Imperial College London

Title:	**Networks of innovation : measuring, modelling and enhancing innovation in surgery**
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Awarding Body:	Imperial College London
Current Institution:	Imperial College London
Date of Award:	2020
Availability of Full Text:	Access from EThOS: Immediate download. Please login to continue. Access from Institution: https://doi.org/10.25560/97209

Abstract:

The rate of innovation occurring in surgery is beyond our systemic capacity to quantify, with several methodological and practical challenges. The existing paucity of surgical innovation metrics presents a global healthcare problem especially as surgical innovations become increasingly costlier at a time when healthcare provision is experiencing a radical transformation driven by pressures to reduce costs, an ageing population with ever-increasing healthcare needs and patients with growing expectations. This thesis aims to devise a novel, quantitative, network-based framework that will permit modelling and measuring surgical innovation to add the most value to patient care. It involves the systematic, graphical and analytical assessment of surgical innovation in a way that has never been done before. This is based on successful models previously applied in the industry with advanced analytical techniques derived from social science (network analysis). In doing so, it offers an exciting new perspective and opportunity for understanding how the innovation process originates and evolves in surgery and how it can be measured in terms of value and virality, a priority for the NHS, RCS, Imperial and the wider surgical community. The ability to measure value and rank innovations is expected to play a fundamental role in guiding policy, strategically direct surgical research funding, and uncover innovation barriers and catalysts. This will ensure participation in the forefront of novel surgical technology and lay the scientific foundations for the development of improved healthcare models and services to enhance the quality of healthcare delivered.

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Qualification Name:	Thesis (Ph.D.)	**Qualification Level:**	Doctoral
EThOS ID:	uk.bl.ethos.858381	**DOI:**	10.25560/97209