

4.2 Revolutionary Steps in Surgery

WARMING UP

1. Discuss in your class.

- (1) Do you like to study science?
- (2) What are the advantages of learning science?
- (3) Are robots truly useful to human beings? Why? Why not?
- (4) How can we take help of robots in our daily life?
- (5) Name some gadgets and appliances that we use in day-to-day life.

2. Imagine that one of your family members / friends / classmates has recently undergone a surgery. You were curious and wanted to learn about his/her experience.

Match the questions you asked with their answers.

1.	What health problem did you suffer from?	a.	I was given a bath and I wore a surgical gown.
2.	Whom did you inform about it first?	b.	I was given an injection of anaesthesia.
3.	What type of doctor did you consult?	c.	I consulted an orthopedic surgeon.
4.	How did he / she find out that you needed a surgery?	d.	I was relieved and happy that the operation was over.
5.	What preparation was done before the surgery?	e.	I had fractured my ankle while playing hockey.
6.	What did you feel when you were taken to the operation theatre?	f.	No, I did not feel anything. I was fast asleep.
7.	What was the first step before the actual surgery?	g.	I recovered and I could walk normally after 3 weeks.
8.	Did you feel any pain during the surgery?	h.	Our school hockey coach
9.	What did you feel when you opened your eyes after the operation?	i.	The doctor took an X-ray of my ankle, and he found a fracture in my ankle.
10.	How soon did you recover?	j.	I was very nervous.



3. We have learnt that sentences may have two, three or more sets of subject + predicate, joined by a conjunction. Each set of subject and predicate that is a part of a larger sentence is called a clause.

Separate the clauses in the following sentences and write the conjunction.

(1) The thief stole the money and he ran away.

Clause (1)

Clause (2)

Conjunction :

(2) She told me that she was a doctor.

Clause (1)

Clause (2)

Conjunction :

(3) He ran fast but he did not win the race.

Clause (1)

Clause (2)

Conjunction :

(4) The traveller arrived at the station after the train had left.

Clause (1)

Clause (2)

Conjunction :

4. Coordination

Observe the clauses in the following sentences.

(1) He is intelligent and he is hardworking.

(2) Asit was tired but he could not rest.

(3) You can go for a walk or you can exercise at home.

(4) Seema has recovered from fever, so she can attend school.

Each of the above sentences has clauses that do not depend on each other for complete sense. They are called Independent or Co-ordinate clauses. They are joined by conjunctions like *and*, *but*, *or*, *so*. Such conjunctions are called **Co-ordinators**.

Other Co-ordinators are : • as well as / not only..... but also

• yet / still / however / nevertheless

• or / nor / else / either..... or / neither nor

• so / therefore / thus / hence / for

- **From the sentences given in Activity 2 pick out two sentences having Co-ordinate Clauses. Point out the Co-ordinators.**



Revolutionary Steps in Surgery

● **revolutionary** : causing a total dramatic change

● **bloodletting** : draining out blood

◆ *Why did doctors begin to use anaesthesia?*

● **anaesthetics** : substances / gases that make one feel no pain

● **benumbs** : makes numb so that one does not feel any pain

● **cardiac** : relating to the heart

◆ *Why had cardiac surgery not developed?*

● **essential** : necessary

● **sedatives** : substances that make someone sleepy

◆ *What had the patient James Cornish suffered from?*

Surgery dates back to as early as 600 BC. 'Sushruta Samhita' is one of the oldest works in the world dealing with surgery. It indicates that Sushruta was probably the first surgeon to perform surgical operations (plastic surgery). Later, some ancient surgeons performed tooth extraction and **bloodletting**.

Major surgery could not develop for centuries because of lack of knowledge and technology. The doctors had to cut open the part of the body that was not healthy, remove it or set right that part. This would involve a lot of pain to the patient. General **anaesthetics** like ether or chloroform developed only from mid – nineteenth century making painless surgical operations possible and successful.

Modern techniques are used nowadays for anaesthesia. General anaesthesia **benumbs** the whole body, and it is used for surgery of any region of the body. For local anaesthesia, local anaesthetics are injected into the surgical spot or an area near nerves.

Over the years now, revolutionary steps have been taken in different types of complicated surgery and these have made such operations successful.

Let us start with **Cardiac** surgery. Today, if you need to have a heart surgery, you can choose from many fine doctors. However, before 1893 this type of surgery was unknown. Doctors did not have modern medical tools and procedures, **essential** for heart surgery. In those days heart patients were treated with **sedatives** and they usually did not survive. Then in 1893 Daniel Hale Williams, a young African American surgeon, attempted a new medical technique in order to save a patient's life.

A patient, James Cornish, was suffering from a very serious knife wound. The knife had cut an artery less than an inch from his heart and punctured the pericardium (the sack around the heart). Dr Williams with six staff doctors, performed a complicated and daring operation. Dr Williams became the first surgeon to save his patient by successfully repairing the human heart.



Now many more advanced techniques are used to in this speciality, to deal with heart complications. Open heart surgery, which can help to repair heart defects, heart **valves** or even replace them, is also performed successfully. With proper measures, patients can recover from cardiac surgery faster than they did before.

Neurosurgery is another recent speciality to have received recognition since the early 1900s. It is concerned with the treatment of **disorders** of the nervous system.

Neurosurgeons operate on the brain, the spine or nerves. They can treat patients of all ages, from the new-born to the elderly, who have suffered a stroke.

Harvey Cushing (1869-1939) is considered to be the father of modern neurological surgery. In the early part of the 20th Century, he developed basic techniques and instruments for operating on the brain as a distinct surgical speciality. Cushing **dramatically** reduced the **mortality** rate for neurosurgery from 90% to less than 10%. By the time of his retirement in 1937, he had successfully removed more than 2000 **tumours**.

The main reason that mortality rates had been so high before, was blood loss. Among Cushing's significant achievements are the methods he developed to **stem** this blood loss by inventing a clip called 'silver clip' or 'Cushing clip'.

Thus neurosurgery is one the most **cutting edges** in the world of surgery and medicine.

What is **Robotic Surgery**?

Robotic surgery is a type of minimally invasive surgery. "Minimally invasive" means that instead of operating on patients through large **incisions**, use is made of **miniaturized** surgical instruments, that fit through a series of quarter-inch incisions. When performing surgery with the Da Vinci, – the world's most advanced surgical robot – these miniaturized instruments are **mounted** on three separate robotic arms, allowing the surgeon maximum range of motion and **precision**. The Da Vinci's fourth arm contains a **magnified** high-definition 3-D camera that guides the surgeon during the procedure.

The surgeon controls these instruments and the camera from a **console**, located in the operating room. Placing his fingers into the master controls, he is able

◆ *What kind of cardiac surgery is done nowadays?*

- **valves** : devices for allowing flow in one direction only
- **Neurosurgery** : surgical specialization that treats diseases and disorders of the brain and spinal cord
- **disorders** : (here) health defects

◆ *Who do neurosurgeons operate upon and on what body parts?*

- **dramatically** : suddenly and successfully
- **mortality** : death rate, especially on a large scale
- **tumour** : abnormal, extra growth
- **stem** : control
- **cutting edges** : latest development
- **Robotic Surgery**: surgery carried by minimum surgical instruments
- **incisions** : surgical cut made in skin or flesh
- **miniaturized** : made very small in size
- **mounted** : set up
- **precision** : accuracy
- **magnified** : enlarged

◆ *What is Da Vinci?*

- **a console** : a combination of display, input devices and control mechanism used for controlling a robot



● **replicated** : made an exact copy of

◆ *What are the advantages of Robotic Surgery?*

to operate all four arms of the Da Vinci. While looking through a stereoscopic high definition monitor, the robot literally places the surgeon inside the patient. This gives him a better, more detailed 3-D view of the operating site, than the surgeon's eye can provide. Every movement he makes with the master controls is **replicated** accurately by the robot. When necessary, the surgeon can even change the scale of the robot's movement. If he selects a three-to-one scale, the tip of the robot's arms will move just one inch for every three inches, that surgeon's hand moves.

Utilizing this advanced technology our surgeons are able to perform a growing number of complex surgical procedures. Since these procedures can now be performed through very small incisions, our patients experience a number of benefits compared to the open surgery of the past.

ENGLISH WORKSHOP

1. Read the lesson and name the following.

- (a) The first surgeon to perform operations
- (b) Anaesthetics used from mid 19th century
- (c) The first successful Cardiac Surgeon
- (d) A sack around the heart
- (e) The father of modern neurosurgery
- (f) The world's most advanced surgical robot

2. Match the terms in 'A' with their explanation in 'B'.

'A'

- (1) tooth- extraction
- (2) cardiac
- (3) sedative
- (4) tumour
- (5) incision
- (6) a console
- (7) 3-D
- (8) Cushing clip

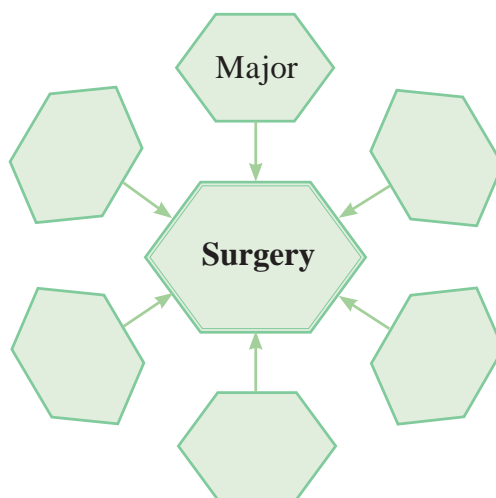
'B'

- (a) a cut made for surgery
- (b) having length, breadth and depth
- (c) plastic surgery
- (d) related to the heart
- (e) a control unit for a robotic surgery
- (f) removing a decayed tooth
- (g) substance that makes a person sleep
- (h) an extra growth in the body
- (i) a device to stop blood loss in neurosurgery

- (1) (2) (3) (4)
- (5) (6) (7) (8)



3. Fill in the web with words related to 'Surgery'.



4. Write 3 to 4 lines about each of the following in your own words.

- (a) 'Sushruta Samhita'
-
- (b) First Cardiac Surgery
-
- (c) First Neurosurgeon
-
- (d) The Robotic Surgery
-

5. (A) Fill in the gaps in the table of Degrees of Comparison.

	Positive	Comparative	Superlative
(1)	.....	.....	oldest
(2)	.....	healthier	.....
(3)	near	.....	.....
(4)	.....	finer	.....
(5)	.....	.....	earliest
(6)	small	.....	.....
(7)	.....	faster	.....
(8)	high	.....	.....

(B) Adjectives that have more than two syllables (long words) take ‘more’ and ‘most’ before them to form Comparative and Superlative degrees.

For example : successful - Positive Degree

more successful - Comparative Degree

most successful - Superlative Degree

• **Give the Comparative and Superlative forms of –**

Positive	Comparative	Superlative
(1) ancient
(2) special
(3) significant
(4) advanced
(5) accurate

6. Join the sentences using appropriate Co-ordinators. (but, or, so, and)

- There was lack of technology. Major surgery could not develop for centuries.
- Cardiac Surgery was tried in the past. Patients did not survive.
- He places his fingers into the master controls. He operates all four arms of the Da vinci.
- Open heart surgery can help to repair heart valves. It can also replce them.
- Heart patients were treated with sedatives. They did not survive.
- These procedures can be performed through very small incisions. Our patients experience a number of benefits.

7. Write in your notebook an imaginary telephonic conversation between you and your family doctor’s secretary, asking for an appointment to consult the doctor for a health problem you are suffering from. Begin with

Secretary : Good morning! This is XYZ Clinic.

How can I help you?

Myself : Good morning! I am

(Now continue.....)

