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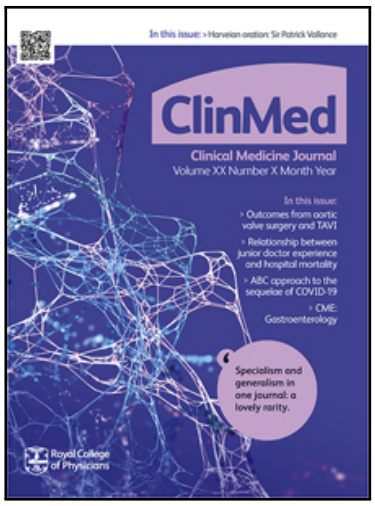

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Abstract

Same Day Emergency Care (SDEC) services are at the heart of recovery plans for Emergency Care in the National Health Service. There are no validated metrics for the quality of care in SDEC.

The Society for Acute Medicine's Quality Improvement Committee invited to a three-stage modified Delphi process to gather metrics used by clinicians. Proposed metrics were ranked and further explored by 33 participating experts from a broad range of backgrounds including clinicians, data scientists and operational managers.

Experts ranked five system-based metrics highest. These focus on optimization of the proportion of patients receiving same day care in and out of SDEC units. Patient and staff experience metrics were ranked low, possibly due to present lack of viable examples.

The paper adds a glossary with the rationale for ranking of metrics and their use for the improvement of quality and safety of clinical care.

Summary box

What is known: Same Day Emergency Care is a concept that is attractive for healthcare providers and patients.

What is the question: How should we measure the quality of Same Day Emergency Care?

What was found: Experts ranked system-based metrics around the proportion of patients receiving same day care in and out of SDEC highest.

What is the implication for practice now: Simplification of metric could help to objectively evaluate interventions in SDEC.

Manuscript

Introduction

With health systems under pressure there is currently a strong emphasis on reducing the reliance of healthcare delivery on hospital beds. Ambulatory Care, Ambulatory Emergency Care and Same Day Emergency Care (SDEC) (1,2) are terms used for services that aim to facilitate timely and safe assessment of patients presenting with urgent conditions to secondary care, delivering appropriate management without overnight admission to an inpatient hospital bed.

Although effective delivery of SDEC is important in the delivery of urgent and emergency care, as highlighted within the NHS Long Term Plan (3), there remains a relative paucity of guidance and evidence regarding the optimum measures to assess the performance and quality of medical SDEC services. A range of possible metrics was suggested by the AEC network, supported by Society for Acute Medicine (SAM) and the Royal College of Physicians of Edinburgh in 2019 (4), however it is not known how widely these metrics have been adopted, the importance placed by clinicians and operational leads on these 19 metrics, or whether additional metrics are felt to be more appropriate in more recent clinical practice.

Although SDEC services are increasingly key to delivery of acute assessment pathways across a variety of specialties, the aim of this paper is to recommend quality metrics for care of patients who present with conditions usually seen by physicians.

Methods

Delphi Consensus Process

The Delphi methodology (5) aims to create a consensus between experts. We undertook a modified Delphi process with three rounds of online questionnaires in the second half of 2022 that were disseminated to members of the Society for Acute Medicine Quality Improvement Committee, a Welsh collaborative on Same Day Emergency Care and via Twitter. Participants were not anonymised but voting by participants was anonymised to minimise bias. The questionnaires asked contributors to list potential ways to measure the quality of SDEC and subsequently rank rather than rate the items (6) in order of importance while giving reasons for ranking of the top three and bottom three items. Round 1 served as a scoping exercise. Round 2 and 3 added further metrics and differentiated ranking of metrics by importance. A final seminar refined the interpretation of the results.

Metrics system – Quadruple aim

Quality metrics for clinical services can be described across four dimensions of the 'Quadruple Aim'(7) recommended by the Institute for Healthcare Improvement: patient outcomes, experience, health economics and staff experience. In a framework of value-based health care the value can be expressed as quality of life, metrics of suffering, acute and chronic burden of disease and impact on those close to a patient. These four dimensions were used to group suggestions from Round 1 of the Delphi process.

Assumptions

The metric system presented in this manuscript is based on the following assumptions:

1. SDEC must add measurable value to patients and/or organisations.
2. The aim of SDEC is timely, safe, effective, efficient and patient centred care for those who are both:
    a. Unlikely to require close monitoring (patients who may deteriorate over hours or days if their acute illness is not managed appropriately, but are not at risk of deterioration within minutes, potentially requiring urgent resuscitation or escalation of care)
    b. Presenting primarily due to an acute clinical need or risk, not due to a documented need for increased care.
3. Triage to identify patients suitable for SDEC can be performed in multiple settings, including ambulances, primary care settings, emergency departments and other clinical settings.
4. Triage systems for SDEC would aim to:
    a. Correctly identify the majority of patients who can be assessed and/or treated on the day of presentation,
    b. Minimise the number of patients managed through SDEC who require subsequent admission to an inpatient bed,
    c. Minimise the number of patients referred for admission and assessed through non-SDEC pathways who can be discharged on the day of presentation.

The underlying assumptions for all health economic considerations in this paper are:

5. Overnight stays in stable patients at minimal risk of deterioration add cost but limited measurable value and potential risk to patients.
6. Higher numbers of steps in a patient journey add to the risk of not completing the necessary assessments required to decide on the need for admission and overnight stays before this becomes necessary for logistic reasons.

7. Different steps in a patient journey add different value, and cutting out low-value steps (i.e. duplicating admission documentation for patients referred from Emergency Departments) will increase efficiency and reduce cost.

Results

Participants

33 healthcare professionals from a broad range of backgrounds contributed to between one and three rounds of the Delphi process. Surveys were completed by 6 experts in round 1 (3 from Wales, 50%), 22 experts in round 2 (9 from Wales, 41%) and by 18 experts in round 3 (8 from Wales, 44%). There was strong representation from Acute Medicine as the specialty that delivers the bulk of SDEC, but also data analysts, operational experts, academics, doctors in training and other representatives of the multi-disciplinary team (Table 1). A number of participants had additional local and regional SDEC leadership positions.

Classification of proposed outcomes

A number of candidate outcome measures were proposed in the first round and refined in the second and third round. They are grouped around the four dimensions of the quadruple aim (8):

A. Patient outcomes

1. Mortality defined as unexpected death after discharge from SDEC: Most SDECs focus on patients with a low-risk of death, but SDEC is also a service open to patients with expected mortality such as those with advanced cancer attending acute oncology services, and may be the most appropriate pathway for management of specific acute concerns or symptom management in selected patients receiving palliative care in the community (9). The rate of unexpected death would therefore be an important safety metric (10). Early death (within 24 or 48 hours of discharge) might be more relevant than late death (within 30 days of discharge).

2. *Readmissions, defined as an inpatient admission for an overnight stay within 7 days:* Planned re-presentations to an SDEC service are common practice for virtual or face-to-face monitoring of disease progress, or for specific investigations, including pathways for suspected venous thromboembolism, or treatment, such as intravenous antibiotics. Coding of reasons for re-presentation is often challenging. The consensus group did therefore suggest classifying re-presentations that result in an overnight stay within 7 days of the initial presentation to the SDEC service as an adverse event.

3. *Deterioration event defined as a 999 call or GP review within 7 days*: Discharges from any service are associated with a predictable rate of deterioration and 12-20% of discharges from Acute Medical Units (AMUs) re-present to hospitals within 7 days (11). Not all healthcare contacts following discharge represent adverse events (12,13) but presentations to someone different than the discharging service are outcomes that might be relevant to patients and funders of services.

B. Patient experience

4. There is currently no established Patient Reported Experience Measures (PREMS) or Patient Reported Outcome Measures (PROMS) specific to acute medicine or SDEC services, but systems to measure patient experience and indeed patient reported outcomes are under development (14). A pilot study coordinated by the Society for Acute Medicine's Quality Improvement Committee is currently in print (personal communication).

C. Health economics

Financial value and efficiency are metrics of interest in a cash strapped health service. The following metrics might capture financial metrics based on the assumptions listed in the methods section.

5. Percentage of patients assessed in SDEC on day of presentation as proportion of all patients referred to the general medical take. This metric is stratified by National Early Warning Score (15) (<5 vs 5 or more) and Clinical Frailty Scale (16) (<5 vs 5 or more), to reflect changes in case-mix that affect suitability of patients for management through SDEC services, as described in the original assumptions regarding triage of patients into SDEC services. Patients that have all of the essential steps completed on the day of presentation to hospital are less likely to be admitted. Increasing the proportion of patients assessed in SDEC will however also increase the likelihood of seeing patients in this service who do not fit into a simple pathway, require a longer period of observation or indeed inpatient treatment and therefore admission. This process measure does therefore need to be linked to a balancing measure (health economic measure 2)

6. Percentage of patients admitted for an overnight stay after SDEC assessment. Admission from SDEC is not a failure but might reduce efficient use of space and staff in SDEC units. In units with fixed limited capacity, patients who require admission might displace patients who could have been discharged on the same day but now require admission.

7. *Percentage of patients referred from ED after a clinical review in ED (duplication) vs after triage (efficiency of flow).* Overloaded Emergency Departments have led to some SDEC services being used as waiting areas for clinical opinions or a substitute for Acute Medical Units

rather than Getting it Right First time (17). The additional processes of (a) handover and (b) transfer between two units (Emergency Department and SDEC unit) are non-value-adding steps (18). Given that most Medical Departments have now got the presence of a senior general or acute physician in Emergency Departments it would be difficult to understand why patients should not be assessed in the place where they reside at the time by the medical team rather than moved to another department. The value chain is different for patients who are being triaged in ED with a condition that is 'SDEC' sensitive and where the complete clinical management can be delivered in an SDEC unit.

8. Percentage of zero length of stay admissions of all medical referrals (SDEC & other pathways): This is a measure of efficiency of the whole system. Depending on the sensitivity and specificity of triage criteria used for selection of patients for SDEC, some patients might be admitted through other pathways, such as AMU, but still discharged on the same day. Some units are using an 'SDEC-as-default' model comparable to the 'Rapid-Assessment-&-Triage' (RATS) model in Emergency Medicine (19) where all essential steps including ECG, X-rays, point-of-care lab tests are performed in a short period of time to gain a higher degree of confidence regarding which patients will require admission to a bed or overnight stay and which are likely to be managed on the day.

9. Percentage of zero length of stay admission in non-SDEC locations: This is a metric of effectiveness of the triage system. The perfect triage algorithm would minimise the number of patients who are discharged without overnight stay, following assessment and treatment though non-SDEC pathways, including AMUs.

10. The rate of new patients to follow-up reviews. This measure is commonly used to describe the effectiveness and efficiency of outpatient services. The same logic might or might not be transferrable to SDEC services, where patients often re-attend for planned monitoring of progress, repeat blood tests, imaging or treatment, as described above.

D. Staff experience

11. *Satisfaction at work*. There is currently no established standard for this setting, or suggested measure for evaluation. SDEC services are often staffed by a range of staff, and satisfaction measures need to account for the range of MDT staff working within SDEC services.
12. *Staff retention*: This can be assessed by the percentage of staff leaving within 12 months of appointment. This may not be a suitable measure for all staff groups, as SDEC teams frequently include rotational doctors in training alongside permanent staff members.

Ranking procedure and results

Items were ranked in three rounds and bottom ranked items were excluded from the next round. There was a clear hierarchy in the way the items were ranked in rounds 2 and 3.

In Round 1 and 2 participants ranked 12 metrics. In round 2 measures of safety and effectiveness ranked highest (metric 1, 2, 5, 8, 6) and metrics describing staff experience and efficiency were rated lower (metric 10, 12).

Within Round 2, additional metrics were suggested. In Round 3 participants re-ranked the remaining 13 metrics. The highest ranked metrics achieved very similar scores and have in common that they optimise the number of patients who benefit from same day treatment in and out of SDEC:

- Number of patients assessed in SDEC on day of presentation as percentage of all patients referred to the general medical take.
- Number of patients with zero length of stay as percentage of all patients referred to the general medical take.
- Number of patients admitted for overnight stay after SDEC assessment as percentage of all patients seen in SDEC.
- Number of days per month that the SDEC is bedded down partially or completely

Other process measures fared significantly worse. The five lowest ranked metrics were

- Number of patients reviewed in SDEC after assessment by a clinical decision maker in another area (i.e. ED) as proportion of all patients seen in SDEC.
- Number of patients reviewed in SDEC after triage only in another area (i.e. ED) as proportion of all patients seen in SDEC.
- Staff satisfaction at work.
- Proportion of patients discharged within 4 hours or arrival.
- Proportion of patients discharged from SDEC with a scheduled return at a later date.

Measures relating to transfers from the Emergency department and rate of follow-ups were close together at the bottom of rankings.

Discussion

Findings

The consensus process supported an analytic approach to measuring the quality of SDEC. To our knowledge this is the first time that experts have ranked the importance of different metrics in this field with a clearly articulated preference for metrics describing efficiency across the system.

The metrics of most importance to the expert panel were those evaluating the overall proportion of medical attendances assessed through SDEC services, and the proportion discharged without overnight admission. This is a measure that should be easy to assess and monitor, as long as attendances and discharges are coded appropriately within electronic health records and patient administration systems.

Limitations

There was bias in the consensus groups towards those with a lot of experience for this form of care, but this will at the same time secure credibility and traction within a community of early adaptors

As patient experience and staff satisfaction do not currently have established assessment tools, participants may be expected to be less comfortable with these measures, as these are not currently widely used in practice.

Similarly, there is concern amongst clinicians working within medical SDEC services that some patients now assessed within SDEC may not have required assessment by the medical team prior to expansion of SDEC services: Patients who may previously have been discharged following an ED clinician assessment without onwards referral may now be referred from ED triage to the medical team. There is currently no established method to assess if and how frequently this occurs, or to identify or monitor the number of patients this may impact.

While we used a Delphi methodology to generate the metrics we did not use all parts of the methodology, we did for example not use predefined criteria to drop items. This is in keeping with other examples from the literature(20).

Comparison to other metric systems

NHS England has published guidance on metrics for SDEC five years ago in 2018 (9): These had limited documentation of the clinical expertise involved. The 19 cited metrics in this document focused heavily on process measures, i.e. the number of patients being seen by different units at the front end of a hospital system and the movement between these units. This type of metric is particularly challenging given the considerable variation in which hospitals are currently use SDEC and AEC units (11) and how they might identify suitable patients(21). While the currently suggested metric would allow description of a system the authors felt that it

lacked metrics that described patient experience or indeed clinical outcomes and value to a patient and the NHS organisation. Our review makes explicit the much-needed balancing measures : the potential burden imposed on primary care and through readmissions, a term that is curiously absent from the NHSE document.

The Ambulatory Care Network has published guidance to optimize the delivery of services for patients, teams, and organisations (22). Our results may help centres to prioritise amongst the measures suggested by the AEC Network and the NHS Benchmarking Network (23).

Implications for clinical practice

Any published guidance is only as good as the quality of its implementation. Peer-networks applying, modifying, and expanding the metrics that we describe in this document should aide to support evidence based high quality care. If applied correctly, the metric should highlight where services are likely used beyond a reasonable scope and protect units from being misused as ineffective and inefficient overflows for underfunded or mismanaged other departments. The metrics highlighted can form a basis for those wishing to evaluate and compare the performance of their SDEC services, helping to expand our understanding of how to most effectively deliver these pathways.

Implications for research

SDEC and Acute Medical care are complex adaptive systems (24). The optimization of structures and processes for best outcomes of patients requires therefore deep insights into behaviour of systems (25). It will require skilful analysis of large, granular datasets to gain insights into what really works for patients in Same Day Emergency Care.. Importantly their remain gaps in the quality metrics for both staff and patient satisfaction.

Conclusion

The present paper represents a consensus-based framework for the assessment of SDEC services for patients presenting with medical conditions. If applied correctly the metrics should encourage patient centred and safe services and optimise the usage of scarce resources.

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Table 1 – Professional roles of participants

Doctors	Acute Physicians (12) Consultant Physicians – other (2) Doctors in Training (2) Orthopaedic surgeon General Practitioner Emergency Physician Acute Oncologist Clinical Academics (2)
Multi-disciplinary team	Advanced nurse & Advanced care practitioner (4) Matron for Acute & Ambulatory Care Consultant Paramedic
Operational teams	Community Planning Specialist General Manager Emergency Care Informatics Senior Project Manager Senior Information Analyst Information Standards Management Lead