

Toolkit 4

What type of study is it?

There are five key steps to follow in Evidence-based Veterinary Medicine (EBVM).

- 1. Asking an answerable clinical question
- 2. Finding the best available evidence to answer the question
- 3. Critically appraising the evidence for validity.
- 4. Applying the results to clinical practice
- 5. Evaluating performance

This handout offers advice on how to identify the design of a study.

Identifying study design

The information needed to identify the type of study design is normally found in the methodology (i.e. in the methods section of the paper). It is good practice not to rely solely on the abstract when identifying study design as it rarely gives sufficient information for you to be sure that the description is accurate. For example, the abstract may say the study was 'a randomised controlled trial' but you would need to read the methodology to see how the randomisation was achieved in order to confirm if this was indeed the case.

The following questions, which are presented both diagrammatically as an algorithm and in a table with accompanying notes, will help you identify the type of study design in the paper you are reading and the relevant critical appraisal checklist.

You should work your way through the questions until you are satisfied with the answer and that you have identified a study design. If you reach the end and are still unsure please contact us at ebvm@rcvsknowledge.org and we will try and help you

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Question	Answer
1. Does the	This question divides studies into experimental and observational.
researcher have	
control over	YES: This is an experimental study where there is an intervention and a
which animals	researcher responsible for designing the intervention and deciding which
are exposed to	animals are exposed/not exposed to the intervention. Go to question 1a
the intervention	
from the start?	NO: This is an observational study where the researcher examines the
	outcomes of an intervention within two groups without having any influence
	over which animals get the intervention. Go to question 2 .
	Tip: Does the methodology say anything about the researchers determining
	which groups of animals got the intervention (e.g. drug treatment, clinical
	therapy, lifestyle change etc) and which did not? Or does it refer to the
	researchers looking backward (or forward) following a particular group of
	animals and observing what happens.
1a. Is there a	YES: This means that there was an alternative to the intervention, i.e. there
comparison or	was a control group that received no treatment or other intervention. The
control between	researchers made their conclusions by comparing two (or more) different
interventions?	scenarios. Go to question 1b .
	NO : If there was no comparison or control group then the study is a
	Descriptive or non-comparative study. Case studies and case series are
	examples of non-comparative studies.
1b. Were the	YES: This is a Randomised Controlled Trial where the animals were
interventions	assigned to different groups by an explicit random process. Use EBVM
randomly	Toolkit 6: Controlled trial checklist
allocated?	
	NO: This is a Non-randomised Controlled Trial where the allocation of
	interventions was not a randomised process. Use EBVM Toolkit 6 :
	Controlled trial checklist
	Tip: The method of randomisation should be described in the methodology
	(computer randomisation, pot luck, etc.)

2. Is the	This question establishes if the study is observational, or if you are dealing with
researcher	a diagnostic validity study or a review.
looking for an	
association	YES: This is an Observational study where the researchers do not
between	manipulate the group or provide an intervention but they do have hypotheses
variables by	about the relationship between two variables. Go to question 2a
observing the	
situation, or the	NO: The study does not address an intervention observed by researchers. Go
animals,	to Question 3.
without directly	
intervening?	
2a. Is there a	YES: If there was a control group that received no treatment or other
comparison or	intervention then the researchers made their conclusions by comparing
control between	different scenarios. Go to question 2b
interventions?	
	NO: This is a Controlled Before-and-After (CBA) study or an
	Interrupted Time Series (ITS). Both can be useful to study changes in a
	major service delivery.
2b. Are	YES : This is a cross sectional study . This means that the study is like a
exposure and	snapshot in time of a defined situation. In this case, the researchers go to the
outcome	subjects only once to collect data. For example, if the researchers collected
measured at the	information on the exposure (diet intake) and the outcome (weight) at the same
same time?	time. Use EBVM Toolkit 7: Cross sectional study checklist
	NO: If the researchers collected information more than once, at different
	points in time, Go to question 2c

2c. Are the	This question separates a Cohort study from a Case control study. Consider
groups defined	whether the comparison groups are based on the outcome (e.g. weight) or the
by outcome?	exposure (e.g. diet intake).
	YES: This is a Case control study. This means that the study starts with
	groups that already have the outcome (e,g, diabetes) and it looks back to
	examine what might have been the exposure factors (obesity). Use EBVM
	Toolkit 8: Case control checklist
	NO: This is a Cohort study. This means that the study starts with groups
	that have been exposed to the same risk factor (e.g. obesity) and then considers
	if there is any association between that exposure and the outcome (e.g.
	diabetes). Cohort studies can be prospective (looking forward) or retrospective
	(looking backwards)
	Use EBVM Toolkit 9: Cohort study checklist
	Tip: The rule of thumb is if the researcher starts with a group of "sick" animals
	and then examines the risks they have been exposed to, then it is a case control
	study. If the researcher follows a group of animals that have been exposed to a
	risk to see if they got "sick" then it is a cohort study.
3. Is the aim of	YES: This is a Diagnostic Test Study. This study evaluates the
the study to	"performance" of a diagnostic test. It might look at how well the test identifies
validate a test,	"sick" animals, how reliable the test is or how well it compares with the existing
tool or	"gold standard".
diagnostic	Use EBVM Toolkit 12: Diagnostic test checklist
method?	
	NO: Go to Question 4.
4. Is the aim of	YES: This is likely to be a review paper. A review paper analyses published
the study to	literature rather than attempting to test a hypothesis. Its aim is to analyse the
review the	current state of knowledge. This can be done by seeking the views of experts or
literature or to	by interrogating the available literature (or both). Go to question 4a
give advice?	
	NO Begin again with Question 1 or ask us for help ebvm@rcvsknowledge.org

4a. Was there	Some reviews analyse the issue at stake through a narrative that references
an explicit	other work that the authors consider to be important. Other reviews set out to
mention of a	analyse all the published references that are found by using specific keywords
literature	to search one or more databases. This question separates the two types of
search?	search.
	YES: In the methodology the author stated the databases searched and the
	keywords used. Go to question 4bNO: This is an opinion article . This
	means that the authors have not carried out a thorough search of the literature,
	though they may mention a couple of journal articles to substantiate their
	claims.
	Opinion, by definition is subject to bias – therefore an opinion article is the
	lowest level of evidence.
4b. Is the search	YES: The authors clearly stated which keywords were used and the databases
comprehensive	searched. This is provided in a way that means others could perform the same
and explicit?	search and obtain the same results. The papers selected for review were based
-	on a set of inclusion/exclusion criteria which are clearly identified. Go to
	question 4c
	NO: This is a narrative review . The authors mention a generic search and
	then proceed to draw conclusions based on the papers <i>they</i> find more relevant
	or interesting. Use EBVM Toolkit 14: Narrative review checklist
4c. Is the data	YES : This is a Meta-analysis which is a statistical technique for combining
from different	the findings from two or more studies. Use EBVM Toolkit 10 : Systematic
papers	review checklist
combined	
statistically?	NO: This is a Systematic Review which s a literature review that tries to
	identify, appraise and synthesise all high quality papers relevant to a research
	question according to an explicit and reproducible methodology. Use EBVM
	Toolkit 10: Systematic review checklist
	Tip: A meta-analysis is not necessarily part of a systematic review. It may be
	part of a smaller review of a few studies that were not chosen systematically as
	part of a thorough literature search

If you get to the end of the questions and are still unsure about the type of study design please email <u>ebvm@rcvsknowledge.org</u> and we will try to help you identify the study design and find a checklist that will allow you to appraise the paper.

Further assistance

- If you need further help then contact RCVS Knowledge Information Specialists on library@rcvsknowledge.org or 020 7202 0752.
- Literature searching workshops: we offer online workshops on a one-to-one basis covering how to focus a search question, database searching and making the most of our resources
- Learning resources: our <u>EBVM for Practitioners</u>, <u>EBVM Learning course</u>, <u>Farm Vet Champions</u> <u>course</u> and additional resources provide easily accessible guidance for those looking to apply evidence-based principles to their work.

Study Design Algorithm

This diagram is meant to help you identify different types of study design. As always, this does not substitute your judgement, and is merely intended as an aid. Start by answering question 1 and follow through until you are satisfied with the answer.





***intervention:** in this context *intervention* describes a wide range of activities from drug treatments and other clinical therapies, to lifestyle changes (e.g. diet or exercise) and social activities

EBVM Toolkit 4: What type of study is it? by <u>RCVS Knowledge</u> is licensed under a <u>Creative Commons Attribution-</u> <u>NoDerivatives 4.0 International License</u>. We welcome comments and suggestions for improvement to this guide. Please email <u>ebvm@rcvsknowledge.org</u> QUESTION 2: Is the researcher looking for an association between variables by observing the situation, or the patients, without directly intervening?



EBVM Toolkit 4: What type of study is it? by <u>RCVS Knowledge</u> is licensed under a <u>Creative Commons Attribution-</u> <u>NoDerivatives 4.0 International License</u>. We welcome comments and suggestions for improvement to this guide. Please email <u>ebvm@rcvsknowledge.org</u> QUESTION 3: Is the aim of the study to validate a test, tool or diagnostic method?



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QUESTION 4: . Is the aim of the study to review the literature or to give advice?

This is a META-ANALYSIS** Use EBVM Toolkit 10: Systematic review checklist

** a systematic review can include a meta-analysis and a meta-analysis might not be a systematic review. In this context, 'systematic review' will refer to the entire process of collecting, reviewing and presenting all available evidence, while the term 'meta-analysis' will refer to the statistical technique

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