Developing Competency-Based Veterinary Education

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AAVMC Working Group on COMPETENCY-BASED VETERINARY EDUCATION (CBVE)
AAVMC CBVE Working Group

- Laura Molgaard (co-chair), University of Minnesota
- Jennie Hodgson (co-chair), Virginia-Maryland
- Harold Bok, Utrecht University
- Kristin Chaney, Texas A&M University
- Jan Ilkiw, University of California - Davis
- Susan Matthew, Washington State University
- Stephen May, Royal Veterinary College
- Emma Read, DVM, University of Calgary
- Bonnie Rush, Kansas State University
- Kathy Salisbury Purdue University
- Jody Frost, Educational Consultant & Facilitator
What is Competency-Based Education and why implement it?

- Current competency frameworks in the health professions

AAVMC Working Group on Competency-Based Veterinary Education (CBVE)

- Proposed Competency Framework; Domains, competencies and illustrative sub-competencies
- Evaluating Progress: Entrustable Professional Activities (EPAs), Milestones and their relationship to Competencies
- Future directions
Today’s Agenda

The first animal to ask an existential question was from a parrot named Alex. He asked what color he was, and learned that it was "grey".

Please ask questions (even if they are not existential) at any time during the talk!
COMPETENCY-BASED EDUCATION

WHAT AND WHY?
Competency-Based Medical Education

- Core strategy world-wide to educate and assess students in undergraduate and graduate medical education

- Achieved through well-defined and documented frameworks that guide development of curricula as well as assessment programs
How is CBE different from traditional education?

<table>
<thead>
<tr>
<th>Traditional</th>
<th>Competency-based</th>
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<tbody>
<tr>
<td>Knowledge objectives</td>
<td>Learner and program outcomes</td>
</tr>
<tr>
<td>Curriculum/Processes are 1º</td>
<td>Curriculum/processes are 2º</td>
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</table>
Learning, accountability, participation

Assessment (both formative and summative)

Abilities/outcomes with developmental milestones

Map and continuously improve curriculum

Why CBME?

Bok and Jaarsma 2017
Increasing commitment to CBME over past 20 years

- Outcomes Project of ACGME and ABMS – USA
- Scottish Doctor Project – Scotland
- Framework for Undergraduate Medical Education – Netherlands
- CanMEDS – Canada
Definitions

doi: 10.1097/ACM.0b013e31829a3b2b
Definitions

Competency:

✓ An observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes.

✓ Since competencies are observable, they can be measured and assessed to ensure their acquisition.

Frank et al cited by Englander et al, 2013
Domains of Competence (DOC):

✓ “Broad, distinguishable areas of competence that in the aggregate constitute a general descriptive framework for a profession” Englander et al., (2013)
Definitions

Competency Framework:

- An organized and structured representation of a set of interrelated and purposeful competencies  
  Englander et al., (2013)
Entrustable Professional Activity (EPA):

- A duty or activity in the clinical setting that may be delegated to a learner by their supervisor once he or she has demonstrated sufficient competence to perform this task without supervision.

- EPAs describe the work that is being done, or must be done, in the workplace. (Ten Cate, 2015)
Competencies: bigger picture descriptors of the health professional

EPAs: descriptors of the work that health professionals do and which combine multiple competencies
Milestones:

✓ A milestone is a behavioral descriptor that marks a level of performance for a given competency.

✓ Milestones help the learner and their supervisor identify stages in learner development. 

AAVMC Core EPAs for Entering Residency, Faculty and Learners Guide (2016)
COMPETENCY-BASED EDUCATION

VETERINARY EDUCATION
AVMA COE “clinical competencies” developed over 15 years ago

1. patient diagnosis
2. treatment planning
3. anesthesia and pain management
4. surgery skills
5. medicine skills
6. emergency and intensive care
7. health promotion, disease prevention/biosecurity
8. client communications and ethical conduct
9. critical analysis of new information and research findings
But concerns were raised about the outcomes of this process
Concerns about “COE 9”

OUTDATED

Not reliable or valid
AAVMC Workshop on Competency Assessment at Minnesota in July of 2015

Associate Deans and Assessment Professionals from around the world

- Modern, shared competency framework
- Common assessment tool(s)
- Continued alignment with the directions of other frameworks in the Health Professions
“Through collective input we could create a powerful argument for change”

Working Group on Competencies in Veterinary Medical Education was conceived
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Volunteer effort for voluntary adoption
COMPETENCY-BASED VETERINARY EDUCATION

WORK TO DATE BY CBVE
CBVE Work to Date

- Started by evaluating existing Frameworks
  - Veterinary Frameworks (e.g., NAVMEC, VetPro)
  - Other Health Care Professional Frameworks
- Drafted Competency Framework and developed Entrustable Professional Activities (EPAs)
- Disseminated drafts and conducted surveys and web-in-aIRS
CBVE Framework

Ready for Rollout!!!

- Intended to be core for all graduates of all programs
- Recognizes that schools may develop additional competencies and sub-competencies that are relevant to their individual/unique missions
1. Clinical Reasoning and Decision-Making
2. Individual Animal Care and Management
3. Animal Population Care and Management
4. Public Health
5. Communication
6. Collaboration
7. Professionalism and Professional Identity
8. Financial and Business Management
9. Scholarship
### CBVE Domains of Competence

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Clinical Reasoning and Decision-making</td>
</tr>
<tr>
<td>2</td>
<td>Individual Animal Care and Management</td>
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<tr>
<td>3</td>
<td>Animal Population Care and Management</td>
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<tr>
<td>4</td>
<td>Public Health</td>
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<tr>
<td>5</td>
<td>Communication</td>
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<tr>
<td>6</td>
<td>Collaboration</td>
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<tr>
<td>7</td>
<td>Professionalism and Professional Identity</td>
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<tr>
<td>8</td>
<td>Financial and Practice Management</td>
</tr>
<tr>
<td>9</td>
<td>Scholarship</td>
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### CBVE framework

- Clinical Reasoning and Decision-making
- Individual Animal Care and Management
- Animal Population Care and Management
- Public Health
- Communication
- Collaboration
- Professionalism and Professional Identity
- Financial and Practice Management
- Scholarship
Competencies & Sub-competencies

DOMAIN 1
Clinical Reasoning and Decision-making

The graduate demonstrates critical thinking and problem solving to arrive at evidence-based decisions that consider animal and client needs, available resources, and social context.

<table>
<thead>
<tr>
<th>COMPETENCIES</th>
<th>ILLUSTRATIVE SUBCOMPETENCIES</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Gathers and assimilates relevant information about animals</td>
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<tr>
<td></td>
<td>a. Collects history</td>
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<tr>
<td></td>
<td>b. Performs physical examination</td>
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<tr>
<td></td>
<td>c. Interprets diagnostic test results</td>
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<tr>
<td></td>
<td>d. Performs necropsy examination</td>
</tr>
<tr>
<td>1.2</td>
<td>Synthesizes and prioritizes problems to arrive at differential diagnoses</td>
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<tr>
<td></td>
<td>a. Identifies problems</td>
</tr>
<tr>
<td></td>
<td>b. Creates refined problem list</td>
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<tr>
<td></td>
<td>c. Prioritizes differential diagnoses</td>
</tr>
<tr>
<td>1.3</td>
<td>Creates and adjusts a diagnostic and/or treatment plan based on available evidence</td>
</tr>
<tr>
<td></td>
<td>a. Appraises available clinical information and acts accordingly despite uncertainty</td>
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<tr>
<td></td>
<td>b. Explains justification for plan</td>
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<tr>
<td></td>
<td>c. Re-evaluates animal or population in a timely manner to adjust plan</td>
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<tr>
<td></td>
<td>d. Uses critical thinking to determine appropriate action when unexpected outcomes occur (e.g., complications, changed diagnosis)</td>
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Description of the Domain

Illustrative sub-competencies
✓ Not all encompassing
✓ But help as they are more how general practitioners think

Relevant individual competencies
Entrustable Professional Activities

- Routine activities that doctors/veterinarians perform in their daily practice
- EPAs describe the work that is being done, or must done in the workplace (ten Cate, 2015)
Developed because they helped “operationalize” the competencies

They also provide a framework for assessment and feedback that guides learners as they work towards independence with key tasks in veterinary practice.
The CBVE Working Group has created 8 core EPAs:

1. Gather a history, perform an examination, and create a prioritized differential diagnosis list
2. Develop a diagnostic plan and interpret results
3. Develop and implement a management/treatment plan
4. Recognize a patient requiring urgent or emergent care and initiate evaluation and management
5. Formulate relevant questions and retrieve evidence to advance care
6. Perform a common surgical procedure on a stable patient, including pre-operative and post-operative management
7. Perform general anesthesia and recovery of a stable patient including monitoring and support
8. Formulate recommendations for preventive healthcare.
EPA 1

Gather a history, perform an examination, and create a prioritized differential diagnosis list

**DESCRIPTION OF ACTIVITY**
Perform a history and exam on an individual animal or herd and assimilate the information collected to derive a prioritized differential diagnosis.

**COMMENTARY**
The history and examination should be tailored to the clinical situation and specific patient encounter. This data gathering serves as the foundation for evaluation and management. Expectations include integration of the scientific foundations of medicine with clinical reasoning skills to guide information gathering.
How do Competencies and EPAs connect?
EPAs and Competencies

EPA₁

DoC₁ → C₁.2

DoC₂ → C₁.3 → C₂.1 → C₂.4 → C₃.2 → C₃.5
Entrustable Professional Activities

EPA 1

Gather a history, perform an examination, and create a prioritized differential diagnosis list

| DESCRIPTION OF ACTIVITY | Perform a history and exam on an individual animal or herd and assimilate the information collected to derive a prioritized differential diagnosis. |

| COMMENTARY | The history and examination should be tailored to the clinical situation and specific patient encounter. This data gathering serves as the foundation for evaluation and management. Expectations include integration of the scientific foundations of medicine with clinical reasoning skills to guide information gathering. |

<table>
<thead>
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<th>MOST RELEVANT DOMAINS</th>
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<tbody>
<tr>
<td>1: Clinical Reasoning &amp; Decision-making</td>
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<tr>
<td>5: Communication</td>
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</table>

<table>
<thead>
<tr>
<th>(SECONDARY DOMAINS)</th>
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<tbody>
<tr>
<td>2: Individual Animal Care &amp; Management</td>
</tr>
<tr>
<td>6: Collaboration</td>
</tr>
<tr>
<td>8: Financial &amp; Practice Management</td>
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- Mapped the EPAs to most relevant Domains of Competence (DOCs)
- As well as secondary domains
Identified the specific competencies within the domain that is relevant for the activities in the EPA.
Another Point to Note about EPAs

- They provide a framework for assessment and feedback that guides learners as they work towards independence with key tasks in veterinary practice.
As each EPA requires proficiency in multiple competencies simultaneously, they also help translate competencies into a practical approach to assessment in workplace-based contexts.

As a learner performs an EPA, he/she develops the required competencies progressing along a continuum.

This developmental progression is marked by achieving milestones that allow the learner, and their assessor, to determine what they are doing well and where they still need to improve.
Used this competency to create milestones that describe the level of proficiency of each of the competencies within the EPA.
Milestones

- A milestone is a behavioral descriptor that marks a level of performance for a given competency.
- Milestones help the learner and their supervisor identify stages in learner development.
- Allow feedback to be specific and focused on areas where improvement can be made to help the learner to the next level of performance.

DOMAINE 1  Clinical Reasoning and Decision-making

The graduate demonstrates critical thinking and problem solving to arrive at evidence-based decisions that consider animal and client needs, available resources, and social context.

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Example Sub-Competencies (non-comprehensive)</th>
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</table>
| 1.2 Synthesizes and prioritizes problems to arrive at differential diagnoses | a. Identifies problems  
b. Creates refined problem list  
c. Prioritizes differential diagnoses |

**Milestones:**

**Beginner:** Learner recalls discrete, isolated medical facts related to clinical findings. List of differential diagnoses contains relevant and irrelevant conditions, supported by isolated portions of the history or physical exam. Explanations are linear and may be inaccurate. Differential diagnoses are not prioritized.

**Advanced Beginner:** Problem list is predominantly accurate with occasional omissions of less common disorders. Learner demonstrates more consistent prioritization of patient problems and differential diagnoses. Knowledge base of common conditions is sufficient to effectively use pattern recognition.

**Competent:** Learner compares and contrasts signalment, history and clinical findings of current animal(s) to previous cases. Considers alternative scenarios. Obtains additional information from appropriate secondary sources, and seeks confirmation of conclusions for less common conditions.

**Proficient:** Follows systematic procedure for synthesis, comparison, and evaluation of information. Consistently develops an accurate, prioritized, comprehensive problem list. Quickly filters irrelevant information and identifies unknowns. Uses deductive reasoning to prioritize needs for additional information through diagnostic testing or secondary sources.
COMPETENCY-BASED VETERINARY EDUCATION

FUTURE DIRECTIONS AND WORKPLACE-BASED ASSESSMENTS
Domains and competencies are part of a framework to identify and organize required outcomes.

EPAs translate competencies into clinical (workplace) practice.

Neither of these are assessment tools per se.

Rather we need a toolbox of assessments to evaluate a learner’s progress.
Next Steps

➢ Finalize the milestones

➢ Develop an assessment tool that incorporates these, along with the EPAs

✓ Potentially similar to ones in other health professions e.g., Physiotherapy

   ❖ Developed a common assessment tool (Clinical Performance Instrument = CPI)
   ❖ Used across the US
   ❖ Have enough data to psychometrically validate the tool
But all competencies can **NOT** be effectively evaluated with this type of tool

- Need to create the rest of the toolbox to help faculty/colleges assess the range of competencies, using multiple assessments modalities

- Create faculty development tools
Keen to identify **Pilot Programs**

- Implement CBVE

Collect Data

- Leads to Refinement and/or Revision
THE FUTURE IS ALREADY HERE. IT’S JUST NOT EVENLY DISTRIBUTED YET.

- William Gibson
1. Where is my discipline (e.g., epidemiology, physiology, radiology)?
2. Where are specific skills (e.g., post-mortem)?
3. Why does this work just address clinical careers (not PH, research, etc.)?
4. How does this framework relate to the COE 9 clinical competencies?
5. Where is public health and one health?