

Clinical Practice Guideline 21:

Major Trauma in the Older Patient

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KEY MESSAGES

- **Current demographic trends show rising major trauma in the elderly.**
- **Major trauma occurs in the elderly with low energy mechanisms.**
- **Co-morbidities and medication use often confound clinical assessment.**
- **Anticoagulant use merits specific focus in clinical assessment.**
- **Those who survive have comparable levels of disability to younger trauma victims.**
- **Holistic assessment is vital, with patient-focused goals for rehabilitation.**
- **Fundamentals of basic care are of primary importance.**
- **Major trauma may be a presenting feature of “Elder Abuse”.**

NIMTN Clinical Practice Guidelines are intended to inform standardised, best-practice care for injured patients across Northern Ireland. Although they are based on up to date evidence at the time of writing, readers should note that it remains the responsibility of individual clinicians to make final decisions regarding the most appropriate treatment for specific patients in their care.

Prehospital practitioners employed by Northern Ireland Ambulance Service (including those involved in specialist teams such as HEMS and HART) may find these guidelines informative but should continue to follow guidance contained within JRCALC, NIAS and HEMS guidelines and SOPs.

Background

It has been recognised for several years that the face of major trauma in these islands has been changing. Several factors have resulted in a falling incidence of “high energy” trauma, and a relative increase in the incidence of “low energy” trauma in an ageing population.

A recent review of the English TARN database (approx. 307,000 patients; all ISS >8); from 2012-2017 found that 47.8% of all cases were at least 65 years old. Alternately put, the median age of all patients was 63.6 years old. The commonest mechanism of injury was a fall of < 2 meters (57.8% of all cases); and only 29.3% of the 65+ age group presented primarily at the Major Trauma Centres. The remaining 70.7% presented at Trauma Units, or Local Emergency Hospitals.

The recognition of the presence of true major trauma can be challenging in older patients, Under-triage is a real risk. The assessment and management of older trauma patients also requires meticulous clinical care as mortality rates are higher than in younger people. However, those who survive do not have a large incidence of disability compared to younger people. There are several useful aids and frameworks to assist clinicians in providing care, referenced below.

Related Guidelines

[CPG 4: The Primary Survey](#)

[CPG 17: The Secondary Survey](#)

[CPG 24: Rehabilitation](#)

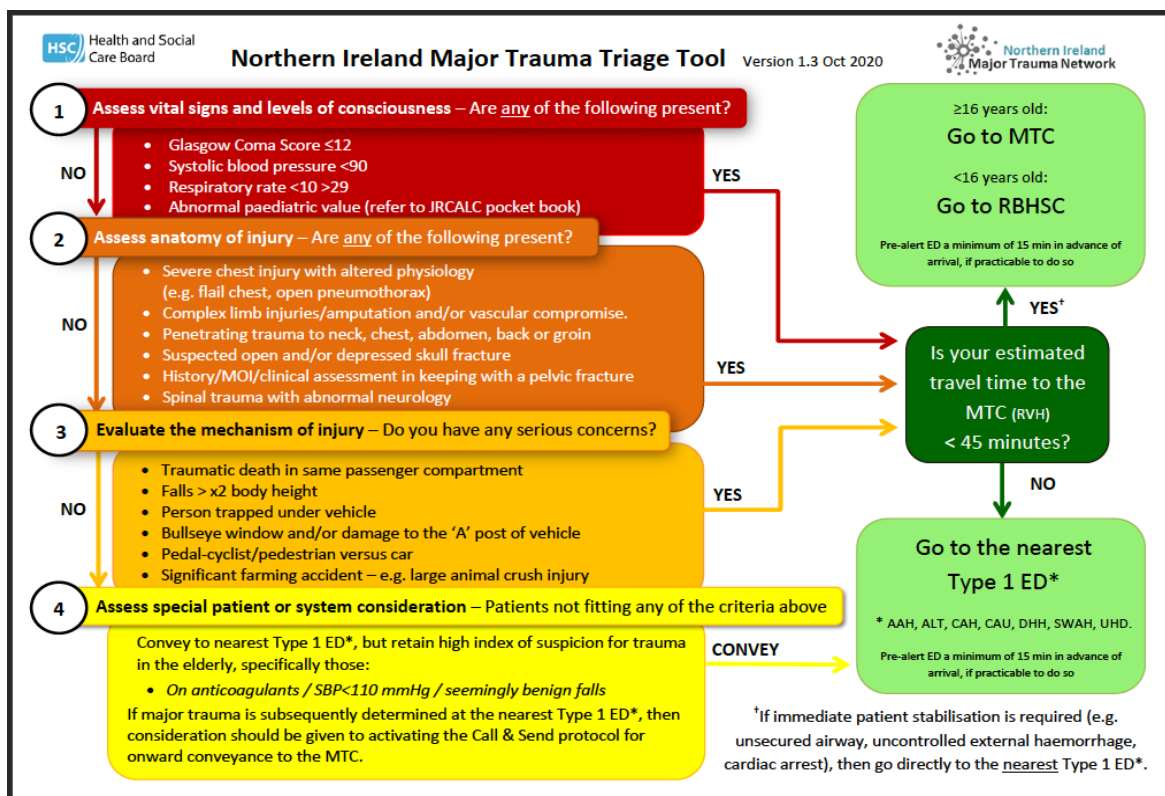
Overarching principles/ factors to consider

- Increased susceptibility to severe injury with a lesser mechanism of injury.
- Diminishing physiological reserves with increasing age.
- The effect of co-morbidities and medications especially anticoagulants.
- Recognition and avoidance of delirium.
- Individualised care – biological age is NOT the same as chronological age. Frailty markers e.g. Rockwood Clinical Frailty Scale.
- Patient’s wishes, including next of kin/carer involvement in “best interests” discussions if capacity is impaired. Consider any prior Advanced Care Plan/Treatment escalation/DNACPR considerations.

- Consider the potential for the range of forms of “Elder abuse”.

Triage

The NI Major Trauma Triage tool should be used, with particular attention paid to point 4. If there are markers of major trauma as outlined, then consideration should be given to conveyance to the MTC.







In all secondary care settings, including the Type 1 Emergency Departments, the NI “Silver Trauma Safety Net” guidance should be followed (see below) and the local major trauma team should be involved in a timely fashion. There may be a role for an urgent “call & send” protocol transfer to the MTC.



Injury >65 years old

Silver Trauma Safety Net

 <p>MECHANISM</p> <ul style="list-style-type: none"> • Fall downstairs (any number) • Pedestrian or cyclist vs. car • RTC (other than simple shunt <30mph) 	 <p>PHYSIOLOGY</p> <ul style="list-style-type: none"> • SBP <110 • HR >90 • GCS <15 • Anticoagulants 	 <p>ANATOMY</p> <ul style="list-style-type: none"> • Injury to 2 or more body regions • Suspected head or spine injury • Shaft of femur or open fracture 	<p>THIS IS SIGNIFICANT TRAUMA</p>  <p>Ensure patient is seen quickly</p> <p>Early analgesia</p> <p>Early review by senior clinician</p> <p>Low threshold for CT imaging</p>
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Resuscitation

Standard considerations apply, with specific additional modifications:

- Primary Survey

Meticulous attention is required to all aspects of the ABCDE assessment; in particular;

Standard Airway and C-spine positioning in the neutral alignment may be neither appropriate nor possible due to pre-existing degenerative deformity.

Respiratory reserves may be reduced and compromised further by lying flat.

Cardiovascular indices should be carefully considered in light of the patient's medications, likely baseline, and co-morbidities. E.g. a blood pressure of 100 systolic should be considered as being very abnormal; likewise the expected tachycardia in the bleeding patient may not occur. Aggressive resuscitation with volume expansion may be complicated by circulatory overload.

Disability assessment may be complicated by an unknown baseline or a medical co-morbidity e.g. sepsis or delirium.

Exposure is more likely to reveal hypothermia, occult injury, and wider concerns than in the younger patient. Patients may have been lying alone, unable to summon help for a prolonged period, with resulting complications e.g. rhabdomyolysis.

Environmental controls are of increased importance, as the older patient may be less able to generate heat, and will be susceptible to delirium in unfamiliar environments.

Across all aspects of the (C)ABCDE of resuscitation, contraction in physical reserves leaves less "spare capacity" or "elasticity" in response to the demands of injury in the elderly. As a consequence, resuscitation needs to be carefully targeted, avoiding the perils of both under- and over-resuscitation.

In taking the "AMPLE" history, knowledge of medications such as anticoagulants is of prime importance to facilitate rapid, thorough assessment and treatment of injury, particularly in head injury. Electronic Care Record review should be considered essential.

Communication may be complicated by poor hearing and vision, fear, pain and confusion.

- Secondary Survey

Whole body CT scanning should be the default position where the mechanism or clinical assessment is compatible with significant injury - significant injuries may remain clinically occult in the early stages. If selective CT scanning of the head is being done, then CT cervical spine should be performed at the same time. Thorough clinical assessment should be meticulous as per routine trauma care

- The Silver Survey

The relatively new concept of an additional "Silver Survey" supplements the primary and secondary survey, adds specific value and enables identification of risk factors for delirium. Enclosed is the relevant summary table from the HECTOR course. This tool can be easily implemented, and the full package of tailored elderly-focused trauma care described in

HECTOR has been shown to reduce morbidity and length of stay in elderly major trauma patients.

The Silver Survey						
A	<ul style="list-style-type: none"> Missing or Broken Teeth / Dentures Swallowing difficulties that could limit nutrition Is SALT assessment needed before oral hydration / feeding 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
B	<ul style="list-style-type: none"> Underlying respiratory disease (e.g. COPD; Asthma; UIP; TB) <i>Baseline ABG and correct hypoxia</i> <i>If risk of CO2 retention, aim sats 88-92% or >94% if normal CO2/HCO3-</i> <i>Review CXR for presence of consolidation, pulmonary oedema and treat</i> >2 rib fractures or undrained pneumo/haemothoraces <i>Ensure patient has adequate pain-relief prescribed</i> 	<input type="checkbox"/> <input type="checkbox"/>				
C	<ul style="list-style-type: none"> Review blood results and clotting profile Prescribe TED stockings Prescribe 40mg enoxaparin (or 20mg if renal impairment), unless any of the following are present: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Patient Related</th> <th style="text-align: center;">Admission Related</th> </tr> </thead> <tbody> <tr> <td style="font-size: small;">Active bleeding; acquired bleeding disorder; use of anticoagulants with INR>2; acute stroke; platelets <75; uncontrolled systolic BP >230mmHg; untreated inherited bleeding disorder</td> <td style="font-size: small;">Intracranial haemorrhage or spinal surgery planned; procedure planned with high risk of bleeding</td> </tr> </tbody> </table>	Patient Related	Admission Related	Active bleeding; acquired bleeding disorder; use of anticoagulants with INR>2; acute stroke; platelets <75; uncontrolled systolic BP >230mmHg; untreated inherited bleeding disorder	Intracranial haemorrhage or spinal surgery planned; procedure planned with high risk of bleeding	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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Active bleeding; acquired bleeding disorder; use of anticoagulants with INR>2; acute stroke; platelets <75; uncontrolled systolic BP >230mmHg; untreated inherited bleeding disorder	Intracranial haemorrhage or spinal surgery planned; procedure planned with high risk of bleeding					
D	<ul style="list-style-type: none"> Patient has visual aids <i>Document if broken or not present</i> Patient has auditory aids <i>Document if broken or not present</i> Calculate 4-point abbreviated mental test score (1 point each) A. YEAR B. PLACE C. AGE D. BIRTHDAY Assess pain and offer analgesia if in discomfort Perform baseline RASS assessment 	<input type="checkbox"/> <input type="checkbox"/> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto; text-align: center; line-height: 20px;">/4</div> <input type="checkbox"/> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>				
E	<ul style="list-style-type: none"> Reassess temperature and aim >36⁰C Assess continence status <i>Continent; catheterised; incontinent of faeces; urinary incontinent; doubly incontinent</i> Assess skin integrity / tissue viability of pressure areas <i>Healthy; tissue-paper like; clammy; grade 1 erythema; grade 2 or above</i> 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

- Pain Management

Early, multimodal pain control is particularly important. Managing pain well will reduce the risks of many complications, especially respiratory compromise and delirium and will enable

early rehabilitation. Regional and local anaesthetic block techniques may have a valuable role, including in allowing a reduction in opioid use.

The Abbey Observational Pain Scale may be used in patients who are unable to give a reliable history themselves.

- Delirium & Agitation:

The presence of delirium increases the risk of mortality and it should be actively prevented. Several tools exist to aid recognition and identification of risk of delirium, including the “4AT” test and the “PInCH ME” tool.

PInCH ME

- P PAIN
- In INFECTION - chest, wound, urine, skin
- C CONSTIPATION & URINARY RETENTION
- H HYDRATION STATUS
- M MEDICATION REVIEW – also consider alcohol/drug withdrawal
- E ELECTROLYTES/ENDOCRINE

Agitation and sedation may also be measured using a tool such as the Richmond Agitation & Sedation Scale (RASS).

Pharmacy concerns

Drug prescription in the older patient should take into account reduced metabolism and excretion and the varying drug distribution seen across body compartments, with a relative increase in body fat composition with age. Oral drugs may also be less well absorbed. In general, “start low; go slow” is appropriate.

Polypharmacy is often seen in older patients; drug interactions and chronic use of time-critical medications need considered.

A particularly useful tool is the “STOPP/START” toolkit, although it is no replacement for timely advice from a competent clinical pharmacist.

Anticoagulation

Anticoagulation may require urgent reversal and the drug itself withheld, as the risk of excess bleeding in the major trauma patient is likely to be higher than the short term risk of normal coagulation. Local clinical advice/guidance/protocols should be followed but the table below may act as a useful summary.

Agent	Half-life*	Specific Antidote	PCC/Octaplex dose	Vitamin K	Tranexamic Acid	Dialysable?
Warfarin	~40h	PCC Vitamin K (5mg IV)	INR <4: 15iu/kg INR >4: 30iu/kg	5mg IV	Yes	No
Dabigatran	12-14h	Idarucizumab 5g IV**	If idarucizumab is not given: Yes-40iu/kg	No	Yes	Yes
Rivaroxaban	5-9h	None	Yes 40-50iu/kg	No	Yes	No
Apixaban	~12h	None	Yes 40-50iu/kg	No	Yes	No
Edoxaban	10-14h	None	Yes 40-50iu/kg	No	Yes	No

* Assuming normal renal function

**Continued clinical and laboratory monitoring is recommended, since a 5 g dose of idarucizumab may not completely neutralise an exceptionally high level of dabigatran (e.g. in case of overdose or renal insufficiency)










Clinical Frailty


This is a key concept which we should recognise early, record and incorporate in the decision-making process and in the development of realistic care plans.

Various definitions exist, including the ideas of: “decreased reserves and resistance to stressors”, “cumulative declines across multiple physiologic systems”, “vulnerability for developing increased dependency and/or death.”

The Rockwood “Clinical Frailty Score” is a good example of an easily applied tool, which has a free, online training module. *Crucially, it must be based upon the frailty estimated approximately two weeks prior to the index presentation, rather than that assumed at the time of presentation, as the acute needs are likely to bias the assessor.*

Clinical Frailty Scale*

	1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.		7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).
	2 Well – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally , e.g. seasonally.		8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.
	3 Managing Well – People whose medical problems are well controlled , but are not regularly active beyond routine walking.		
	4 Vulnerable – While not dependent on others for daily help, often symptoms limit activities . A common complaint is being “slowed up”, and/or being tired during the day.		9. Terminally Ill - Approaching the end of life. This category applies to people with a life expectancy <6 months , who are not otherwise evidently frail .
	5 Mildly Frail – These people often have more evident slowing , and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.		Scoring frailty in people with dementia The degree of frailty corresponds to the degree of dementia. Common symptoms in mild dementia include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal. In moderate dementia , recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting. In severe dementia , they cannot do personal care without help.
	6 Moderately Frail – People need help with all outside activities and with keeping house . Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.		<small>* 1. Canadian Study on Health & Aging, Revised 2008. 2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005; 173:489-495. © 2007-2009. Version 1.2. All rights reserved. Geriatric Medicine Research, Dalhousie University, Halifax, Canada. Permission granted to copy for research and educational purposes only.</small>



Multidisciplinary Team / Comprehensive Geriatric Assessment

National recommendations advise the use of “frailty pathways”, with input from Pre-hospital, Emergency Medicine, Orthopaedic, Anaesthetic and Orthogeriatric clinicians. At the time of writing, these pathways in NI are limited in scope, and require further development.

However all elderly patients suffering major trauma must have a Comprehensive Geriatric Assessment (taking in physical, social, psychological/mental, functional & environmental domains). There will be some local variation in how this is achieved.

Any traumatic injury / fracture in the older person should also prompt consideration of osteoporosis risk; those at risk should be referred appropriately for treatment and secondary prevention.

Ethical issues

It is appropriate in many patients to discuss “ceilings of care”; limiting treatment escalation, including DNACPR considerations. Any existing Advanced Care Plan should be reviewed and the outcomes of any discussions should be documented in the clinical notes. At the time of writing, it is hoped that the existing Community Advanced Care Plans which are used in primary care and recorded on the Electronic Care Record will soon be made available to secondary care clinicians.

Elder Abuse

The older population should be considered “at risk” of all forms of abuse, including from their peers. The potential for the attendance to be a first presentation of elder abuse should always be considered. If elder abuse is considered likely, then clinical teams should be informed and referral should be made to social services in writing via Gateway. This should be documented in the notes.

References

Kehoe A, Smith JE, Edwards A, et al The changing face of major trauma in the UK Emergency Medicine Journal 2015;32:911-915.

Trauma Audit & Research Network (UK). Major Trauma in Older People. 2017. TARN Research. Available at: <https://www.tarn.ac.uk/Content.aspx?c=3793> (Last accessed November 2020)

The impact of age on major orthopaedic trauma: an analysis of the United Kingdom Trauma Audit Research Network Database. J Herron, R Hutchinson, F Lecky, O Bouamra, A Edwards, M Woodford, W Eardley. Bone Joint J 2017;99-B:1677–80

The Tragically Hip. Trauma in Elderly Patients. Hruska K, Ruge T. Emerg Med Clin N Am 36 (2018) 219–235. <https://doi.org/10.1016/j.emc.2017.08.014>

Age and the distribution of major injury across a national trauma system, Dixon JR, Lecky F, Bouamra O, Dixon P, Wilson F, Edwards A, Eardley W. *Age and Ageing* 2020; 49: 218–226.

“The silver book”: 2012.

<https://www.rcem.ac.uk/docs/College%20Guidelines/5z9.%20Quality%20Care%20for%20older%20people%20with%20urgent%20and%20emergency%20care%20needs.pdf>

Comprehensive approach to the management of the patient with multiple rib fractures: a review and introduction of a bundled rib fracture management protocol. Witt CE, Bulger EM. *Trauma Surg Acute Care Open* 2017;2:1–7.

BOAST: BOA Standard “The care of the older or frail orthopaedic trauma patient” at <https://www.boa.ac.uk/resources/boast-frailty.html>

The Rockwood Clinical Frailty Scale. training available at:

<https://rise.articulate.com/share/deb4rT02lvONbq4AfcMNRUJudcd6QMts3#/lessons/IKtVuCGgcpI9zcORiWu5HV9KcBAuhkr>

NICE Head Injury guideline: <https://www.nice.org.uk/guidance/cg176>

STOPP (Screening Tool of Older Persons 'Prescriptions)/START (Screening Tool to Alert Doctors to Right Treatment) criteria for potentially inappropriate prescribing in older people: version 2.

Gallagher P, Ryan C, O'Connor M, Byrne S, O'Sullivan D, O'Mahony D. *Age and Ageing* 2015 Mar; 44(2): 213–218.

HECTOR (The Heartlands' Elderly Care Trauma & Ongoing Recovery Programme) manual available online: <https://www.embeds.co.uk/wp-content/uploads/2019/10/Hector-manual.pdf>