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Human Perspectives ATAR Units 1 & 2

Answers

Chapter 2 Cells make up the human body

Questions 2.1

Recall knowledge

1 State the cell theory.

Answer: All organisms are made of cells, which are the basic structural and functional units of life, and all cells arise from pre-existing cells.

2 Why do we use a microscope to view cells?

Answer: Cells are very small; they cannot be seen with the naked eye.

Apply knowledge

3 Compare and contrast cells in a human body with bricks used to build a house.

Answer: Compare: Both cells and bricks are used to build the structure of the body or house. Contrast: Cells are microscopic, bricks are macroscopic. Cells vary in size and shape, bricks are of similar size and shape. Cells can carry out different functions, bricks carry out the same function.

Questions 2.2

Recall knowledge

1 Label the structures on the diagram of a cell.

Answer:

A – Vesicle

B – Vesicles

C – Rough endoplasmic reticulum

D – Smooth endoplasmic reticulum

E – Cell membrane

F – Ribosome

G – Mitochondrion

H – Golgi body

I – Nucleolus

J – Nucleoplasm or nucleus

K – Centrioles

L – Microtubules or cytoskeleton

M – Cytoplasm

N – Lysosome

2 Describe the function of the:

a Nucleus

Answer: The nucleus, with its DNA, controls the structure and function of the cell.

b Mitochondria

Answer: Site of aerobic respiration.

c Microtubules

Answer: Hollow rods that keep organelles in place or move them around the cell.

d Cytoplasm.

Answer: Suspends the organelles, site of anaerobic respiration.

3 Explain the difference between cilia and flagella.

Answer: Cilia are short and numerous projections off the cell membrane that are used to move substances over the surface of the cell. Flagella are long and fewer (one or two) and are used to propel or move the cell.

4 State the difference between rough and smooth endoplasmic reticulum.

Answer: Rough endoplasmic reticulum has ribosomes on the surface of the membrane, whereas smooth endoplasmic reticulum does not have ribosomes attached.

5 Describe the role of nuclear pores.

Answer: Nuclear pores allow large molecules to enter or exit the nucleus.

Apply knowledge

6 Explain how ribosomes, the endoplasmic reticulum and the Golgi body work together.

Answer: Ribosomes are the site of protein synthesis. Once the proteins have been assembled, they are moved along the channels of the endoplasmic reticulum to the Golgi body. At the Golgi body, the proteins are then modified and packaged for release from the cell.

7 Explain why muscle cells have a large number of mitochondria.

Answer: Muscle cells are highly active and require large amounts of the energy molecule adenosine triphosphate (ATP). Mitochondria make energy available for cell's activities, as such large numbers would be needed in an active cell like a muscle.

8 Explain why cells vary in their size and shape.

Answer: Cells vary to provide the different structures of tissues and organs needed to carry out the functions necessary for life.

Questions 2.3

Recall knowledge

1 Define 'extracellular fluid'.

Answer: Extracellular fluid is the fluid surrounding the cell, also called tissue fluid.

2 Draw a labelled diagram of the fluid mosaic model of the cell membrane.

Answer: Student diagrams will vary. They all should include: the phospholipid bilayer, clear demarcation of hydrophilic head and hydrophobic lipid tails, channel proteins, carrier proteins. Cholesterol, receptor proteins and cell identity markers are not essential.
Refer to Figure 2.11 on page 33 of the student book.

3 List the substances that all cells need to take in.

Answer: Oxygen, glucose

4 State the functions of the cell membrane.

Answer:

- To act as a physical barrier.
- To regulate the passage of materials.
- To be sensitive to changes.
- To support the cell.

5 Which type of transport actively moves substances in membrane-bound sacs?

Answer: Vesicular transport. Endocytosis is bringing liquids or solids into the cell. Exocytosis uses vesicles to release contents out of the cell.

Apply knowledge

6 Compare and contrast the two types of carrier-mediated transport.

Answer: Contrast:

Characteristics	Facilitated diffusion	Active transport
Concentration gradient	Moves along the concentration gradient, from high to low concentration either side of the membrane	Moves against the concentration gradient, from low to high concentration either side of the membrane.
Energy required	None – Passive process	Yes – in the form of ATP

Compare: Both use carrier proteins, that are specific to the molecule, can be saturated and are regulated by hormones.

7 Explain why a cell will expand when placed in a solution of a low concentration of a solute such as sugar.

Answer: A solution of low concentration sugar has a higher water/solvent concentration in comparison to the cytoplasm. Therefore, water will move, via osmosis, into the cytoplasm, making the cytoplasm volume larger – and the cell will swell/expand.

8 Explain why steroids are able to diffuse directly through the membrane, but glucose requires a carrier protein.

Answer: Steroids are lipid soluble, which means they are able to diffuse through the lipid portion of the cell membrane. Glucose is water soluble, so it cannot move through the lipid component of the membrane and requires a carrier protein to enter the cytoplasm.

Questions 2.4

Recall knowledge

1 List the following in order from the lowest level of organisation to the highest: system, tissue, cell, organ.

Answer: Cell, tissue, organ, system

2 What type of tissue is bone?

Answer: Connective tissue

3 Define 'tissue.'

Answer: A group of cells that are similar in structure and that work together to carry out a particular function.

4 List three locations of epithelial tissue.

Answer: Surrounding the outside of organs including, the heart, kidneys, intestines, liver and lungs.
Lining the inside of hollow organs such as the heart, stomach, intestines
The outer layer of the skin.

5 What are nerve cells called?

Answer: Neurons

6 State the function of the circulatory system.

Answer: To transport nutrients, oxygen and wastes to and from cells.

Apply knowledge

7 Classify each of the following tissues (refer to images in student book).

Answer: **a** Connective tissue; **b** Epithelial tissue; **c** Muscular tissue; **d** Nervous tissue

8 Explain the difference between tissues and organs.

Answer: Tissues are groups of cells that are similar in structure, which work together to carry out a particular task, organs contain at least two different tissue types, these tissue types work together to carry out a particular task.

9 Explain why the cells in epithelial tissue are closely packed together.

Answer: The cells are closely packed together so they can form a smooth surface. Epithelium tissue is lining tissue, therefore needs to be smooth.

Chapter 2 Activities

Activity 2.1 Observing cells

Studying your observations

1 What happens to the light intensity when you adjust the iris diaphragm or wheel diaphragm?

Answer: As the iris diaphragm is closed, the light intensity is reduced; the smaller the opening in the wheel diaphragm, the lower the light intensity.

2 How does focusing the condenser affect the light intensity?

Answer: The focus of the condenser lens makes little apparent difference unless used on very high

magnifications. At magnifications of 400X or more, focusing the condenser lens will make the image appear sharper.

3 Which way does the image move when you move the slide on the stage to the right?

Answer: The image will move to the left of the field of view.

4 When you move the slide towards you, which way does the image move?

Answer: The image moves in the opposite direction – away from you.

5 Compare what you can see with high power and low power. On which magnification do you see more of the specimen?

Answer: More of the specimen can be seen on low power.

6 On which magnification is the image brighter?

Answer: The image is brightest on the lowest magnification.

7 Multiply the magnification of each of the objective lenses by the magnification of each of the eyepieces. List the magnifications that are possible with your microscope.

Answer: Answers will depend on the magnification of the lenses on the particular microscope.

8 What was the field diameter on low power?

Answer: Answers will depend on the particular microscope used.

9 Estimate the diameter of the cheek cells in millimetres on the prepared side.

Answer: Answers will depend on the magnification used to view the cells.

10 One millimetre equals 1000 micrometres (μm). What is your estimate of the diameter of an average cheek cell in micrometres?

Answer: It will be the answer to Question 9 multiplied by 1000.

11 Draw a large, labelled diagram showing one or two cheek cells.

Answer: Student diagrams will vary. Diagram should show that cheek cells are irregular in shape and each has a single nucleus.

12 The cheek cells that you observed had been stained. What is the advantage of staining cells?

Answer: Most cells are transparent. The staining enables the cells and their internal structures to be clearly seen.

Activity 2.2 Making a model of a cell

Answer: Student models will vary. A good model will include all relevant organelles, at least 12 different organelles. The organelles will be drawn relatively to scale and will be well labelled.

Activity 2.3 Making a model membrane

Answer: Student models will vary. A good model will show the phospholipid bilayer, and the mosaic would be represented with different labelled proteins.

Activity 2.4 Investigating diffusion through a differentially permeable membrane

Studying your results

1 Do you have any evidence that any molecules passed from the beaker into the bag? Describe any such evidence.

Answer: Yes, because the starch in the bag has changed colour, and the level of liquid in the glass tube has risen.

2 Do you have any evidence that any molecules moved from inside the bag to the outside? Explain your answer.

Answer: No, because nothing has changed in the beaker, except that the water level has gone down a little.

3 Which has larger molecules: starch or iodine-potassium-iodide? Explain your answer. (You can estimate relative molecule size from the results of the experiment.)

Answer: Starch has larger molecules than iodine-potassium-iodide. The starch molecules did not/could not move out of the bag into the beaker through the semi-permeable membrane of the bag. We know that starch did not move out of the bag because there was no colour change outside the bag. Iodine moved into the bag because the molecules were smaller and could fit through the pores of the differentially permeable membrane. We know that iodine moved into the bag because it changed the colour of the starch solution.

4 Use the description of osmosis in this chapter to explain the changes that occurred in the experimental set-up.

Answer: Water moves from areas of high concentration of water to areas of low water concentration across a semi-permeable membrane. The bag had a concentrated starch solution in it, and therefore a low concentration of water, so the water moved into the bag from the beaker.

5 If the cellulose bag containing starch suspension were a model of a cell, which part of the cell would be represented by the cellulose bag itself?

Answer: The cell membrane

6 Predict what would happen if an isolated animal cell were placed in distilled water.

Answer: Water would move across the semi-permeable cell membrane into the cell and the cell would swell and perhaps burst.

Activity 2.5 What size is it?

1 If the field diameter is 0.5 mm, what is the approximate length and breadth of cell A in millimetres and in micrometres?

Answer:

Length = 0.25–0.28 mm, or 250–280 µm, depending on accuracy of measurement.
Breadth = 0.10–0.12 mm, or 100–120 µm, depending on accuracy of measurement.

2 If the objective lens was changed from 40X to 10X, what would be the new field diameter?

Answer: 2 mm

3 How many cells the same size as cell A would fit end-to-end across the field with this new field diameter?

Answer: Approximately 7.7 cells (2 ÷ 0.26)

4 A student drew the cell shown in Figure 2. The actual length of the cell was 100 µm. What is the magnification of the student's drawing?

Answer: Actual length of drawing = 38 mm or 38 000 µm; 38 000 ÷ 100 = magnification of 380×

5 Estimate the length and width of the cell shown in Figure 3.

Answer: 100 µm = 8 mm on the page.
The length of cell on the page is approximately 38 mm, therefore:
38 ÷ 8 × 100 = 475 µm
The width of cell on the page is 16 mm, therefore:
16 ÷ 8 × 100 = 200 µm
Student answers will depend on how accurately they measure the 100 µm scale on Figure 2.35. The important point is the method used for the calculations.

6 Estimate the diameter of the nucleus of the cell in Figure 2.

Answer: The nucleus has a 5 mm diameter on the page.

$5 \div 8 \times 100 = 62.5$ µm

7 How many of the cells in Figure 3 would fit side-by-side across a field of view that has a diameter of 1.6 mm?

Answer: The field diameter converts to 1600 µm and the width of cell to 200 µm, therefore:

$1600 \div 200 = 8$ cells side by side

Activity 2.6 Investigating surface area and volume

Discussion

1 Explain why the agar cubes change colour when placed in the vinegar solution.

Answer: The agar cubes are impregnated with a pH indicator and start off alkaline. As the vinegar diffuses through the cube, the indicator changes colour to denote the lowered pH.

2 Describe the relationship between the surface area and the rate at which diffusion occurs.

Answer: As an object increases in size, the volume of the object increases more in proportion to the increase in surface area (assuming the increase is in three dimensions). As diffusion is limited by the surface area it can access, it will take longer to reach the centre of a large object than that of a small object.

3 Create a graph of time in minutes (*x*-axis) against the %P (*y*-axis) of each cube.

Answer: Student graphs will vary depending on their results.

Activity 2.7 Looking at tissues

I Epithelial tissues

1 Draw a few of the cells and write a description of them.

Answer: Drawings will vary. The cheek cells should appear to be flattened, have irregular shapes and fit together very closely.

2 Estimate the size of an individual cell.

Answer: Actual cell sizes and estimates will vary, but the diameter of the cells should be between approximately 50 µm and 100 µm.

3 Explain how the structure of the cells is suited to their function of providing a smooth lining to the inside of the cheek.

Answer: The cheek cells are thin and flat and fit together very closely to produce a smooth lining.

II Connective tissues

4 In what ways does cartilage tissue differ from the cheek cells that you observed?

Answer: Cartilage cells do not fit closely together. Neighbouring cells are separated by a large amount of matrix.

5 How is the structure of cartilage suited to its function of providing structural material that is firm but flexible?

Answer: The matrix between the cartilage cells is firm but flexible.

6 Draw a few cells from adipose tissue and write a description of them.

Answer: Drawings will vary. Adipose tissue cells have a large globule of fat inside them. The cytoplasm forms a thin layer around the fat globule. The nucleus can be seen within the thin layer of cytoplasm.

7 Estimate the diameter of one adipose cell.

Answer: Adipose cells vary in size depending on the amount of fat they contain. An average size would be approximately 100 μm.

8 How is the structure of adipose tissue related to its function of fat storage?

Answer: The cells of adipose tissue contain a large droplet of fat and have only a thin layer of cytoplasm, which makes them ideal for fat storage.

III Muscular tissue

9 Draw part of a skeletal muscle fibre and write a description of it.

Answer: Drawings will vary. Skeletal muscle fibres are long and thin (cylindrical) with striations (stripes) across the fibre. In each fibre, several nuclei can be seen at the edge of the fibre.

10 Why are muscle cells known as fibres?

Answer: Skeletal muscle cells are known as fibres because they are very long and thin.

11 How many nuclei are present in the fibre that you have drawn?

Answer: Many nuclei will be visible. There may be several hundred nuclei in a single fibre.

12 Why is skeletal muscle sometimes known as striped or striated muscle?

Answer: Skeletal muscle fibres have distinct lines across them when viewed with a light microscope. For this reason, skeletal muscle may be called striped, or striated, muscle.

Studying your observations

1 List the cells that you have seen in order from smallest to largest.

Answer: The probable order of size would be as follows:

a Cartilage cells

b Cheek cells

c Adipose tissue (fat storage) cells

d Skeletal muscle (average length of a cell [fibre] is 3 cm but in some muscles may be up to 30 cm)

2 Write a brief paragraph explaining the relationship between the structure and function of tissues.

Answer: Each tissue has a specific function and the structure of the cells that make up the tissue enables them to contribute to the overall function of the tissue. For example, adipose tissue is fat storage tissue and the cells that make up the tissue are able to contain a large globule of fat; the epithelium that lines the inside of the cheek must be continuous and smooth so the cheek cells are flat and fit closely together.

Activity 2.8 Touring the tissues

Answer: The tour should describe the following:

- Epithelium: Covering or lining tissue; cells very closely joined together; cells may be flattened, cubical or column shaped.
- Connective tissue: Cells separated by a lot of non-cellular matrix; provide support for other tissues and organs
- Muscle tissue: Cells long and thin; able to shorten
- Nervous tissue: Cells have long projections; able to conduct messages

Chapter 2 Review questions

Recall

1 Name the organelles commonly found in human cells.

Answer: Nucleus, Mitochondria, Golgi bodies, Rough Endoplasmic reticulum, Smooth Endoplasmic reticulum, Centrioles, Lysosomes, Ribosomes

2 Describe the organisation of a cell.

Answer: The cell is organised with a membrane to separate it from other substances, the cytoplasm to suspend the organelles and then the organelles in amounts suited to the cell's specific function.

3 Describe the functions of the following organelles:

a mitochondria

Answer: The site where some of the chemical reactions of cellular respiration occur, making energy available to the cell

b endoplasmic reticulum

Answer: Membranes that provide a surface for chemical reactions and form channels for transporting or storing substances

c ribosomes

Answer: The sites where amino acids are joined to make proteins

d nucleus.

Answer: Contains DNA that determines the type of proteins a cell can make

4 What is a vesicle? Describe two ways in which vesicles can be formed.

Answer: Vesicles are bubbles of liquid in the cytoplasm. The bubble is surrounded by a membrane. Some vesicles are formed at the edges of the membranes of the Golgi bodies; others are formed when particles or liquids are taken into the cell.

5 Many cells have inclusions. Give two examples of inclusions.

Answer: The haemoglobin in red blood cells; The pigment melanin, which is found in the pigmented cells in the skin, hair and iris of the eye

6 List the substances that: **a** are required by all cells

Answer: Oxygen and glucose

b have to be removed from all cells.

Answer: Carbon dioxide, water and wastes other than CO_2

7 Label the diagram of the fluid mosaic model of the cell membrane.

Answer:

1 – Phospholipid

2 – Channel protein

3 – Carrier protein

4 – Glycoprotein

5 – Phosphate head (hydrophilic/polar head)

6 – Fatty acid tails (hydrophobic/non-polar tails)

7 – Cholesterol

8 – Integral proteins

8 Use a diagram to describe 'diffusion.'

Answer: Diagrams will vary. A good diagram should show the movement of particles of a liquid or a gas so that they are evenly distributed over an available space. The net movement of molecules or ions from a higher to a lower concentration until they are evenly distributed. Refer to Figures 2.13, 2.14 and 2.15 on page 35 of the student book.

9 Define 'active transport' and provide an example that occurs in humans.

Answer: The use of energy (ATP) to transport more substances, usually ions, across a cell membrane. For example: The sodium-potassium pump.

10 Describe the level of organisation within the human body.

Answer: Cells → Tissues → Organs → Systems → Whole organism

11 Copy and complete the table below regarding the four different types of tissues.

Answer:

Type of tissue	**Function of the tissue**	**Location of the tissue in humans**	**Diagram of the tissue**
Epithelial	A covering or lining tissue	Outer layer of the skin Outer lining of internal organs Inner lining of hollow internal organs	Student diagrams will vary. Cells should be closely joined together. Cells vary in shape from thin and flat to column-shaped and cube-shaped, depending on the particular tissue. Refer to Figure 2.25 on page 43 of the student book.
Connective	To provide support for the body and to	Bone, blood, cartilage,	Student diagrams will vary. Cells should be separated from each other by large amounts of matrix.

	help hold the body parts together	tendons, ligaments	Refer to Figure 2.27 on page 45 of the student book.
Muscular	To respond to a stimulus and contract, becoming shorter	Skeletal muscle: attached to the bones of the skeleton Cardiac muscle: the heart Smooth muscle: walls of the stomach and intestinal wall, walls of blood vessels, iris of the eye, uterus	Student diagrams will vary. Fibres should be long and thin. Refer to Figure 2.28 on page 45 of the student book.
Nervous	To carry impulses from receptors to the central nervous system and back out to effectors (muscles or glands)	Brain, spinal cord and nerves	Student diagrams will vary. Neurons should have long projections from the body of the cell. Refer to Figure 2.29 on page 46 of the student book.

12 Choose two body systems and list the organs that are part of each of those systems.

Answer: The following examples use the digestive, circulatory and respiratory systems.

- Digestive system: Mouth, oesophagus, stomach, pancreas and small and large intestines
- Circulatory system: Heart, veins, arteries and capillaries
- Respiratory system: Trachea, bronchi, bronchioles, lungs, diaphragm and intercostal muscles

Explain

13 Explain the difference between the cytosol and cytoplasm.

Answer: Cytoplasm is the thick fluid inside the cell membrane and all the structures that are suspended in the fluid, while the cytosol is the liquid part of the cytoplasm.

14 The nuclear membrane has large gaps in it. Explain the importance of these gaps.

Answer: The nuclear pores allow large molecules to pass through the nuclear membrane.

15 Why are most cells microscopic?

Answer: The microscopic nature of most cells gives them gives them a very large surface area in relation to their volume. Substances must pass into and out of the cell at the surface so small cells are able to exchange materials efficiently.

16 Explain the relevance of concentration gradient.

Answer: The concentration gradient is needed for substances to move without the input of energy. Cells have requirements, and produce wastes; these requirements and waste removals can be achieved if a concentration gradient between the inside and outside of the cell is maintained.

17 Explain the role of proteins in transport across a cell membrane.

Answer: Carrier proteins are required to move water-soluble and large molecules into and out of the cell. Channel proteins are required to move water, and small ions that are not lipid soluble, either side of the membrane.

18 Explain the differences in function between the three types of muscle tissue.

Answer:

- Skeletal muscle is attached to the bones and is responsible for movement of body parts by pulling on the bones.
- Involuntary muscle is found in organs that are not under voluntary control, such as the walls of the alimentary canal, walls of blood vessels, the uterus and the iris of the eye.
- Cardiac muscle forms the heart and is responsible for contractions of the heart.

19 Explain why, in the lungs, oxygen diffuses from the air into the blood but carbon dioxide diffuses from the blood into the air.

Answer: The air in the lungs contains a greater concentration of oxygen than is in the blood (because fresh air is constantly being brought in from outside); thus, it moves from the area of higher concentration to the area of lower concentration by diffusion. The opposite is true for carbon dioxide, because the concentration is higher in the blood than in the air (because blood from around the body is constantly entering the lung capillaries).

Apply

20 Unlike plant cells, animal cells have no cell wall. How is the shape of a human cell maintained?

Answer: Human cells have a framework of protein fibres in the form of microfilaments and microtubules. These maintain the shape of the cell.

21 Compare and contrast diffusion and osmosis.

Answer: Compare: both move substances along the concentration gradient, from a higher to a lower concentration until equilibrium is met.
Contrast: Osmosis is a special type of diffusion, the diffusion of a solvent, usually water. Osmosis requires a cell membrane, whereas diffusion does not require a cell membrane.

22 Explain the importance of the structure of a mitochondrion.

Answer: A mitochondrion has a double membrane, with the inner membrane folding into the interior of the organelle. The inner membrane (cristae) provides the mitochondrion with a larger surface area for the reactions of aerobic respiration to take place on.

23 Explain how the structure of the cell membrane makes it permeable to some molecules but not to others.

Answer: The cell membrane is semi-permeable. The membrane is a phospholipid bilayer – a group of phospholipids (consisting of a phosphate head and two fatty-acid tails) arranged into a double layer, with the hydrophilic phosphate heads exposed to the water content outside and within the cell and the hydrophobic fatty-acid tails hidden in the inside. The phospholipid bilayer is most permeable to small, uncharged solutes. Protein channels float through the phospholipids. Collectively, this model is known as the fluid mosaic model. Substances that are too large, or in low concentrations compared with the inside of the cell, are transported across using energy. Carrier proteins are specific for certain substances, and unless the correct carrier proteins are present a particular substance cannot move across the membrane.

24 A red blood cell placed in distilled water swells up and bursts, but a red blood cell placed in sea water (about 3% salt) shrivels. Explain why this happens.

Answer: The red blood cell has a concentration of approximately 0.9% salt; thus, the distilled water represents a very dilute solution with a very high concentration of water. This means that water will move across the cell membrane by osmosis into the cell, causing it to burst. Sea water is more

concentrated than the contents of the red blood cell, so water moves out of the red blood cell into the sea water, causing the cell to shrivel.

Extend

25 Predict how human cells would be different if the cell membrane was completely impermeable, rather than selectively permeable.

Answer: There would be a requirement for more specific carrier or channel proteins present in the membrane to allow substances entry and exit from the cell. This would in turn, make the cells significantly heavier. Cells would not receive their requirements and have waste products removed as efficiently, which would slow the action of the cell's function.

26 Explain how lysosomes and vesicles may work together.

Answer: Lysosomes are vesicles that contain digestive enzymes. The enzymes are proteins, made by the ribosomes and packaged by the Golgi bodies into vesicles now called lysosomes. These lysosomes are retained in the cell, becoming an organelle.

27 Would you expect the cells of a large mammal, such as an elephant, to be larger than those of a small mammal, such as a mouse? Explain your answer.

Answer: The cells of a mouse and an elephant would be of similar size because all cells must be small so that they have a large surface area in relation to their volume. The large surface area is essential for efficient exchange of materials between the cell and its surroundings.

28 Some experts do not regard the nucleus as an organelle. Suggest possible reasons why they believe that the nucleus should be classified separately from other organelles.

Answer: The nucleus is much larger than the other organelles. It makes up about 10% of the volume of the cell. It also contains structures within it such as the nucleolus, and it is filled with nucleoplasm. For these reasons, some experts prefer not to think of the nucleus as an organelle.

29 Patients who have suffered severe blood loss or dehydration have to be given large volumes of fluid. A fluid that is often given is a 0.9% solution of sodium chloride, known as normal saline. Why is saline solution given, rather than just plain water?

Answer: Cells in humans have a 0.9% salt concentration under normal conditions/homeostasis. If only plain water were introduced into the blood, body fluids would be diluted (and the water would be excreted). There would also be the risk that cells would swell and possibly burst as the water diffused across the membrane.