FOUNDATIONS OF PATHOPHYSIOLOGY

(CHAPTER 1)

QUESTION 1

Compare pathology with pathophysiology. Give an example of each. How are they used?

páthos (disease)

-logía (study)

PATHOLOGY

"the study of disease"

phúsis (nature)

-logía (study)

PHYSIOLOGY

"the study of our nature"

páthos (disease)

phusiología (physiology)

PATHOPHYSIOLOGY

"the study of our nature *under the effects* of disease"

PATHOLOGY

Usually concerned with examining diseased **cells and tissues** for diagnostic purposes

PATHOPHYSIOLOGY

Studies disease **processes** to understand how diseases affect the human body

QUESTION 2

How is the concept of homeostasis used in health and disease? Give some examples.

hómoios (same)

stásis (state)

HOMEOSTASIS

"steady state; equilibrium"

állos (other)

stásis (state)

ALLOSTASIS

"the **processes** or **forces** pushing the body towards equilibrium"

WHY IS THIS IMPORTANT?

Disease in general is a **loss of homeostasis**.

external force → **allostatic overload** → loss of homeostasis

EXAMPLE

Type 1 diabetes mellitus

Insulin and **glucagon** are responsible for maintaning blood glucose homeostasis

damage to pancreas → insufficient insulin → elevated blood glucose

QUESTION 3

Define etiology, etiologic agent, pathogenesis, and pathogen.

aitía (cause)

lógos (explanation)

ETIOLOGY

"an explanation of why a disease occurs; the root cause"

etiologic agent – any external influence that causes a disease

páthos (disease)

-genḗs (born from)

PATHOGEN

"an organism or substance capable of causing disease"
(usually a microorganism)

páthos (disease)

génesis (origin)

PATHOGENESIS

"the origin and **development** of a disease"

QUESTION 4

Compare acute and chronic disease. Give examples of each.

acute – from Latin **acūtus** (sharp)

- Lasts **less** than 3 months (usually 2 weeks or less)
- Quickly worsens → steadily improves

chronic – from Greek **khronikós** ("of time")

- Lasts **more** than 3 months (often lifelong)
- Can remain at a constant severity indefinitely

EXAMPLES

influenza – **acute**

hypertension – **chronic**

emphysema – **chronic**

strep throat – **acute**

myocardial infarction – **acute**

diabetes mellitus – **chronic**

QUESTION 5

Give an example of prevention and intervention.
Compare primary, secondary, and tertiary prevention.

prevention – prevent something bad from happening, or prevent it from being worse than it needs to be

intervention - intervene in (directly treat) a disease process that is already underway

primary prevention – prevent a disease from ever occurring in the first place

e.g. vaccination, education, risk mitigation

secondary prevention – limit the damage of an already existing disease

e.g. screening, early detection, risk management

tertiary prevention – prevent a **chronic** disease from interfering with life

e.g. rehabilitation, physical therapy, support groups

EXAMPLE

A 65-year-old male patient receives a routine colonoscopy to screen for colorectal cancer

SECONDARY prevention!
(Remember **S**creening is **S**econdary!)

EXAMPLE

A 20-year-old cigarette smoker is educated on strategies for smoking cessation to prevent lung cancer

PRIMARY prevention!

EXAMPLE

An 18-year-old patient newly diagnosed with type 1 diabetes mellitus is referred to a support group for diabetes patients

TERTIARY prevention!

EXAMPLE

A 2-year-old patient receives a DTaP vaccination to prevent infectious illness

PRIMARY prevention!

EXAMPLE

A 24-year-old female patient receives a pap smear during a well-woman exam to assess for risk of cervical cancer

SECONDARY prevention!

EXAMPLE

A 72-year-old male patient suffering a myocardial infarction receives an intravenous morphine drip for persistent chest pain

Trick question, this is an **intervention**! 😂

QUESTION 6

Define symptom, sign, and syndrome.

symptom – subjective evidence of disease **reported by the patient**

sign – an objective **clinical observation** or measurement pointing to disease

sun- (with, together)

drómos (running)

SYNDROME

"a set of **correlated signs and symptoms** that point to a single underlying disease process"

A syndrome can be linked to:

- a **specific etiology**

  (e.g. effects of trisomy 21 referred to as "Down syndrome")
- a **range of etiologies**

  (e.g. "toxic shock syndrome" caused by many pathogens)
- an **unkwown etiology**

  (e.g. "irritable bowel syndrome" is idiopathic but recognizable)

QUESTION 7

Describe the process of differential diagnosis.

Based on the scientific method, often utilizing process of elimination

hypothesis → experiment → conclusion

"What are all the things it **could** be, and what do we need to do to rule out everything it's **not**?"

QUESTION 8

How is idiopathic etiology different from iatrogenic etiology?

Remember from earlier...

ETIOLOGY

"an explanation of why a disease occurs; the root cause"

ídios (separate, individual)

páthos (disease)

IDIOPATHIC

"having an unknown or poorly-understood etiology, distinct from other possible causes"

(e.g. idiopathic thrombocytopenic purpura, essential tremor)

iatrós (healer)

-genḗs (born from)

IATROGENIC

"caused by or during the treatment of another condition"

(e.g. MRSA, hospital-acquired pneumonia)

Another good word to know: **nosocomial**

Like **iatrogenic**, but specifically **hospital**-related

QUESTION 9

Palliative relief is defined as ..., while the definition of prognosis would be...

pallium (cloak)

PALLIATIVE

"seeking to 'cover up' symptoms rather than treating the root disease"

pro- (before)

gnôsis (knowledge)

PROGNOSIS

"evidence-based estimate of the future course/progression of a disease"

QUESTION 10

Compare latent period with prodromal period.
Describe the acute phase.

latent period → prodromal period → acute phase

latent period – completely fine, no signs or symptoms at all... but already infected

"Ew, that guy coughed on me... I hope I don't get sick."

prodromal period – general, non-specific symptoms begin (fever, fatigue, malaise, generalized myalgias)

"Great, I think I'm coming down with something..."

acute phase – full-blown illness with the typical, specific symptoms of the disease

"Well, looks like I've got the flu."

QUESTION 11

Define exacerbation, remission, convalescence, and sequela.

Exacerbation vs. **Sequela**

An **exacerbation** is an **acute** worsening of a **chronic** problem.

Think of an asthma attack, a lupus flare, or a new worsening of chronic back pain.

Exacerbation vs. **Sequela**

A **sequela** is a long-term, **chronic** problem caused by an **acute** injury.

Think of chronic leg pain from an old fracture, chest pain after being in a car crash, or long-term surgical complications.

Convalescence vs. **Remission**

Convalescence is gradual process of recovery from a disease or injury, usually **acute** in nature.

Think of slowly getting better after having the flu for a week, or starting to walk again after a broken leg.

Convalescence vs. **Remission**

Remission is a partial or full recovery from **symptoms** of a **chronic disease**. The patient may become asymptomatic, but the underlying disease remains.

Think of a cancer patient after successful chemotherapy, or an HIV patient with undetectable viral load.

QUESTION 12

Clinical tests should display which characteristics when developed for use in patients?

Predictive value – How well do the test results correlate with presence/absence of disease?

Sensitivity – How well does the test correctly identify **true positives**?

Specificity – How well does the test correctly identify **true negatives**?

Reliability – Can results be reproduced consistently? Does a patient who tested positive once always test positive?

Validity – Is the test detecting what we're actually trying to detect, and not something else?

QUESTION 13

Define epidemiology, endemic disease, epidemic disease, and pandemic disease.

en– (in)

dêmos (people)

ENDEMIC

"spread out **at a constant level** within a specific population"

epí– (upon)

dêmos (people)

EPIDEMIC

"a **focused outbreak** of a disease in a particular location"

pan– (all)

dêmos (people)

PANDEMIC

"a **widespread outbreak** spanning countries, continents, or the entire world"

epidemia (epidemic)

-logía (study)

EPIDEMIOLOGY

"the study of the **patterns** of disease transmission and spread"

QUESTION 14

What are the three leading causes of death in the United States? What is the value of collecting these statistics?

1. Heart disease
2. Cancer (malignant neoplasm)
3. Accidents

WHY CARE?

- Helps us understand the greatest health risks
- Guides prevention and intervention efforts