own a robot

Georgios Garas

FELLOWSHIP/SPONSOR:
The Dr Shapurji H Modi Memorial Research Fellowship

SUPERVISORS:
Professor Thanos Athanasiou and Professor Lord Ara Darzi

SITE OF WORK:
St Mary's Hospital, Imperial College London

PUBLICATIONS:
1. Garas G, Cingolani I, Panzarasa P *et al.* Beyond IDEAL: A call for surgical innovation metrics. *Lancet* 2018 [in press]

2. Garas G, Cingolani I, Panzarasa P et al. Network analysis of surgical innovation: measuring value and the virality of diffusion in robotic surgery. *PLoS One* 2017; **12**: e0183332

PRESENTATIONS:
1. Presented at: Annual Meeting of the American Head and Neck Society – Combined Otolaryngology Spring Meeting; April 2018; USA

2. Presented at: International Surgical Congress of the Association of Surgeons of Great Britain and Ireland; May 2017; Glasgow

PRIZES:
1. Alexander S. Onassis Public Benefit Foundation Fellowship 2018

2. Best E-Poster Prize, Surgical Simulation and Technology Category, Association of Surgeons of Great Britain and Ireland, International Surgical Congress 2017

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Alexander S. Onassis Public Benefit Foundation and Imperial College London for three years

George performing transoral robotic surgery (TORS) as part of his surgical innovation studies.

The NHS is experiencing a radical transformation driven by pressures to reduce costs. An ageing population has ever increasing healthcare needs with patient expectations growing. Measuring healthcare innovation value is more important than ever.

Currently, the rate of innovation occurring in surgery is beyond our systemic capacity to quantify, with several methodological and practical challenges. Existing frameworks are limited to qualitative models. Big data, involving the capture and analysis of large, complex (multidimensional) datasets using machine learning remain underutilised in surgery.

Award of Poster of Distinction Prize by the American Head and Neck Society in New York.

The RCS Research Fellowship provided me with the opportunity to focus on addressing these limitations. With my supervisors and collaborators, we described the surgical innovation funnel and using network analysis developed the first surgical innovation metrics: the innovation index and structural virality. These were subsequently validated using big data from the real world that exceeded seven million hospital stays per year (NIS®). These novel ideas and findings were published in some of the world's most prestigious peer-reviewed scientific journals including *The Lancet*.

My research offers an exciting new perspective 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 RCS, NHS and wider surgical community. The ability to measure value and rank innovations is expected to play a fundamental role in guiding policy, strategically direct 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.

I will be taking this forward by analysing global surgical collaboration networks to demonstrate how this approach can be used to devise effective strategies towards the establishment of partnerships that can enhance innovation and advance patient care.

At a time when the NHS is experiencing a radical transformation driven by pressures to reduce costs, there is a growing sense of urgency to develop rigorous surgical innovation metrics, crucial for optimising patient care.