


# Initiating advance care planning at admission: a brief intervention to increase goals of care discussions in geriatric trauma patients in an urban level I trauma center

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## ABSTRACT

**Objectives** The burden of geriatric trauma continues to rise. Older trauma patients experience higher morbidity and mortality and thus benefit from early goals of care (GOC) discussions and advance care planning (ACP). The American College of Surgeons (ACS) Trauma Quality Improvement Program (TQIP) recommends holding a family meeting within 72 hours of admission when treating geriatric trauma patients. At our level I trauma center, we sought to increase early GOC discussions by implementing a new history and physical (H&P) note template for geriatric trauma patients.

**Methods** Patients (aged >65 years) admitted to the trauma surgery service (≥24 hours) were included in the study. The intervention was a change in the H&P note template to include confirmation of code status or previous ACP and identification of a healthcare proxy. Primary outcomes were the rates of recognizing a pre-existing Do-Not-Resuscitate (DNR) status/advanced directives at admission and of documentation of a GOC discussion within 72 hours. Outcomes from a 3-month period (March–May) during the pre-intervention (2021) and post-intervention (2022) periods were compared.

**Results** The pre-intervention and post-intervention groups had 107 and 150 patients, respectively. We observed an increase in recognition of pre-existing DNR code status at time of admission from 50% to 95% ( $p=0.003$ ) and documentation of a GOC discussion within 72 hours from 17% to 83% ( $p<0.0001$ ). We also observed a trend showing that new DNR orders were placed more frequently in the post-intervention period (9% vs 17%,  $p=0.098$ ). The in-hospital mortality was not significantly different.

**Conclusions** The importance of GOC discussions and ACP documentation for geriatric trauma patients is evident, but its completion can be challenging. Our intervention of a new H&P note template increased GOC discussions, and this implementation may be feasible in other trauma centers to comply with the ACS-TQIP Geriatric Trauma Management Guidelines.

**Level of evidence** Level III.

## BACKGROUND

With advancements in healthcare, more individuals are living longer, and the population continues to age. The number of geriatric trauma patients is undoubtedly increasing, and as a result, geriatric trauma has become a major public health concern. Geriatric trauma is now responsible for >30% of all trauma admissions in the USA.<sup>1</sup> Overall, older trauma patients have higher

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Goals of care (GOC) discussions should be held within 72 hours of admission for geriatric trauma patients, but their completion remains challenging in trauma centers.

## WHAT THIS STUDY ADDS

⇒ By incorporating brief advance care planning to the initial history and physical note template, we improved documentation of GOC discussions from 17% to 83% within a 3-month period.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This change can be implemented at other trauma centers to ensure trauma care is aligned with older patients' goals and preferences.

morbidity and mortality than their younger counterparts. Literature has demonstrated that age over 65 years is an independent risk factor for mortality with up to 2–4 times higher odds of death across all mechanisms.<sup>2</sup> On the whole, geriatric trauma patients represent a vulnerable population at risk of adverse outcomes, and there is a heavier focus on improving outcomes of this high-risk patient population. Some trauma centers with higher geriatric trauma volumes have shown to have decreased mortality, suggesting that trauma centers should develop care pathways tailored to geriatric patients.<sup>3</sup> As such, there has been a growing emphasis on early goals of care (GOC) discussions and advance care planning (ACP) for these patients to ensure that treatments, especially invasive procedures, are in line with their preferences and priorities. This approach was further highlighted as part of the American College of Surgeons (ACS) Trauma Quality Improvement Program (TQIP) Geriatric Trauma Management Guidelines; the ACS-TQIP recommends holding a family meeting within 72 hours of admission to discuss GOC.<sup>4</sup>

GOC discussions are essential in caring for older patients to provide appropriate treatment options. Goals are highly individualized based on each patient's preferences and should reflect their medical comorbidities, personal experiences, cultural context, and religious beliefs. Many older adults value quality over quantity of life. One study showed that if predicted to have a functional or cognitive decline, many older adults with serious illnesses would forgo treatment if outcome was survival with significant impairment.<sup>5</sup> A

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randomized controlled trial in older patients demonstrated that ACP improves end-of-life care and reduces stress, anxiety, and depression in surviving family members.<sup>6</sup> While GOC discussions are imperative conversations to guide treatment, many older adults have not had prior discussions with their care team or primary care provider. Consequently, the trauma surgeons and care team may be faced with having these conversations for the first time during the hospitalizations. For newly admitted patients without prior GOC discussions, this conversation is often delayed. Contributing factors in this delay include shortage of staff, lack of training among staff, lack of time, and inability to have the discussion with the patients themselves due to pre-existing dementia or due to the burden of traumatic injuries. Additionally, patients and their families may have never considered what their wishes would be when faced with prognostic uncertainty or loss of independence.

Currently, there is a paucity of literature addressing GOC discussions in geriatric trauma. One study evaluated implementation of GOC discussions within 72 hours in a trauma ICU, which resulted in no change in mortality but earlier consensus around GOC for those who died, leading to decreased ICU stay.<sup>7</sup> Another more recent study assessed the association between family meetings and use of resources in trauma patients who have died in the hospital.<sup>8</sup> Early family meeting within 3 days was associated with shorter length of stay and ventilator days, which again highlights the benefit of having an early GOC discussion. Both studies, however, are not specific to older trauma patients. In 2016, Centers for Medicare & Medicaid Services began to reimburse clinicians for having ACP discussions with their patients. One study of older patients with dementia undergoing inpatient surgeries showed that ACP billing code use was low despite Medicare reimbursement.<sup>9</sup> Only 27% of ACP discussions occurred before the surgical admission while 58% occurred after undergoing surgery, suggesting that ACP discussions are taking place more frequently after surgery in association with postoperative complications. Again, this study was focused on geriatric patients undergoing non-trauma-related inpatient surgery.<sup>9</sup> Nonetheless, there exist opportunities to improve early ACP in surgical and trauma patients.

At our institution, an urban level I trauma center, we sought to improve the frequency and documentation of GOC discussions at the time of admission for all our geriatric trauma patients. Our intervention was to create a new history and physical (H&P) note template requiring confirmation of the code status and identifying a healthcare proxy at admission. This brief intervention added only a few additional minutes to the admission process and could be carried out by our physician assistants (PAs) or residents as part of the initial history. Our aim was to increase the rate of GOC discussions among our geriatric trauma patients within 72 hours of admission, to improve recognition of previous code status and/or advanced directives/medical orders for life-sustaining treatment (MOLST), and to identify patients who may benefit from additional discussions or for whom we should modify treatments to align with their previously stated preferences.

## METHODS

### Study population

Our intervention was developed in early 2022. To compare pre-intervention and post-intervention groups, we retrospectively reviewed all trauma activations and consults from two similar 3-month periods. A convenience sample of patients admitted in March, April, and May 2021 were compared with those in March, April, and May 2022. Patients were retrospectively reviewed using electronic medical records and trauma registry.

### Brief Advance Care Planning (ACP)

Healthcare Proxy Name/Relationship: \*\*\*

Phone number for the proxy: \*\*\* or \*\*\* already in chart

Pre-existing advance care directive or MOLST: {Yes or No:25073}

Code Status: {code status:46431}

**Figure 1** The ACP questionnaire added to the H&P note template. MOLST, medical orders for life-sustaining treatment.

Patients aged 65 years and above who were admitted to the trauma surgery service for >24 hours were included in the study. Exclusion criteria were: (1) patients with minor or no traumatic injuries who were transferred to a non-surgical service within 2 days of admission for ongoing care for non-trauma-related diagnoses and (2) patients transferred to the trauma service after initial admission to a different service. There was no active patient participation.

### Intervention

The new H&P note template was developed in February 2022. A brief ACP questionnaire (figure 1) was added to our standard template. The note template was changed in the electronic medical charting software EPIC, and the team was trained to use this new format for all geriatric patients getting admitted to the trauma service. This process change along with staff training was accomplished in under 1 month. The study population was divided into pre-intervention (2021) and post-intervention group (2022).

### Demographics and outcomes

The data collected for the study population included: age at admission, admission date, mechanism of injury, level of trauma activation, gender, preadmission residence (home, skilled nursing home, subacute rehabilitation), frailty score, geriatrics and palliative care consultation during admission, ICU admission, ICU length of stay, rate of respiratory failure requiring intubation and ventilator days, rate of tracheostomy and surgical feeding tube placement, pre-existing DNR, whether the pre-existing DNR was recognized at admission, date of the first GOC discussion/ACP note, number of GOC discussions, number of operations or interventional radiology (IR) procedures, discharge date, discharge disposition, hospital length of stay, and mortality. The primary outcomes of this study were the rate of recognizing a pre-existing DNR/MOLST/advanced directive at the time of admission and the percentage of GOC discussions within 72 hours. Both the initial ACP questionnaire as part of the H&P note and additional family meetings focused on GOC counted as GOC discussions in our study.

Our trauma team has screened for frailty at admission since 2019, using the Fatigue, Resistance, Ambulation, Illnesses, and Loss of weight scale, and the frailty score of 3 or above served as a trigger for geriatric consult and 5 a trigger for palliative care consult.

Data were analyzed using Microsoft Excel 2020 (Microsoft, Redmond, Washington, USA). Bivariate analyses were conducted using Pearson's  $\chi^2$  test or Fisher's exact test for categorical variables and two sample t-tests for continuous variables. P values <0.05 were considered statistically significant.

## RESULTS

The pre-intervention group (March–May 2021) included 107 patients; the post-intervention group (March–May 2022) had

**Table 1** Patient demographics/hospital outcomes

	2021 (n=107)	2022 (n=150)	P value
Age (mean±SD) in years	82.32±9.43	81.28±8.63	0.310
Male	38 (36%)	44 (29%)	0.295
Preadmission residence			
Home	99 (93%)	141 (94%)	0.220
SNF	5 (4.7%)	8 (5.3%)	
Assisted living	2 (1.9%)	0	
Homeless	1 (1%)	0	
Subacute rehabilitation	0	1 (1%)	
Mechanism of injury			
Fall (ground level)	86 (80%)	129 (86%)	0.394
Fall down steps	14 (13%)	12 (8%)	
Pedestrian struck	4 (4%)	5 (3%)	
Assault	1 (1%)	3 (2%)	
Other	2—self-inflicted stab, fall off ladder (2%)	1—hanging (1%)	
Mean Injury Severity Scale (±SD)	9.62±6.12	7.97±6.46	0.044*
Frailty assessed	87 (81%)	142 (95%)	0.0007*
Median frailty (first–third quartiles)	2 (1–3)	2 (1–3)	0.216
Geriatric consult	32 (30%)	73 (49%)	0.003*
ICU admission	30 (28%)	38 (25%)	0.628
Requiring ventilation	8 (8%)	8 (5%)	0.483
Tracheostomy	1 (1%)	2 (1%)	
Surgical feeding tube	0	2 (1%)	
Operations/Procedures	42 (39%)	53 (35%)	0.521
Orthopedic	30 (71%)	47 (89%)	
Trauma	3 (7%)	0 (0%)	
Neurosurgery	2 (5%)	2 (4%)	
Spine	2 (5%)	0 (0%)	
IR	2 (5%)	1 (2%)	
Other	3 (7%)	2 (4%)	
Median LOS (first–third quartiles) in days	4 (3–8)	4 (2–6)	0.013*
In-hospital mortality	8 (7%) 4/8 comfort care	5 (3%) 4/5 comfort care	0.135
Discharge disposition			
SNF	51 (51%)	77 (53%)	0.843
Acute rehabilitation	10 (10%)	15 (10%)	
Home	10 (10%)	24 (17%)	
Home with health services	24 (24%)	26 (18%)	
LTAC	1 (1%)	0	
Hospice (home or SNF)	3 (3%)	2 (1%)	
Other	0	1—psych (1%)	

\*Marks statistically significant values.  
ICU, intensive care unit; IR, interventional radiology; LOS, length of stay; LTAC, long-term acute care; SNF, skilled nursing facility.

150 patients. Demographics for each group are shown in [table 1](#). Seven patients were excluded from the study. Three were transferred to medicine, two were transferred to neurology, and two were admitted to orthopedics initially and transferred to trauma later.

The demographics did not differ significantly between groups. Patients were predominantly female with a mean age just over 80 years. The majority of the patients presented from home while only 5% came from skilled nursing facilities. Mechanisms of injury were similar between 2021 and 2022. Most of the patients presented after a ground level fall (84%), and a small percentage fell down steps (10%), followed by pedestrians struck (3.5%). The frailty screening compliance increased from 2021 to 2022

**Table 2** Code status and GOC discussions

	2021 (n=107)	2022 (n=150)	P value
Pre-existing DNR	18 (17%)	19 (13%)	0.350
DNR recognized at admission	9/18 (50%)	18/19 (95%)	0.003*
New DNR order placed during hospitalization	8/89 (9%)	22/131 (17%)	0.098
Documentation of GOC discussions within 72 hours	18 (17%)	124 (83%)	<0.0001*

\*Marks statistically significant values.  
GOC, goals of care.

from 81% to 95% along with geriatric consultation from 30% to 50%. The median frailty score remained the same at 2. The rate of ICU admission, respiratory failure requiring intubation, and operative interventions/IR procedures did not differ significantly. Thirty-seven per cent of the cohort under went orthopedic procedures.

The in-hospital mortality rate was lower in the post-intervention group (3%) compared with the pre-intervention group (7%), but this difference was not statistically significant ( $p=0.135$ ). In the pre-intervention group, among those who died in the hospital, one of eight patients had a full code status documented at the time of death; four of the eight patients died after converting goals to comfort care. The remaining three patients had DNR orders at the time of death. In the post-intervention group, all five patients who died during the hospitalization had DNR orders placed, and four of the five died on comfort care. The discharge dispositions were not statistically different between pre- and post-intervention groups.

We compared the number of patients with pre-existing DNR, DNR orders placed at the time of admission, new DNR orders placed during the hospitalization, and the rate of GOC discussions within 72 hours of admission ([table 2](#)).

Fourteen per cent of the entire cohort had pre-existing DNR orders. In the pre-intervention group, only half of the patients with preadmission DNR orders were maintained at admission; the other half of patients were admitted to the hospital with ‘full code’ orders, and there was no documentation that their previous advance directives or MOLST were identified. However, after the implementation of the new H&P note, 95% of patients with pre-existing DNR were maintained at the time of admission. In the post-intervention group, the one patient whose code status was full code at the time of admission was intubated immediately after presentation and had no healthcare proxy or family identified; additionally, the team learned of the code status only after obtaining records from an outside hospital. The patient did not have a MOLST or other documents to indicate appropriate code status.

GOC discussions were documented within 72 hours of admission in <20% of the pre-intervention group; in the post-intervention group, the rate increased to 83%. Additionally, while not found to be statistically significant, there appeared to be an increasing trend of new DNR orders placed during admission in the post-intervention group (9% vs. 17%,  $p=0.098$ ).

## DISCUSSION

Having GOC discussions for geriatric trauma patients early during hospitalization is paramount to providing care that is aligned with their preferences and recommended by the ACS-TQIP. Nonetheless, its completion remains a challenge for trauma centers. In our trauma center, GOC discussions within 72 hours of admission were completed in <20% of geriatric patients. Our intervention aimed to increase this rate. Additionally, we



aimed to recognize and maintain pre-existing ACP documents or limited intervention status at admission. With a simple intervention, we increased our GOC discussion rate from 17% to 83% and recognition of pre-existing DNR status from 50% to 95%. Our study demonstrates that a brief intervention built into the admission process can improve compliance with the ACS-TQIP Geriatric Trauma Management Guidelines in a busy level I trauma center.

A study by Southerland *et al* reported low documentation of GOC discussion of 18% despite having implemented a geriatric consultation service.<sup>10</sup> Our institution had a similar rate prior to the intervention, possibly underscoring the practical challenges in compliance with the guidelines promoted by the ACS-TQIP. Preadmission DNR status among geriatric trauma patients has previously been reported to be 7%–11%.<sup>11,12</sup> Our study found a slightly higher rate of 14%, most likely because our patients' mean age was over 80 years. The most striking finding in our study was the disappointingly low rate (50%) of addressing a previous DNR status on admission during the pre-intervention period. Many of these were later recognized during the hospital course. Confirmation of code status at the time of admission cannot be overemphasized, especially for geriatric trauma patients who are already at a high risk for clinical deterioration during hospitalization. There is no literature looking at this specific issue of failure to recognize or acknowledge pre-existing ACP documents or pre-existing code status. In our institution, the rate of addressing pre-existing DNR code status has increased drastically in the post-intervention period to almost 100% after the implementation of the brief ACP component in the H&P note template. This remarkable increase came with no other interventions than implementing a brief questionnaire which could be completed by any member of the trauma team (PAs, residents, or faculty) at the time of admission.

The GOC discussion in post-intervention group occurred at a much higher rate of 83%, which is more than a quadruple increase from the rate in 2021. The initial ACP portion of the H&P was deferred for some patients as they have baseline dementia, and due to the admission time, mostly at night, the trauma team was not able to contact the family members at admission. Unfortunately, completion of the GOC discussions was not followed up by the team afterwards in those patients. However, with this increase in GOC discussion, we observed an increasing trend, although not statistically significant, to have more DNR orders placed in 2022 (17% vs 9%,  $p=0.098$ ). More notably, 95% of these DNR orders were placed after the first GOC discussion at the time of admission (21 out of 22), demonstrating that one GOC discussion alone can help elicit older patients' preferences and can lead to official documentation in medical charts to prevent any unwanted interventions during and after that specific hospitalization. Our brief intervention allowed older adults an opportunity to express their wishes and to initiate ACP even in those who have expressed to be full code at the time. Another key finding in our study is that despite the increase in GOC discussions in our geriatric trauma patients, the in-hospital mortality did not change, demonstrating that a DNR order does not negatively impact the quality of care.

One question that remains to be answered is: did our intervention decrease the number of futile invasive procedures in our patients, especially for those who eventually transitioned to comfort care? Given the low in-hospital mortality, it is difficult to conjecture if early GOC discussions affected the rate of surgical interventions, such as tracheostomy or feeding tube placements. In 2022, only one out of the four patients who died on comfort care had a neurosurgical procedure on hospital day (HD) #1 followed by a tracheostomy

and a gastrostomy tube placement on HD #4; further GOC discussions took place based on the clinical trajectory, and the patient subsequently transitioned to comfort care 4 days after. This case demonstrates the challenges in prognostication during early phase of traumatic brain injury (TBI). Trauma surgeons often face this medical and ethical conflict to complete tracheostomy within 7 days of TBI as this is one of the recommendations proposed by the ACS-TQIP Guidelines for TBI.<sup>13</sup> More in-depth and more frequent family meetings over an extended period may eventually lead to transitioning to comfort care for certain patients, but trauma surgeons may also feel obligated to perform tracheostomy early for its obvious benefits. This case ultimately highlights the need for better prognostications for geriatric trauma patients, such as those with severe TBI, early during the hospitalization. Although we cannot demonstrate statistically significant differences in the number of invasive procedures, we feel that our intervention to start having GOC discussions at admission may have benefited some of the patients with poor prognoses. For instance, in 2022, one of four patients who transitioned to comfort care did so within 5 days of hospitalization after having had two GOC discussions. The family opted not to pursue orthopedic surgery given the patient's cardiac conditions and chose comfort measures only. This finding is similar to what has been reported in patients with advanced cancer; early end-of-life care discussions were associated with less ICU care and more frequent and earlier hospice.<sup>14</sup>

Another example of invasive interventions that could be avoided with earlier recognition of code status is intubation. In 2022, we successfully recognized pre-existing DNR/Do-Not-Intubate (DNI) status in all but one patient. This patient was intubated in the trauma bay because the patient was not able to express the code status secondary to devastating TBI, and the previous MOLST at an outside institution was unavailable at that time. After locating this MOLST and identifying no family or friends to serve as proxies, the patient was then transitioned to comfort care based on the previous GOC discussions that were well documented. This one case exemplifies the possible reduction or elimination of aggressive measures in older trauma patients who have previously expressed their wishes against invasive interventions and hence the importance of early ACP at admission.

Our study has a few limitations. There is likely some degree of Hawthorne effect in the drastic increase in GOC discussions in the post-intervention period. The trauma team was expected to use the new H&P template with the brief ACP component and was aware that their compliance was tracked. Nonetheless, if this new H&P template could prompt the PAs and residents to incorporate brief ACP to their admission workflow, just like eliciting medical history and allergies, the authors believe that the compliance will continue to remain high. Other limitations are its retrospective nature and a relatively small study patient population spanning only 3 months of 2021 and 2022. However, our results showing the drastic increase in early GOC discussions and the rate of addressing pre-existing DNR again support that our brief intervention led to significant changes. Another aspect of ACP endeavors we strive to improve includes filling out the electronic MOLST or the paper MOLST for all geriatric trauma patients by training our social workers and all members of the trauma team. In addition, the future goal to increase GOC discussions at our institution would encompass not only trauma patients but also geriatric emergency general surgery patients and any surgical patients admitted to ICU.

Our intervention to include a brief ACP in H&P and create these prompts through the note template change has significantly increased the rate of early GOC discussions and improved discussions regarding pre-existing DNR orders at the time of

admission in our geriatric trauma patients. This simple process could be incorporated into practice at other trauma centers to improve care for older trauma patients.

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