Unpredictable Predictables:
Complexity Theory and the Construction of Order In Intensive Care

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Doctor of Philosophy

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Certificate of Authorship / Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student

_____

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Abbreviations

CICU	Cardiac Intensive Care Unit
CSN	Clinical Support Nurse
CNS	Clinical Nurse Specialist
ED	Emergency Department
HDU	High Dependence Unit
ICU	Intensive Care Unit
MET	Medical Emergency Team
NICU	Neonatal Intensive Care Unit
NUM I	Nurse Unit Manager (level 1)
NUM II	Nurse Unit Manager (level 2)
OT	Operating Theatre
RN	Registered Nurse

Glossary

Adaptive Practice	The flexibility of, and adjustments made to the work practices and modes of communication by clinicians in light of the changeable demands of the environment in which clinicians work.
Adjustment	An adjustment is an official marking made by the in-charge nurse or nurse unit manager on the allocation sheet. This adjustment is identified and highlighted by the NUM II - the role in charge of rostering - indicating a change to the original staffing roster that is to be updated for pay accuracy.
Allocation	Allocation is the process of assigning the correct number of nurses and the correctly qualified and skilled nurse to the individual patient needs.
Allocation sheet	The allocation sheet is the paper-based organisational tool used for performing and documenting allocation.
Bedside Nurse	The nurse who is allocated a patient in intensive care and whose shift comprises of patient care duties.
Buff	The degree of 'spare' nursing staff in intensive care that can be allocated in times of high acuity or unit busyness.
Clinical Support Nurse	This is a nursing role assigned to experienced nurses in intensive care. This role assists the tasks that fall under the responsibility of both the in-charge nurse and bedside nurses
Dynamic Order	An order that is continually adapted and responsive to the changing needs of an un/certain environment. It is an

	emergent order that, rather than being a static state, is the result of a continual process of ordering.
Fellow	A fellow is a doctor who is a qualified specialist in a particular area of medicine, but who is not as yet appointed as a specialist in the hospital and is working under the direction of specialist to gain experience.
In-fellow / intensivist	The doctor designated as “in-charge” of patients within intensive care.
In-Charge Nurse	The in-charge nurse is a senior nurse who is designated on a shift-by-shift basis as “in-charge” of the practical running of the ward.
Intubation	The process of inserting a tube into the airway of a patient to enable mechanical ventilation.
Intensivist	A specialist doctor in intensive care medicine.
Out-fellow / intensivist	The doctor designated as “in-charge” of potential admissions into intensive care from outlying hospitals, other hospital wards such as emergency and retrievals.
Medical Emergency Team	The team includes designated medical and nursing staff who respond to medical emergencies throughout the hospital. They are alerted via individual pagers that they wear in their belt or carry in their pocket.
Nurse Unit Manager	The Nurse Unit Manager is responsible for the nursing business manager of a ward in a health service. Their

	responsibilities include coordination of patient services, staffing and unit management.
Registrar	A register is a senior doctor who is training in a particular area of specialty. A registrar is more junior than a fellow.
Skill mix	Skill mix is the term used for the collective formal clinical skills, experience and qualifications of the nursing cohort.
Un/Certainty	The inextricable interconnectedness between certainty and uncertainty in complex systems.

Abstract

The Intensive Care Unit (ICU) is a unit that manages the most critically ill, complex and unstable patients in the hospital. As a result, the ICU is characterised by a high degree of clinical and organisational unpredictability and uncertainty. In Western discourse, uncertainty is often portrayed as problematic, and as something to be controlled and reduced. This research challenges this discourse by examining the productive relationship between certainty and uncertainty in the work practices of ICU clinicians, and subsequently, how intensive care clinicians utilise uncertainty to construct order in a highly unpredictable work environment. To understand how order can coexist with ICU's unremitting unpredictability, complexity theory is used to frame this investigation.

This research engaged an emergent, interventionist methodology, deploying multiple methods. Using ethnography, video-ethnography, and video-reflexivity, this research relied on clinicians' participation in the construction and analysis of video data of the ICU clinicians' work practices. This resulted in clinician-led practice change in the ICU. This research suggests that methods need to be deployed adaptively in order to deal with the complexity of ICU, in addition to the moment-to-moment emergence of events that require the researcher's own work plans to be revisited. Moreover, in order to gain traction with, and understand highly complex and changeable environments, the researcher needs to also enter and experience uncertainty herself.

Using complexity theory as its analytical tool, this research shows an inseparability of uncertainty and certainty in the ICU which is labeled 'un/certainty'. Three main conclusions emerge from this research. First, un/certainty predominates in intensive care, and due to this, ordering is a process rather than a final state. Un/certainty is at the heart of the adaptive practices that clinicians enact. These adaptive practices are highly interconnected to the changes that the ICU environment may require, and thus produce a dynamic order in the unit. Second, the researcher herself, in order to come to terms with the complexity and un/certainty of the ICU environment must also enter un/certainty in order to gain traction with the ICU environment: unpredictability and complexity cannot be

studied from a neat and disengaged distance. Third, the presence of un/certainty in the ICU can be significant and enabling rather than disabling for clinicians in their ongoing pursuit of dynamically ordering practice. The contribution of un/certainty to frontline practice is as a central driver to managing change and complexity. Therefore it should be positively revalued by health services researchers, policy makers and clinicians alike.