

'Molecular fingerprinting' will improve monitoring of surgical patients, experts say

May 18 2011

Chemical screening technologies will help doctors to monitor surgical patients before, during and after operations, providing better targeted care and treatment, say Imperial College London experts in an article published in *The Lancet* today.

Scientists use [NMR spectroscopy](#) and [mass spectrometry](#) to determine the [chemical composition](#) of a sample. Studies have shown that using these technologies can produce a “molecular fingerprint” of a biological sample, which could provide useful diagnostic information about which parts of tissue are diseased, how severe a disease is, and what the effects of particular therapies might be.

The world’s first Centre for Surgical Metabonomics, which opened at Imperial College London earlier this year, is already enabling researchers to apply this kind of analysis in a hospital setting. Teams are using nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry to analyse body fluids and tissue samples from patients undergoing surgery at Imperial College Healthcare NHS Trust, to investigate how these tools could be used to tailor treatment and care to individual patients. Led by Imperial’s Professor Jeremy Nicholson and Professor Lord Ara Darzi, scientists here have been focusing on diagnosing patients in real-time on the operating table.

Now, Professors Nicholson and Darzi are planning to extend this approach to monitor the entire “patient journey”, helping doctors to choose the best treatment options before, during, and after an operation.

They hope their teams will be able to begin analysing samples from patients at different stages of treatment later this year, when a new centre is due to open featuring two high field NMR spectrometers. This multimillion pound clinical phenotyping centre is the result of a partnership between Imperial, the National Institute for Health Research and Bruker, a major manufacturer of analytical instruments.

"We are using powerful metabolic screening tools to give doctors more information about the patient's physiology and their response to treatment," said Professor Nicholson, Head of the Department of Surgery and Cancer at Imperial. "This is a bold step in translational medicine that will help optimise the management of individual patients.

"The patient screening paradigm is based on many years of basic science research in our computational medicine unit at Imperial. We believe that we're now ready to translate that science into most areas of hospital patient care.

"We intend to use the approach to monitor cancer patients and patients in intensive care. The new diagnostic information will help [doctors](#) to manage patients with rapidly changing or highly complex disease conditions. Ultimately we hope to save lives as well NHS money with these new methods."

Professor Darzi, Chair of the Institute of Global Health Innovation at Imperial, said: "The work that we are conducting at the Centre for Surgical Metabonomics will unquestionably bring us closer to the ultimate goal of personalised surgical healthcare. Until now the practical application of bio-analytical technologies to surgery has presented a challenge, and the strength of metabolic profiling is that it can provide relevant and interpretable data in a time-frame short enough to be of practical use for the clinician. We anticipate that metabolic phenotyping will revolutionise the way we map the surgical patient journey. It will

provide us with information before, during and after surgery, ensuring that we deliver surgical care that is truly customised to each patient's unique metabolic makeup.”

Research projects at the Centre are being funded by Imperial's Comprehensive Biomedical Research Centre. Imperial's is one of five Comprehensive Biomedical Research Centres in the UK; it was awarded to Imperial College Healthcare by the National Institute for Health Research following a national competition. The new laboratory forms part of the Academic Health Science Centre, a unique partnership between the Trust and Imperial College London, which aims to improve the quality of life of [patients](#) and populations by taking new discoveries and translating them into new therapies as quickly as possible.

More information: [\(11\)60171-2/fulltext](http://www.thelancet.com/journals/lan...)

Provided by Imperial College London

Citation: 'Molecular fingerprinting' will improve monitoring of surgical patients, experts say (2011, May 18) retrieved 8 May 2024 from <https://medicalxpress.com/news/2011-05-molecular-fingerprinting-surgical-patients-experts.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--