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## Non-Clinical Benefits of Evidence-Based Veterinary Medicine

A Knowledge Summary by

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### Clinical bottom line

- There are few studies addressing business benefits of evidence-based veterinary medicine (EBVM)
- While the need for a wider adoption of EBVM has been highlighted and linked to commercial benefits, further empirical studies are needed to identify and quantify such linkages

### Question

Does the adoption of EBVM by UK veterinary practices (versus the non-adoption) provide commercial benefits?

### Summary of the evidence

Vandeweerd et al (2012)	
<b>Population:</b>	Veterinarians (who work in the French-speaking part of Belgium)
<b>Sample size:</b>	201 Veterinarians n=201
<b>Intervention details:</b>	Telephone survey and semi-structured face-to-face interviews
<b>Study design:</b>	Qualitative data analysis
<b>Outcome studied:</b>	Objective assessment of veterinary practitioners' clinical decision making
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Veterinary practitioners base their decision making on specialist opinion, first-opinion colleagues, laboratories, and on the internet, rather than scientific and peer-reviewed data.</li> <li>• A lack of time is the key barrier to a wider adoption of EBVM.</li> <li>• Adequate information and tools are needed to optimise the time spent on query and assessment of scientific information. Practitioners need to be trained in their use.</li> </ul>
<b>Limitations:</b>	Based on a small population, findings may not apply outside the French speaking part of Belgium

Mateus et al (2014)	
<b>Population:</b>	Veterinarians
<b>Sample size:</b>	21 veterinarians from seven veterinary first opinion practices n=21

<b>Intervention details:</b>	Semi-structured interviews
<b>Study design:</b>	Qualitative data analysis: Thematic analysis using qualitative data analysis software (NVivo)
<b>Outcome studied:</b>	<ul style="list-style-type: none"> <li>• Criteria used for selecting antimicrobials</li> <li>• Influences by colleagues</li> <li>• Influences by clients</li> <li>• Pet characteristics</li> <li>• Sources of knowledge</li> <li>• Awareness of guidelines and</li> <li>• Protocols implemented in practice by veterinarians that may affect antimicrobial usage</li> </ul>
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Veterinarians make their decisions on antimicrobial use mainly based on individual preference of substance and previous experience.</li> <li>• Clinical and scientific evidence is not taken into account.</li> <li>• The cost of therapy was only found to be a factor in lower socioeconomic areas.</li> <li>• Three out of 21 participants had a strong perception of the veterinary service as business. They took 'meeting client expectations' into their decision making. There was a perceived risk of losing clients to other practices.</li> </ul>
<b>Limitations:</b>	Very small sample size

Faulkner (2014)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	<ul style="list-style-type: none"> <li>• Delivering sustainable practice through four outcomes:</li> <li>• Clinical resolution</li> <li>• Client satisfaction</li> <li>• Financial resolution</li> <li>• Harmony and Happiness</li> </ul>
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• An evidence-based consultation, using evidence-based diagnostics and treatment is seen as the ideal way of practicing.</li> <li>• This may not be attained for practical or technical reasons, or because of lacking client buy in.</li> <li>• Clients can be dissatisfied with the best evidence-based advice if it does not 'fit' with their assumptions and beliefs about their pet's condition and what should be done about</li> </ul>

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<b>Limitations:</b>	Ideas and expert opinion. Topics not empirically tested

Viner (2010)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	Clinical governance provides a framework to help improve standards of care
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Clinical governance provides a framework for organisations to continually improve the quality of service and safeguard the high standards of care.</li> <li>• Clinical guidelines can assist in applying evidence-based veterinary medicine uniformly but need to be used flexibly with the needs of the individual patient in mind.</li> </ul>
<b>Limitations:</b>	Ideas and expert opinion. Topics not empirically tested

Kronfeld (2005)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Series of commentaries on evidence-based medicine in equine medicine
<b>Outcome studied:</b>	Objective assessment of the factors influencing good clinical decision making.
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Clinical decision making depends on 3 kinds of specific evidence: clinical, experimental, and economic, and 3 general factors: aesthetic, ethical, and social.</li> <li>• Business success is relevant to clinical decision making. It should be used as an 'evidence factor' because it integrates the effectiveness of veterinary services and the whole enterprise.</li> </ul>
<b>Limitations:</b>	Ideas and expert opinion. Topics not empirically tested

Gibbons (2009)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA

<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	Description of how problem-oriented veterinary medicine can help veterinarians refine case information into a diagnosis, satisfy the concerns of their clients, and provide the best possible quality of life for their exotic companion animal patients.
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Problem Oriented Veterinary Medicine (POVM), which forms the basis of evidence-based decision making, is a four step cyclical process which includes: (1) gathering case information, (2) identifying problems and assessing evidence, (3) making diagnostic, treatment and client education plans, (4) following up and evaluating progress.</li> <li>• By practicing POVVM, the veterinarian has a guide to achieve the ultimate goals of every case, which are to satisfy the concerns of the client and provide the best possible quality of life for the patient.</li> <li>• Because in exotic animal practice few diseases and treatments have been researched, the approach is particularly beneficial to exotic animal practice.</li> </ul>
<b>Limitations:</b>	The author suggests that a problem oriented approach is good for veterinary business, but does not base this on evidence.

<b>Holmes and Ramey (2007)</b>	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	EBVM is the conscientious, explicit, and judicious use of the current best evidence in making decisions about the care of individual patients
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• The decision-making process in EBVM: The optimal outcome depends on the clinical situation, best evidence, and wishes of the client (and patient). Veterinary clinical expertise is required for all aspects of the decision-making process.</li> <li>• A practice of adopting EBVM examines common procedures on a regular basis to establish that practice policy is backed up by the current best evidence.</li> <li>• Applying evidence-based approaches to veterinary care benefits all who participate in the veterinarian-client-patient interaction.</li> </ul>
<b>Limitations:</b>	Topics not empirically tested

Ramey (2008)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	Evidence-based veterinary medicine holds the promise of providing the best standard of care for animal patients
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• When making clinical decisions a veterinarian takes into account: (1) their skills as a clinician, (2) a client's ability and willingness to pay and, (3) their knowledge about a particular medical condition.</li> <li>• Clinical information not based on evidence can be dangerous to patient health.</li> <li>• There is a need to make EBVM information wider available, and veterinarians need to be able to read and interpret study results.</li> <li>• Cost of treatment is a factor that needs to be included in clinical decision making</li> </ul>
<b>Limitations:</b>	Topics not empirically tested. There is no direct link between EBVM and commercial benefits to veterinarians, but the paper does highlight that each client's ability to pay is factored into a veterinarian's decision making

Kochevar and Fajit (2006)	
<b>Population:</b>	NA
<b>Sample size:</b>	NA
<b>Intervention details:</b>	NA
<b>Study design:</b>	Ideas, editorials, expert opinion
<b>Outcome studied:</b>	The process of implementing EBVM in small animal practice
<b>Main findings: (relevant to PICO question):</b>	<ul style="list-style-type: none"> <li>• Clinicians must be able to frame relevant answerable clinical questions and they must be able to understand statistical evidence, study design and application of clinical trials</li> <li>• The therapeutic approach should be selected by integrating the critical appraisal with clinical expertise and an understanding of the unique circumstances of individual patients and clients.</li> <li>• It is important to assess the decision-making process and outcomes continually for effectiveness and efficiency so as to improve future appraisals and outcomes.</li> </ul>
<b>Limitations:</b>	NA

## Appraisal, application and reflection

Little research exists on the commercial benefits of EBVM. While the clinical benefits have been fairly well documented, the business aspect of evidence-based veterinary medicine has not. Two types of papers were included in this knowledge summary. Firstly, non-empirical papers highlighting the perceived connection between EBVM and better business performance. Secondly, empirical research that assesses veterinary practitioners' decision making with regards to commercial benefits of EBVM. Despite the specificity of the search terms, the search strategy was dominated by results that focused on specific clinical benefits of EBVM and did not touch on any financial or other commercial benefits.

This knowledge summary specifically focuses on financial, commercial and business impacts of EBVM on the individual business. While financial benefits only include monetary aspects such as profit and loss of a practice, business and commercial benefits include a wider spectrum of benefits such as client satisfaction, client retention and reputation. These benefits are often intangible and difficult to measure but can have a major impact on the success of a business. Wider economic benefits, that include potential impacts on the entire economy, such as a decrease in disease outbreaks due to better veterinary practice, are outside the scope of this study.

The methodologies used to research veterinary practitioners' decision making include inductive approaches whereby conclusions were drawn from thematic coding of face-to-face interviews and telephone surveys (Vandeweerd *et al* 2012; Mateus *et al* 2014). Some of the published research also consists of literature reviews, published commentaries and expert opinion on the topic and therefore offer opportunities for further exploration, rather than definitive conclusions based on empirical research. While these papers are not based on empirical research, they highlight an existing awareness of the potential business benefits of EBVM, thus these papers were included in this knowledge summary.

While many authors (Holmes and Ramey, 2007; Ramey, 2008; Gibbons, 2009; Faulkner, 2014) describe the application of EBVM in practice and mention the potential commercial benefits to be derived, they do not present any data or key performance indicators that show how the advent of EBVM has improved practice performance via commercial benefits. The aforementioned authors merely present ideas based on improvements to client engagement and possible improvements to business due to better clinical outcomes. Studies investigating decision making in veterinarians found that often the business aspect does not feature in a veterinarian's decision-making process and that EBVM is seen as one of many options to make clinical decisions (Vandeweerd *et al* 2012; Mateus *et al* 2014).

A limitation of this study is the use of the two databases (CAB Abstracts and PubMed), which did not yield some of the grey literature available on EBVM. A further limitation is the very small number of papers published on the topic. This has led to the inclusion of opinion pieces, which are very low down the evidence pyramid and do not provide any empirical evidence on the topic. The reason for their inclusion was to demonstrate that there is recognition of the need for a commercial approach to EBVM.

To conclude, currently no papers provide evidence of any commercial benefits of EBVM. As such, the question relating to whether or not adoption of EBVM by veterinary practitioners leads to commercial benefits, cannot be answered by a review of the literature. While there are many papers suggesting a link between the practice of EBVM and better commercial benefits such as client satisfaction, client retention and lower production costs, a business case to clearly demonstrate the commercial benefits of EBVM is yet to be produced.

## Methodology Section

Search Strategy	
Databases searched and dates covered:	CAB Abstracts on the CAB Direct interface, date range: 1973 - 2016 and PubMed accessed via the NCBI interface, date range: 1971 - 2016
Search terms:	(veterinar* AND (business* OR practice OR practices OR management OR organisation* OR organization* OR company OR companies)) AND ("evidence-based" OR "evidence* based" OR EBM OR EBVM OR EBP OR EBHC) AND ((client* OR owner* OR consumer* OR customer*) AND (satisf* OR benefit*)).OR ("business case*" OR economic* OR monetary OR financ*) OR ((business* OR commercial*) ADJ5 (benefi* OR gain* OR value* OR potential* OR advantag* OR viable OR viabilit*))
Dates searches performed:	February 19 <sup>th</sup> 2016

Exclusion / Inclusion Criteria	
Exclusion:	No link between EBVM and business, commercial or financial benefits. Business benefits were defined as benefits to the veterinary business, excluded were farming and epidemiological outcomes. Non English-language.
Inclusion:	Any link between evidence based practice and non-clinical benefits to veterinarians.

Search Outcome					
Database	Number of results	Excluded – does not answer PICO question	Excluded – study design	Excluded – Duplicates	Total relevant papers
NCBI PubMed	51	47	1	0	3
Cab Abstracts	71	57	2	6	6
Total relevant papers when duplicates removed					9

## CONFLICT OF INTEREST

The authors declare no conflicts of interest.



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