# 7 Diagnostics: Data-gathering and interpretation

This performance area is about the gathering and use of data for clinical judgement, the choice of examination and investigations and their interpretation.

Needs Further Development	Competent for licensing	Excellent
Obtains information from the patient that is relevant to their problem.	Systematically gathers information, using questions appropriately targeted to the problem. Makes appropriate use of existing information about the problem and the patient's context.	Proficiently identifies the nature and scope of enquiry needed to investigate the problem.

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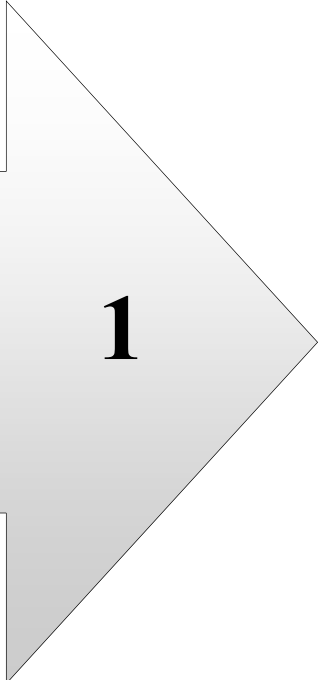
This first progression is principally about the history and illustrates how we move from:

Simply gathering information from the patient without seeking out what is already known or using a systematic and efficient approach to gather information.

Showing the ability to use a targeted rather than blunderbuss approach, deciding what reliance can be placed on information that is already available and focusing any further enquiries on the problem.

Having identified the problem, being able to quickly and fluently decide how far-ranging and probing the further enquiries need to be to adequately investigate the problem.

Joined up?
See p14

Which aspects of our DNA, our deeper features, are particularly important in Data gathering & interpretation ? If we look back at the competencies for the 'Diagnostics' section (page 60), we see that clinical expertise is heavily represented, followed by problem-solving skills. It is important to remember that 'data' is much wider than numbers and technical information and includes thoughts, opinions and judgements. In addition, data-gathering is the fuel for the problem-solving machine. It is therefore needed not just at the outset (for example, when the patient initially presents), but throughout the problem-solving process.

Looking at each of the word pictures from the first progression in turn:

Obtains information from the patient that is relevant to their problem.

Note that the word picture talks about obtaining information that is relevant to the *problem* rather than solely the disease or condition. This emphasises that we are encouraged to use a problem-orientated approach rather than a disease-based approach. Significant problems are not always clinical diseases and clinical problems may be seen very early on in the natural history when they are symptoms rather than diseases that we can put a name to. Part of the enquiry will therefore be related to finding out whether the problem has a medical basis. Being problem-orientated rather than disease-focused means that we take seriously those problems that are not diseases but still have an impact on health. It also encourages us to seek to understand the problem from the patient's problem-perspective, which in turn helps any management plan to be more appropriate and concordance to be improved.

Systematically gathers information, using questions appropriately targeted to the problem.

This behaviour is thought by many educators to be the most important in this area of performance.

Being systematic is very important and is looked for closely, particularly in CSA. Examiners need to feel that the candidate can be trusted to adopt a rational approach when faced with a problem. This is more important than just 'being right' in the sense that if the candidate suggests an appropriate diagnosis or management option, this must have its roots in rational enquiry and must not just appear from nowhere like a rabbit pulled from a hat.

Examples of systematic approaches are:

- The logical questioning used to investigate abdominal pain, allowing a doctor to make a diagnosis of irritable bowel syndrome by positively excluding other more serious conditions.
- The use of rating scales and questionnaires to establish the diagnosis of depression and rate its severity.
- The construction of a family tree by taking and interpreting a family history based on the knowledge of simple inheritance patterns.

'Targeting questions' often takes place in a different phase of the consultation, when communication moves from being inclusive and open to becoming more doctor-centred and closed. It is often better to signpost this phase to patients so that they do not feel distanced or, in a negative sense, interrogated.

Whose problem is it?

When the problem has been identified and accepted by the patient, then further questions are likely to be accepted and responded to. Compare this to the frequent situation in which doctors pursue their own clinical agenda without adequately involving the patient.

Without explanation, preferably early on in the consultation, patients may not understand the purpose of questioning and can be reticent, obstructive or even angry. They may feel that we have not heard them or are ignoring their concerns.

For example, a patient may complain of pain in the left arm. Without explanation, enquiries about smoking, diabetes and exercise may seem puzzling or even pointless to the patient, whereas they would not to another doctor.

Makes appropriate use of existing information about the problem and the patient's context.

Making use of existing information means that once we have initial ideas about the problem, we look to see what information is available that might shed further light. This includes assessing to what degree this information can be relied upon and therefore whether previous history, examination and investigations need to be repeated or added to.

How would you make use of information about the patient's context?

Context is a broad term. At one level, it may refer to the patient's occupational, social and cultural background. Knowledge of the patient's occupation may modify the differential diagnosis and will almost certainly influence the management plan. For instance, back pain in a non-manual worker may not be a threat to livelihood in the way that it could be for a labourer. Occupational exposure may make some lung diseases more likely and a 'faint' will have different implications for an HGV driver than a bank clerk.

'Gender' is another example of context. The curriculum teaches us to recognise that men consult less frequently, have more illness and are generally more reluctant to admit a problem exists. Male sex should therefore lower our threshold for suspicion of significant disease (also see page 72 for a more general discussion of probability)

Assessor's corner: systematic questioning

Systematic questioning is easy to spot when the style is more of an interrogation. More fluent doctors tend not ask all the relevant questions in one go, but bring them in at appropriate points, building up a picture throughout the consultation.
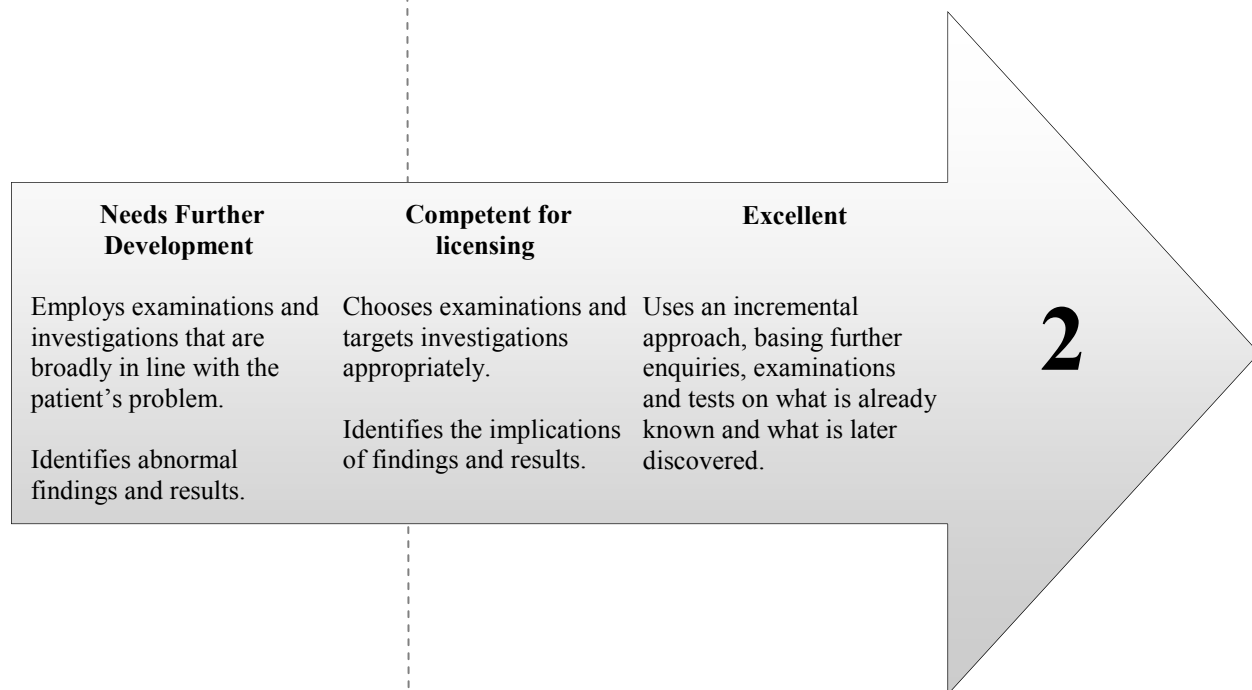
Look out for red flag symptoms and signs. These should not be missed and should normally trigger targeted questioning.

Proficiently identifies the nature and scope of enquiry needed to investigate the problem.

We must decide the range and depth of enquiry that is required. This means:

- Formulating a differential diagnosis,
- Identifying which differentials are more significant (perhaps in terms of risk) than others
- Deciding which questions are needed to explore these possibilities
- Deciding the range and depth of questions needed to exclude unlikely but serious alternatives
- Prioritising the questions appropriately, on the basis of the above

This behaviour falls in the 'excellent' bracket because we have to undertake this sequence proficiently, i.e. quickly and fluently, which requires considerable expertise when the differential diagnosis is extensive or complex.

For example, we may be presented with difficult symptoms such as dizziness or headache, where there are multiple differentials, some of which are serious. Efficient problem-solving will depend upon having a structured and logical approach to questioning and diagnosis.

Once again, the exploration must occur with the consent and co-operation of the patient, which means that we must explain what we are asking, be alert to cues and explain our findings.

Assessor's corner: using available information

There are many sources of information with the main ones being from the patient and medical records.

Does the trainee make use of this information and try to link it with the patient's problem, thereby putting the problem in context?

Needs Further Development	Competent for licensing	Excellent	
Employs examinations and investigations that are broadly in line with the patient's problem. Identifies abnormal findings and results.	Chooses examinations and targets investigations appropriately. Identifies the implications of findings and results.	Uses an incremental approach, basing further enquiries, examinations and tests on what is already known and what is later discovered.	**2**

What types of test might we be expected to know about?

Targeting investigations means understanding the indications for a test and also knowing which tests are best, based on availability, predictive value and patient acceptability.
Examples include:

Blood tests

The indications for plain x-rays, ultrasound, CT and MRI

Knowledge of secondary care investigations and treatment, e.g. endoscopy, abdominal imaging, biopsy, ERCP in abdominal investigations, EEG and nerve conduction studies in neurological problems, slit lamp investigations and IOP measurement in ophthalmological problems.

This second progression leads on from history taking and is concerned with physical examination and investigations. The progression illustrates how we move from:

Targeting examinations and investigations to the patient's problem; recognising when tests are abnormal, even if we do not fully understand the implications.

Deciding what reliance can be placed on available data and focusing any further questions, examination and tests on the problem. Additionally, understanding what the implications of abnormal results might be.

Taking a stepwise approach, monitoring the situation and tailoring further tests to our evolving understanding of the problem.

Looking at each of the word pictures in turn:

> **Employs examinations and investigations that are broadly in line with the patient's problem.**

There is an assumption here that examinations and investigations are necessary. This is not always the case and there are situations in which investigation may delay the appropriate action. Obviously, emergency admission is one such. Another is when the situation is not an emergency but could deteriorate during the investigation period. For example, the curriculum warns us that

investigation may delay referral in suspected head and neck cancer.

Identifies abnormal findings and results.

At the 'needs further development' level, we need to recognize when the data suggests abnormality. For many tests, this may not be a challenge as laboratories increasingly highlight abnormal results, showing the normal range and even suggesting possible causes or recommended action. However, there are many other pieces of information that can't be highlighted in this way and require baseline knowledge on our part.

Chooses examinations and targets investigations appropriately.

This behaviour is thought by educators to be particularly important

'Choosing examinations' means deciding which examinations are required to provide the information needed to include or exclude a diagnosis from the list of possibilities.   Examining a patient in primary care is not the same as in hospital. There is not the same expectation that a full medical clerking will be undertaken with a top to toe examination. Also, time available is very short especially when we include the time taken for the patient to dress/undress. Making an appropriate choice is also influenced by patient consent and the need to maintain the patient's dignity.

In CSA, certain cases may require doctors to suggest or to undertake physical examination. Examiners will be looking for the ability to weigh the risks, think of the likelihood of examination contributing significantly to the diagnostic process and then choose appropriately, treating the patient with compassion and respect.

'Targeting investigations' requires us to decide upon appropriate tests for any particular problem. 'Investigations' can include questionnaires, such as dementia screens or depression inventories. When targeting investigations, we also need to take into account the cost-efficiency and cost-benefit of tests. Tests may sometimes be counter-productive if they distract us, e.g. by producing red-herrings. This can lead to patient harm as well as being a poor use of resources, so choosing tests carefully is important.

Identifies the implications of findings and results.

Clearly, we would be expected to understand the implications of a normal finding or test. With abnormal findings and tests, there will be implications for case management which may include: no further action, repeating the test, obtaining more information perhaps through further investigation and finally, referral. Another factor is the urgency with which any of the above need to be conducted.

In the workplace, we may repeat tests if they date from some time back, but may be quite happy with recent results. In CSA, there may be a temptation to repeat tests 'for safety's sake'. However, examiners are looking for the ability to 'make appropriate use of existing information' which means that it may be quite in order to accept results without repeating them. This also allows us to demonstrate our efficient use of resources.

Broadly speaking, abnormal findings and tests will modify our previous estimation of the probability of 'nothing being wrong' versus 'something being wrong', or one condition being more likely than another.

What other sorts of abnormality might we be asked to identify?

These might include abnormal physiological measurements such as temperature and blood pressure. You may also be expected to know how these numbers compare with guideline recommendations. For example, a BP that is normal for a non-diabetic individual may be too high in a diabetic.

Near patient tests such as urinalysis, blood glucose and ECG

Recognizing abnormalities includes identifying deviations from an acceptable trend. For example, deviations from growth centiles, simple spirometry results and trends in a serial peak flow chart.

'Abnormality' may also be recognized from a cluster of measurements. For instance, coronary heart disease risk is derived from a multifactorial assessment of physiological and lifestyle factors in an individual.

Data may also be used to assess health care, e.g. a comparison of standardised mortality rates between the practice population and neighbouring populations.

'Probability' is not simply an intellectual notion. The most significant way in which we can demonstrate our understanding of the implications of findings and results is in the way we *explain* these to the patient. This includes communicating the probabilities and then checking that they have been correctly understood.

> **Uses an incremental approach, basing further enquiries, examinations and tests on what is already known and what is later discovered.**

The key skill here is to use a stepwise approach, which implies having a mental map of how the problem might evolve. It also implies constantly monitoring the patient's progress to look for deviations from the expected path. When deviations occur, further information may be needed (such as examinations and investigations) and the map may need to be modified. We therefore can't afford to have a rigid approach or a dogmatic mindset. Instead, we need to have our antennae perpetually twitching for feedback and further information and to have a flexible and forgiving approach.

Why forgiving? Because rather than feel upset that the initial diagnosis or management plan is shown to be wrong, we should *expect* not to be immediately correct and should expect to modify our ideas and plans as the problem unfolds. This approach means that we don't threaten our self-esteem through inappropriate expectations and that we remain vigilant, rarely drawing a line under a problem. This is good for us and good for patient safety.

Given that we have to work in much more uncertain conditions than hospital doctors, this mindset is appropriate. Incidentally, it is usually well-understood by patients, who are more forgiving if doctors are open with them about the uncertainties and probabilities and if they are forewarned that ideas are likely to change as the journey progresses.

There are many examples of patient journeys in which time is used as a diagnostic tool (see page 72). Chronic neurological conditions like multiple sclerosis and Parkinson's disease are good examples of where this approach is essential. With any prolonged incremental journey, the importance of good communication, trust and partnership cannot be underestimated and is also an important part of risk management.

> **Tolerating uncertainty**
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> The process of 'tolerating' does not simply mean stoically or lazily accepting a situation, but anticipating that some situations will be associated with a great deal of uncertainty and that steps can be taken to minimise this.
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> Using a stepwise approach to deal with chronic problems is a good example of a situation where uncertainty is inevitable and where good communication, partnership and follow-up can minimise the adverse effects

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In what way could DNA rates be thought of as abnormal findings?

The point of this question is to illustrate that 'findings' can come from many sources. Practices notice when patients DNA appointments that they had booked and GPs may use this information to modify patient behaviour (or at least, to try!).

Sometimes the implications of this abnormal finding may be more significant. For example, if children fail to attend appointments this may trigger concern, given that they are reliant on parents and carers to make the appointment. Is the children's care an issue?

Could DNAs reflect a problem with the convenience of appointment times?

In the next chapter, we will see how the data that is gathered is then used for probably the most important skill that GPs have, which is to make justifiable decisions in situations of complexity and uncertainty.