**Supplemental Digital Content 2**

**Code book developed to assist coding of the latent safety threats and protective factors**

The following table presents the description of each latent safety sub-category generated for the purpose of coding in the present study. The sub-categories names and concepts in the table below are drawn from the ‘contributory factors framework’ from the London Protocol[[1]](#footnote-1) . Additional subcategories developed for the purpose of this study marked with an asterisk.

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| Sub-category name | Description | Examples | Exclusions/inclusions |
| **Individual (staff factors)** |
| **Knowledge and skills** | Gaps in specific knowledge or skills. May be implied by an action statement recommending staff training on a particular technique, provided there is some indication that the knowledge gap was influential in the scenario.  | Staff did not know how to use the Belmont (rapid fluid infusion) device. | Items can be coded if referring to group, rather than an individual. |
| **Competence** | Gaps in the quality of care indicating staff incompetence or negligence. |  |  |
| **Physical and mental health** | Physical or mental health barriers to performing tasks.  | Long-term burnout, stress, or physical illness preventing safety-relevant tasks. |  |
| **Institutional context**  |
| **Economic and regulatory context** | Financial resources – when comment indicates these are NZ-wide issues, or issues related to the regulatory context, such as scopes of practice | "Insufficient priority given by regulators to safety issues" (Vincent, 2003)e.g. scope of practice limitations that contribute to errors |  |
| **Links with external organisations** | Issues with linkages with organisations, communication or coordination gaps |  |  |
| **National health service executive** | National group influence on guidelines or influence other aspects of care that contribute to an issue. |  |  |
| **Organisational and management factors** |
| **Financial resources and constraints** | Contributing factors referring to options being restricted by a lack of funds, or funding prioritisation  | A 2nd defibrillator was previously requested, but declined due to insufficient funding. | If noted at a national level then code in the national grouping. |
| **Organisational structure** | Contributing factors related to organisational structure such as Information flow between parts of the organisation, location of rules, roles, responsibilities and decision making within the organisation. | Key information not shared between ED and OT on patient transfer.No access to staff from other departments in an emergency. |  |
| **Policy, standards and goals** | Policies, or specific standards of the organisation that contribute to unsafe care.  | Policies leading to inadequate staffing levels, lack of availability of appropriate drugs. |  |
| **Safety culture and priorities** | Contributing factors referring to safety culture and priorities of organisation or management. | Lack of awareness or support for safety issues on the part of management. |  |
| **Patient factors** |
| **Condition (complexity and seriousness)** | Contributing factors related to patient condition (complexity and seriousness). | Patient co-morbidities.  |  |
| **Language and communication** | Contributing factors related to the language or communication style being used by the patient. | Patient did not appear to understand questions. |  |
| **Personality and social factors** | Contributing factors related to patient personality, behaviour or dynamics with others accompanying the patient. | Family members accompanying the patient were hostile |  |
| **Task and technology factors** |
| **Availability and accuracy of test results** | Contributing factors related to the availability and accuracy of test results.  | Blood gas results not available in a timely manner. | Availability of necessary equipment for tests can also be coded under 'design, availability and maintenance of equipment' |
| **Availability and use of protocols** | Issues related to the availability of protocols about patient management and how they are used.  | Staff are unable to find easily because they are stored in different locations in each OT. | Crisis checklists, cognitive aids and algorithms should be coded under decision making aids.  |
| **Task design and clarity of structure** | Issues related to the design of a task, or ambiguity around the structure of a task.  | Uncertainty about the key steps in the process for ordering bloods. |  |
| **Decision-making aids** | Issues related to the availability of crisis checklists, cognitive aids and algorithms, and how they were used or not in the scenario. |  | Protocols on more general patient management to be coded under availability and use of protocols. If report specifically mentioned gaps in knowledge of cognitive aids, code to knowledge and skills.  |
| **Team factors** |
| **Supervision and seeking help** | Contributory factors related to supervision or seeking help.  | Availability and responsiveness of senior staff, clear definitions of responsibility, willingness of junior staff to seek help (examples from Vincent), issues with the use of a red bell to seek help. | Speaking up is coded under verbal communication, unless it specifically relates to seeking help with a task. |
| **Team structure (i.e. team skill mix)** | Issues related to the skill mix or suitable numbers of junior and senior staff . | Skills mix of team, balance of senior and junior staff, balance of medical and nursing staff. |  |
| **\* Task sharing within team members** | Issues related to the distribution of tasks between team members. | Overloaded team members failing to share tasks. | This has been created as a subcategory as it doesn't meet the original Vincent definition but seems to logically fit here. |
| **Verbal communication**  | Contributing factors related to verbal communication (or lack of).  | Communication between junior and senior staff, communication between professions, adequate handover. |  |
| **\* Using, remembering or knowing names**  | Comments specifically relating to the remembering, using or knowing names. This could mention a gap in verbal or written communication. | Name badges could not be clearly read. |  |
| **Written communication** | Contributing factors related to written communication (or lack of).  | Legibility and signatures of records, Adequate management plan, availability of records | Only code to this items written during the procedure, or related to this procedure (else code to availability of protocol, or policies and standards, administration and managerial support as appropriate. |
| **Work environment factors** |
| **Administrative and managerial support** | Department specific administrative or management processes that act as a barrier to safe patient care. |  |  |
| **Design, availability and maintenance of equipment** | Issues related to the design, availability and maintenance of equipment. Medication has been added as a subcategory. | Equipment parts brokene.g. defibrillator failed to function unless plugged in | Do not code gaps in knowledge about how to use equipment here – this goes under knowledge and skills. |
| **\* Issues related to medication storage** | Issues that were related to the storage of medication . | Medication that should have had restricted access was not locked. |  |
| **Staffing levels and skills mix** | Number of staff and/or having the appropriate skill mix available. | No staff with skillsets in resuscitation available in the department to assist. | This relates to departmental gaps in numbers and skill mix – gaps in the specific team operating should be coded as "team structure". |
| **Workload and shift patterns** | Issues related to workload and shift patterns.  | Hours of work, rest hours between shifts, reference to number of tasks being undertaken at once. |  |
| **Physical** | Issues with the physical environment not covered elsewhere. |  |  |
| **Environment** | Issues with the non-physical environment not covered elsewhere. |  |  |

Note: ‘Vincent’ refers to Vincent C, Taylor-Adams S, Stanhope N. Framework for analysing risk and safety in clinical medicine. *BMJ* 1998;316(7138):1154-57.

\*Indicates additional subcategory developed by authors.

1. Taylor-Adams S, Vincent C. Systems analysis of clinical incidents: the London protocol. *Clin Risk* 2004;10(6):211-20. and Vincent C, Taylor-Adams S, Stanhope N. Framework for analysing risk and safety in clinical medicine. *BMJ* 1998;316(7138):1154-57. [↑](#footnote-ref-1)