THIS Institute Perioperative Improvement Fellow

**Supporting Information**

**Improving Timeliness to Emergency Laparotomy through the National Emergency Laparotomy Audit (NELA) and an Improvement Core approach**

NELA is part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP), overseen by the Healthcare Quality Improvement Partnership (HQIP). NELA has been funded since 2012 to enable quality improvement of care for patients undergoing an emergency laparotomy. NELA audits care for patients against a set of standards, derived from recommendations from key stakeholder organisations, including the Royal College of Surgeons of England and the Centre for Perioperative Care. All NHS hospitals in England and Wales that perform eligible operations take part in NELA. NELA collects data on key standards of care on a continuous basis, reporting results annually on a hospital and national level.

Patient outcomes have improved during the first 8 years that NELA has collected data. But, while some key process measures in the pathway have improved, some have not. National guidelines from the Royal College of Surgeons of England recommend prompt early management, supported by an evidence base demonstrating reduction in mortality associated with improving the timeliness of definitive management of emergency patients. However, NELA data shows that significant numbers of patients continue to experience unacceptable delays which contribute to worse outcomes. The Improving Timeliness to Emergency Laparotomy project is a collaboration between the RCOA and THIS Institute at the University of Cambridge that aims to address the need to improve timeliness processes using an innovative online co-design learning system approach known as an Improvement Core.

The concept of an Improvement Core has been developed by The Healthcare Improvement Studies Institute (THIS Institute) with the aim of creating an infrastructure for large-scale improvement, guided by the principles of co-design and learning system approaches. The intention is that Cores will support three critical elements of a learning health system using online, participatory methods:

1. **characterising and understanding problems** from multiple perspectives and coming up with shared visions of what good looks like
2. **developing and optimising candidate solutions** where ideas are sourced from diverse groups – including staff and patients -- and solutions are co-designed and refined using human factors principles; and
3. **evaluation at scale** using routinely collected data (including audits) and process evaluation methods to establish what works and what doesn’t, and why, iteratively improve interventions, and determine optimised implementation strategies.

The Improvement Cores will be hosted on Thiscovery, an online platform developed within THIS Institute and now hosted by THIS Labs.

The Core approach will be used as an improvement strategy to address timeliness to surgery for patients needing emergency laparotomy who present in emergency departments, specifically to:

* Characterise the problems to be solved in improving timeliness of care for patients who present to Emergency Departments with an intra-abdominal emergency condition
* Co-design a set of candidate interventions to improve timeliness of care
* Conduct a pilot to test candidate interventions using a learning system model

The Improvement Core methodology will be refined and iterated as the project proceeds, so a developmental learning approach will be needed and a process evaluation to run alongside the project will be conducted by THIS Institute.