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Physiology: Tissues & Homeostasis

Printable Flashcards — Pre-Med Biology

The four tissue types, homeostasis, and feedback loops. Foundation for organ system physiology.

141 cards — Print double-sided, flip on long edge, then cut along dashed lines.

141 cards — Printable Flashcards

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1

Anatomy vs physiology: what's the difference?

2

Physiology is basically the study of... (say it like a normal person)

3

The #1 big idea in physiology is...

4

Homeostasis means the body keeps variables exactly constant. True or false?

5

Give 3 classic variables the body regulates (homeostasis).

6

Negative feedback: what does it do?

7

Positive feedback: what does it do?

8

Which is more common in the body: negative or positive feedback?

2

How the body keeps you alive and working, minute by minute.

1

Anatomy = structure. Physiology = function (how it works).

4

False.

3

Homeostasis (keeping internal conditions in a safe range).

6

Pushes a variable back toward normal when it drifts.

5

Body temperature, blood glucose, and blood pH (also water balance, blood pressure).

8

Negative feedback.

7

Amplifies a change (it pushes the system further in the same direction).

9

Name one real positive feedback example.

10

Name one classic negative feedback example.

11

In a feedback loop, what are the 3 main parts?

12

Receptor (sensor) in physiology means...

13

Effector means...

14

Stimulus vs response: what's the difference?

15

Negative feedback {{c1::opposes}} the original change and restores a variable toward its {{c2::set point/range}}.

16

Positive feedback {{c1::amplifies}} the original change (used for events like clotting and childbirth).

10

Thermoregulation (sweating/shivering) or blood glucose regulation (insulin/glucagon).

9

Childbirth (oxytocin contractions) or blood clotting.

12

Something that detects a change (stimulus).

11

Receptor (sensor), control center, effector.

14

Stimulus = the change. Response = what the body does about it.

13

The thing that actually makes the change (muscle, gland, organ).

16

Positive feedback amplifies the original change (used for events like clotting and childbirth).

15

Negative feedback opposes the original change and restores a variable toward its set point/range.

17

Homeostasis vs equilibrium: are they the same?

18

Levels of organization (small -> big):

19

Tissue vs organ (don't mess this up):

20

Physiology is all about 'form follows function'. Give a simple example.

21

Why do we care about diffusion in physiology?

22

Diffusion goes from...

23

Osmosis (in one line):

24

Ventilation vs respiration: what's the difference?

18

Cell -> tissue -> organ -> organ system -> organism.

17

No. Homeostasis is controlled and dynamic; equilibrium is no net change.

20

Alveoli have thin walls (simple squamous) so O2 diffuses fast.

19

Tissue = similar cells doing a job. Organ = multiple tissues working together.

22

High concentration to low concentration.

21

Because gases and many small molecules move by diffusion (lungs, capillaries).

24

Ventilation = moving air. Respiration = gas exchange (and using O2 in cells).

23

Water moves toward higher solute concentration across a semipermeable membrane.

25

Nervous vs endocrine signaling: which is faster?

26

Endocrine glands release hormones into...

27

Exocrine glands release secretions...

28

If a gland has ducts, it's...

29

pH basics: lower pH means...

30

Blood pH is tightly controlled because...

31

If CO_2 rises, blood tends to become more acidic or more basic?

32

Quick homeostasis scenario: you're cold. Name two effectors your body uses.

26

The bloodstream.

25

Nervous is faster; endocrine is slower but longer-lasting.

28

Exocrine.

27

Through ducts onto a surface or into a cavity (like saliva, sweat).

30

Enzymes and proteins need the right pH to work; big shifts can be dangerous.

29

More H^+ (more acidic).

32

Shivering (muscles) and constricting skin blood vessels.

31

More acidic.

33

Quick homeostasis scenario: you're overheating. Name two responses.

34

Steady state is closer to homeostasis or equilibrium?

35

If a question says 'set point', what does it mean?

36

Fever: does your body temperature 'accidentally rise', or is the set point changed?

37

Basic physiology question style: if the body wants more O2 delivery, what happens to breathing?

38

Basic physiology question style: if you start running, heart rate usually goes...

39

Quick definition: metabolism means...

40

Catabolism vs anabolism (one line each):

34

Homeostasis.

33

Sweating and vasodilation (more blood to skin).

36

The set point is raised (you actively feel cold and shiver to reach it).

35

The target value/range the body tries to maintain.

38

Up.

37

Breathing rate/depth increases.

40

Catabolism breaks molecules down; anabolism builds molecules up.

39

All the chemical reactions in the body (building and breaking down).

41

You don't need to memorize every number in physiology because...

42

Mini trap: 'more hormone = more response' always true?

43

Afferent vs efferent: which one carries info TO the CNS?

44

Endocrine glands are {{c1::ductless}} and release hormones into the {{c2::blood}}.

45

Exocrine glands release secretions through {{c1::ducts}} onto a {{c2::surface}} or into a cavity.

46

How many main tissue types are there in the human body?

47

Epithelial tissue does what (big idea)?

48

Connective tissue does what (big idea)?

42

No.

41

Most questions are logic: direction of change + cause/effect.

44

Endocrine glands are ductless and release hormones into the blood.

43

Afferent (sensory) goes to CNS. Efferent (motor) goes from CNS to effectors.

46

4: epithelial, connective, muscle, nervous.

45

Exocrine glands release secretions through ducts onto a surface or into a cavity.

48

Supports, connects, protects, stores, and transports.

47

Covers surfaces, lines cavities, and forms glands.

49

Muscle tissue does what (big idea)?

50

Nervous tissue does what (big idea)?

51

Epithelium has lots of cells and little... what?

52

Connective tissue has fewer cells and lots of...

53

Epithelium is avascular (no blood vessels). True or false?

54

If epithelium has no blood vessels, how does it get nutrients?

55

Connective tissue is usually vascular. True or false?

56

Cartilage has blood vessels: true or false?

50

Sends and processes electrical signals (communication/control).

49

Contracts to produce movement.

52

Extracellular matrix (fibers + ground substance).

51

Extracellular matrix.

54

Diffusion from connective tissue underneath.

53

True.

56

False (cartilage is avascular).

55

Usually true, but there are exceptions (cartilage is avascular).

57

Basement membrane: where is it?

58

Epithelium has polarity. What does that mean?

59

Apical surface of epithelium faces the...

60

Basal surface of epithelium faces the...

61

Epithelia are classified by
TWO things. What are they?

62

Simple epithelium means...

63

Stratified epithelium means...

64

Squamous cells look like...

58

It has an apical (top) side and a basal (bottom) side.

57

Between epithelium and connective tissue.

60

Basement membrane / connective tissue.

59

Lumen or outside environment.

62

One layer of cells.

61

Number of layers + cell shape.

64

Flat, like thin tiles.

63

Multiple layers of cells.

65

Cuboidal cells look like...

66

Columnar cells look like...

67

Simple squamous epithelium location: give one.

68

Endothelium is...

69

Mesothelium is...

70

Simple cuboidal epithelium location: give one.

71

Simple columnar epithelium location: give one.

72

Stratified squamous epithelium is built for...

66

Tall rectangles.

65

Cube-shaped (as tall as they are wide).

68

Simple squamous epithelium lining blood vessels.

67

Alveoli of lungs or capillary walls (endothelium).

70

Kidney tubules or small gland ducts.

69

Simple squamous epithelium lining body cavities (serous membranes).

72

Protection from abrasion.

71

Small intestine lining (with microvilli) or stomach lining.

73

Keratinized stratified squamous epithelium location:

74

Non-keratinized stratified squamous epithelium location:

75

Pseudostratified columnar epithelium: one layer or many?

76

Pseudostratified ciliated columnar epithelium location:

77

Transitional epithelium is found where?

78

Why is transitional epithelium special?

79

Cilia vs microvilli: what's the difference?

80

Microvilli are common in...

74

Mouth, esophagus, vagina.

73

Skin (epidermis).

76

Trachea and upper respiratory tract.

75

One layer (it just looks layered).

78

It stretches and changes shape without tearing.

77

Urinary bladder (and ureters).

80

Small intestine and kidney tubules.

79

Cilia move stuff along the surface; microvilli increase surface area for absorption.

81

Cilia are common in...

82

Goblet cells do what?

83

Connective tissue has 3 main components. Name them.

84

Collagen fibers mostly give tissue...

85

Elastic fibers mostly give tissue...

86

Loose (areolar) connective tissue: where is it commonly found?

87

Adipose tissue: what's its job + where is it found?

88

Dense regular connective tissue is built to resist force in...

82

Secrete mucus.

81

Trachea/airways and fallopian tubes.

84

Tensile strength (resist pulling).

83

Cells, fibers, and ground substance (matrix).

86

Under epithelia and around organs/vessels.

85

Elasticity (stretch and recoil).

88

One direction (parallel fibers).

87

Stores energy, insulates, cushions;
found under skin and around organs.

89

Dense regular connective tissue location:

90

Dense irregular connective tissue resists stress in...

91

Dense irregular connective tissue location:

92

Cartilage: what's its general job?

93

Hyaline cartilage location (classic examples):

94

Elastic cartilage location:

95

Fibrocartilage location:

96

Bone tissue does what?

90

Many directions.

89

Tendons and ligaments.

92

Flexible support and cushioning.

91

Dermis of the skin (also organ capsules).

94

External ear (pinna) and epiglottis.

93

Tracheal rings, nose, ends of long bones (joints).

96

Support, protection, movement leverage, mineral storage, blood cell production.

95

Intervertebral discs and menisci.

97

Blood is actually what tissue type?

98

Why is blood considered connective tissue?

99

Three types of muscle tissue:

100

Skeletal muscle location + control:

101

Cardiac muscle location + control:

102

Smooth muscle location + control:

103

Striated muscles are...

104

Non-striated muscle is...

98

Cells are suspended in an extracellular matrix (plasma).

97

Connective tissue.

100

Attached to bones; voluntary control.

99

Skeletal, cardiac, smooth.

102

Walls of hollow organs and blood vessels; involuntary.

101

Heart; involuntary.

104

Smooth muscle.

103

Skeletal and cardiac.

105

Skeletal muscle cells are typically...

106

Cardiac muscle cells are typically...

107

Smooth muscle cells are typically...

108

Intercalated discs are found in...

109

Nervous tissue is made of...

110

Where do you find nervous tissue?

111

Neuron's job (one line)?

112

Glial cells are basically...

106

Branched, usually one nucleus, with intercalated discs.

105

Long, cylindrical, multinucleated.

108

Cardiac muscle.

107

Spindle-shaped, one nucleus, no striations.

110

Brain, spinal cord, and nerves.

109

Neurons + glial cells.

112

Support cells for neurons (nutrition, insulation, cleanup, protection).

111

Receive, process, and transmit electrical signals.

113

Mucous membranes line...

114

Serous membranes (like pleura) line...

115

Epithelium that lines alveoli (gas exchange):

116

Epithelium that lines kidney tubules (classic):

117

Epithelium of the urinary bladder:

118

Epithelium of the trachea (classic):

119

Tissue type: tendons and ligaments:

120

Tissue type: dermis of skin:

114

Closed body cavities and cover organs (reduce friction).

113

Passages that open to the outside (digestive, respiratory, etc.).

116

Simple cuboidal epithelium

115

Simple squamous epithelium

118

Pseudostratified ciliated columnar epithelium

117

Transitional epithelium

120

Dense irregular connective tissue

119

Dense regular connective tissue

121

Tissue type: heart muscle:

122

Tissue type: walls of intestines and blood vessels:

123

Trap: 'Simple epithelium = protection.' Usually true or false?

124

Trap: 'Stratified epithelium = best for diffusion.' True or false?

125

Trap: 'Pseudostratified has many layers.' True or false?

126

Trap: 'Blood is not a tissue.' True or false?

127

Trap: 'Cartilage heals fast because it has blood vessels.' True or false?

128

Trap: 'Smooth muscle is voluntary.' True or false?

122

Smooth muscle

121

Cardiac muscle

124

False.

123

Usually false.

126

False. Blood is connective tissue.

125

False.

128

False.

127

False.

129

Trap: 'Cardiac muscle is non-striated.' True or false?

130

Trap: 'All glands are endocrine.' True or false?

131

The 4 main tissue types are {{c1::epithelial}}, {{c2::connective}}, {{c3::muscle}}, and {{c4::nervous}}.

132

Simple epithelium = {{c1::one layer}}; stratified epithelium = {{c2::many layers}}.

133

Simple squamous epithelium is ideal for {{c1::diffusion}} (e.g., {{c2::alveoli}}).

134

Transitional epithelium is found in the {{c1::urinary bladder}} and can {{c2::stretch}}.

135

Dense regular connective tissue is found in {{c1::tendons}} and {{c2::ligaments}}.

136

Blood is classified as a {{c1::connective}} tissue because cells are suspended in a {{c2::matrix}}.

130

False.

129

False.

132

Simple epithelium = one layer;
stratified epithelium = many layers.

131

The 4 main tissue types are epithelial,
connective, muscle, and nervous.

134

Transitional epithelium is found in
the urinary bladder and can stretch.

133

Simple squamous epithelium is
ideal for diffusion (e.g., alveoli).

136

Blood is classified as a connective tissue
because cells are suspended in a matrix.

135

Dense regular connective tissue is
found in tendons and ligaments.

137

Why are capillary walls simple squamous?

138

Why is the skin epithelium stratified squamous and keratinized?

139

Why does the trachea have cilia + mucus (pseudostratified ciliated epithelium)?

140

Why does the small intestine use simple columnar with microvilli?

141

Why does the bladder use transitional epithelium?

138

Because it needs strong protection + water resistance.

137

Because diffusion/exchange needs the thinnest barrier possible.

140

Max absorption: tall cells + huge surface area.

139

To trap particles in mucus and move them out of the airway.

141

Because it needs to stretch when filling and not leak/tear.