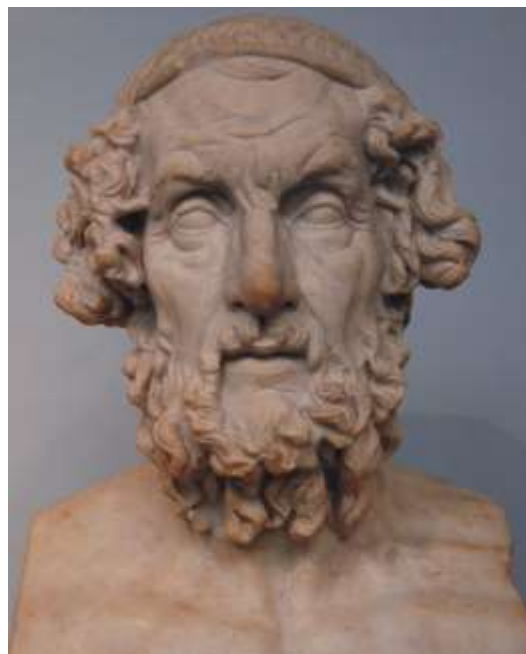


Unit 3 – Medical Practice in Antiquity



Aristotle University of Thessaloniki

Medicine in Homer's times

- Homer on medicine → to show his poetic ability NOT his medical capacity
- Mycenaean civilization described (1580-1200 BC) ← with cultural elements from Homer's era → unknown era of described medical info
- Everything is possible, even miracles

Religious & theocratic medicine:

- rage of gods → cause of disease
- gods cure → rituals for appeasing them

Assumption that Homer was a physician → no proof



MS 2628
Homer: The Iliad XVI:2 - 14, 32 - 37, 40 - 43, 47 - 61, 75 - 91. Egypt, 1st c. BC - 1st c. AD

**Manuscript of Iliad in papyrus (1st c. BC- 1st c. AD) found in Egypt, located
now in Bibelmuseum, Münster, Germany**

Heroes with medical abilities

Machaon & Podalirius: children of Asclepius

- no war virtues are mentioned
 - *“good healers”*: learned medical art from their father
-
- Arctinus: “To one of them, his father gave lighter hands, to extract arrows from the flesh, to cut flesh and to heal wounds. To the other one, he granted the ability to recognize and understand the unseen within the human body and to heal the incurable”
 - Machaon = “surgeon”, Podalirius = “internal medicine”



Asclepius - Asclepieia



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Asclepius

- of Apollo
- Father of Machaon & Podalirius
- God? Hero? Mortal?
- Student of centaur Cheiro
- Healed with medicaments/surgery/chants
- He even resurrected → Pluto became raged → killed by Zeus
- Always holds a rod where a snake is coiled up
 - Rod = supports and allows doctors to rest
 - Snake = symbol of renewal and rejuvenation



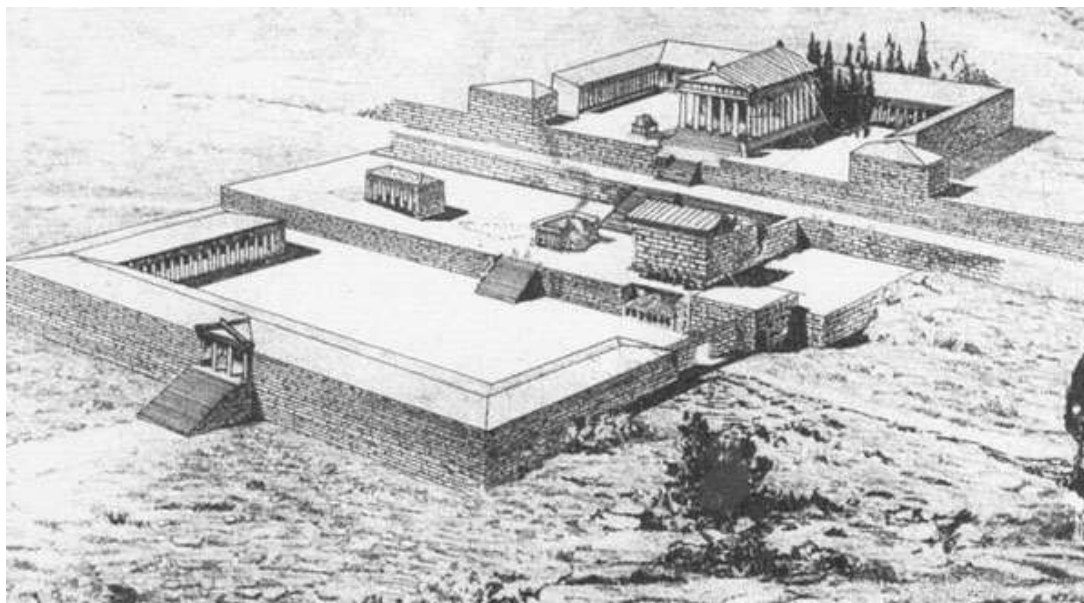
Asclepius

Worshiped in the Asclepieia

Asclepieia = temples-treating centers

Huge complexes consisting of:

- **Buildings for**
 - treatment
 - hosting
 - entertainment (theaters, stadiums, performing arts, hippodromes, libraries, etc.)
- **Temple of Asclepius**
- **«Katagogion» (“hotel”)**
- **Tholos / Thymele**
- **Avaton (where god was supposed to treat the patient)**



Asclepius

Procedure:

- preliminary purification (baths, abstinence from foods/drinks)
- overnight in the Avaton waiting for a therapeutic dream
- appearance of the high-priest pretending to be Asclepius and application of therapeutic method



Asclepius

Therapeutics:

Appearance of the healer/god, accompanied with a snake or a dog

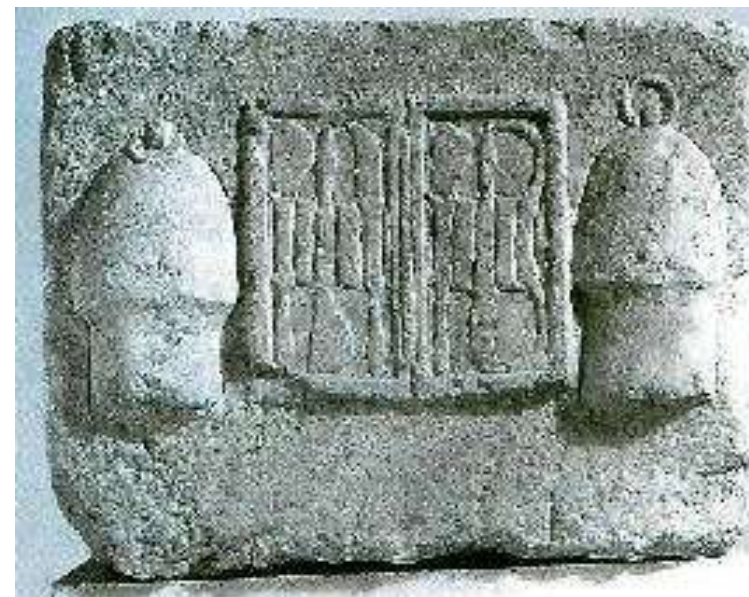
Cure with

- touch
- medicament
- surgery
- bandaging

The dog often licked the trauma

Most often healed:

- blind
- deaf
- paralyzed
- suffering from insomnia



Pre-Socratic philosophers

- None was a physician
- Exploration of the world
- Use of observation and logic

Question: which is the primary substance?

•Empedocles: 4 elements: air, water, earth & fire

→4 corresponding powers or qualities (cold, moist, dry & warm)

Thus:

Warm+ moist=Air

Cold+moist=Water

Warm+dry=Fire

Cold+dry=Earth

Hippocratic era

Existing medical schools

School of Knidos

Older

Classification of illnesses:

7 illnesses of the bile

12 illnesses of the bladder

4 illnesses of the kidneys

4 stranguries

3 tetani

4 jaundices

3 phthises

Simple observation

Simple description of symptoms

School of Cos

Highlighting of common characteristics in illnesses

Exact and systematic description of symptoms

Prognosis

HIPPOCRATES

Main characteristics of Hippocratic medicine

- 1) Against any supernatural explanation for the cause of disease: natural causes of every illness
- 2) Nature = the main therapeutic factor. Best method = use of “contraries”
- 3) “Diet” = the way a person should organize his life (food, sleep, exercise, sex, etc)
- 4) Observation = main diagnostic method

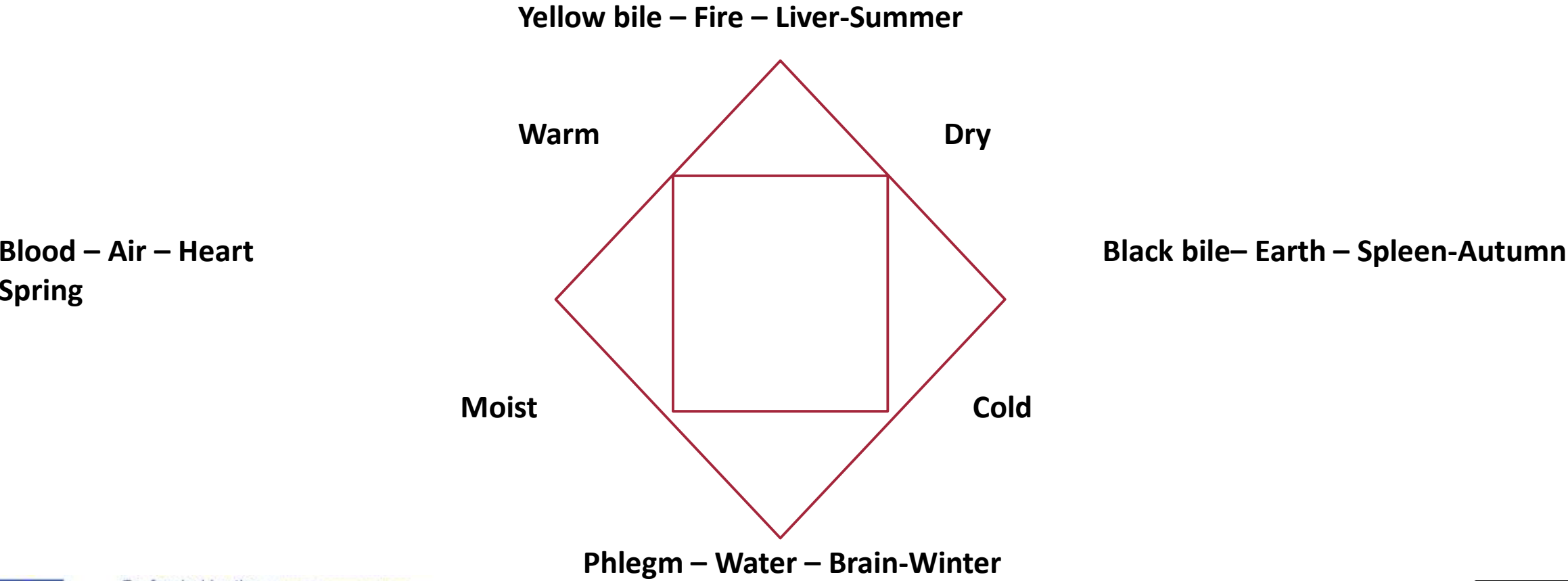
Main Hippocratic teachings

- Beginning of disengagement of medicine from theocratic beliefs:
«With the disease called sacred, here is how it is: I do not believe at all that this disease is more divine than the rest of the diseases or more sacred. I believe that for this one there is a natural cause like for the rest»



Need for a logical interpretation for etiology of diseases→
New system of “physiology” & “internal medicine”

- 4 basic elements (air, fire, earth, water)
- 4 humors (blood, yellow bile, black bile, phlegm)
- 4 organs related to the 4 humors (heart, liver, spleen, brain)
- 4 qualities related to the humors (warm, dry, cold, humid)



Heat = vital agent

Pneuma = necessary for physiology

Liver: creates blood → vivified in the heart with existing “innate heat”

Pneuma: vivified in the heart → for sensory and motor functions

Brain = center of thought, motion and sense

Cause of diseases = Humoral imbalance

Etiology of humoral imbalance

- Main cause= environment
- Temperament (physical / mental condition of each person)
- Heredity (!!)

Environment:

- climate	- sunlight
- soil	- water
- season	- dietary habits
- winds	

Heredity: first appearance of hereditary factor (e.g. epilepsy = an illness passing from one generation to another)

Hippocratic clinical method

Classification of diseases:

According to distribution: epidemic / endemic / sporadic

According to course: acute / chronic

“Protocol”

- 1) Medical history
- 2) Clinical examination: survey of the body, including posture, nourishment, color of face, odor, digestion, obvious alterations of the viscera, excretions (perspiration, feces, vomits, excretions, urine). For urine: check of the quantity, color, smell, existence of residues or nebula
- 3) Checking temperature with hand on the chest
- 4) Checking of pulse
- 5) Palpation of the patient
- 6) Auscultation:
 - e.g in pleuritis: sound of friction in accumulation of secretion in the lung: rattle



Diagnostic/prognostic factors

1. Common (influencing all residents of an area)
2. Personal (influencing a specific patient)

1. Common

A) Stellar bodies (Pleiades, Arcturus, etc.)

Basic astronomical & meteorological knowledge = necessary → location of the stars=method of defining seasons

B) Seasons

Each season had standard weather conditions. Regularity promotes health ≠ irregularity promotes disease.

Regularity of weather → illnesses with expected progress = easier manageable (predictable crises) → more accurate prognosis

Typology of seasons: winter raises phlegm, spring raises blood, summer raises yellow bile and autumn raises black bile → regularity fortified the typology while irregularity complicated things much

1. Common

C) Area of residence

Each area has specific traits with impact on the temperament of residents

Example:

“Inhabitants of a region which is mountainous, rugged, high, and watered, where the changes of the seasons exhibit sharp contrasts, are likely to be of big physique, with a nature well adopted for endurance and courage, and such possess not a little wildness and ferocity” (*Airs, waters, places* 24)

2. Personal

A) Age

Specific illnesses “prefer” specific ages.

Different reaction to the same illness by patients of different age → different prognosis

Children = more vulnerable

B) Sex

Women react in different way towards certain diseases.

Certain diseases appear only in women (e.g. hysteria)

C) Family history

Some diseases were inherited from one generation to another

D) “Diet”

Dietary plan, exercise, baths, sleeping habits, sexual activity, etc. → affects temperament

Ancient diagnostic/prognostic tools

The 5 senses

1) Olfaction

Impossible to describe the smell of urine, feces, ulcers, or breath → use only for verification that something is wrong

2) Taste

Seven different types of taste → to differentiate perspiration

3) Hearing

For evaluation of breathing, coughing and flatulence

Auscultation (of little importance for Galen)

Main use: during conversation between patient and doctor (evaluate the ability to articulate, hue and quality of the voice, his will to respond frankly)

4) Touch

Use in sphymology, temperature check and palpation of thoracic / abdominal area

Ancient diagnostic/prognostic tools

The 5 senses

5) Sight

Use to examine the patient:

Examine: -urine and feces

-sleeping posture

-nails

-dryness of eyes & tongue

-tonsils & nose passages

-eye pupils

-color of cheeks

-color & dryness of skin

-presence of blood

Use to study the patient's environment:

Examine: -patient's room and house

-area of residence

-city

-wind, water, soil, etc

Ancient diagnostic/prognostic tools

Palpation

Hippocratic physicians: for differentiation of the viscera

Aretaeus of Cappadocia (2nd c. AD): for diagnosing ascites and peritoneal abscess

Diagnosis of ascites in Aretaeus:

“by applying the hand and pushing the lower part of the abdomen: because the fluid will move to other parts”

Diagnosis of peritoneal abscess in Aretaeus:

“if the collection may not be found under the pleura, this means that the peritoneum suffers. If palpation is applied, the hand sank in the body”



Ancient diagnostic/prognostic tools

Auscultation

Hippocratic use for the diagnosis of empyema

«Empyema» = collection of pus in thorax (most common), uterus, bladder, ear, etc.

Cause: -due to introduction of a foreign body in the lung
-due to pre-existing *peripneumonia* or pleuritis

Preliminary symptoms: fever, shivering, pain in the thorax with sense of burden

Symptoms: fever (higher in night), red eyes, perspiration, cough, convex nails, edema in lower extremities, anorexia

Ancient diagnostic/prognostic tools

Auscultation

Hippocratic use for the diagnosis of empyema

Diagnostic techniques:

- Shaking and auscultation (sound of waive) → fluid in the hemithorax
- If no sound when shaking → palpation of the thorax: empyema exists in the swollen and painful part

Treatment

Thoracostomy and drainage with the aid of tube



— XXIII —
LA MÉDECINE HUMORISTIQUE

Deuts. original

PAR GILB



AUSCULTATION FINE

Feststellt... du silence respiratoire.

— 801 —

Ancient diagnostic/prognostic tools

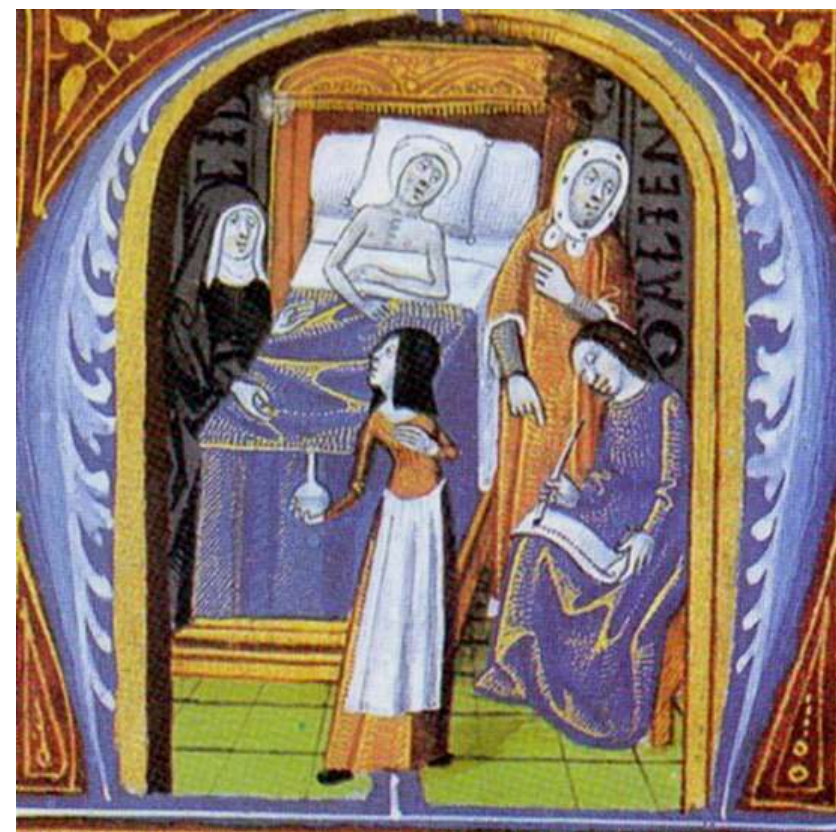
Uroscopy

Sources

- Hippocratic *De urinis*
- Galen *De urinis*
De signis ex urinis
- Magnus of Emesa (3rd-4th c. AD) *De urinis*
- Stephanus Athenaeus or Alexandrinus (~550-620)
De urinis
Scholia in Magni sophistae librum de urinis
- Theophilus Protospatharius (7th or 9th c. AD)
De urinis

And many more...





Hippocratic therapeutics

“First, do no harm”

«What medicaments do not cure, the scalpel may cure. What the scalpel does not cure, fire may cure. What fire does not cure, should be considered as incurable» *Aphorisms VII, 87 and IV, 608*

Three factors for successful treatment:

- curable illness
- cooperative patient
- knowledgeable doctor

- Diet (food for amelioration of digestion and facilitation of evacuations)
- Reasonable use of medicaments
- Surgery
- Trepanations
- Thorax paracentesis and abscess drainage
- Hemorrhoids
- Amputations
- Orthopedics
- Embryotomy
- Gynecological operations
- Ophthalmological operations
- Nose diseases (e.g. polyps)



Hemostasis: use of medicinal plants, cold plasters, raising of limbs, pressing bandages and cautery

Trauma and bone surgery: development. Suture or dry bandages. If rupture had occurred, suppuration was desirable

Good knowledge of osteology

Excellent technic of bandaging and resetting a bone

“It is not thus something great to handle a broken hand: it is, to say, every doctor’s job”



Hellenistic period

Alexandria: established in 332 BC by Alexander the Great

Under the Ptolemies (successors of Alexander): economic, artisanal, business center, shelter for philosophers, artists, scholars, and physicians)

Permission to perform dissections

Hellenistic period

Herodotus: “Egypt is full of doctors” and “The Egyptians, together with the Libyans, are the healthiest people)

Permission to perform dissections and maybe (??) on living humans: “it is not in reality inhumane to sacrifice a few criminals in view of finding cures for the innocent people” (Celsus)

Herophilus:

Anatomist (only fragmenta from his texts)

Discernment between nerves and blood vessels

Discernment of lymphatic vessels (they contain blood & milk)

Discernment between arteries and veins

Discernment between brain and cerebellum

Brain = main organ of the nervous system

Medicine needs three types of knowledge:

- knowledge on health: anatomy, physiology
- knowledge on diseases: internal medicine
- knowledge of generic elements: therapeutics

Use of pulse/diet

Treatment based on experience and clinical observation

Numerous medicaments

A good doctor is qualified in both theory and practice

An excellent doctor is the one who tells the difference between possible and impossible

Erasistratus

Physiologist

Study of nerves and blood vessels

“Triple-web” (*triploikia*) = presence and relation of three elements in every organ (nerves, arteries and veins)

Description of heart and valves

Description of liver

Theory of pneuma = inhalation->air to the left part of the heart → forwarded to the whole body as “vital spirit” / air to the brain, as “psychic pneuma”, forwarded to the body for movement and sense

No to Hippocratic humoral theory

Yes to stereopathology (the seat of the diseases lies in the solid organs)

No to pulse, cathartics, bleeding, enemas

Yes to few medicaments, leeches, cautery, cataplasms, diet.



Alexandrine physicians

3 types of therapeutic methods

1. Diet
2. Medicaments
3. Surgery (subtypes: phlebotomy, cautery, trephination, etc)

Herophileans: development of surgical gynecology and obstetrics

Erasistrateans: invasive surgery and traumatology

Hemostasis: Hippocratic measures were found insufficient

- use of venesection for hemostasis (with artificial interception of bleeding to the area of hemorrhage)
- first reports of ligation
- firm tampons

Alexandrine surgeons

Sources for 14 surgeons

Examples:

Menodorus (Erasistratean, 1st half of the 1st c. AD)

In a skull fracture, he cut and removed the bone part that penetrated (the Hippocratic physicians waited until external suppuration)

Philoxenus (~150/100 BC)

Discerned 2 types of cancer:

- “hidden” cancers with ulcer (in uterus and bowel)
- “ulcered” cancers

Menes from Sidon (~ 50 BC-10 AD)

Surgery of growths

Diseases of the umbilical area

Fistulae

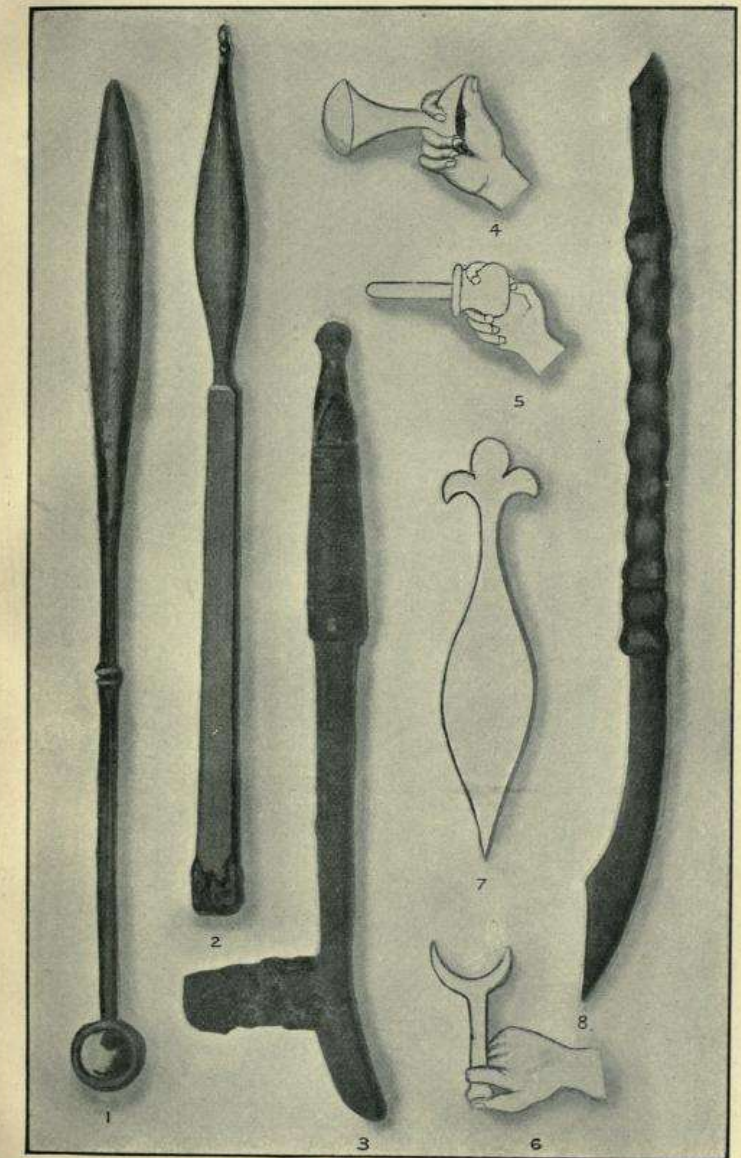
Creates a special chisel for lithotomies

Ammonius (~50 BC-10 AD)

Stones in the bladder and lithotripsy

«but if such a stone in the bladder is big enough and has such an appearance, this could only be extracted with reaming of the neck of the bladder. This is reason why someone should break it. Ammonius, the finder of the above method, carried the name “lithotomist”. The operation is done in the following way: a convex hook is applied on the stone in a way that it holds the stone firmly, to avoid it falling back in the bladder. Then, we take an instrument of medium thickness, with thin but blunt end. We direct it to the stone and break it from one side with a single hit. We must be very careful so that the instrument not to reach the bladder or any part of the broken stone to cause injuries»

No 4 is closer to the descriptions



Size of originals.	Museum.	Size of originals.	Museum.
1. 15 ^{cm}	Montauban	4, 5, 6.	Hypothetical
2. 13 ^{cm} , 5	Bibliothèque Nationale	7.	After Albucasis
3. 12 ^{cm}	Naples	8. 14 ^{cm}	Orfila

Roman Medicine

Conquest of Alexandria by the Romans = end of the Hellenistic period (33 BC)

Rome = new capital

Medicine inherited by the local Etruscans

Primitive medicine

Cause of diseases: gods and demons

Cure: prayers & invocations

Augury – liver divination

Use of medicinal herbs (mainly turnip) & wine / development of hygiene

The Romans feared that the enslaved Greek physicians were going to poison them

Galen

Characteristics of a doctor:

- **excellent knowledge of:**
 - ✓ **general medical theory**
 - ✓ **therapeutic methods**
 - ✓ **specialized methods of diagnosis of specific pathological entities**
- **understanding of basic components of human body and their organization into structures**

Galen

Basic components: four humors, four elements and four qualities (Hippocratic theory).

- **Four qualities: inherent in the anatomical structures;**
- **Anatomical structures: organized in two forms:**
 - ✓ **in *homoiomeres* or uniform parts (such as the muscle, the bone and the cartilage)**
 - ✓ **in organic parts or organs (such as the heart, the liver and the lungs)**

All parts of the body have a certain *krasis* or mixture of the four elemental qualities.

The *krasis* may vary from part to part and from person to person but there is an optimum state, necessary for health.

Galen

The body may be divided into three main functional systems:

- 1. The brain, spinal cord, and nerves; these are responsible for motor and sensory functions**
- 2. The heart and arteries; these are responsible for the vital power and for the preservation of innate heat**
- 3. The liver and veins; these are responsible for the nutrition of all body parts.**

Humoral-pathological theory of Galen

4 elements

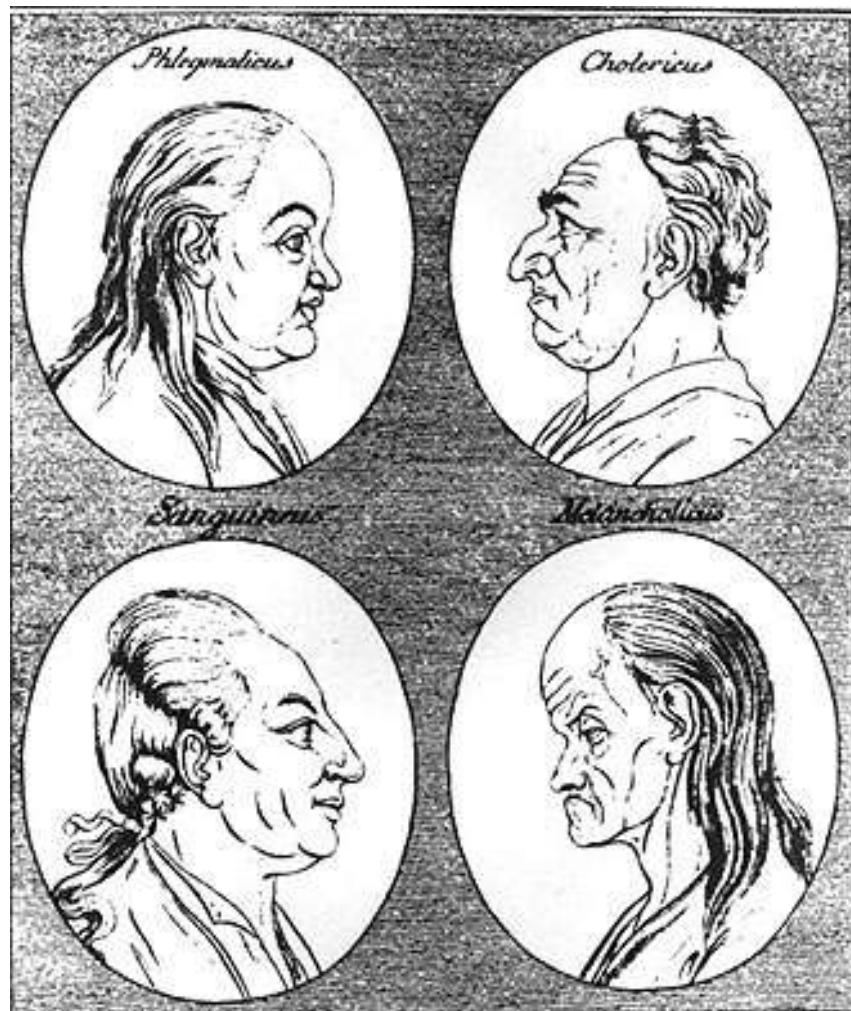
4 qualities

4 humors

4 organs

4 characters / temperaments





Galen

Theory of pneuma

Pneuma: carrier of life & regulator of powers

Three types of pneuma:

Psychic (seat = brain, carried through the nervous system)

Vital (seat = heart, carried through the arteries, manifesting itself through the pulses)

Physical (seat = liver, carried through the veins)

Brain = seat of thought, center of sense and movement

Three types of diseases

- 1) Due to derangement of the 4 humors
- 2) Due to derangement in the tissues
- 3) Due to derangement in the organs

Common diagnostic tools as the Hippocratic ones

Pulse / Sphygmology

Already in use since Praxagoras and Herophilus

7 Galenic and 1 pseudo-Galenic treatise:

- ✓ De usu pulsuum
- ✓ De pilsibus ad tirones
- ✓ De pulsuum differentia
- ✓ De dignoscendis pulsibus
- ✓ De causis pulsuum
- ✓ De praesagitione ex pulsibus
- ✓ Synopsis librorum suorum sedecim de pulsibus

- ✓ De pulsibus ad Antonium (spurious)

Example of a diagnostic tool: Pulse

Galen

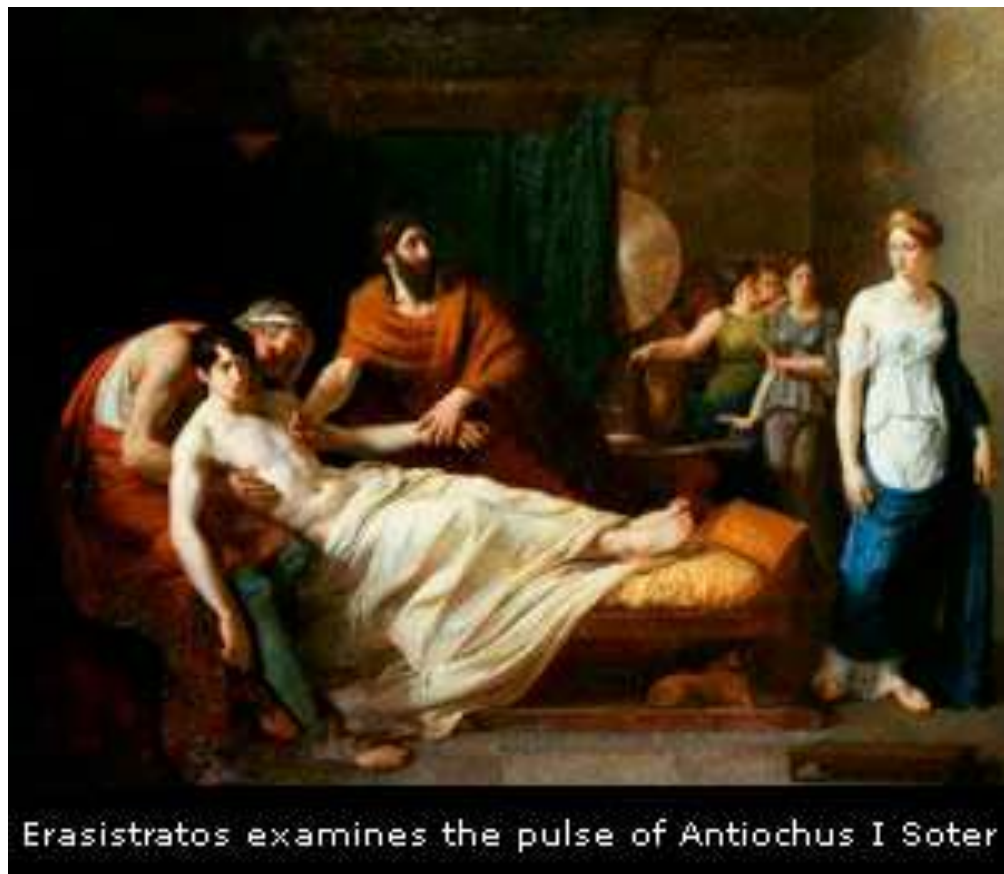
“with the pulse, we diagnose what is present and we prognose what will occur”

- Simultaneous contraction of the heart and arteries. When the ventricles contract, the arteries contract as well, while in dilation, arteries extend.
- When arteries contract, the aortic valve is open.
When the arteries dilate, the aortic valve is closed

Basic functions of the arteries = collection of air during dilation and expulsion of air during contraction

Arteries are elastic while veins are not

- **Ancient sphygmology was set in accurate grounds**
- **Accurate differentiation and analysis of pulses**
- **Types of pulses and location of their function in the heart already since Praxagoras and Herophilus**
- **Every malfunction was apparent through the pulse = always due to bad mixture of humors and elements**
- **Qualitative and quantitative terms of different grades, such as small, rapid, hard, thick, etc.**
- **Body and temperament affect the pulse (ie. a naturally warm person has larger, more rapid and thicker pulse but not stronger as well). Thin people have large pulses, but less thick -since thinness offers more space for the dilation of arteries.**



Galen

3 therapeutic aims:

1. **Restoration of the natural temperament, usually with the aid of “the contraries”**
2. **Restoration of normality in the organic parts that fall short of size, number, structure or position – when deviation impede function. Use of surgery or other means**
3. **Restoration of continuity or unity when there is dissolution. Use of surgery with appropriate postoperative care or use of medicaments**

Galen

Methods of bleeding

Venesection

Removes 2 types of “harmful” blood:

- blood that is intrinsically “harmful” because it does not fulfill the basic function of blood (ie nourishment) – use of venesection is dangerous!
- blood that is “harmful” because it is in surplus in a specific area of the body, creating *plethora*

Types of *plethorae*:

1. Dynamic: due to inability of the natural excretive power → sepsis appears
2. Mechanic: due to overfilling – the vessels naturally enlarge due to the surplus of blood → rupture of the vessel occurs

If *plethora* occurs due to overheated blood → fever ← application of venesection to avoid inflammation

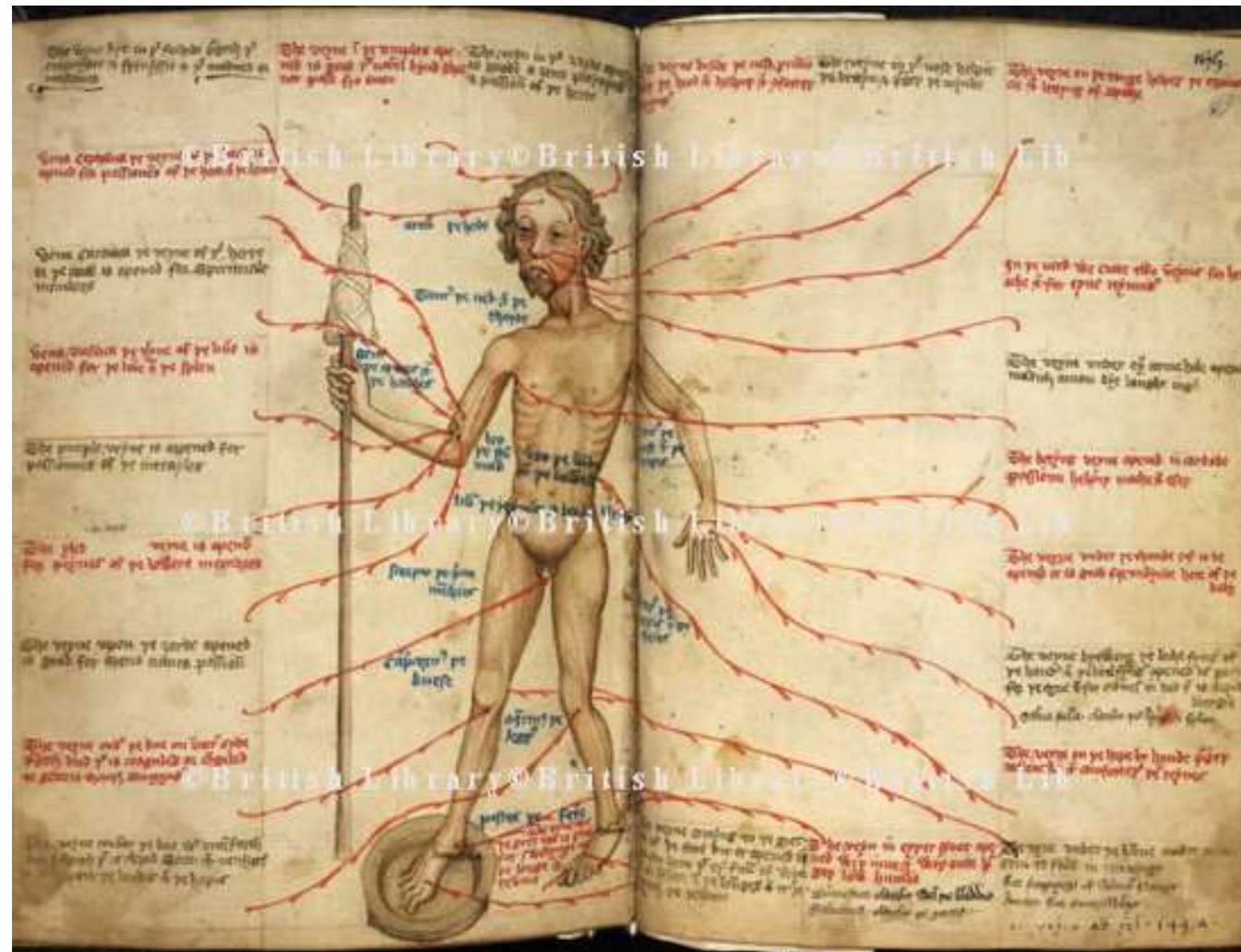
Galen

Venesection

Indications

Most common: severity of a case, bearing in mind the general condition of the patient

In: angina, *peripneumonia* with sense of suffocation, *synanche*, suppression of menstrual blood, *ophthalmia*, anorexia, anoia, hyperactivity, lethargy, gout, arthritis, epilepsy, melancholy, pleuritis, hepatitis, etc



Ms Harley 3719, 15th c.

OTHER ANCIENT THERAPEUTIC MEANS

Cups

Reference in Ebers papyrus for the extraction of a foreign body

Use in the Asclepieia

Aim: extraction of surplus of blood (cups with scarifications)

2 types of cups:

-slightly convex instrument with small, round mouth and long but light handle

Used in cases where blood should be extracted from a deeper area

“this cup draws in direct line and attracts scattered fluids towards the tissue”

-with large, round mouth

Use:

-when pain extends in all tissues because “it draws the unhealthy material from as many areas as possible to the appropriate place”

-when rheum blocks inner structures, because it attracts more material from the tissues

Leeches

First (??) recorded medical use of leech in an Egyptian tomb (1567-1308 BC)

Nicander or Themisson: first (??) written testimony

Nicander: use of leech after the bite of a poisonous animal

Galen:

Method of use: leeches should remain in a container for a day and be fed with some blood, to reduce their “poison”. Put the leech in tepid water and clean its slime with a sponge. Clean the area of application with niter. Scratch the area with the nails to increase circulation and rub it with tepid oil. When there is need to extract the leech, rub it with salt or ash. After the extraction of the leech, apply a cup to extract its “poison”. If hemorrhage continues, rub with cumin or flour.

Indication: surplus of blood, especially if it causes some illness

Antyllus: leeches draw blood superficially. Use when the patient is afraid of scarifications or if the area is too small or hollow to use cups

Cautery

Hippocratic use in:

- Persistent illnesses of the head: 8 iron cauteries (2 near the ears, 2 on the back of the head, 2 on the neck and 2 on the nose, near the eyes). Burn the arteries behind the ears deeply, until these stop throbbing
- Illnesses of the eyes: in ophthalmia → on the vessels of the head
in edema of the eyelids → internal cautery of the eyelids with care not to damage the

“cartilage”

Celsus:

In serous ophthalmia: on the temporal and occipital arteries / incision on the top of the head and cauterize the skull until it peels

In epilepsy

Celsus/Galen: in phthisis → 1 scarification under the chin, 1 on the neck, 2 on each chest, 2 under the scapula

Hippocrates/Aretaeus/Celsus: in abscesses of the liver

All authors prescribe it for “cancer”



Points of cautery, Ms Sloane 1975, ~12th c

Arteriotomy

Celsus: in ophthalmic diseases

Galen: in vertigo, chronic headaches, ophthalmic diseases

Antyllus' description:

Incision of the artery existing over the nape, below the top of the head, between the great tendons (occipital artery?).

Alternatively, incision of the artery existing behind the ears (posterior auricular or temporal artery?).

“The latter should rarely be incised because it is of great size, located very close to the muscles and intertwined with many membranes”. The best one is the occipital: an incision is performed down to the bone, which is striped from flesh. Then, the “mouths” of the artery are tied. “It is easier to isolate the artery by placing underneath a double-edged tool, making a small and partial incision of the vessels. When enough blood has flown, the tool should be gently removed, and the surgeon should incise on the part between the ligations”. This way the artery will not reunite and there is no danger of hemorrhage, since the mouths of the artery retract towards the flesh

Arteriotomy

Severus' description

Arteriotomy may take place in different parts of the head. The artery in the back of the head should be used in intense headache, gangrene or ophthalmic diseases of cornea or in case of eye prolapse.

Shave the area, palpate the pulse, count 3 fingers behind the ears. The incision should have the shape of a cross, until the scalpel finds the bone. The pericranium should be meticulously scraped and the doctor should wait until much blood has flown (until the patient faints or until pain is intolerable). Then, a linen plaster in the size of the incision should be placed, soaked in vinegar and water. If this cannot be done, a bandage is tightly tied around the head. In the next day, the bandage should be soaked with wine and oil. On the third day, the bandage should be removed. The doctor wipes off any humidity from the wound, which should be scraped until it bleeds. Medicaments promoting healing should also be applied.

Incisions

For numerous external or internal diseases/traumas

Celsus: hernias (goiter, umbilical hernia, intestinal hernia, epiplocele, sarcocele, hydrocele)

varicocele, bubonocoele,

Example of umbilical hernia

-Causes: rupture of the intestine on the umbilicus, leakage of fluid from the umbilicus or simultaneous rupture of the omentum and intestine in the umbilicus.

-How to diagnose?

- (1) In intestinal rupture: distention is neither hard nor soft; it decreases when cold is applied while it increases when hot is applied or when the patient holds his breath. When the patient lies on his back, the distention decreases because the intestine returns to its position.
- (2) In rupture of the omentum: The distention is soft, “large on its root and thinner towards its peak”. If someone tries to grab it, it slips off.
- (3) In simultaneous rupture of intestines & omentum: The flesh is hard. When the patient lies on his back, the distention does not disappear, and it does not abate with pressure

-How to treat children between 7-14 years:

We mark the root of the distention with ink, then press it with our fingers.

We pull the umbilicus outwards and tightly ties with thread over the ink markings. The part after the ligation should be burned with caustics and the wound should be treated as a burn.

This technique should not be used for large hernias.



Operations on the head, Sloane 1977, ~ 1300