An introduction to problem-based clinical reasoning

Author : Royal Veterinary College

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Clinical reasoning skills form the cornerstone of the diagnostic and treatment decisions vets make every day. Jill Maddison discusses how vets make those decisions and how they can be enhanced.

Vets must make rapid decisions every day about diagnostic and treatment options for their patients. Clinical reasoning skills form the cornerstone of those decisions, as well as a sound and appropriate (to the case) knowledge base.

The latter also must include an understanding of important pathophysiological principles relevant to the patient's clinical problem. However, knowing the facts is not the same as knowing what to do. Knowledge is only useful if it can be accessed, formulated and applied to the problem at hand.

When a patient presents with one or more clinical problems, various methods can be used to solve the case and come up with a list of possible diagnoses to consider. One method involves pattern

recognition – looking at the pattern of clinical signs and trying to match that pattern to known diagnoses. This is also referred to as developing an illness script.

Another method can involve relying on blood tests to tell us what is wrong with the patient – also referred to as the minimum database. Or we can use problem-based clinical reasoning. Often we may use all three methods.

Pattern recognition?

Knowledge is only useful if it can be formulated and applied to the problem at hand. IMAGE: GeniusMinus / fotolia.

Pattern recognition involves trying to remember all diseases that fit the "pattern" of clinical signs/pathological abnormalities that the animal presents with. This may be relatively simple, but can also lead to errors of omission, and works best:

- for common disorders with typical presentations
- if a disorder has a unique pattern of clinical signs
- if only a few diagnostic possibilities exist that are either:
    - easily remembered
    - can easily be ruled in or out by routine tests
- if the vet has extensive experience, is well-read and up to date, reviews all diagnoses critically and has excellent memory

Pattern recognition works well for many common disorders and has the advantage of being quick and cost-effective, provided the diagnosis is correct. The vet looks good to the client because they have acted decisively and confidently, provided the diagnosis and treatment are correct.

However, pattern recognition can be flawed and unsatisfactory when the clinician is inexperienced and, therefore, has seen very few patterns. Even if the clinician is experienced, it can be flawed:

- for uncommon or common diseases presenting atypically
- when the patient is exhibiting multiple clinical signs that are not immediately recognisable as a specific disease
- if the pattern of clinical signs is suggestive of certain disorders, but not specific for them.

In addition, for experienced clinicians the success of pattern recognition relies on a correct diagnosis being reached for the pattern observed previously and not assuming similar patterns must equal the same diagnosis. Pattern recognition can lead to dangerous tunnel vision where the clinician pursues his or her initial diagnostic hunch, based on pattern spotting, to the exclusion of other diagnostic possibilities. They then may interpret all subsequent data as favourable to their initial diagnosis, including ignoring data that doesn't "fit" their preferred diagnosis. This phenomenon is described in psychological literature as confirmation bias – defined as a tendency for people to favour information that confirms their beliefs or hypotheses.

Finally, the disadvantage of relying entirely on pattern recognition to solve clinical problems means, should the clinician subsequently realise their pattern recognition was incorrect, they have no logical intellectual framework to help them reassess the patient. Thus, pattern-based assessment of clinical cases can result at best in a speedy, correct, "good value" diagnosis, but at worst in wasted time, money and sometimes endangers the life of the patient.

I'll do bloods!

Cases always exist that do not yield their secrets so readily using pattern recognition. IMAGE: Andrey Kuzmin / fotolia.

Routine diagnostic tests, such as haematology and biochemistry, can be enormously useful in progressing the understanding of a patient’s clinical condition. However, relying on blood tests (often called a minimum database) to give us more information about the patient before forming any assessment of possible diagnoses can be useful for disorders of some body systems, but totally unhelpful for others.

Serious, even life-threatening disorders of the gut, brain, nerves, muscles, pancreas (especially in cats) and heart, for example, rarely cause significant changes in haematological and biochemical parameters that are measured on routine tests done in practice. Over-reliance on blood tests to steer us in the right clinical direction can also be problematical when the results do not clearly confirm a diagnosis. We can waste much time and the client’s money searching without much direction for clues as to what is wrong with the patient.

Of course, the financial implications of non-discriminatory blood testing can also be considerable and many clients are able or willing to pay for comprehensive testing. Using blood testing to “screen” for diagnoses can be misleading as the sensitivity and specificity of any test is influenced by the prevalence of a disorder in the population.

For experienced vets, pattern recognition combined with "fishing expeditions" – ”I have no idea what’s going on, so I’ll do bloods and hopefully something will come up" – can result in a successful diagnostic or therapeutic outcome in many medical cases in first opinion practice. But cases always exist that do not yield their secrets so readily using these approaches and it is these cases that frustrate vets, prolong animal suffering, impair communication with clients and, all in all, make veterinary practice less pleasant than it should be.

You also have to know about, and remember, lots of diagnoses for this approach to be effective. That is problematical if the vet does not recognise or remember potential diagnoses or if, as aforementioned, the pattern of clinical signs doesn’t suggest a relatively limited number of differentials. It is also less useful for inexperienced vets or vets returning to practice after a career break or changing their area of practice.

Logical approach

It is for all these reasons the Logical Clinical Problem Solving Online course, led by Jill Maddison and Lucy McMahon, has been developed to enhance problem-solving skills and build your knowledge base about key pathophysiological principles.

'Immediately relevant'

Previous participants who have enrolled on this course have said:

“The tutors were brilliant. Always responded quickly to any queries and very helpful.”

“I learned absolutely loads, but was not overwhelmed by the amount to do. Perfect!”

“The course is immediately relevant to what I do every day in my consulting room and I could see it having a direct effect on how I do my job.”

“The best course I attended so far. Great value for the money.”

Jill and Lucy want to help you develop a framework for a logical approach to clinical problems that is easy to remember, robust and can be applied in principle to a range of clinical problems. The formal term for this is problem-based inductive clinical reasoning – a logical approach to clinical problem solving centred on problem-based clinical reasoning that:

- is a structured approach to clinical cases that is much more than just listing problems and then listing differentials for each problem (a common misconception about problem-based medicine)
- has “rules” that are easy to remember and can be applied to most clinical problems animals present with
- has a structured approach centred on four main steps:
    - define and refine the problem
    - define and refine the system
    - define the location (where appropriate)
    - define the lesion

- provides a structure to hang your ever-increasing knowledge on, allowing you to recognise more easily what information you need to access and when
- reduces the need to remember long lists of differentials
- helps prevent getting trapped by a perceived “obvious” diagnosis
- provides memory triggers to ensure an appropriate history is taken and a through clinical examination performed
- provides a rationale for choosing diagnostic tests or treatments that can be clearly communicated to owners
- helps turn a terrifying case into a manageable one

For more information, or to register on the course, visit http://cpd.rvc.ac.uk