Chapter 1

Introduction to differential diagnosis

Differential diagnosis is not a subject that entails the acquisition of new knowledge related to medicine, but instead it is the learning of an analytical process which relies on information already learned, such as anatomy, physiology, pathology and clinical medicine. The key words mentioned above are 'the learning of an analytical process'. What is this process?

Differential diagnosis is being able to demonstrate and apply a justified and well reasoned argument when arriving at a diagnosis that is always patient-centred. As a student when attending your training clinic you will be expected to justify and explain your diagnosis to your clinic supervisor. The process of arriving at a definitive diagnosis requires that you demonstrate your differential diagnosis argument by providing reasons FOR and AGAINST each of the possibilities.

As a student your case history will be recorded in a structured form whereby you follow a defined structures starting with the presenting complaint and then covering all sections of the case history. On completion of the case history and in some cases after physical examination, you will need to provide your differential diagnosis. These are the different conditions which could – to a varying extent – explain some or all of the patient's signs and symptoms.

Before you present your definitive diagnosis, you need to explicitly demonstrate that you have considered all reasonable possibilities and with a balanced argument how and why you have rejected the unsupported differentials.

The best way to provide this analysis is to provide arguments FOR and AGAINST for each of your differentials. Your diagnosis will therefore have the most compelling list of factors that support that diagnosis (argument FOR) and similarly the least arguments (AGAINST).

Differential diagnosis is a skill of sorting all the signs and symptoms plus other information from the case history into a ranking of most likely and least likely diagnoses for each particular clinical picture. It also involves identifying the most important information from the less relevant or distracting details.

"Differential diagnosis t*eaches the student to integrate previously acquired theoretical knowledge combined with case history taking and basic clinical skills in order to reach a diagnosis through a systematic decision making process"*

Differential diagnosis is often regarded as an end stage process after case history and clinical examination. This established view is a rather simplified appreciation of the concept. It can be argued that differential diagnosis is an ongoing process that starts with case history and runs throughout the entire clinical encounter until you arrive at a definitive diagnosis. However, it must be emphasised that this statement does not imply that you prejudice the progression of the clinical consultation by using incomplete information to influence the progress of the clinical encounter.

From the early stages of the consultation you will be processing the patient's story in a way that refines the progression of the consultation and as themes start to emerge it becomes more focused. If this sifting, refining and funnelling process does not take place your case history will fail to analyse the emerging theme and your subsequent physical examination will be an indiscriminate list of tests.

In the beginning of the case history taking if you were to attempt to compile a differential diagnosis list, this will include a large number of probabilities but all with little supporting evidence. As the case history progresses and more information is gathered your differential diagnosis list will become more selective but those conditions remaining on the list will become stronger in probability.

As a student you are encouraged to make a note of your differentials as they develop during the progress of the consultation. This list should be constantly reviewed as you progress through the consultation, re-enforcing the strongly emerging themes and eliminating those conditions that have yielded very little supporting evidence.

In some cases a definitive diagnosis can be made with case history alone, whilst in others you will need additional supporting evidence from physical examination or from further diagnostic procedures. If for example during the case history a patient describes a skin condition with symptoms of itchiness, redness and scratching, you cannot make a definitive diagnosis for eczema as many skin conditions present with similar symptoms. In this simplified scenario, when you examine the skin you may have noticed that the lesions conform to fungal infection.

Other conditions can exhibit the opposite rationale, whereby even an endless barrage of tests can yield negative information, and therefore you will rely heavily on the quality of your case history in order to actively exclude other possibilities that share similar pathology. Good examples are irritable bowel and chronic fatigue syndromes. This is what we call 'diagnoses by exclusion'. This means, that in the case of IBS, you have excluded conditions that produce similar symptoms, such as gastroenteritis and food intolerances, either by information from the case history or by clinical examinations. As you are aware, there are no tests of good diagnostic value for the above two conditions, or for many other pathologies.

You must also bear in mind that in some instances your differential diagnosis may produce more than one definitive diagnosis. This scenario becomes more likely with advancing years, as elderly patients are likely to present with more than one co-existing condition. Such cases will prove a diagnostic challenge as predisposing and co-existing conditions can produce a variety of symptoms. Similarly, long standing chronic conditions will also produce a broad range of symptoms as the result of the 'knock-on' affects on related organs and systems. For instance, obstructive lung disease like fibrosing alveolitis can lead to right sided heart failure, and similarly left sided heart failure may result in pulmonary congestion.

There will be instances when a definitive diagnosis can't be reached, either because of weakness in the quality of information from the case history or due to ambiguous results from subsequent examinations. You will need to judge if there is sufficient objective information to identify the most likely diagnosis, and use this as a basis to start a treatment or a monitoring programme. This is what we call a 'working diagnosis'. In such cases you will need to closely monitor the patient's progress and responses to treatment which may provide you with additional information that can be used when revising your differential diagnosis. When using the working diagnosis approach, you must ensure that there are no contraindications to your treatment programme, or if you chose to wait and see, this delay would not place the patient under any unnecessary risk. Equally, if any red flags are identified in the case history or during examination then you must take appropriate and timely action.

The usual progression after case history is to perform a physical examination of the patient, or perform physical examination procedures within the parameters of your training and of your clinical setting. If these procedures have not provided you with sufficient information to make a definitive diagnosis or they have revealed new potential conditions, then you may need to refer the patient for specialist diagnostic procedures. When diagnostic procedures are carried out, either in your practice or by a laboratory, they need to be properly selected so that the tests have high reliability, validity and sensitivity for the condition that you wish to investigate.

- Reliability means that whether you or another examiner conducts the same test, the results would be consistent.
- 'Validity refers to the accuracy of the test, it assess the degree to which the test measures what it is designed to measure'. J R JAMISON.

References, Bibliography and Recommended reading

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Beck R, et al (2003), Tutorials in Differential Diagnosis, 4th edn., Churchill Livingstone. ISBN: 978-04430615-7-8

DVD-VIDEO recordings
Syrimis A (2007), Clinical Examinations DVDs, Bloomsbury Educational Ltd,
ISBNs:

- Respiratory system examination: 978-0-9551291-0-0
- General system examination: 978-0-9551291-1-7
- Cardiovascular system examination: 978-0-9551291-2-4
- Abdominal system examination: 978-0-9551291-3-1
- Peripheral nervous system examination: 978-0-9551291-4-8
- Cranial nerves examination: 978-0-9551291-5-5
- Musculoskeletal examination: 978-0-9551291-6-2
- Case History Taking: 978-0-9551291-7-9
- Clinical Examinations: Complete DVD series: 978-0-9551291-9-3

http://www.clinicalexams.co.uk/student-resources-section.htm
(For additional lecture notes, Q&As and images, Username & Password provided in class)

Boon N A, Colledge N R, Walker, B & Hunter J A A (2006), Davidson's Principles and Practice of Medicine. 20th Edition, Churchill Livingston ISBN: 978-0-4430703-5-8

Bickley, L. S.; Szilagyi, P. G.; 2003; ***Bates' Guide to Physical Examination and History Taking****;* (8th Ed); Lippincott; New York.

Epstein, O.; et al.; 1997; *Clinical Examination;* (2nd Ed.); Mosby; London. (similar to Bates but presents the information in a different but equally good way. Some very good photographs and is user friendly).

Marsh J; 1999 *History and Examination;* Mosby London. (a great 'crash course' book with sample questions. Very user friendly. I recommend it).

Forbes, C. D.; Jackson, W. F.; 1998; *Color Atlas and Test of Clinical Medicine;* (2nd Ed.); Mosby; London. Excellent reference book for photographs of various pathologies.

Haslett, C.; et al.; 1999; *Davidson's Principles and Practice of Medicine;* (18th Ed.); Churchill Livingstone; Edinburgh. (Use to put your clinical findings into context of general medicine).

Bradley J, Rubenstein D, Wayne D, The Clinical Manual, Blackwell Scientific publications. ISBN 0-632-03312-6. This is another very good pocket size book but you may have to order it. I find this book very useful because it also had a summary of the main pathologies and their signs and symptoms.