HEALTH BASICS

Epithelium

Epithelium is tissue that covers body surfaces, lines organs, and forms glands.

WHAT IT IS
Tissue covering surfaces and lining organs and body spaces

WHERE IT COMES UP
Pathology, urine, and cervical screening reports

WHY IT MATTERS
Its location and changes help interpret test results

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Clinician who ordered the test or a pathologist

HOW IT IS CHECKED
Microscopy of cells or tissue when clinically needed

Overview

Epithelium is one of the main types of tissue in your body. It forms the outer layer of your skin and lines many internal structures, including your airways, digestive tract, blood vessels, bladder, and reproductive organs. It also forms most glands.

The cells in epithelium are called epithelial cells. They are packed closely together to create a protective or working surface. Their role changes according to where they are. For example, skin epithelium helps block injury and infection, while intestinal epithelium absorbs nutrients.

Epithelium is not a disease or a diagnosis. The word may appear in a laboratory or pathology report simply to identify the type of tissue found in a sample. The meaning comes from the location, appearance, and condition of the cells-not from the word "epithelium" alone.

How it works

Epithelial cells form organized sheets. One side faces a body surface, an organ space, or the inside of a tube. The other side attaches to a thin supporting layer called the basement membrane. This organization is known as polarity: different parts of each cell have different jobs.

Epithelium has no blood vessels of its own. Oxygen and nutrients move into it from nearby connective tissue. Many epithelial tissues replace worn or damaged cells regularly, although the rate of renewal differs by location.

Epithelia are often classified by the number and shape of their cells:

Some epithelial cells have specialized structures. Cilia are tiny hair-like projections that move material across a surface. In the airways, they help move mucus and trapped particles. Microvilli are much smaller projections that increase surface area, helping tissues such as the intestine absorb substances.

Glandular epithelium makes and releases products. Some glands release substances through ducts, such as sweat or saliva. Others release hormones into the bloodstream.

- Simple epithelium has one cell layer, allowing absorption, secretion, or exchange
- Stratified epithelium has several layers, giving extra protection
- Squamous cells are thin and flat
- Cuboidal cells are roughly cube-shaped
- Columnar cells are taller than they are wide
- Transitional epithelium can stretch, especially in the bladder and urinary tract

Why it matters for your health

The term "epithelial" often helps identify where cells came from. A pathology report may describe epithelial tissue in a biopsy, which is a sample removed for examination under a microscope. The report may also describe the cells' shape, organization, and whether they look typical for that location.

Epithelial cells may appear in urine. A small number can be present because cells naturally shed from the urinary tract or surrounding skin. The laboratory may report whether the cells are squamous, transitional, or renal tubular cells. Their importance must be interpreted with the rest of the urine test and with how the sample was collected. Squamous cells, for example, may indicate that cells from the skin or genital area entered the container during collection.

Cervical screening also examines epithelial cells. The laboratory looks for cell changes that may be linked to human papillomavirus, or HPV. An abnormal screening result does not by itself mean that cancer is present. Follow-up is based on the specific result and the screening program being used.

Many cancers begin in epithelial tissue. These cancers are called carcinomas. An

adenocarcinoma begins in epithelial cells that have gland-like features or produce substances such as mucus. The word "epithelial" alone does not mean cancer; most epithelial tissue described in tests is not being labelled cancerous simply because of its tissue type.

What can go wrong

Because epithelium forms boundaries and active surfaces, it can be involved in many different conditions. The condition-not epithelium itself-determines the health effects.

Inflammation can affect epithelial linings during infections, immune conditions, chemical irritation, or physical injury. The report may describe inflamed, damaged, or reactive epithelial cells. "Reactive" usually means the cells have changed in response to irritation or repair. It is not another word for cancer.

Metaplasia means that one mature type of epithelial cell has been replaced by another mature type. This can be an adaptation to long-term irritation. Examples include changes in the airways linked to smoke exposure and changes in the lower oesophagus associated with Barrett's oesophagus. Metaplasia is not cancer, but some forms need monitoring because of the condition in which they occur.

Dysplasia means that cells have abnormal features and organization. It is sometimes described as low grade or high grade. Dysplasia is not the same as invasive cancer, but some types can develop further over time. The tissue involved and the grade determine what follow-up may be offered.

Carcinoma in situ refers to severely abnormal epithelial cells that remain above the basement membrane. Invasive carcinoma means cancer cells have crossed that boundary into nearby tissue. These are medical diagnoses that require interpretation and planning by the relevant clinical team.

An epithelial-cell finding can also reflect sample collection rather than disease. This is particularly common with urine, cervical, or surface swab samples. A laboratory may recommend a repeat sample if contamination or poor sample quality prevents a clear result.

What you can do

There is no general test to check all epithelium, and healthy people do not need routine testing simply because epithelial tissue exists throughout the body. Tests are chosen for a specific reason, such as investigating a symptom, screening the cervix, or examining a removed tissue sample.

If "epithelial cells" appears in a result, check the full wording rather than focusing on that phrase alone. Useful questions include:

Keep a copy of the complete report and any follow-up plan. Terms such as "atypical," "dysplasia," and "carcinoma" have different meanings, so ask the clinician who ordered the test to explain the exact wording in context.

An incidental mention of epithelium usually does not require emergency care. Arrange routine follow-up if a report recommends another sample, repeat screening, specialist review, or a biopsy.

Seek urgent advice if the clinical service tells you that a result needs rapid assessment. Emergency care is based on serious symptoms-such as severe breathing difficulty, uncontrolled bleeding, or sudden severe pain-not on the word "epithelium" in a report.

- Which organ or sample did these cells come from?
- Were the cells described as normal, reactive, atypical, dysplastic, or malignant?
- Could sample contamination explain the finding?
- Is a repeat test, biopsy, or routine follow-up recommended?
- When and how will the result be reviewed?

Common questions

Are epithelial cells normal?

Yes. Epithelial cells are a normal part of skin, organ linings, and glands. They are also naturally shed. Whether a laboratory finding matters depends on the cell type, number, appearance, and sample location.

Does "epithelial" mean cancer?

No. "Epithelial" identifies a type of tissue. Carcinoma is a cancer arising from epithelial cells, but epithelial tissue can be normal, inflamed, healing, or affected by many non-cancerous conditions.

What are atypical epithelial cells?

"Atypical" means the cells do not look entirely usual under the microscope. It does not give a diagnosis by itself. Infection, inflammation, repair, sample quality, precancerous change, and cancer are among the possible explanations. The report's other findings guide follow-up.

Why were epithelial cells found in my urine?

They may have been shed from the urinary tract or entered the sample from nearby skin or

genital tissue. The type of cell, amount reported, collection method, and other urine findings help determine whether the result needs attention.

Can epithelium repair itself?

Many epithelial tissues renew and repair themselves by producing new cells. The ability to heal depends on the tissue, the depth of injury, blood supply to nearby supporting tissue, and whether irritation continues.

Sources

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