Silver Trauma Review Clinic: a novel model of care to manage non-operative injuries in older patients

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ABSTRACT

Background Increasing numbers of older patients are presenting to the ED following trauma. These patients require multidisciplinary care that the traditional trauma model fails to provide. A Silver Trauma Review Clinic (STRC) was developed in conjunction with the geriatric ED and multidisciplinary services to improve the post-discharge care of patients with non-operative traumatic injuries.

We aimed to assess the STRC by reviewing the journey and outcomes of patients who attended the clinic.

Methods A retrospective review of electronic chart data was performed on all patients who attended the clinic over the initial 1-year period. Data were collected on patient demographics, medical history, medications, timelines, trauma assessments and further investigations, fracture types, occult injuries, geriatric assessments (Comprehensive Geriatric Assessment, Clinical Frailty Scale, bone health, falls, Orthostatic Hypotension (OH), cognitive screening, mobility), number of reviews and discharge destination.

Results 137 patients were reviewed with a median age of 80 years (IQR 74–86) and 69% were female. The median Clinical Frailty Scale was 3 with a median time from the patient's initial ED presentation to clinic of 15 days (IQR 9.75–21) and median time from initial review to discharge 20 days (IQR 1–35). 71% of presentations were as a result of falls under 2 m. Tertiary survey in the STRC identified previously unrecognised injuries in 24 patients (18%). In total, 56 patients were reviewed with vertebral fractures. 87% of these patients (n=49) were further investigated with a CT or MRI and 95% of patients (n=53) were referred for physiotherapy. Patients attending the STRC had a comprehensive geriatric assessment with abnormal Mini-Cog assessments found in 29%, a new diagnosis of osteoporosis in 43% and orthostatic hypotension diagnosed in 13% of patients. 61% were discharged to primary care and 19% linked into a specialist geriatric clinic.

Conclusion The STRC is a novel approach allowing timely, patient-focused, comprehensive and collaborative trauma care of older patients following non-operative injuries.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Older trauma patients may have complex presentations and can benefit from review by a geriatrician.

WHAT THIS STUDY ADDS

⇒ Comprehensive management of older trauma patients in an outpatient setting is a unique opportunity to identify in timely fashion occult injuries, review medications and falls risk screening, make new diagnoses of orthostatic hypotension, osteoporosis or dementia with appropriate interventions and follow-up while avoiding hospital admission.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Further research is required to prospectively examine outcomes. Trauma models of care should explore novel strategies for management of this patient cohort.

INTRODUCTION

Management of trauma in older adults, or 'silver trauma', can be challenging due to pre-existing comorbidities and frailty.[1 2] Relatively minor injuries can have a significant impact on functional outcome.[3–6] While many injuries will not require hospital admission, patients can experience ongoing issues with medication management, side effects, undiagnosed or missed injuries and pain.[2 5 6] Previous studies have established the positive effects of geriatrician review on long-term outcome following trauma.[7–10] The number of average-aged trauma patients in Ireland is increasing, with the most recent data from the National Office of Clinical Audit recording a mean age of 61 years for major trauma patients.[11]

We sought to improve post-discharge care for patients who attended the ED with non-operative injuries. These were patients who did not require admission and who had sustained injuries that were amenable to conservative management—either due to the injury pattern itself, or patient factors, such as comorbidity, frailty or baseline function. Prior to our intervention, these injuries were managed in the orthopaedic fracture clinic which lacks access to specialist geriatric care and does not provide services such as cognitive screening and falls risk assessment. While patients could also be referred to a specialist falls clinic or geriatric clinic, this was at the discretion of the referring emergency practitioner and occurred on an ad-hoc basis. We therefore recognised a deficit in the post-discharge care for these patients and sought to address this issue.

To this end, a Silver Trauma Review Clinic (STRC) was designed and commenced in May 2021. The purpose of the clinic is to provide comprehensive multidisciplinary management for older patients in

a timely manner following trauma. We aimed to assess this by reviewing the journey and outcomes of patients who attended the STRC and examining new diagnoses and interventions arising from the clinic.

METHODS

Setting

The STRC is based in a level 4 teaching hospital in Dublin's inner city. In 2021, the hospital was selected as the designated major trauma centre for the Central Trauma Network in Ireland. The STRC clinical team consists of a consultant in emergency medicine (with a special interest in geriatric emergency medicine), a consultant geriatrician, a physiotherapist and an advanced nurse practitioner (ANP).

Clinic eligibility

The clinic reviews patients ≥65 years of age with a Clinical Frailty Scale (CFS) >2, who are discharged from the ED following a trauma with soft tissue injury or a non-operative fracture. These include non-operative fragility fractures (for example, fractures of the distal radius, pelvis or vertebral column) soft tissue injuries and minor head injuries/concussion.

Setting

The STRC is held for a half-day each week. Patients are referred to the clinic by an ED clinician or by the hospital's Frailty Intervention Team at the time of the initial ED presentation. Other suitable patients are recruited by reviewing referrals made to the orthopaedic fracture clinic on a secure medical messaging application. The referrals to fracture clinic are monitored by consultant orthopaedic surgeons and by members of the STRC, allowing identification and diversion of suitable patients to the STRC. On average, patients are seen in the clinic approximately 2 weeks after their initial trauma.

The STRC assesses patients for occult injury, identifies medical complications following injury, performs falls risk and bone health assessments and develops a plan for rehabilitation. Medications are reviewed and optimised including reducing, stopping and screening for side effects of certain medications to ensure optimal benefit and avoid inappropriate prescribing. A cognitive assessment is carried out if indicated. A standardised electronic document is used for each patient (online supplemental appendix A). On the first visit, patients are evaluated by each member of the clinical team and a multidisciplinary management plan is created. The consultant in emergency medicine is responsible for conducting a tertiary survey and for management of the patient's injuries, but pathways have been developed to access orthopaedic input via fracture clinic and vertebroplasty via interventional radiology, if indicated.

Patients are often seen again 2–4 weeks later to ensure bone healing, review pain and function and discuss investigation results. On discharge from the clinic, the completed assessment document is sent to the patient's general practitioner. Patients may be discharged to their primary provider, physiotherapy and geriatric review clinic, or referred for further specialist review.

Data collection

A retrospective electronic chart review was performed on all patients who attended the clinic from 1 June 2021 to 1 June 2022. Data were collected from the electronic assessment document completed by each member of the multidisciplinary team (MDT) during each patient review. The data collection was performed by two clinicians who were not involved in establishing the clinic or directly involved in patient care in the clinic. The two data abstractors were trained to screen the electronic assessment document of each patient and input the data into an anonymised password-protected Excel document. Data were collected on patient demographics, medical history, medications, timelines, trauma assessments and further investigations, fracture types, geriatric assessments (Comprehensive Geriatric Assessment (CGA), CFS, bone health, falls, OH, cognitive screening, mobility), number of reviews and discharge destination. The first abstractor collected all the initial data and inputted it into the Excel sheet. The second abstractor 'checked' the data collected and filled any missing fields. The abstractors periodically met to discuss any discrepancy or uncertainty. The data were regularly monitored by the two consultants who had established the clinic.

Analysis

Simple summary statistics were used to describe the patients attending the clinic. Primary outcomes were time to follow-up and new geriatric diagnoses. Secondary outcomes were secondary injuries found and discharge destination.

Patient and public involvement

Patients and the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

RESULTS

Over a 1-year period, 161 patients were referred to the STRC. Nine (6%) patients did not attend and 15 (8%) patients are awaiting further investigations or reviews (eg, scans, bone health review).

Table 1 describes the baseline characteristic and injuries of patients attending the STRC. In total, 137 patients were fully reviewed with a median age of 80 years (IQR 74–86), and 69% were female (n=95). The median CFS was 3 with 75 patients (55%) having a CFS of 1, 2 or 3 indicating patients are, respectively, very fit, fit or managing well. Sixty patients (44%) had a CFS of 4 or more indicating a high proportion of older patients reviewed in the clinic were vulnerable or requiring help with activities of daily living. Twenty-seven (20%) patients already had a diagnosis of dementia with other comorbidities listed in online supplemental appendix B.

Median time from initial presentation to ED to review was 15 days (IQR 9.75–21) and median length of time from initial clinic visit to discharge was 20 days (IQR 1–35). The majority of patients required one or two reviews prior to discharge from the clinic (n=120, 88%).

Seventy-one per cent of patients' presentations (n=97) to the STRC were caused by a fall from less than 2 m. Fifteen per cent of patients (n=15) had atraumatic presentations (fragility fractures) with other mechanisms of injuries and injuries summarised in table 2. Primary injuries were limb fractures (n=62, 45%), vertebral fractures (n=47, 34%), thoracic injuries (n=24, 18%), pelvic fractures (n=15, 11%), head injuries (n=10, 7.2%) or soft tissue injuries (n=4, 3%). Tertiary survey in the STRC identified previously unrecognised injuries in 24 patients (18%) following review. The occult injuries identified included limb fractures (n=11, 8%), vertebral fractures (n=9, 6%), thoracic injuries (n=5, 3%) and a head injury (n=1, 1%). In total, 56 patients were reviewed with vertebral fractures. Eighty-seven per cent of these patients (n=49) were further investigated with a CT or MRI, and 95% of patients (n=53) were referred for physiotherapy (online supplemental appendix C).

Table 1 Characteristics, injuries and timelines of patients attending the STRC

	Median (IQR) or n (%)
Total number	137
Age (years)	80 (74–86)
Female	95 (69)
Dementia	27 (20)
Osteoporosis	42 (31)
Medications	
0–5 tablets	56 (41)
6–10 tablets	54 (39)
>11 tablets	24 (18)
Clinical Frailty Scale	
1	14 (10)
2	27 (20)
3	34 (25)
4	26 (19)
5	22 (16)
6	8 (6)
7	4 (3)
Unknown	2 (1)
Functional aid	
None	77 (54)
Walking stick	29 (21)
Crutches	4 (3)
Zimmer frame	13 (9)
Rollator	8 (6)
3-wheeled rollator	9 (7)
Wheelchair	0 (0)
Timelines	
Injury to presentation (days)	2 (1-7)
Presentation to clinic (days)	15 (9.75–21)
Review to discharge (days)	20 (1–35)
Mechanism of injury	
Fall <2 m	98 (72)
Fall >2 m	12 (9)
Road traffic accident	4 (3)
Assault	1 (0.7)
Atraumatic	21 (15)
Primary injuries	
Limb fracture	62 (45)
Vertebral fracture	48 (35)
Thoracic injury	24 (18)
Pelvic fracture	15 (11)
Head injury	10 (7)
Soft tissue injury	4 (3)
Tertiary survey injuries	
Limb fracture	11 (8)
Vertebral fracture	8 (6)
Thoracic injury	5 (4)
Head injury	1 (0.7)
Pelvic injury	0 (0)

STRC, Silver Trauma Review Clinic.

Seventy-two of 137 (53%) patients attending the STRC had a full CGA carried out prior to their attendance in STRC. All patients in STRC, irrespective of the prior review, underwent a CGA as detailed by the Silver Trauma Assessment document (online supplemental appendix A).

Table 2 Assessments and outcomes of patients attending STRC

	Total n (%)	n with CFS ≥3 (% of those with CFS ≥3)
Prior Comprehensive Geriatric Assessment		
Yes	72 (53)	63 (66)
No	65 (47)	33 (34)
Mini cognitive assessment		
Normal	93 (68)	55 (57)
Abnormal	40 (29)	38 (40)
Unknown	4 (3)	3 (3)
Orthostatic hypotension diagnosis		
Yes	18 (13)	15 (16)
No	119 (86)	81 (84)
Osteoporosis diagnosis		
New	59 (43)	40 (42)
No	37 (27)	22 (23)
Known	42 (30)	34 (35)
DEXA		
Yes	83 (61)	52 (54)
No	49 (36)	44 (46)
Osteoporosis medications on discharge		
Oral bisphosphonates	18 (13)	13 (14)
IV bisphosphonates	31 (23)	20 (21)
Denosumab	46 (34)	36 (38)
Change in osteoporosis medications		
Yes	70 (51)	46 (48)
No	62 (45)	45 (47)
Not fracture	24 (18)	
Number of reviews		
1	72 (53)	50 (52)
2	48 (35)	32 (33)
3	15 (11)	13 (14)
4+	2 (1)	1 (1)
Discharge destination/outcome		
Primary care	89 (65)	57 (59)
Geriatric clinic	34 (25)	31 (32)
Fracture clinic	17 (12)	10 (10)
Community team	3 (2)	3 (3)
Off-site rehab or other specialist clinics	22 (16)	15 (16)

CFS, Clinical Frailty Scale; DEXA, dual-energy X-ray absorptiometry; IV, intravenous; STRC, Silver Trauma Review Clinic.

Table 2 summarises the assessments and outcomes of patients attending the STRC and further details the assessments and outcomes for those with CFS ≥3. Abnormal Mini-Cog assessments were found in 40 patients (29%). Of these, 22 patients had a prior diagnosis of neurodegenerative disorder/cognitive impairment. Eighteen patients had a newly identified abnormal Mini-Cog—of these, three required referral for inpatient rehabilitation (under the care of a geriatrician). All others were referred to the geriatric clinic for further evaluation (under the ongoing care of the geriatrician who reviewed them in the STRC).

A diagnosis of orthostatic hypotension was made in 18 patients (13%) using the supine-to-standing method with appropriate tailored interventions and advice (medication review, fluid advice, countermanoeuvres, etc).

Eighty-three patients (61%) had a dual-energy X-ray absorptiometry (DEXA) scan in the STRC and a new diagnosis of osteoporosis was made in 59 patients (43%) with 42 patients

(31%) having known osteoporosis. All 42 of the patients with a recorded diagnosis of osteoporosis were already prescribed bone protection medication and medication was started in all patients with a new diagnosis of osteoporosis. Prescribed bone protection medication concordance was reported in 28 patients: 8 were non-concordant, and for 6 patients, concordance was not recorded. Of the 42 patients with a prior diagnosis of osteoporosis, 13 had their bone protection medication changed in the clinic.

Thirty-one patients (23%) were linked to an intravenous zoledronic acid clinic.

Overall, 84 patients (61%) were discharged to primary care, 26 patients (19%) were linked into a specialist geriatric clinic for follow-up and 15 patients (11%) required further follow-up in a fracture clinic. Four patients (3%) were linked with specialist geriatricians in the community and 22 patients (16%) were referred to off-site rehabilitation or other specialist clinics.

DISCUSSION

A Silver Trauma Review pathway and clinic for patients >65 years presenting to the ED provides a unique opportunity for follow-up, diagnosis and comprehensive assessment of older patients following a trauma. This dedicated outpatient service allows timely identification of important health, mobility and functional issues.

Forty-four per cent of patients had a CFS of 4 or more, reflecting a potential vulnerable or frail cohort of patients.[12] As previously shown, these patients highly benefit from CGA to identify, coordinate and treat their needs.[13]

Thirty per cent of patients in our review had a clinical frailty score of 1 or 2 on review in the STRC, and therefore did not meet the criteria for referral to the STRC. These may be patients who presented to the ED with a frailty syndrome, and further study and review of the referral criteria may determine which patients receive maximal benefit from this novel service. That being said, in this review, the majority of new diagnoses of osteoporosis, new identification of abnormal Mini-Cog, diagnosis of orthostatic hypotension and onward referral to a geriatrician occurred in those with CFS ≥3 (table 2).

One of the most important aspects of care offered by the STRC is combined, multidisciplinary specialist assessment by a consultant geriatrician, an emergency medicine physician, a physiotherapist and an ANP. This facilitates a comprehensive evaluation and review of the factors contributing to emergency presentations, such as medications, mobility, bone health, cognition and falls assessments. On screening when indicated, abnormal cognitive assessments were picked up in about one-third of patients and appropriate education and follow-up could be arranged. Orthostatic hypotension was diagnosed in a small number of patients. The STRC facilitates a more in-depth and holistic analysis of the patients' primary concerns such as pain, mobility, fear of falling, lifestyle and possible future planning.

Due to their complexity and reduced physiological reserves, older patients may have atypical presentations.[14 15] Thanks to the short follow-up times, the STRC provides an opportunity for tertiary trauma surveys, with occult or further injuries identified in nearly one-fifth of patients reviewed. The STRC allows quick access to imaging. With access to DEXA scans and bone heath screening, new osteoporosis was diagnosed in 43% of our patients and half of our patients had changes made to their osteoporosis treatment to improve compliance and prevent further fractures.

Similarly, outpatient combined comprehensive specialist care has been previously described in patients with hip fracture with the benefit of identifying and managing issues overlooked during the patients' acute care.[9] These issues included prevention of secondary fractures with correct osteoporosis treatment, falls risk assessments and reviewing potentially harmful medications. Furthermore, combined specialist and geriatric care through orthogeriatrics, oncogeriatrics and geriatric cardiology is emerging with positive outcomes for an increasing older population requiring mixed patient-centred skills.[16–18] These collaborative models of care have been shown to reduce mortality and length of stay, enhance functional status, address untreated comorbidities and improve risk assessments of possible treatment options with a focus on individualised tailored care of each older patient. These are all carried out through an MDT approach similar to our STRC.

Strengths of our study include data collection from a single electronic clinic template completed by each member of the interdisciplinary team on review. Our centre has been identified as the regional major trauma centre and this model of combined outpatient specialist care of older patients could be a future standard of care for the management of older patients with non-operative trauma.

Limitations include selection bias of patients. Our review included a high proportion of patients who were not frail. However, this is a unique opportunity for this cohort of non-frail patients to be given preventive lifestyle advice on 'healthy ageing' including physical activity, socialising and good nutrition.[19] The generalisability of this study is also limited as it is a single-site study and the potential benefits of STRC are yet to be proven through prospective validation. Future research will assess the impact of the STRC on functional outcomes, admission avoidance and surveys on patient and healthcare satisfaction.

CONCLUSION

The STRC is a novel model of care allowing review of older patients with non-operative trauma following presentation to the ED. The short time to follow-up allows to review progress after the injury, pick up potential further occult injuries or any medication side effects. An early comprehensive and multidisciplinary assessment addressing primary and secondary injuries, and potential further investigations and treatment to prevent further injuries are down the line. Following a CGA, there is also a unique opportunity to diagnose geriatric and frailty syndromes while linking patients to appropriate specialty and community services.

Contributors All authors take responsibility for the content of the work submitted and have helped draft and review the manuscript. All authors were involved in the conception and design of the work. HS and LM performed the data collection. HS, LM and CB performed the data analysis and interpretation. HS, DB, LM and CB drafted the article. All authors were involved in critical revision of the article and all authors gave final approval of the version to be published. CB is the guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval Ethical exemption and approval for external dissemination were provided by the Clinical Audit and Effectiveness Committee, Mater Misericordiae University Hospital (ref. CA22-087).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. The data that support the findings of this study are available from the corresponding author, HS, upon reasonable request.

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REFERENCES

1 Beck B, Cameron P, Lowthian J, *et al*. Major trauma in older persons. *BJS Open* 2018;2:310–8.
2 Bonne S, Schuerer DJE. Trauma in the older adult: epidemiology and evolving geriatric trauma principles. *Clin Geriatr Med* 2013;29:137–50.
3 Sirois M-J, Carmichael P-H, Daoust R, *et al*. Functional decline after nonhospitalized injuries in older patients: results from the Canadian emergency team initiative cohort in elders. *Ann Emerg Med* 2022;80:154–64.
4 Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist* 1969;9:179–86.
5 Richmond TS, Kauder D, Strumpf N, *et al*. Characteristics and outcomes of serious traumatic injury in older adults. *J Am Geriatr Soc* 2002;50:215–22.
6 Rickard F, Ibitoye S, Deakin H, *et al*. The clinical frailty scale predicts adverse outcome in older people admitted to a UK major trauma centre. *Age Ageing* 2021;50:891–7.
7 Braude P, Short R, Bouamra O, *et al*. A national study of 23 major trauma centres to investigate the effect of a Geriatrician assessment on clinical outcomes in older people admitted with serious injury in England (Fitr 2): a Multicentre observational cohort study. *Lancet Healthy Longev* 2022;3:e549–57.
8 Park C, Bharija A, Mesias M, *et al*. Association between implementation of a geriatric trauma clinical pathway and changes in rates of delirium in older adults with traumatic injury. *JAMA Surg* 2022;157:676–83.
9 Ratnayake H, Crabtree A, Hunter P, *et al*. Evaluation of a dedicated outpatient hip fracture clinic. *Australas J Ageing* 2022;41:325–9.
10 Langridge CR, McQuillian C, Watson WS, *et al*. Refracture following fracture liaison service assessment illustrates the requirement for integrated falls and fracture services. *Calcif Tissue Int* 2007;81:85–91.
11 National Office of Clinical Audit. Major trauma audit national report 2019 and 2020; 2022.
12 Rockwood K, Song X, MacKnight C, *et al*. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005;173:489–95.
13 HSE National Clinical Programme Older People. Specialist geriatric team guidance on comprehensive geriatric assessment; 2015.
14 Limpawattana P, Phungoen P, Mitsungnern T, *et al*. Atypical presentations of older adults at the emergency department and associated factors. *Arch Gerontol Geriatr* 2016;62:97–102.
15 Clegg A, Young J, Iliffe S, *et al*. Frailty in elderly people [published correction appears in lancet. 2013 Oct 19;382(9901):1328]. *Lancet* 2013;381:752–62.
16 Grigoryan KV, Javedan H, Rudolph JL. Orthogeriatric care models and outcomes in hip fracture patients: a systematic review and meta-analysis. *J Orthop Trauma* 2014;28:e49–55.
17 Presley CJ, Krok-Schoen JL, Wall SA, *et al*. Implementing a multidisciplinary approach for older adults with cancer: geriatric oncology in practice. *BMC Geriatr* 2020;20:231.
18 Bell SP, Orr NM, Dodson JA, *et al*. What to expect from the evolving field of geriatric cardiology. *J Am Coll Cardiol* 2015;66:1286–99.
19 Livingston G, Huntley J, Sommerlad A, *et al*. Dementia prevention, intervention, and care: 2020 report of the lancet commission. *Lancet* 2020;396:413–46.

Silver Trauma Review Clinic
Patient Name: **MRN :** **Date:**
Assessor name and designation:

TRAUMA ASSESSMENT	
Name: **MRN:** **Address:** **DOB:** **Phone numbers:** **NOK Ph:** **GP:**	**Date of Injury:** **MECHANISM OF INJURY:**
INJURIES: PRIMARY ASSESSMENT	**INJURIES SECONDARY ASSESSMENT**
1. 2. 3. 4. 5. 6.	1. 2. 3. 4. 5. 6.
Past Medical history:	**Medications:**
Imaging:	**Issues:**

INVESTIGATIONS REQUIRED
Bloods: Geriatric Screen **Y** ☐ **N** ☐
Imaging: Further imaging required: **Y** ☐ **N** ☐
Other: ECG **Y** ☐ **N** ☐

Silver Trauma Review Clinic
Patient Name: **MRN :** **Date:**
Assessor name and designation:

	CURRENT ISSUES	
Pain:	Location, aggravating factors, analgesia Pain score: 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐	
Medications	Paracetamol Y ☐ N ☐ Codeine Y ☐ N ☐ NSAIDs Y ☐ N ☐ Opiates Y ☐ N ☐ Neuropathic Y ☐ N ☐ Topical Agents Y ☐ N ☐ Capsaicin Y ☐ N ☐ Pain patches Y ☐ N ☐	Sleeping tablets Y ☐ N ☐ Heat/Ice Y ☐ N ☐ TENS Y ☐ N ☐ Others:
Psychosocial/Mood:	Do you feel depressed or low? Y ☐ N ☐ Flashbacks ☐ Night terrors ☐	Are you lonely/isolated? **Y** ☐ **N** ☐
Sleeping Pattern	Disturbed Y ☐ N ☐ Slightly < 1h ☐ Mild 1-2h ☐ Moderate 2-3h ☐ Severe 3-4h ☐ Completely > 4 h ☐	
Recent behaviour change/Agitation/Aggression	Y ☐ N ☐	
Constipation	Y ☐ N ☐ Laxatives Y ☐ N ☐	
PLAN		

Pain Management	Imaging
Physiotherapy ☐ Plastic Surgery ☐ Orthopaedics ☐ Thoracic Surgery ☐ Other ☐	**FOLLOW UP:** Review in STRC ☐ When? RAC ☐ COTOP Day Ward ☐ PCT ☐ Fracture clinic ☐

Silver Trauma Review Clinic
Patient Name: **MRN :** **Date:**
Assessor name and designation:

BONE HEALTH

Weight: kg Height: cm Smoking: **Y** ☐ **Ex** ☐ **N** ☐ **Alcohol: units/week** **Dairy intake:** **Calcium/Vit D Supplementation:**	Previous fracture Y☐ N☐ If yes: location? 1st degree family history of hip fracture or osteoporosis? Y☐ N☐ **Age of Menarche:** **Age of Menopause:** **Current Treatment:** **Compliance:**	**Secondary Osteoporosis** Long term steroid use. Y☐ T1DM Y☐ Hyperthyroidism Y☐ Cushing's Disease Y☐ Coeliac or absorption disorder Y☐ IBD Y☐ CKD Y☐ Eating disorder Y☐ Chronic Liver disease Y☐ Rheumatoid Arthritis Y☐

DEXA

Previous DEXA Scan results :

FRAX Score

https://www.sheffield.ac.uk/FRAX/tool.aspx?country=48

Cognitive Screen	Clinical Frailty Scale
Mini Cog Normal ☐ Abnormal☐	**CFS Score:**

GERIATRICIAN ASSESSMENT

Silver Trauma Review Clinic

Patient Name: **MRN :** **Date:**

Assessor name and designation:

Falls Screen	Ax of Orthostatic Hypertension
1. In the past year have you had any other fall, including a slip or trip in which you lost your balance and lost your balance and landed on the floor or ground or lower level? **Y** ☐ **N** ☐ a. How many times did you fall in the past year? _____ b. How did you fall? (please describe e.g. activity, place, time): C. Could you get up from the floor following your fall? **Y** ☐ **N** ☐ **2.** Are you afraid of falling? **Y** ☐ **N** ☐ Sometimes ☐ Don't know ☐ **3.** Did your fall require medical intervention? (specify): **4.** Have you any difficulty with your walking or balance? (specify): **5.** Do you get Dizzy or light headed? **Y** ☐ **N** ☐ Is this on standing up? **Y** ☐ **N** ☐ **ECG Done Y** ☐ **N** ☐ **Comments(specify):**	• **Lie down for 5 minutes. Take BP 1=** • **Stand up. Take BP 2 in 1st minute=** • **After 3 minutes take BP 3=** **Symptoms (specify):** **POSITIVE RESULT Y** ☐ **N** ☐ • **Drop in systolic BP of 20mmHG or more.** • **A drop in diastolic BP of 10mmHg or more with symptoms.** • **A drop below systolic 90mmHg on standing.**

PHYSIOTHERAPY MUSCULOSKELETAL ASSESSMENT

Special Tests :

Walking: TUG (>20 seconds more detailed assessment) :

Balance: time held on one foot (<5seconds more detailed assessment):

Muscle strength:5xSTS (>15 seconds more detailed ax):

Subjective fear of falling: Y ☐ **N** ☐

Arom:

Power:

Balance:

Gait Assessment:

International Exercise Recommendations for older Adults:

Do you get 30 mins of aerobic exercise on any day during the week?

Do you do resistance training on any day during the week?

Do you do balance training on any day during the week?

Assessment Summary/ Treatment Plan

Silver Trauma Review Clinic
Patient Name: **MRN :** **Date:**
Assessor name and designation:

Action Plan		
Problems Identified	**Actions**	**Completed**
1.		
2.		
3.		
4.		

Patient Follow up Plan of Care		
Interventions	**Follow up**	**Referrals made**
Pain management ☐		GP ☐
Immobilisation device ☐		Geriatrician ☐
Bone health ☐	Follow up in STR clinic Date……	Fracture Clinic ☐
Medication alteration ☐		Integrated Care Team Older Persons (ICT) ☐
Falls prevention		Iv Zol clinic ☐
	Discharged to GP ☐	Others ☐
Health Promotion ☐	Discharged to Geriatric OPD ☐	
	Discharged to IV Zol Clinic ☐	
	Appointment made ☐	
	Voice message left to Sec ☐	

Assessor name and designation: «USERIMC»	**Date:**	**Time:**

Secondary Survey **By Dr:**_____**@** **…… : ……hrs**

Silver Trauma Review Clinic		
Patient Name:	**MRN :**	**Date:**
Assessor name and designation:		

Review #1
Imaging/interventions:
Physiotherapy:
Advanced Nurse Practitioner:
Geriatrician
Trauma
Follow up plan:

Appendix B Baseline characteristics of patients attending the STRC

	n (%)
Past medical history	
1. Cardiovascular disease	95 (69%)
2. Respiratory	37 (27%)
3. Chronic kidney disease	19 (14%)
4. Liver disease	9 (7%)
5. Chronic gastrointestinal disease	26 (19%)
6. Chronic haematological disease	7 (5%)
7. Active cancer	9 (7%)
8. Osteoarthritis	23 (17%)
9. Diabetes	19 (14%)
10. Neurological disease	13 (9%)
11. Dementia	27 (20%)
12. Osteoporosis	42 (31%)
Medications	56 (41%)
0-5 tablets	54 (39%)
6-10 tablets	24 (18%)
>11 tablets	72 (53%)
Previous fracture	
Yes	63 (46%)
No	69 (50%)
Unknown	5 (4%)
Previous Dexa	
Yes	42 (31%)
No	92 (67%)
Unknown	3 (2%)
30 minutes exercise x 5 / week	
Yes	35 (26%)
No	59 (43%)
Unknown	43 (31%)

Appendix C Vertebral fracture characteristics STRC

	n (%)
Vertebral fractures	
Total	56 (41%)
Cervical	0 (0%)
Thoracic	26 (46%)
Lumbar	30 (54%)
Sacrum	6 (11%)
Coccyx	1 (2%)
Imaging of vertebral fractures	
Plain x-ray	38 (68%)
CT	20 (36%)
MRI	29 (52%)
TLSO brace	
Yes	7 (13%)
No	40 (71%)
Unknown	9 (16%)
Management of vertebral fractures	
Physiotherapy	53 (95%)
Analgesia	54 (96%)
Vertebroplasty	10 (18%)
Surgery	2 (4%)
Bone protection	48 (86%)