes	Lose teaching hospitals. Performance measured on teaching, not research. Faculty activities may be more profitable.
Q5	Biggest Impl. Challenges	Tradition. Academics & state constituencies Finding adequate preceptorships in rural areas
Q6	Greatest Benefits	Produces self-learning critical thinkers. Cheaper to the state (?). Less expensive to implement.

## 5.7 Canadian Distributive

This group focused on the University of Calgary Veterinary Medicine as a starting point for their discussions.

### CURRENT MODEL: Canadian Distributive

#### Team VEM: Canadian Distributive

Top-3 Areas for Improvement:

- Large Distance between CVM and Distributed Veterinary Learning Community
  - *Decrease distance between CVM and Distributed Veterinary Learning Community members for core rotations*
- Faculty suffers from logistic and personal time demands
  - *Increase the investment in faculty recruitment, retention and development*
- The model should make it less expensive to train veterinarians but tuition is still high
  - *Pass the cost savings inherent in the model on to the students*



### Strengths

- Huge & relevant caseload
- Very competent entry-level skills
- Lower OH/CAPEX (efficiency)
- Expanded pool of enthusiastic practitioner-teachers/role models
- Adaptable to changing societal needs
- Great recruiting pool (practitioners)
- Broad network for clinical trials
- Potential for scalability

### Weaknesses

- Difficult on faculty
- Quality control of distributed practice (distance)
- Potential practice fatigue
- Disruption of student personal life
- Unproven sustainability
- Difficult to recruit faculty for host sites ('home' + travel)
- Less facts-based learning

### NEW MODEL: Advanced Distributive Model

#### New/Improved VEM: Overview

- Three years are spent at a central teaching facility, then one year is spent in a Distributed Veterinary Learning Community (DVLC)
  - *i.e. private clinics, gov't agencies, diagnostic facilities, etc.*
- The large, diverse, flexible DVLC provides a real-world, highly relevant learning experience
- Fully integrated basic & applied sciences are taught throughout the curriculum
- There is an inherent integration & cultivation of non-technical skills in the DVLC experience
- It capitalizes on current and future IT technology for connectivity of the DVLC and enhanced student (and faculty) learning



### Improvement Ideas (Brainstorming)

The Canadian Distributive group brainstormed improvement ideas that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (Canadian: Advanced Distributive)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Bring adjunct faculty back for clinical/skills training</li> <li>▪ Seed money for distance faculty</li> <li>▪ Prescribed rotations for distance practices</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Competition for adjunct faculty (best teacher awards)</li> <li>▪ Clear termination agreements</li> <li>▪ Adequate compensation for diagnostics/work-ups</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Virtual access practice for students</li> <li>▪ Free services to adjunct faculty from CVM</li> <li>▪ Ensure students have adequate specialist exposure</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Advanced teacher training for adjunct faculty</li> <li>▪ Clear guidelines/check lists</li> <li>▪ Teach year-round for 3 years</li> <li>▪ 'e-books' to save \$</li> <li>▪ Good reference libraries at clinics</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Multi-school formal agreement to fill all societal needs</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Give group buying power to distance faculty</li> <li>▪ Market CVM-practice bond</li> <li>▪ Look for ways to reduce \$ to distance faculty</li> <li>▪ Contract with communities instead of/in addition to practice</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ Fixed/respected downtime for faculty</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Shorten required pre-vet to 2 years (B Sc)</li> <li>▪ Shared quality lab space for distance faculty</li> </ul>
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ Discourage 'mandatory' internships</li> </ul>



### Improvement Decisions (Developing the New VEM)

The Canadian Distributive group then made choices about which improvement ideas should be applied to their new VEM.

Focus Area	Improvement Decisions (Canadian: Advanced Distributive)
<b>Cost</b>	<ul style="list-style-type: none"> <li>▪ Cost savings to institutions passed on to students (already a strength)</li> <li>▪ Heavy investment in IT (e.g. remote clinics)</li> <li>▪ Invest in teaching spaces, not in veterinary teaching hospital</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Very tight connection between central school and distance clinics</li> <li>▪ Advanced training in teaching techniques/consistency of practice &amp; assessment</li> <li>▪ Geographic limits (100km) for core rotations</li> <li>▪ Flexible schedules for students &amp; faculty (module-based)</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Connect, recognize and value both VLDC and in-house faculty</li> </ul>
<b>Faculty</b>	<ul style="list-style-type: none"> <li>▪ Expensive diagnostic equipment available to all faculty</li> <li>▪ Invest heavily in faculty</li> </ul>

## CURRENT VS. IMPROVED VEM

### Key Comparisons

The Canadian Distributive group identified some key differences between their original VEM and the new model they had created.

### Comparison Old vs. Improved VEM

Focus Area	Current VEM	Improved VEM
Education Delivery	Distributed Veterinary Learning Community spread across the province	VDLC is limited to a smaller radius, especially for core rotations
CVM Infrastructure	Very difficult on faculty	High level of investment into recruiting, retaining and developing faculty
Education Delivery	Very labor-intensive on in-house faculty	Enhances training of DVLC members to distribute workload

**Potential Impacts**

The Canadian Distributive group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

**Responses to Impact Questions**

	Topic	Response
Q1	Competencies & Assessment	There is a huge and relevant caseload, teaching technical and non-technical competencies in innovative way
Q2	Implementation	Either is possible, but implementation in a new facility would be easier
Q3	Expense Areas	Investing in faculty and DVLC (major IT/AV and Diagnostic Equipment) AND repurposing costs for current infrastructure +/- student & faculty transportation and housing costs

**Responses to Impact Questions**

	Topic	Response
Q4	Significant Changes	It is a new paradigm for faculty and CVM, the changes are large and significant
Q5	Biggest Impl. Challenges	Assuring the quality of the DVLC and engaging faculty members into the new model
Q6	Greatest Benefits	Relevant, flexible training delivered in a real-world setting

## OTHER CRITICAL INFORMATION

The Canadian Distributive group shared several additional points they felt would expand understanding of their new model.

### Other Critical Information

- Minimum of 2 years in Pre-vet prerequisites, but could have allowance for Bachelor's degree during DVM program (or prior to admission)
- There is an enhanced learning experience due to the wide variety of teaching approaches on and off campus

## 5.8 2+2

This group focused on Iowa State University and University of Nebraska Colleges of Veterinary Medicine as a starting point for their discussions.

### CURRENT MODEL: 2+2

#### Team VEM: 2 + 2

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##### Top-3 Areas for Improvement:

- need for increased clinical experience/exposure
- challenge of implementing change with two schools
- need for increased opportunities for developing non-technical SKAs



2+2

1

#### Strengths

- Opportunity for NE (e.g. students)
- Strategic partners/alliances (private, state-to-state)
- Small population benefits/student base strengthened
- Graduates more vets

### Weaknesses

- Increased difficulty for two schools administratively to implement changes
- Less clinical experience until Year 3
- Faculty development/promotion more difficult
- Faculty disconnect/hard on families
- State budget increased creating new small faculties
- Fewer extracurricular/hosted events (SKA Development), (SAVMA, Hills)

### NEW MODEL: 2+2=1

#### New/Improved VEM: Overview

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- Increased clinical exposure/experience from year 1
- Establishment of a joint culture that facilitates change within a 2+2 model
- Increased opportunities for development of non-technical SKAs in first 2 years



2+2

2

### Improvement Ideas (Brainstorming)

The 2+2 group brainstormed improvements that could be applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (2+2=1)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Both parties on curriculum committee</li> <li>▪ Private sector/clinical experience in Year 1 &amp; 2</li> <li>▪ Get students into 'Bio 2' clinic earlier on</li> <li>▪ More basic science</li> <li>▪ Turn out entry level vets, not specialists</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Integrate through distance mechanisms (poly com, Blog)</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Experiential learning early</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Fullest spectrum possible</li> </ul>
<b>Admission Criteria</b>	
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Compress pre-vet requirements</li> </ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"> <li>▪ More experience offered for alternative careers</li> <li>▪ More time reserved for other learning opportunities in last 2 years</li> </ul>
<b>Infrastructure</b>	
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>▪ "Small 2" more involved with shelters, government &amp; university herds, horse rescue, etc.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>▪ Common assessment tools &amp; methods help articulation</li> <li>▪ Biannual retreats hosted by alternating schools</li> </ul>

### Improvement Decisions (Developing the New VEM)

The 2+2 group then made choices about which improvement ideas should be applied to their new VEM.

Focus Area	Improvement Decisions (2+2=1)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Increase clinical exposure/experience from Year 1               <ul style="list-style-type: none"> <li>○ More private sector engagement</li> <li>○ Strategic alliances with private practice (both IA &amp; NE)</li> <li>○ Learn from Caribbean model (clinical faculty, basics emphasis, dog/cat/horse/cow)</li> <li>○ Presence of a 'clinic' (low-cost, small) (NE &amp; IA)</li> </ul> </li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Establish a joint culture that facilitates change within a 2+2 model               <ul style="list-style-type: none"> <li>○ Faculty share curriculum responsibilities</li> <li>○ Deliberate effort to creatively create opportunities for faculty collaboration</li> <li>○ Identify change champions &amp; network them</li> <li>○ Value teaching in promotion &amp; tenure</li> <li>○ Dedicated teaching faculty (free others to research)</li> <li>○ Incorporate teaching into research/research into teaching</li> <li>○ Centre of Excellence standard</li> </ul> </li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Ensure opportunities for development of non-clinical SKAs in first 2 years</li> <li>▪ Facilitate student networks               <ul style="list-style-type: none"> <li>○ Bring NE upper classmen back to NE</li> <li>○ IA upper level students adopt NE students</li> </ul> </li> <li>▪ Pre-merger face-to-face meetings during Year 1 &amp; 2</li> <li>▪ Facilitate common exposure to clinical experience or both groups</li> <li>▪ Leadership workshops for students</li> <li>▪ Cooperative meetings (IVMA &amp; NVMA)</li> <li>▪ Electronic communications of clinical cases</li> <li>▪ Faculty designee liaison to IVMA, NVMA etc</li> </ul>

**CURRENT VS. NEW**

**Key Comparisons**

2+2 group identified some of the key differences between their original VEM and the new model they had created.

**Comparison Old vs. Improved VEM**

Focus Area	Current VEM	Improved VEM
Increase clinical experience from year 1	Not engaged with private practice	Strategic alliances with private sector, including practice, at both schools
	Limited clinical faculty at non-VTH school	Clinical faculty teaching in the non-VTH school
	No clinic at non-VTH school	Consider smaller scale clinic at non-VTH school
Joint culture to facilitate change	Limited team-teaching	Faculty share curricular responsibilities
	Limited joint committee membership	Create opportunities for faculty collaboration
	"Because we've always done it that way"	Identify champions of change

**Comparison Old vs. Improved VEM (contd.)**

Focus Area	Current VEM	Improved VEM
Increase non-technical SKAs	Limited partnerships with state Vet Assocs	Partnerships of faculty, students, state Vet Assoc (and others) to create opportunities
	Limited connections of students from partner schools <3 <sup>rd</sup> year	Student mentoring and "buddy" system between students of both schools



## Potential Impacts

The 2+2 group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

### Responses to Impact Questions

	Topic	Response
Q1	Competencies & Assessment	Addresses veterinary competencies
Q2	Implementation	Incrementally
Q3	Expense Areas	Cost of increasing clinical exposure/experience
Q4	Significant Faculty Changes	Increased time in collaboration "Train the Trainer " in non-technical SKAs
Q5	Biggest Implementation Challenges	Culture
Q6	Greatest Benefits	Increase strategic partnerships and alliances, especially for areas w/o CVMs

## OTHER CRITICAL INFORMATION

The 2+2 group shared several additional points they felt would expand understanding of their new model.

### Other Critical Information

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- Especially amenable to incorporating distance learning technologies
- Circumstances dictate need for this VEM
- Need appropriate institutions already in existence to serve as partners
- Business plan, including cost/benefit analysis

## 5.9 New Concepts

This New Concepts group focused on the new concepts proposed by Virginia Kiefer and Dean Cyril Clarke as a starting point for their discussions.

### PROPOSED MODELS: Kiefer & Clark

#### Team VEM: “Out of the Box” Model

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Top-3 Areas for Improvement:

- Decrease Costs
- Institutional Implementation
- Ensure accreditation



### Strengths

- Decreases cost of education (pre-vet online ✓flexibility/–cost)
- Addresses disconnect between undergrad requisites & DVM pre-req's
- Universities can focus on specialty areas/centers of emphasis
- Early focus on clinical training
- Course system block-focused – active/applied learning
- Early assessment of knowledge, pre-vet exam

### Weaknesses

- Challenging to implement at institutional level (financial & agreement on pre-req's & other)
- How to ensure accreditation
- What if student changes mind midway?
- Solely online format decreases SKAs/less mature applicants
- Potential for low completion of online prerequisites
- Scheduling issues
- Life/balance issues for students/travel costs

### NEW MODEL: Out of the Box

#### New/Improved VEM: Overview

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- 2 year pre-vet (no prerequisites that couldn't be completed in 2 yrs or less)
- 3.5 year DVM program
- Integrated modular design with extensive use of online technology and different methods of delivery
- Primary care/clinically focused
- Self paced, competency based (not lock step)



**Improvement Ideas (Brainstorming)**

The New Concepts group brainstormed improvement ideas that could applied to a new VEM. These were drawn from the presentations provided the day before and from participants' own experience.

Focus Area	Improvement Ideas (New Concepts: Out of the Box)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Generate more practice-ready (profit ready), efficient right out-of-school grads</li> <li>▪ Integrated curriculum (Nottingham/Ross)</li> <li>▪ Incorporate vet technicians in vet team training</li> <li>▪ Ensure certain pre-reqs stay in vet medicine coursework</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Increase business training</li> <li>▪ Ensure flexibility to engage in non-traditional/public health studies throughout/including admissions</li> <li>▪ Include non-technical competencies across the board</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Focus on adult learning (integrated/active/relevant)</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Increase online educational opportunities</li> <li>▪ Use expanded models in clinics (non-university facilities)</li> <li>▪ Use outside practitioners to teach</li> <li>▪ Remove specialty hospitals/teach students for general practice</li> <li>▪ Increase technical staff at vet teaching hospitals/stop using students as vet techs</li> <li>▪ Turn teaching hospitals into general practices™ student run</li> <li>▪ Emphasize teaching over research</li> <li>▪ Combined undergrad/grad degree™ huge advantages</li> <li>▪ Increase use of teaching techs where appropriate</li> <li>▪ More options/flexibility for students start-to-finish</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Required behavioural interview</li> <li>▪ Across-the-board acceptance of core courses</li> <li>▪ Broaden admissions criteria (focus on the end product)</li> <li>▪ Decrease pre-req's time while maintaining strong, broad education</li> <li>▪ Focus admission on business-minded students</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Business plan on cost of education for DVMs™ target biggest cost</li> <li>▪ Cost reduction in vet school</li> </ul>
<b>Meeting Societal Needs</b>	
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>▪ More use of paraprofessionals in practice</li> </ul>
<b>Collaboration</b>	

## Improvement Decisions (Developing the New VEM)

The New Concepts group then made choices about which improvement ideas to apply to their new VEM.

Focus Area	Improvement Decisions (New Concepts: Out of the Box)
<b>Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Core training in the fundamental disciplines to meet accreditation (could be focused)</li> <li>▪ Graduates with Day 1 competencies</li> <li>▪ Competency based (individual basis)</li> <li>▪ Getting vet students (or pre-vets) into clinics on day 1</li> <li>▪ Open source, collaborative curriculum (e.g. medpedia)/graded by peers/faculty</li> <li>▪ Incorporate public health throughout</li> <li>▪ Cross-curriculum training with MDs – One Health</li> <li>▪ Paradigm shift – curriculum based on what practitioners want grads to know</li> <li>▪ Curriculum committees composed of practitioners</li> <li>▪ Driven by end product/external stakeholders</li> <li>▪ Reflective outcomes assessment</li> <li>▪ Innovative anatomy</li> </ul>
<b>Non-Technical Curriculum</b>	<ul style="list-style-type: none"> <li>▪ Expose vet students to all career options</li> <li>▪ Maintain students' self-esteem throughout training</li> <li>▪ Business training throughout/distributed model</li> </ul>
<b>Adult Learning</b>	<ul style="list-style-type: none"> <li>▪ Students working experientially from Day 1</li> <li>▪ Online communities of learning (cohorts)</li> <li>▪ Include all types of learning/teaching models/styles</li> </ul>
<b>Education Delivery</b>	<ul style="list-style-type: none"> <li>▪ Virtual matrix education (online/clinical totally distributed)/virtual vet school</li> <li>▪ Flexible, competency-based (students can come &amp; go, e.g. work, peace corps)</li> <li>▪ Network of gifted lecturers/top experts available to all students via distance learning tools (e.g. pharmacologists)</li> <li>▪ Targeted faculty/staff to direct interaction</li> <li>▪ Choosing appropriate distributed locations</li> <li>▪ Web conferencing/shared rounds (e.g. PAHO – 17000 conferences)</li> <li>▪ Innovation in teaching labs/better simulations (fund by Animal Rights groups)</li> <li>▪ Shared lab simulators</li> <li>▪ Create incentive for teaching-focused faculty/others focus on research</li> <li>▪ Facilitated teacher teaching (not necessarily a pharmacist teaching pharmacy)</li> </ul>
<b>Admission Criteria</b>	<ul style="list-style-type: none"> <li>▪ Students can be accepted after 2 years of pre-req's</li> <li>▪ Uniform pre-req's</li> <li>▪ Inter-professional training pre-admission (pre-med/pre-vet)</li> </ul>
<b>Education Cost</b>	<ul style="list-style-type: none"> <li>▪ Use of blended curriculum (online &amp; in-person)</li> <li>▪ Online shared across institutions</li> </ul>

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<b>Focus Area</b>	<b>Improvement Decisions (New Concepts: Out of the Box)</b>
	<ul style="list-style-type: none"><li>▪ Use of less specialized teachers</li><li>▪ Lower post grad costs (internships)</li></ul>
<b>Meeting Societal Needs</b>	<ul style="list-style-type: none"><li>▪ Clinics for distributive model into areas not typically served by vet medicine</li><li>▪ More affordable, more accessible = greater diversity</li><li>▪ Specific modules targeted to diversity</li><li>▪ Innovative housing for students</li></ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"><li>▪ University-owned profitable vet practices</li><li>▪ Sharing faculty across CVMS/universities (must be recognized)</li><li>▪ Change accreditation</li><li>▪ CVMs may not have all disciplines located on campus</li></ul>
<b>Collaboration</b>	<ul style="list-style-type: none"><li>▪ Combine resources from across CVMs</li><li>▪ Faculty pool across universities to lecture face-to-face (virtual or face-to-face)</li><li>▪ Cooperative vet/vet tech programs</li></ul>

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**NEW CONCEPTS VS. OUT OF THE BOX VEM**

**Key Comparisons**

The New Concepts group identified critical insights into the new model they created.

**Comparison Old vs. Improved VEM**

Focus Area	Current VEM	Improved VEM
Total length of program, incl. prereq.		5.5 total years
Cost of education, collaboration		Sharing of faculty and curricular resources
Curriculum		Curriculum is stakeholder driven, producing practice ready graduates

**Comparison Old vs. Improved VEM (contd.)**

Focus Area	Current VEM	Improved VEM
Curriculum		Collaboration between vet schools and vet tech programs (train the team)
Adapting to new societal needs		Develop and maintain self esteem and confidence through experiential learning
Education delivery methods		Quality control through assessment

**Potential Impacts**

The New Concepts group responded to a series of impact questions regarding their new VEM. A detailed list of these questions can be found in Appendix A.

**Responses to Impact Questions**

	Topic	Response
Q1	Competencies & Assessment	Veterinary competencies are built into the curriculum which is outcome based and assessed through ongoing assessment.
Q2	Implementation	New School: Major changes Existing School: Incremental changes
Q3	Expense Areas	1) Restructuring the clinical experience 2) Development of high quality online learning experience 3) Faculty

**Responses to Impact Questions**

	Topic	Response
Q4	Significant Changes	1) Change in faculty mindset (paradigm shift) from controller to learner centered 2) Teaching hospital shift to primary care
Q5	Biggest Impl. Challenges	1) Gaining buy in at all levels 2) Financial implications (is it sustainable?)
Q6	Greatest Benefits	1) Decrease cost to students 2) Practice ready vets = better salaries 3) Accommodates retraining of DVM's shifting focus 4) Flexible and adaptable to maintain relevancy



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## OTHER CRITICAL INFORMATION

The New Concepts group emphasized one additional point about their model.

### Other Critical Information

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“It’s all about the student”

## 6.0 Closing Plenary Session

Participants took part in a general discussion on the need to generate new veterinary medicine education models that would better meet the evolving needs of society, students and the profession. Specifically, they were invited to bring forward ideas they had not yet had the opportunity to express. Key points raised include:

### Consider Whole Profession

- Remember that the profession is a system; must act on behalf of the whole, not just out of self-interest. Often the answers are not either/or; they are a hybrid.

### Need for Meaningful Data (Student Outcomes & Student Debt)

- Is there a mechanism for measuring success of graduates on a national basis? There is a need for:
  - Metrics on student outcomes for each CVM/employer surveys/income earned in first year of private practice
  - Ask questions on performance that are relevant to all professions (e.g. public health); not just about revenue
  - Detailed data on costs of running CVMs and relative impacts
  - Comparable data on student debt levels – is problem getting worse, better or staying the same (over time)?

### Day 1 Competencies

- Can learn a lot from the European model. UK developed Day 1 competencies with a lot of input from practitioners. These set out what must be assessed at end of the program. If students want to go into profession or graduate studies, they must self-assess whether they are confident to practice in certain areas.

### Student Debt – Search for Solutions

- Caution against equating reducing student debt with shorter time in school; risks cutting our qualifications; not the only model.
  - Other solutions:
    - Public-private partnerships
    - Lobbying congress to reduce interest on student debt
    - Give grads better business training to enhance their post-grad revenues
    - Enhance profile of VM as part of overall health profession so can access NIH grants, HEARSA grants, increase USDA direct/indirect rates
    - Reduce costs of CVMs and pass savings to students
    - Graduate practice-ready vets/reduce internship time
    - Look how private practices can assist with training
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- Need to counsel students about how much student loan they are taking (often are young/not aware of long-term consequences)
- Raise awareness of career options, e.g. U.S. Army Veterinary Corps will provide funding for education
- Teaching hospitals should be 'real world'; should show students how to move through cases quickly and effectively
- Student debt also has do with choice
- Think of student debt in larger context; if we reduce student cost/time in school, there is less revenue for CVMs; the second leg is to reduce education cost.
  - Inter-institutional cooperation could generate efficiencies
  - Teaching hospitals could generate revenues
  - Strengthen relationships with state associations to bring more funding to CVMs (pass on benefit to students)

### **Impact on Research Programs**

- When exploring how to re-distribute expertise, shorten programs, contain (reduce) cost and strongly focus on practice-ready grads, it is important to continue to consider the potential negative implications on research capabilities, scientific expert development (faculty) and engaging the veterinary profession into One Health.

### **Public Health**

- Public health is being discussed as an 'add-on'; should be integral to curriculum.
  - Public health includes human-animal bond; impact on human obesity, diabetes, heart health, mental health etc./includes wildlife
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## ***Appendix A***

### **IMPACT QUESTIONS FOR NEW Veterinary Education Models (VEMs)**

Each group was asked to answer the following impact questions to begin to assess the potential performance of their new VEM.

- Q1. How does your new VEM create future veterinary competencies? How will these competencies be assessed/measured?
  - Q2. How would you recommend this new VEM be implemented (one major change or incrementally?)
  - Q3. What do you estimate to be the major implementation expense areas?
  - Q4. What are the most significant changes for faculty and CVM infrastructure?
  - Q5. What are the biggest challenges to implementing this model?
  - Q6. What is the greatest benefit of your new VEM – why should a VEM implement it?
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## ***Appendix B***

### **PROFESSIONAL QUALIFICATIONS (United Kingdom)**

#### **A. OFFICIAL VETERINARIAN**

1. The competent authority may appoint only veterinarians who have passed a test meeting the requirements of paragraph 2 as official veterinarians.
  2. The competent authority must make arrangements for the test. The test is to confirm knowledge of the following subjects to the extent necessary depending on the veterinarian's background and qualifications.
    - National and Community legislation on veterinary public health, food safety, animal health, animal welfare and pharmaceutical substances;
    - Principles of the common agricultural policy, market measures, export refunds and fraud detection (including the global context; WTO, SPS, Codex Alimentarius, OIE);
    - Essentials of food processing and food technology;
    - Principles, concepts and methods of good manufacturing practices and quality management;
    - Pre-harvest quality management (good farming practices);
    - Promotion and use of food hygiene, food related safety (good hygiene practices);
    - Principles, concepts and methods of risk-analysis;
    - Principles, concepts and methods of HACCP, use of HACCP throughout the food production chain;
    - Prevention and control of food-borne hazards related to human health;
    - Population dynamics of infection and intoxication;
    - Diagnostic epidemiology;
    - Monitoring and surveillance systems;
    - Auditing and regulatory assessment of food safety management systems;
    - Principles and diagnostic applications of modern testing methods;
    - Information and communication technology as related to veterinary public health;
    - Data-handling and applications of biostatistics;
    - Investigations of outbreaks of food-borne diseases in humans;
    - Relevant aspects concerning TSEs;
    - Animal welfare at the level of production, transport and slaughter;
    - Environmental issues related to food production (including waste management);
    - Precautionary principle and consumer concerns;
    - Principles of training of personnel working in the production chain.
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