Sustainability of a proactive geriatric trauma consultation service

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Background: Proactive geriatric trauma consultation service (GTCS) models have been associated with better delivery of geriatric care and functional outcomes. Whether such collaborative models can be improved and sustained remains uncertain. We describe the sustainability and process improvements of an inpatient GTCS.

Methods: We assessed workflow using interviews and surveys to identify opportunities to optimize the referral process for the GTCS. Sustainability of the service was assessed via a prospective case series (July 2012–December 2013). Study data were derived from a review of the medical record and trauma registry database. Metrics to determine sustainability included volume of cases, staffing levels, rate of adherence to recommendations, geriatric-specific clinical outcomes, trauma quality indicators, consultation requests and discharge destination.

Results: Through process changes, we were able to ensure every eligible patient was referred for a comprehensive geriatric assessment. Compared with the implementation phase, volume of assessments increased and recommendation adherence rates were maintained. Delirium and/or dementia were the most common geriatric issue addressed. The rate of adherence to recommendations made by the GTCS team was 88.2%. Only 1.4% of patients were discharged to a nursing home.

Conclusion: Workflow assessment is a useful means to optimize the referral process for comprehensive geriatric assessment. Sustainability of a GTCS was shown by volume, staffing and recommendation adherence.

Contexte : Les modèles de services de consultation proactifs en traumatologie gériatrique ont été associés à une amélioration des soins gériatriques et des capacités fonctionnelles. Toutefois, on ignore toujours s'il est possible de perfectionner et de maintenir ces modèles collaboratifs. Nous décrivons donc ici la viabilité et l'amélioration des procédures d'un service de consultation en traumatologie gériatrique en milieu hospitalier.

Méthodes : Nous avons réalisé des entrevues et des sondages afin d'évaluer le déroulement du travail et de trouver des occasions d'optimiser le processus d'orientation des patients dans ce type de services. La viabilité du service a été évaluée par étude prospective de cas (juillet 2012 à décembre 2013). Les données analysées provenaient de dossiers médicaux et d'une base de données sur les traumas, et les indicateurs de viabilité utilisés comprenaient le nombre de patients rencontrés, l'effectif, le taux de respect des recommandations, des résultats cliniques propres aux personnes âgées, des indicateurs de la qualité des soins de traumatologie, le nombre de demandes de consultation et la destination au moment du congé.

Résultats : Grâce à des changements aux procédures, nous avons pu veiller à ce que chaque patient admissible soit orienté vers une évaluation gériatrique complète. Comparativement à la phase de mise en œuvre, le nombre d'évaluations a augmenté, et le taux de respect des recommandations s'est maintenu. Le délire et la démence étaient les problèmes gériatriques les plus fréquents. Le respect des recommandations faites par le service était de 88,2 %, et seuls 1,4 % des patients sont allés dans un centre de soins infirmiers à leur congé.

Conclusion : Bref, l'évaluation du déroulement du travail est un bon moyen d'optimiser le processus d'orientation des patients vers une évaluation gériatrique complète. La viabilité d'un service de consultation en traumatologie gériatrique a été démontrée par le nombre d'évaluations réalisées, l'effectif du service et le respect des recommandations proposées.

Adults aged 65 years or older will make up about 40% of all trauma patients by 2050.[1] Delays in recognizing the special needs of older trauma patients may result in suboptimal care.[2] Postinjury complications in elderly trauma patients negatively impact survival and contribute to longer lengths of stay in hospital (LOS) among survivors and nonsurvivors than in younger trauma patients.[3] Among other interventions, a comprehensive geriatric assessment conducted by a dedicated geriatric trauma team may contribute to improved functional recovery after traumatic injury in elderly patients.[4] A comprehensive geriatric assessment is a multidimensional, interdisciplinary diagnostic process to determine the medical, psychological and functional capabilities of a frail elderly person in order to develop a coordinated and integrated plan for management and longitudinal follow-up.[5]

We previously reported on the implementation of a proactive geriatric trauma consultation service (GTCS) model, in which all older trauma patients receive a comprehensive geriatric assessment within 72 hours of admission.[6] The goals of this model include the prevention and management of age-specific complications and early attention to discharge planning. In a before/after case series comparing clinical outcomes pre- and postimplementation of a GTCS, the GTCS was associated with significant reductions in delirium, consultations with psychiatry, consultations with internal medicine and discharge to a nursing home. There was also a trend toward decreased LOS in the intervention group. However, the potential impact may have been suboptimal as only 60% of all eligible patients were seen by the GTCS in the implementation phase; specifically, 28% of the patients were not seen because the referral process was not activated for unknown reasons.[6] Other studies have shown that GTCS improves geriatric quality of care indicators and functional recovery.[4,7]

Implementation is the initial process of embedding interventions within a setting; sustainability is the process by which interventions can continue to be delivered over time with the necessary elements built to support their delivery. Measurement of outcomes over time to determine continued benefit has been shown to support sustainability of a practice.[8] Often, studies evaluate only the initial intervention adoption and implementation. Sustained practice change and optimization of interventions are rarely investigated. In this study, we report on strategies used in the sustainability of the proactive GTCS service and on the outcomes of these efforts.

Methods

Study sample and setting

St Michael's Hospital is a level 1 trauma centre providing quaternary trauma services in an academic setting. The GTCS implementation study period participants (September 2007–March 2010) have been described previously,[6] and participants with complete data (n = 246) were used for comparison. In this sustainability study, all patients aged 65 years or older admitted to the trauma service between July 2012 and December 2013 were eligible, excluding those who were dead on arrival or who died in the emergency department (ED). Ethics approval for the study was granted by the Research Ethics Board at St. Michael's Hospital.

Sustainability interventions

To identify gaps in the referral process, we used 3 steps. First, one of us (R.A.) conducted a workflow assessment, reviewing the identification, referral and referral handling processes over 8 sessions to achieve data saturation. This information was then used to map the GTCS referral process. Second, we conducted individual semi-structured interviews with the 2 frontline staff who identify eligible patients and with the administrative staff who processes the completed referral in order to understand the barriers and facilitators to referral completion. Third, we distributed an online survey to 12 key individuals who were part of either the GTCS or trauma teams. The survey asked stakeholders which components of the existing referral process should be kept and which should not be kept. As a result of this 3-step process to identify gaps in the referral process, several changes were implemented in the GTCS process. These changes included keeping a log of the referrals, simplifying the referral form, linking the referral form on the hospital intranet, developing a standard operating procedure and assigning referral responsibility to an alternative individual if the regular staff is absent. The GTCS continued to be staffed by an advanced practice nurse in geriatrics, a geriatrician and occasionally a resident physician. There were no changes in the funding model.

Data sources

Data sources for sustainability and clinical outcomes included paper medical records, electronic medical records and the hospital trauma registry database. All eligible patients were approached prospectively for consent to abstract and analyze data on clinical outcomes. Demographic data and clinical outcomes for all patients admitted to the trauma service at St. Michael's Hospital are systematically tracked in a prospectively maintained database: the St. Michael's Hospital Trauma Registry Database. The registry is routinely reviewed by the Canadian Institute for Health Information and the National Trauma Data Bank in the United States to ensure accuracy of the registry database.

Data abstraction

Data were abstracted on the basis of the study protocol guidelines by 1 of 3 designated researchers (R.A., H.Y.L., or C.V.). A subset was abstracted in duplicate to ensure interrater reliability was achieved for geriatric-specific outcomes

Sustainability outcomes

The outcomes of interest for the sustainability study were volume of patients seen by the GTCS, percentage of patients who were eligible to be seen by the GTCS but who were not assessed, and percentage of GTCS recommendations that were adopted by the primary team. We determined volume based on the mean number of patients seen per month by the GTCS. We categorized the reasons why patients in the sustainability phase were not seen by the GTCS within the first 72 h of admission into 1 of 7 groups: died within first the 72 h, referral not sent, discharged from hospital within the first 72 h, transferred to a different service within the first 72 h, imminent death or withdrawal of care anticipated, referral sent but reason not seen, or unknown. The recommendation adherence rate was defined as a proportion of the number of recommendations implemented among the total number of recommendations made.

Clinical outcomes

Clinical outcomes of interest were geriatric-specific in-hospital complications (i.e., falls, delirium, physical restraint use), trauma quality indicators and discharge to nursing home. Delirium was identified via a validated medical chart abstraction instrument.[9] Trauma quality indicators of interest included decubitus ulcer, thromboembolism, myocardial infarction, pneumonia, cardiac arrest and missed injuries. Discharge to nursing home was defined as a transfer from the trauma service directly to a facility designed for people who require the availability of 24-h nursing care and supervision within a secure setting, as defined by the Ontario Ministry of Health and Long-Term Care.

Statistical analysis

We calculated means and standard deviations for continuous variables, and absolute and relative frequencies were measured for discrete variables. Continuous variables were compared using the Student t test, and we evaluated proportions using the χ^2 or Fisher exact test, as appropriate. We considered results to be significant at $p < 0.05$. Statistical comparison of clinical outcomes between the implementation and sustainability phases was not performed owing to different methods in participant recruitment. All data were analyzed using SAS software version 9.1.

RESULTS

In this sustainability phase, 89.9% (124 of 138) of patients aged 65 or older admitted to the trauma service received a comprehensive geriatric assessment compared with only 59.4% during the implementation phase ($p < 0.001$). The volume of patients seen per month increased in the sustainability phase to 6.9 ± 2.7 compared with 4.9 ± 2.1 during the implementation phase. The distribution of reasons for no assessment by the GTCS in the sustainability phase ($n = 14$) are outlined in Table 1. Notably, there were no instances where a referral was not sent for an eligible patient.

Seventy-seven of 138 patients (55.8%) were prospectively recruited and consented for data abstraction and analysis of clinical outcomes (26 declined participation, 14 died before the consent process, 10 did not return the consent form, 11 did not consent for other reasons). Of the 77 patients, 76 were seen by the GTCS (1 patient was not seen because imminent death was anticipated). The participants in the sustainability period were older and had more comorbidities, but had similar injury severity as participants in the implementation period (Table 2). This may have been

Table 1. Distribution of reasons for patients not being seen by the GTCS in the sustainability study period ($n = 14$)

Reason	No. (%)
Died within 72 h of admission	9 (64.3)
Discharged within 72 h of admission	1 (7.1)
Transferred to a different service within 72 h of admission	1 (7.1)
Imminent withdrawal of care or death anticipated	2 (14.3)
Referral sent, but not seen and reason unknown	1 (7.1)
No referral sent	0 (0)

GTCS = geriatric trauma consultation service.

Table 2. Characteristics of study participants

Characteristic	Phase; no. (%) or mean ± SD	
	Implementation ($n = 246$)	Sustainability ($n = 76$)
Age, yr	73.7 ± 9.1	76.9 ± 7.9
Female sex	90 (36.6)	39 (50.7)
High alcohol level	25 (10.2)	7 (9.1)
Comorbidities		
Diabetes	48 (19.5)	23 (30.3)
Cardiovascular disease	31 (12.6)	26 (34.2)
Alcohol dependence	23 (9.4)	12 (15.8)
Hypertension	132 (53.7)	57 (75)
Cognitive impairment	49 (19.9)	21 (27.3)
Mood disorder	46 (18.7)	22 (28.9)
Injury characteristics		
Mechanism		
Motor vehicle collision	61 (24.9)	24 (31.2)
Fall	101 (41.2)	32 (41.6)
Intentional Injury	17 (6.9)	0 (0)
ISS	24.7 ± 14.1	24.1 ± 11.5

ISS = injury severity score; SD = standard deviation.

because of different strategies used for participant recruitment; that is, retrospective in the implementation phase and prospective in the sustainability phase. Thus, we did not perform statistical comparisons. Rates for various outcomes and quality indicators are shown in Table 3. In total, 1.4% of participants were discharged to a nursing home.

At least 1 recommendation was made by the GTCS in 73 of the 76 patients. The mean number of issues identified in the implementation phase participants (4.3) was similar to that in the sustainability phase participants (4.7). The most common issues addressed by the GTCS were delirium/dementia (83.0%) and mobilization (71.4%; Table 4). The adherence by the trauma team to recommendations made by the GTCS in the sustainability phase was 88.2% and 93.2% in the implementation phase.

Discussion

Our centre and others have previously shown that proactive geriatric consultation for older patients admitted with trauma may improve geriatric quality indicators and functional recovery.[4,6,7] To our knowledge, this is the first study to report on the sustainability of this type of care model. We showed that the combination of a workflow assessment, semistructured interviews and survey of stakeholders is a useful means to optimize the referral process for comprehensive geriatric assessment, such that all eligible patients were identified and referred. Sustainability of a GTCS was shown by volume, staffing and recommendation adherence.

Table 3. Geriatric complications and other quality indicators

Indicator	Phase; no. (%)	
	Implementation (*n* = 246)	Sustainability (*n* = 77)
Consultations		
Internal medicine	18 (17.3)	11 (14.3)
Psychiatry	18 (17.3)	4 (5.2)
Geriatric complications		
Falls	3 (1.5)	3 (3.9)
Delirium	83 (40.9)	41 (53.3)
Physical restraint use	102 (50.3)	38 (49.4)
Other quality indicators		
Decubitus ulcer	9 (4.4)	8 (10.4)
Deep vein thrombosis	1 (0.5)	5 (6.5)
Myocardial infarction	4 (2.0)	0 (0)
Pneumonia	37 (18.2)	18 (23.4)
Dischage destination		
Nursing home	3 (1.7)	1 (1.4)

Table 4. Frequency of geriatric issues addressed in the sustainability period (*n* = 77)

Geriatric issue	No. (%)
Delirium/dementia	67 (87.0)
Mobilization	55 (71.4)
Continence	53 (68.8)
Pain	51 (66.2)
Discharge planning	43 (55.8)
Medication reconciliation	39 (50.7)
Sensory impairment	14 (18.2)
Mood disorder	6 (7.8)
Nutrition	4 (5.2)
Restraint	4 (5.2)
Decubitus ulcer	3 (3.9)

Strengths and limitations

Strengths of this study include the evaluation of the sustainability of a model of care beyond the initial intervention adoption and implementation. A limitation of this study was that the participant recruitment strategy in the implementation phase was retrospective and that in the sustainability phase was prospective; this resulted in differences in the characteristics of the participants, which precluded statistical comparison of clinical outcomes. It is thus unclear whether the improvements in geriatric quality indicators were sustained. The patients in the sustainability phase had more comorbidities and were older than those in the implementation phase, and thus were likely at higher risk for adverse outcomes.

Collaboration between trauma and geriatric specialists needs to continue to develop innovations and process-based quality indicators to meaningfully improve outcomes in elderly patients. Future directions include standardizing a comprehensive set of quality indicators that can be incorporated prospectively into existing trauma registries.

Conclusion

Workflow assessment is a useful means to optimize the referral process for comprehensive geriatric assessment. Sustainability of a geriatric trauma consultation service, as defined by volume, staffing and recommendation adherence is attainable.

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