The diagnostic process in general practice: has it a two-phase structure?

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The diagnostic process is a complex transition process that begins with the patient’s individual illness history and culminates in a result that can be categorized. A patient consulting the doctor about his symptoms starts an intricate process that may label him, classify his illness, indicate certain specific treatments in preference to others and put him in a prognostic category. The outcome of the process is regarded as important for effective treatment, by both patient and doctor.

Various models have been proposed for diagnostic work in clinical practice. Sackett describes four main strategies. Pattern recognition is the instant recognition of a disease, for instance diagnosing Downs syndrome after one look at the patient. In the hypothetico-deductive strategy, one performs some form of test to check a hypothesis, a tentative diagnosis. The two last strategies that he mentions are the algorithm strategy and the ‘complete history’ strategy.

The patient’s presentation of his symptoms will be coloured by his experiences and his understanding of his symptoms, and by how articulate he is. In Sackett’s model, the transition from individual clues to a tentative diagnosis suitable for a hypothetico-deductive strategy remains obscure. A string of symptoms merely listed seldom leads to a diagnosis. To a certain degree, a list of symptoms can overlap between diseases. Still, this individual diversity does not usually mislead the doctor, as is seen from the fact that a medical diagnosis in >70% of cases is based on the patient’s history alone. It will be roughly the same whether the patient has a somatic disease or not. In the following discussion, I will, for the sake of simplicity, focus on the diagnostic process when the patient has a somatic disease. The reasoning will be analogous for other illnesses.

The patient’s account of his illness will be structured largely by the pathological process taking place in his body, i.e. the pathological process has an impact on how and in what order the patient experiences and describes his symptoms. In the consultation, the doctor works on the way in which the patient has involuntarily clustered the symptoms based on his illness experiences, and at how he lets them develop chronologically in his illness story. These factors give far more information on which to base the diagnosis than a mere listing of symptoms.

The clustering of signs and their development over time is, in narrative theory, defined as the plot. It is therefore tempting to draw a parallel between the pathological process constituting a cluster of inter-related events and their development over time, and the plot of the patient’s illness story constituting a cluster of inter-related symptoms developing over time. The doctor works with the plot of the patient’s narrative, and Hunter argues that the plot is the diagnosis, indicating that narrative work is a part of the diagnostic process.

This will have a familiar ring to many medical practitioners. We work with the patient’s illness history, starting with few clues on what may be wrong, and then often quite suddenly we recognize which possible diagnoses to pursue further. Sometimes this process is quick, as in Sackett’s category ‘pattern recognition’. At other times, a longer period of non-directive work is required before we suddenly see a few diagnostic possibilities that may be tested further.

Diagnostic criteria are valid for groups of patients (with a specific disease), while diagnostic work in practice means working with individual particularities in the process towards the non-individual category of a diagnosis. In this process, the doctor looks for both generalities and for specific and idiosyncratic clues. Ginzburg argues that in an opaque reality, there are certain points—clues, symptoms—that allow us to decipher it. These points are often located ‘on the fringe’ of the picture, and Ginzburg calls the process of reading them conjectural thinking.

Such points often may be overlooked by the novice, but may constitute a main diagnostic tool for the expert. Basing the diagnosis on the patient’s history requires clinical knowledge and experience. We learn by
experience how and where to look. Nobody learns to be a diagnostician simply by applying explicit criteria. Eco theorizes that doctors are conjecturing over a series of apparently disconnected elements, operating a reductio ad unum of a plurality. The doctor works with all these small and apparently unrelated clues. Taking into account their clustering and development over time, he reaches some possible diagnoses.

Implicit knowledge of clinical experience has been called ‘knowing in practice,’ and is largely comprised of tacit knowledge. Tacit knowledge, as exercised in the care of the patient, may be regarded as a matter of narrative, practical reason, implying that diagnostic work may be seen as tacit narrative work on the plot of the patient’s history.

This requires the complex skill of comparing plots. Schmidt et al. demonstrate that medical expertise is based on “cognitive structures that describe the features of prototypical patients,” rather than on superior medical reasoning. It is interesting to note the parallel between Hunter’s hypothesis ‘The plot is the diagnosis,’ and Schmidt’s findings on expertise as being dependent on cognitive structures, describing prototypical patients for use in diagnostic work. Can the experience-based storing of plots, based on other patients’ case histories, create cognitive structures necessary to master the pre-hypothetical phase of the diagnostic process at an expert level? If so, this has important consequences for medical training, both for undergraduates and for those in vocational training. Complex skills may only be learned through reflective practice, i.e. training in diagnostic competence requires an educational frame that makes ‘reflecting-in-practice’ possible.

Umberto Eco refers to Peirce, calling diagnostic work in a medical context an undercoded abduction. An abduction is the process of going from the (clinical) signs to the constructed entity of a medical diagnosis, which is already part of the medical knowledge currently at the doctor’s disposal. The process is undercoded because the doctor infers a probable diagnosis from subjective symptoms and signs: data which both individually and together carry less information than the diagnostic category.

We may regard hypothesizing as inferring a property of the case (i.e. the patient) from the theory and the result of the test. In other words, when we have arrived at a tentative diagnosis probable or significant enough to be worth testing, we do so by applying a specific test, usually a closed question. The result we get is inferred as a property of the patient. Consequently, the deduction from a hypothesis is the process of using logic to check the patient’s particulars against a given medical theory.

Abduction, however, is the process of working one’s way from the patient’s particulars to the diagnostic domain of medical theory. This process is very different from deductive hypothesizing, which starts with a criteria-based theory (the diagnosis) which is then checked by a suitable test. In the abductive phase of the diagnostic process, we start by sampling data. We may listen until we see the elements as a complete picture. Part of the work is also co-editing the patient’s narrative. Most of it we probably do at an unconscious level.

Evidence-based medical knowledge of the test’s clinical epidemiological properties is based on deductions from a known gold standard. When a given test is used deductively, based on the still tentative diagnosis D1, it is uncertain which gold standard should be used. Thus, the clinical epidemiological properties of a test in an actual clinical situation are not precisely known.

Evidence-based medicine is said to start and end with the patient. There seems, however, to be an open no-man’s-land between the point where the patient starts to present his problem and the point later in the diagnostic process where the doctor has gained enough insight to decide on one or a few possible diagnoses, applying evidence-based knowledge to decide whether or not to use a test. This leaves the knowledge derived from evidence-based techniques inaccessible for a large part of diagnostic work.

In summary, it seems logical to regard the diagnostic process as falling into two phases. The doctor starts the process by working his way through clustered signs or the plot of the patient’s narrative. From this, he infers one or more possible diagnoses (abductive phase). Next, having formed some idea of which diagnosis to pursue, he begins to check his assumptions with specific tests (deductive phase). If one regards the diagnostic process as being two-phased, there are implications for research, medical education and for how we should perform and reflect on the diagnostic process in practice. Each of the two phases requires its own specific working strategy, and both phases are essential to diagnostic work.

References

Two-phase structure of the diagnostic process in general practice?