

Glossary of terms

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A

Allergy

A reaction in the body to a substance, which itself is usually not harmful (for example, pollen, peanuts, pets). Symptoms may be mild (a runny nose or itchy eyes) or life-threatening (collapse or inability to breath). Allergy is very common, 1 in 4 people in the UK will have an allergic reaction at some time in their lives. The doctors who specialise in the diagnosis and treatment of allergies are immunologists and allergists, although other specialties such as dermatologists have expertise in allergies affecting their organ of interest. Although approximately 11% of GP prescriptions are for allergies, there are very few immunologists or allergists in the UK.

Antibiotics

a group of drugs that kill bacteria and some other infective organisms but have no effect on viruses, which cause the common cold and 'flu'. Examples of antibiotics include penicillin, cephalexin, ciprofloxacin, trimethoprim and tetracycline. Examples of infections that can be treated with antibiotics include some kinds of meningitis, pneumonia and urinary infections.

Antibody

Antibodies are Y-shaped proteins that form part of the body's immune defences. They are produced by specialised white blood cells called plasma cells and bind to foreign proteins, called antigens. Antibodies are usually made in response to foreign materials such as bacteria or chemicals, but sometimes the body makes antibodies to its own proteins. This results in autoimmune disease.

B

Bacteria

Bacteria are single-celled organisms. Many have no effect on the human body, some are beneficial and others are harmful. Harmful bacteria include those that cause cholera, tuberculosis and leprosy. Medical microbiologists are the pathologists who specialise in the identification and treatment of bacterial diseases, as well as preventing them from spreading.

Biochemistry

Also called clinical biochemistry, the pathology specialty that is concerned with the analysis of body fluids such as blood and urine. Clinical biochemists can diagnose, treat and monitor diseases by interpreting the level of different chemicals in samples.

Biomedical Scientist

These science graduates are not medically qualified and work in laboratories in pathology specialties including haematology and histopathology.

Blood Transfusion

The process of transferring blood from one person to another, for example following a car crash, an operation or to treat anaemia.

C

Cancer

Diseases that develop when the body's cells grow without the normal control. Cancers can form lumps (tumours) and can spread to distant parts of the body. There are lots of types of cancer, for example, lung cancer, breast cancer, lymphoma, sarcoma.

Cellular Pathology

This term describes the group of pathology specialties that look at changes in cells and tissues using a microscope to make a diagnosis. The tissue might come from a biopsy, a smear or from a post mortem examination. The branches of cellular pathology include histopathology, forensic pathology, paediatric pathology, neuropathology, and cytology. Cellular pathology now also includes 'molecular pathology' which involves looking at the DNA and proteins that make up a tissue to work out what disease is present and how to treat it.

Cervical Sample

A test performed to look for changes on the cervix (neck of the womb) that might turn into cancer if left untreated. A thin scraping of cells is taken from the cervix with a small brush and the cells are rinsed into a vial of liquid, then filtered onto a slide and stained. A biomedical scientist looks at all the cells on the sample and reports negative samples. If a possible abnormality is found, a cytopathologist, a doctor who specialises in looking at cytology samples, examines the slide under the microscope to look for any abnormal cells. There are thousands of cells on every smear, so it takes a very sharp eye and great patience to pick up abnormalities.

Chemical Pathology

Chemical Pathology is the study of changes in the chemical composition of body fluids in the diagnosis and monitoring of disease processes, for example, blood sugar in diabetes.

Chromosome

Chromosomes are made up of DNA and associated proteins. Humans have 23 pairs of chromosomes. Chromosome abnormalities can cause malformations and disease (for example, leukaemia). Genetics is the pathology specialty which studies chromosomes in patients and family members, who may be at risk of having children with the same chromosome abnormality.

Clinical Cytogenetics

The pathology specialty that involves the microscopic analysis of chromosomal (DNA) abnormalities that may result in disease.

Clinical Embryology

The specialty that involves the handling of gametes (sperm and eggs) and embryos to treat male and female infertility.

Colon

The colon is another name for the large bowel or intestine. A healthy diet, high in fruit and vegetables, helps keep the colon healthy. One in twenty people in the UK will develop colon cancer. There is a national Bowel Cancer Screening Programme. Being screened for bowel cancer significantly reduces the risk of developing the disease.

Cytopathology

Cytopathology is the study of abnormal cells in body fluids, smears and tissue samples, for example, cervical smears for the detection of changes in the cervix that could lead to cancer.

D

Dermatopathology

The branch of pathology that studies disease of the skin. For example, rashes, lumps and skin cancer.

Dermis

The dermis is another name for the skin, which is the body's biggest organ. The skin may be damaged by exposure to the sun or chemicals or by infection. Dermatopathologists are the specialist pathologists who diagnose skin diseases such as basal cell carcinoma and melanoma by examining thin slices under the microscope.

Diagnosis

Working out what a disease is and what caused it. Diagnosis describes both the process that is followed (what the pathologist does) and the final answer (what the pathologist thinks the disease is).

DNA - Deoxyribonucleic acid (DNA)

Deoxyribonucleic acid consists of nucleotides arranged in sequence in a double-stranded helix. The nucleotide sequence (genetic code) determines characteristics such as height and eye colour. Faulty DNA (mutations) may cause recognised conditions (for example, cystic fibrosis). Geneticists are pathologists who specialise in detection of genetic mutations which may be inherited.

F

Fine Needle Aspirate (FNA)

This is a type of specimen where cells are sucked up through a small needle, transferred onto a glass slide and examined by a cytopathologist (pathologist who specialises in looking at cells). This technique is often used to diagnose cancer, for example by looking at cells from a lump in the breast or neck.

Forensic Pathology

This is the branch of pathology in which doctors examine people who have died, usually when there is concern that the cause of death was unnatural (for example, not due to an illness). Forensic pathologists often give evidence in court, for example in murder trials. Although this is a branch of pathology that many people have heard of, it is one of the smallest specialties.

G

Gene

A unit of heredity: a length of DNA that contains instructions for making a specific protein. Genes are found in succession along the length of chromosomes. Humans have around 20,000 to 25,000 genes.

Genetics

The study of heredity and variation. Genetics also includes the study of the changes underlying genetic diseases, for example, cystic fibrosis.

H

Haematology

The pathology discipline involved in the care and treatment of patients with blood disorders such as anaemia or leukaemia.

Haematology and Transfusion Medicine

The diagnosis and treatment of diseases of the blood, for example, anaemia, leukaemia and the organisation of blood transfusion.

Histocompatibility and Immunogenetics

The study of organ transplantation and tissue matching. These pathologists make sure that transplanted organs are suitable for the recipient to try and avoid the organ being rejected.

Histopathology

The branch of pathology that involves looking at tissue under the microscope to diagnose disease. If you have a mole or a breast lump removed, the histopathologist will examine it to work out what it is.

I

Immunology

The science of disorder of the immune system. Doctors who specialise in the diagnosis and treatment of disorders of the immune system are called Clinical Immunologists. They often also run the specialist laboratories that provide testing for immunological disorders as well as looking after people with autoimmunity, immune deficiency and allergies.

Infection Prevention and Control

The collection of practices that are designed to minimise the risk of spread of infections from person to person, environment to person and animal to person. It seeks to break the chain of transmission of microorganisms through important measures such as hand washing.

L

Laboratory

The room where scientific testing is performed on fluids and tissues removed from patients. Modern laboratories usually contain large machines and lots of chemicals. Laboratories are not usually open to the public.

M

Medical Microbiology

The branch of pathology which deals with the investigation, treatment and monitoring of infections in humans.

Metabolic Medicine

A group of overlapping areas of clinical practice with a common dependence on the detailed understanding of basic biochemistry and medicine. These areas fall within the territory of both physicians and chemical pathologists. They include clinical nutrition, lipid abnormalities, diabetes, metabolic bone disease, porphyria and adult inherited metabolic disorders.

Microbiology

The diagnosis of infection caused by bacteria, fungi, parasites and viruses; identification of the best treatment options for infection; and the monitoring of antibiotic resistance. It also includes testing for how well a patient is responding to treatment of infection.

Mutation

Change in the normal DNA sequence usually associated with a disease. This term can also be used to describe an event that causes an alteration in the DNA sequence.

N

Neuropathology

The branch of cellular pathology that is concerned with the diagnosis of diseases of the brain, spinal cord, skeletal muscle and nerves by the examination of biopsy specimens and through post mortem examinations. Neuropathologists diagnose conditions such as brain tumours, muscular dystrophy and dementia.

O

Operation

Surgeons perform operations but they need pathologists to tell them about the tissue they have removed. Histopathologists are doctors who diagnose disease by looking at tissue under the microscope. So if you've had your appendix out or a mole removed, a histopathologist will have examined it, looking at the cells to diagnose inflammation, for example.

Oral Pathology

The branch of pathology concerned with diseases of the mouth. Oral pathologists are also trained as dentists.

P

Paediatric Pathology

The branch of pathology concerned with diseases and disorders of babies and children, including foetuses. Paediatric pathologists look at samples under the microscope and also perform post mortem examinations following the death of a foetus or child.

Poison

Poisons are substances that damage the body and can be fatal. There are many types of poison including some drugs, plants and household chemicals. Toxicology is the pathology specialty involved in the study of the adverse effects of chemicals and other toxic agents on living organisms and how these effects can be avoided or minimised.

Post Mortem

Also called an autopsy, a post mortem is an examination of the body after death. Post mortems are performed if the cause of death is not known or if there are any unusual circumstances. Information obtained from a post mortem often helps bereaved families understand what happened to their loved one as well as helping doctors learn about how diseases can affect the body.

S

Screening

In the UK there are several screening programmes for cancer, including cancers of the breast, cervix (neck of the womb) and bowel. These are highly organised programmes involving many clinical, supporting and administrative staff. All screening programmes aim to pick up disease early, when treatment will be more effective.

Smear

The term Cervical Smear is no longer used because the old smear technique has been replaced by a more advanced test, Liquid Based Cytology. The term "sample" is now used.

T

Test Tube Baby

Louise Brown was the first test tube baby, born in 1978. Since then thousands of babies have been born following this technique, in which eggs and sperm are mixed outside the body (the "test tube") and the resulting embryos put back into the mother, where they grow normally. This technique is also called IVF (in vitro fertilisation).

Test Tubes

Test tubes have many uses in pathology - but are mainly used for collecting blood samples. The tubes are sent to the haematology, microbiology or biochemistry laboratory where scientists analyse the blood to look for blood cells, infectious organisms and chemicals. Next time you have a blood test, think about what happens to your sample.

Tissue

Group of associated, similarly structured cells that perform specialised functions. Healthy tissue can be transplanted from a donor to a recipient to treat certain diseases e.g. bone marrow transplantation to treat patients with leukaemia, kidney transplantation to treat patients with kidney failure.

Toxicology

The branch of pathology concerned with the study of drugs and poisons and their effects on the body.

Transfusion Medicine

Transfusion Medicine is the branch of medicine that is concerned with the transfusion of blood and blood components.

V

Veterinary Pathology

The branch of pathology concerned with diseases of animals. Veterinary pathologists train as vets first, not doctors.

Virology

The term applied to the study of viruses and the diseases caused by them. The term 'Medical Virology' is applied to human diseases caused by viruses. Specialists in medical virology help in the investigation and treatment of patients suspected of having a viral infection.

Virus

These microorganisms are smaller than bacteria and cause a wide range of disease in humans. They cause illnesses from the common cold and chicken pox to cancer (for example, cervical cancer can occur due to chronic infection with human papilloma virus). Viruses are not able to multiply outside living cells so do not exist in the environment; however they can infect any living cell whether plant or animal.

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