Surgery – An Introduction

Choose the most appropriate answer or answers :

1. Scientific dissection of the human body was first performed in :

a. Egypt
b. Greece
c. Rome
d. the 4th century BC
e. the Renaissance

2. During the Middle Ages, most doctors learned about anatomy by reading :

a. Hippocrates
b. Aristotle
c. Galen
d. Andreas Vesalius
e. Antonie van Leewenhoek

3. Bacteria were first observed :

a. in 331 BC
b. in 1543
c. in 1676
d. in saliva
e. by Andreas Vesalius

4. Ignaz Semmelweis realized that puerperal fever was caused by :

a. microorganisms
b. poor hygiene
c. fermentation
d. doctors and medical students
e. blood loss

5. The fact that germs were responsible for infection was first recognized by :

a. Hippocrates
b. Antonie van Leewenhoek
c. Andreas Vesalius
d. Joseph Lister
e. Louis Pasteur

6. In the 1950s the development of "heroic surgery" was made possible thanks to :

a. antibiotics
b. blood transfusion
c. anesthetics
d. radiology
e. confidence

7. Minimally invasive surgical techniques include :

a. coronary artery bypass (CABG)
b. keyhole surgery
c. radical mastectomy
d. craniotomy
e. endovascular aneurysm repair (EVAR)

8. Post-operative care for patients typically includes :

a. pain relief
b. bloodletting
c. physiotherapy
d. monitoring for complications
e. psychotherapy

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

1. *The branch of medicine that deals with the diagnosis and treatment of injury, deformity, and disease by manual and instrumental means :* _____
2. *A very narrow intense beam of light, which is used for cutting very hard materials and in surgery etc. :* _____
3. *A small straight knife with a thin sharp blade used in surgery and dissection. :* _____
4. *A physical injury to the body especially one caused by physical trauma and consisting of a laceration (cutting), piercing or breaking of the skin or mucous membrane. An opening made in the skin or a membrane of the body incidental to (following) a surgical operation or procedure :* _____
5. *A strand or thread of material used for closing wounds. :* _____
6. *A physician (doctor) specializing in the diagnosis and treatment of injury, deformity, and disease by manual and instrumental means :* _____
7. To cut out disks of bone, usually from the skull : _____
8. An opening or a perforation ; orifice : _____
9. *The bony or cartilaginous framework of the head, made up of the bones of the braincase and face ; cranium :* _____
10. *A (pathological) impairment of the normal state of the living body or one of its parts that interrupts or modifies the performance of the vital functions and is a response to environmental factors (as malnutrition, industrial hazards, or climate), to specific infective agents (as worms, bacteria, or viruses), to inherent defects of the organism (as genetic anomalies). SYN. : sickness, illness :* _____
11. To get free from confinement : _____
12. A number more than two or three but not many : _____
13. *A localized collection of pus, formed by tissue disintegration and surrounded by an inflamed area :* _____
14. *Familiarity, awareness, or understanding gained through experience or study :* _____
15. *A microscopic organism or agent, especially one that is pathogenic, such as a bacterium or virus. :* _____
16. A small reference book, especially one giving instructions. : _____
17. A sweet yellowish or brownish viscid fluid produced by bees from the nectar of flowers and used as food. : _____
18. Covered with mold (fungi) : _____
19. 1. The animating and vital principle in humans, credited with the faculties of thought, action, and emotion and often conceived as an immaterial entity. 2. The spiritual nature of humans, regarded as immortal, separable from the body at death, and susceptible to happiness or misery in a future state. : _____
20. A life or existence believed to follow death. : _____
21. To treat (a corpse) with preservatives in order to prevent decay. : _____
22. *A test under controlled conditions that is made to examine the validity of a hypothesis :* _____
23. A (magic) formula used in ritual recitation : _____
24. 1. to follow or run after (a person, animal, etc.) persistently or quickly 2. to force to run (away); drive (out) : _____
25. To inquire into ; investigate : _____

26. *To observe carefully or critically; inspect. To investigate a patient's state of health :* _____

27. With attention, conscientiously : _____

28. *A transformation or transition from one state, condition, or phase to another :* _____

29. *To be found to exist or appear :* _____

30. *An unhealthy condition of body or mind* SYN. *: sickness:* _____

31. *To make comprehensible ; To define ; To offer reasons for :* _____

32. *To cut apart or separate (tissue) for anatomical study :* _____

33. *A dead body, especially the dead body of a human. :* _____

34. A learned person. A specialist in a given branch of knowledge : _____

35. *The protrusion of an organ through the wall that normally contains it ; a rupture :* _____

36. *To take off ; To take away ; To eliminate :* _____

37. *An itching or painful mass of dilated veins in swollen anal tissue ; hemorrhoids :* _____

38. *A pair of organs in the abdominal cavity, functioning to maintain proper water and electrolyte balance, and filter the blood of metabolic wastes, which are excreted as urine :* _____

39. *A small hard mass that forms from deposits chiefly of phosphates and urates :* _____

40. *A person having expert knowledge of one or more sciences, especially a natural or physical science. :* _____

41. *To accomplish, carry out, execute :* _____

42. *Relating to, derived from, or used in science :* _____

43. *A dead body, especially one intended for dissection. :* _____

44. *The portion of the central nervous system that is enclosed within the cranium, continuous with the spinal cord, and composed of gray matter and white matter. It is the primary center for the regulation and control of bodily activities, receiving and interpreting sensory impulses, and transmitting information to the muscles and body organs. It is also the seat of consciousness, thought, memory, and emotion. :* _____

45. *Any of the membranous tubes that form a branching system and carry blood to the heart. :* _____

46. *Any of the muscular elastic tubes that form a branching system and that carry blood away from the heart to the cells, tissues, and organs of the body. :* _____

47. The first or first mentioned of two ; the second or second mentioned of two : _____

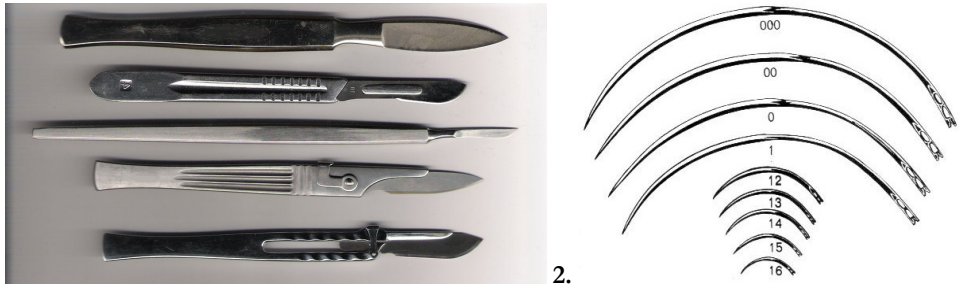
48. To be dependent : _____

49. A period of one thousand years : _____

50. Almost entirely; mainly : _____

51. The traditional beliefs, myths, tales, and practices of a people, transmitted orally. : _____

Traditionally the term ***surgery*** has been used for treatments that involve cutting or stitching tissue. However, advances in surgical techniques have made the definition more complicated : sometimes lasers, rather than scalpels, are used to cut tissue, and wounds may be closed without stitches. In modern medical care, distinguishing between a surgical and medical procedure is not always easy.



1. Scalpel blades *are made of 440C stainless steel.* **2. Surgical needles** *in different sizes are used to apply sutures, or stitches, through a patient's skin or tissue.*

Origins of surgical practice[1]

The first surgeons lived in prehistoric times. One of the earliest surgical operations was trephining, that is, cutting a hole in the skull. People believed that this* cured disease by letting evil spirits escape from the head. Prehistoric skulls, discovered by modern archaeologists, often contain several holes. Ancient surgeons also performed amputation (cutting off an arm or leg), mastectomy (cutting off the breast), and cutting open abscesses. But three problems limited the progress of surgery. First, the ancient surgeons had almost no knowledge of anatomy or physiology. Second, they* had no modern anesthetics. Third, they* did not understand about germs (microorganisms), so their* patients usually died from infection after a major operation.

[1] Adapted from : Greenhalgh, T. (1993). *Medicine Today*, London: Longman

Trepanated skull, Neolithic (ca. 3500 BC). *Natural History Museum, Lausanne.– The perimeter of the hole in the skull is rounded off by ingrowth of new bony tissue, indicating that the patient survived the operation.*

Anubis was the ancient Egyptian god associated with mummification and burial rituals; here, he attends to a mummy. Canopic jars were used to store and preserve the viscera for the afterlife. The jars were four in number, each with the head of a different god, responsible for protecting a particular organ:: the stomach, intestines, lungs, and liver. The Egyptians considered the heart to be the seat of the soul so it was left inside the body instead of being placed in a canopic jar.

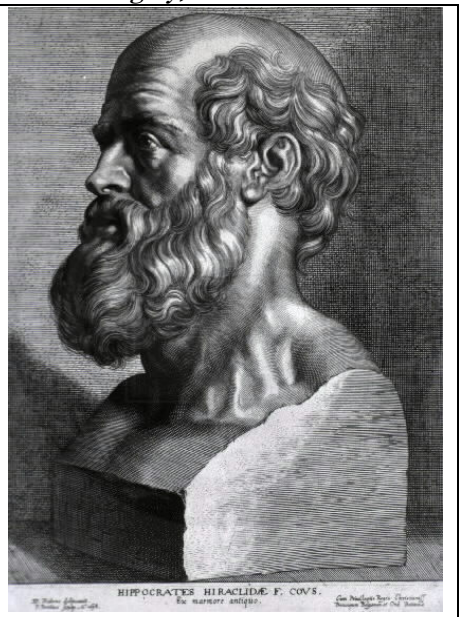
Mummification in ancient Egypt – *The preservation of the body was an essential part of ancient Egyptian funerary belief and practice. The art of mummification was perfected in the New Kingdom period (ca. 1550 BC – ca. 1069 BC) and finally declined during the Ptolemaic and Roman eras[2]. The best literary account of the mummification process is given by the ancient Greek historian Herodotus (ca. 484 BC – ca. 425 BC). He records that the entire process took seventy days. The internal organs, apart from the heart and kidneys, were removed via a cut in the left side. The organs were dried and wrapped, and placed in "canopic" jars. The brain was removed, often through the nose, and discarded. Bags of "natron" or salt were packed both inside and outside the body, and left for forty days until all the moisture had been removed from the remaining body tissue. The body was then cleansed with aromatic oils and resins and wrapped with linen bandages. Scientific analysis of mummies using processes such as X-ray and CT scanning has revealed a wealth of information about how individuals lived and died. It has been possible to identify conditions such as lung cancer, osteoarthritis and tuberculosis, as well as parasitic disorders.[3]*

Historically, the oldest surgical document in the world is the Edwin Smith Papyrus, an ancient Egyptian manual of trauma surgery written in about 1600 BC. The Edwin Smith Papyrus describes treatments such as closing wounds with sutures, and preventing or curing infection with honey and moldy bread. Egyptian practitioners had a basic understanding of anatomy, but based much of their medical practice upon religious belief as well. Ancient Egyptians believed that the body had to be preserved in order for the soul to reach immortality in the afterlife. This resulted in the development of mummification, a complex process of embalming the body and internal organs to preserve them for eternity. In fact, doctors in ancient Egypt were also priests. They* tried to cure disease through religious rituals, and they* did not use the rules of science (that is, experiment and observation) in medicine. Like most ancient people, the Egyptians thought that diseases were caused by magic forces, and many of the "cures" described in ancient Egyptian papyri included incantations to chase away disease-causing demons.

Hippocrates (ca. 460 BC – ca. 370 BC), a doctor who lived in ancient Greece, questioned this* theory of disease. He* believed that disease was caused by physical problems, not by magic, and that doctors must study the human body in a scientific way. Hippocrates taught his students to examine their patients carefully and to observe the changes that occurred during illness. He taught them* to examine the patient's environment – his* home, his* work and his* personal habits – in order to explain and treat the illness. But doctors in ancient Greece could not dissect human bodies, so Hippocrates and his pupils dissected only animals.

[2] http://en.wikipedia.org/wiki/Ancient_egypt#Burial_customs
[3] http://www.britishmuseum.org/pdf/Visit_Egypt_Mummification_KS2.pdf

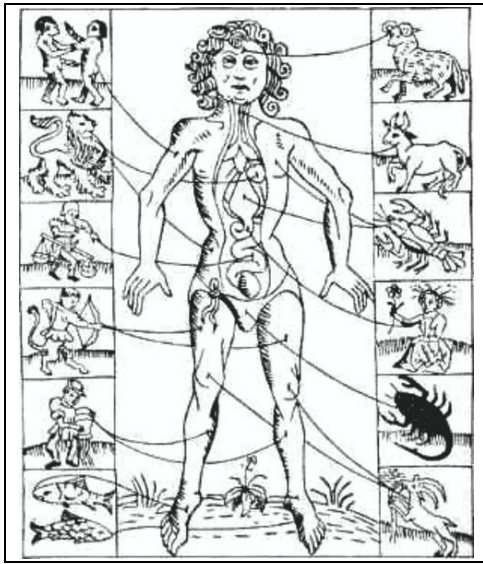
Hippocrates *is credited with being the first physician to argue that disease was not a punishment inflicted by the gods but rather the product of environmental factors, diet and living habits. However, Hippocrates did work with many convictions that were based on what is now known to be incorrect anatomy and physiology, such as Humorism.*
Hippocrates and his followers were the first to describe many medical conditions such as clubbing of the fingers, an important diagnostic sign in lung and heart disease. For this reason, clubbed fingers are sometimes referred to as "Hippocratic fingers". Hippocrates' approach was very successful in treating broken bones and dislocations, and his descriptions of the symptomatology, surgical treatment and prognosis of certain thoracic diseases remain relevant today.
The Hippocratic Oath was a seminal document on the ethics of medical practice. While the Oath is rarely used in its original form today, it serves as a foundation for other, similar oaths and laws that define good medical practice and morals.



"Primum, non nocere" – Hippocrates, *Engraving by Peter Paul Rubens, 1638*

Following the Greek conquest of Egypt (331 BC) a massive library was built in Alexandria that contained the works of all of the greatest philosophers, such as Aristotle and Plato who argued that the soul of a person left the body upon death, making dissection of the corpse permissible. Such was the importance of philosophy and learning in Alexandria that, for the first time in the history of Greek medicine, dissection of the human body was allowed. The medical school in Alexandria was the first school to teach students to dissect the human body. Surgeons from Alexandria were scholars, who performed operations such as repair of hernias, removal of piles (hemorrhoids) and removal of kidney stones[4]. Herophilus (335-280 BC), was the first scientist to systematically perform scientific dissections of human cadavers. Herophilus placed intelligence in the brain, and associated the nervous system with motion and sensation. He also distinguished between veins and arteries, noting that the latter* pulse while the former* do not.

Herophilus' works have not survived into modern times, but were extensively quoted by Galen (AD 129 – ca. 216), a prominent Roman physician, surgeon and philosopher who had to rely on Herophilus' earlier observations given that Roman law in his* time again forbade dissection and autopsy of the human body. Galen's theories and writings dominated Western medical science for well over a millennium. Indeed, after the fall of the Roman Empire, medical knowledge in the early Middle Ages was obtained chiefly from ancient Greek and Roman manuscripts preserved in monasteries. Over time, medicine became limited to folklore based on magic, astrology or herbal remedies ; and surgery was performed by barber-surgeons who practiced bloodletting and sutured soldiers' wounds.



The Zodiac Man *or homo signorum was used in anatomical diagrams dating from ancient times to the later medieval period. The human body was believed to be linked to the heavens. This was often illustrated with the Zodiac Man, who had every part of his body linked with an astrological sign, a season, and its corresponding humor.*

***What do the following words refer to ?**

a. *"People believed that this* cured disease"* → "This" refers to …
b. *"Second, they* had no modern anesthetics. Third, they* did not understand about germs, so their* patients usually died from infection"* → "They" and "their" refer to …
c. *"They* tried to cure disease through religious rituals, and they* did not use the rules of science"* → "They" refers to …
d. *"questioned this* theory of disease"* → "This theory" refers to the theory that …

e. *"He* believed that disease was caused by physical problems"* → "He" refers to …
f. *"He taught them* to examine"* → "Them" refers to …
g. *"his* home, his* work and his* personal habits"* → "His" refers to …
h. *"noting that the latter* pulse while the former* do not"* → "The latter" refers to … while "the former" refers to …
i. *"Roman law in his* time again forbade dissection"* → "His" refers to …

[4] *"Ammonius of Alexandria, surnamed Lithotomus from the instrument he invented to break a stone too large to pass through a perineal incision, practised lithotomy in about 200 B.C."* (From : The History of Lithotomy and Lithotrity, Sir Eric Riches,)

True or False ? (Be ready to explain and discuss).

i. In modern surgical practice, trephining is known as "craniectomy".
ii. Hippocrates and his students could not touch their patients' bodies, and therefore used medicines called "humors" to treat patients, rather than surgery.
iii. Dissection in ancient Egypt was a religious ritual.
iv. Egyptian surgeons were the first to use antibiotics to treat infection.
v. Ancient surgeons had no drugs to relieve pain.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW (×2) – WHY (×2) – WHERE – WHAT

1. ***The likelihood (probability) of*** **patients** ***surviving*** **surgery in ancient times.** ***Reasons for this.*** **→** …

underwent – procedures such as – because of – given that – not – germs

Few patients …

2. ***The reasons*** **surgeons didn't study anatomy in ancient times.** ***The place in which*** **doctors began to study human anatomy. →** …

no knowledge – given that – illegal – except – where – learned to – and – stones

Ancient surgeons …

3. ***The innovation in*** **Hippocrates' understanding of disease. Factors** ***that*** **Hippocrates' pupils learned to take into account in order to explain and treat disease. →** …

incorrect – humors – nonetheless – first – realize – caused by – factors – rather than – thus – taught – study – body – and – in order to – disease

Even though[5] …

4. **Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.**

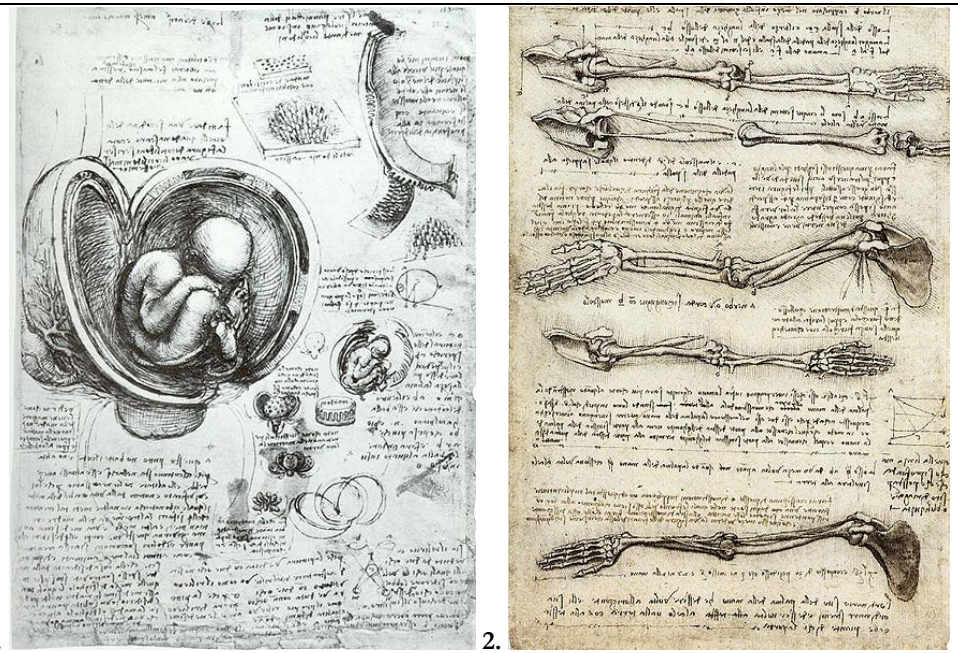
[5] NB. *though, although, even though* = bien que, quoique, même si … – Ne pas confondre avec "*thought*", la pensée.

Foundations of Modern Surgery : anatomy, blood loss and pain control

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

52. 1. To be extended or enlarged. ; To become distributed or widely dispersed 2. To distribute widely : _____
53. A machine that transfers lettering or images by contact with an inked surface onto paper or similar material. : _____
54. *Correct, precise :* _____
55. Characterized by originality and innovation : _____
56. An exposition of a given subject delivered before an audience or a class, as for the purpose of instruction. : _____
57. Beyond question or doubt ; indubitable or indisputable : _____
58. 1. To put into practice 2. To bring to a conclusion; accomplish : _____
59. *Conforming to fact and therefore worthy of belief :* _____
60. Of exceedingly great size, extent, or quantity. Syn. enormous : _____
61. An interruption or a disruption in continuity or regularity: television programming without commercial breaks. A sudden or marked change : _____
62. To find the explanation for or solution to (a mystery or problem) : _____
63. An explosive mixture of potassium nitrate, charcoal, and sulphur, used to propel projectiles from guns, and fireworks : _____
64. Bullets fired from a gun : _____
65. *A cord, wire, or bandage used in surgery to close vessels :* _____
66. *The process of burning a part of the body in order to stop bleeding. :* _____
67. *To fasten by drawing together the parts or sides (of something) and knotting with strings or laces. :* _____
68. *To cut right through or cut off (something) :* _____
69. 1. In addition, more 2. To a greater degree or extent. : _____
70. 1. Fundamental; elemental ; Of the greatest possible size or significance; maximum 2. The final point; the conclusion. : _____
71. 1. The act or an instance of losing something. 2. Something lost. : _____
72. 1. An expression of an intention to inflict pain, injury, etc. 2. Something that is a source of danger : _____
73. *1. To emit or lose blood. 2. To take or remove blood from. :* _____
74. *The therapeutic removal of blood, usually from a vein, formerly used as a treatment to reduce excess blood (one of the four humors of medieval medicine) :* _____
75. *Causing an unpleasant (physical) sensation as a consequence of injury, disease, or emotional disorder. :* _____
76. *An agent, such as an analgesic drug, that relieves pain :* _____
77. Present and ready for use ; accessible : _____
78. *An agent that causes loss of sensation with or without the loss of consciousness :*_____
79. *A volatile, highly flammable liquid, $C_2H_5OC_2H_5$, derived from the distillation of ethyl alcohol with sulfuric acid and widely used as a reagent, a solvent, and an anesthetic :* _____
80. *To anesthetize (completely) :* _____
81. 1. In or into the inner part; inside. 2. Inside the limits or extent of in time : _____
82. *The emergence and separation of offspring (children) from the body of the mother ; parturition :* _____
83. *An unpleasant sensation occurring as a consequence of injury, or disease ; (physical) suffering :* _____
84. For that reason ; consequently : _____
85. *An agent, such as heat, radiation, or a chemical, that destroys, neutralizes, or inhibits the growth of disease-carrying microorganisms :* _____
86. *To perform surgery. :* _____

The scientific approach to medicine and surgery reemerged in the Renaissance (14th-16th centuries). In the fifteenth century a revolution in scientific thought spread through Europe. The invention of the printing press helped establish a community of scientists who could easily communicate their* discoveries. The great Italian artists Leonardo da Vinci (1452-1519), Raphael (1483-1520) and Michelangelo (1475-1564), began to dissect human bodies in order to draw people more accurately.

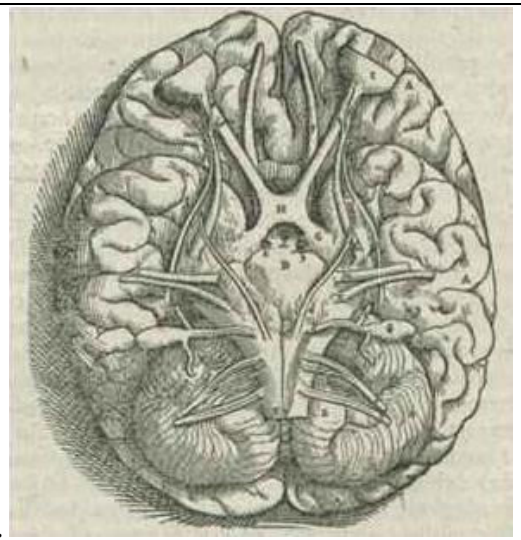


1. **2.**

Leonardo da Vinci (Journal) – 1. Fœtus in the womb *A page from Leonardo's journal showing his study of a fœtus in the womb, one of many detailed anatomical drawings by the artist which helped new doctors to understand the body (c. 1510) Royal Library, Windsor Castle* **2. Anatomical study of the arm, (c. 1510)**

In 1543 Andreas Vesalius, a physician and anatomist from Brussels, published his *De humani corporis fabrica* in seven volumes, a groundbreaking work of human anatomy based on his lectures in Padua, Italy, in which* he deviated from common practice by actually dissecting a human corpse to illustrate his lessons. Previously anatomy had been taught by reading classic texts, mainly Galen whose* ideas, e.g. the theory that arteries carried the purest blood to the higher organs such as the brain and lungs from the left ventricle, while veins carried blood to the lesser organs like the stomach from the right ventricle, were regarded as unquestionable. This* was then followed by an animal dissection performed by a barber-surgeon. Vesalius carried out dissection himself as the primary teaching method, direct observation was considered the only reliable source – a huge break with medieval practice. Vesalius' *Fabrica* presents a careful examination of the organs and the complete structure of the human body, and represents the first significant advance in the understanding of human anatomy since Herophilus over 1800 years earlier. This* would not have been possible without the many other advances that had been made during the Renaissance, including both artistic developments and the technical development of printing.

1.



2.

1. Andreas Vesalius (*Brussels, 1514 – Zante, 1564) was an anatomist, physician, and author of one of the most influential books on human anatomy, De humani corporis fabrica (On the Workings of the Human Body). Vesalius is often referred to as the founder of modern human anatomy.* **2. Base of the Brain**, *showing optic chiasma, cerebellum, olfactory bulbs, etc. From Andreas Vesalius' Fabrica (1543)*

In the Renaissance, surgeons began to study anatomy again. But to make its* transition to the modern era, the art of surgery still had to solve three major problems that effectively prevented surgery from progressing into modern science, these* were bleeding, pain and infection.

In the late fifteenth and early sixteenth centuries the use of gunpowder increased and spread throughout Europe. Surgeons learned to extract gunshot fragments (bullets) from wounds, and to control bleeding through the use of **ligatures** introduced by Ambroise Paré (c. 1510 – 1590) instead of cauterization. A ligature is a piece of material used to tie closed the end of a severed blood vessel to prevent further bleeding. Ligatures form the basis of modern bleeding control, but at the time, they* often spread infection because the surgeons using them* had no concept of infection control.

The ultimate problem however, was for the medical profession to recognize that blood loss was a major threat to the survival of the patient. In fact, doctors would typically bleed patients. Bloodletting was used to treat almost every disease and it* was thought to prevent infection. Before surgery blood was removed to prevent inflammation. The practice* was abandoned only in the late 1800s.

Until the nineteenth century, surgical operations were extremely painful and horrific. The only painkillers available were alcohol and opium. The first **general anesthetic** was given in the United States in 1846, when the surgeon John Warren used ether to put a patient to sleep during an operation. Within a year*, all American surgeons were using anesthetics for their operations. In 1853, Queen Victoria of Britain asked for an anesthetic (chloroform) to help her through the pain of childbirth. Anesthetics eliminated pain. Surgeons could therefore* perform longer and more difficult operations, whereas previously surgery had been largely limited to amputations and suturing wounds. But many patients still died a few days after the operation. The problem was infection. Surgeons did not know that germs (microorganisms) caused disease, or that disinfectants could kill germs. Often they* did not even wash their hands before operating on a patient.

1. 2.

1. Early inhaler for ether anaesthesia, 1847-1848. 2. Morphine, syringe with hypodermic needle – ***Anesthesia*** *(or anaesthesia), has traditionally meant the condition of having sensation (including the feeling of pain) blocked or temporarily taken away. This allows patients to undergo surgery and other procedures without the distress and pain they would otherwise experience. Anesthesia differs from* ***analgesia*** *in blocking all sensation, not only pain.*

The first anesthesia (a herbal remedy) was administered in prehistory. ***Opium*** *poppies were collected in 4200 BC. The use of opium-like preparations is recorded in the Ebers Papyrus of 1500 BC. But the use of herbal anaesthesia had a crucial drawback compared to modern practice — as lamented by the Italian anatomist Fallopius (1523 - 1562), "When soporifics are weak, they are useless, and when strong, they kill."*

Morphine*, a highly potent opiate analgesic drug, is the principal active agent in opium, and is considered to be the prototypical opioid. Like other opioids, morphine acts directly on the central nervous system (CNS) to relieve pain. Morphine has a high potential for addiction; tolerance and both physical and psychological dependence develop rapidly. Morphine was first isolated in 1803 by the German pharmacist Friedrich Wilhelm Adam Sertürner, who named it "morphium" after Morpheus, the Greek god of dreams. But it was not until the development of the hypodermic needle in 1853 that its use spread, especially during the Austro-Prussian and Franco-Prussian Wars in 1866 and 1871.*

In 1846, John Warren, assisted by dentist William Morton, performed the first public demonstration of ***ether*** *as a general anesthetic, for a patient undergoing an excision of a vascular tumor from his neck.. Despite its unpleasant side effects (such as nausea and vomiting) ether was safer than chloroform because it had a higher therapeutic index (~1.5-2.2), a larger difference between the recommended dosage and a toxic overdose. Ether is still the preferred anesthetic in some developing countries due to its high therapeutic index and low price.*

***What do the following words refer to ?**

j. *"who could easily communicate their* discoveries"* → "Their" refers to …
k. *"in which* he deviated from common practice"* → "Which" refers to …
l. *"whose* ideas … were regarded as unquestionable"* → "Whose" refers to …
m. *"This* was then followed by an animal dissection"* → "This" refers to …
n. *"This* would not have been possible without the many advances that had been made during the Renaissance"* → "This" refers to …
o. *"to make its* transition to the modern era"* → "Its" refers to …
p. *"these* were bleeding, pain and infection"* → "These" refers to …
q. *"they* often spread infection because the surgeons using them*"* → "They" and "them" refer to …
r. *"it* was thought to prevent infection"* → "It" refers to…
s. *" The practice* was abandoned only in the late 1800s "* → "The practice" refers to the practice of …
t. *"Within a year*"* means in the year that followed …
u. *"Surgeons could therefore* perform longer and more difficult operations."* → "Therefore" refers to the fact that …
v. *"they* did not even wash their hands"* → "They" refers to …

True or False ? (Be ready to explain and discuss).

vi. During the Renaissance, surgical practice improved thanks to the use of gunpowder.
vii. Ligatures were an improvement over cauterization.
viii. After 1846, alcohol and opium were replaced by more effective anesthetics like ether.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW (×2)– WHAT (×2) – WHY

5. *Ways in which* surgeons' knowledge of anatomy improved during the Renaissance. → …

anatomy – thanks to – science and – especially – invention – publication – such as – as well as – practical – extracting

During the Renaissance …

6. Surgeons' *beliefs and practices* before the 19th century *regarding* blood loss. → …

learned to – wounds – using – instead of – nonetheless – continued to – before operations – prevented

Ironically[6], even when …

[6] NB. Ironically : contrary to what was expected or intended, syn. paradoxically, not without contradiction…

7. *Improvements* in surgical technique during/after the Renaissance. *The reason* survival rates following surgery remained poor until the 19th century. → …

technical – such as – which enabled – improve – skills – prognosis – many patients – lack – understanding about – hygiene

Despite …

8. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.

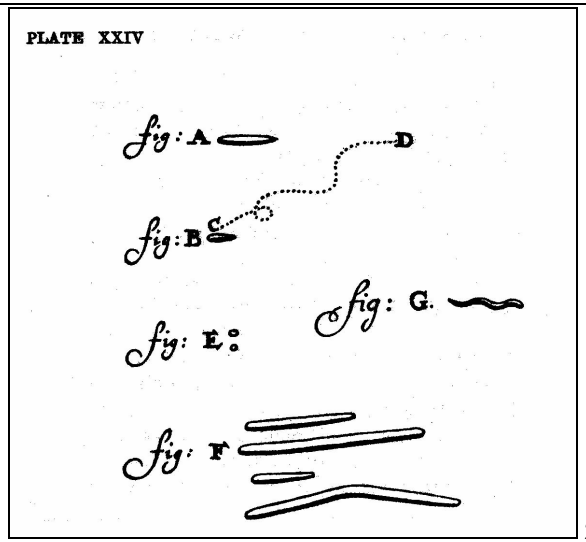
Foundations of Modern Surgery : germ theory and antisepsis

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

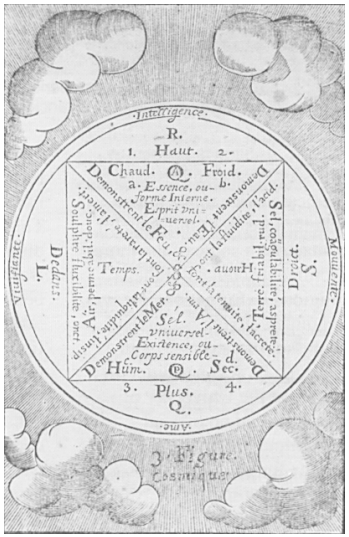
87. *Small, unicellular microorganisms of the kingdom Monera that cause many diseases and infections. :* _____
88. A merchant who sells cloth, clothing and sewing articles. : _____
89. 1 The buying and selling of goods and services 2. A person's job : _____
90. A graphic representation, especially a detailed plan for construction or manufacture. :_____
91. To come into the mind of [Latin occurrere to run up to] : _____
92. *The concept that all infectious and contagious diseases are caused by living microorganisms. :* _____
93. *Spectacular; impressive, remarkable :* _____
94. *The extent or rate of occurrence, especially the number of new cases of a disease in a population over a period of time. :* _____
95. *The cessation of all vital functions of the body including the heartbeat, brain activity (including the brain stem), and breathing. :* _____
96. *Septicemia accompanied by fever, in which the focus of infection is a lesion of the mucous membrane of the parturient canal due to trauma during childbirth; usually due to a streptococcus. :* _____
97. *To assist a woman in giving birth to a baby. :* _____
98. *A woman who attends another woman during pregnancy and labor, an expert practitioner in the care of expectant women and the delivery of uncomplicated pregnancies. :* _____
99. *Free from danger: she doesn't feel safe ; taking or involving no risk, not dangerous :* _____
100. To state or express positively; affirm : _____
101. Exceptionally small; tiny. : _____
102. A white powder comprised of calcium hydroxide (lime) and chloride and hypochlorite and used to bleach and/or disinfect : _____
103. By that means, consequently : _____
104. An established social order. A group of people holding most of the power and influence in a government or society. : _____
105. *A toxic condition resulting from the presence of urinary constituents in the blood, caused by deficiencies in the secretion of urine. :* _____
106. To become reduced in size or volume. : _____
107. *1. A serious injury or shock to the body, as from violence or an accident.2. An event or situation that causes great distress and disruption. :* _____
108. 1. An error 2. A misconception or misunderstanding. : _____
109. *1. The usual food and drink of a person. 2. A regulated selection of foods, as for medical reasons or cosmetic weight loss. :* _____
110. *A sensation of coldness, often accompanied by shivering :* _____
111. 1. To offend 2. To produce anger, resentment or indignation : _____
112. To condemn openly. To accuse : _____
113. *To become deranged or mentally disturbed. :* _____
114. *An institution for the care of individuals with mental impairments, who require organized supervision or assistance. :* _____
115. *Bacterial infection in the bloodstream or body tissues :* _____
116. To take the life of someone, to kill : _____
117. *A division in a hospital for the care of a particular group of patients :* _____
118. A poisonous atmosphere formerly thought to cause disease. : _____
119. To assert as a fact : _____
120. Fine, dry particles of matter. : _____
121. *A localized protective reaction of tissue to irritation, injury, or infection, characterized by pain, redness, swelling :* _____
122. *A substance that inhibits the growth and reproduction of disease-causing microorganisms. :* _____
123. *To remove dirt, etc. To purify :* _____
124. *Preceding in time or order, before :* _____
125. *A proportion ; Level of quality :* _____
126. A person of equal rank, position, or background; a peer. : _____
127. *The condition of being safe; freedom from danger, risk, or injury. :* _____
128. *Ability that is acquired or developed through experience ; talent, competence, aptitude :* _____
129. *To make or become greater or larger in number or amount :* _____
130. *To advance to a better state or quality ; To make or become better :* _____
131. Having a favorable outcome. Having obtained a desired or intended result : _____
132. *Inflammation of the small pouch attached to the cecum, at the beginning of the large intestine, usually caused by a blockage or infection. :* _____
133. *Surgery in which the thoracic cavity is opened to expose the heart and the blood is recirculated and oxygenated by a heart-lung machine :* _____

Bacteria, and other microorganisms, were first observed in 1676 by Antonie van Leeuwenhoek, a Dutch haberdasher by trade and amateur microscopist, using a single-lens microscope of his* own design. In so* doing, Leeuwenhoek had made one of the most important discoveries in biology. However, given contemporary medical theories, which considered illnesses to be the result of an imbalance between different body fluids, it* did not actually occur to Leeuwenhoek that these microorganisms could cause disease[7], and it was almost 200 years before the germ theory of disease was scientifically recognized and applied to the practice of surgery.

[7] http://www.answers.com/topic/anton-van-leeuwenhoek



1.



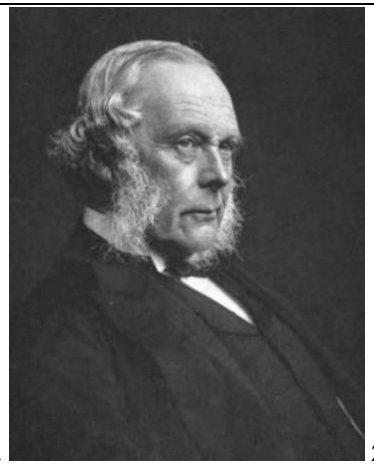
2.

1. Antonie van Leeuwenhoek's drawings of bacteria from the human mouth. *1684 ;* **2. Diagram illustrating the convergence of elements, humors, and geocosmic factors** *From Annibal Barlet, Le Vray et methodique Cours de ... Chymie (Paris, 1653)*[8]

The first real progress in combating infection was made in 1847 by Ignaz Semmelweis, an assistant obstetrician in the maternity clinic at the Vienna General Hospital, when he noticed the dramatically high incidence of death from puerperal fever among women who delivered with the help of the doctors and medical students. Births attended by midwives were relatively safe. Semmelweis realized that these doctors had usually come directly from autopsies. Asserting that puerperal fever was a contagious disease transmitted by minute infectious "particles", he* made doctors wash their hands with water and chlorinated lime before examining pregnant women, thereby* reducing mortality after childbirth from over 15% to less than 2% at his* hospital. Nevertheless, he* and his* theories were viciously attacked by most of the Viennese medical establishment who claimed that his observations lacked scientific reasoning, and attributed the fever instead to causes such as uremia, pressure exerted on adjacent organs by the shrinking uterus, emotional traumata, mistakes in diet, chilling, or atmospheric influences. Semmelweis was outraged by the indifference of the medical profession and began writing increasingly angry letters to prominent European obstetricians, denouncing them* as irresponsible murderers. His contemporaries, including his wife, believed he* was losing his mind, and in 1865 he* was committed to an asylum where he* died only 14 days later.

[8] http://www.nlm.nih.gov/exhibition/paracelsus/paracelsus_3.html

At about the same* period, an English surgeon, Joseph Lister, had begun to search for a solution to the problem of wound sepsis (infection) following surgery, which* claimed the lives of almost 50% of the patients in his ward. At the time the usual explanation for wound infection was that the exposed tissues were damaged by "miasma", a poisonous vapor in the air. In 1865, a colleague drew Lister's attention to the work and writings of Louis Pasteur who, in several notable reports[9], had claimed that putrefaction and fermentation were caused by living organisms carried on dust particles and transported by the air[10]. Lister concluded that inflammation was the result of germs entering and developing in the wound. Using carbolic acid (phenol) as an antiseptic, he* developed methods to cleanse the wound, his* hands, surgical instruments, and even the air in the operating room prior to surgery. Between 1865 and 1869 surgical mortality in his* accident ward fell from 45 to 15 percent. From 1871 to 1877 he* performed 725 major operations with a mortality rate of only 5.1%. Nonetheless many fellow surgeons remained indifferent, skeptical, or even hostile, and it was not until 1877 that Lister's method was finally recognized as a major advance in the safety of operative procedure.



1.

2.

1. Portrait of Joseph Lister ; 2. Joseph Lister's antiseptic steam spray producer *(by Marr, London c. 1878)*

Anesthetics and disinfectants made surgery both acceptable and safe. In the late nineteenth century, surgeons tried out new operations on all parts of the body. Their* knowledge and skills quickly increased, and their* status in society

[9] Especially : *Mémoire sur les corpuscules organisés qui existent dans l'atmosphère. Examen de la doctrine des générations spontanées* (1861) and *Recherches sur la putréfaction* (1863)

[10] http://www.whonamedit.com/doctor.cfm/3367.html

improved. The first successful operation for appendicitis was done in 1880 and the first open heart surgery in 1896.

***What do the following words refer to ?**

w. *"a single-lens microscope of his* own design"* → "His" refers to …
x. *"In so* doing, Leeuwenhoek had made one of the most important discoveries in biology"* → "So" means by …
y. *"it* did not actually occur to Leeuwenhoek"* → "It" refers to the idea that …
z. *"he* made doctors wash their hands"* → "He" refers to …
aa. *"thereby* reducing mortality after childbirth"* → "Thereby" means that mortality was reduced by …
bb. *"at his* hospital"* → "His" refers to …
cc. *"he* and his* theories were viciously attacked"* → "He" and "his" refer to …
dd. *"denouncing them* as irresponsible murderers"* → "Them" refers to …
ee. *"believed he* was losing his mind, and in 1865 he* was committed to an asylum where he* died"* → "He" refers to …
ff. *"At about the same* period"* → "The same period" refers to …
gg. *"which* claimed the lives of almost 50% of the patients"* → "Which" refers to …
hh. *"he* developed methods to cleanse the wound, his* hands …"* → "He" and "his" refer to …
ii. *"surgical mortality in his* accident ward fell from 45 to 15 percent. From 1871 to 1877 he* performed 725 major operations …"* → "His" and "he" refer to …
jj. *"Their* knowledge and skills quickly increased, and their* status in society improved"* → "Their" refers to …

True or False ? (Be ready to explain and discuss).

ix. Van Leeuwenhoek discovered cells in different body fluids.
x. Joseph Lister believed that infection was caused by contact with the air.
xi. Ignaz Semmelweis argued that puerperal fever was a contagious disease transmitted by minute infectious organisms.
xii. Louis Pasteur discovered that puerperal fever was caused by bacteria.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW – WHY (×2) – WHAT (×2)

9. *The length of time* before *germ theory was* recognized. → …

discovered by – as early as – relationship to – understood – until after – demonstrated – microscopic – responsible for – years – later

Although microbes …

10. *The reason* Semmelweis' ideas about hygiene were rejected by his contemporaries. *The conceptual difficulty for* doctors in the mid 19th century to understand *the transmission of* infectious disease. → …

first – relationship between – but – rejected – who – unable to – life-threatening – invisible – and – their own – responsible

Semmelweis was …

11. The conclusions *that* Joseph Lister *drew* from Pasteur's work on fermentation. Lister's innovations and their success. → …

realized – like fermentation – also caused by – which led – methods of – thereby – rates – from – to – %

After reading …

12. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.

200 years of microbiology : from microscopes to germ theory

The cell was first discovered by ***Robert Hooke*** *in 1665. He examined very thin slices of cork under a microscope and saw a multitude of tiny pores that he remarked looked like the walled compartments of a honeycomb. Because of this association, Hooke called them "cells", the name they still bear. However, Hooke did not know their real structure or function.*

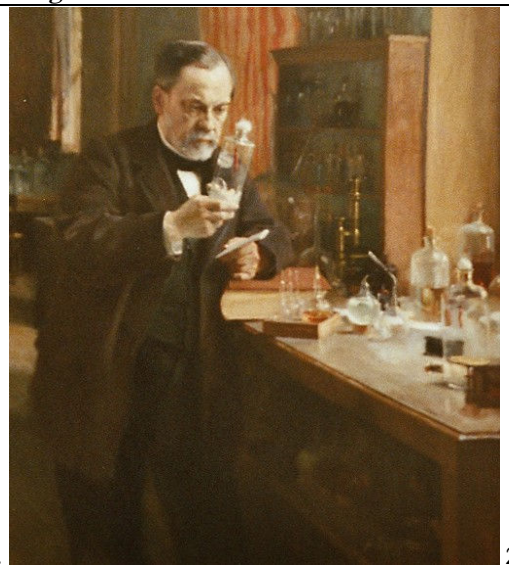
The first person to witness a live cell under a microscope was ***Antonie van Leeuwenhoek****, who in 1674 described the algae Spirogyra. He named the tiny, moving organisms he observed "animalcules", meaning "little animals". Leeuwenhoek was the first to record microscopic observations of bacteria, yeast, muscle fibers, spermatozoa and blood flow in capillaries. He is commonly known as "the Father of Microbiology", and is considered to be the first microbiologist.*

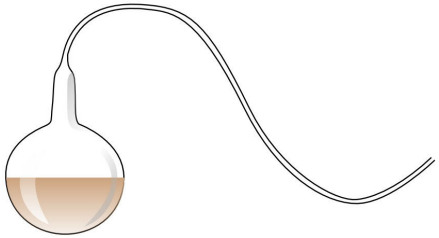
Theodor Schwann *(1810 –1882) was a German physiologist who observed plant and animal cells, and noted that they had different properties. Schwann also discovered the organic nature of yeast, and questioned the idea of spontaneous generation. In his "Microscopic Investigations on the Accordance in the Structure and Growth of Plants and Animals", he expressed one of the earliest formulations of cell theory when he declared that "All living things are composed of cells and cell products." His generalization became the foundation of modern histology, and led* ***Rudolf Virchow*** *to establish the principle of "omnis cellula e cellula" (every cell originates from another cell), thereby placing modern pathology on a truly scientific basis.*

Cell theory stood in contrast to the theories of vitalism proposed before the discovery of cells, which held that life processes arose from a nonmaterial "vital principle" and could not be explained as physical and chemical phenomena. The cell theory is now a widely accepted explanation of the relationship between cells and living things. The classical interpretation of cell theory states :

- *All living things or organisms are made of cells.*
- *New cells are created by old cells dividing into two.*
- *Cells are the basic building units of life.*

Louis Pasteur *(1822 – 1895) finally demonstrated that fermentation is caused by the growth of microorganisms, and that the growth of bacterium in nutrient broths is not due to spontaneous generation but rather to biogenesis. He exposed boiled broths to air in vessels with a long curved tube ("col de cygne") that would not allow dust particles to pass. Nothing grew in the broths unless the flasks were broken open. This was one of the last and most important experiments disproving the theory of spontaneous generation. The experiment also supported germ theory. While Pasteur was not the first to propose germ theory, he developed it and conducted experiments that clearly indicated its correctness and managed to convince most of Europe it was true. Today he is often regarded as the father of germ theory and bacteriology, together with Robert Koch.*





1. Louis Pasteur in his laboratory, *painting by A. Edelfeldt, 1885 (Detail) – Louis Pasteur was a French chemist and microbiologist best known for his remarkable breakthroughs in the causes and prevention of disease. His discoveries reduced mortality from puerperal fever, and he created the first vaccine for rabies. He was best known to the general public for inventing a method to stop milk and wine from causing sickness, a process that came to be called pasteurization. Pasteur also made many discoveries in the field of chemistry, most notably the molecular basis for the asymmetry of certain crystals.* **2. Swan-necked bottle** *(col de cygne) used by Pasteur to prevent dust particles from reaching the nutrient broth inside, while allowing air to pass.*

"Heroic" Surgery : technical progress vs. patients' well-being

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

134. *The transfer of whole blood or blood products from one individual to another :* _____

135. *Continuous and closely monitored health care that is provided to critically ill patients :* _____

136. *A building, special room, etc. Created to serve a particular function :* _____

137. *The fact of living or persisting through danger :* _____

138. *A surgical operation within or upon the contents of the abdominal–or pelvic, cranial, or thoracic cavities, involving anesthesia or respiratory assistance :* _____

139. More and more ; to an ever-increasing degree : _____

140. A short saying expressing the guiding maxim or ideal of a family, organization etc. : _____

141. *One of the jointed appendages, such as an arm or leg, used for locomotion or grasping :* _____

142. *Two milk-secreting, glandular organs on the chest of a woman ; the human mammary gland :* _____

143. *Any of various malignant neoplasms characterized by the proliferation of anaplastic cells that tend to invade surrounding tissue and metastasize to new body sites. :* _____

144. *Surgical removal of all or part of a breast, sometimes including excision of the underlying pectoral muscles and regional lymph nodes, usually performed as a treatment for cancer :* _____

145. Complete : _____

146. *The part of the body between the neck and the abdomen, enclosed by the ribs ; the thorax :* _____

147. *The fluid consisting of plasma, erythrocytes, leukocytes, and platelets that is circulated by the heart carrying oxygen and nutrients :* _____

148. *An elastic tubular channel, such as an artery, a vein, or a capillary :* _____

149. *Small, oval or round bodies that supply lymphocytes to the bloodstream and remove bacteria and foreign particles :* _____

150. *To cut off a limb (or part of a limb), by surgery. :* _____

151. *In good physical condition :* _____

152. Apt to, Possessing the qualities that make something probable : _____

153. *Suffering from a physical illness :* _____

154. *1. To cure someone of disease or affliction, to heal injured tissues 2. To return to a sound state :* _____

155. Careful, vigilant, conscious : _____

156. A privilege that is legitimate and just : _____

157. Inoffensive ; Not severe ; mild : _____

158. Lacking general approval or acceptance ; regarded with disfavor : _____

By the early twentieth century surgeons were able to cure many patients by removing diseased parts of the body. Blood transfusion, antibiotics, and intensive care facilities improved the survival rates for major surgery. In the 1950s, 60s and 70s, surgery became increasingly aggressive and "heroic". The surgeon's motto was "when in doubt, cut it out". Almost every patient, it seemed, needed a major operation to remove an organ or part of a limb. For example, surgeons advised all women with breast cancer to have a radical mastectomy, that is, removal of the whole breast, the muscles of the chest and several blood vessels and lymph nodes. Some surgeons even amputated an arm as well*. Many surgeons thought that if they removed a lot of healthy tissue, they would be more likely to cure the cancer. This* was not true, but for many years neither patients nor surgeons questioned the principle of heroic surgery.

In the late 1970s, however, surgeons began to see that major operations caused major stress to the sick patient. The wounds caused by the surgeon were just as dangerous as any other wound, and they* might take months or even years to heal. Patients, more aware of their rights over their bodies and influenced by alternative medicine, demanded gentler forms of treatment. Women patients, perhaps influenced by feminism, demanded less mutilating breast surgery. Heroic surgery became unpopular.

***What do the following words refer to ?**

kk. *"Some surgeons even amputated an arm as well*"* → "As well" means that some surgeons amputated an arm in addition to …

ll. *"This* was not true"* → "This" refers to the idea that if …

mm. *"and they* might take months or even years to heal"* → "They" refers to …

True or False ? (Be ready to explain and discuss).

xiii. The more tissue is surgically removed, the more likely a cancer is to be cured.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW – WHY – WHAT

13. ***The reasons*** **surgery became more and more aggressive after the 1950s.** ***Surgeons' beliefs*** **about "heroic" surgery.** → …

during – and 70s – because of – improvement in – rates after – thanks to – and also – believed that – by+V-ING – a lot of – for example – more likely

Surgery became …

14. *Reasons* heroic surgery became unpopular with surgeons and patients. → …

realized that – caused by – dangerous – a long time – and that – operations – major stress – Furthermore, – who were – aware of – demanded – and less – forms of

In the late 1970s surgeons …

15. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.

Modern surgical techniques : minimally invasive surgery

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

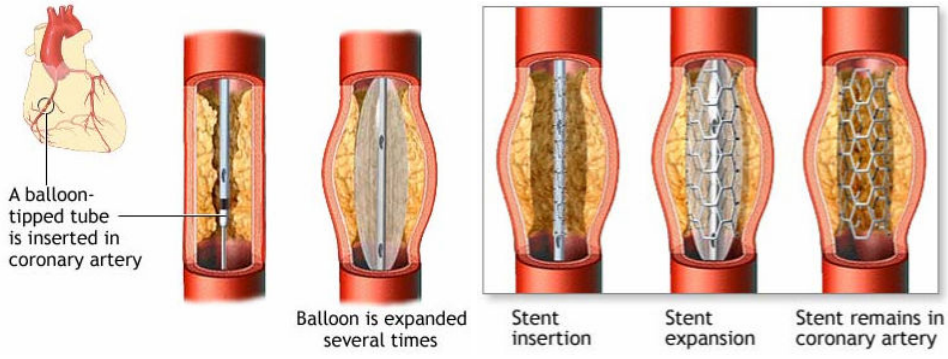
159. *Various procedures, typically carried out through the skin or through a body cavity using an endoscope or similar device, to avoid open invasive surgery in favor of closed or local surgery with less trauma. : _____*
160. *Surgical excision of a lobe, as of the lung : _____*
161. *Surgical excision of a tumor from the breast with the removal of a minimal amount of surrounding tissue : _____*
162. *An irregularly shaped mass or piece (especially a hard irregular mass within a soft material or liquid) ; Pathology. A swelling or small palpable mass : _____*
163. *Surgical removal of part or all of the uterus : _____*
164. *The uterus : _____*
165. *The female reproductive organ that produces ova, estrogen and progesterone : _____*
166. *The glandular mucous membrane that lines the uterus : _____*
167. *Surgical removal of part of an organ or a structure : _____*
168. *A covering for an inside surface : _____*
169. *The technology of light transmission through very fine, flexible glass or plastic fibers : _____*
170. *An instrument for examining visually the interior of a bodily canal or a hollow organ such as the colon, bladder, or stomach : _____*
171. To permit ; make possible : _____
172. *The alimentary canal, especially the intestine or stomach. The bowels ; entrails ; viscera : _____*
173. Not in any manner; in no circumstances : _____
174. *To take through the mouth and throat into the stomach ; to ingest : _____*
175. Small in diameter : _____
176. *A lesion of a mucous membrane such as the one lining the stomach or duodenum that is accompanied by formation of pus and necrosis of surrounding tissue, usually resulting from inflammation or ischemia : _____*
177. *A slender, tubular endoscope that is inserted through an incision in the abdominal wall to examine or perform minimally invasive surgery within the abdominal or pelvic cavities : _____*
178. *The membranous tissue forming an external protective covering and consisting of the epidermis and dermis. : _____*
179. *A type of operation performed using a flexible endoscope via a small incision in the skin (like the small hole in a lock) which allows the instrument to be passed into a cavity. : _____*
180. *A small, muscular sac, located under the right lobe of the liver, in which bile is stored : _____*
181. *To return to a normal or usual condition : _____*
182. *A mark left on the skin after a surface injury or wound has healed : _____*
183. *A secondary disease or injury that develops during the treatment of a preexisting disorder. : _____*
184. *(Relating to) a surgical procedure in which a catheter containing medications or miniature instruments is inserted percutaneously into a blood vessel for the treatment of vascular disease. : _____*
185. *Performed through the skin : _____*
186. *The main artery of the thigh, a continuation of the external iliac artery, supplying blood to the groin and lower extremity. : _____*
187. *An inflatable spherical device that is inserted into a body cavity or structure and distended with air or gas for therapeutic purposes. : _____*
188. *A slender thread, rod, or catheter placed within the lumen of tubular structures, such as a blood vessel, to provide support during or after anastomosis (surgical connection of separate or severed tubular hollow organs): _____*
189. *A platinum spiral commonly used in intracranial non-invasive surgery for the occlusion of brain aneurysms : _____*
190. *A surgical procedure for the treatment of angina pectoris or coronary vessel disease, in which a saphenous vein, mammary artery, or other blood vessel or a synthetic graft is used to build a shunt from the aorta to one of the coronary arteries to bypass a circulatory obstruction. : _____*
191. A slender (thin) flexible strand of metal : _____
192. *A hollow, flexible tube inserted into a body cavity, duct, or vessel to allow the passage of fluids or distend a passageway : _____*
193. *A definite distinctive form ; the physical dimensions or configuration of something : _____*
194. The proper position or location : _____
195. *An x-ray procedure that combines an X-ray source and a fluorescent screen to produce immediate images and motion on a screen and enable direct observation. The images look like those seen at airport baggage security stations. : _____*

Thus, beginning in the early 1980s surgeons began to develop new techniques of reducing the trauma associated with surgery, such as operating through smaller incisions which heal more quickly. Such* techniques are described as "**minimally invasive**". Radical mastectomy was replaced by lobectomy (removal of part of the breast), or even lumpectomy (removal of the lump alone). More recently, hysterectomy (removal of the womb and sometimes the ovaries as well) has been replaced in some cases by endometrial resection (removal of the inner lining of the womb).

Improvements in **fiber-optic** technology have revolutionized many surgical procedures. The fiber-optic endoscope, introduced in about 1980, allows the surgeon to see into the gut (endoscopy) and perform small operations with no incision at all. The patient swallows the thin endoscope tube and the surgeon pushes it* along the gut. Bleeding ulcers in the stomach and intestine are now often treated by endoscopy rather than major surgery. The laparoscope is another fiber-optic instrument, which* is pushed through a tiny incision in the skin ; this* is known as "keyhole surgery". Surgeons can now remove the appendix, the gallbladder and the ovaries, and also repair hernias, with a laparoscope. The patient recovers very quickly and has only a tiny scar. Complications, such as

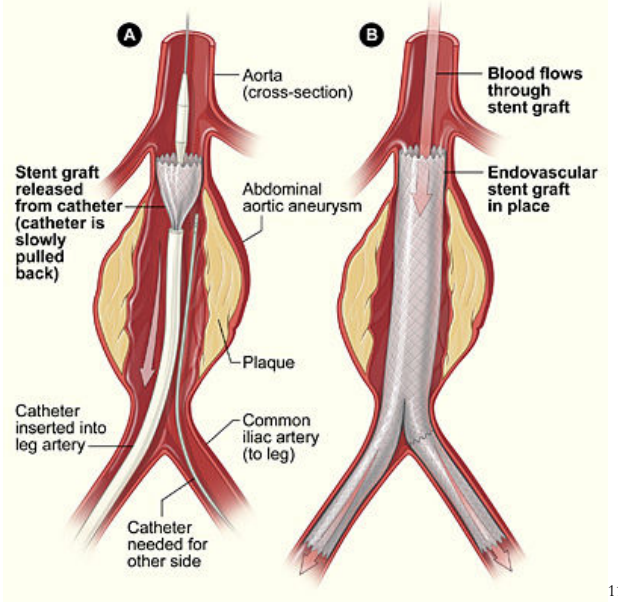
bleeding or infection, are much less common. The patient spends less time in hospital so the operation costs less money.

Endovascular surgery is a form of minimally invasive surgery designed to access many regions of the body via major blood vessels. Basic techniques involve the introduction of a catheter percutaneously into a large blood vessel (typically the femoral artery). In recent years, the development of intravascular balloons, stents and coils has allowed for new therapies as alternatives to traditional surgeries such as coronary artery bypass surgery (CABG). Stents and coils are composed of fine wire materials such as platinum, that can be inserted through a thin catheter and expanded into a predetermined shape once they are guided into place using fluoroscopic X-ray imaging.



1.

1. Coronary artery balloon angioplasty – *The small arteries of the heart muscle (the coronary arteries) can be narrowed or blocked when fat and cholesterol accumulate inside arteries (atherosclerosis). In balloon angioplasty a balloon-tipped tube is positioned so that the balloon part of the tube is beside the blockage. The balloon is then inflated for a few seconds to compress the blockage against the artery wall. Then the balloon is deflated. A latticed, metal scaffold known as a stent may then be placed within the coronary artery to keep the vessel open.*



2. [11]

This illustration shows the placement of an endovascular stent graft in an aortic aneurysm. In figure A, a catheter is inserted into an artery in the groin (upper thigh). It is then threaded up to the abdominal aorta, and the stent graft is released from the catheter. In figure B, the stent graft allows blood to flow through the aneurysm.

2. Endovascular Aneurysm Repair (EVAR), *is a type of Endovascular surgery used to treat an abdominal aortic aneurysm (AAA). The procedure is carried out under fluoroscopic x-ray guidance by a vascular surgeon or an interventional radiologist. The patient is either given a full GA (general anaesthetic) or an epidural. Vascular 'sheaths' are introduced into the patient's femoral arteries, through which the guidewires, catheters and eventually, the stent graft are passed.*

***What do the following words refer to ?**

nn. *"Such* techniques are described as "minimally invasive"* → "Such techniques" refers to …

oo. *"the surgeon pushes it* along the gut"* → "It" refers to …

pp. *"which* is pushed through a tiny incision in skin"* → "Which" refers to …

qq. "*this* is known as "keyhole surgery'"* → refers to the procedure of …

True or False ? (Be ready to explain and discuss).

xiv. "Minimally invasive" surgery nowadays includes many fiber-optic techniques such as laparoscopy, thoracoscopy, esophagogastroduodenoscopy and colonoscopy.

xv. Nowadays, ulcers, aneurysms and arteriosclerosis can be treated using minimally invasive fiber-optic techniques such as endoscopy.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

[11] http://www.nhlbi.nih.gov/health/dci/Diseases/arm/arm_treatments.html

WHAT (×2) – HOW

16. *Examples of* techniques *that* "minimally invasive therapy" includes. → …

such as – (that is, – through – tiny – using –) – smaller – like – and – which have replaced – and

Minimally invasive therapy …

17. "Endovascular" surgery. *Means of treating* vascular pathologies. → …

for – pathologies – in which – fluoroscopically – through – (hence the term " – ") – in order to – balloon or – at the site of

Endovascular surgery …

18. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.

Modern surgical techniques : lithotripsy, lasers and radiosurgery

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

196. The part of a sharp weapon, tool, or knife, that forms the cutting edge : _____
197. *A small, slender implement used for sewing or surgical suturing, made usually of polished steel and having an eye at one end through which a length of thread is passed and held. :* _____
198. The method, or instrument used to obtain a result or achieve an end : _____
199. *Pulverization of kidney stones by means of shock waves :* _____
200. *An abnormal concretion in the body, usually formed of mineral salts and most commonly found in the gallbladder, kidney, or urinary bladder. :* _____
201. *A set of tools or devices used for a particular purpose :* _____
202. *A large-amplitude variation, a transfer of energy :* _____
203. *To separate or be separated into pieces :* _____
204. *(A procedure) that does not penetrate the body. :* _____
205. To a complete degree or to the full or entire extent : _____
206. *One of the minute vessels connecting the arterioles and venules, the walls of which act as a semipermeable membrane for interchange of various substances between the blood and tissue fluid. :* _____
207. *Injury or harm :* _____
208. *An escape of blood from the blood vessels :* _____
209. A small globule or pocket of air or a gas in a liquid : _____
210. To extend on all sides of something simultaneously; encircle. : _____
211. *To end in a particular way, to have as a consequence :* _____
212. *Inability of an organ to perform or to function properly. :* _____
213. *The use of an intensely hot, precisely focused beam of light to remove or vaporize tissue and control bleeding in a wide variety of non-invasive and minimally invasive procedures. :* _____
214. *To cause (light rays, for example) to converge on or toward a central point; concentrate. :* _____
215. *A concentrated stream of particles or a similar propagation of waves :* _____
216. *Any of a wide variety of organisms that reproduce by spores, including the mushrooms, molds, yeasts, and mildews. :* _____
217. *To close completely or hermetically. :* _____
218. *The terminal of a nerve fiber, usually in synapse with another fiber or in a sensory organ. :* _____
219. *A vascular duct that carries lymph which is eventually added to the venous blood circulation :* _____
220. *Transient abnormal enlargement of a body part or area, caused by the exudation of fluid from vessels into the tissue. :* _____
221. *1. To be extended or enlarged. ; To become distributed or widely dispersed 2. The dissemination of an infection either systemically in the same patient, or to others :* _____
222. *An early keratinocyte (epidermal cell that produces keratin), present in the deepest layer (stratum basale) of the epidermis. :* _____
223. *An epithelial tumor of the skin that seldom metastasizes but has the potential for local invasion and destruction; it usually occurs as one or several small pearly nodules with central depressions on the sun-exposed skin of older adults :* _____
224. *A major category of lung carcinomas, which accounts for approximately 85% of all lung cancers, and including adenocarcinoma of the lung, large cell carcinoma, and squamous cell carcinoma. The cells in these subtypes differ in size, shape, and chemical make-up but they are grouped together because the approach to treatment and prognosis are very similar[12]. The treatment of choice for patients with early stages of disease is resection. :* _____
225. *A disease in which the cells of the uterine cervix become abnormal and start to grow uncontrollably, forming tumors, caused by several types of human papillomaviruses (HPV) and detected by means of routine screening with Pap tests (Pap smear), to identify precancerous and early-invasive stages[13]. :* _____
226. *Eye surgery in which the surface of the cornea is reshaped using a laser, performed to correct certain refractive disorders such as myopia. :* _____
227. *A visual defect in which distant objects appear blurred because their images are focused in front of the retina rather than on it :* _____
228. *An abnormal condition of the eye in which vision is better for distant objects than for near objects. It results from the eyeball being too short for light rays to properly focus on the retina, thus forming a blurred image. :* _____
229. *1. To change into vapour or gas 2. To cause to evaporate or disappear :* _____
230. *A single thickness of a material covering a surface or forming an overlying part or segment ; a stratum or lamina. :* _____
231. Having a specified distance between opposite surfaces : _____
232. To give a new, different shape (to something) : _____
233. The transparent convex anterior portion of the outer fibrous coat of the eyeball that covers the iris and the pupil and is continuous with the sclera. : _____
234. To have as a necessary condition : _____
235. *To remove, especially by cutting ; excise (tissue) :* _____
236. *The use of ionizing radiation to destroy cancerous or diseased tissue. :* _____
237. To carry to a particular destination : _____
238. *An apparatus for precisely aimed intersecting beams of gamma rays that delivers radiation therapies as treatment for intracranial lesions, either tumors or vascular anomalies. It is used in stereotactic radiosurgery. :* _____
239. *A machine or tool used for a particular purpose :* _____
240. *A new growth of tissue in which cell multiplication is uncontrolled and progressive. :* _____
241. *A surgeon specialized in treating diseases of the brain, spinal cord and nerves :* _____
242. *The object that a weapon, ball, etc., is aimed at :* _____
243. *Describing a procedure involving removal of a tissue or body part, or destruction of its function. :* _____
244. *To save or protect ; To refrain from harming or destroying :* _____

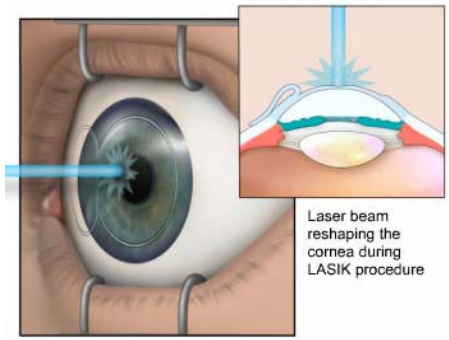
[12] http://www.cancer.org/Cancer/LungCancer-Non-SmallCell/DetailedGuide/non-small-cell-lung-cancer-what-is-non-small-cell-lung-cancer
[13] http://medical-dictionary.thefreedictionary.com/cervical+cancer

In other modern methods of surgery, various forms of energy, such as shock waves and gamma rays, have replaced blades and needles as means of operating on the patient's body.

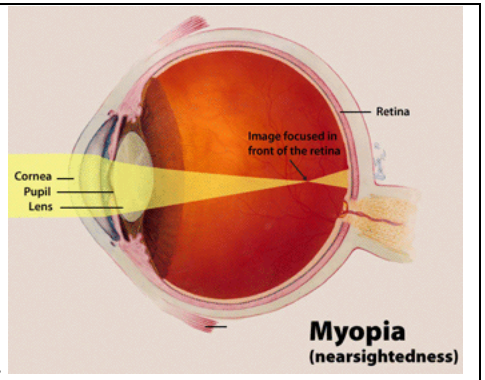
Extracorporeal shock wave lithotripsy (ESWL) was developed in the mid 1980s and quickly became a standard treatment of calculosis (kidney and gallbladder stones). Although the equipment for ESWL is expensive, the cost of removing stones by ESWL is much less than the cost of an operation. The ESWL machine delivers a powerful shock wave through the body to a stone in the kidney or gallbladder. The stone breaks up and disappears without any surgery at all. ESWL is a non-invasive method of treating kidney stones, but it* is not entirely without risks. In some cases, the shock waves can cause capillary damage or hemorrhage, directly or because of the formation of bubbles surrounding the stone, resulting in long-term consequences such as kidney failure or hypertension.

Laser surgery uses high-intensity light to treat cancer and other illnesses. Because lasers can focus very accurately on tiny areas, they* can also be used for very precise surgical work in the eye[14], or even deep within the brain[15]. A laser beam has a natural sterilization effect – it* evaporates bacteria, viruses and fungi, which* leads to a decrease in local infections[16]. Moreover, lasers can seal nerve endings to reduce post-operative pain and seal lymphatic vessels to reduce swelling and limit the spread of tumor cells. Lasers can be used endoscopically to shrink or destroy a tumor in the trachea (windpipe), esophagus, stomach, colon or uterus. Lasers are commonly used to treat superficial cancers (cancers on the surface of the body or the lining of internal organs) such as basal cell skin cancer and the very early stages of some cancers, such as non-small cell lung cancer or cervical cancer.[17] When* used to treat preinvasive cervical cancer, laser vaporization is successful in about 95%[18] of cases[19], and most women are able to return to normal activity within 2 to 3 days after surgery.

LASIK (Laser-ASsisted In-situ Keratomileusis) is a laser technique commonly used to correct near- and far-sightedness in vision. The laser vaporizes layers of tissue tens of micrometres thick in a finely controlled manner to reshape the surface of the cornea. No burning with heat or actual cutting is required to ablate the tissue.



1.

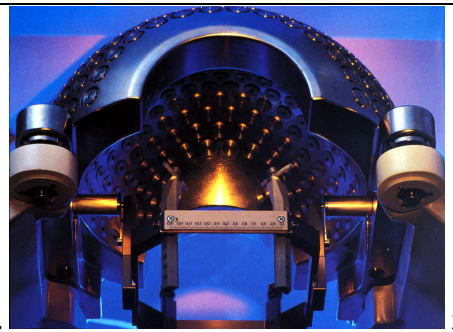


[20] 2.

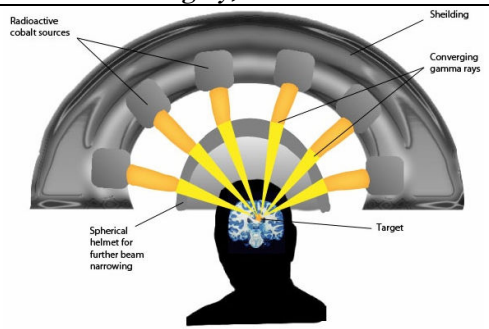
1. LASIK *(laser-assisted in-situ keratomileusis) – The illustration shows the left eye at an angle with the corneal flap laid open. A smaller frame shows the eye in cross section with the eye cut in half from front to back in the horizontal plane. A laser beam is shown removing corneal tissue in the center of the eye.* **2. Myopia** *is a refractive defect of the eye in which light is focused in front of the retina. Patients with myopia see near objects clearly but far-away objects appear blurred. With myopia, the eyeball is too long, or the curve of the cornea is too steep (convex), so images are focused in the vitreous humor inside the eye rather than on the retina at the back of the eye. The opposite defect of myopia is hyperopia or "far-sightedness" in which the cornea is too flat or the eye is too small.*

Radiosurgery uses high doses of radiation delivered precisely to kill cancer cells and avoid damaging healthy brain tissue. A **gamma knife** is a device used to treat brain tumors with a high dose of radiation therapy in one day. The device* was invented by Lars Leksell, a Swedish neurosurgeon, in 1967 at the Karolinska Institute in Sweden. The device aims gamma radiation through a target point in the patient's brain. Gamma knife radiosurgery is able to accurately focus many beams of gamma radiation to converge on the tumor from different angles. A concentrated ablative dose of radiation is thereby* sent through the tumor in one treatment session, but given that each individual beam is relatively low energy, surrounding brain tissues are relatively spared.

[14] http://www.nlm.nih.gov/medlineplus/ency/article/001913.htm
[15] http://www.abta.org/siteFiles/SitePages/ABC3A809DEA9E6F5B1A2E4C935ED6188.pdf
[16] http://en.wikipedia.org/wiki/Soft_tissue_laser_surgery
[17] http://www.cancer.gov/cancertopics/factsheet/Therapy/lasers
[18] http://www.webmd.com/cancer/cervical-cancer/carbon-dioxide-laser-surgery-for-abnormal-cervical-cell-changes
[19] http://www.cervicalcancer.org/lasersurgery.html
[20] http://www.fda.gov/cdrh/Lasik/animation.htm



1.



2.

1. The Leksell Gamma Knife *contains 201 cobalt-60 sources of approximately 30 curies (1.1 TBq) each* **2. Beams of gamma radiation converge on a target point in the patient's brain. –** *Radiosurgery is a radiosurgical procedure that allows non-invasive treatment of benign and malignant tumors. Patients can be treated within one to five days and as an outpatient. By comparison, the average hospital stay for a craniotomy (conventional neurosurgery, requiring the opening of the skull) is about 15 days. Radiosurgery costs less than conventional surgery, with much less morbidity, e.g. mortality, pain and post-surgical complications, such as hemorrhage and infection. However, radiosurgery is not without limitations and disadvantages. It is difficult to treat masses larger than 3 cm because it will require very high doses of radiation. It is important to remember that radiosurgery does not physically remove the tumor. Open surgery is needed to relieve pressure, remove the tumor totally or reduce it in size to make it a better target for radiosurgery. Open surgery and radiosurgery are often used in combination for many types of brain tumors.*

***What do the following words refer to ?**

rr. *"but it* is not entirely without risks"* → "It" refers to …
ss. *"they* can also be used for very precise surgical work"* → "They" refers to …
tt. *"it* evaporates bacteria, viruses and fungi"* → "It" refers to …
uu. *"which* leads to a decrease in local infections"* → "Which" refers to …
vv. *"When* used to treat preinvasive cervical cancer"* → "When used to treat" means when _____ _____ _____ to treat preinvasive cervical cancer
ww. *"The device* was invented by Lars Leksell"* → "The device" refers to …
xx. *"An ablative dose of radiation is thereby* sent through the tumor"* → "Thereby" means that an ablative dose of radiation is sent through the tumor because …

True or False ? (Be ready to explain and discuss).

xvi. ESWL, laser surgery and gamma surgery are described as "minimally invasive" techniques because they affect only a small area of the body.
xvii. In radiosurgery, brain tumors are vaporized by a high-intensity beam of gamma radiation.
xviii. *Nowadays, radiosurgery has replaced trephining as a treatment for brain tumors.*

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

WHAT – HOW (×3)

19. ***Advantages of laser surgery.*** → …

precision – sterilizes – by – and also – vessels – and – endings – thereby – and swelling

In addition to …

20. ***The invasiveness of*** **radiosurgery.** ***The principle by which*** **tumors are destroyed in radiosurgery. The effect on healthy tissue.** → …

treatment – since[21] – only – beams – to ablate – physically penetrates – Moreover – healthy – because – only – where – converge – ablative – whereas – other – smaller

Radiosurgery is described as …

21. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.

[21] NB. Since : 1. depuis que ; 2. puisque

The day of surgery

VOCABULARY *in context*. Match the following definitions with words from the reading passage below, then give an appropriate translation in French.

245. Clothes considered as a group, garments : _____
246. Ornaments, such as bracelets, necklaces, or rings, made of precious metals set with gems : _____
247. *A short-sleeved, thigh-length garment worn by patients in hospitals or other medical facilities. : _____*
248. *The room where a patient waits and undergoes final preparations before entering the operating room to have surgery : _____*
249. *To remove the beard or other body hair from, with a razor : _____*
250. *To remove (dirt, etc.) By hard rubbing. : _____*
251. *Administered into a vein (drug, etc.) : _____*
252. *A room in a hospital equipped for the performance of surgical operations : _____*
253. *Anesthesia characterized by the loss of sensation only in the area of the body where an anesthetic drug is applied or injected. : _____*
254. *To make unable to feel sensation or pain : _____*
255. *Anesthesia characterized by the loss of sensation in a circumscribed region of the body, produced by application of an anesthetic agent to all the nerves supplying that region : _____*
256. *To furnish or provide. To serve as a conduit (medium of transmission) : _____*
257. *Completely conscious; not in a state of sleep. : _____*
258. *Necessary to the continuation of life. : _____*
259. *Anesthesia produced by the injection of a local anesthetic into the epidural space of the lumbar or sacral region of the spine, inducing regional anesthesia from the abdomen or pelvis downward and used especially to control pain during childbirth. : _____*
260. *Physically situated below a similar or comparable thing ; located in an inferior position : _____*
261. *The posterior portion of the trunk of the human body between the neck and the pelvis; the dorsum. : _____*
262. *Anesthesia characterized by unconsciousness, muscle relaxation, and loss of sensation over the entire body (as for a major surgical operation) : _____*
263. *To give or dispense medicine : _____*
264. To cause to become; make : _____
265. *Temporarily lacking consciousness. Unable to perceive things through the senses; insensible or comatose : _____*
266. *To observe and evaluate a function of the body (e.g., blood pressure or heart or respiratory rate) closely and constantly. : _____*
267. *The number of heartbeats per unit of time, usually expressed as beats per minute (bpm). : _____*
268. *The alternate inhalation and exhalation of air in respiration. : _____*
269. *To diminish gradually in effect : _____*
270. *The pressure exerted by the blood against the walls of the arteries, maintained by the contraction of the left ventricle, the resistance of the arterioles and capillaries, the elasticity of the arterial walls, and by the viscosity and volume of the blood. : _____*
271. A cleansing agent or detergent that is made from a mixture of the sodium salts of various fatty acids of natural oils and fats.. : _____
272. *A two-piece garment of lightweight cotton, worn by hospital staff especially when participating in surgery. : _____*
273. *A soft close-fitting covering for the head : _____*
274. *A robe or smock worn in operating rooms and other parts of hospitals as a guard against contamination. : _____*
275. *A covering for the hand with a separate sheath for each finger, made of latex rubber, sterilized or capable of sterilization, thin enough not to interfere with touch sensation or digital dexterity, disposable or reusable. : _____*
276. A group organized to work together : _____
277. *One who is highest in rank or authority; a leader. : _____*
278. *A medical specialist who administers an anesthetic to a patient before an operation : _____*
279. *A nurse who directly assists the surgeon in the operating room : _____*
280. *A nurse who participates in a surgical procedure, coordinating, planning and implementing all the nurse-related activities during an operation, but who has not scrubbed with the surgical team itself. : _____*
281. *An electronic device used to record or check constantly on a function of the body, e.g., blood pressure or heart or respiratory rate. : _____*
282. *Basic indicators of body function, including heartbeats per minute, breaths per minute, blood pressure and body temperature. : _____*
283. To convey a liquid or gas by means of pipes (tubes) : _____
284. *A negative pressure device used for the removal (aspiration) of a fluid: _____*
285. *To keep (stop) someone from doing something : _____*
286. *A hospital room equipped for the care and observation of patients immediately following surgery. : _____*
287. Faint, weak, or dizzy ; stunned or confused and slow to react : _____
288. To wake up, stop sleeping : _____
289. *To feel or cause to feel nausea sickness in the stomach characterized by an urge to vomit : _____*
290. 1. As long as; during the time that 2. A period of time : _____
291. Determined by conditions or circumstances that follow. Cf. According to : _____
292. *A specialized section of a hospital containing the equipment, medical and nursing staff, and monitoring devices necessary to provide care for seriously ill patients requiring immediate and continuous attention : _____*
293. *Body temperature above the normal of 98.6°F (37°C). Also called pyrexia. : _____*
294. *A semisolid, gelatinous mass of coagulated blood that consists of red blood cells, white blood cells, and platelets in a fibrin network. : _____*
295. *To reduce or eliminate pain, anxiety, or distress. : _____*
296. *A medication that relieves pain without causing loss of consciousness (e.g. Aspirin and nsaids) : _____*
297. To put onto a surface : _____

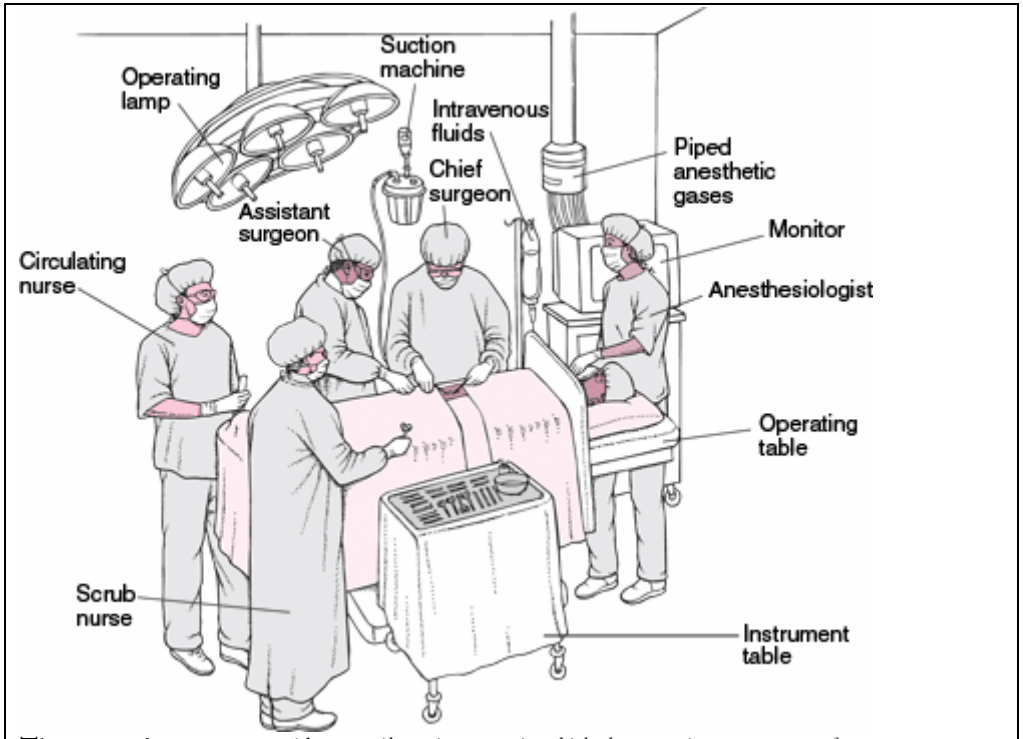
298. *A medicated adhesive pad that is placed on the skin to deliver a timed-release dose of medication through the skin into the bloodstream. : _____*
299. *The return to a normal, healthy state after illness or surgery : _____*
300. O begin again after interruption : _____
301. *The return to function after illness or injury, often with the help of specialized medical professionals, including physical therapy, occupational therapy, speech therapy etc. To restore some or all of the patient's physical, sensory, and mental capabilities or compensate for deficits that cannot be reversed medically : _____*
302. *The treatment of physical dysfunction or injury by the use of therapeutic exercise and the application of modalities, intended to restore or facilitate normal function or development. : _____*
303. *The ability of a muscle to produce or resist a physical force : _____*
304. *The ability of a muscle or extremity to relax and stretch : _____*
305. *The ball-and-socket joint formed between the head of the femur and the acetabulum of the pelvis. : _____*
306. To extend (the limbs or body), to become longer : _____

Before most operations, a person removes all clothing, jewelry, contact lenses or eyeglasses and puts on a hospital gown. The patient is taken to a specially designated room, the holding area, for final preparations before surgery. The operative site may be shaved, and is scrubbed with an antiseptic to prevent infection. A catheter is inserted in one of the veins of the hand or arm, through which* fluids and drugs are given. A drug may be given intravenously for sedation. The patient is then taken to the operating room (OR) and moved to the operating table.

Because surgery is generally painful, it* is almost always preceded by the administration of some type of **anesthesia**, which blocks the perception of pain. In local anesthesia, a drug is injected under the skin of the site to be cut, numbing only that site. In regional anesthesia, the drug is injected into one or more nerves and numbs an area of the body supplied by those nerves. During local and regional anesthesia, the patient remains awake. Local and regional anesthesia are generally considered safer than general anesthesia because they* usually do not affect the vital organs. Spinal and epidural anesthesia are specific types of regional anesthesia in which* a drug is injected around the spinal cord in the lower back. Spinal and epidural anesthesia are useful for operations of the lower body, and for childbirth. In general anesthesia, a drug that circulates throughout the bloodstream is administered (intravenously or inhaled), rendering* the person unconscious. General anesthetics affect vital organs, so the anesthesiologist closely monitors the heart rate, heart rhythm, breathing, body temperature, and blood pressure until the drugs wear off.

Doctors, nurses, and other personnel thoroughly scrub their hands with **antiseptic** soap. For surgery, they* also wear scrub suits, caps, masks, shoe covers, sterile gowns, and sterile gloves. The operating team consists of the chief surgeon, who directs the surgery ; one or more assistant surgeons, the anesthesiologist, the scrub nurse, who passes instruments to the surgeon ; and the circulating nurse, who provides extra equipment to the operating team.

The operating room typically contains a monitor that displays vital signs, an instrument table, and an operating lamp. Anesthetic gases are piped into the anesthetic machine. A catheter attached to a suction machine removes excess blood and other fluids, which can prevent surgeons from seeing the tissues clearly.



The operating room *provides a sterile environment in which the operating team can perform surgery.*

After Surgery

After the operation is completed and anesthesia begins to wear off, the patient is taken to a recovery room to be closely monitored for about 1 or 2 hours. Most people feel groggy when awakening, particularly after major surgery, some* are nauseated for a short while, others* may feel cold.

Depending on* the nature of the surgery and the type of anesthesia, a person may go home directly from the recovery room or be admitted to the hospital, sometimes in an intensive care unit (ICU). Complications such as fever, blood clots, and infection can develop during the days after surgery. Drugs that relieve pain (analgesics) can be given intravenously, by mouth, by injection into the muscle, or applied to the skin as a patch. A patient being sent home must be thinking clearly, breathing normally, able to drink fluids, able to urinate, able to walk, and be free of severe pain. The operative site should be free of bleeding and unexpected swelling.

During recovery from surgery, the person gradually resumes normal activity. Some people need rehabilitation or physiotherapy, which involves special exercises and activities, to improve strength and flexibility. For example, rehabilitation after hip replacement surgery can involve learning ways to walk, stretch, and exercise.

VOCABULARY *in context*. Give appropriate definitions and translations for the following words taken from Case Histories 1 & 2 :

307.*PTA*

308.*CXR*

309.*acute abdomen*

310.*resuscitation*

311.*undergo*

312.further

313.*uneventfully*

314.*discharge*

315.*angina pectoris*

316.*ST-elevation*

317.*PTCA*

318.*harvest*

319.*groin*

320.*swab*

321.display

General vocabulary (Eng-Fr) : http://www.wordreference.com/fr/ ; *Technical and scientific vocabulary (Eng-Fr) :* http://www. granddictionaire.com ; *Medical vocabulary (Eng-Fr) :* http://dictionnaire.reverso.net/medical-francais-anglais/ ; *Medical vocabulary (English definitions) :* http://medical-dictionary.thefreedictionary.com/

Case history 1[22]

A 54-y.o. Caucasian man presented to the Accident and Emergency department with a 20-day history of abdominal pain, vomiting and loss of appetite. He mentioned an eight kg weight loss over the last 20 days **PTA**, as he had been drinking almost exclusively water due to his symptoms. He had not presented to any hospital facility earlier because he lived in a remote area in the mountains. On admission, he had paleness, tachypnea, tachycardia (110 bpm) and a fever of 101.3°F[23], as well as a rigid abdomen. Abdominal and plain **CXR** demonstrated free gas under both hemidiaphragms. The patient's worsening clinical profile and deteriorating clinical signs (tachypnea and tachycardia), along with the presence of **acute abdomen** led to the decision to perform an emergency laparotomy. After initial **resuscitation** (placement of intravenous lines and nasogastric tube followed by adequate administration of fluids), the patient **underwent** emergency exploratory laparotomy. Because of the emergency situation, a computed tomography (CT) scan was not performed. Laparotomy revealed peritonitis due to a perforated ulcer on the anterior wall of the duodenum, which was sutured and reinforced with an omental patch. After a thorough lavage of the peritoneal cavity,

[22] Adapted from : *Synchronous perforation of a duodenal and gastric ulcer: a case report* http://www.jmedicalcasereports.com/content/4/1/272

[23] NB. *In Fahrenheit, the freezing point of water is 32°F and the boiling point is 212°F. A temperature interval of 1° Fahrenheit is equal to an interval of 5/9 degrees Celsius (1°C = 1.8°F / 1°F = 0.56°C). The following formula may be used to convert temperatures in Fahrenheit to Celsius : ([°F] − 32) × 5/9 = [°C], for example :* 0°C = 32°F [(32 – 32) × 5/9 = 0] ; 37°C = 98.6°F [(98.6 – 32) × 5/9 = 37]

further exploration revealed a second perforated, posterior pre-pyloric ulcer on the lesser curvature of the stomach. A wedge resection with staplers was carried out. The patient recovered **uneventfully** and was discharged home on the 13th post-operative day; with an appropriate triple therapy consisting of a proton pump inhibitor, amoxicillin and clarithromycin. After **discharge** the patient was referred to gastrointestinal specialists who planned a surveillance endoscopy according to their protocol.

Case history 2[24]

A 68-y.o. man with severe, diffuse coronary artery disease presented with two months of progressive **angina pectoris** symptoms. Coronary angiography revealed 3-vessel-disease with significant stenoses of the main coronary branches (LAD 99%, RCX 80%, RCA 90%), moderately-decreased systolic left-ventricular function and **ST-elevations** in leads II, III and aVF. For these reasons, surgical revascularization was indicated. The patient had a significant history of arterial hypertension, Type II diabetes mellitus, cigarette smoking (49 pack years), hypercholersterolemia and **PTCA** of the left coronary artery in 2002.

CABG was performed with three single vein-grafts to the diagonal branch (DB), right posterior descending artery (RPD) and left posterolateral circumflex artery (LPL). The left anterior descending artery (LAD) was revascularized by the left internal mammarian artery (LIMA). The saphenous vein was **harvested** by conventional open saphenectomy which involved an incision extending from the left medial malleolus, along the medial aspect of the knee to the **groin**.

During the patient's stay in the ICU, hemodynamic conditions were stabilized and the patient was moved to a normal ward on the second postoperative day. On the 6th postoperative day the patient was suffering from pain in his leg and developed a wound infection of the left upper leg where the great saphenous vein had been harvested. Clinical laboratory parameters (leucocytes and CRP) were significantly increased, and a gram-positive *Staphylococcus epidermidis* culture was identified from a wound **swab** taken from the infected site. The antibiogram presented methicillin-resistance as well as resistance to several conventional antibiotics, but **displayed** sensitivity to Daptomycin (Cubicin®, Novartis Pharma Corp., Germany). The drug was administered intravenously (dose: 4 mg/kg body weight) for ten days. During this time clinical parameters decreased significantly. Ten days later, another swab was taken from the wound but no microbiological culture was identified. The wound was closed operatively and healed without any further complications The patient was discharged from hospital on the twenty-eighth postoperative day and was sent for further rehabilitative therapy.

***What do the following words refer to ?**

yy. *"through which* fluids and drugs are given"* → "Which" refers to …
zz. *"it* is almost always preceded by the administration of some type of anesthesia"* → "It" refers to …
aaa. *"because they* usually do not affect the vital organs"* → "They" refers to …
bbb. *"in which* a drug is injected around the spinal cord"* → "Which" refers to …
ccc. *"rendering* the person unconscious"* → The subject of "rendering" is …
ddd. *"they* also wear scrub suits, caps …"* → "They" refers to …
eee. *"some* are nauseated for a short while, others* may feel cold"* → "Some" and "others" refer to …

fff. *"Depending on* the nature of the surgery and the type of anesthesia"* → The nature of the surgery and the type of anesthesia can determine …

True or False ? (Be ready to explain and discuss).

xix. During an operation, it is important for surgeons to carefully monitor the patient's vital signs.
xx. Following surgery, patients are admitted to an intensive care unit (ICU) to be monitored for complications such as fever, blood clots or infection.

Questions : (1) Ask questions about the following points, then (2) let someone else answer in a complete sentence (3) using as many of the suggested terms as possible.

HOW – WHAT (×2)

22. *Methods of* pain control during and after surgery. → …

administered into – thus causing – area – to become – (i.e. without –) – local or – or even – consciousness – in the case of – Patients – given – to relieve – once – wear off

During the operation …

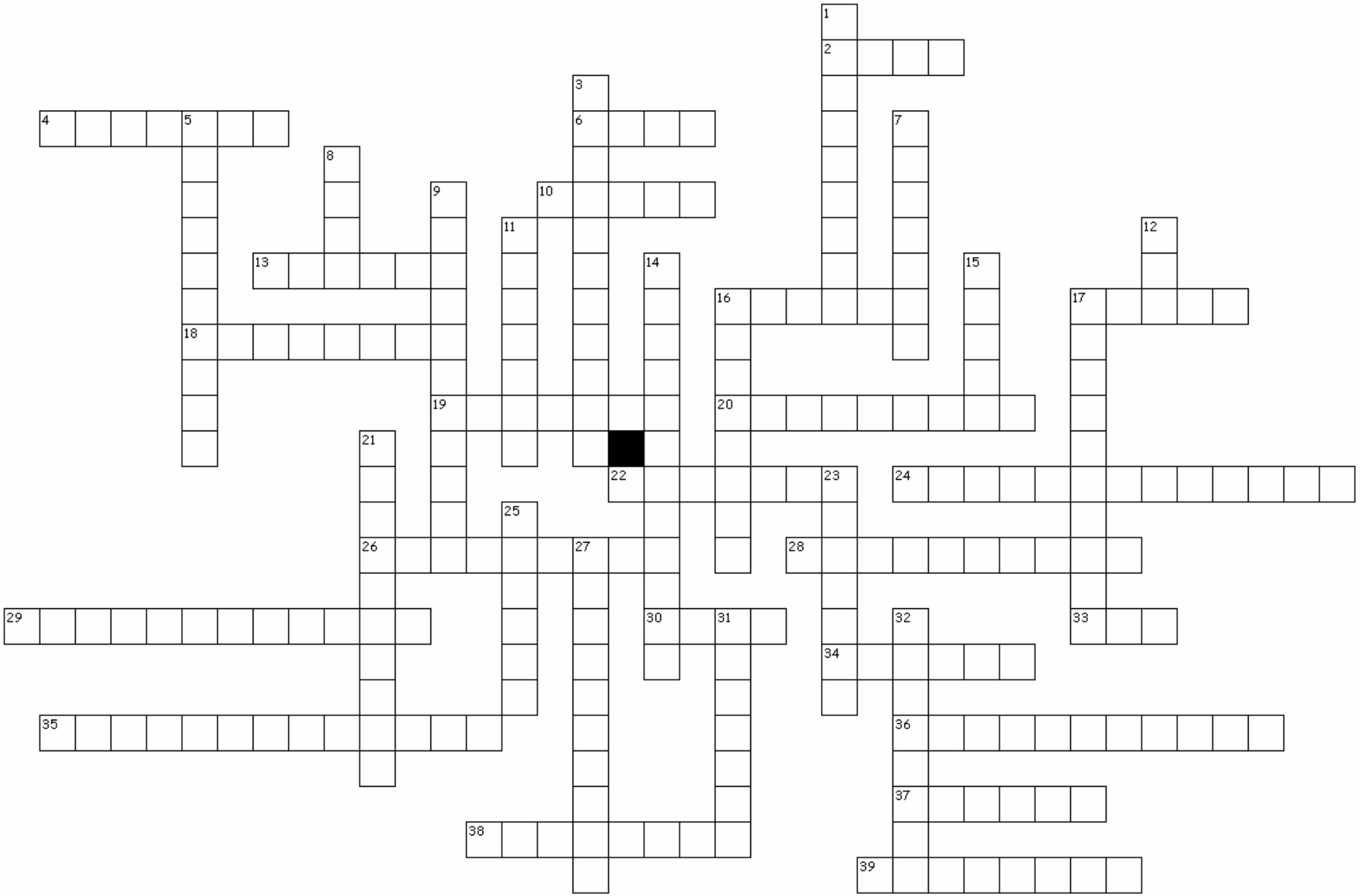
23. Objectives of pre-operative and post-operative care. Criteria *to release patients post-op.* → …

[24] Adapted from : *Daptomycin for treatment of methicillin-resistant Staphylococcus epidermidis saphenectomy wound infection after coronary artery bypass graft operation (CABG): a case report*
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2753312/

to prevent – by – soap – Post-operative – monitoring – in case – complications – in which case – transferred to – Indeed, before – ensure – cognitive and – functions – normal – i.e. – patient can – but also – not experience

Pre-operative care …

24. Make up one original question of your own relating to this section of the article, then write a 2-3 line answer to it using information either from the article or from outside sources.



Across

2. A surgical procedure for the treatment of angina pectoris or coronary vessel disease, in which a saphenous vein, mammary artery, or other blood vessel or a synthetic graft is used to build a shunt from the aorta to one of the coronary arteries to bypass a circulatory obstruction.
4. A small straight knife with a thin sharp blade used in surgery and dissection.
6. An irregularly shaped mass or piece (especially a hard irregular mass within a soft material or liquid) ; Pathology. A swelling or small palpable mass.
10. A physical injury to the body especially one caused by physical trauma and consisting of a laceration (cutting), piercing or breaking of the skin or mucous membrane. An opening made in the skin or a membrane of the body incidental to (following) a surgical operation or procedure.
13. 1. To be extended or enlarged. ; To become distributed or widely dispersed 2. To distribute widely.
16. A strand or thread of material used for closing wounds.
17. To remove (dirt, etc.) By hard rubbing.
18. A cord, wire, or bandage used in surgery to close vessels.
19. A physician (doctor) specializing in the diagnosis and treatment of injury, deformity, and disease by manual and instrumental means.
20. Small, oval or round bodies that supply lymphocytes to the bloodstream and remove bacteria and foreign particles.
22. To reduce or eliminate pain, anxiety, or distress.
24. A room in a hospital equipped for the performance of surgical operations.
26. Surgery in which the thoracic cavity is opened to expose the heart and the blood is recirculated and oxygenated by a heart-lung machine.
28. An apparatus for precisely aimed intersecting beams of gamma rays that delivers radiation therapies as treatment for intracranial lesions, either tumors or vascular anomalies. It is used in stereotactic radiosurgery.
29. A surgical operation within or upon the contents of the abdominal–or pelvic, cranial, or thoracic cavities, involving anesthesia or respiratory assistance.
30. To make unable to feel sensation or pain.
33. The reestablishing of heart and lung action after cardiac arrest or apparent sudden death resulting from electric shock, drowning, respiratory arrest, and other causes. The two major components are artificial ventilation and closed chest cardiac massage.
34. A small, slender implement used for sewing or surgical suturing, made usually of polished steel and having an eye at one end through which a length of thread is passed and held.
35. A robe or smock worn in operating rooms and other parts of hospitals as a guard against contamination.
36. Temporarily lacking consciousness. Unable to perceive things through the senses; insensible or comatose.
37. 1. A serious injury or shock to the body, as from violence or an accident.2. An event or situation that causes great distress and disruption.
38. Conforming to fact and therefore worthy of belief.
39. A localized, blood-filled dilation of a blood vessel caused by disease or weakening of the vessel wall.

Down

1. A person having expert knowledge of one or more sciences, especially a natural or physical science.
3. An elastic tubular channel, such as an artery, a vein, or a capillary.
5. An agent, such as an analgesic drug, that relieves pain.
7. In good physical condition.
8. A mark left on the skin after a surface injury or wound has healed.
9. A small hard mass that forms from deposits chiefly of phosphates and urates.
11. The branch of medicine that deals with the diagnosis and treatment of injury, deformity, and disease by manual and instrumental means.
12. Chest X-Ray.
14. An agent, such as heat, radiation, or a chemical, that destroys, neutralizes, or inhibits the growth of disease-carrying microorganisms.
15. 1. To emit or lose blood. 2. To take or remove blood from.
16. Transient abnormal enlargement of a body part or area, caused by the exudation of fluid from vessels into the tissue.
17. Relating to, derived from, or used in science
21. An escape of blood from the blood vessels.
23. To observe carefully or critically; inspect. To investigate a patient's state of health.
25. To become reduced in size or volume.
27. A substance that inhibits the growth and reproduction of disease-causing microorganisms.
31. A woman who attends another woman during pregnancy and labor, an expert practitioner in the care of expectant women and the delivery of uncomplicated pregnancies.
32. To end in a particular way, to have as a consequence.

- *(not) at all / (pas) du tout*
- *(to be) likely / (avoir) des chances de*
- *ablate / enlever, pratiquer l'ablation de*
- *ablative / ablatif*
- *abscess / un abcès*
- *accurate(ly) / précis(ément)*
- *administer / administrer (médicament)* NB. *Ne pas confondre avec "administr-ate" qui correspond au sens "gérer" du verbe administrer*
- *afterlife / après la mort, l'au-delà*
- *allow / permettre*
- *amputate / amputer*
- *analgesic / un analgésique*
- *anesthesiologist / un anesthésiste*
- *anesthetic / un anesthésique, un anesthésiant*
- *antiseptic / un antiseptique*
- *appendicitis / l'appendicite (f.)*
- *apply to / appliquer*
- *artery / une artère*
- *assert / affirmer*
- *asylum / un asile (d'aliénés), un hôpital psychiatrique*
- *available / disponible*
- *awake / éveillé, réveillé, conscient*
- *awaken / s'éveiller*
- *aware / conscient de*
- *back / le dos*
- *bacteria (pl.), bacterium (sing.) / les bactéries*
- *balloon / un ballonnet*
- *basal cell / une cellule basale,*
- *basal cell carcinoma, basal cell skin cancer / l'épithélioma cutané basocellulaire*
- *beam / un rayon, un faisceau (laser)*
- *blade / une lame*
- *bleed / saigner*
- *blood / le sang*
- *blood clot / un caillot sanguin*
- *blood pressure / la tension artérielle*
- *blood transfusion / la transfusion sanguine*
- *blood vessel / un vaisseau sanguin*
- *bloodletting / une saignée*
- *brain / le cerveau*
- *break (with) / un changement, une rupture (par rapport à…)*
- *break up / se briser, se disperser*
- *breast / le sein*
- *breathing / la respiration*
- *bubble / une bulle*
- *cadaver / un cadavre*
- *cancer / le cancer*
- *capillary / un capillaire*
- *carefully / soigneusement, attentivement, avec précaution*
- *carry out / effectuer, accomplir*
- *catheter / un cathéter, une sonde creuse*
- *cauterization / la cautérisation*
- *cervical cancer / le cancer du col utérin*
- *change / un changement*
- *chase (away) / chasser, faire fuir*
- *chest / le torse, la poitrine*
- *chief / chef, en chef*
- *chiefly / principalement, essentiellement*
- *childbirth / l'accouchement*
- *chill(ing) / un refroidissement, un coup de froid*
- *chlorinated lime / l'hypochlorite de calcium (≈ l'eau de Javel)*
- *circulating nurse / infirmière de salle d'opération (en service externe)*
- *claim / affirmer, prétendre que*
- *claim the life of… / coûter, ôter la vie à… ((claim = revendiquer))*
- *cleanse / nettoyer, aseptiser*
- *clothing / les vêtements*
- *coil / une spirale*
- *complication / une complication*
- *cornea / la cornée*
- *coronary artery bypass surgery (CABG) / un pontage coronarien*
- *corpse / un cadavre*
- *damage / des dégâts (*NB. *Le mot "damage" en anglais est indénombrable, contrairement à ses équivalents français)*
- *death / la mort, la mortalité*
- *deliver / accoucher, faire accoucher*
- *deliver / envoyer, diriger, procurer (une dose de radiation) ; irradier*
- *denounce / dénoncer, accuser*
- *depending on / suivant, selon, en fonction de*
- *design / un dessin, la conception*
- *device / un appareil, une machine*
- *diet / 1. l'alimentation, 2. un régime*
- *disease / une maladie, une pathology*
- *disinfectant / un désinfectant*
- *dissect / disséquer*
- *dramatic(ally) / remarquable(ment), exceptionnel(lement)*
- *dust / la poussière*
- *embalm / embaumer*
- *endometrium / l'endomètre (m)*
- *endoscope / un endoscope (*NB. *L'accent se déplace : EN-doscope → en-DOS-copy)*
- *endovascular / endovasculaire*
- *entirely / totalement, complètement, entièrement*
- *epidural anesthesia / l'anesthésie péridurale*
- *equipment / le matériel, un équipement*
- *escape / (s')échapper*
- *establishment / l'ordre établi, les autorités*
- *ether / l'éther (m)*
- *examine / examiner* NB. *La pseudo-lexie "examin-ate", inventée semble-t-il par des étudiants en médecine hyperconsciencieux, n'existe pas !*
- *experiment / une expérience scientifique*
- *explain / expliquer*
- *facility / un équipement, une installation, un service*
- *failure / l'insuffisance (rénale, cardiaque, etc.)*
- *far-sightedness (a.k.a. Hypermetropia) / l'hypermétropie*
- *fellow / un pair, un confrère*
- *femoral artery / l'artère fémorale*
- *fever / la fièvre*
- *fiber optics / la fibre optique*
- *flexibility / la souplesse, l'élasticité, la flexibilité*
- *fluoroscopy / la radioscopie*
- *focus / focaliser ; faire converger, diriger*
- *folklore / les croyances populaires, les traditions populaires*
- *fungus (pl. Fungi) / un champignon, une mycose*
- *further / en plus, supplémentaire*
- *gallbladder / la vésicule biliaire*
- *gamma knife / un couteau gamma*
- *general anesthesia / l'anesthésie générale*
- *gentle / léger*
- *germ / un microbe*
- *germ theory / la théorie microbienne (de la maladie)*
- *glove (surgical glove) / un gant*
- *gown (operating gown) / une blouse, un tablier de chirurgien*
- *groggy / sonné, étourdi, ensuqué*
- *groundbreaking / "de pionnier, de débroussaillage", novateur, révolutionnaire*
- *gunpowder / la poudre à canon*
- *gunshot / (par) balle*
- *gut / l'intestin*
- *haberdasher / un mercier*
- *heal / 1. guérir 2. cicatriser*
- *healthy / sain, en bonne santé*
- *heart rate / la fréquence cardiaque*
- *hemorrhage / un hémorragie*
- *hernia / une hernie*
- *hip / la hanche, l'articulation coxo-fémorale*
- *holding area (a.k.a. Surgery Preparation Room, Pre-Operative Area) / la salle (d'attente) préopératoire*
- *hole / un trou*
- *honey / le miel*
- *hospital gown / une chemise d'opéré, d'hôpital*
- *huge / énorme*
- *hysterectomy / l'hystérectomie*
- *illness / une maladie*
- *improve / (s')améliorer*
- *incantation / une incantation*
- *incidence / l'incidence*
- *increase / augmenter, s'accroître*
- *increasingly / de plus en plus*
- *inflammation / l'inflammation*
- *intensive care / les soins intensifs*
- *intensive care unit (ICU) / une unité de soins intensifs, un service de réanimation*
- *into place / (mettre) en place, en position, placer, positionner*
- *intravenously (abbr. IV) / par voie intraveineuse, par perfusion*
- *jewelry / les bijoux, la bijouterie*
- *keyhole (surgery) / la cœlioscopie (keyhole = trou de serrure)*
- *kidney / le rein*
- *kidney stone / un calcul (rénal, biliaire)*
- *knowledge / la connaissance*
- *laparoscope / un laparoscope, un coelioscope*
- *laser / un laser*
- *laser surgery / la chirurgie au laser*
- *LASIK / la kératomileusie in situ assistée par laser*
- *layer / une épaisseur*
- *lecture / un cours magistral, une conférence universitaire*
- *ligature / une ligature*
- *limb / un membre*
- *lining / un revêtement intérieur*
- *lithotripsy / la lithotritie, la lithotripsie*
- *lobectomy / la lobectomie*
- *local anesthesia / l'anesthésie locale*
- *lose (one's) mind / perdre la raison*
- *loss / la perte*
- *lower / bas, inférieur (position)*

- *lump / un nodule, une masse, une grosseur (aussi : grumeau)*
- *lumpectomy / l'ablation d'une tumeur (mammaire)*
- *lymph node / un ganglion lymphatique*
- *lymphatic (vessel) / un vaisseau lymphatique*
- *major surgery / la grande chirurgie*
- *manual / un manuel*
- *mastectomy / la mastectomie, la mammectomie*
- *means / un moyen (NB. "means" prend un –s au singulier comme au pluriel)*
- *miasma / le miasme*
- *midwife / une sage-femme*
- *millenium / un millénaire*
- *minimally invasive (surgery) / la chirurgie mini-invasive, minimalement invasive (CMI)*
- *minute / minuscule, infime (NB. l'adjectif se prononce [mai'nju:t] tandis que l'unité temporelle se prononce [minit])*
- *mistake / une erreur*
- *moldy / moisi*
- *monitor / surveiller*
- *monitor / un moniteur*
- *motto / une devise, une maxime*
- *nauseated / écœuré, nauséeux*
- *near-sightedness (a.k.a. Myopia) / la myopie*
- *needle / une aiguille*
- *nerve ending / la terminaison nerveuse*
- *neurosurgeon / un neurochirurgien*
- *non-invasive / non-invasif*
- *non-small cell lung cancer / un carcinome non à petites cellules*
- *numb / engourdir, endormir, anesthésier*
- *occur / se produire, avoir lieu*
- *occur to / venir à l'esprit*
- *open heart / à cœur ouvert*
- *operate ON / opérer (un patient) NB. Se faire opérer = "to be operated ON", or "to have surgery"*
- *operating room (OR), (GB : operating theatre) / une salle d'opération, le bloc opératoire*
- *outrage / outrager, scandaliser (être outré)*
- *ovary / un ovaire*
- *pain / la douleur*
- *painful / douloureux*
- *painkiller / un analgésique, un calmant*
- *patch (transdermal patch, skin patch) / un "patch", un timbre transdermique*
- *percutaneously / par voie percutanée*
- *perform / pratiquer, réaliser*
- *physiotherapy (a.k.a. physical therapy) / la kinésithérapie*
- *piles / les hémorroïdes (fpl)*
- *pipe / amener, acheminer (par des tuyaux ou des conduits)*
- *prevent… from v-ing / empêcher*
- *printing press / l'imprimerie, la presse typographique*
- *prior to / avant, préalablement à*
- *puerperal fever / la fièvre puerpérale (due à une infection utérine)*
- *put to sleep / endormir (ansthésier)*
- *radiosurgery / la radiochirurgie*
- *rate / un taux, un rythme*
- *recover / récupérer, se remettre*
- *recovery / le rétablissement, la guérison*
- *recovery room / la salle de réveil*
- *regional anesthesia / l'anesthésie régionale*
- *rehabilitation / la rééducation*
- *reliable / fiable (cf. rely on)*
- *relieve / soulager*
- *rely on / compter sur, dépendre de, faire confiance à*
- *remove (removal) / enlever, retirer (une ablation)*
- *render / rendre + adjectif (rendre heureux, rendre inconscient, rendre fou etc.)*
- *require / nécessiter, exiger, requérir*
- *resection / la résection*
- *reshape / refaçonner, remodeler*
- *result in / avoir pour résultat, entraîner (comme conséquence)*
- *resume / reprendre, recommencer*
- *right / un droit*
- *safe / sûr, sans risque, sans danger*
- *safety / la sécurité, la sécurisation, la réduction des risques*
- *scalpel / un scalpel (cf. Lancet)*
- *scar / une cicatrice*
- *scholar / un érudit*
- *scientific / scientifique (adj.)*
- *scientist / un scientifique, un chercheur (NB. Ne pas confondre le nom "scientist" qui désigne toujours un personne, et l'adjectif "scientific" qui peut servir à décrire diverses choses : "the scientific method", "a scientific experiment")*
- *scrub / frotter, récurer, nettoyer à fond*
- *scrub cap / un calot (de chirurgien), une charlotte*
- *scrub nurse / un(e) instrumentiste*
- *scrub suit / un pyjama de bloc, une tenue chirurgicale stérile*
- *seal / sceller, souder, fermer hermétiquement*
- *sepsis / la sepsie*
- *sever / sectionner, couper*
- *several / plusieurs*
- *shape / la forme*
- *shave / raser*
- *shock wave / une onde de choc*
- *shrink / rétrécir*
- *sick / malade*
- *skill / compétence, savoir-faire*
- *skin / la peau*
- *skull / le crâne*
- *soap / le savon*
- *solve / résoudre*
- *soul / l'âme*
- *spare / épargner*
- *spread / 1 répandre, se répandre ; 2. la dissémination, la dispersion, la propagation*
- *spread / répandre, se répandre*
- *stent / un stent*
- *stitch / (un point de) suture*
- *stone / un calcul (rénal, etc.)*
- *strength / la force physique*
- *stretch / s'étirer, se tendre*
- *study / étudier*
- *successful / réussi, fructueux*
- *suction machine / un aspirateur chirurgical, une pompe aspirante*
- *supply / alimenter, innerver*
- *surgeon / un chirurgien*
- *surgery / la chirurgie*
- *surround / entourer (surrounding / autour de)*
- *survival / la survie*
- *swallow / avaler*
- *swelling / une enflure, la tuméfaction*
- *target / une cible*
- *team / une équipe*
- *the former… the latter / celui-ci… celui-là ; le(s) premier(s) … ce dernier, le(s) dernier(s)*
- *thereby / de cette façon, ainsi (NB. 1/ "thereby" est souvent suivi d'un verbe en –ING (gérondif). 2/ À ne pas confondre avec "therefore" qui exprime une conséquence logique : par conséquent, de ce fait)*
- *therefore / par conséquent*
- *thick (N mm. Thick) / épais (de N mm.)*
- *thin / mince*
- *threat / une menace*
- *tie / nouer, lier, attacher*
- *trade / 1. Le commerce, les échanges ; 2. Un métier*
- *trauma (sing.), traumata (pl.) / un traumatisme*
- *trephine / trépaner*
- *tumor / une tumeur*
- *ulcer / un ulcère*
- *ultimate / 1. Fondamental, essentiel (cf. Nec plus ultra) 2. Ultime, final*
- *unconscious / inconscient, sans connaissance*
- *unpopular / déprécié, impopulaire, qui n'a plus la cote*
- *unquestionable / incontestable*
- *uremia / l'urémie*
- *vaporize / vaporiser (sublimer), évaporer, volatiliser*
- *vein / une veine*
- *vital / vital*
- *vital signs / les constantes physiologiques, les signes vitaux*
- *ward (hospital ward) / un service hospitalier (aussi : une salle de garde)*
- *wear off / se dissiper, disparaître, passer*
- *while / 1. Pendant que… 2. Un temps, une (courte) période*
- *whole / entier*
- *wire / un fil, un filament*
- *within / 1. À l'intérieur de ; 2. En l'espace de, en moins de…*
- *womb / l'utérus, la matrice*
- *wound / une plaie, une blessure*