

A PATIENT'S GUIDE TO DIGITAL PATHOLOGY

*This flyer was created in partnership with
the Digital Pathology Association.*



Pathology is a branch of medicine where human tissue samples are assessed by a specialist doctor called a pathologist. Pathologists are like detectives that examine microscopic clues to try and get as much information as possible about a patient's disease. For over 100 years, pathologists have used microscopes, similar to the ones you may have used at school, but recently, things have changed with the introduction of digital pathology. Creating digital images of patient tissues opens new opportunities to improve the diagnosis and treatment of patients. In this flyer we will explore the role of pathology in the patient journey, and how digital pathology can improve diagnostic services for patient and public benefit.

WHAT IS PATHOLOGY?

Pathology is the study of diseases at a microscopic level, which involves the examination of specially prepared patient specimens by a pathologist, traditionally using a microscope. This is done to:

- Provide a detailed diagnosis for the patient and their care team
- Provide prognostic information – for example grading and staging of tumours to help patients make decisions about their care pathway
- Provide information on success and effects of treatment
- Make suggestions about suitability of proposed treatments

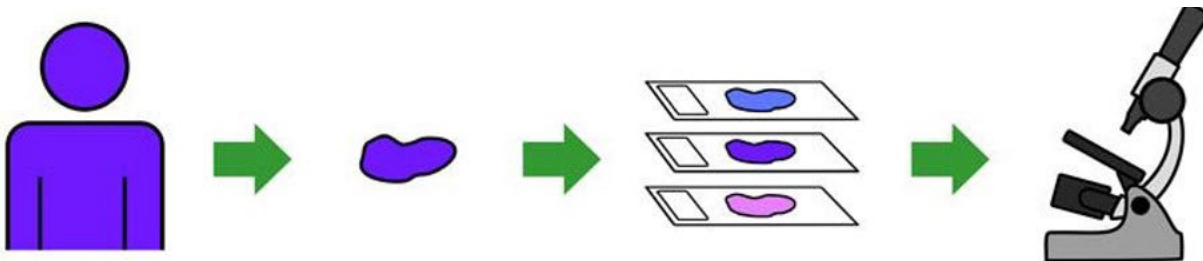


Image credit Dr Alex Wright <https://www.virtualpathology.leeds.ac.uk/public/>

HOW DOES A PATHOLOGIST MAKE A DIAGNOSIS?

Traditionally, the pathologist examines thin sections of stained tissue on glass slides using a microscope. A pathology specimen may be a tiny biopsy on a single slide, or a complex surgical case with more than 100 glass slides, all of which must be examined under the microscope by a pathologist, to make sure they spot all the important clues and patterns in the tissue. Sometimes, if a case is very complex or rare, the slides may need to be reviewed by an expert at another hospital.

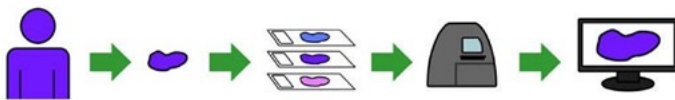
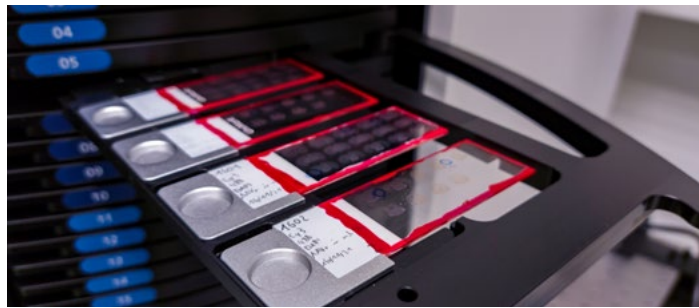


Image credit Dr Alex Wright <https://www.virtualpathology.leeds.ac.uk/public/>

WHAT IS DIGITAL PATHOLOGY?

With the use of digital pathology, the glass slides that are made in the hospital laboratory for the pathologist to examine are scanned using a robotic microscope to produce digital images. These images are then viewed on a computer monitor, rather than under a microscope. The images are stored securely in the hospital computer and can be transmitted instantly to a pathologist, or group of pathologists.

The pathologist views the slides on a high-quality computer monitor and can use digital tools to make measurements quickly on screen. If the pathologist needs a second opinion, they can quickly and easily share the images with other pathologists or an expert at another hospital.

WHAT ARE SOME BENEFITS OF DIGITAL PATHOLOGY?

The stage of colorectal cancer corresponds to the extent to which it has spread throughout the body and relates to the severity of the cancer. The stages of colon cancer range from 0 to IV:

Faster diagnosis

More efficient transfer of digital slides may allow patients to receive their pathology results earlier, so they can start making decisions about their care. Pathologists can work quickly using the digital microscope for large and complex cases, and can use digital tools to make faster, more accurate measurements.

Better collaboration

Digital slides can be shared and transferred between pathologists more easily than traditional methods, which include mailing slides or using couriers. It is easier and faster for a pathologist to get a second opinion from a colleague or an expert pathologist at another hospital. Digital slide

archives provide a valuable resource for the training of junior doctors, and better collaboration for medical research and quality checks, which improve diagnostic services for patients.

Improved patient safety

Digital systems can help prevent errors such as mix-ups of patient information in the laboratory and medical record by linking digital slides directly to patient records.

Patient engagement

Digital pathology is revolutionizing the way patients access and understand their health information. It enhances patient engagement by allowing them to view their pathology images via patient portals or through direct interactions with their pathologist and/or treating clinician. This helps patients foster a better understanding of their condition and facilitates more informed discussions with their healthcare providers. This transparency and accessibility empower patients to take an active role in their healthcare journey, ultimately leading to improved outcomes and a stronger patient-provider relationship.

HOW COULD AI IMPROVE PATHOLOGY SERVICES FOR PATIENTS AND THE PUBLIC?

Image analysis and artificial intelligence (AI)

Digital slides can be used to train and develop artificial intelligence tools that could assist the pathologist in their daily work by rapidly identifying patterns and features in tissue, and by counting and quantifying key features of tumors. This allows the pathologist to concentrate on some of the more challenging parts of diagnosis.

Work is already being done to train and test AI algorithms that could support pathologists in their daily work. The combination of the computer “brain” and pathologist “brain” can work together, as both have different strengths and work best when combined:

| Improved patient safety | Pathologist strengths |
|---|---|
| Counting and quantifying | Assessing, evaluating and combining information from multiple sources |
| Searching and finding | Understanding and appreciating the patient's context and consequences of the pathology report |
| Performing repetitive tasks without getting tired | Recognizing and dealing with uncertainty and the unexpected |
| Answering a specific question | Advocating for patients and communicating with care teams |

Pathologists and medical laboratory scientists are the healthcare professionals who provide vital diagnostic and prognostic information to help patients and their care teams make decisions about treatment. Pathology is changing, with more and more hospitals digitizing pathology images to improve the timeliness, accuracy, and safety of diagnosis. In the future, pathologists will be further supported using AI, which could help us gain new insights into disease and treatments.

WHAT CAN YOU DO AS A PATIENT?

Ask Questions

Patients should ask their healthcare providers if digital pathology is being used in their diagnosis and treatment. This can raise awareness and encourage providers to evaluate this technology.

Request Access

By requesting access to their digital pathology images, patients can demonstrate the value of this technology in enhancing their understanding of their health conditions.

Provide Feedback

Sharing their experiences and feedback with healthcare providers can help improve the implementation and usability of digital pathology systems.

Advocate for Technology

Patients can advocate for the adoption of digital pathology within their healthcare networks, emphasizing its benefits in terms of accuracy, access, and patient engagement.

If you would like to find out more about histopathology or digital pathology, you can access the following:

- <https://www.virtualpathology.leeds.ac.uk/public> To view digital slides using virtual microscope software yourself!
- <https://digitalpathologyassociation.org/about-digital-pathology> to learn more about digital pathology.
- <https://digitalpathologyassociation.org/blog/a-brief-history-of-the-dpa/> and <https://digitalpathologyassociation.org/about-the-dpa> to find out about the Digital Pathology Association.