

# Diagnostic Process

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# Objectives:

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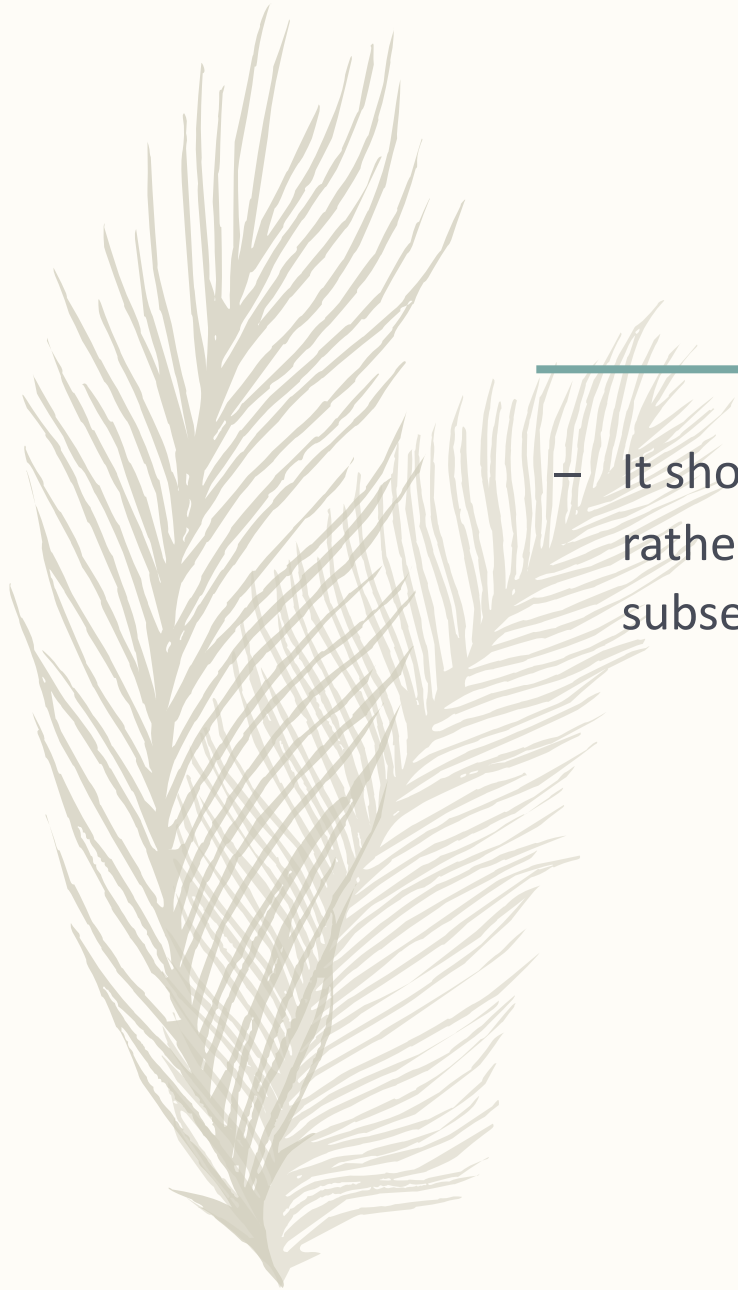
- Identifying how to reach a patient-centered medicine.
- To differentiate between inductive and hypotheticodeductive methods of problem solving.
- To generate and rank “appropriate” diagnostic possibilities for common complaints.
- To apply prediagnostic interpretation and “checklists” in generating diagnostic hypothesis.
- To know the difficulties that medical students face in making diagnoses.
- To recognize the “Triple diagnosis”.




# Diagnosis

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- Identification of a condition, disease, disorder, or problem by systematic analysis of the background or history, examination of the signs or symptoms, evaluation of the research or test results, and investigation of the assumed or probable causes.
- **Effective prognosis is not possible without effective diagnosis**



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- It should be remembered that a diagnosis is usually a statement of probability rather than certainty and often regarded as provisional until supported by the subsequent course of the case or the response to specific treatment.



# Difference between patient centered diagnosis and disease centered diagnosis

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- Disease centered diagnosis: search for and identification of organic disease.
- Patient centered diagnosis: includes consideration of the patient's thoughts and feelings concerning the presenting complaints. (ABC),(FEFI)
  - A. Anxiety   B. Beliefs   C. Concerns
  - F. Function   E. Expectations   F. Feelings   I. Ideas
- It is encouraged to consider diagnosis in whole-person terms, which include both patient centered and disease centered elements.



# How to reach patient centered diagnosis

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by helping patients feel understood through inquiry into patients' needs and expectations attending to the psychosocial context; and expanding patients' involvement in understanding their illnesses and in decisions that affect their health.

Good communication skills, empathy and shared understanding may make the practice of medicine more patient centered

**Mr. Naser is a 42-year-old teacher. He has chest pain.**

➤ **Possible ideas**

- He may think it is from his heart
- He may think it could be a result of heavy meal
- He may think it could be (bad eye) or (black magic)
- He may think it could be trauma

➤ **Possible concerns**

- His main concern could be his work
- His main concern could be his image as a distinguished teacher
- He might be worried his fitness
- He might be worried about his family, what will happen to them if he died

➤ **Possible expectations**

- His main expectation could be just explanation and reassurance
- He may expect ECG or X-Ray or cardiac catheterization
- He may expect referral for more reassurance
- He may expect medical report or just a sick leave

➤ **Possible effects of the problem**

- This problem may affect him physically and prevent him from doing his daily activities
- It may affect him socially and make him isolated
- It may affect him psychologically and make him anxious and depressed

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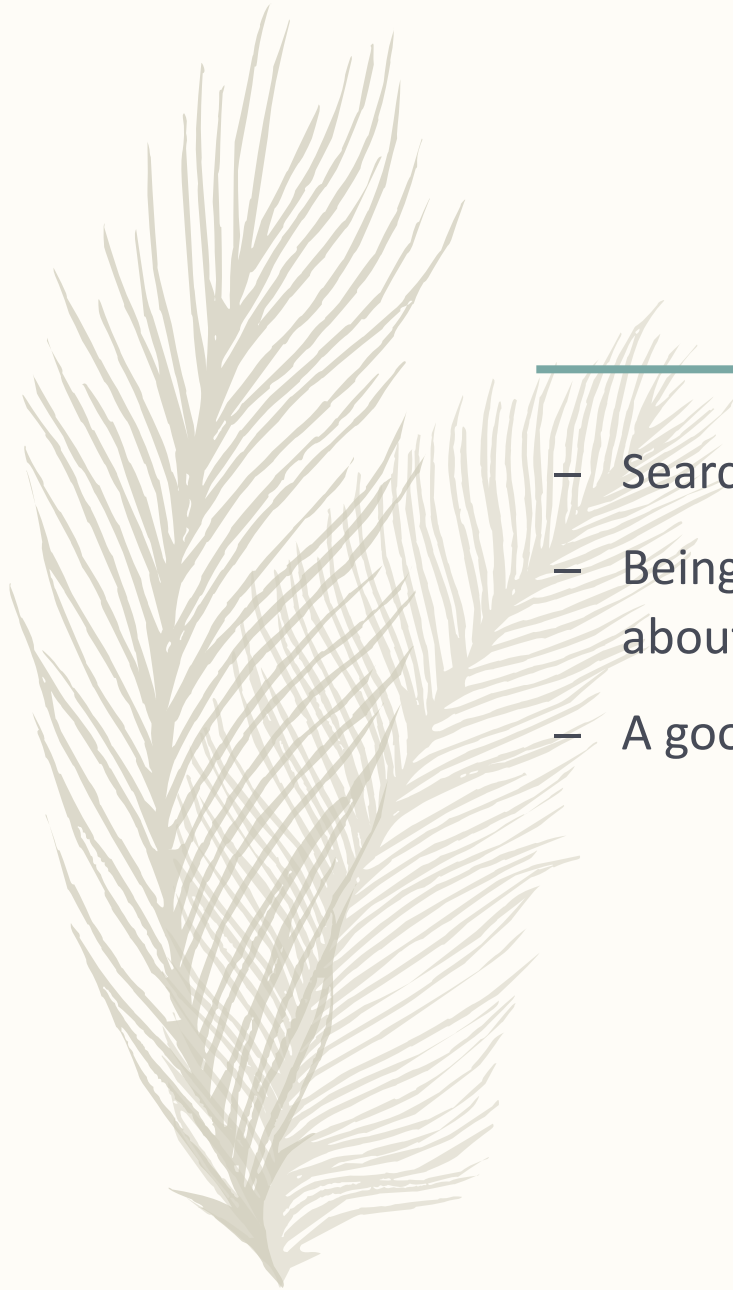


# Patient centered medicine

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- Emphasis on patient autonomy
- Shift from hospital care to community
- Increased attention to prevention and patient education
- Medical care costs
- The whole person medicine
- Enhancing doctor patient relationship
- Care of the family life cycle





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- Search for the patient beliefs , ideas , concerns , expectation and effect of these.
  - Being interested and wanted to know , to be a good doctor you have to care about people .
  - A good strategy is to listen and demonstrate empathy .



# Generating and ranking appropriate diagnostic possibilities

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- There are four principal factors which influence the generation and ranking of appropriate diagnostic possibilities:
  1. Probability.
  2. Seriousness.
  3. Treatability.
  4. Novelty.

# Probability

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- the most important -> make an estimate of the likely cause, or causes, of the patient's symptoms.
- In any clinical circumstance the doctor must ask : “What is the most likely cause or causes of my patient symptoms?”
- It's further influenced by two inter-related factors:
  - The crude FREQUENCY of occurrence of the particular condition(s) suspected.
  - The complex interaction of patient and symptom variables and its effect on the previous point.





# The probability diagnosis

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- The probability diagnosis is based on the doctor's perspective and experience with regard to prevalence, incidence and the natural history of disease.
- GPs acquire first-hand epidemiological knowledge about the patterns of illness apparent in individuals and in the community




# Seriousness:

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- Particular consideration should be given to the possibility that a life threatening or seriously incapacitating condition may be responsible for presenting symptoms.
- Given appropriate clinical presentation, such diagnostic possibility should merit inclusion even though disproportionate to their actual frequency of occurrence because of potentially catastrophic consequence due to delay in making diagnosis. i.e.: malignant melanoma



What serious disorders must not be missed?



# Diagnostic triads for life-threatening conditions

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## Examples

- DxT: fever + rigors + hypotension = septicæmia
- DxT: fever + vomiting + headache = meningitis
- DxT: fatigue + dizziness ± syncope = cardiac arrhythmia
- DxT: fever + drooling + stridor (child) = epiglottitis
- DxT: headache + vomiting + altered consciousness = subarachnoid haemorrhage (SAH)
- DxT: abdominal pain + amenorrhoea + abnormal vaginal bleeding = ectopic pregnancy
- DxT: fatigue + dyspnoea on exertion + dizziness = cardiomyopathy



# Treatability:

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- The more amenable to treatment a potential underlying cause for presenting symptom is, the more likely it is to be included as a diagnostic possibility and the higher its ranking is likely to be.
- For example, hypothyroidism is an uncommon cause of tiredness but should not be overlooked as it can be easily corrected.




# Novelty:

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- (especially if there is previous personal experience)
- Very rare but memorable conditions are disproportionately to be included in a potential list of causes.
- i.e: pheochromocytoma (usually suggested by students)



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- When faced with the practical problem of generating appropriate differential diagnosis, you should aim to produce a list with two distinct categories.
    - The first -> contain most likely causes.(5)
    - The second -> include the less likely but important to consider possibilities. (2)
    - Novelty causes should feature rarely.



# The concept of diagnostic model

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The diagnostic model for a presenting problem

- 1 What is the probability diagnosis?
- 2 What serious disorders must not be missed?
- 3 What conditions are often missed (the pitfalls)?
- 4 Could this patient have one of the 'masquerades' in medical practice?
- 5 Is this patient trying to tell me something else?



# prompt

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- Each of the above five questions will be expanded. An excellent acronym on this theme, 'PROMPT' :
- P probability
- R red flag
- O often missed
- M masquerades
- P patient wants to
- T tell me something



# Things are not always cut and dried

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- C connective tissue disorders
- U UTIs, particularly in very old and very young
- T thyroid disease
- AND D depression
- R remember to rule out serious and rare causes

I iatrogenic causes

E emotional needs

D diabetes

# Red flags



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- weight loss, vomiting, altered cognition, fever  $>38^{\circ}\text{C}$ , dizziness, and/or syncope at the toilet and pallor.

# 'pitfalls'

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- Abscess (hidden)
- Addison disease
- Allergies
- Candida infection
- Chronic fatigue syndrome
- Coeliac disease
- Domestic abuse,  
- including child abuse Drugs
- Endometriosis
- Faecal impaction
- Foreign bodies





# masquerades

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- The seven primary masquerades
- 1 Depression
- 2 Diabetes mellitus
- 3 Drugs
  - iatrogenic • self-abuse — alcohol — narcotics — nicotine — others
- 4 Anaemia
- 5 Thyroid and other endocrine disorders
  - hyperthyroidism • hypothyroidism • Addison disease
- 6 Spinal dysfunction
- 7 Urinary tract infection (UTI)





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Is the patient trying to tell me something?

# Low back pain: diagnostic strategy model Q

- Probability diagnosis A. Vertebral dysfunction especially facet joint and disc Musculoligamentous strain/sprain Spondylosis (degenerative OA)
- Q. Serious disorders not to be missed A. Cardiovascular: • ruptured aortic aneurysm • retroperitoneal haemorrhage (anticoagulants) Neoplasia: • myeloma • metastases Severe infections: • vertebral osteomyelitis • epidural abscess • septic discitis • tuberculosis • pelvic abscess/PID Osteoporotic compression fracture Cauda equina compression
- Q. Pitfalls (often missed) A. Spondyloarthropathies: • ankylosing spondylitis • reactive arthritis • psoriasis • bowel inflammation Sacroiliac dysfunction Spondylolisthesis Claudication: • vascular • neurogenic Paget disease Prostatitis Endometriosis
- Q. Seven masquerades checklist A. Depression Diabetes Drugs Anaemia Thyroid disorder Spinal dysfunction UTI  
✓ – – – – ✓ ✓
- Q. Is this patient trying to tell me something? A. Quite likely. Consider lifestyle, stress, work problems, malingering, conversion reaction



# Some practical tips to assist in generating Dx:

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- Clarify presenting symptoms
- Checklists:
  - can act as a trigger to the memory
  - can facilitate the generation of diagnostic possibilities which would otherwise not have been included
  - the most useful of these checklists are the so called “surgical sieve” and the systems and anatomical approaches respectively .
  - The anatomical approach is best suited to a consideration of presentations concerned with pain whereas the others are best used to tackle vague symptom presentations.



# Surgical sieve

- **VITAMIN CDEF**

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- **V:** vascular
- **I:** infective/inflammatory
- **T:** traumatic
- **A:** autoimmune
- **M:** metabolic
- **I:** iatrogenic/idiopathic
- **N:** neoplastic
- **C:** congenital
- **D:** degenerative/developmental
- **E:** endocrine/environmental
- **F:** functional

# Keep in mind

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- Uncommon manifestations of common conditions are more common than common manifestations of uncommon diseases.
- Simple conditions are caused by simple problems.
- Diverse symptoms and signs are commonly caused by a single disease or entity.
- If all else fails, refer to books, journals or consult colleagues.





# Difficulties that medical students face in making diagnoses

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- Gp must usually diagnose what things are not rather than what they are, which require the ability to tolerate a higher degree of uncertainty than medical students can bear.
- Improper history taking and physical examination. > limited ability to perceive and interpret diagnostic problems irrespective of the clinical context, because the way their knowledge is structured in their memory is not geared for clinical practice.
- Poor communication.
- Uncooperative patient.
- Lack of experience.
- Maintaining a focus on a particular diagnosis



# Some common errors:

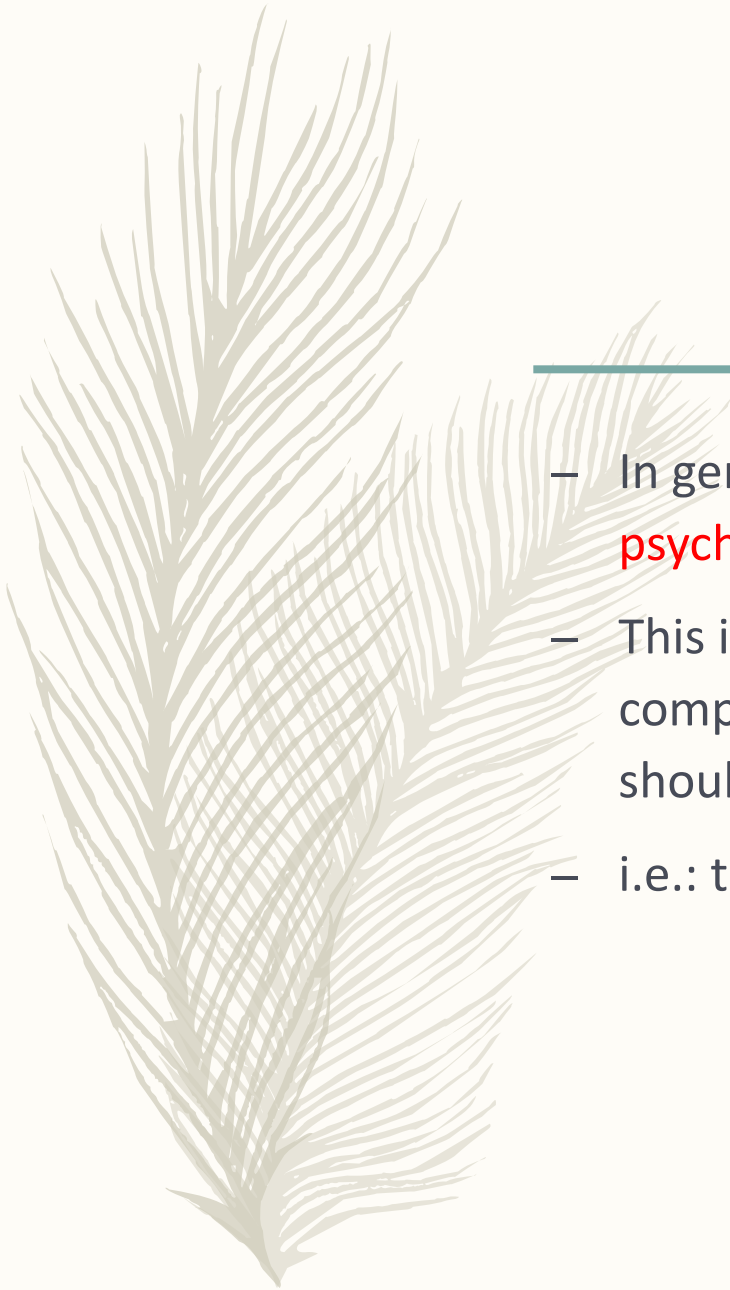
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- Unwarranted fixation on a hypothesis (focusing on a particular hypothesis, twisting all data in an attempt to fit it)
- Premature closure of hypothesis generation
- Rule out syndrome (consequence of poorly focused history taking)
- Generation of very unlikely hypothesis (novelties)

# Triple diagnosis

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- In generating diagnostic hypothesis, it is essential to think in **physical, social** and **psychological** terms.
- This is not to suggest that all disease have physical, social and psychological components in equal measures, it's just a reminder that the three aspects should always be considered at each consultation as appropriate.
- i.e.: teenager with acne vulgaris





# Methods to reach diagnosis

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- Inductive method of problem solving
- Hypothetico-deductive problem solving





# Inductive method of problem solving

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- a comprehensive history has to be taken from every patient followed by a complete physical examination, backed up by a number of investigations, many of which are a routine nature.
- Mainly used by medical students for learning purposes. ( not in actual clinical practice) unless the patient has vague symptoms and serious underlying cause cannot be excluded

# INDUCTIVE METHOD OF PROBLEM-SOLVING

Need to take a comprehensive history

System review

Complete physical examination

Investigations



Diagnosis

- may not be used by all practitioners
- time- consuming
- unfocused

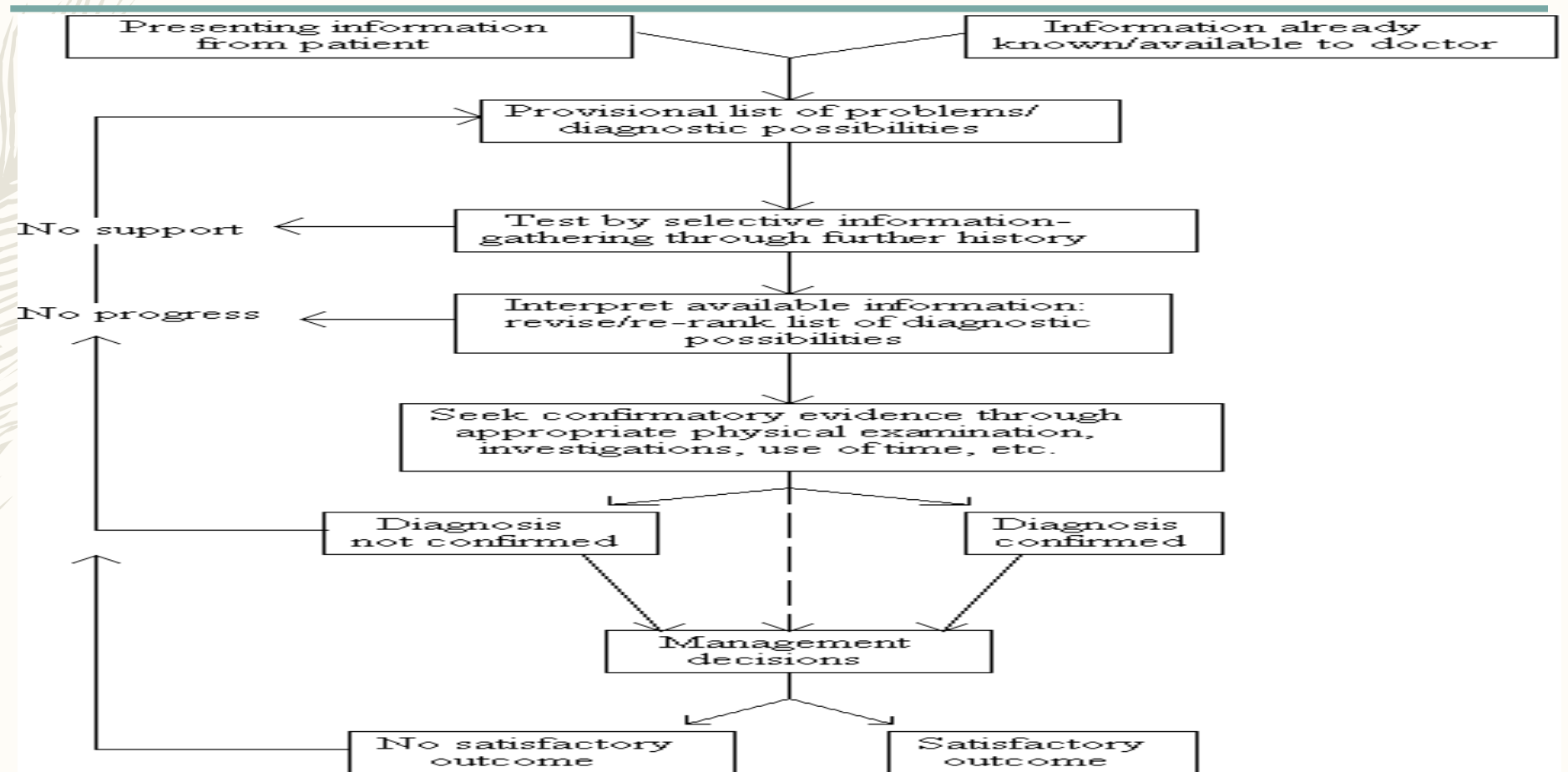


- Hypothetico-deductive problem solving

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- by educated guessing and testing (Multiple hypothesis-guided, problem oriented enquiry)
- This method is efficient as it enable doctors to solve problems with maximum time- and cost-effectiveness and minimal disturbances to the patient.
- 1- Pre-diagnostic interpretation: the doctor begins to asses the patient's problems in terms of broad categorizations rather than specific diagnostic entities.
- 2- Ask particular questions in an attempt to find support for, and to discriminate between the diagnostic possibilities he has previously generated.
- 3- Selective and discriminating approach to physical examination to provide confirmatory evidence in favor of one or more diagnostic probabilities.

## Simplified representation of the stages involved in the hypotheticodeductive diagnosis method





# Hypothetico deductive diagnosis and history taking

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- Chief complaint
- Duration                      file information
- The differential diagnosis is based on
- Probability
- Seriousness
- Treatability
- Novelty
- ( At least seven differential diagnoses arranged from most likely to the least likely ) .



- **\*History**

- Taking a proper history is the single most important step

- An ideal history must cover all of the following :

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- 1) Socrates ( for all complaints)

- Site ( can be ignored in certain situation such as dizziness )

- Onset

- Timing , duration , frequency

- Character

- Radiation

- Exacerbation and relieving factors

- Severity

- Associated symptoms : pertinent clues for each one of probability , seriousness, treatability and novelty.




## \*4 Ds :

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- 2) **D1** : Disease
  - Previous similar attacks :including Dx and Mx
  - Past medical \ surgical history
- **3) D2** : Drugs
  - For the current disease
  - Any other drugs \Herbs
  - Allergy
  - Addiction



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- **4) D3** : Diet
  - Appetite
  - Any specific diet
  - Current weight and significant changes
  - Certain diseases
  - Hydration



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## 5) D4 : Dokhan (smoking)

Marital status

Level of education Job

Alcohol consumption

Financial status

Insurance

Psychological status

Sexual history and genetics

Life cycle

(teenage until menopause)



**whole patient medicine**

# 6 ) Patient centered medicine

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## ABC

Anxiety

Beliefs

Concerns

## FEFI

Function

Expectation (cause of the problem AND management)

Feelings

Ideas

Why the patient is coming today ? (an essential question in each consultation )



# \*Physical examination

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- General appearance ; mouth breathing , paleness , jaundiced, distressed .....
- Vital signs
- Temperature
- Respiratory rate
- Heart rate
- Blood pressure
- Focused physical examination :related to the DDx list





# \*Management plan : RAPRIOP acronym

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- Reassurance and explanations
- Advice
- Prescription
- Referral
- Investigation
- Observation
- Prevention
- Patient-doctor interaction : explaining the DDx ; the cause , course and available management options , and sharing all these info with the patient
- Noting that all of the above is taking into consideration patient ' s concerns and worries .



# Inductive Vs. deductive problem solving

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<b>Inductive</b>	<b>deductive</b>
Starts with facts and details and moves to a general conclusion. (Observation -> pattern -> hypothesis -> Theory) “Bottom-up” logic	Starts with a conclusion and then explains the facts and details. (Theory -> hypothesis -> observation -> conformation) “top-down” logic



*Thank You* 😊