Characteristics of the included studies

First author, year	Population grouping	Aim(s)	Study design and methods	Study setting (country, section of acute care [e.g. ED])	Intervention / model of care/ pathway	Comparison	Participants (population and sample, including numbers)	Injury Severity Score (ISS)	Outcome measures collected
1. **FRAILTY PATHWAYS n=1 study**									
Bryant, 2019[34]	Moderate trauma patients with frailty	To determine if an interdisciplinary care pathway for frail geriatric trauma patients improved in-hospital mortality, complications, and 30-day readmissions.	Retrospective cohort study	USA, urban level 1 trauma centre	Frailty Identification and Care Pathway including (1) education, (2) frailty screening (3) early initiation of geriatric-focused care processes	Pre-implementation (April 2015 to March 2016), and one year post-(October 2016 to September 2017) implementation	n=269 trauma patients aged 65+; pre-implementation n= 125 pre-frail or frail patients, post-implementation n=190 screened as frail.	Mean (SD) ISS pre-11.46 (5.96), post 11.78 (6.18)	Delirium; major complications; in-hospital mortality; 30-day readmission
2. **GERIATRIC TRAUMA CONSULTATION ALONE IN OLDER PEOPLE n=7 studies**									
Fallon, 2006[48]	Moderate trauma patients described as 'older' or 'geriatric'	To evaluate the impact of a Geriatric Trauma Consultation Service	Retrospective cohort study, using prospectively collected medical record and trauma registry data	USA, level I trauma centre	Mandatory geriatric consult (assessment and advise on treatment and management) at ICU stage of care, provided by a geriatric trauma team (GTT) composed of geriatricians and an advance practice nurse (APN) =SEEN group, 2004 onwards	Not seen by the geriatric consult service = UNSEEN group, 2004 onwards	n=285 trauma admissions age 65 and older; n=114 (40%) seen by the GTT,	ISS median 9.8; n=171 unseen, ISS median 9.1	Physician adherence to the consultation team's recommendations; Overall length of stay (LOS) and LOS on ICU; discharge disposition; types of issues addressed by GTT recommendations; mortality and cause of death

Lenartowicz, 2012[40]	Major trauma patients described as 'older' or 'geriatric'	To describe and evaluate an inpatient geriatric trauma consultation service (GTCS)	Before and after case series comparison on clinical outcomes pre and post implementation of GTCS	Canada; Level I trauma centre	Patients referred to a Geriatric Trauma Consultation Service (GTCS) : advanced practice nurse specialist in geriatrics and a geriatrician undertaking a comprehensive geriatric assessment within 72h of admission	Pre-GTCS (March 2005-August 2007) and post-GTCS (September 2007-March 2010)	n=238 pre-GTCS and n=248 post-GTCS patients ≥ 60 years (excluding patients who died on arrival and within ED).	Mean ISS 22 pre-GTCS and 24.7 post-GTCS	Rate of geriatric consultation; recommendation adherence rate; geriatric-specific in hospital complications; trauma quality indicators; sub-speciality consultation requests; length of stay; mortality; discharges to long term care
Min, 2015[38]	Major trauma patients described as 'older' or 'geriatric'	To evaluate degree of quality improvement in geriatric care of older patients with acute trauma in hospital impacted by a geriatric consultation intervention	"Pre-post" observational study, using intention to treat, medical record review	USA, level 1 academic trauma centre	Geriatric faculty and a rotating geriatric medicine fellow, with a typical practice of daily visits until resolution of geriatric medical and disposition issues for all trauma patients aged 65 years and older requiring hospital admission. From December 2007	The medical centre's usual care, which included the option of requesting a general medical or geriatric consultation, admitted between December 2006 and November 2007	n=147 patients age 65 years or older admitted to the trauma service, with length of stay >24 hours: n=71 in the control group, (retrospectively identified) and n=76 in the intervention group, (prospectively identified), sequentially admitted patients,	Control group mean (SD) ISS 14.3 (9.28); intervention groups mean (SD) ISS 15.3 (9.98).	Quality of Care (QOC) score (aggregated from 33 Assessing the Care of Vulnerable Elders 'ACOVE-3' quality indicators categorised by subtype: geriatric condition-based care versus non-geriatric care, delirium care (vs all other care), and care to promote mobility (vs all other care)
Olufajo, 2016[52]	Major trauma patients described as	To evaluate the implementation of mandatory geriatric consults for all trauma	Prospective and retrospective observational study, using chart review	USA, level 1 trauma centre	Geriatric consult protocol (October 2013 through September 2014). delivered by a geriatrician within	Trauma patients admitted before activation of the protocol (June 2011	n=406 patients; n=215 in the pre-intervention group and n=191 in the	Mean [SD] Injury Severity Score was similar in both groups	In-hospital mortality, 30-day mortality (within 30 days of discharge), ICU readmission

	'older' or 'geriatric'	patients 70 years or older.			24 hours of admission (weekdays) or at the beginning of the next week following weekend admission for all trauma patients aged 70 years and older identified prospectively	through June 2012) who would have been eligible for geriatric consults	post-intervention group.	(14.29 [7.6] vs 13.56 [8.7]).	(within the incident hospitalisation), 30-day readmission (within 30 days of hospital discharge), and hospital length of stay.
Southerland 2017[53]	Moderate trauma patients described as 'older' or 'geriatric'	To examine the effectiveness of implementing a geriatric consultation model of care, called the GeriTrauma collaboration	Retrospective chart review, using the institutional Trauma databank and electronic medical record system	USA, level 1 trauma centre	Trauma physician and care providers' education; geriatric consultation triggers; geriatric consultation usually within 24 hours of admission, with follow-up until resolution or discharge. Implemented in July 2014. Pre-implementation period July 2013 to December 2013.	Post-implementation period July 2014 to December 2014	n=245 of 391 charts included for adults 65+ years old admitted to the trauma service with inpatient stay >24 hours); n=48 pre-implementation and n=197 post implementation.	Mean [SD] ISS 9.5 [8.1]; geri trauma 8.7 [1.7], trauma 10.1 [9.7], p 0.83.	Consultation rates; ICU length of stay; initial documentation; proportion of accomplished TQIP Geriatric Trauma quality indicators; discharge quality indicators – length of stay, inpatient survival, discharge to higher care need environment; 90-day hospital readmissions
Wong, 2017[42]	Major trauma patients described as 'older' or 'geriatric'	To describe the sustainability and process improvements of an inpatient geriatric trauma consultation service	Prospective cohort using medical record and trauma registry review of implementation and	Canada; level 1 trauma centre	Sustainability interventions based on workflow assessment, staff interviews and survey to identify gaps in the geriatric trauma consultation	Implementation (pre-sustainability interventions) phase; Sept 2007 - Mar 2010	Patients aged 65 years and older admitted to the trauma service (not dead on arrival or died in the ED): Implementation phase n=246 patients;	Implementation phase mean (SD) ISS 24.7 (14.1) and Sustainability phase mean (SD) ISS 24.1 (11.5);	Percentage of patients who received a comprehensive geriatric assessment; Reasons for no assessment by the geriatric trauma consultation

			sustainability phases		service (advanced practice nurse in geriatrics, geriatrician, resident physician within 72 hours of admission): July to Dec 2013		Sustainability phase n=138 (n=77 with prospective data collection)		service; Geriatric-specific in hospital complications and trauma quality indicators; Discharge destination; Frequency of geriatric issues addressed by the geriatric trauma consultation service, mean number of issues per participant and number of recommendations made; Trauma team adherence rate to recommendations
Cortez, 2018[41]	Moderate trauma patients described as 'older' or 'geriatric'	To assess the impact of implementation of a geriatric trauma protocol (GTP) based on American College of Surgeons recommendations to improve patient outcomes	Quasi-experimental non-equivalent group design, using patient chart review	USA, level II trauma centre	Implementation involved 1) training for surgical residents on a Geriatric Trauma Protocol (GTP). 2) GTP including ISAR screening to geriatric consultation; medication review, toxicology screen, assessment for hypoperfusion, review of comorbidities, geriatrician referral if appropriate, involvement of family members, consideration of	Three months pre-intervention, during 2016	n=117; all patients 65+ years old who were admitted to the hospital as a trauma case; n=77	Pre-intervention mean [SD] ISS 7.16 [6.1], and n=40 post-intervention mean ISS 10.75 [7.4]).	Length of stay, discharge destination, mortality, medical complications, processes of care

					palliative care, consideration of delirium, early mobilisation. Eight weeks post-intervention during 2016				
3. **GERIATRIC-SPECIFIC CARE (including geriatric consultation in some cases) n=4 studies**									
Bradburn, 2012[49]	Moderate trauma patients described as 'older' or 'geriatric'	To evaluate the effectiveness of a high risk geriatric protocol	Cross-sectional retrospective analysis	USA, Level II trauma centre	Geriatric Protocol (GP): multidisciplinary process for patients who are ≥ 65 with a specific high-risk injury, one or more medical history indicator, and one or more assessment indicator are placed on the geriatric protocol, including pre-specified immediate investigations and treatment, ICU admission and geriatric consult. Implemented 2007. Partial (geriatric consult or patient on the guideline) and Both (geriatric consult and patient on the guideline) 2007-2010.	Patients not receiving geriatric consult nor the guideline. 2000-2007	n=4,534 patients aged ≥65. n= 3,902 were included in analysis due to missing covariates. n=2,887 patients did not receive the geriatric protocol; n= 1,015 patients received geriatric protocol (n=609 partial elements, n=406 both elements).	ISS Low (1-9) 52.7%, moderate (10-16) 23.1%, severe (17-25) 15.5%, most severe (>25) 8.7	In-hospital mortality
Frederikson, 2013[50]	Moderate trauma patients described as	To assess the impact of the implementation of four patient care protocols in the critical care	Retrospective pre-test/post-test study, and a post-protocol implementation, with regression	USA, level 1 trauma centre and trauma ICU	Four patient care protocols: • Ventilator-associated	Pre-protocol period January 1, 2004 to December 31, 2006	All elderly patients (aged >65 years) with trauma, excluding patients who died within 48 hours of	Pre-protocol mean [SD] ISS 9.93 [7.65] and post-protocol phase	ICU length of stay; Hospital length of stay; ED discharge location

	'older' or 'geriatric'	environment within an elderly trauma population	discontinuity design		pneumonia prevention • Rib fracture • Massive blood transfusion • Anticoagulation Post-implementation January 1, 2007 to December 31, 2009		admission for regression analyses. n=902 pre-protocol and n=1156 post-phase	mean ISS 10.25 [7.24]	
Saillant, 2017[55]	Moderate trauma patients described as 'older' or 'geriatric'	To determine which evidence-based geriatric protocols were correlated with decreased mortality	Cross-sectional observational study, using a survey and data from a state-wide trauma database	USA, level I and II trauma centres in one state	Survey administered by trained interviewers using a standardised script: description of geriatrics-specific trauma care at each centre, survey date unspecified. Trauma database data 2011 to 2013.	n/a	n=26 out of 27 eligible trauma centres participated (n=13 level I, n=13 level II; n=24 teaching hospitals). Risk-adjusted mortality data available for n=101,477 patients aged 65 and over	n/a trauma centre respondents	Definition of an older adult; adoption of TQIP guidelines; risk-adjusted mortality
Bradburn, 2018[54]	Moderate trauma patients described as 'older' or 'geriatric'	To analyse trends in geriatric outcomes with consideration of the impact of a high-risk geriatric protocol (HRGP), and the anticoagulation and trauma alert (ACT).	Longitudinal cohort study, using retrospective data from a prospectively maintained trauma registry	USA, level II trauma centre	Two practice management guidelines (PMGs) were implemented for the elderly trauma population: 1) a high-risk geriatric protocol (HRGP) (Bradburn, 2012), implemented February 2006 – Phase 2; and 2) anticoagulation and trauma (ACT) alert, implemented March 2012 – Phase 3.	Baseline control period January 2000 to January 2006 – Phase 1	n=8,471 geriatric patients (age ≥ 65) admitted with a blunt injury, not burns or DNR. Phase 1 n=1,879 patients ; Phase 2 n=3,393 Phase 3: n=3,199	Phase 1: ISS mean 12.0 [SD 9.15], Phase 2: ISS mean 11.1[SD 8.29], Phase 3: ISS mean 9.4 [SD 7.32]	Mortality; complications

4. PALLIATIVE CARE CONSULTATION n=2 studies									
Kupensky, 2015[43]	Major trauma patients described as 'older' or 'geriatric'	To evaluate the impact of Palliative Medicine Consultation (PMC) on geriatric trauma patients' outcomes	Retrospective, descriptive study, using data from a medical records and the Trauma Registry	USA, Level I trauma centre	Patients who received a PMC after implementation of an institutional practice management guideline requiring PMC on or before post-trauma day two in surgical ICU was implemented; study period July 2013 to November 2014.	Patients who did not receive a PMC after implementation of an institutional practice management guideline requiring PMC on or before post-trauma day two in surgical ICU was implemented; study period July 2013 to November 2014.	n=202 patients aged 65 years or older, admitted to trauma services in the surgical ICU, and alive 24 hours post hospital admission.	Average ISS 17.86 (range: 0-57).	Palliative care consultation; evidence of symptom management; advance care goals length of stay in surgical ICU and total in hospital; discharge disposition
Lilley, 2016[37]	Major trauma patients described as 'older' or 'geriatric'	To study processes associated with complex end-of-life decision making in geriatric patients (≥65 years) admitted with severe traumatic brain injury	Retrospective review of cases	USA, Level I Trauma Centre	Institutional practice management guideline requiring palliative medicine consultation on or before post-trauma day 2 In 'Responders' (GCS > 8 at 72 hours) between January 1, 2011 and December 31, 2014	Institutional practice management guideline requiring palliative medicine consultation on or before post-trauma day 2 'Non-responders' (GCS ≤ 8 at 72 hours) between January 1, 2011 and December 31, 2014	n=90 patients, aged 65 years and older, who were admitted at the centre with TBI and severe neurologic impairment (defined as initial GCS < 8)	Median (IQR) ISS 25 (16-26).	End of life decision making

5. INTERVENTIONS RELATED TO THE TRIAGE OF OLDER PATIENTS WITH TRAUMA n=8 studies									
5a. TRAUMA CENTRES VERSUS OTHER PROVIDERS, OR LEVELS/TYPES OF TRAUMA CENTRES n=3 studies									
Meldon, 2002[47]	Moderate trauma patients described as 'older' or 'geriatric'	To and examine the association between trauma centre verification and hospital mortality in very elderly trauma patients (>80 years)	Retrospective cohort study, using countywide trauma registry data	USA, all Level I and II trauma centres, and acute care hospitals in one county	Trauma centre care	Non-trauma centre care	n=451 patients (level I TC n=38, level II TC n=191, AC n=);>80 years with traumatic injury (not #NOF)	ISS median (IQR): Level I TC 13 (4-25); Level II TC 5 (4-9); AC 4 (4-9)	Hospital mortality
Staudenmayer, 2013[39]	Major trauma patients described as 'older' or 'geriatric'	To determine the current state of triage practice and the associated outcomes for severely injured elderly patients triaged to a level I or II trauma centre with those admitted to a non-trauma centre	Retrospective cohort study using a population-based database	USA; emergency services translational research network in two states	Admission to a level I or II trauma centre following an injury call placed to 911	Admission to a non-trauma centre	n=6,015 patients aged 55 years or older, had presented through the emergency medical systems and been transported to acute care hospitals. n=244 patients with	Injury Severity Score >15. Non-trauma centres ISS less often >15 (2.2% vs 6.7%, p<0.01).	60-day mortality; length of stay; in-hospital costs
Scheetz, 2018[46]	Major trauma patients described as 'older' or 'geriatric'	To conduct a comparative analysis of complications and mortality among severely brain-injured older adults treated at trauma centres and non-trauma centres	Secondary analysis of 2014 data from the Healthcare Cost and utilization Project New York State Inpatient Discharge data	USA: single state	Admission to trauma centre	Admission to a non-trauma centre	n= 7138 patient records of patients age 55 years and older with a primary diagnosis of brain injury and initial admission to an acute care hospital; n=1,737.	Injury Severity Score of >15 (n=143 trauma centre and n=1,594 non-trauma centre). Patients median (IQR) new injury severity score to non-trauma centre = 25 (18-27), to trauma centre = 22 (18-27), p<0.001	Sixteen specified complications; mortality (in-hospital death)
5b. TRAUMA CENTRES MANAGING A HIGHER PROPORTION OF OLDER TRAUMA PATIENTS n=1 study									

Zafar 2015[51]	Moderate trauma patients described as 'older' or 'geriatric'	To determine if older trauma patients have better outcomes at centres that manage a higher proportion of older trauma patients	Retrospective cohort observational study, using the National Trauma Data Bank	USA, level I and II trauma centres with at least 500 trauma visits per year	Trauma centres with greater than 50% of older trauma patients, admission years 2007 to 2011	All centres categorised into six groups based on proportions of older trauma patients: less than 10%, 10% to 20%, 20% to 30%, 30% to 40%, 40% to 50%, admission years 2007 to 2011	n=444,038 patients with age >65 years, from 295 Level 1 and Level 2 trauma centres.	ISS: 0-8, 33.2% 9-15, 41.2% 16-24, 13.9% 25-75, 7.9% *(study team-estimated mean ISS 13.8, based on mid-point assumption in grouped ISS data)*	Mortality, risk-adjusted mortality ratio (RAMR)
5c. TRAUMA TEAM ACTIVATION WITHIN THE RECEIVING HOSPITAL n=4 studies									
Demetriades, 2002 [35]	Major trauma patients described as 'older' or 'geriatric'	To assess the effect of a modified trauma team activation (TTA) policy on mortality and hospital charges	Retrospective study, using trauma-registry data over an 8.5 years period to compare outcomes pre- and post-introduction of the new TTA criteria	USA (Southern California), level 1 academic trauma centre	Trauma team activation (TTA) to include age 70+ as a criterion, and a protocol on early intensive monitoring and resuscitation and early surgical intensive care unit admission, initiated from March 2000 to August 2001	Time period prior to new TTA policy, January 1993 to February 2000	n=335 patients age 70+ years	ISS>15, admitted at the site between January 1993 and August 2001. Pre-intervention n=260 patients, mean ISS 25 [SD 10]); post-intervention group n=76 patients mean ISS 24 [SD 7].	Survival/mortality, functional status on discharge, hospital charges
Rogers, 2012[36]	Moderate trauma patients described as	To investigate outcomes of under-triage of	Retrospective analysis of trauma registry data	USA, trauma department of one acute hospital	Three levels of trauma team response: two Trauma Team Activations	Did not undergo a trauma team activation (defined as	n=3,902 patients aged 65 and over with full data on ISS, Glasgow-Coma score	ISS >15	Mortality according to under-triage, adjusted mortality, complications,

	'older' or 'geriatric'	older trauma patients			(Code T and Trauma Alert), both with a 10-minute response and trauma team consultation, with a 45 minute response. 2000 to 2010	under-triage if ISS >15)	(GCS), occurrence of complications, Revised Trauma Score (RTS), level of Trauma Team Activation (TTA), and/or discharge status.		coumadin use, mechanism of injury
Sahr, 2013[44]	Moderate trauma patients described as 'older' or 'geriatric'	To assess the efficacy of the implementation of a rib fracture protocol among elderly trauma patients	Retrospective cohort study, method not described	USA; level 1 trauma 2000 to 2016 centre	Emergency Department Rib Fracture Protocol Post protocol (2009-2010)	Treatment according to emergency physician discretion Pre-protocol implementation (2007 to 2008):	n=148 trauma patients 65 years of age and older admitted with at least one rib fracture (n= 81 pre-protocol and n=67 post-protocol); n=30 <3 fractured ribs	Mean [SD] ISS 11.50 [7.20] and n=51 three or more fractured ribs mean [SD] ISS 18.63 [12.44]	Hospital length of stay; ICU length of stay
St John, 2016[45]	Major trauma patients described as 'older' or 'geriatric'	To investigate the role of trauma team activation in outcomes of elderly trauma patients	Cohort and case-control study collecting data from a registry maintained on all admitted trauma patients in a single centre.	USA, level 1 trauma centre with a 4-state catchment area	Trauma team activation against injury, mechanism, physiologic variables or required treatment guidelines for a full or modified activation for patients aged 65 years and older January 1, 2011 and December 31, 2012.	Trauma team activation in those aged less than 65 years between January 1, 2011 and December 31, 2012.	n=10,033 patients >= 18 years of age (n=2,099 aged 65 and over) with complete data on critical variables of trauma team activation and hospital admissions admitted	Mean (SD) ISS: Received TTA 22.2 (14.6); no TTA Mean ISS (SD) 12.6 (10.3)	Effectiveness of trauma team activation by age: adverse outcomes, factors associated with poor outcomes