

Approach to the patient

LECTURE IN INTERNAL MEDICINE PROPAEDEUTICS

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Plan of the lecture

Approach to the patient

- Medical tests
- Interviewing of the patient
- Physical examination of the patient
- Instrumental methods for evaluating of the patient status
- laboratory methods for evaluating of the patient status
- Examination of patients who lack decision-making capacity
- Cost-effectiveness of patients examination

Medical test: definition

A medical test is a kind of medical procedure performed to detect, diagnose, or monitor diseases, disease processes, susceptibility, and determine a course of treatment



Medical test: types

By purpose:

- Diagnostic (to confirm, or determine the presence of disease or to exclude disease in an individual suspected of having the disease)
- Screening (to detect or predict the presence of disease in individuals at risk for disease or to exclude disease/ risk factor)
- Monitoring (to monitor the progress or regress of disease, and response to medical treatment including side effects)

By method :

- interviewing (questions asked)
- physical examination
- laboratory /instrumental (radiologic, in vivo diagnostics, in vitro diagnostics etc.)

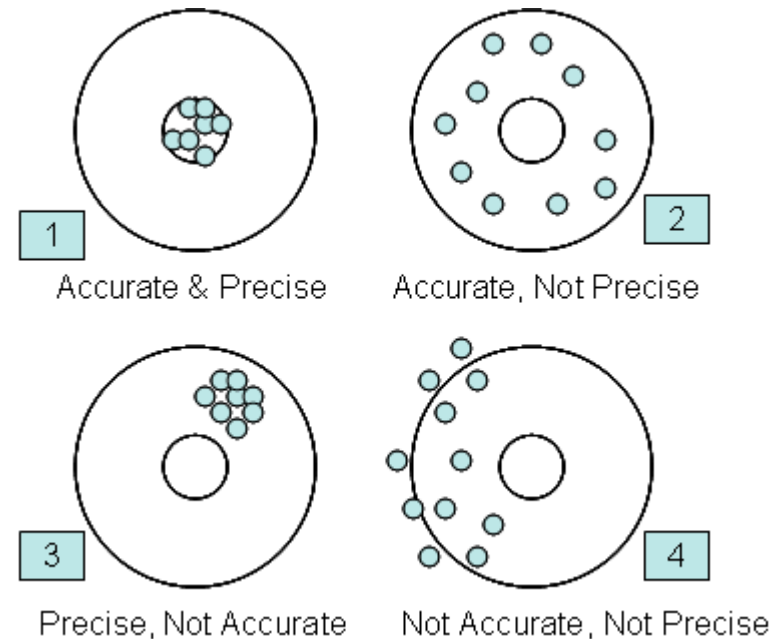
By sample location:

- blood
- urine
- sputum
- liquor, etc.



Medical test: accuracy and precision

- Accuracy of a test is its correspondence with the true value
- Accuracy is maximized by calibrating equipment with reference material and by participation in external quality control programs
- Precision is a measure of tests reproducibility when repeated on the same sample
- An imprecise test is one that yield widely varying results on repeated measurement
- The precision is monitored by using control material



Medical test: positive or negative

- The result of a test aimed to detect an entity may be positive or negative: this has nothing to do with a favorable or unfavorable prognosis, but rather means that the test worked or not, and a certain parameter that was evaluated was present or not (a negative screening test for breast cancer means that no sign of breast cancer could be found (which is in fact very positive for the patient))
- The classification of test results into either positive or negative gives a binary classification, with resultant ability to perform bayesian probability and performance metrics of tests, including calculations of sensitivity and specificity



Medical tests: three categories

- Invasive (requiring the entry of a needle, catheter, or other instrument into a part of the body)
- Minimally invasive (is carried out by entering the body through the skin or through a body cavity or anatomical opening, but with the smallest damage possible to these structures - minimally invasive endoscopy)
- Non-invasive \neq safe (X-Ray - exposure to radiation, with caution in pregnancy)



Interviewing of the patient: nature and goals

- The patient's interviewing may have greater diagnostic value than either the physical or the laboratory investigations
- More than 2/3 of diagnoses can be made on the basis of the patient's interviewing alone
- An accurate interviewing also provides focus to the physical and the laboratory examination, making them more efficient
- Clinical hypotheses generated during the interview provide the basis for a cost-effective utilization of the physical, laboratory and other diagnostic modalities
- The patient enters the interview seeking relief from the discomforts and uncertainties of illness, while the physician actively conducts the interview in order to clarify his (her) problems and derive favor diagnostic and therapeutic plans
- The interview becomes a dialogue between two (in most cases) persons driven toward a common goal

Interviewing of the patient: two couples basic approaches

First couple basic approach :

- The problem-oriented interview reflects the patient's request for help with specific problems
- The health promotion interview establishes a data baseline concerning the patient's current , past and future health problems

Second couple basic approach

- Diagnostic tasks
- Therapeutic tasks



In reality, doctors combine both couples basic types of the patient interviewing

Interviewing of the patient: three golden rules

1. Avoid "closed-ended-questions", that can be answered with a "yes" or a "no"
2. Use the patient's words, and only the patient's words
3. If a patient denies complaints involving a specific area/function, require him to confirm that there is nothing wrong with it



Interviewing of the patient: characterizing the symptoms

Every symptom can be characterized by 7 sets of bodily and emotional aspects

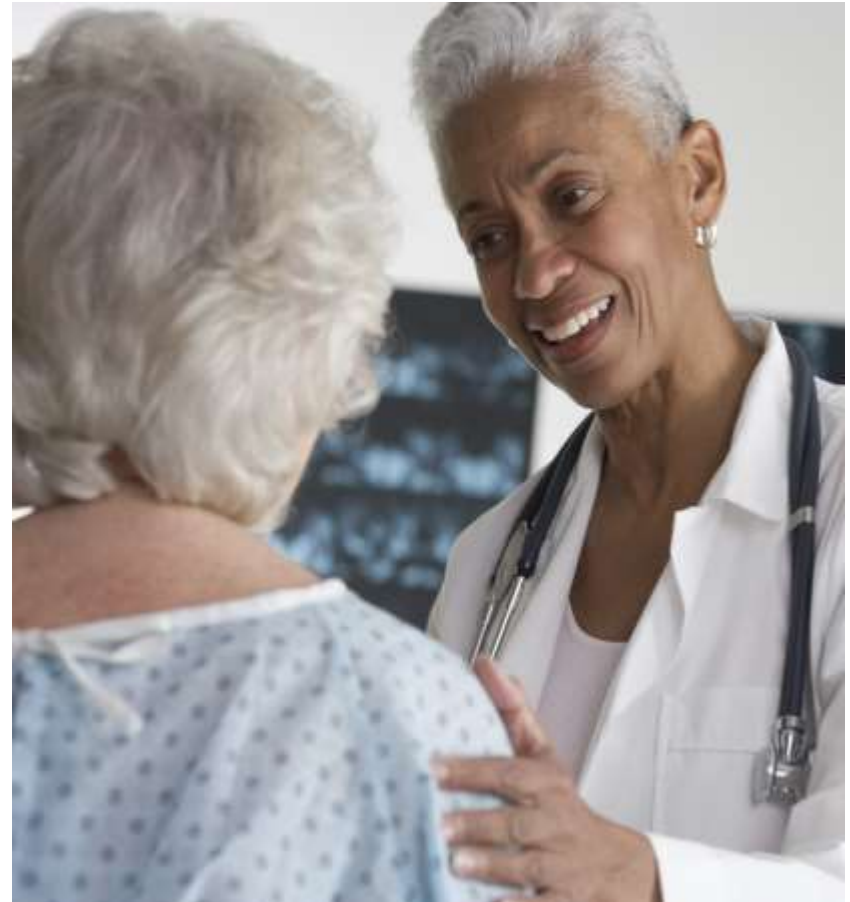
- Chronology
- Bodily location
- Quality
- Quantity
- Setting
- Any aggravating or alleviating factors
- Associated manifestations



Interviewing of the patient: the chief complaint

- The chief complaint means the primary symptom that a patient states as the reason for seeking medical care
- It is necessary ranks the symptoms in order of importance and listens for patterns that suggest disease processes
- Some symptoms will be clearly related to the chief complaint , others are unrelated or of only possible relevance

Patient may talk about embarrassing or confidential problems when rapport and trust have been deepened and occasionally bring up important issues only at the end of the encounter



Interviewing of the patient: the history of the present illness

- The history of the present illness (HPI) includes all of the patient's history, both recent and remote, that is pertinent to understanding the current illness
- It is recommend to scan the information already gathered looking for symptom complexes or diagnostic patterns
- With increasing understanding of clinical symptom complexes and diagnostic patterns ability to form more complex diagnostic hypotheses grows
- Each hypothesis is tested for validity with further specific questions



Interviewing of the patient: drug history

- Drugs used
- Dose
- Dosing schedule
- Prescriber
- Reason for prescribing the drugs
- Precise nature of any drug allergy
- Tolerance (side effects)
- Compliance to treatment



Interviewing of the patient: past history

Three key parts:

- Past Medical History (a review of past medical problems and treatments not directly pertinent to the HPI completes the past medical history) includes childhood and adult illnesses, surgery interventions, trauma, allergies and drug sensitivities (characterized in detail), obstetric/gynecologic problems in females, immunizations, and health maintenance
- Family History (medical problems in relatives ~ hereditary issues)
- Social history/Patient profile (the patient's education, occupation, marital status, usual daily activities, functional status, relationships with friends and family, social supports and stresses, financial status/insurance coverage and habits such as smoking or alcohol consumption that have known negative health consequences)



Interviewing of the patient: review of systems

- Before concluding the interview it is necessary to make review of systems (R.O.S.) to assure that all areas of the patient's health have been considered
- The entire R.O.S. should take less than 5 minutes



Interviewing of the patient: the SAMPLE helpful mnemonic system

Signs/Symptoms reported by
the patient

Allergies

Medications

Past Medical History

Last Oral Intake

Events leading to this episode
of injury or illness



*This system help us to avoid
missing important patient
assessment steps and questions*

Interviewing of the patient: three categories of problems

1. Problems with the patient (e.g., intense emotional reactions, altered mental status, unrealistic fantasies about the doctor).
2. Problems with the interviewer (e.g., an overly judgmental attitude, too directive approach in questioning, failure to listen to the patient)
3. Problems with the physician–patient relationship (e.g., a language barrier, failure to negotiate a shared goal for the encounter)



Interviewing Milestones

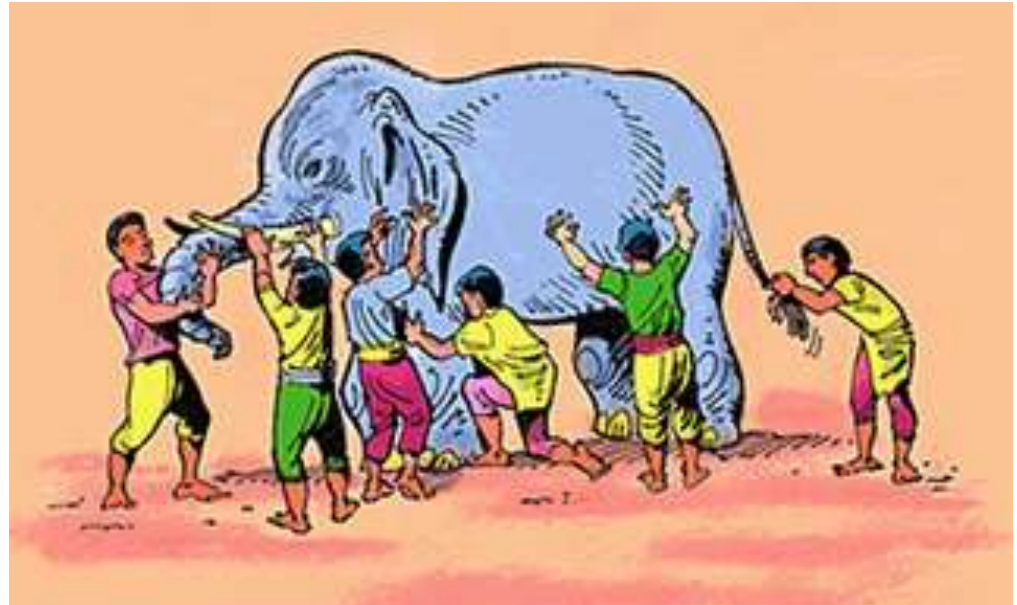
- Getting Ready. The approach to the interview taking time for self-reflection. Reviewing the chart. Reviewing your clinical behavior and appearance. Adjusting the environment. Taking notes.
- Learning About the Patient. The Sequence of the interview greeting the patient and establishing rapport. Inviting the patient's story. Setting the agenda for the interview. Expanding and clarifying the patient's story. Creating a shared understanding of the patient's concerns. Negotiating a plan. Following up and closing the interview.
- Building the Relationship. The techniques of skilled interviewing active listening. Guided questioning. Nonverbal communication. Empathic responses. Validation. Reassurance. Partnering. Summarization. Transitions. Empowering the patient.
- Adapting interview to specific situations. The silent patient. The confusing patient. The patient with impaired capacity. The talkative patient. The angry or disruptive patient. Interviewing across a language barrier. The patient with low literacy. The deaf or hard-of-hearing patient. The blind patient. The patient with limited intelligence. The patient seeking personal advice.
- Sensitive topics that call for special skills/ The sexual history. Mental health. Alcohol and drug use. Family violence. Death and dying.
- Societal Aspects of Interviewing Achieving cultural competence. Sexuality in the clinician–patient relationship. Ethical considerations.

Physical examination of the patient: definition

Physical examination is the process of evaluating objective anatomic and functional findings through the use of observation, palpation, percussion, and auscultation

The information obtained must be thoughtfully integrated with the patient's history

The physical examination, thoughtfully performed, should yield 20% of the data necessary for patient diagnosis and management

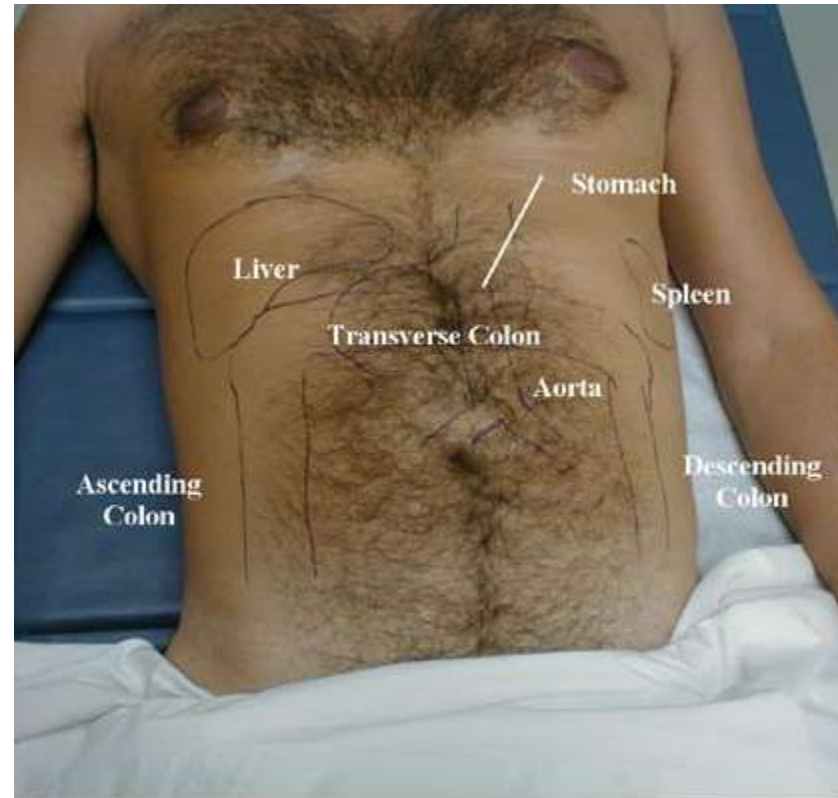


Physical examination of the patient: requirements

- The observer should examine the patient in privacy, preserving the patient's modesty before and after the physical examination
- The observer should not assist a patient to dress or undress unless the patient is having difficulty and requests assistance
- The observer should avoid making inappropriate verbal or non-verbal expressions during the examination
- The observer should ensure the examination is not interrupted by phone calls or other unnecessary interference
- Following an examination or investigation, the findings should be communicated to the patient
- Intimate examinations such as examination of the genitals, breasts, or internal examinations can cause particular distress; gloves should always be worn when conducting an intimate or internal examination
- Observers should be aware that patients have their own views regarding what constitutes an intimate examination

Physical examination of the patient: types

- Routine physicals are performed on asymptomatic patients for medical screening purposes
- Comprehensive (executive) physicals typically supported by laboratory tests, chest x-rays, pulmonary function testing, audiograms, full body CAT scanning, EKGs, heart stress tests, vascular age tests, urinalysis, and mammograms or prostate exams depending on gender
- Pre-employment examinations (clearance) are screening tests which judge the suitability of a worker for hire based on the results of their physical examination
- Insurance exams are performed as a condition of buying health insurance or life insurance



Physical examination of the patient: the context

Some medical history about the patient is available at the time of the physical examination

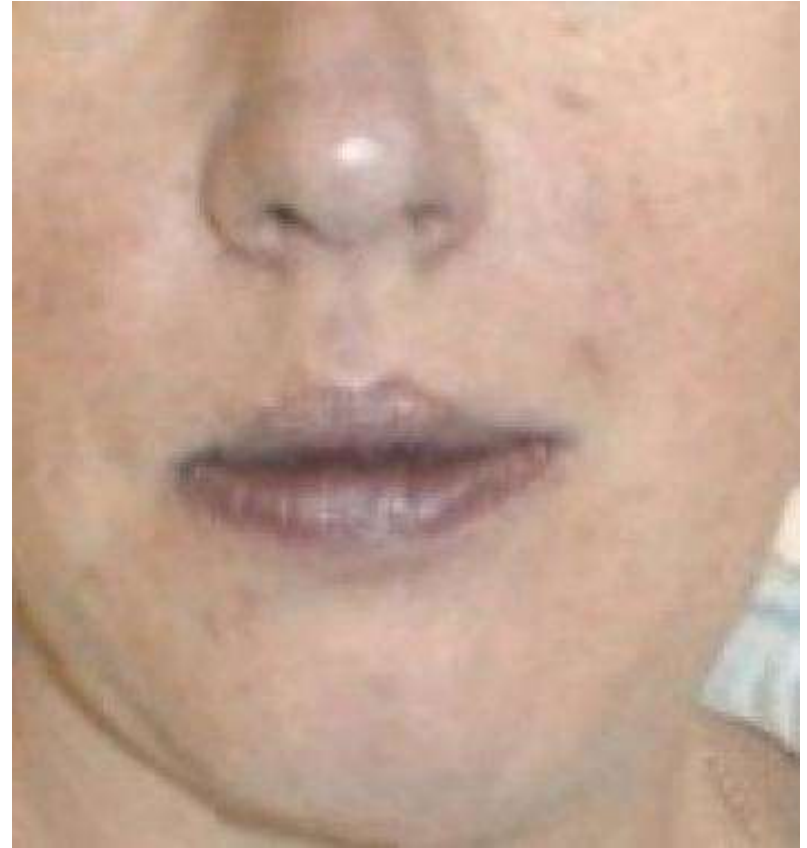
Information pertinent to the physical examination can be learned from observation of speech, gestures, habits, gait, and manipulation of features and extremities

Interactions with relatives and staff are often revealing

Skin color changes such as cyanosis, jaundice, and pallor may be noted

Sweating, blanching, and flushing may provide clues about vasomotor tone related to mood or physiologic abnormalities

Aspects of patient habits, interests, and relationships can be ascertained from pictures, books, magazines, and personal objects at the bedside



Physical examination of the patient: the physician–patient interaction

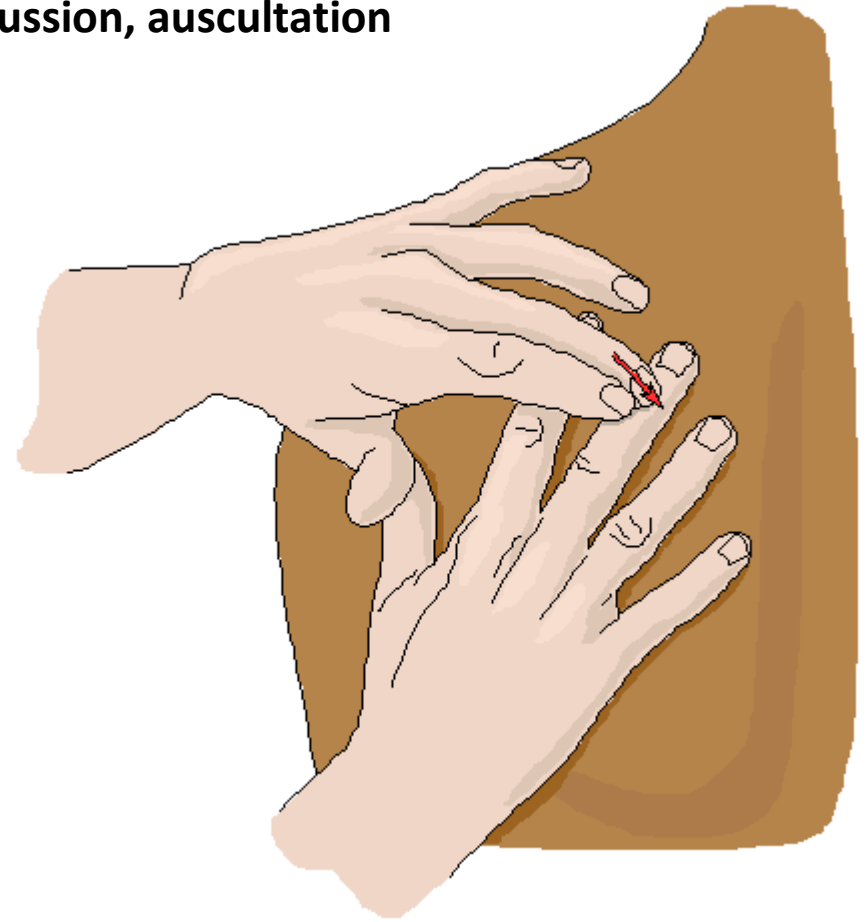
- Aside from the office, physical examination may occur in a variety of settings where it is difficult to establish privacy and quiet
- The patient should be addressed politely and asked to perform the required maneuvers of the examination
- Patients should be prepared for unpleasant portions of the examination
- An examination that ends abruptly may diminish the value of the doctor–patient relationship and may destroy its therapeutic content
- The patient may benefit from a brief summary of relevant findings and may require reassurance about what has and has not been found



Physical examination of the patient: four parts

Each organ system ought to be examined in the same order: I. P. P. A.
– inspection, palpation, percussion, auscultation

- Inspection: looking for signs
- Palpation: feeling for signs
- Percussion: tapping for signs, used when doing a lung and/or gut examination.
- Auscultation: listening using the stethoscope, or in olden times, purely listening with direct ear.



Physical examination of the patient: the tools required for the examination

- Cotton wisp
- Flashlight
- Lubricating jelly
- Mydriatic solution
- Oto-ophthalmoscope
- Paper towels
- Rectal gloves
- Reflex hammer
- Sphygmomanometer
- Stethoscope
- Tape measure
- Thermometer
- Tissues
- Tongue depressors
- Tuning fork (128 Hz)
- Vials of coffee and cinnamon

Physical examination of the patient: the examination

- As the environment affects the quality of the physical examination, it is wise to arrange for quiet and privacy, darkening the room for parts of the examination, and comfort for the patient and observer
- The complete examination should proceed in an orderly fashion with a minimum of required position shifts by the patient
- The observer must be able to ascertain the integrity of the various organ systems from regional examinations
- When examining an anatomic region, the observer must be alert to the appearance of any abnormality and question at the time the morphologic aspects of the abnormality and its clinical significance

Physical examination of the patient: positions of patient and observer

Anatomical area or activity	Patient	Observer
Vital signs, general inspection	Sitting or reclining	Standing before patient or at bedside
Head and neck	Sitting	Standing before patient
Anterior torso	Sitting	Standing before patient initially, later behind the patient
Posterior torso	Sitting	At patient's side
Anterior chest and abdomen	Supine	Before the patient
Male genitalia	Standing	Before the patient
Gait, station, coordination	Variable positions	Behind the patient
Female genitalia	Reclining on examining table, draped, knees flexed, legs adducted, feet in stirrups	Sitting on stool at times or standing

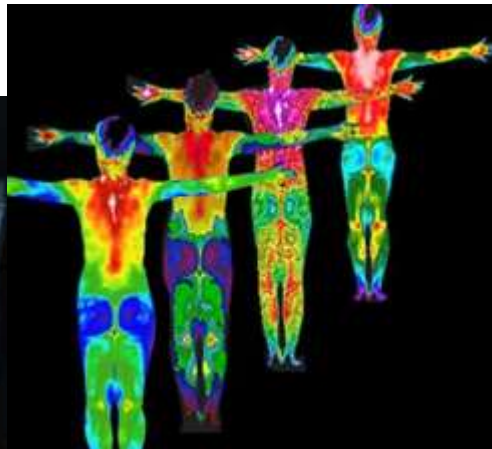
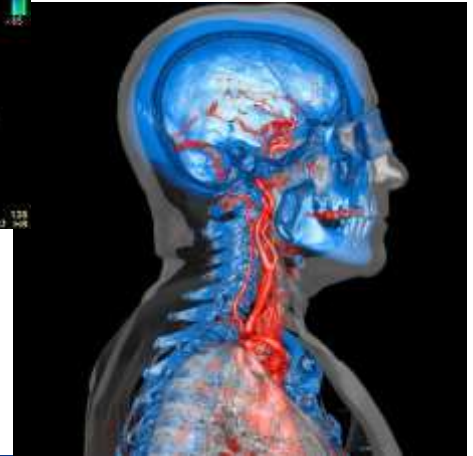
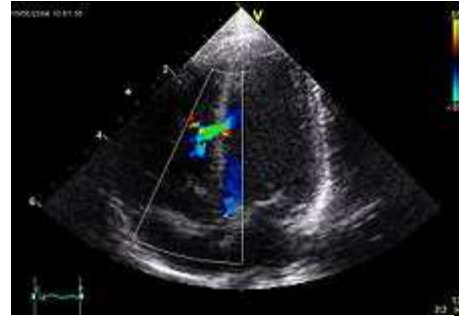
Physical examination of the patient: vital signs

- Weight
- Height
- Temperature
- Pulses
- Blood Pressure
- Respiratory rate



Instrumental methods for evaluating of the patient status: visualization

- X-ray
- Computer tomography
- Echo
- Endoscopy
- Infrared thermography
- MRI

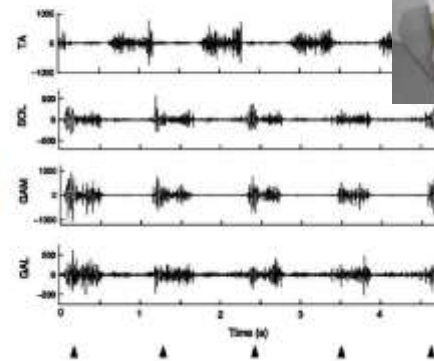
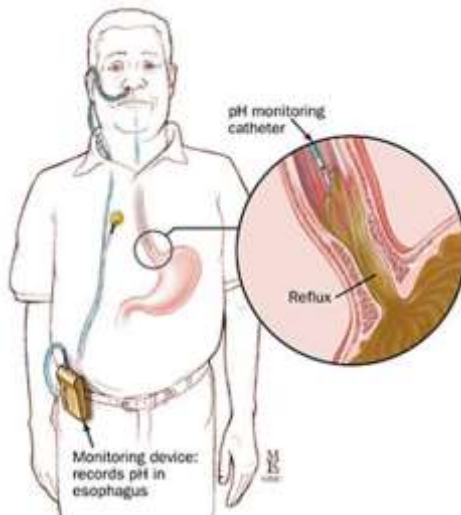
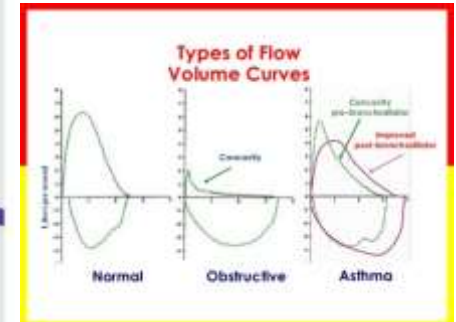
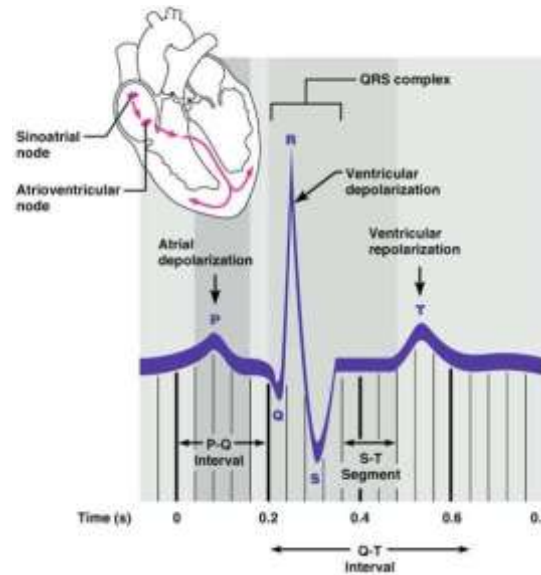


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Instrumental methods for evaluating of the patient status: physiological processes

- Electrocardiography
- Spirometry
- Electromyography
- Ph-metry



Instrumental methods for evaluating of the patient status: cardiac stress testing

Type of stress

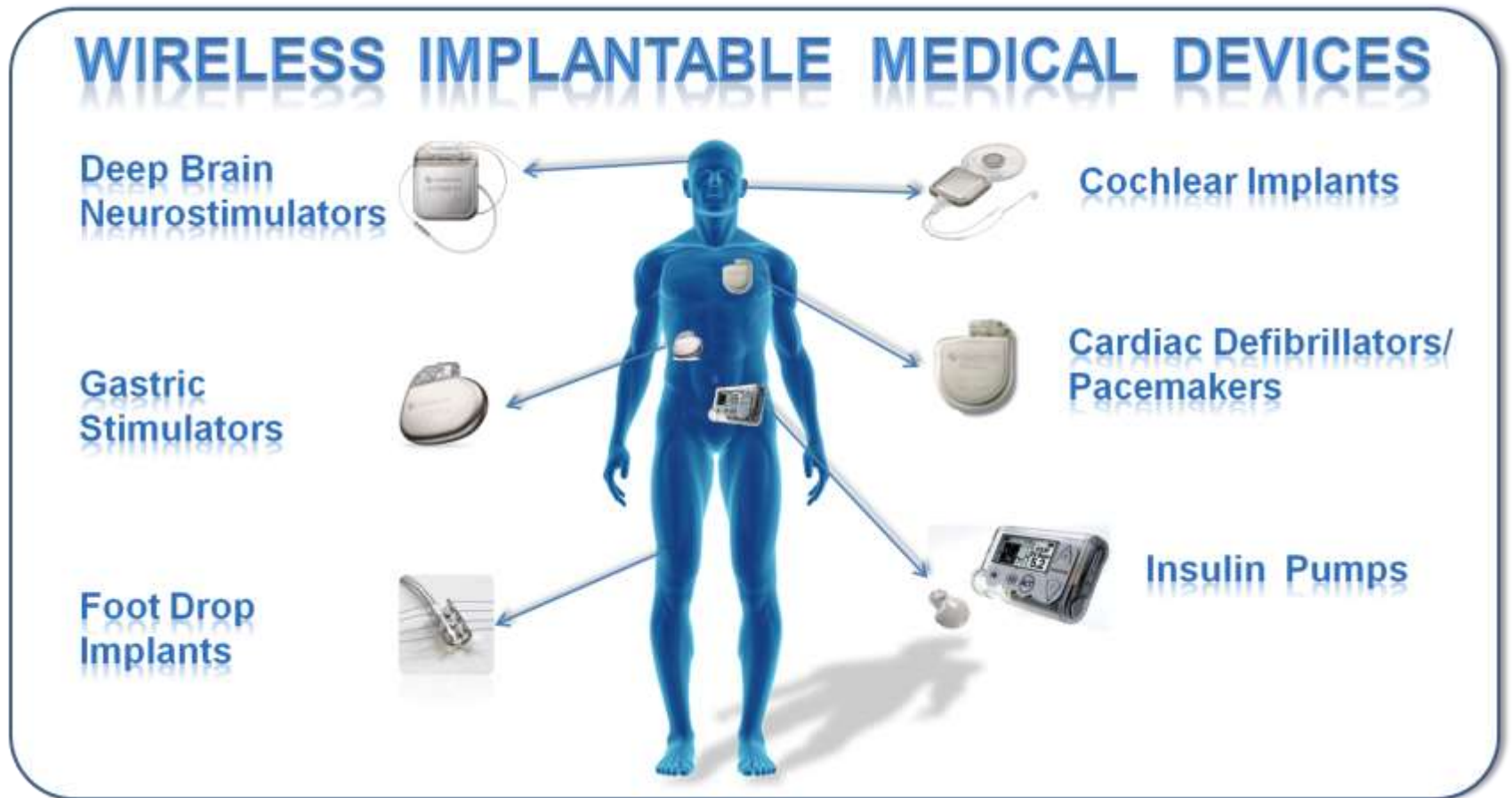
- Exercise stress tests(treadmill or ergometer)
- Pharmacological tests (simulating exercise for patients unable to exercise on a treadmill/ ergometer)

Type of investigation

- Electrocardiography
- Echocardiography
- Nuclear imaging



Instrumental methods for evaluating of the patient status: implantable devices



Laboratory methods for evaluating of the patient status: complete blood count

Type of Cell	Increase	Decrease
<u>Red Blood Cells</u> (RBC)	<u>erythrocytosis</u> or <u>polycythemia</u>	<u>anemia</u> or <u>erythroblastopenia</u>
<u>White Blood Cells</u> (WBC):	<u>leukocytosis</u>	<u>leukopenia</u>
– <u>lymphocytes</u>	– <u>lymphocytosis</u>	– <u>lymphocytopenia</u>
– <u>granulocytes</u> :	– <u>granulocytosis</u>	– <u>granulocytopenia</u> or <u>agranulocytosis</u>
– – <u>neutrophils</u>	– – <u>neutrophilia</u>	– – <u>neutropenia</u>
– – <u>eosinophils</u>	– – <u>eosinophilia</u>	– – <u>eosinopenia</u>
– – <u>basophils</u>	– – <u>basophilia</u>	– – <u>basopenia</u>
<u>Platelets</u>	<u>thrombocytosis</u>	<u>thrombocytopenia</u>
All cell lines	–	<u>pancytopenia</u>

Laboratory methods for evaluating of the patient status: comprehensive metabolic panel

Specimen	Normal Range ^[3]	Units
Albumin	3.9 - 5.0	g/dL
Alkaline phosphatase	44 - 147	IU/L
ALT (alanine aminotransferase)	8 - 37	IU/L
AST (aspartate aminotransferase)	10 - 34	IU/L
BUN (blood urea nitrogen)	7 - 20	mg/dL
Calcium	8.5 - 10.9	mg/dL
Chloride	96 - 106	mmol/L
CO2 (carbon dioxide)	20 - 29	mmol/L
Creatinine	0.6 - 1.1 (women) ^[4] 0.7 - 1.3 (men)	mg/dL
Glucose	70 - 100	mg/dL
Potassium	3.7 - 5.2	mEq/L
Sodium	136 - 144	mEq/L
Total bilirubin	0.2 - 1.9	mg/dL
Total protein	6.3 - 7.9	g/dL

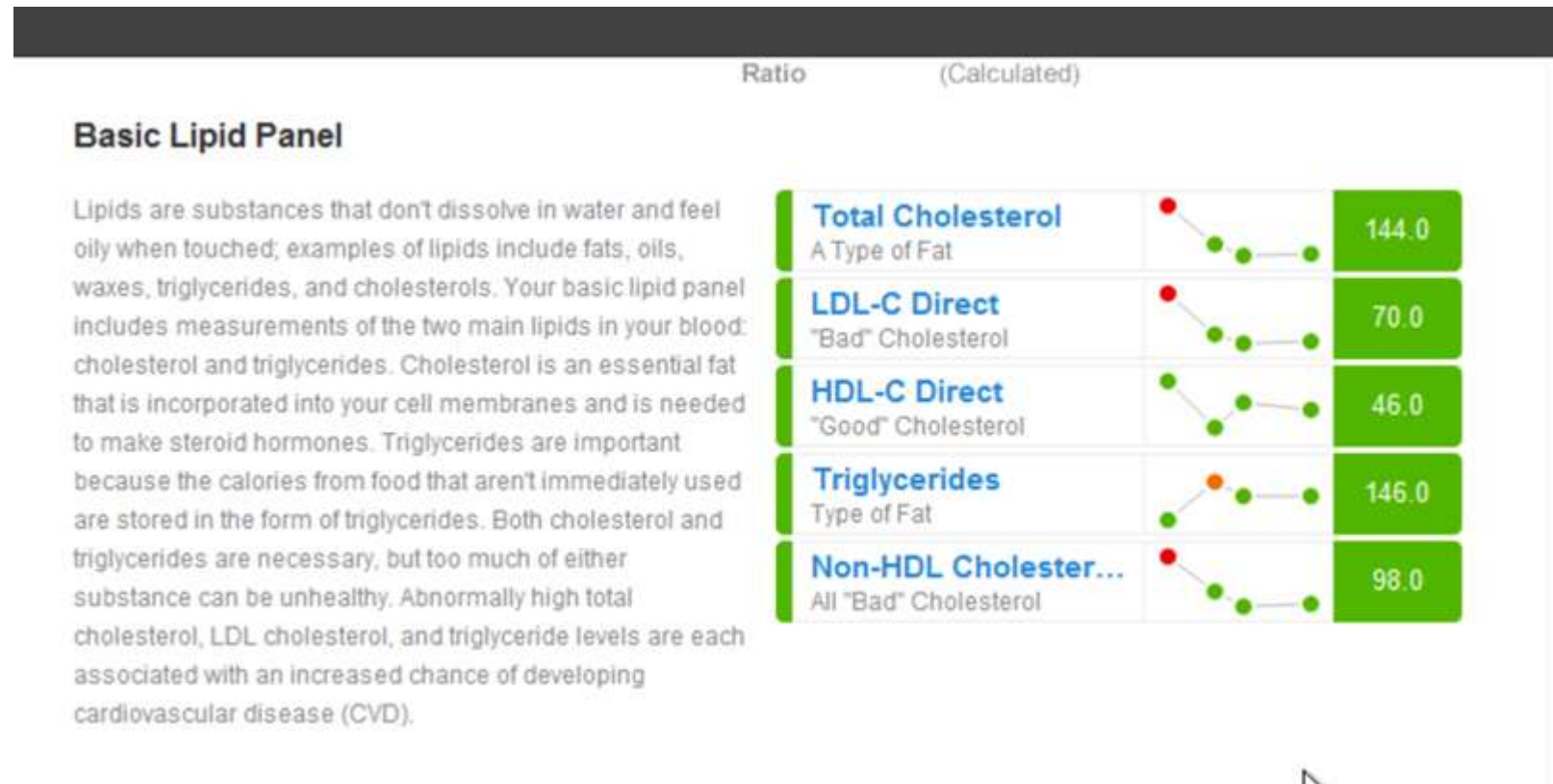
Laboratory methods for evaluating of the patient status: hepatic function tests

Specimen	Normal Range ^[3]	Units
Aspartate aminotransferase (AST)	0-42	U/L
Alanine aminotransferase (ALT)	♥ 0-20; ♠ 0-35	U/L
Alkaline phosphatase (ALP)	♥ 39-118; IU/L ♠ 41-137 IU/L; ♦ 95-368	U/L
Bilirubin	0-1.2	mg/dL
Blood Urea Nitrogen (BUN)	10-20 mg/dL; ♦ 5-18 mg/dL; ♦ 3-12	mg/dL
Creatine (Cr)	♥ 0.6-1.2 mg/dL; ♠ 0.7-1.3 mg/dL; ♦ 0.2-1.0	mg/dL
BUN to Creatine Ratio (BUN: Cr)	varies	
Uric Acid	3.5 and 7.2	mg/dL
Ammonia	15 – 45	mcg/dL

Laboratory methods for evaluating of the patient status: cardiac markers

Specimen	Normal Range ^[3]	Units
Troponin T	< 0.1	ng/mL
Troponin I	< 0.03	ng/mL
Total CK Creatine kinase (CK-T)	30-135, 55-170	IU/L
Creatine kinase-MB (CK-MB)	5	ng/mL
β-type natriuretic peptide (BNP)	0.5-30	pg/mL

Laboratory methods for evaluating of the patient status: lipid panel



Laboratory methods for evaluating of the patient status: coagulation studies

Specimen	Normal Range	Units
Prothrombin Time (PT)	10-13	seconds (for blood sample to coagulate)
International Normalized Ratio (INR)	2.0-3.0	(patients on warfarin therapy)
Partial Thromboplastin Time (PTT or aPTT)	20-36	seconds

Laboratory methods for evaluating of the patient status: thyroid hormones

Specimen	Normal Range	Units
Thyroid Stimulating Hormone (TSH)	0.4 – 4.0	mIU/L (milli-international units per liter)
Triiodothyronine (T3)	2.3- 4.2	pg/mL
Thyroxine (T ₄)	0.8 – 1.8	ng/L
Anti-thyroid peroxidase antibodies (TPO-Ab)	Anti-thyroid antibodies are evaluated through the use of a highly sensitive radioimmunoassay system (Wakita, Nagasaki, Nagata, Imanishi, Yamada, Yoda, Emoto, Ishimura, & Inaba)	
Anti-thyroglobulin antibodies (Tg-Ab)		

Laboratory methods for evaluating of the patient status: pH, arterial blood gases, oxygen

Specimen	Normal Range	Units
pH	7.34 ^[8] -7.44 ^[8]	
H ⁺	35–45	n ^{mol} /L(n ^M)
Arterial ^{oxygen partial pressure} (P _a O ₂)	11 ^[9] -13 ^[9]	kPa
Arterial ^{carbon dioxide partial pressure} (P _a CO ₂)	4.7 ^[9] -6.0 ^[9]	kPa
HCO ₃ ⁻	22–26	mEq/L
^{SBC_e}	21 to 27	mmol/L
^{Base excess}	-2 to +2	mmol/L
<i>total</i> CO ₂ (tCO ₂ (P) _c)	23 ^[13] -30 ^[13]	mmol/L
O ₂ Content (C _a O ₂ , C _v O ₂ , C _c O ₂)	Vol	% (mL oxygen/dL blood)

Laboratory methods for evaluating of the patient status: immune system and inflammatory markers

Specimen	Normal Range	Units
Erythrocyte Sedimentation Rate (ESR)	3 - 13	mm/hr
C-Reactive Protein (CRP)	> 3.0 = high risk for cardiovascular disease	mg/L
Antinuclear Antibody Panel (ANA)	The panel is obtained to detect signs of certain conditions such as autoimmune disease	

Laboratory methods for evaluating of the patient status: urine studies

Specimen	Normal Range	Units
Specific Gravity of Urine	1.005-1030	mm/hr
Urine Osmolality	300-900	mOsm/kg/24 hours
Creatinine Clearance	♥ 84, ♠ 90	mg/min/173 m ² of body surface
Urine Sodium Concentrate	10-20	mEq/L
Urine Output	1,000-2,000	mL/day

Laboratory methods for evaluating of the patient status: microbiologic examination

Test	Clinical Significance
Urine Culture	To diagnose a urinary tract infection
AFB Culture	To help identify a mycobacterial infection, to diagnose tuberculosis, to monitor the effectiveness of treatment
Herpes Culture	To screen for or diagnose infection with the herpes simplex
Rapid Beta Screen	To determine if a sore throat (pharyngitis) is caused by a Group A streptococcal bacteria ("strep throat")
Chlamydia Screen	To screen for or diagnose chlamydia infection
GC Screen	To screen for Neisseria gonorrhoeae, which causes the sexually transmitted disease gonorrhea
MRSA Screen	To identify the presence of S. aureus, to determine whether it is a MRSA strain, and to evaluate the staph's susceptibility to available antibiotics
VRE Screen	VRE are specific types of antimicrobial-resistant staph bacteria

Laboratory methods for evaluating of the patient status: fecal analysis

Test	Clinical Significance	Normal Range
Blood	To screen for gastrointestinal bleeding, which may be an indicator of colon cancer	Negative
C Difficile Toxin	To detect the presence of Clostridium difficile toxin	Negative
Giardia Specific Antigen	To detect protein structures on the giardia parasite	Negative
White Blood Cells (WBC'S)	WBC may be present in the stool when there is a bacterial infection	None Seen

Examination of patients who lack decision-making capacity

- Patients who lack decision-making capacity (such as children) require a surrogate decision-maker to consent to the examination. A familiar individual such as a family member or carer should generally accompany an individual during the examination



Cost-effectiveness of patients examination

- Cost-effectiveness analysis compares the costs and health effects of an intervention to assess the extent to which it can be regarded as providing value for money
- It is necessary to distinguish between independent interventions and mutually exclusive interventions
- For independent interventions, average cost-effectiveness ratios suffice, but for mutually exclusive interventions, it is essential to use incremental cost-effectiveness ratios if the objective – to maximize healthcare effects given the resources available – is to be achieved
- Cost-effectiveness ratios should be related to the size of relevant budgets to determine the most cost-effective strategies



Glossary of patients examination' terms

Internal Medicine Definitions and Terms