



Episode 7.02 Show Notes Silver Trauma

Presented by: Dr Iain Wilkinson

Faculty: Pam Trangmar, Dr Cathryn Mainwaring, Susan Hendrickson,

Rebecca Norton

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Infographic Points

- 1. The over 75's are the fastest growing major trauma group (54%)
- 2. A fall from standing height (<2m) is the most common mechanism of injury
- 3. LOS the same for older or younger trauma
- 4. Older females are at greater risk of having trauma than men
- 5. Older people, who survive major trauma, have similar outcomes to their younger counterparts

#MDTeaClub

Please leave here any <u>questions and/or links</u> resources that may stimulate discussion in addition to those below e.g. charitable sites, guidance, papers, comment pieces.



Social Media / Website

(On the recording day bring something 'medical' from social media to talk about)

<blockquote class="twitter-tweet" data-lang="en">Functional decline or lack of improvement is common in older adults with severe <a</pre>

href="https://twitter.com/hashtag/frailty?src=hash&ref_src=twsrc%5Etfw">#frailty undergoing #TAVR or #SAVR. The anticipation of health trajectories is needed to correctly design patient-tailored interventions@JAMAInternalMed#Heart #Geriatrics https://t.co/0B7EkMBryx<February 5, 2019</body>

<script async src="https://platform.twitter.com/widgets.js" charset="utf-8"></script>

Other:

Rebecca Norton: It is a review article published in the BMJ on 31 January. Authored by Terence Quinn, Simon Mooijaart (Moy-yaart), Katie Gallacher, and Jennifer Burton. It's called "Acute care assessment of older adults living with frailty." I chose this because in it there's a simple graphic to guide initial assessment of the frail older person when they present to acute care settings. To give a flavour of what is highlighted under four key domains you find, under history - medications, for physical exam - vision and hearing assessment, for psychiatric exam - a delirium screen, and for functional assessment - gait





and balance. And what I liked about this is that around these four domains the authors have highlighted the knowledge about the home environment and caregivers as essential contextual information that should shape management of these individuals.

https://www.bmj.com/content/364/bmj.l13

Cathryn:

David Oliver piece

https://www.bmj.com/content/364/bmj.l403

GSTT silver trauma course

https://www.eventbrite.co.uk/e/silver-trauma-tickets-42089078567

King's silver trauma course

http://pgmde.kch.nhs.uk/courses/simulation-courses/silver-trauma.aspx

Driving assessment: https://www.drivingmobility.org.uk/

Main Show Notes:

Learning Outcomes

Knowledge:

To be able to describe the frequency and severity of trauma in older people To understand that older people are at risk of traumatic events **Skills:**

To be able to assess the severity of injury in an older people





To understand the principles and importance of the completion of a secondary survey in older people

Attitudes:

To understand that the mechanism of injury for major trauma in older people may require less of an impact than in younger people.

To understand that older people require input from a range or specialities when they have major trauma

Definitions:

Major Trauma is defined in the scientific literature using the Injury Severity Score (ISS), which assigns a value to injuries in different parts of the body and totals them to give a figure representing the severity of injury. An ISS greater than 15 is defined as Major Trauma

Practical Definition

Major Trauma; "multiple serious injuries that could result in disability or death" - it makes no comment on the mechanism of the injury

The Silver Book, the British Geriatric Society guidelines for the emergency care of the older people, recognises the need for additional special considerations to be integrated with the ATLS approach in managing elderly trauma and endorses the view that geriatricians should receive training in the structured assessment of older people trauma, including hip fractures, head injury and polytrauma

https://www.bgs.org.uk/resources/silver-book





Important to point out here I think that trauma can mean: Neurological injury, chest injury, skeletal injury or internal organ injury. It is not just broken bones. Assessment therefore as we shall see requires a range of professionals. We will not really talk too much about neck of femur fracture care as that is only one part of trauma and I will talk too long!

Key Points from Discussion

What is major trauma?

- Historically disease of young men and high energy transfer mechanisms of injury
 - o e.g. road traffic collisions, crush injuries, stabbings/shootings etc
 - o 1990 biggest major trauma group 0-24 years old (approx 40%)
- but...now- mean age of trauma patients is increasing
 - The UK population is ageing in the past 70 years ago, life expectancy in the United Kingdom has increased dramatically. Now just over 10% of Britons die before age 65, compared to nearly 50% when the NHS was founded in 1948.
 - This increase has been greater than that predicted by population data alone, with the percentage of major trauma patients over 70 years old nearly tripling since 2005.
 - In 1990, the mean age of the Major Trauma patient was 36.1 years, but by 2013 this had increased to 53.8 years
 - the most common mechanism of injury is fall from standing height (i.e. low transfer mechanism of injury)





Trauma Audit and Research Network (TARN)

- In the late 1980s data showed that there was unnecessary mortality due to inadequacies in organisation and delivery of care led to the development of TARN
 - o national organisation, collects data on trauma in the UK
 - inputs- type of injury, physiological parameters, predicted survival, compared with actual outcomes
 - o now the largest trauma database in Europe
- really good source of lots of useful information/ research on trauma in the UK

Trauma Audit and Research Network. MAJOR TRAUMA IN OLDER PEOPLE 2017.

https://www.tarn.ac.uk/content/downloads/3793/Major Trauma in Older People 2017.pdf (accessed January 8, 2019).

Trauma Systems

- Trauma services are geographically organised into trauma networks
- In each region you will have;
 - A Major Trauma unit (e.g Kings, St George's, Brighton) with centralisation of expertise and specialties (such as neurosurgery, trauma surgery, cardiothoracics ect)
 - Peripheral trauma units (e.g Frimley park, East Surrey Hospital) that provide care for most injured patients
 - Trauma units will tend to see the less severely injured patients, whereas major trauma units will see those with more severe and multiple injuries
 - Very similar process being set up in Scotland 4 major centres

https://www.stag.scot.nhs.uk/Publications/dashboard.html

 Patient are seen initially in the prehospital setting (i.e. ambulance/ air ambulance)





- Prehospital practitioners use triage tools, transfer time and clinical judgement in order to decide whether the patient is transferred to a trauma unit or major trauma unit
- The major benefits of prehospital care are realized during the second phase of trauma (after the initial impact), when the timely provision of care can limit or halt the cascade of events that otherwise quickly leads to death or lifelong disability. Without prehospital care, many people who might otherwise survive their injuries may die at the scene or en route to the hospital. Most deaths in the first hours after injury are the result of airway compromise, respiratory failure or uncontrolled haemorrhage. All three of these conditions can be readily treated using basic first aid measures.

Prehospital Trauma Care Systems WHO Document

- Triage tools take in to account factors such as vital signs, anatomy of injury and mechanism of injury to guide decision making.
 - Most tools also include special considerations for special patient groups such as pregnant women, the morbidly obese and older patients
 - The idea is to get the right patient to the right place at the right time for the right treatment
- Current prehospital triage systems are not good at identifying older major trauma patients: just 17% of major patients older than 60 were triaged directly to MTCs by pre-hospital services, compared to 40% of those under 60 years old.
- This could be because much of the teaching on trauma triage emphasises the
 importance of mechanism of injury, aiming to identify high energy transfer mechanisms.
 However, this does not apply to older people, who can sustain serious injuries from
 relatively low energy transfer mechanisms.





- This lack of early identification means that initial treatment is more likely to be in a lower level Trauma Unit or District General Hospital, and to be undertaken by a more junior doctor.
- It also means older patients are less likely to be transferred to specialist care, and have longer times to both investigation and intervention for instance, TARN has shown the elderly wait longer for a CT head following head injury, and have longer times to surgery across all body areas and categories.

Survival

- As expected, age has a profound impact on survival from Major Trauma: 12-month mortality in the over 75s is 40%, compared to 10% in the over 60s.
- Although older patients are more likely to die, those who survive do not have a larger incidence of disability compared to younger people.

Koizia L, Kings R, Koizia A, Peck G, Wilson M, Hettiaratchy S, et al. Major trauma in the elderly: Frailty decline and patient experience after injury. Trauma (London, England) 2019;21:21–6

Why is this though?

Thinking through the ABCDE of ATLS [NERD ALERT] - to talk through fairly swiftly - Must mention it comes from the excellent GeriFM course

A (AIRWAY)

- Difficult mouth opening (TMJ arthritis, general systemic stiffening),
- Cervical arthritis causes decreased mobility,
- Variable dentition and presence of dentures,
- Big tongue,
- Fragile easily damaged mucus membrane





B (BREATHING)

- Decreased respiratory reserve (because of both normal aging and the effect of disease):
- Decreased chest wall musculature
- Fragile bones mean easily broken ribs
- Decreased chest wall compliance causing more devastating pulmonary contusion

C (CIRCULATION)

- Age-related changes affecting cardiac output:
 - Significant decrease in maximum heart rate (= 220 age),
 - Decreased response to adrenergic catecholamines because of reduced responsiveness of membrane receptors
 - "Stiff pump" causes diastolic dysfunction and therefore cardiac output much more dependent on atrial filing
 - Non-age-related changes affecting cardiac output:
 - Maximum rate further decreased by medications:
 - Diuretic therapy can produce a chronically contracted vascular volume
- A common pitfall in assessment of Circulation is to interpret "normal" vital signs as representing normovolemia.

D (DISABILITY)

- Cerebral atrophy and increased CSF brain is somewhat protected from contusion
- Resultant stretching of parasagittal bridging veins easily injured with minor impact and accel/decel injury
- Loss of intervertebral disks makes the vertebral column stiffer shifting force to the facets, ligaments and muscles and more fragile bone.
- Osteoporosis





- Osteoarthritis and resultant spinal stenosis, segmental immobility and kyphosis
 E (EXPOSURE / ENVIRONMENT)
 - Age-related changes affecting injuries:
 - Skin and connective tissue lose cells, strength and function skin is thinner, less vascular and less able to thermoregulate
 - o More prone to:
 - hypothermia
 - skin and soft tissue infection
 - rapid development of pressure ulcers

From: https://geri-em.com/trauma-falls/

Effects of comorbidities

- Comorbidity does have an adverse effect on outcome, but it is likely that other factors associated with age have a greater effect, in particular frailty.
- A single-centre study from 2015 looked at mortality based on location of injury (indoors vs outdoors) and found mortality significantly higher in indoor fallers.

Hendrickson SA, Osei-Kuffour D, Aylwin C, Fertleman M, Hettiaratchy S. "Silver" trauma: Predicting mortality in elderly major trauma based on place of injury. Scand J Trauma Resusc Emerg Med 2015

- Other studies have shown significantly different characteristics between indoor and outdoor fallers with indoor fallers being frailer and more comorbid
 - for instance the large MOBILIZE Boston Cohort study
 - Here there were more wounds in outdoor falls but both groups had mobility and joint problems - hinting to the mechanism of the fall perhaps.
 (lain to mention here about 'mechanical' falls)





Chippendale T, Gentile PA, James MK, Melnic G. Indoor and outdoor falls among older adult trauma patients: A comparison of patient characteristics, associated factors and outcomes. Geriatr Gerontol Int 2017;17:905–12

• Both these studies have failed to show that increasing Injury Severity Score (ISS) significantly impacts on outcome - but our systems to look after older people with trauma as we shall see are often based around this score.

Outcomes

- Good outcomes are possible following Major Trauma in the elderly, and it appears possible to improve outcomes with coordinated and systematic approach, as has happened in neck of femur fractures (mortality has halved thanks to the NHFD)
- Surgeons in all specialties and anaesthetists are less reticent to operate on elderly
 patients than previously as outcomes continue to improve.
 - For instance, severe open lower limb trauma is a complex injury in patients of all ages, and limb salvage may require free tissue transfer.
 - Older people are more prone to this type of injury
 - a recent single-centre study of management of severe open lower limb trauma in the elderly demonstrates positive outcomes: the group report only 7% mortality at 6 months, with the cause of death unrelated to injury in all of these patients.
 - The study also reported positive patient reported outcome measure results, and clinical outcomes in keeping with and even better than those reported for other age groups (i.e., 1% flap failure rate and 150 days to bony union).





It is vital to point out that this elderly patient group received expedient surgical intervention, indeed they received it as quickly as patients in younger age groups, and in keeping with national guidance.

Khadim MFK, Emam A, Wright TC, Chapman TW, Khan U. A Comparison Between The Major Trauma Centre Management Of Complex Open Lower Limb Fractures In Children And The Elderly. Injury 2019.

- Systematic literature review and meta analysis of older patients with trauma (>65 but compared the >75 group to the 65-75 yrs)
 - Overall mortality rate among the geriatric population presenting with trauma is higher than among the adult trauma population. Patients older than 74 years experiencing traumatic injuries are at a higher risk for mortality than the younger geriatric group. However, the trauma-related mortality sustains the same rate after the age of 74 years without any further increase. Moreover, severe and extremely severe injuries and low systolic blood pressure at the presentation among geriatric trauma patients are significant risk factors for mortality.

Hasmi et al. Predictors of mortality in geriatric trauma patients: a systematic review and meta-analysis. J Trauma Acute Care Surg. 2014 Mar;76(3):894-901.

A more recent large scale review:

- Older people appeared to have poorer postinjury functioning and HRQoL compared with younger adults or preinjury levels
- Poor preinjury function, pre-existing conditions and increasing age were associated with poorer outcomes, whereas preinjury-independent living was associated with better outcomes.





• but.... The studies were heterogeneous, limiting synthesis. There was a lack of evidence around the impact of injury on older people in terms of paid work and unpaid work. It was unclear if existing injury outcome guidelines are appropriate for older people.

Brown et al. Functioning and health-related quality of life following injury in older people: a systematic review Inj Prev. 2017 Dec;23(6):403-411.

TARN:

- Older people do worse generally, and are often at increased risk of peri-procedural mortality, although this may relate to a more severe initial illness. However older people, who survive major trauma, have similar outcomes to their younger counterparts
- There is little seasonal variation in major trauma in older people.
- There was little variation in length of hospital stays across the adult age groups
- Comorbidity (as measured by the Charlson Comorbidity Index) has an adverse effect on outcome, but it is likely that other factors associated with age have a greater effect.
 Research is needed to determine the effect of frailty

TARN annual report - 2017

Injury Prevention

- During the past few decades, research has shown that many injuries can be prevented or their severity reduced through the implementation of simple measures.
- Innovative solutions that engage different sectors of society have resulted in cost-effective interventions that can prevent injuries at work, at home and on the street.
 - Examples include the use of motorcycle helmets and restraining systems, such as seat-belts and child restraints in cars.





detectors; and the installation of fencing around hazards such as wells or deep pools of water.

• Many of these strategies are highly cost effective.

Mini quiz...

- Motorbike helmets in UK 1973
- Seat belt law in UK Motorbike helmets 1983
- Seat bels in buses all made after 2001
- Health and safety act 1974
- Adult safeguarding part of care act 2014

Where will we be in 2031?

Systems of care and care pathways in operation or in development

Midlands Silver Trauma Group

- The Midlands Silver Trauma Group was established in November 2016 by Midlands
 Critical Care and Trauma Networks to fulfil a number of aims
 - 1. To respond to issues emerging in management of elderly trauma
 - 2. To establish workable, evidence-based standards of care
 - 3. To expand their HECTOR (Heartlands Elderly Care Trauma & Ongoing Recovery) training programme from a regional to national initiative
- Their response to the problem of under-triage of elderly trauma patients was to implement a SIlver Trauma alert a pre-alert issued to the receiving emergency





department when an elderly patient was likely to need early intervention or access to imaging, but who may not always need a trauma team response.

Criteria for activation of the Silver Trauma Alert are:

- 1. Age 65 or over
- 2. Physiological parameters
 - a. SBP <110mmHg with a significant injury
- 3. Anatomical factors
 - a. Injury to 2 or more body regions
 - b. Suspected shaft of femur fracture
 - c. Open fracture proximal to the wrists or ankles
- 4. Mechanism factors
 - a. Fall downstairs
- 5. Direct conveyance to Major Trauma Centre if RTC or Pedestrian vs car mechanism

<u>Midlands Silver Trauma Group - "silver safety net" https://www.mcctn.org.uk/silver-trauma.html</u> HECTOR - Dave Raven david.raven@heartofengland.nhs.uk

London Major Trauma System

- A pan-London elderly trauma group met in 2016 to develop guidelines for management of elderly trauma, which were published in February 2017. It made several recommendations:
 - 1. Trauma networks within the region ensure geriatricians are involved in the development and review of elderly trauma policies.





- 2. Staff should be trained to understand the effects of altered physiological reserve and comorbidities in the elderly
- 3. Education in major trauma centres and trauma units should include specifics in assessing and managing injured elderly patients.
- 4. Admission pathways for major trauma centres and trauma units should be supplemented with age-specific suggestions for the clinical management of elderly major trauma.
- Some of the age-specific suggestions integrated within the primary, secondary and tertiary surveys and so forth were:
 - 1. Trauma team activation activation for lower energy mechanisms
 - 2. Immediate reversal of anticoagulation prior to ward admission
 - 3. Check for prior advance directive/ DNAcpr documentation
 - 4. Within 72 hours comprehensive geriatric assessment carried out by a geriatrician

It also proposes age-specific guidance for neurotrauma, injuries to spine, pelvis, chest, and limbs.

<u>London Major Trauma System - Management of Elderly Trauma</u> http://www.c4ts.gmul.ac.uk/downloads/plmts-management-of-elderly-trauma-09022017.pdf

USA

The American College of Surgeons has published Geriatric Trauma Management
Guidelines as part of a rolling Trauma Quality Improvement Program. It supports the
introduction of elderly-specific management protocols alongside universal protocols
that guide trauma services.





These elderly-specific guidelines still adhere to core ATLS principles with some important adaptations:

- 1. It encourages clinicians to have a **lower threshold for activation of the trauma team** when looking after older people, recommending that triage priority ought to be escalated by one level based on fulfilment of age criteria. The aim of this is to overcome the persistent problem of under-triage of elderly trauma patients which is associated with an increased risk of mortality.
- 2. **Early involvement of a senior geriatrician** is advised as part of the admission process to the trauma unit. Specialist review with comprehensive geriatric assessment has a number of benefits including fewer episodes of delirium, fewer in-hospital falls, a lesser chance of discharge to a care home, and shorter length of stay.
- 3. The guidance acknowledges these recommendations place a significant additional burden on both trauma and care of the elderly teams which may not be practical or necessary on every occasion. In response to this it proposes a screening tool for Identification of Seniors At Risk - ISAR tool.

One point is awarded for a positive response to each question in the tool. A score of >/=2 warrants consultant geriatrician review as a score of 2 or more is associated with a greater likelihood of functional decline, nursing home admission, long term hospitalisation and death.

- 1. Before the illness or injury that brought you to the Emergency, did you need someone to help you on a regular basis?
- 2. Since the illness or injury that brought you to the Emergency, have you needed more help than usual to take care of yourself?
- 3. Since the illness or injury that brought you to the Emergency, have you needed more help than usual to take care of yourself?
- 4. Since the illness or injury that brought you to the Emergency, have you needed more help than usual to take care of yourself?





- 5. In general, do you have serious problems with your memory?
- 6. Do you take more than three different medications every day?

<u>American College of Surgeons - Geriatric Trauma Management Guidelines as part Trauma Quality</u>

<u>Improvement Program</u>

One example of a dedicated geriatric trauma service found in the literature is the G-60 service in the United States, set up by Dr Alicia J Mangram. In this service all trauma patients >60 years of age were admitted to the geriatric trauma unit and had their care overseen by a multidisciplinary team. Evaluation of the service demonstrated a reduction in time to the operating theatre, shorter length of stay in hospital and in ICU settings, as well as lower rates of complications.

Mangram et al developed geriatric trauma service G-60 J Trauma Acute Care Surg. 2012

Jan;72(1):119-22.

American College of Surgeons - Geriatric Trauma Management Guidelines as part Trauma Quality Improvement Program

https://www.facs.org/~/media/files/quality%20programs/trauma/tqip/geriatric%20guide%20tqip.ashx

Europe

The European Task Force on Geriatric Emergency Medicine is a partnership between the European Society for Emergency Medicine and the European Geriatric Medicine Society.





Their founding objectives include the implementation of a standard curriculum for Geriatric Emergency Medicine as well as to develop clinical guidelines for assessment and management of older people who have sustained traumatic injuries. Indeed they did propose a curriculum for geriatric emergency medicine in 2016. Core competencies proposed for trainees are aimed at overcoming the tendency for for traumatic injuries to be under-recognised and under-triaged when it comes to assessing elderly patients.

European Task Force on GEM -

https://eusem.org/images/European_Curriculum_of_Geriatric_EM_Apr16.pdf

European Society for Emergency Medicine - https://eusem.org/sections-and-committees/geriatric-section

European Geriatric Medicine Society - https://www.geriemeurope.eu/

MDTeaser

And not it's time for the #MDTeaser - our MDT item guessing game....

This series the game is based on that TV classic catchphrase....

lain - I am going to describe an image to you Jo... your job is to guess the catchphrase / MDT item etc.

And for you we have one - go to twitter and check out the pinned tweet to out feed to the latest clue! First correct guess gets a mug!

The Gallery

https://youtu.be/WZT4EbWGOdA

https://www.flowmagazine.com/read/illustrators/faces-of-a-century.html





If you have something you would like us to include - a poem, passage from a book etc then please let us know via Twitter etc etc.

Curriculum Mapping

This episode covers the following areas (n.b not all areas are covered in detail in this single episode):

Curriculum	Area
NHS Knowledge Skills Framework	Suitable to support staff at the following levels: • Personal and People Development: Levels 1-3 • Service Improvement: Level 1 - 2 • Communication: Levels 3-4
Higher Specialist Training in Geriatric medicine	28. Diagnosis and Management of Acute Illness 30. Rehabilitation and Multidisciplinary Team Working 41. Orthogeriatrics
Foundation curriculum	 9. Recognises, assesses and initiates management of the acutely ill patient 16. Demonstrates understanding of the principles of health promotion and illness prevention 19. Makes patient safety a priority in clinical practice
Core surgical training	Module 5 - Peri-operative care. The assessment and management of the surgical patient Module 6 - Assessment and management of patients with trauma (including the multiply injured patient)





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