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Implementation Gaps in Geriatric Surgical Care for Older Adults Admitted Under General Surgery: A Multidomain Service Evaluation From a District General Hospital

Charlotte Kennedy [1], Cleo Byrne [1], Elliott Hulme [1], Chandani Rathnam [2], Elizabeth McShane [1], Michael Okocha [1, 3]

1. General and Colorectal Surgery, Great Western Hospitals NHS Foundation Trust, Swindon, GBR 2. General and Colorectal Surgery, University of Bristol, Bristol, GBR 3. General and Colorectal Surgery, University of Cambridge, Cambridge, GBR

Corresponding author: Charlotte Kennedy, charlotte.kennedy10@nhs.net

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Abstract

Background

Older adults admitted under general surgery frequently have frailty, multimorbidity, cognitive vulnerability, and reduced physiological reserve beyond the presenting surgical pathology. Geriatric surgical care requires recognition of frailty, delirium, treatment-escalation needs, and palliative care requirements. We evaluated implementation of geriatric surgical care processes in a district general hospital.

Methods

A retrospective service evaluation used two cohorts aged ⩾65 years. Consecutive patients admitted under general surgery between 16 February and 16 March 2026 (n=44) were assessed for frailty, multimorbidity, delirium assessment, and geriatric medicine referral. A second cohort of patients aged ⩾65 years admitted between 1 January 2025 and 31 January 2026 (n=3969) was reviewed for Recommended Summary Plan for Emergency Care and Treatment (ReSPECT) documentation, inpatient mortality, and specialist palliative care referral. Validated delirium assessment was defined as Alertness, Abbreviated Mental Test (AMT4), Attention, and Acute change or fluctuating course (4AT), Confusion Assessment Method (CAM) or 3-Minute Diagnostic Interview for CAM (3D-CAM).

Results

Mean age was 77.3 years and mean Clinical Frailty Scale (CFS) score was 4.6. Twenty-two patients (50.0%) had CFS 1-3, 13 (29.5%) CFS 4-5 and nine (20.5%) CFS ⩾6. One patient (2.3%) was referred to geriatric medicine. Ten patients (22.7%) had documented confusion or delirium; none underwent validated delirium assessment, and two (4.5%) underwent cognitive assessment. In the cohort, 281 of 3969 patients (7.1%) had ReSPECT documentation. Ninety-one died; 34 (37.4%) were referred to specialist palliative care.

Conclusion

Documented implementation of predefined geriatric surgical care processes was low across geriatric medicine referral, validated delirium assessment, treatment-escalation planning and specialist palliative care referral. A pathway incorporating frailty-based referral criteria, validated delirium screening, mandated ReSPECT documentation and parallel palliative care planning may improve coordinated, person-centred surgical care.

Categories: Palliative Care, General Surgery, Geriatrics
Keywords: delirium, elderly, emergency general surgery, frailty , general surgery, multidomain service evaluation, older adults, palliative care, respect

Introduction

Older adults admitted under general surgery frequently have frailty, multimorbidity and functional vulnerability that extend beyond the presenting surgical pathology. These factors contribute to increased postoperative complications, prolonged hospitalisation, loss of independence, institutionalisation and mortality, yet traditional surgical pathways remain centred on diagnosis and operative decision-making rather than the broader needs of older patients [1-4]. As populations age, general surgical services increasingly care for patients whose outcomes are determined not solely by the technical success of an operation but by physiological reserve, cognition, functional status and social circumstances.

Emergency general surgery represents a particularly high-risk setting for older adults with geriatric

vulnerability. Unlike elective surgical pathways, patients frequently present with physiological instability, sepsis, bowel obstruction, perforation or acute functional decline, leaving limited opportunity for optimisation before treatment decisions are required [4,5]. Frailty, multimorbidity and cognitive impairment are common in this population and are consistently associated with increased postoperative morbidity, delirium, prolonged length of stay, discharge to higher levels of care and mortality [6-10]. Recognition of these vulnerabilities has led to increasing emphasis on Comprehensive Geriatric Assessment (CGA), multidisciplinary perioperative care and proactive identification of patients at highest risk [11]. A Cochrane review demonstrated that CGA improves survival and reduces institutionalisation in older hospitalised adults [12], while embedded geriatric surgical liaison services have been associated with shorter hospital stay and improved perioperative care [13,14].

Optimal care extends beyond identification of frailty alone. Delirium is one of the commonest complications affecting older surgical patients and is associated with prolonged admission, functional decline, long-term cognitive impairment and death [15-17]. Routine assessment using validated tools such as the Alertness, Abbreviated Mental Test (AMT4), Attention, and Acute change or fluctuating course (4AT) can improve structured recognition rather than relying on subjective clinical impression alone [18,19]. Likewise, emergency surgical decision-making increasingly recognises the importance of structured communication and shared decision-making. The Recommended Summary Plan for Emergency Care and Treatment (ReSPECT) process moves beyond traditional cardiopulmonary resuscitation decisions by documenting personalised recommendations for emergency care, treatment escalation and interventions that are appropriate to the individual patient's goals and values [20,21]. Within emergency general surgery, this should include discussion of operative intervention, admission to critical care and circumstances in which non-operative management may better achieve patient-centred outcomes [22].

Supportive and specialist palliative care should similarly be considered part of high-quality surgical care rather than an intervention reserved for the final hours or days of life. A model of parallel planning, whereby active surgical treatment, symptom control and advance care planning occur concurrently while prognosis remains uncertain, is consistent with the wider development of integrated surgical palliative care [23,24]. Earlier involvement of palliative care can facilitate symptom management, communication with patients and families and treatment-escalation planning without precluding active treatment [24,25].

Despite a growing evidence base, implementation of these principles remains variable within routine general surgical practice, particularly in hospitals without embedded perioperative geriatric services. Although frailty assessment, delirium surveillance, treatment-escalation planning and timely specialist palliative care are often considered independently, they represent complementary components of comprehensive geriatric surgical care. Evaluating how consistently these predefined care processes are delivered provides an opportunity to identify pragmatic, implementable improvements in care for older adults admitted under general surgery.

The aim of this study was to evaluate documented implementation of four predefined geriatric surgical care processes in older adults admitted under general surgery within a district general hospital: formal referral to geriatric medicine, contemporaneous validated delirium assessment among patients with documented confusion or delirium, ReSPECT documentation, and specialist palliative care referral among patients who died during admission.

Materials And Methods

Study design

We conducted a retrospective service evaluation of older adults aged ⩾65 years admitted under the general surgery service at a UK district general hospital. The age threshold of ⩾65 years was used to define the older surgical population for this evaluation, consistent with the commonly used definition of an older adult in clinical research. Referral to geriatric medicine was then assessed as a documented care process within this population. The evaluation examined documented implementation of four predefined geriatric surgical care processes: formal referral to geriatric medicine, contemporaneous validated delirium assessment among patients with documented confusion or delirium, treatment-escalation planning using the ReSPECT, and referral to specialist palliative care among patients who died during admission.

These domains were selected because they represent complementary components of contemporary geriatric surgical care and are recommended within national perioperative guidance or local service standards. Importantly, inclusion in the evaluation based on age ⩾65 years did not imply that all patients met criteria for geriatric medicine referral. Formal referral was dependent on clinical assessment and the established local referral pathway, and the evaluation assessed documented referral activity rather than retrospectively determining whether referral was clinically indicated for each patient.

Study population

Two complementary cohorts were analysed. The first comprised consecutive patients aged ⩾65 years admitted under general surgery between 16 February and 16 March 2026. This cohort was used to evaluate

frailty, multimorbidity, validated delirium assessment and referral to geriatric medicine.

The second comprised all patients aged ⩾65 years admitted under general surgery between 1 January 2025 and 31 January 2026. This cohort was used to evaluate ReSPECT documentation, inpatient mortality and referral to specialist palliative care among patients who died during admission.

Different timeframes were used because frailty, delirium and geriatric medicine referral required detailed manual case-note review, whereas ReSPECT completion, mortality and specialist palliative care referral could be identified through electronic reporting and referral-tracking systems across a longer period.

Data collection

Clinical and demographic data were extracted retrospectively from the electronic patient record. Variables included age, sex, admission type, admission source, discharge destination, length of stay, inpatient mortality, Rockwood Clinical Frailty Scale (CFS) [26], documented comorbidities, episodes of confusion or delirium, ReSPECT documentation, and referrals to geriatric medicine and specialist palliative care.

Frailty was assessed using the Rockwood CFS [26]. Multimorbidity was described using documented chronic medical conditions, including hypertension, previous malignancy, ischaemic heart disease or heart failure, diabetes mellitus, chronic kidney disease and atrial fibrillation.

Outcome measures

The primary outcome was implementation of four predefined geriatric surgical care processes: (1) Formal referral to geriatric medicine; (2) Contemporaneous validated delirium assessment among patients with documented confusion or delirium; (3) Completed ReSPECT documentation; (4) Specialist palliative care referral among patients who died during admission, defined as a documented referral to the specialist palliative care team.

Validated delirium assessment was defined as documentation of a recognised delirium screening instrument within the electronic patient record, including the 4AT, Confusion Assessment Method (CAM) or 3-Minute Diagnostic Interview for CAM (3D-CAM) [27-29]. Narrative documentation of confusion, altered mental state or reduced consciousness within routine clinical documentation or National Early Warning Score 2 (NEWS2) observations alone was not considered equivalent to validated delirium assessment. Recognised cognitive assessments including the Abbreviated Mental Test (AMT), Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA) were recorded separately as cognitive assessments, but were not classified as validated delirium screens [30-32]. For patients with documented confusion or delirium, records were reviewed to determine whether a contemporaneous validated delirium assessment had been completed.

Formal referral to geriatric medicine and specialist palliative care was defined as a documented electronic referral within the trust electronic referral and patient-tracking system. Informal discussion, verbal advice or review without a recorded electronic referral was not classified as a specialist referral.

ReSPECT completion was defined by the presence of a completed ReSPECT document within the electronic patient record. During the evaluation period, the local Trust standard required ReSPECT documentation for patients aged ⩾65 years admitted under general surgery; therefore, the denominator for ReSPECT completion was all patients aged ⩾65 years in the 13-month general surgery cohort. The timing, content and quality of ReSPECT discussions were not assessed.

Statistical analysis

Continuous variables are presented as mean with range or median where appropriate. Categorical variables are presented as frequencies and percentages. Analyses were descriptive and reported separately for each cohort according to the predefined outcome measures.

Results

Baseline characteristics

Two complementary cohorts were analysed (Table *1*).

Characteristic	One-month general surgery cohort, n=44	13-month general surgery cohort, n=3969
Age, mean, years	77.3	77.1
Age range, years	65–94	65–101
Female sex	24 (54.5%)	1854 (46.7%)
Male sex	20 (45.5%)	2115 (53.3%)
Emergency admission	33 (75.0%)	Not available
Clinical Frailty Scale (CFS) documented	44 (100%)	1958 (49.3%)
Clinical Frailty Scale, mean	4.6	Not available
Non-frail, CFS 1–3	22 (50.0%)	Not available
CFS 4–5	13 (29.5%)	Not available
CFS ≥6	9 (20.5%)	Not available
Modal Clinical Frailty Scale score	Not applicable	1, n=730
Hypertension	29 (65.9%)	Not available
Previous malignancy	25 (56.8%)	Not available
Heart failure or ischaemic heart disease	20 (45.5%)	Not available
Type 2 diabetes mellitus	14 (31.8%)	Not available
Chronic kidney disease	7 (15.9%)	Not available
Atrial fibrillation	7 (15.9%)	Not available
Length of stay, mean, days	Not available	3.8
Length of stay, range, days	Not available	0–130
Discharged to usual residence	Not available	3624 (91.3%)
Inpatient deaths	4 (9.1%)	91 (2.3%)

TABLE 1: Characteristics of older patients admitted under general surgery

Data are presented as n (%) unless otherwise stated.

The first comprised 44 patients aged ⩾65 years admitted under general surgery between 16 February and 16 March 2026 and was used to evaluate frailty, geriatric medicine referral and delirium assessment. The second comprised 3,969 patients aged ⩾65 years admitted under general surgery between January 2025 and January 2026 and was used to evaluate ReSPECT documentation and specialist palliative care referral

Within the one-month cohort, the mean age was 77.3 years (median 75.5 years; range 65-94 years). Twenty-four patients (54.5%) were female and 20 (45.5%) were male. Thirty-three admissions (75.0%) were emergencies, with the remainder elective or planned admissions.

Frailty and multimorbidity were common. The mean CFS score was 4.6. Twenty-two patients (50.0%) had CFS 1-3, 13 (29.5%) had CFS 4-5 and nine (20.5%) had CFS ⩾6. Hypertension was present in 29 patients (65.9%), previous malignancy in 25 (56.8%), ischaemic heart disease or heart failure in 20 (45.5%), type 2 diabetes mellitus in 14 (31.8%), chronic kidney disease in seven (15.9%), and atrial fibrillation in seven (15.9%). Four patients (9.1%) died during admission.

Frailty and geriatric medicine referral

Formal geriatric medicine referral was uncommon. Only one patient (2.3%) underwent a formal electronic referral to the geriatric medicine service during admission. This patient received CGA following clinical deterioration. The remaining patients in the cohort did not have a recorded formal geriatric medicine referral, although this process measure does not establish whether specialist review was clinically indicated in every case.

Delirium screening

Validated delirium assessment was infrequently performed among patients with documented confusion or delirium. Ten patients (22.7%) had documented confusion or delirium during admission; however, none underwent contemporaneous assessment using a validated delirium screening instrument.

Overall, two patients (4.5%) had documented cognitive assessment using a recognised cognitive tool (AMT, MMSE or MoCA). One of these patients subsequently underwent geriatric medicine review. These cognitive assessments were recorded separately and were not classified as validated delirium assessments. In all remaining cases, cognitive status was described narratively within clinical documentation or inferred from NEWS2 observations rather than assessed using a validated delirium screening instrument.

Treatment-escalation planning

The larger cohort comprised 3,969 patients aged ≥65 years admitted under general surgery during the 13-month study period. Mean age was 77.1 years (range 65-101 years); 2,115 patients (53.3%) were male and 1,854 (46.7%) female.

CFS scores were documented in 1,958 patients (49.3%), with a modal score of one (730 patients). Ninety-one patients died during admission, giving an inpatient mortality rate of 2.3%. Mean length of stay was 3.8 days (range 0-130 days), and 3,624 patients (91.3%) were discharged to their usual residence.

Only 281 patients (7.1%) had a completed ReSPECT document recorded within the electronic patient record. Because local Trust standards required ReSPECT documentation for patients aged ≥65 years admitted under general surgery, the denominator for this measure was the full 13-month cohort. Consequently, more than 90% of older surgical admissions had no documented RESPECT discussion describing treatment preferences or escalation plans.

Specialist palliative care referral

Among the 91 patients who died during admission, 34 (37.4%) had a documented referral to specialist palliative care.

Overall implementation of predefined geriatric surgical care processes

Across all four evaluated domains, recorded implementation of predefined geriatric surgical care processes was consistently low despite a patient population characterised by advanced age, frailty and multimorbidity (Table *2*).

Care-process measure	Eligible population	Completed, n (%)	Not completed, n (%)
Formal geriatric medicine referral	One-month general surgery cohort, n=44	1 (2.3%)	43 (97.7%)
Contemporaneous validated delirium assessment among patients with documented confusion or delirium	Patients with documented confusion or delirium, n=10	0 (0%)	10 (100%)
ReSPECT documentation	13-month cohort, n=3969	281 (7.1%)	3688 (92.9%)
Specialist palliative care referral among patients who died	Inpatient deaths, n=91	34 (37.4%)	57 (62.6%)

TABLE 2: Completion of predefined geriatric surgical care processes

Formal referral was defined as a recorded electronic referral through the electronic patient record. Validated delirium assessment included the 4AT, CAM or 3D-CAM. Cognitive assessment tools, including the AMT, MMSE or MoCA, were recorded separately and were not classified as validated delirium screens. Routine narrative documentation of confusion or NEWS2 consciousness scoring alone was not considered a validated delirium screen. ReSPECT completion was assessed using all patients aged ≥65 years in the 13-month cohort as the denominator, in line with the local Trust standard.

ReSPECT, Recommended Summary Plan for Emergency Care and Treatment; 4AT, Alertness, Abbreviated Mental Test (AMT4), Attention, and Acute change or fluctuating course; CAM, Confusion Assessment Method; 3D-CAM, 3-Minute Diagnostic Interview for CAM; AMT, Abbreviated Mental Test; MMSE, Mini-Mental State Examination, and MoCA, Montreal Cognitive Assessment.

Formal geriatric medicine referral occurred in 2.3% of patients in the one-month general surgery cohort, contemporaneous validated delirium assessment was completed in 0% of patients with documented confusion or delirium, ReSPECT documentation was present in 7.1% of older surgical admissions, and

specialist palliative care referral occurred in 37.4% of patients who died during admission. These findings identify substantial variation between predefined care processes and documented routine practice within the service.

Discussion

The principal finding of this study is that documented implementation of predefined geriatric surgical care processes was low across four complementary domains despite a patient population characterised by advanced age, frailty and multimorbidity. Formal geriatric medicine referral, contemporaneous validated delirium assessment among patients with documented confusion or delirium, ReSPECT documentation and specialist palliative care referral among patients who died were all infrequently recorded. These findings should be interpreted as evidence of implementation gaps in documented processes of care rather than as direct measures of the appropriateness or quality of individual clinical decisions. Nevertheless, taken together, they suggest that opportunities to recognise and respond systematically to geriatric vulnerability may be missed within routine general surgical pathways.

Recognition of frailty represents the foundation of contemporary perioperative care. Frailty is consistently associated with increased postoperative morbidity, mortality, prolonged hospitalisation, discharge to institutional care and loss of independence, and predicts surgical outcomes more accurately than chronological age alone [2,3,6,33]. These associations have been reproduced across emergency abdominal and emergency general surgical populations [7,34,35]. CGA remains the principal multidimensional intervention following identification of geriatric vulnerability and improves survival and reduces institutionalisation in older hospitalised adults [12]. Models incorporating geriatric medicine into surgical care have also demonstrated improvements in processes of care and length of stay [13,14,36]. In our cohort, only one patient underwent formal geriatric medicine referral despite substantial frailty and multimorbidity. Although this does not establish that all other patients required specialist geriatric review, it suggests that frailty recognition was not consistently linked to a documented formal geriatric referral pathway.

Our findings are consistent with those reported by Hu et al. in a US emergency general surgery population, in which substantial geriatric and palliative care needs were identified among older patients with frailty or cognitive impairment. In their cohort, 64% of patients were moderately or severely frail, while geriatric service interventions commonly addressed delirium prevention or management (66%) and facilitated serious-illness conversations (58%). The authors concluded that systematic geriatric involvement revealed a substantial burden of needs extending beyond the presenting surgical pathology. Although their study evaluated patients receiving a dedicated geriatric surgical service whereas ours examined routine practice without such an embedded model, the findings are complementary: both demonstrate the importance of systematically identifying frailty, cognitive vulnerability and palliative care needs in older general surgical patients [36].

Delirium represents one of the commonest and most consequential complications affecting older hospitalised and surgical patients. It is associated with prolonged admission, increased mortality, long-term cognitive impairment and functional decline, yet remains frequently under-recognised [15-17]. Despite documented confusion or delirium in almost one-quarter of patients, no patient underwent contemporaneous assessment using a validated delirium assessment tool. Instead, altered cognition was recorded descriptively within clinical documentation or inferred from NEWS2 observations. This finding indicates a gap in formal delirium assessment following documented confusion or suspected delirium. However, because the assessment denominator was restricted to patients with documented confusion or delirium, it does not capture patients with hypoactive or unrecognised delirium who may not have been identified in the first place. Reliance on clinical impression alone may therefore contribute to under-recognition of delirium. The 4AT provides a brief validated method of delirium assessment [18,19], while the 3D-CAM provides an alternative structured assessment that can be completed within approximately three minutes [37]. Incorporating a validated tool into surgical admission documentation and subsequent assessment therefore represents a practical intervention to improve systematic recognition.

Treatment-escalation planning was similarly uncommon. Fewer than one in 10 older surgical admissions had a completed ReSPECT document despite a local Trust standard requiring ReSPECT documentation for patients aged ⩾65 years admitted under general surgery. ReSPECT should not be regarded simply as a replacement for Do not attempt cardiopulmonary resuscitation (DNACPR) documentation. Instead, it provides a structured framework for shared decision-making that records recommendations for emergency treatment based on individual goals, values and clinical priorities [20,21]. Within surgical practice, these discussions should extend beyond cardiopulmonary resuscitation to include operative intervention, admission to critical care, invasive radiological procedures and circumstances in which non-operative management may better achieve patient-centred outcomes. Structured approaches to high-stakes surgical communication can improve the discussion of prognosis, treatment options and outcomes that matter to patients [22]. Earlier documentation may therefore reduce uncertainty and the burden placed upon patients, relatives and clinicians required to make time-critical decisions during episodes of acute deterioration.

The rate of documented specialist palliative care referral among patients who died highlights a further area for review within multidisciplinary care. Palliative care should not be considered synonymous with end-of-

life care, non-operative management or therapeutic withdrawal. Integration of palliative care into surgical practice supports symptom control, communication, advance care planning and goal-concordant decision-making alongside active treatment [23,24]. This is particularly relevant to emergency general surgery, where prognosis may remain uncertain and the appropriateness of further intervention may evolve during admission. Parallel planning allows active surgical treatment and supportive care to proceed concurrently rather than requiring a transition from one to the other. Evidence from other serious illnesses demonstrates that earlier palliative care can improve symptom burden and quality of life without preventing disease-directed treatment [25]. In our cohort, fewer than two-fifths of patients who died had a documented specialist palliative care referral. This does not imply that specialist referral was required in every case, as the need for palliative care may not have been apparent at the time of admission and may have evolved during the clinical course. Nevertheless, the finding provides an opportunity to review how changing palliative and end-of-life needs are recognised and addressed during acute surgical admissions.

Importantly, these findings should not be interpreted as criticism of individual clinicians or isolated omissions in practice. They reflect the challenges of delivering comprehensive geriatric care within a busy district general hospital surgical service. Resource limitations, competing clinical priorities and variable access to embedded geriatric medicine services influence implementation of predefined care processes. The interventions identified in this study were selected because they represent pragmatic improvements that can be incorporated into routine practice: frailty assessment linked to geriatric referral criteria, validated delirium assessment, early ReSPECT conversations and parallel planning with specialist palliative care. Experience from dedicated geriatric surgical services suggests that coordinated geriatric and palliative interventions can be integrated successfully within emergency general surgery pathways [36].

The strength of this study lies in its multidomain evaluation of geriatric surgical care. Frailty, cognitive vulnerability, treatment-escalation planning and palliative care are closely related aspects of the care of older surgical patients rather than independent problems. By assessing these complementary processes within the same surgical service, this study provides a broader assessment of how effectively geriatric principles are translated into routine clinical practice and provides a baseline for subsequent quality improvement.

Limitations

Several limitations should be considered when interpreting these findings. As a single-centre retrospective service evaluation, the study relied on electronic documentation and may therefore have missed unrecorded assessments or informal specialist advice. Furthermore, the use of two complementary cohorts limited patient-level comparison across all four domains. Although the detailed one-month cohort provided a consecutive snapshot of practice, its findings may be susceptible to short-term variation; however, its mean age was similar to that of the larger 13-month cohort. In addition, referral rates reflected processes rather than clinical appropriateness, and examining palliative care referral among patients who died may not have identified all those who could have benefited from earlier input. Similarly, ReSPECT completion was assessed by documented presence alone, without consideration of timing, quality or patient involvement. Finally, as the study focused on care processes rather than clinical outcomes, it cannot establish whether improved implementation would translate into reduced morbidity or mortality.

Conclusions

Older adults admitted under general surgery had varying levels of frailty and multimorbidity. However, documented rates of geriatric medicine referral, validated delirium assessment, ReSPECT completion and specialist palliative care referral were low. These processes are complementary components of comprehensive surgical care rather than independent initiatives. Their inclusion in routine surgical pathways is important. Clear criteria for specialist referral and local standards for treatment-escalation planning are also needed to improve the quality, safety, and delivery of patient-centred care for older adults.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Charlotte Kennedy, Elliott Hulme, Michael Okocha

Acquisition, analysis, or interpretation of data: Charlotte Kennedy, Cleo Byrne, Chandani Rathnam, Elizabeth McShane, Michael Okocha

Drafting of the manuscript: Charlotte Kennedy, Elliott Hulme, Michael Okocha

Critical review of the manuscript for important intellectual content: Cleo Byrne, Chandani Rathnam, Elizabeth McShane, Michael Okocha

Supervision: Michael Okocha

Disclosures

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