The Future of Evidence-Based Veterinary Medicine
Challenges & Opportunities
Challenges- What’s in Our Way?
Challenges—Vets Not Seeing the Need

As a veterinarian now practicing homeopathy and chiropractic almost exclusively, I have all the proof I need every day in my practice to justify these modalities.


The EBM approach was never mentioned in any of the interviews, with occasional isolated opinions such as “The information from research is not important and does not influence decisions.”

Understanding veterinary practitioners’ decision-making process: implications for veterinary medical education.
Challenges- Why Don’t We See It?

- We don’t track outcomes (clinical audit)
  - Success and failure rate
  - Complications

- We don’t realize our limitations
  - Cognitive biases, Other sources of error

- We don’t understand the limitations of evidence
  - Expert opinion
  - Personal Experience
  - Poor quality research

- Inertia, Habit, Tradition, Overconfidence
Challenges - Myths & Misconceptions

- There is no evidence
- It’s all about RCTs
- It ignores clinical experience
  - Impractical
    - Time, Money, Information, Training, etc.
- It undermines confidence
Challenges- Philosophical Objections

- "Western" Science is just one way of looking at things
- The hierarchy of evidence isn’t valid
- Population research can’t help with clinical decisions about individuals
- There’s no evidence EBVM works
Challenges- Aesthetic Objections

- EBVM is impersonal, cold, unfeeling
- Ivory Tower academics telling clinicians what to do
- Autonomy of individual practitioners
- Complicated, abstract, not “real world”
Challenges - Practical Barriers
Challenges - Time

2011 VIN survey (mostly US):
19% scheduled 15-minutes appointments
34% scheduled 20-minute appointments
28% scheduled 30-minute appointments

2007 survey by SPVS (UK):
78% scheduled 10-minute appointments
14% scheduled 15-min appointments
Challenges- Information

...there are no objective data either way. In the absence of efficacy studies, potential efficacy differences between single and multiple-organism products are solely conjecture.

However, insufficient research has been performed to firmly state true maxima for the horse, and current research...

As far as we know, there are no studies or information in the literature concerning the estrogenic properties of goat...

Similar studies have not been conducted in dogs and cats, and in the absence of evidence it is prudent to conclude that the case is similar in those species.

...all patients anticipated to be under general anesthesia for long periods of time (Table 4). In the absence of evidence-based anesthesia fluid rates for animals, the authors suggest initially starting at...

...IgM in different hosts, and so far there are no studies reported in dogs or cattle.
Challenges - Information

- Not enough evidence
- Evidence not always useful
- Evidence not always available
- Insufficient training for veterinarians and students
  - Asking answerable questions
  - Finding evidence
  - Evaluating evidence
- Communicating with clients about uncertainty
Challenges- Lack Of Coercion

- Malpractice Litigation
- Government Regulation
- Insurance Reimbursement Rules
- Professional Standards
Opportunities
Opportunities- Educate & Inform

- Understanding What Vets Think & Need

Practitioner Survey: Evidence-Based Veterinary Medicine Association

Brennen McKenzie, MA, VMD*

28 March 2011

ABSTRACT

Early in 2010, the Practitioner Committee of the Evidence-Based Veterinary Medicine Association (EBVMA) conducted a survey of practicing veterinarians in the United States concerning their familiarity with the terms and concepts of evidence-based medicine and their attitudes towards it. The survey instrument was based on those used in published studies involving medical doctors and nurses. There were significant challenges in obtaining an adequately large, representative sample of U.S. practitioners. Ultimately, 5,000 veterinarians were invited to participate via a printed letter, and 119 completed web-based questionnaires were completed, a response rate of about 2.5%. While this does not permit meaningful generalizations to be made about the population of interest, the project was, at the least, an instructive pilot study, and further studies are planned. Feel free to contact me with any questions or comments concerning this project.†

Key words: evidence-based medicine, veterinary, practitioner, survey, epidemiology
Opportunities- Educate & Inform

- Understanding What Vets Think & Need

### Table 6: How would you describe your attitude towards evidence-based medicine? (118 responses)

<table>
<thead>
<tr>
<th>Respondents Own Attitude Towards EBM</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>91%</td>
</tr>
<tr>
<td>Neutral</td>
<td>19%</td>
</tr>
<tr>
<td>Negative</td>
<td>1%</td>
</tr>
<tr>
<td>No opinion</td>
<td>7%</td>
</tr>
</tbody>
</table>

### Table 8: Do you feel research findings are useful in your day-to-day management of patients? (119 responses)

<table>
<thead>
<tr>
<th>Usefulness of Research Findings</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very useful</td>
<td>50.42%</td>
</tr>
<tr>
<td>Somewhat useful</td>
<td>47.06%</td>
</tr>
<tr>
<td>Not useful</td>
<td>2.52%</td>
</tr>
<tr>
<td>No Opinion</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

> 97%
Opportunities - Educate & Inform

- Understanding What Vets Think & Need

Table 14: When did you last do a literature search which influenced your clinical practices? (113 respondents)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within last month</td>
<td>46</td>
<td>40.71%</td>
</tr>
<tr>
<td>Within last 6 months</td>
<td>32</td>
<td>28.32%</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>14</td>
<td>12.39%</td>
</tr>
<tr>
<td>&gt; 12 months</td>
<td>14</td>
<td>12.39%</td>
</tr>
<tr>
<td>Never</td>
<td>7</td>
<td>6.19%</td>
</tr>
</tbody>
</table>

31%

Table 15: Have you ever received formal training in electronic literature search strategies or appraisal of scientific literature? (115 respondents)

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
<td>14.78%</td>
</tr>
<tr>
<td>No</td>
<td>98</td>
<td>85.22%</td>
</tr>
</tbody>
</table>
Opportunities- Educate & Inform

- Understanding What Vets Think & Need

<table>
<thead>
<tr>
<th>Research not relevant</th>
<th>No Barrier</th>
<th>Slight</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 (8.5%)</td>
<td>25 (23.6%)</td>
<td>57 (53.8%)</td>
<td>15 (14.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research not generalizable to practice</th>
<th>No Barrier</th>
<th>Slight</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 (1.9%)</td>
<td>33 (30.8%)</td>
<td>55 (51.4%)</td>
<td>17 (15.9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of research overwhelming</th>
<th>No Barrier</th>
<th>Slight</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 (11.2%)</td>
<td>29 (27.1%)</td>
<td>39 (36.4%)</td>
<td>27 (25.2%)</td>
</tr>
</tbody>
</table>
Opportunities - Educate & Inform

- Understanding What Vets Think & Need

<table>
<thead>
<tr>
<th>Response</th>
<th>Unfamiliar</th>
<th>Some Understanding</th>
<th>Could Explain</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative/Absolute Risk</td>
<td>28 (25.2%)</td>
<td>69 (62.2%)</td>
<td>14 (12.6%)</td>
<td>111</td>
</tr>
<tr>
<td>Systematic Review</td>
<td>30 (27.3%)</td>
<td>67 (60.9%)</td>
<td>13 (11.8%)</td>
<td>110</td>
</tr>
<tr>
<td>Meta-Analysis</td>
<td>85 (76.5%)</td>
<td>21 (18.9%)</td>
<td>5 (11.8%)</td>
<td>111</td>
</tr>
<tr>
<td>Confidence Interval</td>
<td>53 (47.8%)</td>
<td>44 (39.6%)</td>
<td>14 (12.6%)</td>
<td>111</td>
</tr>
<tr>
<td>Publication Bias</td>
<td>30 (27.0%)</td>
<td>56 (50.4%)</td>
<td>25 (22.5%)</td>
<td>111</td>
</tr>
<tr>
<td>Positive/Neg Predictive Value</td>
<td>32 (28.6%)</td>
<td>57 (50.9%)</td>
<td>23 (20.5%)</td>
<td>112</td>
</tr>
<tr>
<td>Confirmation Bias</td>
<td>65 (58.6%)</td>
<td>40 (36.0%)</td>
<td>6 (5.4%)</td>
<td>111</td>
</tr>
<tr>
<td>Number Needed to Treat</td>
<td>39 (35.4%)</td>
<td>64 (58.2%)</td>
<td>7 (6.4%)</td>
<td>110</td>
</tr>
</tbody>
</table>
Opportunities- Educate & Inform

- Understanding What Vets Think & Need
  - CEVM Practitioner Survey (2011)
  - Clinical decision making in veterinary practice.
  - Understanding veterinary practitioners’ decision-making process: implications for veterinary medical education.
Opportunities- Educate & Inform

• Evidence-Based Veterinary Medicine Association

• Centre for Evidence-based Veterinary Medicine
Opportunities - Educate & Inform
Opportunities - Generate Evidence

- Colleges of Veterinary Medicine
- Industry
  - Pharmaceutical
  - Pet Food
- Government
  - Food Animal
  - Public Health
  - One Health, Translational Medicine
- Private Foundations
Opportunities - Generate Evidence

- EBVM-Specific Funding
  - EBVMA- Roy Montgomery Research Award
- RCVS
Opportunities - Make Evidence Useful

- Systematic Reviews

Total number of veterinary systematic reviews (cumulative)

~260

~48
Opportunities - Make Evidence Useful

~5700
Opportunities- Make Evidence Useful

- Systematic Reviews

Systematic review of efficacy of nutraceuticals to alleviate clinical signs of osteoarthritis.


The effect of neutering on the risk of mammary tumours in dogs—a systematic review.

Opportunities- Make Evidence Useful

- Systematic Reviews
  - VetSReV
    - Searchable database of veterinary systematic reviews
    - Produced by CEVM
Opportunities - Make Evidence Useful

- Appraisal & Summary (CATs)
  - BestBETs for Vets-
**Pimobendan versus benazepril in dogs with mitral valve disease and congestive heart failure**
In [dogs with congestive heart failure secondary to mitral valve disease] does [pimobendan or benazepril] [improve the life expectancy of the affected dogs]?

**Nutraceuticals versus carprofen in dogs with osteoarthritis**
In [dogs with osteoarthritis] is a [glucosamine & chondroitin supplement or carprofen] better at [reducing the clinical signs of osteoarthritis]?

**Azathioprine in dogs with IMHA**
In [dogs with immune-mediated haemolytic anaemia] does the use of [azathioprine in addition to prednisolone compared to prednisolone alone] [increase the chance of survival]?

**Age at neutering and mammary tumours in bitches**
In [bitches being spayed] does [surgery before first season compared to later] reduce [risk of mammary tumours]?

**Oseltamivir in dogs with acute parvovirus infection**
In [dogs with acute parvovirus infection] does [the use of oseltamivir in combination with supportive therapy compared to supportive therapy alone] decrease [the severity of clinical signs in the affected dogs]?
Opportunities - Make Evidence Useful

- Appraisal & Summary (CATs)
  - Banfield BARK
  - White papers
  - CATs
Feline Chronic Kidney Disease

Probiotics

Heartworm Disease

Feline Tooth Resorption

Obesity

Periodontal Disease
Diabetes Mellitus

Treatment of feline hyperthyroidism

Effectiveness of exercise and its role in treating overweight obesity

Dental home care

Evaluation of Nutraceuticals

Cyclosporine
Opportunities- Make Evidence Useful

- Evidence-Based Practice Guidelines


There is a tendency toward support for the idea that outcomes improve for patients, personnel, or organizations if clinical practice in health care is evidence-based, that is, if evidence-based clinical practice guidelines are used.
Opportunities- Make Evidence Useful

- Evidence-Based Practice Guidelines


RECOVER evidence and knowledge gap analysis on veterinary CPR. Part 7: Clinical guidelines.

Opportunities- Make Evidence Useful

RECOVER (Reassessment Campaign on Veterinary Resuscitation)

Dr. Daniel Fletcher, Cornell University
Dr. Manuel Boller, University of Pennsylvania
161 dogs and 43 cats with in-hospital CPA

Anesthesia Related vs. Other
Dogs: 47% vs 2%
Cats: 42% vs 0%

ROSC: 35-45%

CPR

Arrest

% Alive

Time

Discharge: 6-7%

Identify a Problem

Courtesy of Dr. Daniel Fletcher
Ask Specific Questions

PICO

Patient

Intervention

Comparison

Outcome

In dogs and cats with cardiac arrest (P), does the use of interposed abdominal compressions-CPR (I) compared with standard CPR (C), improve outcome (e.g. ROSC, survival) (O)?
## Identify & Appraise Evidence

<table>
<thead>
<tr>
<th>LOE 1</th>
<th>Randomized Controlled Clinical Trials (RCTs) in target species or meta-analyses of RCTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOE 2</td>
<td>Prospective clinical studies in target species with concurrent controls, but without randomization</td>
</tr>
<tr>
<td>LOE 3</td>
<td>Experimental laboratory studies in target species</td>
</tr>
<tr>
<td>LOE 4</td>
<td>Retrospective clinical studies in target species</td>
</tr>
<tr>
<td>LOE 5</td>
<td>Case series and case reports in target species</td>
</tr>
<tr>
<td>LOE 6</td>
<td>Studies not directly related to the specific patient/population (e.g., different patient population, different species, mechanical models etc.)</td>
</tr>
</tbody>
</table>
Identify & Appraise Evidence

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Most or all of the quality items</td>
</tr>
<tr>
<td>Fair</td>
<td>Some of the quality items</td>
</tr>
<tr>
<td>Poor</td>
<td>Few to none of the quality items</td>
</tr>
</tbody>
</table>

**Randomized Controlled Trials**
- Group assignment was randomized and blinded
- All patients enrolled were accounted for
- Intent-to-treat analysis
- Baseline characteristics were similar between groups

**Experimental Studies**
- Randomized controls
- Question posed was of high relevance
- Size of the effect of the intervention was clinically relevant

**Retrospective Studies**
- Clearly defined comparison groups
- Outcomes measured in same, objective way between groups
- Sufficiently long and relevant follow-up time
## Conclusions & Confidence Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Benefit vs. Risk</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Benefit &gt;&gt;&gt; Risk</td>
<td><strong>Should</strong> be performed, is <strong>recommended</strong></td>
</tr>
<tr>
<td>IIa</td>
<td>Benefit &gt;&gt; Risk</td>
<td>Is <strong>reasonable</strong> to perform</td>
</tr>
<tr>
<td>IIb</td>
<td>Benefit ≥ Risk</td>
<td><strong>May be considered</strong></td>
</tr>
<tr>
<td>III</td>
<td>Risk &gt; Benefit</td>
<td><strong>Should not</strong> be performed</td>
</tr>
</tbody>
</table>

### Criteria

- **A**
  - Multiple high quality or high LOE studies

- **B**
  - Multiple low quality or low LOE studies
  - Few to no high quality of high LOE studies

- **C**
  - No strong evidence in the literature
  - Consensus opinion, expert opinion, or standard of care

*Courtesy of Dr. Daniel Fletcher*
Make Evidence Available

*JVECC* special issue June 2012

RECOVER web site

Training Materials & Courses

Registry for Outcomes Assessment

Regular Review and Updates
Impact of Guidelines

Fewer Codes
From 37 in 6 months to 17

Charging More

Smoother, Less Stressful/Wasteful

Outcomes?
32% ROSC (25-35% published)
5% Survival to discharge
Before RECOVER?
Opportunities - Make Evidence Available

1. Open Access Journals
   The Ohio State University - [http://library.osu.edu/](http://library.osu.edu/)
   Directory of Open Access Journals - [http://www.doaj.org](http://www.doaj.org)

2. Professional Society Membership

3. Alumni Association Membership

4. Google *sigh*
Opportunities - Coercion?
Policies of Professional Organizations

• **Federation of Veterinarians in Europe**
  “work only on the basis of scientifically proven and evidence-based methods and to stay away from non-evidence-based methods.“

• **British Veterinary Association**
  “cannot endorse the use of homeopathic medicines, or indeed any medicine making therapeutic claims, which have no proven efficacy. As with any medicine, BVA believes that veterinary medicinal products must be evidence-based, with any medicinal claims made by a manufacturer supported.”

• **Australian Veterinary Association**
  “AVA resources will not be used to promote therapies that, in the Board’s opinion, are not compatible with current understanding of physiology and pathophysiology and have been demonstrated to be ineffective by the current accumulated body of knowledge.”

“The Board agreed that the veterinary therapies of homeopathy and homotoxicology are considered ineffective therapies in accordance with the AVA promotion of ineffective therapies Board resolution.”
Policies of Professional Organizations

• European Board of Veterinary Specialties

“The veterinary profession received the prerogative for diagnosis and treatment of animal diseases based on the assumption that veterinarians are guided by scientific methods. The EBVS therefore only recognises scientific, evidence-based veterinary medicine which complies with animal welfare legislation. Specialists or Colleges who practise or support implausible treatment modalities with no proof of effectiveness run the risk of withdrawal of their specialist status. No credit points can be granted for education or training in these so-called supplementary, complementary and alternative treatment modalities.”

• RACE

CE offerings shall be designed to…refresh the participant in the standards for practice and the foundational, evidence-based material presented in accredited colleges or schools of veterinary medicine… CE programs that advocate unscientific modalities of diagnosis or therapy are not eligible for RACE approval...All scientific information referred to, reported or used in RACE Program Applications in support or justification of an animal-care recommendation must conform to the medically accepted and scientifically supported standards of experimental design, data collection and analysis.”
Opportunities- Coercion?