

SECOND EDITION

# CLINICAL REASONING IN VETERINARY PRACTICE

EDITED BY

JILL E. MADDISON • HOLGER A. VOLK • DAVID B. CHURCH



WILEY Blackwell



# **Clinical Reasoning in Veterinary Practice**



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## **Problem Solved!**

### **Second Edition**

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# Contents

About the Editors, vii

List of Contributors, ix

Preface, xi

Acknowledgements, xiii

- 1** Learning to learn and its relevance to logical clinical problem-solving, 1  
*Ivan Newman*
- 2** Introduction to logical clinical problem-solving, 7  
*Jill E. Maddison and Holger A. Volk*
- 3** Vomiting, regurgitation and reflux, 35  
*Jill E. Maddison*
- 4** Diarrhoea, 55  
*Jill E. Maddison and Lucy McMahon*
- 5** Weight loss, 73  
*Jill E. Maddison*
- 6** Abdominal enlargement, 89  
*Jill E. Maddison*
- 7** Weakness, 103  
*Holger A. Volk, David B. Church and Jill E. Maddison*
- 8** Fits and strange episodes, 125  
*Holger A. Volk*
- 9** Sneezing, coughing and dyspnoea, 153  
*David B. Church*

- 10** Anaemia, 181  
*Jill E. Maddison and Lucy McMahon*
- 11** Jaundice, 199  
*Jill E. Maddison and Lucy McMahon*
- 12** Bleeding, 215  
*Jill E. Maddison*
- 13** Polyuria/polydipsia and urinary incontinence, 237  
*Jill E. Maddison and David B. Church*
- 14** Gait abnormalities, 261  
*Holger A. Volk, Elvin R. Kulendra and Richard L. Meeson*
- 15** Pruritus, scaling and otitis, 285  
*Andrea Volk*
- 16** Problem-based approach to problems of the eye, 305  
*Charlotte Dawson*
- 17** Problem-based approach to small mammals – rabbits, rodents and ferrets, 323  
*Joanna Hedley*
- 18** Problem-based clinical reasoning examples for equine practice, 353  
*Michael Hewetson*
- 19** Principles of professional reasoning and decision-making, 391  
*Elizabeth Armitage-Chan*
- Index, 407



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Jill is a small animal veterinarian with expertise in internal medicine and clinical pharmacology. She is currently Professor of General Practice at the Royal Veterinary College (RVC) and Director of Professional Development overseeing the college's continuing education programmes. She is actively involved in undergraduate teaching and continuing professional development (CPD) at the RVC in the areas of clinical reasoning in small animal medicine and clinical pharmacology. She has lectured extensively on these topics to veterinarians around the world and published on a wide variety of topics related to internal medicine, pharmacology and veterinary education.

## **Holger A. Volk**

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Holger studied veterinary medicine at the University of Veterinary Medicine Hannover, Germany and at the Ecole Nationale Vétérinaire de Lyon, France. He is a board-certified clinical neurologist, passing the ECVN exams in 2008. He is actively involved in clinical research and has published extensively in the area of clinical neurology. Holger is currently Head of Department of Small Animal Diseases, University of Veterinary Medicine Hannover. He has been a recipient of the prestigious Bourgelat Award from BSAVA and the International Canine Health Award from the Kennel Club. His main research interests are Chiari-like malformation and syringomyelia in Cavalier King Charles Spaniel and canine and feline epilepsy.

## **David B. Church**

**BVSc PhD MACVSc FHEA MRCVS**

David is currently Professor of Small Animal Studies at the Royal Veterinary College. He has spent more than 30 years in small animal specialist practices and is the author of more than 200 peer-reviewed publications and numerous textbook chapters on companion animal endocrinology and small animal medicine. He has been a long-standing advocate of the benefits of veterinarians developing a logical approach to clinical reasoning to complement their pattern recognition skills. As a co-founder of VetCompass, he is also passionate about developing mechanisms to define and understand the disorders encountered in general practice and how to optimise their management.

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# Preface

The second edition of our book has been a wonderful opportunity to update relevant content, expand the areas of clinical practice discussed and, perhaps most importantly, improve the layout and formatting using Universal Design for Learning principles. This edition has benefited from extensive reader feedback about the first edition which we are very grateful for. We hope that this second edition will help enhance clinical and professional reasoning skills of veterinary students and veterinarians around the world. Keep on problem-solving!



# Acknowledgements

We are indebted to the support and feedback we have received from veterinary students and colleagues at the RVC and the Centre for Veterinary Education at the University of Sydney. Special thanks to Alex Currie, Sue Bennett and Karen Humm who all provided insightful input or feedback. We are particularly grateful to Dr Ivan Newman, whose work with students with learning differences has been seminal in the development of the format of the book to enhance its accessibility for all.





## CHAPTER 1

# Learning to learn and its relevance to logical clinical problem-solving

Ivan Newman

*Specialist Study Skills Tutor, Dyslexia Assessment & Consultancy Ltd, London, UK*

### The why

- Animals present to veterinarians with clinical signs, not diagnoses. Therefore, the aim of this book is to enhance your clinical reasoning skills by providing you with a consistent and transferable problem-solving framework that can be applied to common clinical signs in veterinary practice.
- Most of the chapters relate to small animal practice, but there are also chapters demonstrating how to use the problem-solving framework in exotic animals and horses as well as a chapter discussing a framework for professional reasoning.
- Before we start, though, we should review why having a consistent problem-solving framework can be so powerful for veterinary students starting on their clinical journey as well as veterinarians who have knowledge and experience but may struggle when medical cases become more complex or unusual.

### Learn more effectively

This chapter will help you learn more effectively, both to build your veterinary knowledge and more generally. Of course, as learning carries on beyond graduation, many of the ideas described here will be useful for years to come and so are relevant to those of you who

may be studying for post-graduate qualifications. The chapter examines:

- How we learn – using our senses in combination to boost memorisation
- How to use this book
- Study skills strategies for veterinary knowledge.

## Let's get going

How do we learn? Our five senses play a major part in how and what we learn, as much of what we learn is based on memory; using them together results in much better memory outcomes than only using one or even two senses.

Consider this sequence of learning something new: reading alone; reading with hearing; reading with hearing plus kinaesthetic (doing or acting out); reading with hearing plus kinaesthetic (doing or acting out) and repetition. As we proceed through this sequence, we understand and remember more and for longer (Flanagan 1996) – what could be called the 'staircase' of memorisation.

We remember:

- 20% of what we read
- 30% of what we hear
- 40% of what we see
- 50% of what we say
- 60% of what we do
- And as much as 90% of what we read, hear, say, see and do.

That last bullet point is worth emphasising; we can achieve exceptional results by combining multiple senses (see Figure 1.1).

Of particular relevance to this book, placing information within 'frameworks' further boosts memorisation. In the context of veterinary studies, imagine you are in a lecture, in person or online, and the presenter just verbally describes a procedure step-by-step. How much do you remember? Perhaps not too much. Now imagine that the presenter talks you through the procedure step-by-step using a diagram, ideally using colour. Are you likely to remember more? Probably. Now imagine that you later talk yourself through the procedure, using your finger to trace the diagram's steps. Is your memory

better? Again, probably. Now additionally you perform the procedure either in mime or a practical session. How is your recall now? Quite likely better still. Finally, if you add in teaching the procedure to someone else, you will achieve the highest level of memorisation.

Figure 1.2 illustrates this idea of increasing ability to memorise. Note that the graphic itself provides a sequence/framework that can be learned, and it uses colour and directional symbols to support the above description and underlying concept.

Figures 1.1 and 1.2 embody alternative representations of broadly the same idea. This repetition is intentional; repetition is important in building memory, especially if that repetition occurs multiple times shortly after original exposure to the material (Ebbinghaus 1885; Flanagan 1996). This is one of the key elements of the problem-solving framework we will discuss – repetition and consistency of clinical reasoning steps regardless of the clinical problem.

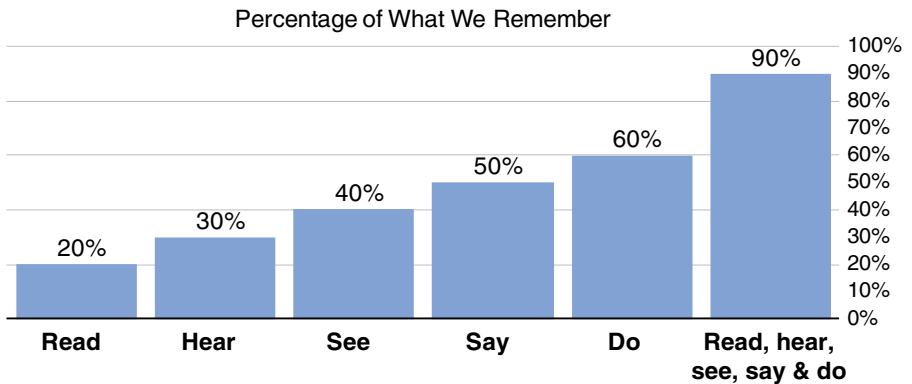


Figure 1.1 Visual representation of the staircase of memorisation.

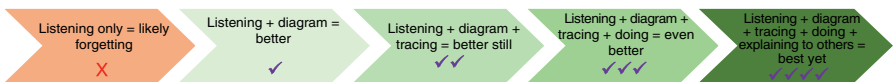


Figure 1.2 Introducing a diagram into the sequence of actions to improve understanding and memorisation.

## How is this learning theory relevant to this book?

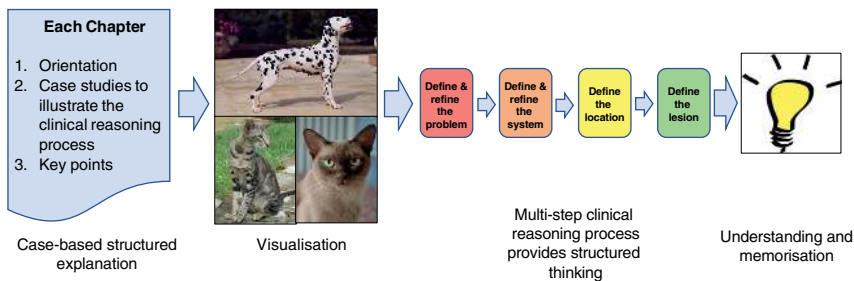
This book is designed to give you a multi-sensory approach to learning, reinforced by repetition, together with a robust framework on which to 'hang' veterinary facts. The problem-solving framework is based on pathophysiological principles that will lead you to a deeper understanding, enhanced ability to recall information and more reliable diagnoses.

Chapter 2 introduces you to clinical reasoning in general and the logical clinical problem-solving (LCPS) process in particular. It uses case studies to illustrate the strengths and challenges of different clinical reasoning approaches.

The subsequent chapters use particular clinical problems to illustrate and further explain how to use LCPS for common clinical signs. Each of the four steps is consistently colour coded so you can associate the colour to the step. The case scenarios in many chapters will help you visualise how LCPS is applied to real-life cases.

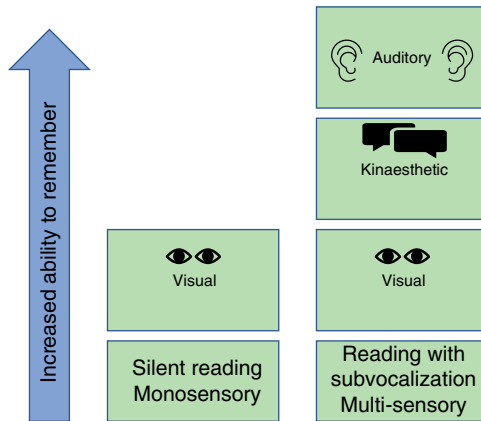
Every chapter opens with an orientating introduction and ends with a key points recap. Figure 1.3 illustrates how the structure of the chapters leads to understanding and memorisation. Take a moment to follow the flow step-by-step.

You can perhaps see what is 'going on' here. The book is designed to help you remember and learn more effectively by providing a

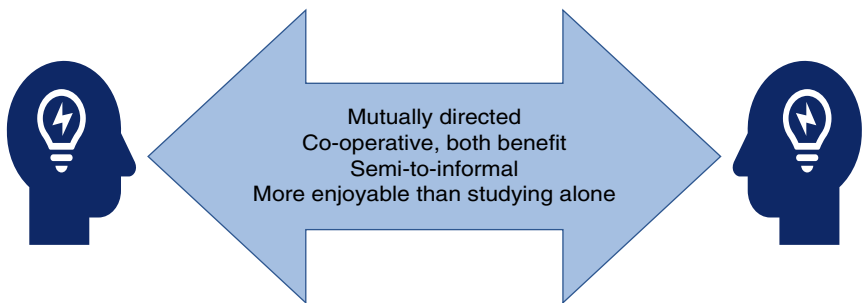


**Figure 1.3** How the structure of the chapters leads to understanding and memorisation.

process, scenario-based text, graphics, colour and repetition – many of the elements in the staircase to memorisation. You can add further elements, such as talking through to yourself (subvocalising; see Figure 1.4) each step of the LCPS process for each scenario and perhaps teaching each of the scenarios within the clinical reasoning process to a colleague (a learning buddy; see Figure 1.5).



**Figure 1.4** Memorisation benefit through subvocalisation.



**Figure 1.5** Benefits of having a learning buddy.

### Key points – learning more effectively

- Make your learning multisensory. The more senses you use, the better you remember.
- Create and use frameworks on which to ‘hang’ your knowledge; they are powerful tools to help you remember and learn.
- The logical clinical reasoning process, the framework at the heart of this book, is specifically designed to help you become a more effective veterinarian, especially when faced with the unexpected.

### References

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## CHAPTER 2

# Introduction to logical clinical problem-solving

Jill E. Maddison<sup>1</sup> and Holger A. Volk<sup>2</sup>

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### The why

- The aim of this book is to assist you to develop a structured and pathophysiologically sound approach to the diagnosis of common clinical problems in small animal practice.
- The development of a sound basis for clinical problem-solving provides you, a current or future veterinarian, with the foundation and scaffolding to allow you to potentially reach a diagnosis regardless of whether you have seen the disorder before.
- Furthermore, the method presented in this book will help you avoid being stuck trying to remember long differential lists and hence free your thinking skills to solve complex medical cases.
- The aim of the book is *not* to bombard you with details of different diseases – there are many excellent textbooks and other resources that can fulfil this need. What we want to provide you with is a framework by which you can solve clinical problems and place your veterinary knowledge into an appropriate problem-solving context.

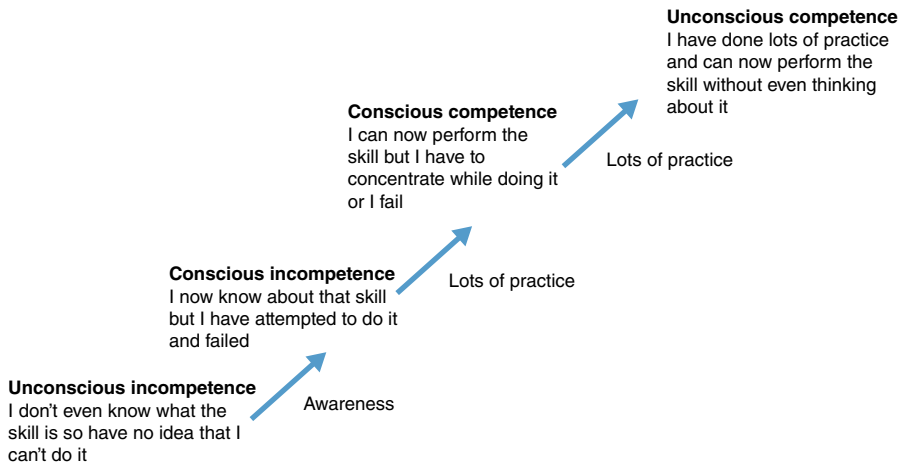
### Introduction to clinical reasoning

We all remember our first driving lessons, which may have been quite challenging – for us and/or our instructors! We had to think actively about many factors to ensure we drove safely. The more experienced

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we became at driving, the more non-driving-associated tasks, such as talking to our passengers, listening to the radio and changing the radio channels, we were able to do while driving. If we had attempted any of these tasks at the beginning of our driver training, we might have had an accident. As we become more experienced at a task, we need to think less about it, as we move to what is known as unconscious competence (Figure 2.1).



**Figure 2.1** Skill acquisition pathway. (This pathway can apply to the acquisition of any skill.)

We see a similar process in clinical education. During the progression from veterinary student to experienced clinician, knowledge and skills are initially learnt in a conscious and structured way. Veterinary undergraduate education in most universities is therefore based on systems teaching, discipline teaching, species teaching or a mixture of all three. These are excellent approaches to help develop a sound knowledge base and understanding of disease processes and treatments.

However, when an animal or group of animals becomes unwell, the clinical signs they exhibit can be caused by a number of disorders of a range of different body systems – the list may seem endless. They do not present to the veterinarian with labels on their heads stating the disease they have (more's the pity!). Therefore, for veterinarians to



fully access their knowledge bank about disorders and their treatment, they need to have a robust method of clinical reasoning they can rely on. This method allows them to consolidate and relate their knowledge to the clinical case and progress to a rational assessment of the likely differential diagnoses. This makes it easier to determine appropriate diagnostic and/or management options for the patient. Because you have a clear path, communication with the client becomes easier.

The next part of the journey to becoming an experienced clinician is that clinical judgement and decision-making processes become unconscious or intuitive. The rapid, unconscious process of clinical decision-making by experienced clinicians is referred to in medical literature as intuition or the 'art' of medicine. The conscious thinking process is often referred to as 'science' (evidence based) or analytic. Intuition is context-sensitive, influenced by the level of the clinician's experience, context-dependent and has no obvious cause-and-effect logic. Why is this important? We have all thought 'I just know that the animal has . . .' The unconscious mind will pretend to the conscious mind that the clinical decision was based on logical assumptions or causal relationships. This is not a problem as long the intuition or 'pattern recognition' has resulted in a correct diagnosis. However, when it does not, we need to understand why it failed and have a system in place to rationally progress our clinical decision-making.

This book will provide you with the tools and thinking framework needed to unravel any clinical riddle, unleashing the potential of your unconscious mind rather than blocking your working memory as you try to recall all of the facts you may have once known.

### **Why are some cases frustrating instead of fun?**

Reflect on a medical case that you have recently dealt with that frustrated you or seemed difficult to diagnose and manage. Can you identify why the case was difficult?

There can be a multitude of reasons why complex medical cases are frustrating instead of fun.

- Was it due to the client (e.g. having unreal expectations that you could fix the problem at no cost to themselves? Unwilling or unable to pay for the diagnostic tests needed to reach a diagnosis? Unable to give a coherent history?)