Cydar imaging overlay system for endovascular surgery

Cydar is an imaging overlay system developed by the Department of Biomedical Engineering at King’s College London, UK, and commercialised by Cydar Ltd. Its intended use is to improve the clinician’s perception of 3D anatomy during X-ray guided surgery or interventions in the chest, abdomen or pelvis, where there is a pre-operative CT scan.

Cydar has developed an image fusion system where high-performance computer software accurately matches 3D information from the pre-operative 3D CT scan to the live X-ray images in the form of a 3D roadmap. This matching of a CT to an X-ray image is known as image registration. The Cydar system tracks the patient throughout the procedure rather than the operating table or X-ray system position, and provides maximum accuracy in the centre of the live field-of-view.

The company anticipate a CE mark and UK NHS launch of the Cydar imaging overlay system in early-mid 2015.

Cydar Ltd are also collaborating with Microsoft Research to develop a touchless gesture based technology to control the 3D Cydar imaging overlay system.

The National Institute for Health Research (NIHR) awarded funding to Guy’s and St Thomas NHS Foundation Trust, in partnership with King’s College London to establish a Healthcare Technology Co-operative (HTC) in cardiovascular disease. This HTC will help clinicians identify and develop technology based solutions which are focused on clinical need and improving patient care. Cydar has been developed through the HTC.
POTENTIAL FOR IMPACT

Minimally-invasive surgery, such as endovascular surgery, benefits patients by avoiding large incisions. Optical camera guidance cannot be used in solid organs and blood vessels so X-ray guidance is commonly used instead. However, these X-rays are flat (2D), shadow images and poorly visualise important soft tissues. This makes accurate positioning of devices inside the body more difficult and time consuming.

Detailed pre-operative 3D CT scan images of the soft tissues are often used to plan interventions and surgery. The company claim that Cydar demonstrates the first use of software to automatically match these pre-operative CT scans with live X-ray images to support X-ray guided interventions and surgery. They hope that the system will reduce the current mean operating time, resulting in an improvement in operating room throughput and productivity. The company state that the Cydar 3D roadmap will provide a perception of real anatomy and help improve the clinician’s accuracy, thus reducing errors in endovascular surgery and leading to a reduced number of repeat interventions.

If proven to be effective, the Cydar imaging overlay system may reduce endovascular surgery time and improve clinician accuracy. Expected benefits to the patient include: a reduction in iodinated contrast use (the leading cause of contrast-induced nephropathy), a reduction in X-ray exposure and a decrease in procedure duration.

EVIDENCE

RELEVANT PAPERS


COMPLETED UNPUBLISHED STUDIES


COMPANY INFORMATION (Optional)

A multicentre trial for automated 3D overlay for X-ray guided surgery is expected to start in October 2015.

INFORMATION FROM

This Alert is based on information from the company and a time-limited internet search.