



## ICU capacity strain: negative impact on care processes, outcomes



Strained intensive care unit (ICU) capacity represents a fundamental supply-demand mismatch in ICU resources. A new systematic review has identified 16 indicators of strained ICU capacity across the spectrum of healthcare quality domains, noting that strain negatively impacts care processes and outcomes for patients as well as care providers.

"The most common indicators of strain showed overlap with recommended ICU key performance indicators (i.e., ICU acuity, ICU readmission, after-hours discharge, and occupancy)," the authors write. "Several indicators of strain could readily be implemented and would likely add value, particularly if clustered as a dashboard or index, to provide holistic ICU-specific information on key contributors to strain."

Strained capacity is perceived among ICU professionals to be encountered more frequently due to growing demand for and relatively fixed supply of critical care services. Moreover, strain has recognised implications for the practice of critical care, consistently showing association with altered care processes, suboptimal care delivery, adverse patient outcomes, and a negative workplace environment. In response to not being able to identify a prior appraisal characterising indicators of strained ICU capacity, the authors performed a rigorous systematic review and evidence synthesis.

For this review, investigators made a comprehensive search online for studies, published in English after 1990, that: (1) focused on ICU settings; (2) included description of a quality or performance measure; and (3) described strained capacity. Quality was assessed using the Newcastle-Ottawa Quality Assessment Scale (NOS). Of 5,297 studies identified in their search, investigators included 51 in this analysis.

Most were cohort studies ( $n = 39$ ; 76.5%), five (9.8%) were case-control, three (5.8%) were cross-sectional, two (3.9%) were modelling studies, one (2%) was a correlational study, and one (2%) was a quality improvement project. Most observational studies were high quality. Sixteen measures designed to indicate strain were identified 110 times, and classified as structure ( $n = 4$ , 25%), process ( $n = 7$ , 44%) and outcome ( $n = 5$ , 31%) indicators, respectively.

The researchers found that the most commonly identified indicators of strain were ICU acuity ( $n = 21$ ; 19.1% [process]), ICU readmission ( $n = 18$ ; 16.4% [outcome]), after-hours discharge ( $n = 15$ ; 13.6% [process]) and ICU census ( $n = 13$ ; 11.8% [structure]). There was substantial heterogeneity in the operational definitions used to define strain indicators across studies.

"Notably, these strain indicators have considerable overlap with commonly recommended key indicators of ICU performance (KPI)," the researchers point out. Several other indicators that were

identified, although also analogous with some ICU KPIs, may also be suitable to characterise strained capacity conditions. These specific structure (e.g., queuing; nurse-to-patient ratios), process (e.g., bed turnover; workload; refusal rate) and outcome (e.g., healthcare professional burnout; surgery postponements) indicators could be evaluated over both the short-term and intermediate-term to provide holistic data on contributors to and effects of strained ICU capacity, the researchers say.

"The challenge for healthcare professionals is to clearly understand when and to what extent strain is negatively impacting their decision-making, the quality of care provided and the performance of a given ICU, and to readily identify and respond to factors most responsible," the authors write.

"Healthcare professionals should be particularly mindful of the influence strained ICU capacity may have to modify behaviours and care processes."

Source: [Critical Care](#)

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