GERIATRIC TRAUMA

... IT'S NOT JUST ABOUT THE INJURY

ATLANTIC TRAUMA AND EMERGENCY MEDICINE CONFERENCE 2017

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09.21.2017

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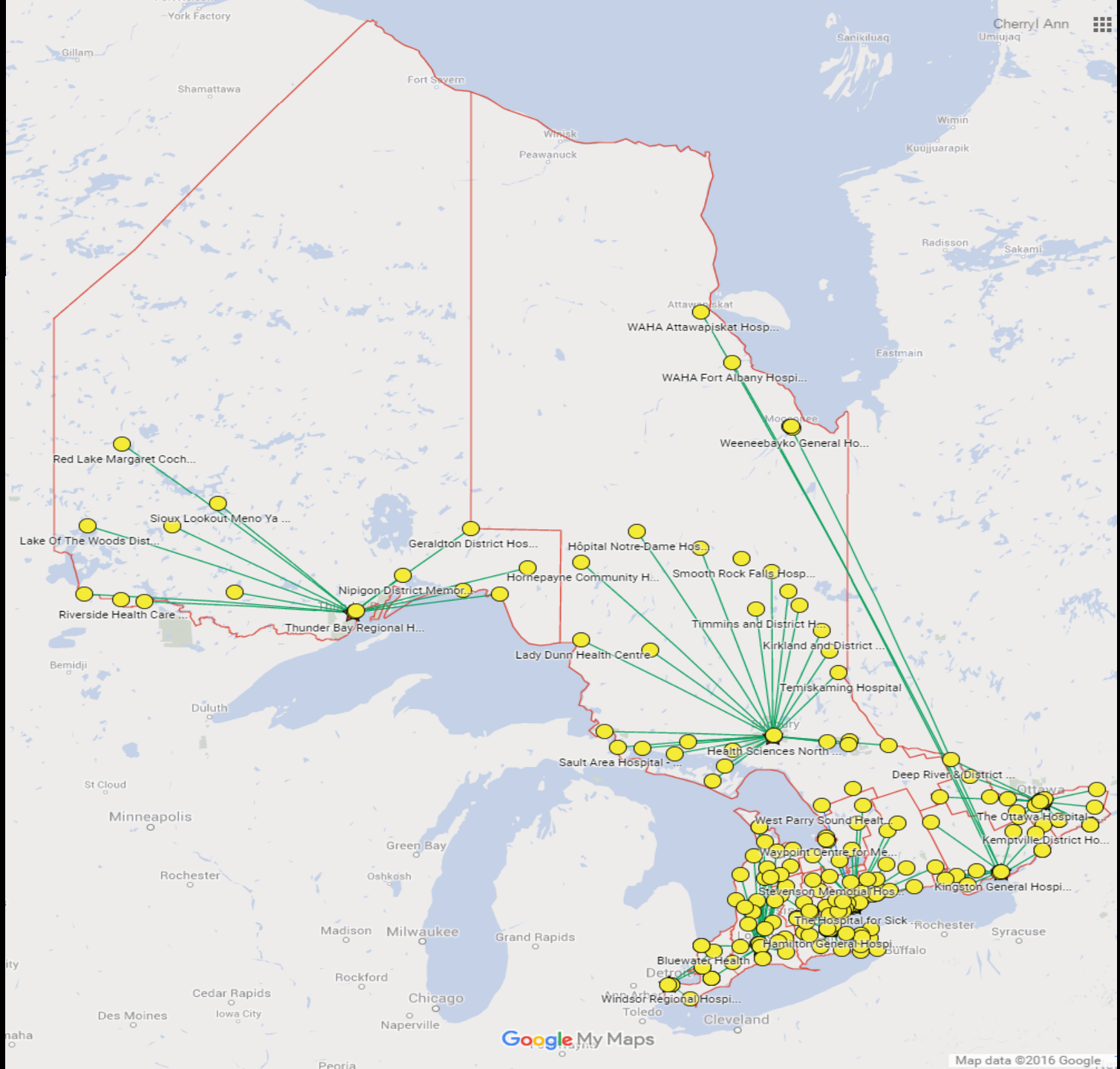
DISCLOSURES, CONFLICTS OF INTEREST

None

OBJECTIVES

1. To understand why traumatic injury and its consequences in older adults are **different** than in adults.
2. To recognize the elements of and evidence for **proactive** geriatric medicine consultation and other geriatric trauma models in the trauma setting.
3. To apply the **lessons learned** to move geriatric trauma care forward in the Atlantic provinces.


Cherryl Ann
York Factory
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Shamattawa
Fort Severn
Sanikiluaq
Umiujaq
Wimin
Kuujjuarapik
Winisk
Peawanuck
Radisson
Sakami
Attawapiskat
WAHA Attawapiskat Hosp...
Eastmain
WAHA Fort Albany Hospi...
Moosonee
Weeneebayko General Ho...
Red Lake Margaret Coch...
Sioux Lookout Meno Ya ...
Lake Of The Woods Dist...
Geraldton District Hos...
Hôpital Notre-Dame Hos...
Hornepayne Community H...
Smooth Rock Falls Hosp...
Nipigon District Memor...
Riverside Health Care ...
Thunder Bay Regional H...
Timmins and District H...
Kirkland and District ...
Lady Dunn Health Centre
Temiskaming Hospital
Bemidji
Duluth
Health Sciences North ...
Sault Area Hospital -...
Deep River & District ...
St Cloud
Minneapolis
Ottawa
West Parry Sound Healt...
The Ottawa Hospital ...
Kemptville District Ho...
Green Bay
Waypoint Centre for Me...
Rochester
Oshkosh
Stevenson Memorial Hos...
Kingston General Hospi...
The Hospital for Sick ...
Madison
Milwaukee
Grand Rapids
Rochester
Syracuse
Hamilton General Hospi...
Buffalo
Bluewater Health
Detroit
Rockford
Cedar Rapids
Chicago
Windsor Regional Hospi...
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OBJECTIVES

1. To understand why traumatic injury and its consequences in older adults are **different** than in adults.
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3. To apply the **lessons learned** to move geriatric trauma care forward in the Atlantic provinces.

Geriatric trauma IS different.

Pre-existing conditions, altered responses, atypical signs,
and more serious injuries for same mechanism of injury.

Geriatric trauma IS different.

↑death

adults aged 65+ account for 51% of trauma deaths

↑LOS

mean of 13.5 vs 18.0 days

↑falls

account for 74% of major injury hospitalizations in adults aged 65+

Canadian National Trauma Registry 2013 Report

Geriatric trauma IS different.

Frailty

Better predictor than age or injury severity.

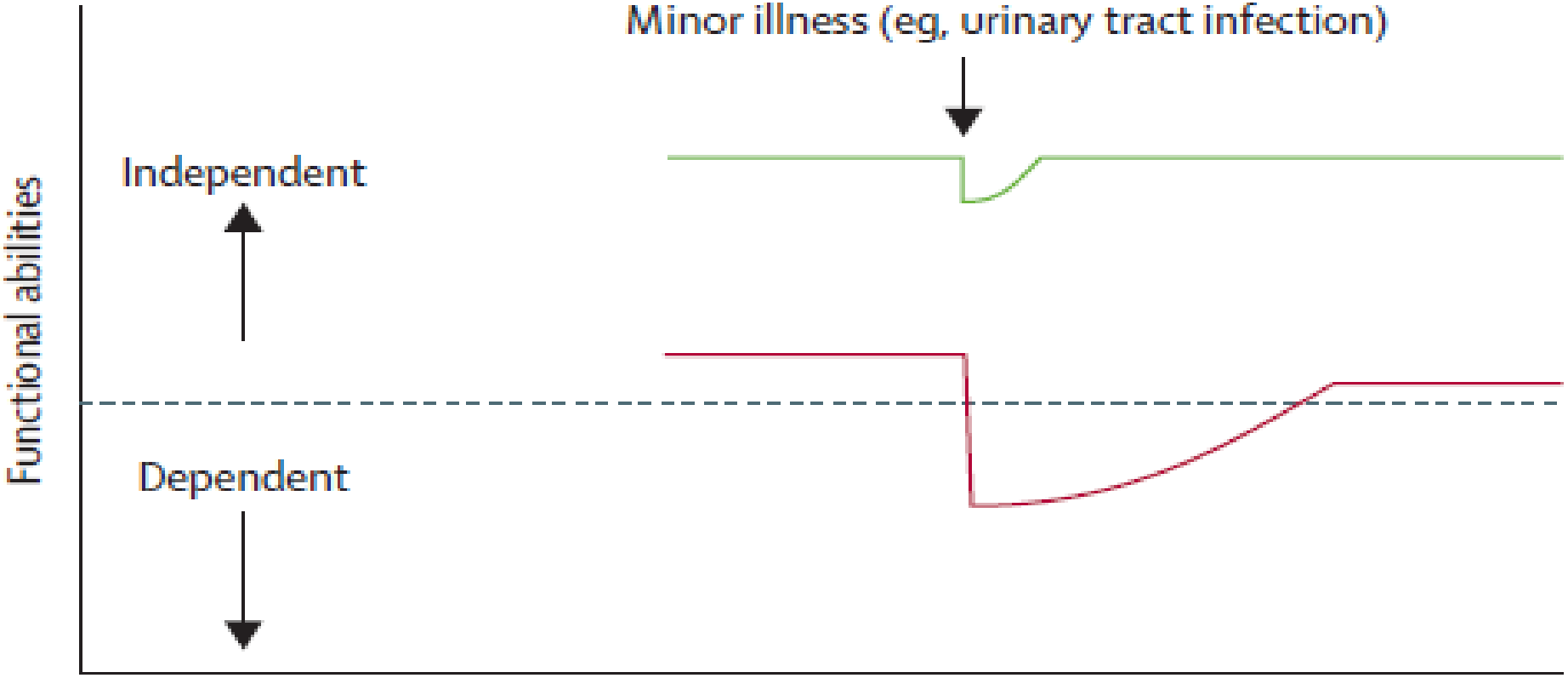
↑ in-hospital complications

Odds ratio 2.5, 95% CI 1.5-6.0

↑ adverse discharge

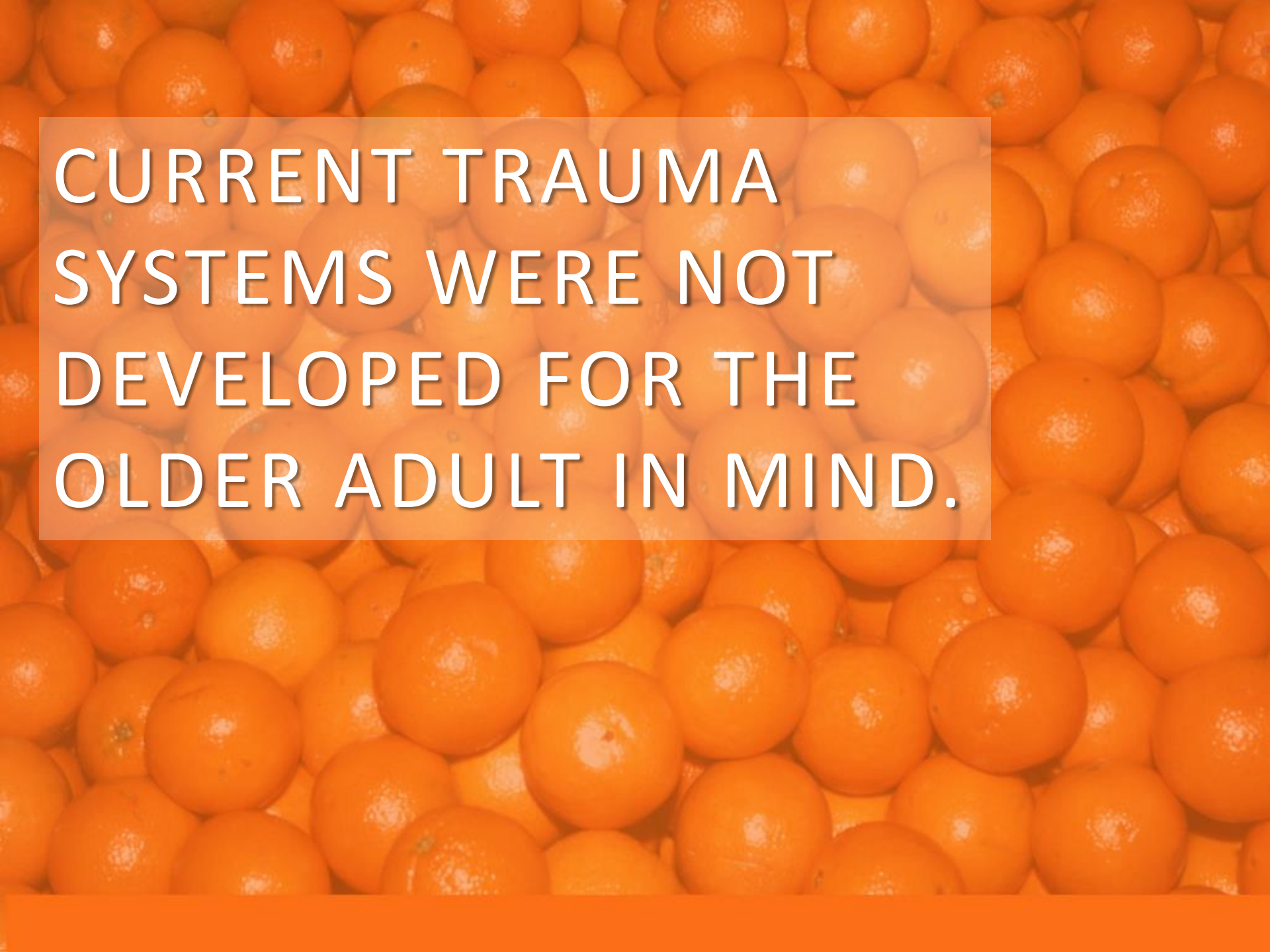
Odds ratio 1.6, 95% 1.1-2.4

JAMA Surg. 2014;149(8):766-72.



FRAILTY

A STATE WITH HIGH VULNERABILITY TO ADVERSE HEALTH CARE OUTCOMES


CURRENT TRAUMA SYSTEMS WERE NOT DEVELOPED FOR THE OLDER ADULT IN MIND.

Under triage in the field.

Treatment at a trauma centre may not be associated with reduced risk of death.

Differences in trauma centre-specific mortality are most pronounced in older adults.

Current trauma systems were not developed for the older adult in mind.

Undertriage is increased in older adults, reaching 60% for those older than 90 years old.

Evaluating Age in the Field Triage of Injured Persons

Yoko Nakamura, MD, Mohamud Daya, MD, MS, Eileen M. Bulger, MD, Martin Schreiber, MD, Robert Mackersie, MD, Renee Y. Hsia, MD, MSc, N. Clay Mann, PhD, MS, James F. Holmes, MD, MPH, Kristan Staudenmayer, MD, Zachary Sturges, MD, Michael Liao, MD, Jason Haukoos, MD, MSc, Nathan Kuppermann, MD, MPH, Erik D. Barton, MD, MS, MBA, Craig D. Newgard, MD, MPH, and the WESTRN Investigators

From the Center for Policy and Research in Emergency Medicine, Department of Emergency Medicine (Nakamura, Daya, Newgard), and the Division of Trauma and Critical Care (Schreiber), Oregon Health & Science University, Portland, OR; the Department of Surgery, University of Washington, Seattle, WA (Bulger); the Department of Surgery, San Francisco General Hospital, San Francisco, CA (Mackersie); the Department of Emergency Medicine, University of California San Francisco, San Francisco General Hospital, San Francisco, CA (Hsia); the Intermountain Injury Control Research Center, University of Utah, Salt Lake City, UT (Mann); the Department of Emergency Medicine, University of California at Davis, Sacramento, CA (Holmes, Kuppermann); the Department of Surgery, Stanford University, Palo Alto, CA (Staudenmayer); the Division of Emergency Medicine, Department of Surgery, University of Utah School of Medicine, Salt Lake City, UT (Sturges, Barton); and the Department of Emergency Medicine, Denver Health Medical Center, Denver, CO, and the Department of Epidemiology, Colorado School of Public Health, University of Colorado School of Medicine, Aurora, CO (Liao, Haukoos).

Study objective: We evaluate trauma undertriage by age group, the association between age and serious injury after accounting for other field triage criteria and confounders, and the potential effect of a mandatory age triage criterion for field triage.

Methods : This was a retrospective cohort study of injured children and adults transported by 48 emergency medical services (EMS) agencies to 105 hospitals in 6 regions of the western United States from 2006 through 2008. We used probabilistic linkage to match EMS records to hospital records, including trauma registries, state discharge databases, and emergency department databases. The primary outcome measure was serious injury, as measured by an Injury Severity Score greater than or equal to 16. We assessed undertriage (Injury Severity Score ≥16 and triage-negative or transport to a nontrauma center) by age decile and used multivariable logistic regression models to estimate the association (linear and nonlinear) between age and Injury Severity Score greater than or equal to 16, adjusted for important confounders. We also evaluated the potential influence of age on triage efficiency and trauma center volume.

Results: Injured patients (260,027) were evaluated and transported by EMS during the 3-year study period. Undertriage increased for patients older than 60 years, reaching approximately 60% for those older than 90 years. There was a strong nonlinear association between age and Injury Severity Score greater than or equal to 16. For patients not meeting other triage criteria, the probability of serious injury was most notable after 60 years. A mandatory age triage criterion would have decreased undertriage at the expense of overtriage, with 1 patient with Injury Severity Score greater than or equal to 16 identified for every 60 to 65 additional patients transported to major trauma centers.

Conclusion: Trauma undertriage increases in patients older than 60 years. Although the probability of serious injury increases among triage-negative patients with increasing age, the use of a mandatory age triage criterion appears inefficient for improving field triage. [Ann Emerg Med. 2012;60:335-345.]

Ann Emerg Med. 2012;60(3):335-45.

Current trauma systems were not developed for the older adult in mind.

The risk of death is lower among older patients treated at trauma centres than among those treated at non-trauma centres, but this is only a trend.

- death in hospital RR 0.94 (0.56-1.61)
- death at 365 days RR 0.92 (0.67–1.28)

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

A National Evaluation of the Effect of Trauma-Center Care on Mortality

Ellen J. MacKenzie, Ph.D., Frederick P. Rivara, M.D., M.P.H., Gregory J. Jurkovich, M.D., Avery B. Nathens, M.D., Ph.D., Katherine P. Frey, M.P.H., Brian L. Egleston, M.P.P., David S. Salkever, Ph.D., and Daniel O. Scharfstein, Sc.D.

ABSTRACT

BACKGROUND

Hospitals have difficulty justifying the expense of maintaining trauma centers without strong evidence of their effectiveness. To address this gap, we examined differences in mortality between level 1 trauma centers and hospitals without a trauma center (non–trauma centers).

METHODS

Mortality outcomes were compared among patients treated in 18 hospitals with a level 1 trauma center and 51 hospitals non–trauma centers located in 14 states. Patients 18 to 84 years old with a moderate-to-severe injury were eligible. Complete data were obtained for 1104 patients who died in the hospital and 4087 patients who were discharged alive. We used propensity-score weighting to adjust for observable differences between patients treated at trauma centers and those treated at non–trauma centers.

N Engl J Med 2006;354:366-78.

Current trauma systems were not developed for the older adult in mind.

Differences in trauma centre-specific mortality are most pronounced in geriatric trauma patients.

median odds ratio = 1.40

CMAJ OPEN

Research

Temporal trends and differences in mortality at trauma centres across Ontario from 2005 to 2011: a retrospective cohort study

David Gomez MD PhD, Aziz S. Alali MD PhD, Barbara Haas MD PhD, Wei Xiong MSc, Homer Tien MD MSc, Avery B. Nathens MD PhD

Abstract

Background: Care in a trauma centre is associated with significant reductions in mortality after severe injury. However, emerging evidence suggests that outcomes across similarly accredited trauma centres are not equivalent, even after adjusting for case-mix. The primary objective of this analysis was to evaluate secular trends in overall mortality at trauma centres. Secondarily, we explored trauma centre–specific mortality to determine the extent of variation between centres.

Methods: Data on 26 421 adults (≥ 18 yr) admitted to a trauma centre between 2005 and 2011 were derived from the Ontario Trauma Registry. We used generalized estimating equations to calculate in-hospital mortality over time and hierarchical models to estimate trauma centre–specific mortality. To quantify variability between centres, we calculated median odds ratios. Adjusted odds of death were calculated for each trauma centre to identify those with higher than expected, average and lower than expected mortality.

Results: Overall mortality at trauma centres decreased from 13.2% in 2005 to 11.2% in 2009. After adjusting for case mix, the odds of death decreased by approximately 3% a year (95% confidence interval 0%–5%). Trauma centre–specific mortality ranged from 11.4% to 13.1%. After adjusting for case mix, differences in trauma centre–specific mortality were observed (median odds ratio = 1.25), suggesting that the odds of dying could be 1.25-fold greater if the same patient was admitted to 1 randomly selected trauma centre as opposed to another. Differences were most pronounced for patients with isolated head injuries and among older patients as evidenced by higher median odds ratios and the number of outliers.

Interpretation: We observed a significant improvement over time in the mortality of severely injured patients cared for at Ontario's trauma centres. However, considerable differences in trauma centre–specific mortality were observed. Differences were most pronounced among older injured patients and those with isolated traumatic brain injury. System-wide performance improvement initiatives should target these subgroups.

CMAJ Open. 2014; 2(3): E176–E182.

Current trauma systems were not developed for the older adult in mind.

Treatment at hospitals with higher geriatric trauma proportion is associated with lower hospital mortality.

HR 0.71 (95% CI 0.54 to 0.94)

Does Hospital Experience Rather than Volume Improve Outcomes in Geriatric Trauma Patients?

Olubode A Olufajo, MD, MPH, David Metcalfe, LLB, MSc, Arturo Rios-Diaz, MD, Elizabeth Lilley, MD, MPH, Joaquim M Havens, MD, FACS, Edward Kelly, MD, FACS, Joel S Weissman, PhD, Adil H Haider, MD, MPH, FACS, Ali Salim, MD, FACS, Zara Cooper, MD, MSc, FACS

BACKGROUND: Although high absolute hospital geriatric trauma volume (GTV) is associated with improved outcomes among geriatric trauma patients, the actual geriatric trauma proportion (GTP) might be a better predictor of outcomes.

STUDY DESIGN: Adult trauma admissions were identified in the California State Inpatient Database, 2007 to 2011. Hospital characteristics were extracted from the American Hospital Association database. The annual trauma volume of patients 65 years and older was calculated for each hospital. The GTP was derived by dividing the GTV by the overall adult trauma volume and hospitals were categorized into tertiles of GTP. Outcomes were hospital mortality, failure to rescue (FTR), and 30-day readmission in geriatric trauma patients. Independent risk factors were assessed with clustered multivariate logistic regression models adjusted for patient and hospital characteristics.

RESULTS: There were 61,915 geriatric trauma patients included from 63 trauma centers. Hospital mortality, FTR, and 30-day readmission rates were 4.99%, 16.07%, and 12.03%, respectively. The adjusted odds ratios and 95% CIs for in-hospital mortality and FTR per 100 patient increase in GTV were 0.91 (95% CI, 0.83−1.00) and 1.01 (95% CI, 0.90−1.14), respectively. As compared with hospitals in the lowest tertile, adjusted odds of mortality and FTR in the highest tertile were 0.71 (95% CI, 0.54−0.94) and 0.67 (95% CI, 0.48−0.92), respectively. None of the hospital factors measured was significantly associated with readmission. The Wald test revealed that GTP played a larger role than GTV in predicting hospital mortality ($p = 0.018$ vs $p = 0.048$) and FTR ($p = 0.015$ vs $p = 0.985$).

CONCLUSIONS: Treatment at hospitals with higher GTP is associated with lower hospital mortality and FTR among geriatric patients. These findings suggest that creation of specialized services for geriatric trauma care can improve outcomes among geriatric trauma patients. (J Am Coll Surg 2016;223:32−41.

Disclosure Information: Nothing to disclose.

Disclosures outside the scope of this work: Dr Haider is an equity shareholder in the company that runs the website www.doctella.com.

Presented at the Western Surgical Association 123rd Scientific Session, Napa Valley, CA, November 2015.

Geriatric patients are responsible for a large proportion of the volume and cost of trauma care in the United States. Between 2007 and 2011, the proportion of trauma patients older than 64 years rose from 19.4% to 27.7%.[1] Injured older patients account for about 49,000 deaths annually and, in 2010 alone, the com-

J Am Coll Surg. 2016;223(1):32-40.

Current trauma systems were not developed for the older adult in mind.

Geriatric trauma IS different. It is complicated.

- Atypical presentation
- Frailty
- Processes suboptimal
- System variability

OBJECTIVES

1. To understand why traumatic injury and its consequences in older adults are **different** than in adults.
2. To recognize the elements of **proactive** geriatric medicine consultation and the evidence for it in the trauma setting.
3. To apply the **lessons learned** to move geriatric trauma care forward in the Atlantic provinces.

THE COMPREHENSIVE GERIATRIC ASSESSMENT

THE CGA

A comprehensive geriatric assessment (CGA) is a multidimensional, interdisciplinary diagnostic process to determine the medical, psychological, and functional capabilities of a frail elderly person in order to develop a coordinated and integrated plan for treatment and long-term follow-up

SOURCE: J AM GERIATR SOC 1991;39:8S-16S.

The 5 M's

J Am Geriatr Soc. 2017 [epub ahead of print]

THERAPEUTIC HARMONIZATION

ALIGNING PROGNOSIS AND GOALS WITH CARE.

These were stunning results. If scientists came up with a device – call it an automatic defrailer – that wouldn't extend your life but would slash the likelihood you'd end up in a nursing home or miserable with depression, we'd be clamouring for it …

We'd have pink ribbon campaigns to get one for every person over seventy-five …

Medical students would be jockeying to become defrailulation specialists …

Instead it was just geriatrics.

BEING MORTAL
ATUL GAWANDE

COMPREHENSIVE GERIATRIC ASSESSMENT

NNT = 33

to have one more older adult survive

and return home at discharge.

Cochrane Database Syst Rev. 2017; CD006211.

PROACTIVE CGA

CASE FINDING	Case finding is done SYSTEMATICALLY based on pre-defined criteria and processes.
EARLY	Involvement is early -- before treatment decisions are made.
PREVENTION	Focus on prevention of geriatric syndromes.
DIRECT	Recommendations are implemented directly.

Cross-Specialty Collaborative Models

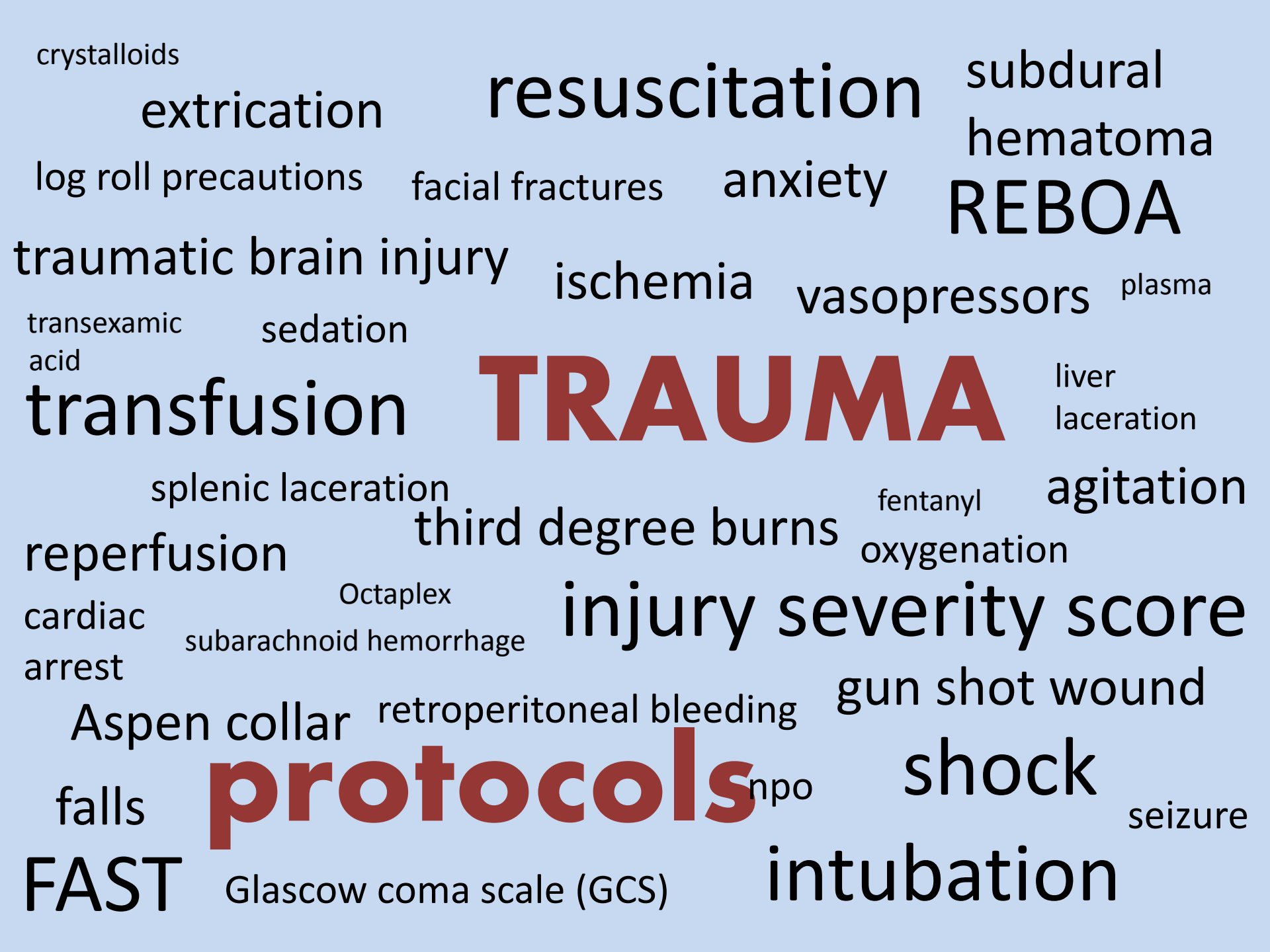
Early CGA in other settings has improved clinical outcomes.

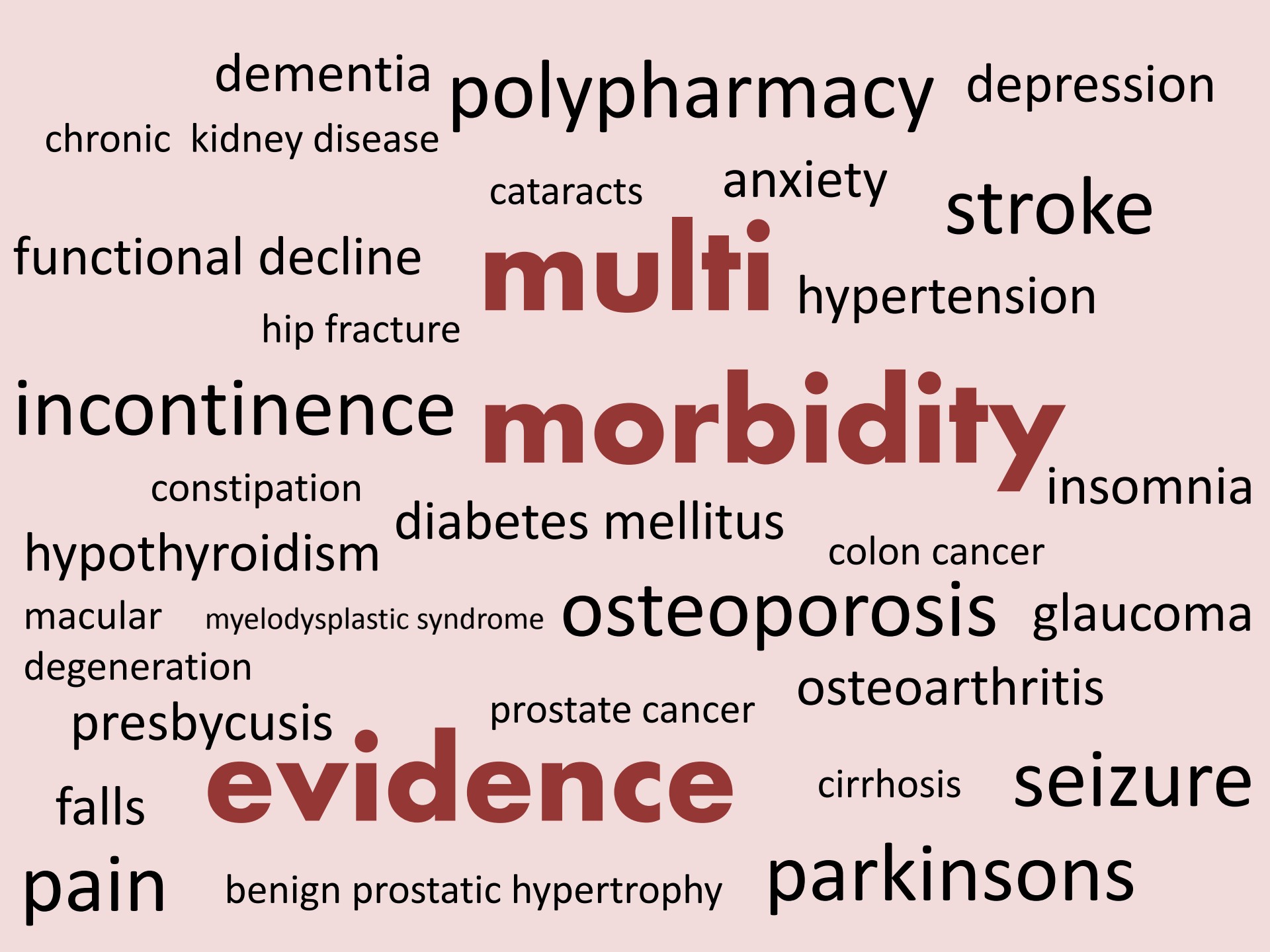
Reduction in delirium after hip fracture. 50% vs 32%, p=.04

Reduction length of stay index in patients admitted to hospitalist service.

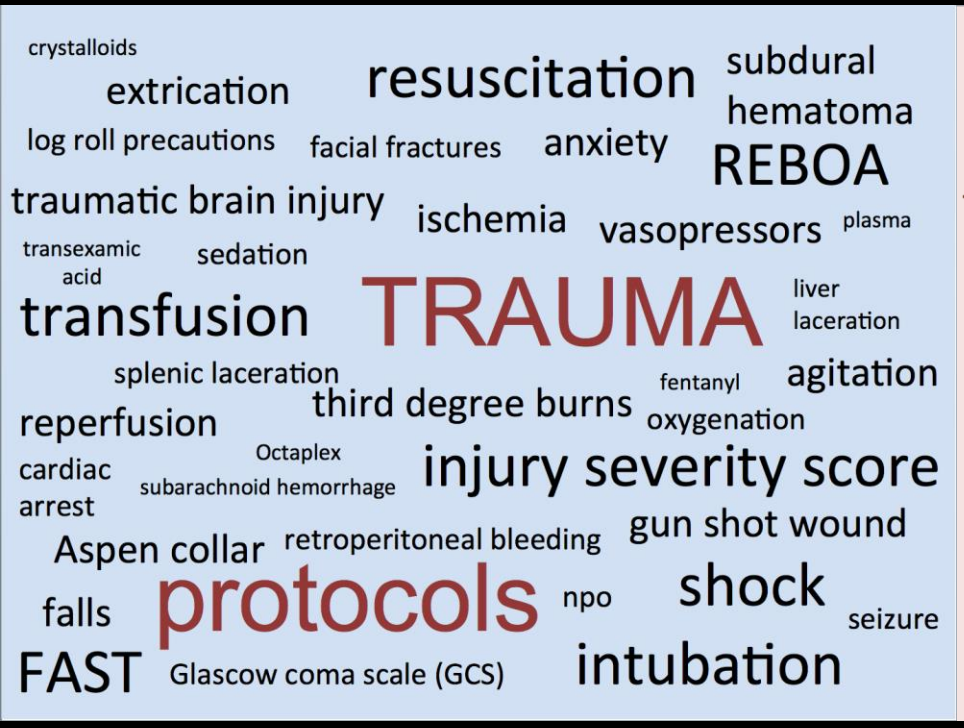
Reduction in pneumonia, delirium, pressure sores, pain, and catheter-use in elective orthopedic surgery.

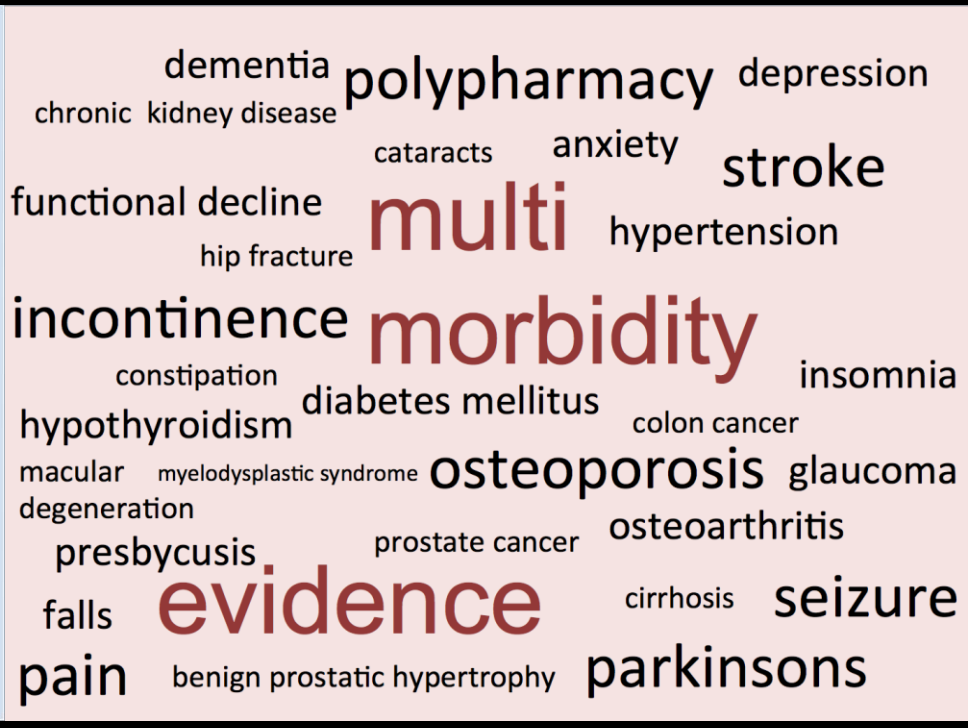
J Am Geriatr Soc. 2001;49(5):516-22.
J Am Geriatr Soc. 2009;57(11):2139-45.
Age Ageing. 2007;36(2):190-6.


crystalloids
extrication
resuscitation
subdural
hematoma
log roll precautions
facial fractures
anxiety
REBOA
traumatic brain injury
ischemia
vasopressors
plasma
transexamic
acid
sedation
transfusion
TRAUMA
liver
laceration
splenic laceration
agitation
fentanyl
third degree burns
reperfusion
oxygenation
Octaplex
injury severity score
cardiac
arrest
subarachnoid hemorrhage
gun shot wound
Aspen collar
retroperitoneal bleeding
protocols
shock
falls
npo
seizure
FAST
Glascow coma scale (GCS)
intubation

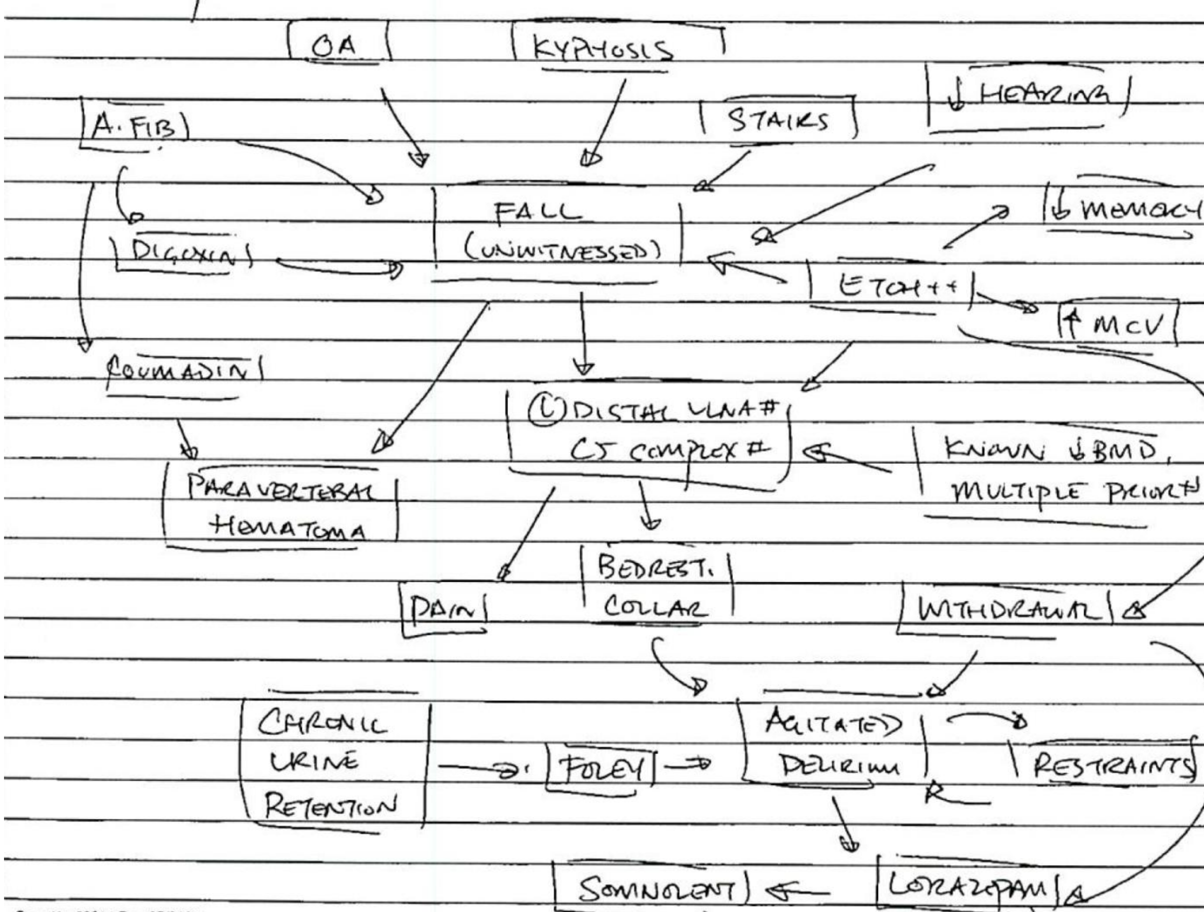

dementia
polypharmacy
depression
chronic kidney disease
cataracts
anxiety
stroke
functional decline
multi
hypertension
hip fracture
incontinence
morbidity
constipation
insomnia
diabetes mellitus
hypothyroidism
colon cancer
macular
myelodysplastic syndrome
osteoporosis
glaucoma
degeneration
osteoarthritis
presbycusis
prostate cancer
evidence
cirrhosis
seizure
falls
pain
benign prostatic hypertrophy
parkinsons

GERIATRIC TRAUMA





91 ♀ from a retirement facility admitted with the following clinical picture:



Form No. 60514 Rev. 07/2002

Examined. Intermittent somnolence. Disorganized. Inattentive.

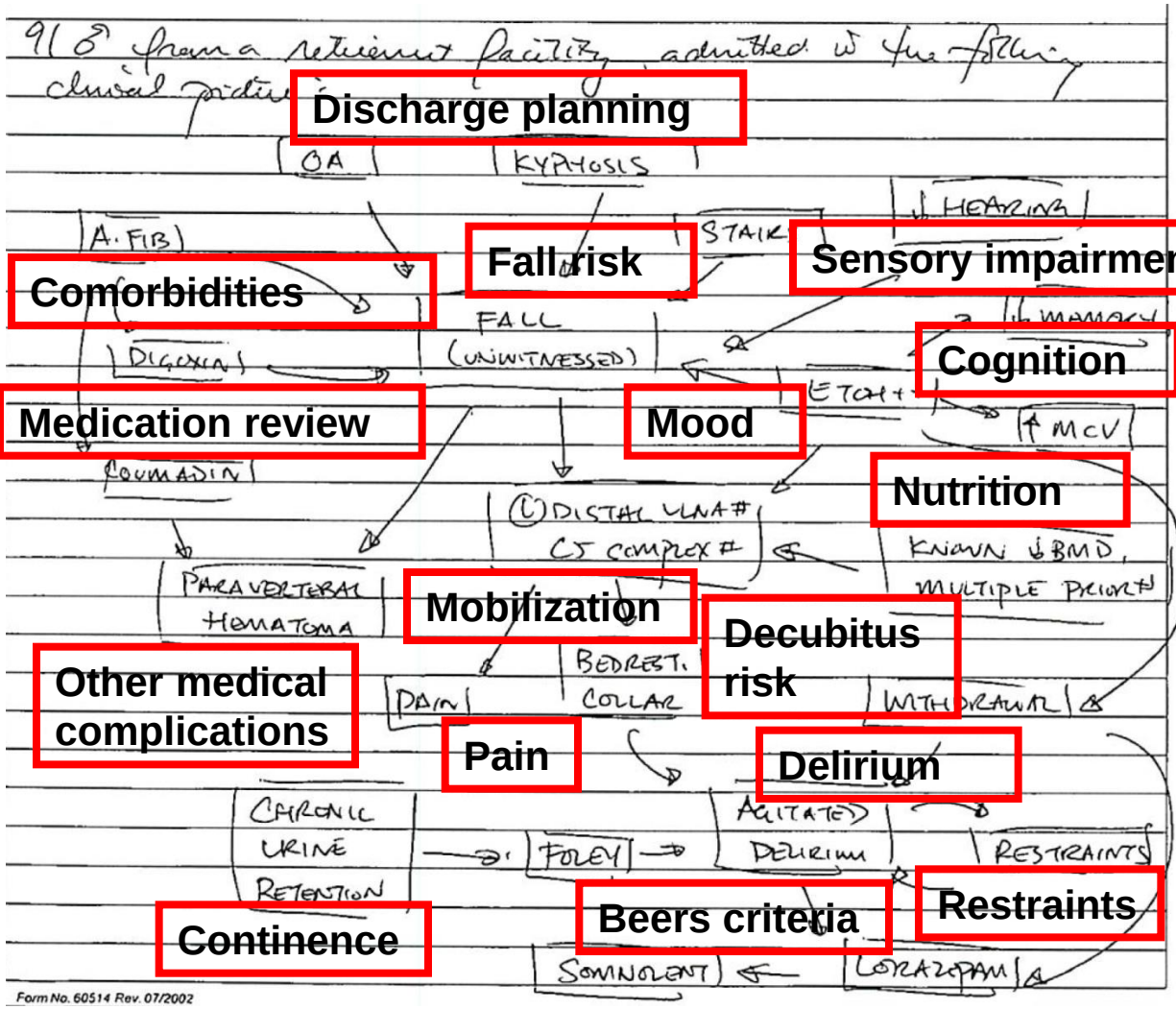
Investigations reviewed.

Recommendations.

- X-ray Ⓡ elbow – ++ bruised.

1. FALLS – d/c digoxin (if HR > 110 bpm, then use Beta blocker)
   - vit D 1000 daily – Check B12 (↑MCV)
   - check postural BP once off legroll.
   - will need EtOH counselling.
2. OSTEOPOROSIS – was on Alendronate, but multiple #.
   - this is not a fragility #, as from standing height
   - vit D 1000
   - elemental Ca 1200 mg daily from all sources
   - do not resume Alendronate (hx of med non-adherence and EtOH)
   - I will make referral to Metabolic Bone Clinic for Zolendronate
   - w/u 2° causes, including TSH.
3. DELIRIUM – continue CIWA + thiamine.
   - d/c loxapine, d/c lorazepam → simplify to one option. ↑ sitter to ↓ restraints use
   - d/c Foley when off legroll, then IMC if retention
   - S/L IV when drinking well.
   - d/c digoxin.
4. URINE RETENTION – will clarify etiology with family MD
   - PVR post d/c Foley
   - urinalysis
5. CHRONIC ETOH – when not delirious – will counsel on EtOH.
6. INCIDENTAL FINDINGS – 1.5 cm lingula nodule – if in keeping with patient values/preferences, re-image in 3-6 months.
7. DISPOSITION – will need rehab (was living in a retirement home, used cane, independent for ADLs, no major pre-existing cognitive concerns)

[signature]


Discharge planning
Fall risk
Sensory impairment
Comorbidities
Cognition
Medication review
Mood
Nutrition
Mobilization
Decubitus risk
Other medical complications
Pain
Delirium
Continence
Beers criteria
Restraints
OA
KYPHOSIS
A. FIB
DIGOXIN
FALL (UNWITNESSED)
ETOH+
MCV
COUMADIN
DISTAL ULNA#
CT COMPLEX#
KNOWN ↓BMD, MULTIPLE PRIORS
PARAVERTEBRAL HEMATOMA
PAIN
BEDREST, COLLAR
WITHDRAWAL
CHRONIC URINE RETENTION
FOLEY
AGITATED DELIRIUM
RESTRAINTS
SOMNOLENT
LORAZEPAM
Form No. 60514 Rev. 07/2002

Johanna Reimann, 76, recovering from a car accident, is grateful she was taken her to the first hospital in Canada with a geriatrician on its trauma tear

RENE JOHNSTON/TORONTO ST/

New ways to mend seniors

A project at St. Michael's Hospital is improving how the most fragile recover from bad accidents

THERESA BOYLE
HEALTH REPORTER

From her bed at St. Michael's Hospital, Johanna Reimann recounts with remarkable clarity the events that landed her here in late June.

The Etobicoke woman hit a rock face on the side of the highway while driving home from her Parry Sound cottage. Emergency service workers, who used the Jaws of Life to extricate her from her crumpled car, told her while she was lying on a stretcher, staring up into the sky, to be on the lookout for a medevac helicopter. If it was orange, they said, she would be airlifted to St. Mikes; if it was white, she would be taken to a local hospital.

Two weeks later, Reimann, 76, is counting her blessings it was an orange helicopter on the horizon that fateful day. In being transported to St. Mike's, she ended up at the only hospital in Canada with a geriatrician on its trauma team.

Every patient over the age of 60 who comes into the trauma unit is seen by a geriatrician who works alongside the typical team of surgeons, anesthesiologists, intensivists and trauma nurses.

The Geriatric Trauma Consultation Service was introduced in 2007 at the urging of Dr. Avery Nathens, director of the hospital's trauma unit.

A year earlier, the *New England Journal of Medicine* published a study, on which Nathens worked, which found trauma centres performed better than community hospitals in treating all patients — except seniors.

Nathans says that study, and others he has worked on since, highlight the fact that trauma units need to do a better job of meeting the needs of elderly patients.

Reimann suffered 11 broken bones including both legs and her left arm. She also sustained some damage to her kidneys and spleen, as well as numerous lacerations. She underwent five hours of emergency surgery and now has a long pin sticking through her right foot, holding the bones together.

SENIORS continued on **GT4**

The Toronto Star, August 2 2011

The PROACTIVE GERIATRIC TRAUMA CONSULTATION SERVICE

SYSTEMATIC IDENTIFICATION

age 65+ admission to trauma

E A R L Y

comprehensive geriatric assessment within 72 hours of admission

COLLABORATE

The proactive geriatric trauma consultation service team: geriatrician, CNS
Collaborators: trauma team, family MD, pharmacy, social network, community services

- Electronic consultation notes and orders
- Verbal communication
- Weekly interdisciplinary rounds

SYSTEMATIC DATA COLLECTION

evaluation and quality improvement

ORIGINAL ARTICLE

An Evaluation of a Proactive Geriatric Trauma Consultation Service

Magda Lenartowicz, MD, Meredith Parkovnick, MSc,† Amanda McFarlan, BA,† Barbara Haas, MD,‡ Sharon E. Straus, MD, MSc,§ Avery B. Nathens, MD, PhD, MPH,|| and Camilla L. Wong, MD, MHSc§*

Objective: To describe and evaluate an inpatient geriatric trauma consultation service (GTCS).

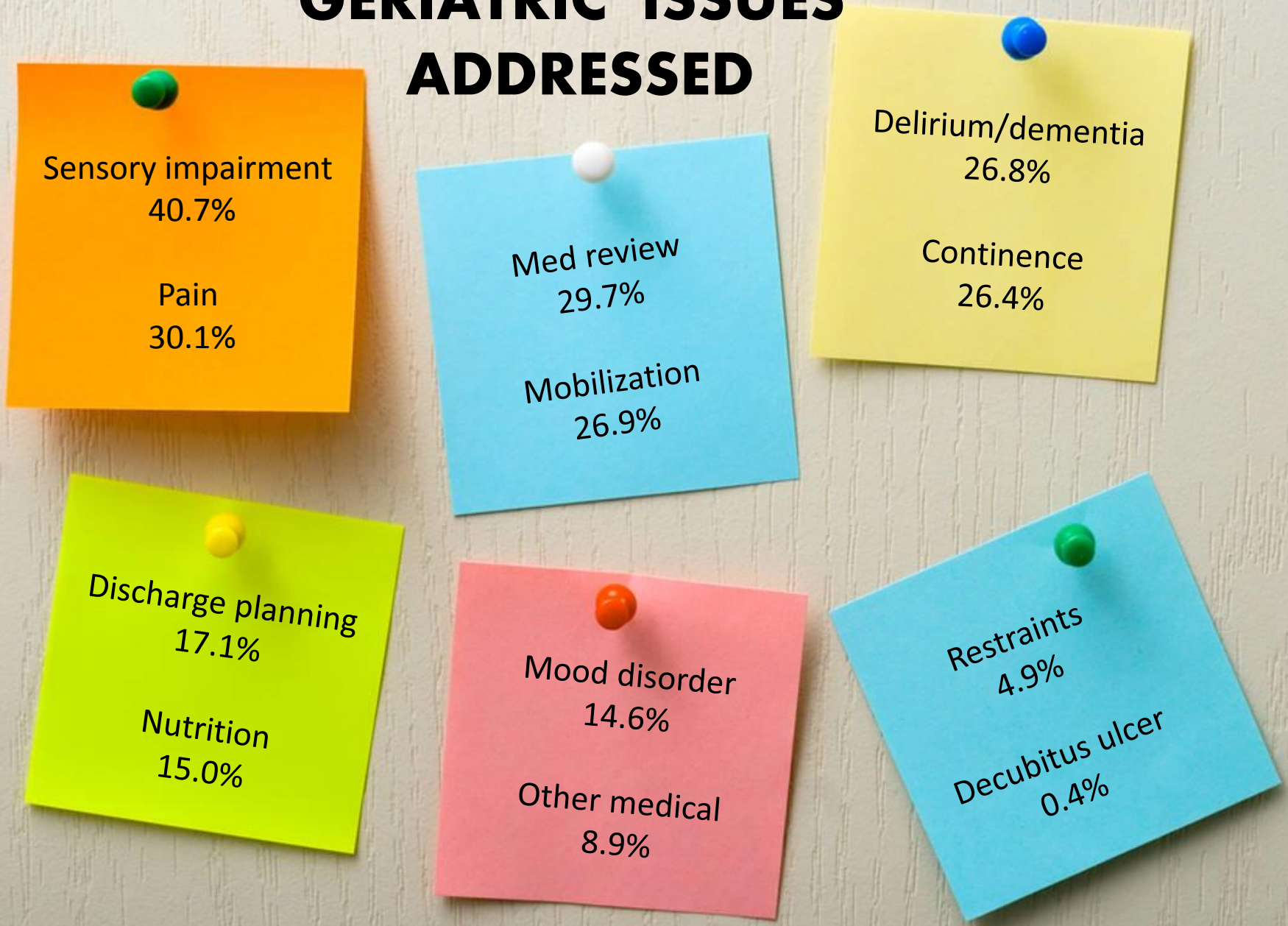
Background: Delays in recognizing the special needs of older trauma patients may result in suboptimal care. The GTCS is a proactive geriatric consultation model aimed at preventing and managing age-specific complications and discharge planning for all patients 60 years or older admitted to the St Michael's Hospital Trauma Service.

Methods: This was a before and after case series of patients admitted pre-GTCS (March 2005–August 2007) and post-GTCS (September 2007–March 2010). Study data were derived from a review of the medical records and

Delays in recognizing the special needs of older trauma patients may result in suboptimal care.[3] Postinjury complications in the elderly trauma patient negatively impact survival and contribute to longer lengths of stay in survivors and nonsurvivors than in younger trauma patients.[4] Management of geriatric trauma patients is challenging because the validity of standard injury scores such as the Injury Severity Score is uncertain[5–8] and the elderly have more comorbidities resulting in more in-hospital complications and medical consultations.[9] The optimal management of these patients remains unclear. A comprehensive geriatric assessment is a multidimensional, interdisciplinary diagnostic process to determine the medical, psy-

Ann Surg. 2012;256(6):1098-101.

GERIATRIC ISSUES ADDRESSED



Ann Surg 2012;256: 1098–1101.

Proactive Geriatric Trauma Consultation Service

CGA within 72 hours of admission by a clinical nurse specialist and geriatrician, verbal and written communication of recommendations, weekly interdisciplinary meetings with the trauma team, and measurement of quality indicators.

Ann Surg 2012;256: 1098–1101.

↓9.6%

Reduction in delirium.
50.5% vs 40.9%, p<.05

↓4.8%

Reduction in discharge to long term care.
6.5% vs 1.7%, p=0.03

↓

Reduction in consultations to Internal Medicine (p=.04) and Psychiatry (p=.02).

AGREEMENT

Adherence to recommendations was 93%.

Ann Surg 2012;256: 1098–1101.


RUSSIA
N Canada
Arctic Ocean
Ellesmere Island
GREENLAND
ICELAND
Reykjavik
Baffin Bay
Nuuk (Godthåb)
UNITED STATES
Victoria Island
Baffin Island
YUKON TERRITORY
Gulf of Alaska
NORTHWEST TERRITORIES
NUNAVUT
Labrador Sea
Pacific Ocean
Hudson Bay
NEWFOUNDLAND AND LABRADOR
CANADA
ALBERTA
MANITOBA
BRITISH COLUMBIA
SASKATCHEWAN
QUEBEC
ONTARIO
NOVA SCOTIA
NEW BRUNSWICK
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Sustainability of a proactive geriatric trauma consultation service

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This meeting was presented at the Scientific Meeting of the Canadian Geriatrics Society in Edmonton, Alberta in April 2014, and at the Trauma Association of Canada meeting, Halifax, Nova Scotia. May 2016.
Accepted for publication July 18, 2016

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Background: Proactive geriatric trauma consultation service (GTCS) models have been associated with better delivery of geriatric care and functional outcomes. Whether such collaborative models can be improved and sustained remains uncertain. We describe the sustainability and process improvements of an inpatient GTCS.

Methods: We assessed workflow using interviews and surveys to identify opportunities to optimize the referral process for the GTCS. Sustainability of the service was assessed via a prospective case series (July 2012 and December 2013). Study data were derived from a review of the medical record and trauma registry database. Metrics to determine sustainability included volume of cases seen, staffing levels, rate of adherence to recommendations, geriatric-specific clinical outcomes, trauma quality indicators, consultation requests and discharge destination.

Results: Through process changes, we were able to ensure every eligible patient was referred for a comprehensive geriatric assessment. Compared with the implementation phase, volume of assessments increased and recommendation adherence rates were maintained. Delirium and/or dementia were the most common geriatric issue addressed. The rate of adherence to recommendations made by the GTCS team was 88.2%. Only 1.4% of patients were discharged to a nursing home.

Conclusion: Workflow assessment is a useful means to optimize the referral process for comprehensive geriatric assessment. Sustainability of a GTCS was demonstrated by volume, staffing and recommendation adherence.

Proactive Geriatric Trauma Consultation Service Sustainability

After 6-7 years, the program has demonstrated sustainability on several measures.

☑volumes

6.9 ± 2.7 patients seen per month.

☑funding

☑adherence

88.2% recommendation adherence rate

☑outcomes

1.4% discharged to long term care

Can J Surg. 2017;60(1):14-18.

ACS TQIP GERIATRIC TRAUMA MANAGEMENT GUIDELINES

ACS tqip®
TRAUMA QUALITY IMPROVEMENT PROGRAM

Improved geriatric quality of care indicators (p<.01).

Quality of Care Delivered Before vs After a Quality-Improvement Intervention for Acute Geriatric Trauma

Lillian Min, MD, MSHS, Henry Cryer, MD, PhD, FACS, Chiao-Li Chan, MSW, Carol Roth, RN, MPH, Areti Tillou, MD, MSEd, FACS

BACKGROUND: Older trauma-injury patients had improved recovery after we implemented routine geriatric consultation for patients aged 65 years and older admitted to the trauma service of a Level I academic trauma center. The intervention aimed to improve quality of geriatric care. However, the specific care processes that improved are unknown.

STUDY DESIGN: We conducted a prospective observation comparing medical care after (December 2007 to November 2009) vs before (December 2006 to November 2007) implementation of the geriatric consult-based intervention. To measure quality of care (QOC), we used 33 previously validated care-process quality indicators (QIs) from the Assessing the Care of Vulnerable Elders (ACOVE) study, measured by review of medical records for 76 geriatric consult (GC) vs 71 control group patients. As prespecified subgroup analyses, we aggregated QIs by type: geriatric (eg, delirium screening) vs nongeriatric condition–based care (eg, thrombosis prophylaxis) and compared QI scores by type of care. Last, we aggregated QI scores into overall, geriatric, and nongeriatric QOC scores for each patient (number of QIs passed/number of QIs eligible), and compared patient-level QOC for the GC vs control group, adjusting for age, sex, ethnicity, comorbidity, and injury severity.

RESULTS: Sixty-three percent of the GC patients vs 11% of the control group patients received a geriatric consultation. We evaluated 2,505 QIs overall (1,664 geriatric type and 841 nongeriatric QIs). In general, fewer geriatric-type QIs were passed than nongeriatric QIs (71% vs 81%; $p < 0.001$). We provided better overall QOC to the GC (77%) than control group patients (73%; $p < 0.05$). However, the difference was not statistically significant after multivariable adjustment ($p = 0.08$). We improved geriatric QOC for the GC (74%) compared with the control group (68%; $p < 0.01$), a difference that was significant after multivariable adjustment ($p = 0.01$).

CONCLUSIONS: Geriatricians and surgeons can collaboratively improve geriatric QOC for older trauma patients. (J Am Coll Surg 2015;220:820–830. © 2015 by the American College of Surgeons)

J Am Coll Surg. 2015;220(5):820-30.

Better recovery of function in the year following traumatic injury (p<.01).

Original Investigation | SURGICAL CARE OF THE AGING POPULATION

Long-term Postinjury Functional Recovery
Outcomes of Geriatric Consultation

Areti Tillou, MD, MSEd; Lorraine Kelley-Quon, MD; Sigrid Burruss, MD; Eric Morley, MPH; Henry Cryer, MD, PhD; Marilyn Cohen, RN; Lillian Min, MD, MSHS

IMPORTANCE Functional recovery is an important outcome following injury. Functional impairment is persistent in the year following injury for older trauma patients.

OBJECTIVE To measure the impact of routine geriatric consultation on functional outcomes in older trauma patients.

DESIGN, SETTING, AND PARTICIPANTS In this pretest-posttest study, the pretest control group (n = 37) was retrospectively identified (December 2006-November 2007). The posttest geriatric consultation (GC) group (n = 85) was prospectively enrolled (December 2007-June 2010). We then followed up both groups for 1 year after enrollment. This study was conducted at an academic level 1 trauma center with adults 65 years of age and older admitted as an activated code trauma.

INTERVENTION Routine GC.

MAIN OUTCOMES AND MEASURES The Short Functional Status survey of 5 activities of daily living (ADLs) at hospital admission and 3, 6, and 12 months postinjury.

RESULTS The unadjusted Short Functional Status score (GC group only) declined from 4.6 preinjury to 3.7 at 12 months postinjury, a decline of nearly 1 full ADL ($P < .05$). The ability to shop for personal items was the specific ADL more commonly retained by the GC group compared with the control group. The GC group had a better recovery of function in the year following injury than the GC group, controlling for age, sex, race/ethnicity, length of stay, comorbidity, injury severity, postdischarge rehabilitation, complication, and whether surgery

JAMA Surg. 2014 Jan;149(1):83-9.

Improved advanced care planning and reduced intensive care readmission rates.

Integrating Geriatric Consults into Routine Care of Older Trauma Patients: One-Year Experience of a Level I Trauma Center

Olubode A Olufajo, MD, MPH, Samir Tulebaev, MD, Houman Javedan, MD, Jonathan Gates, MD, MBA, FACS, Justin Wang, BA, Maria Duarte, BA, Edward Kelly, MD, FACS, Elizabeth Lilley, MD, MPH, Ali Salim, MD, FACS, Zara Cooper, MD, MSc, FACS

BACKGROUND: Although involvement of geriatricians in the care of older trauma patients is associated with changes in processes of care and improved outcomes, few geriatrician consultations were ordered on our service.

STUDY DESIGN: Mandatory geriatric consults were initiated in September 2013 for all trauma patients 70 years and older admitted to our hospital. We prospectively collected data on patients admitted from October 2013 through September 2014 (postintervention) and compared their data with those of patients admitted from June 2011 through June 2012 (preintervention). We collected data on processes of care (DNR and do not intubate status, delirium, and referral for cognitive evaluation) and patient outcomes (mortality, readmission, and length of stay). Descriptive statistics and post-hoc power analyses were performed.

RESULTS: There were 215 and 191 patients included in the preintervention and postintervention cohorts, respectively. After the intervention, geriatric consults increased from 3.26% to 100%. Patients with DNR and do not intubate status increased from 10.23% to 38.22% ($p < 0.01$). Referral for formal cognitive evaluation increased from 2.33% to 14.21% ($p < 0.01$) and delirium documentation increased from 31.16% to 38.22% ($p = 0.14$). In-hospital mortality and 30-day mortality in the pre- and postintervention periods were 9.30% vs 5.24% ($p = 0.12$) and 11.63% vs 6.81% ($p = 0.10$), respectively. Intensive care unit readmission rate was 8.26% preintervention and 1.96% postintervention ($p = 0.06$). There were no changes in 30-day hospital readmission and length of stay. Power analyses showed more patients were needed to show statistically significant outcomes.

CONCLUSIONS: The initiation of mandatory geriatric consults on our trauma service was associated with improved advance care planning and increased multidisciplinary care. Ensuring involvement of geriatricians can aid in reducing adverse outcomes among geriatric trauma patients. (J Am Coll Surg 2016; 222:1029–1035.

J Am Coll Surg 2016; 222:1029-1035.

Proactive Geriatric Trauma Consultation Service

Other studies of geriatric trauma collaborations have demonstrated improved outcomes.

JAMA Surg. 2014;149(1):83-9.
J Am Coll Surg. 2015;220(5):820-30.
J Am Coll Surg. 2016;222(6):1029-35.

☑quality

Improved geriatric quality indicators (74% vs 68%, p <.01)

☑recovery

Better functional status at one year (p <.05)

☑advanced care planning

Increased DNR and DNI status (38.2% vs 10.2%, p <.01)

GERIATRIC TRAUMA

PROACTIVE. Systematic case finding, early involvement, focus on geriatric syndrome prevention, and direct implementation.

COLLABORATIVE. Address trauma complexity with frailty complexity.

IMPACT. Reduce delirium, improve geriatric quality indicators, preserve function, and decrease discharge to long term care.

OBJECTIVES

1. To understand why traumatic injury and its consequences in older adults are **different** than in adults.

2. To recognize the elements of and evidence for **proactive** geriatric medicine consultation and other geriatric trauma models in the trauma setting.

3. To apply the **lessons learned** to move geriatric trauma care forward in the Atlantic provinces.

What was easy.

You are invited

TO COFFEE WITH TRAUMA.
HALLWAY CONVERSATIONS TO FOLLOW.

Facilitators.

RESEARCH (EVALUATION) DRIVES SUSTAINABILITY

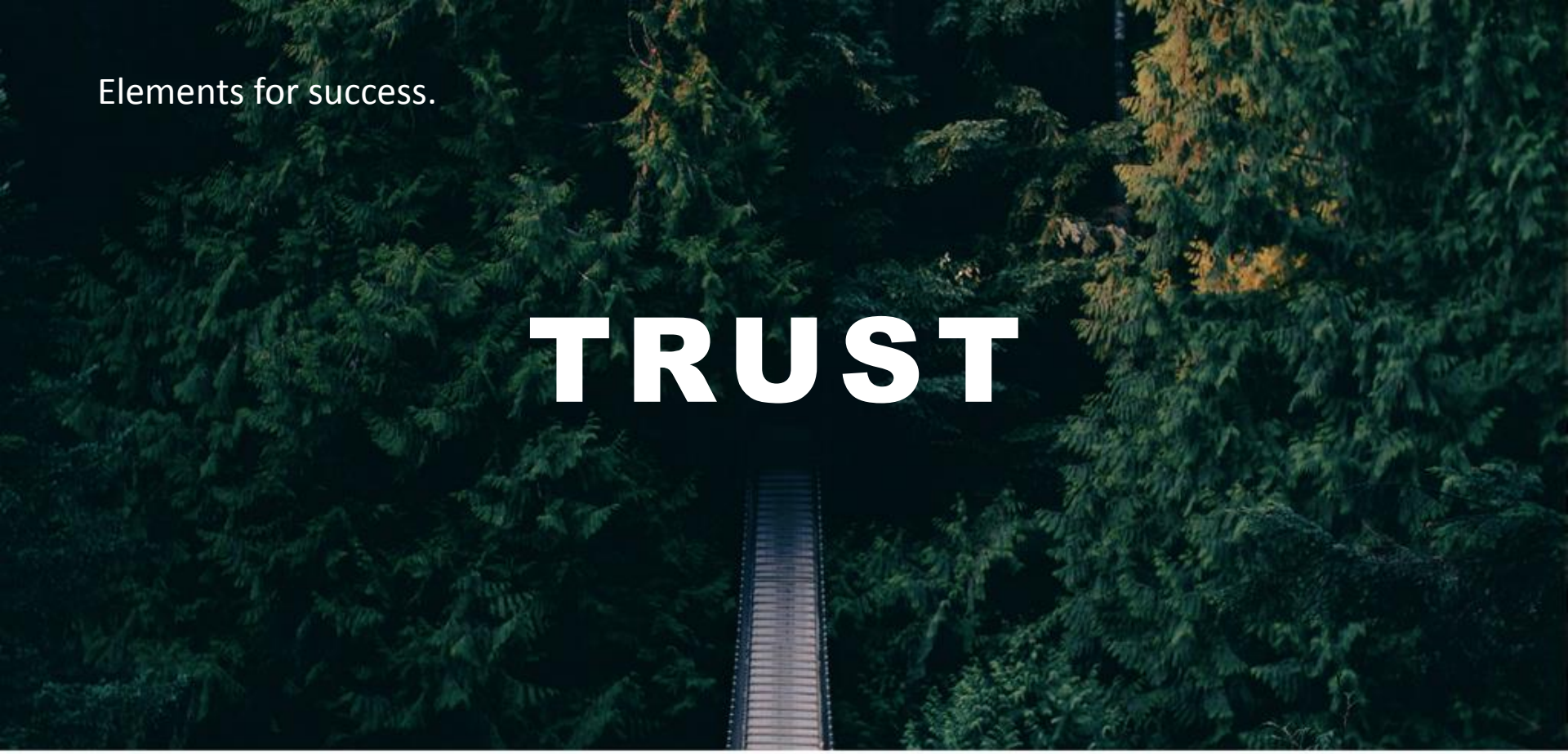
When you have positive, measurable, published, impact, everyone will want to keep the collaboration model going.

What was challenging.

TRYING TO SPEAK THE SAME LINGO.

There is so much to learn about the other field.

Elements for success.



There must be mutual respect for one another's domain of expertise.

The secret sauce.

CONSISTENCY for CONTINUITY

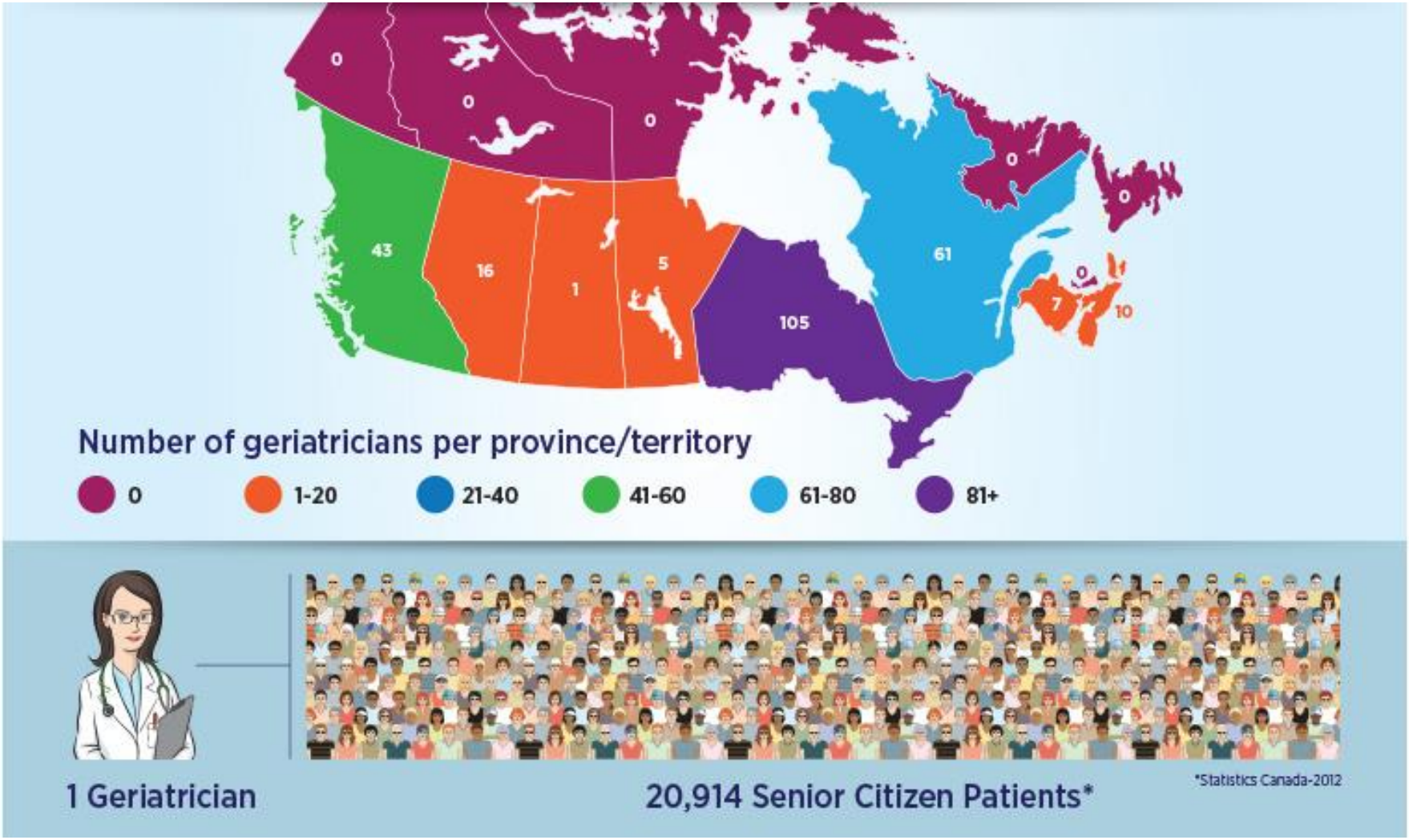
same clinical nurse specialist (geriatrics)
same nurse practitioner (trauma)

Threats.

EVERYONE WANTS IN.

geriatric cardiology
geriatric nephrology
perioperative geriatrics
geriatric oncology

Did you know? There are only 261 geriatricians in Canada?



CMA 2015.

Use **geriatric-specific** trauma field triage criteria.

- lowers mortality in individuals with ISS <10; OR = 0.81 (0.70-0.95)
- more individuals discharged home; OR = 1.06 (1.01-1.11)

Effect of Geriatric-Specific Trauma Triage Criteria on Outcomes in Injured Older Adults: A Statewide Retrospective Cohort Study

Jeffrey M. Caterino, MD, MPH, Nicole V. Brown, MS,† Maya W. Hamilton, BA,‡ Brian Ichwan, MD,§ Salman Khaliqdina, MBBS,* David C. Evans, MD,¶ Subrahmanyan Darbha, MS,* Ashish R. Panchal, MD, PhD,* and Manish N. Shah, MD, MPH***

[See Editorial Comments by Timothy F. Platts-Mills, Christopher S. Evans, and Jane H. Brice]

OBJECTIVES: To evaluate the effect on outcomes of the Ohio Department of Public Safety statewide geriatric triage criteria, established in 2009 for emergency medical services (EMS) to use for injured individuals aged 70 and older.

DESIGN: Retrospective cohort study of the Ohio Trauma Registry.

SETTING: All hospitals in Ohio.

PARTICIPANTS: Individuals aged 70 and older in the Ohio Trauma Registry from January 2006 through December 2011, 3 years before and 3 years after criteria adoption (N = 34,499).

MEASUREMENTS: Primary outcomes were in-hospital mortality and discharge to home. Criteria effects were assessed using chi-square tests, multivariable logistic regression, interrupted time series plots, and multivariable segmented regression models.

RESULTS: After geriatric criteria were adopted, the proportion of older adults qualifying for trauma center transport increased from 44% to 58%, but EMS transport rates did not change (44% vs 45%). There was no difference in unadjusted mortality (7.1% vs 6.6%) ($P = .10$). In adjusted analyses, subjects with an injury severity score (ISS) less than 10 had lower mortality after adoption (3.0% vs 2.5%) (odds ratio (OR) = 0.81, 95% confidence interval (CI) = 0.70–0.95, $P = .01$). Discharge to home increased after adoption in the adjusted analysis (OR = 1.06, 95% CI = 1.01–1.11, $P = .02$). There were no time-dependent changes for either outcome.

CONCLUSION: Although the proportion of older adults meeting criteria for trauma center transport substantially increased with geriatric triage criteria, there were no increases in trauma center transports. Adoption of statewide geriatric triage guidelines did not decrease mortality in more severely injured older adults but was associated with slightly lower mortality in individuals with mild injuries (ISS <10) and with more individuals discharged to home. Improving outcomes in injured older adults will require further attention to implementation and use of geriatric-specific criteria.
J Am Geriatr Soc 64:1944–1951, 2016.

Key words: geriatric; trauma; triage

Individuals aged 65 and over account for 13% of the U.S. population and more than 25% of all hospital admissions for trauma.[1,2] By 2050, 40% of all individuals admitted to the hospital for trauma will be older adults.[3–5] Injured older adults have greater morbidity and mortality than younger adults with similar injuries. They have greater acuity, longer

J Am Geriatr Soc. 2016;64(10):1944-1951.

Development of Geriatric Consultation Criteria to focus geriatric resources on vulnerable patients.

Association for Academic Surgery

Early geriatric consultation increases adherence to TQIP Geriatric Trauma Management Guidelines

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ARTICLE INFO

Article history:
Received 22 November 2016
Received in revised form
31 January 2017
Accepted 23 March 2017
Available online 31 March 2017

Keywords:
Geriatrics
Trauma
Quality measures
TQIP
Geriatric consultation

ABSTRACT

Background: The American College of Surgeons' Trauma Quality Improvement Program (TQIP) Geriatric Trauma Management Guidelines recommend geriatric consultation for injured older adults. However it is not known how or whether geriatric consultation improves compliance to these quality measures.

Methods: This study is a retrospective chart review of our institutional trauma databank. Adherence to quality measures was compared before and after implementation of specific triggers for geriatric consultation. Secondary analyses evaluated adherence by service: trauma service (Trauma) or a trauma service with early geriatric consultation (GeriTrauma).

Results: The average age of the 245 patients was 76.7 years, 47% were women, and mean Injury Severity Score was 9.5 (SD ±8.1). Implementation of the GeriTrauma collaborative increased geriatric consultation rates from 2% to 48% but had minimal effect on overall adherence to TQIP quality measures. A secondary analysis comparing those in the post implementation group who received geriatric consultation ($n = 94$) to those who did not ($n = 103$) demonstrated higher rates of delirium diagnosis (36.2% vs 14.6%, $P < 0.01$) and better documentation of initial living situation, code status, and medication list in the GeriTrauma group. Physical therapy was consulted more frequently for GeriTrauma patients (95.7% vs 68.0%, $P < 0.01$) Documented goals of care discussions were rare and difficult to abstract. A subgroup analysis of only patients with fall-related injuries demonstrated similar outcomes.

Conclusions: Early geriatric consultation increases adherence to TQIP guidelines. Further research into the long term significance and validity of these geriatric trauma quality indicators is needed.

J Surg Res. 2017;216:56-64.

G60 TRAUMA

The G-60 Unit Model

- Decreased ICU LOS
- Decreased LOS
- Decreased complications (AKI, CHF, UTI, pneumonia, respiratory failure)

Geriatric trauma service: A one-year experience

Alicia J. Mangram, MD, Christopher D. Mitchell, MD, Vanessa K. Shifflette, MD, Manuel Lorenzo, MD, Michael S. Truitt, MD, Anuj Goel, MD, Mark A. Lyons, MD, Deborah J. Nichols, RN, *and* **Ernest L. Dunn, MD,** *Dallas, Texas*

BACKGROUND: Trauma centers nationwide have been experiencing an increase in their elderly trauma patients because of an ever growing elderly population within the United States. Many studies have demonstrated the physiologic differences between an older trauma patient versus a younger trauma patient. Coupling these differences with their coexisting medical comorbidities, makes caring for this population extremely challenging. To meet these challenges, we organized a geriatric trauma unit specifically designed with a multidisciplinary approach to take a more aggressive stance to the care of the geriatric trauma patient.

METHODS: We created a geriatric trauma unit at our Level II trauma facility, called the G-60 unit. This unit opened for admission in August 2009. Inclusion criteria included all trauma patients older than 60 years. Data were abstracted from our G-60 unit from the period of August 2009 to July 2010. We compared these data to a similar patient population (control group) from January 2008 to December 2008.

RESULTS: Our Trauma Data Bank yielded 673 patients for the above queried time period. The G-60 group contained 393 patients, while the control group had 280 patients. A decrease was seen among the G-60 group in all categories: average emergency department length of stay (LOS), average emergency department to operating room time, average surgical intensive care unit LOS, and average hospital LOS. A 3.8% mortality rate was found in the G-60 group compared with a 5.7% mortality rate in the control group. Our analysis also showed rate of 0% pneumonia, 1.3% respiratory failure, and 1.5% urinary tract infection in the G-6O group, while the control group had a rate of 1.8% pneumonia, 6.8% respiratory failure, and 3.9% urinary tract infection.

CONCLUSION: Our data from the 1-year experience of our G-60 unit show that addressing the specific needs of elderly trauma patients will lead to better outcomes. (*J Trauma.* 2012;72: 119–122. Copyright © 2012 by Lippincott Williams & Wilkins)

LEVEL OF EVIDENCE: II.

KEY WORDS: Geriatric trauma; geriatric trauma service; geriatric trauma unit; elderly trauma.

The elderly population in the United States continues to increase in size. The 2000 US Census Bureau states that the number of elderly (age >65 years) increased by 12% between the 1990 and 2000 census reports with more than 35 million Americans now categorized as elderly.[1,2] These numbers are expected to increase when the 2010 census data are finalized.[3] As a consequence of America's advancing age, trauma centers will see a rise in their elderly trauma population. The older trauma patient is unique in age, physiologic reserve, and prevalence of chronic illness. Caring for these patients can be complex, requiring multiple physician specialties for optimal care.[2,4] The involvement of multiple physicians with no clear leader may result in fragmentation of medical care and subsequent delivery of suboptimal patient care. Increasingly, the trauma literature is supporting the idea that elderly trauma patients demand specialized attention; they are not just older adults.[2,4] Geriatric trauma patients have significantly worse outcomes compared with younger patients.[5] Therefore, trauma care given to these patients should be distinctively different from care given to their younger cohorts. Thus, the purpose of this study was to evaluate the effectiveness of a multidisciplinary trauma service model (G-60) aimed at improving elderly trauma patient outcomes. The study will test the hypothesis that higher proportions of patients who received treatment for trauma under the surgeon-lead geriatric service model (G-60) are associated with improved morbidity, mortality, and process measurement outcomes compared with matched historical trauma patient controls. The primary study endpoints were in-hospital mortality and morbidity (urinary tract infection [UTI], respiratory failure [RF], congestive heart failure [CHF], acute renal failure [ARF], pneumonia [PNA], deep venous thrombosis [DVT], pulmonary

J Trauma Acute Care Surg. 2012;72(1):119-22.

Opportunities.

Refinement.

Current research focus on using pre-trauma frailty to refine patient selection criteria.

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.

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.

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.

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.

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.

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).

8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

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.**

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.

* 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.

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Inspiring Minds

Pre-admission frailty is associated with adverse discharge destination.

- moderate to severe frailty, OR=5.3; 95% CI 2.1-13.5; P<.001
- age OR=1.1; 95% CI 1.0-1.1; P=0.006
- three or more comorbidities OR=2.8; 95% 1.1-7.3, P=0.04

ORIGINAL SCIENTIFIC ARTICLE

Canadian Study of Health and Aging Clinical Frailty Scale: Does It Predict Adverse Outcomes among Geriatric Trauma Patients?

Annie Cheung, BHSc, Barbara Haas, MD, PhD, FRCSC, Thom J Ringer, MD, JD, MPhil, Amanda McFarlan, RN, Camilla L Wong, MD, MHSc, FRCPC

BACKGROUND: The Canadian Study of Health and Aging Clinical Frailty Scale (CFS) and the laboratory Frailty Index (FI-lab) are validated tools based on clinical and laboratory data, respectively. Their utility as predictors of geriatric trauma outcomes is unknown. Our primary objective was to determine whether pre-admission CFS is associated with adverse discharge destination. Secondary objectives were to evaluate the relationships between CFS and in-hospital complications and between admission FI-lab and discharge destination.

STUDY DESIGN: We performed a 4-year (2011 to 2014) retrospective cohort study with patients 65 years and older admitted to a level I trauma center. Admission FI-lab was calculated using 23 variables collected within 48 hours of presentation. The primary outcome was discharge destination, either adverse (death or discharge to a long-term, chronic, or acute care facility) or favorable (home or rehabilitation). The secondary outcome was in-hospital complications. Multivariable logistic regression was used to evaluate the relationship between CFS or FI-lab and outcomes.

RESULTS: There were 266 patients included. Mean age was 76.5 ± 7.8 years and median Injury Severity Score was 17 (interquartile range 13 to 24). There were 260 patients and 221 patients who had sufficient data to determine CFS and FI-lab scores, respectively. Pre-admission frailty as per the CFS (CFS 6 or 7) was independently associated with adverse discharge destination (odds ratio 5.1; 95% CI 2.0 to 13.2; $p < 0.001$). Severe frailty on admission, as determined by the FI-lab (FI-lab > 0.4), was not associated with adverse outcomes.

CONCLUSIONS: Pre-admission clinical frailty independently predicts adverse discharge destination in geriatric trauma patients. The CFS may be used to triage resources to mitigate adverse outcomes in this population. The FI-lab determined on admission for trauma may not be useful. (J Am Coll Surg 2017;■:1−8. © 2017 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

It is projected that 21% of the US population will be aged 65 years or older by 2050.[1] As a result, there will be a rapid increase in the number of elderly injured every year. Individuals aged 65 years or older represented 15% of all major trauma hospitalizations in 2004; by 2014, this number rose to 28%.[2,3] It is estimated that the elderly will account for 39% of trauma admissions by 2050.[4] Older trauma patients have worse outcomes than younger patients, with higher mortality, higher complication rates, adverse discharge outcomes, and longer hospital stays.[5-8]

Disclosure Information: Nothing to disclose.
Presented at the 36th Annual Scientific Meeting of The Canadian Geriatrics Society, Vancouver, BC, April 2016.

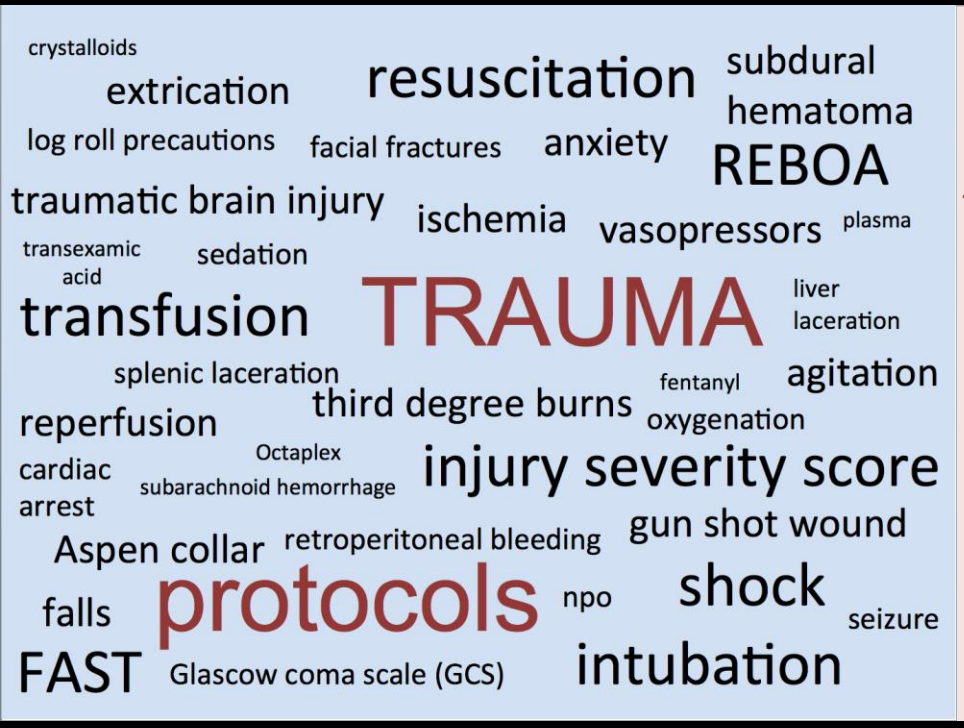
Received June 29, 2017; Revised August 7, 2017; Accepted August 8, 2017.

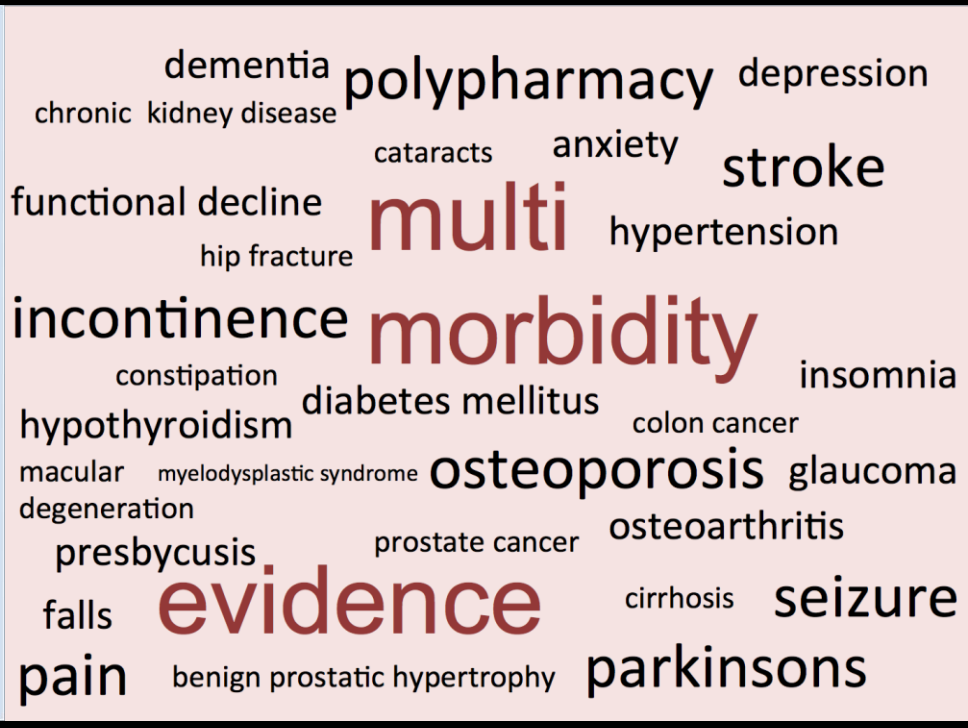
From the Faculty of Medicine, University of Ottawa, Ottawa, Ontario (Cheung); the Department of Surgery and the Interdepartmental Division

J Am Coll Surg. 2017. [pub ahead of print]

Tip for collaborative care models.

GERIATRIC TRAUMA





… and they lived happily ever after.


The Allen T.
LAMBERT
TRAUMA AND NEUROSURGERY INTENSIVE CA NIT
This facility was made possible
Dr. Wong

Acknowledgements

St. Michael's Hospital Geriatric Trauma Consultation Service Design, Implementation and Evaluation
Dr. Maria Zorzitto, Geriatrician
Dr. Sharon Straus, Geriatrician
Dr. Avery Nathens, Trauma Surgeon
Dr. Barbara Haas, Trauma Surgeon
Lee Ringer, CNS
Anne Stephens, CNS
Amanda McFarlan, Trauma Registry and Quality Coordinator, SMH
Raghda Al Atia
Magda Lenartowicz
Meredith Parkovnick
Christina Valiaveetil
Holly Lee
Thom Ringer
Annie Cheung

St. Michael's Hospital Geriatric Trauma Consultation Service Evaluation Funding
Division of Trauma, St. Michael's Hospital
Department of Medicine, St. Michael's Hospital
Keenan Research Centre of the Li Ka Shing Knowledge Institute of St. Michael's Hospital
AHSC AFP Innovation Fund, Ontario Ministry of Health and Long-term Care
Department of Medicine Strategic Innovation Fund, University of Toronto

Thank you.

Geriatric Trauma Panel

Pamela Jarrett MD, FRCPC, FACP

Geriatrician

Horizon Health Network Saint John

Associate Professor of Medicine Dalhousie and Memorial University

NB Trauma Program
Programme de traumatologie du NB

Locations in New Brunswick

What's the Big Picture?

Percentage of Trauma Registry Discharges
65 years of age and older

- **2014-15 = 46.8%**
- **2015-16 = 48.7%**

NB Trauma Program
Programme de traumatologie du NB

Seniors and Serious Injury

Cases Included in the NB Trauma Registry	April 2014 to March 2015		April 2015 to March 2016	
Total Discharges in Registry	2417		2672	
Total Discharges >64	1131	46.79%	1302	48.73%
65 to 74	312	27.59%	347	26.65%
75 to 84	415	36.69%	470	36.10%
85 +	404	35.72%	485	37.25%
Total ISS>12 in Registry	218		234	
Proportion ISS>12	72	33.03%	64	27.35%
65 to 74	34	10.90%	27	7.78%
75 to 84	24	5.78%	18	3.83%
85 +	14	3.47%	19	3.92%

What is this telling us?

- **Almost a third of ISS>12 patients are seniors**
- **With respect to seniors: Higher proportion of younger seniors have ISS >12**
- **Within each senior age grouping for all discharges: – a significant number have ISS >12**

NB Trauma Program
Programme de traumatologie du NB

How Are Seniors Injured?

Cases in the NB Trauma Registry						
	April 2014 to March 2015			April 2015 to March 2016		
Mechanism	Fall	MVC	Other	Fall	MVC	Other
	998	63	44	1164	61	45
	88.24%	5.57%	3.89%	89.40%	4.69%	3.46%
65 to 74	23.55%	65.08%	43.18%	23.37%	44.26%	53.33%
75 to 84	37.27%	30.16%	38.64%	36.68%	37.70%	28.89%
85 +	39.18%	4.76%	18.18%	39.95%	18.03%	17.78%

What is this telling us?

- **The VAST MAJORITY are FALLS**
- **Falls are the leading cause of injury admission in all age groups**
- **~40 % of seniors admitted with a FALL are 85+**

NB Trauma Program
Programme de traumatologie du NB

How Long Do They Stay In Acute Care?

Cases in the NB Trauma Registry	April 2014 to March 2015	April 2015 to March 2016
Average Length of Stay (days)	20.06	21.07
65 to 74	14.94	13.92
75 to 84	20.95	18.68
85 +	22.98	28.51

What is this telling us?

- **Average Length of Stay (LOS) increases with age (other factors involved?)**
- **For those 85+: Average LOS appears to be increasing**

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Where Do They End Up?

Cases in the NB Trauma Registry	April 2014 to March 2015			April 2015 to March 2016		
Discharge Disposition	Home	Another Facility	Died	Home	Another Facility	Died
	761	261	109	813	371	112
65 to 74	31.67%	18.77%	20.18%	33.09%	17.79%	9.82%
75 to 84	37.19%	38.70%	28.44%	35.55%	37.20%	36.61%
85 +	31.14%	42.53%	51.38%	31.37%	45.01%	53.57%

What is this telling us?

- **Good news: Majority of seniors with injury are discharged home >60%**
- **After injury ~25% of all seniors are discharged to another facility for further care – with need increasing with age**
- **Bad news: Regardless of injury severity – there is >50% mortality in 85+ age group & mortality for all seniors is high**

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GA ≠ CGA

1. SCREENING
2. ASSESSMENT

} geriatric assessment

3. GOAL-DIRECTED INTERVENTION
4. FOLLOW-THROUGH

} CGA

PROACTIVE CGA

CASE FINDING

Case finding is done SYSTEMATICALLY based on pre-defined criteria and processes.

EARLY

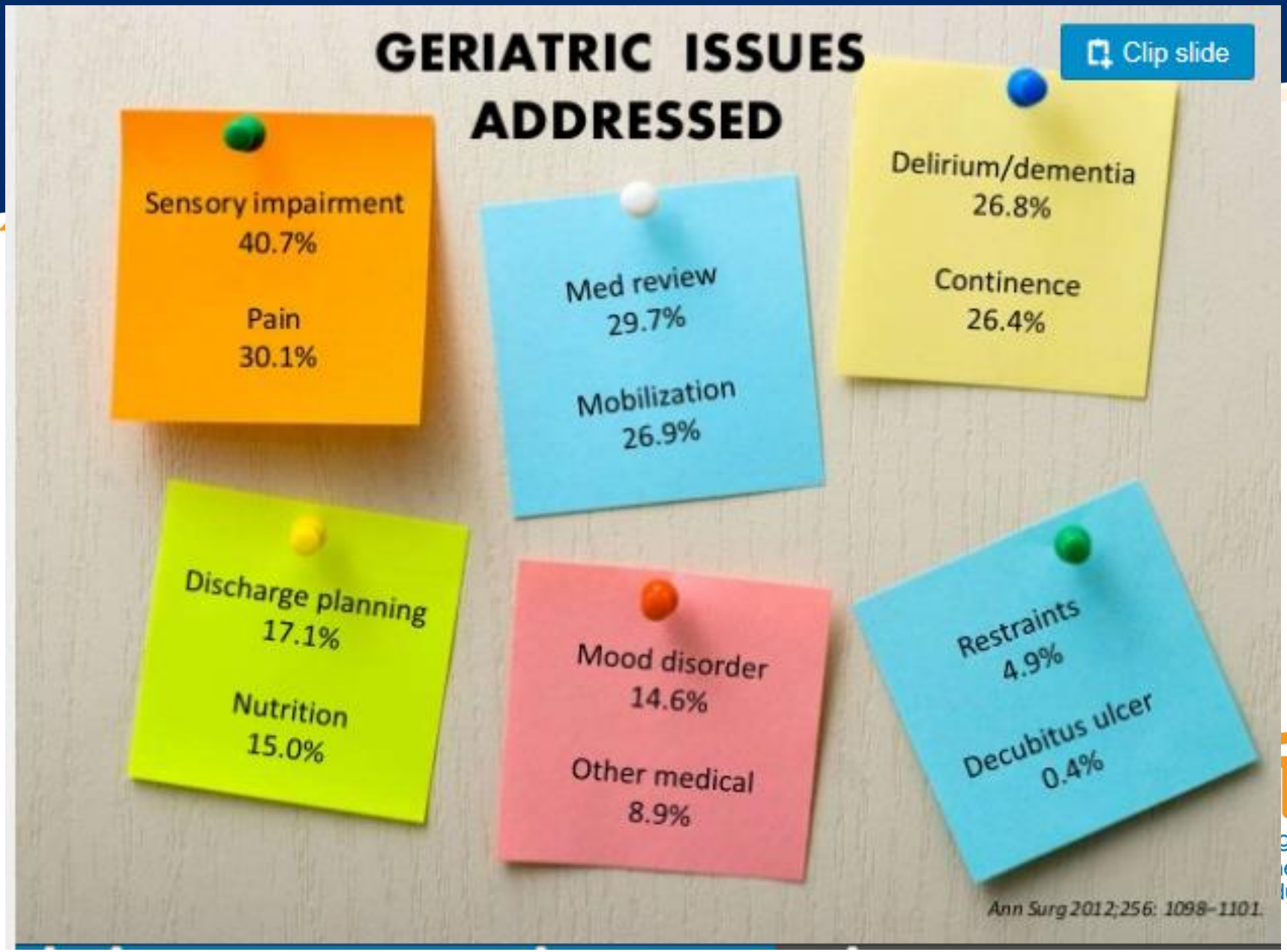
Involvement is early -- before treatment decisions are made.

PREVENTION

Focus on prevention of geriatric syndromes.

DIRECT

Recommendations are implemented directly.


GERIATRIC ISSUES ADDRESSED
Clip slide
Sensory impairment 40.7%
Pain 30.1%
Med review 29.7%
Mobilization 26.9%
Delirium/dementia 26.8%
Continence 26.4%
Discharge planning 17.1%
Nutrition 15.0%
Mood disorder 14.6%
Other medical 8.9%
Restraints 4.9%
Decubitus ulcer 0.4%
Ann Surg 2012;256: 1098–1101.

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.

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.

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.

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.

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.

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).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

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**

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.

* 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.

DALHOUSIE UNIVERSITY
Inspiring Minds

So where do we go from here?

- Focus on trying to understand the premorbid frailty level on arrival to hospital
- Try to individualize care based on frailty
- Build frailty assessment into the assessment process upon arrival to hospital

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So where do we go from here?

- Early Comprehensive Geriatric Assessment
  - Who can do this?
- Prevention of common geriatric syndromes in hospital
- Research focus on how Frailty impacts Trauma Outcomes

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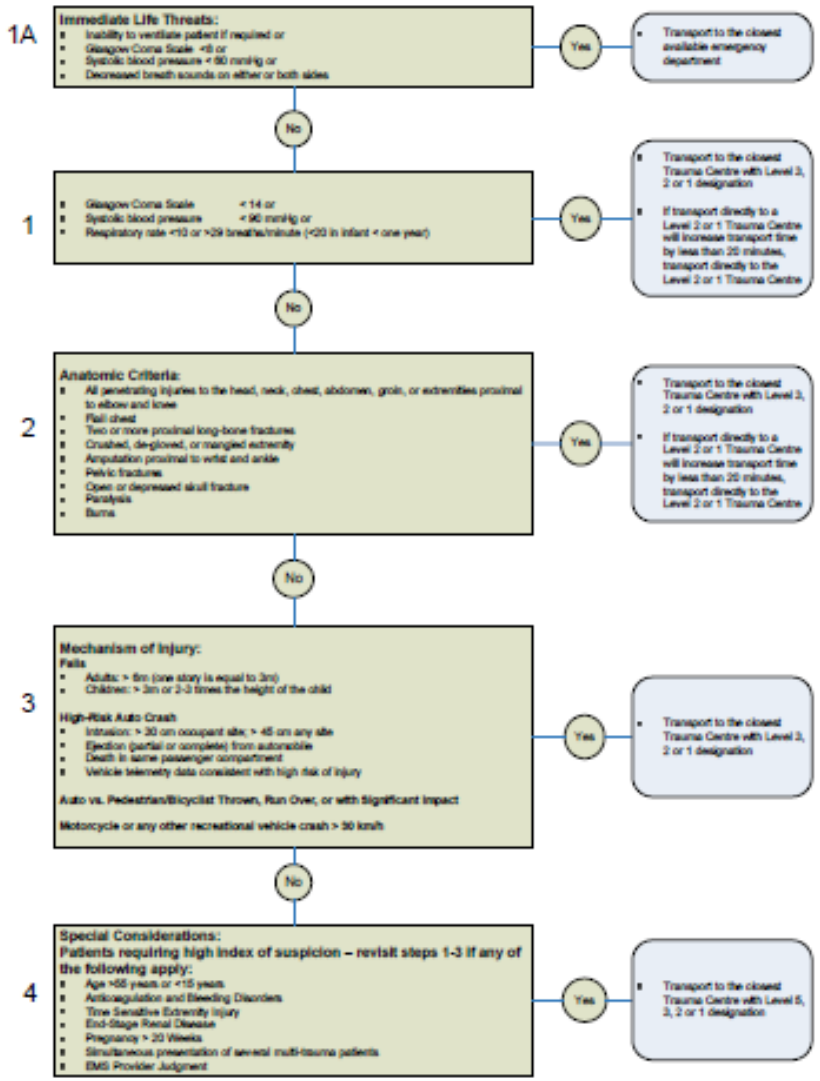
Field Trauma Triage Guidelines



CALL 1-888-790-9222

Version 1.0 - For more copies of this document, contact the NB Trauma Program at (506) 848-6040.
Field Trauma Triage Guidelines are adapted from: Sasser, S. M., Hunt, R. C., Sullivent, E. E., Wald, M. M., Mikhail, J., Jurkovich, G. J., et al. (2009) Guidelines for Field Triage of Injured Patients. Department of Health and Human Services Centers for Disease Control and Prevention

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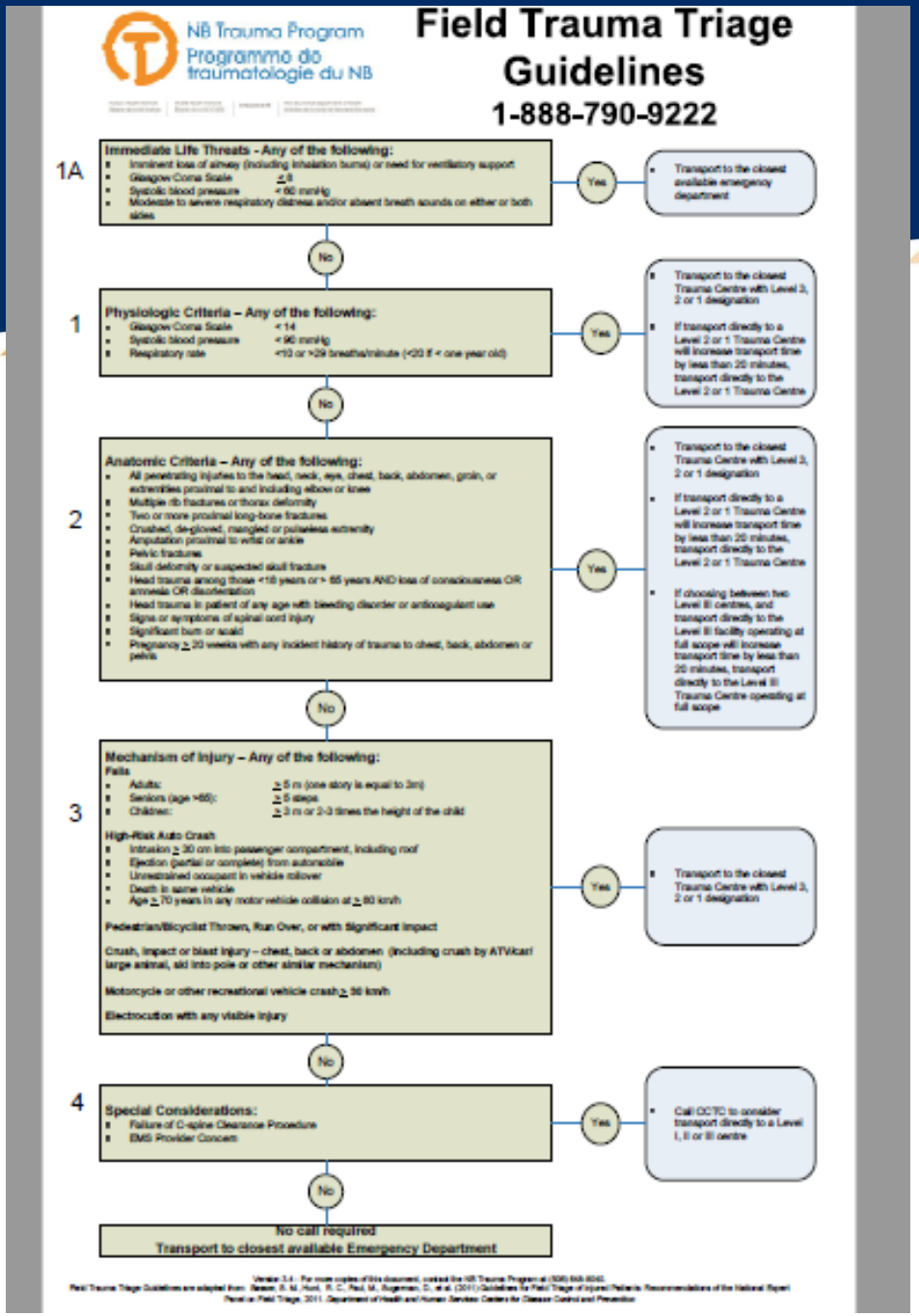

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Anatomic Criteria – Any of the following:

- All penetrating injuries to the head, neck, eye, chest, back, abdomen, groin, or extremities proximal to and including elbow or knee
- Multiple rib fractures or thorax deformity
- Two or more proximal long-bone fractures
- Crushed, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Skull deformity or suspected skull fracture
- Head trauma among those <18 years or > 65 years AND loss of consciousness OR amnesia OR disorientation
- Head trauma in patient of any age with bleeding disorder or anticoagulant use
- Signs or symptoms of spinal cord injury
- Significant burn or scald
- Pregnancy ≥ 20 weeks with any incident history of trauma to chest, back, abdomen or pelvis

Geriatric Trauma

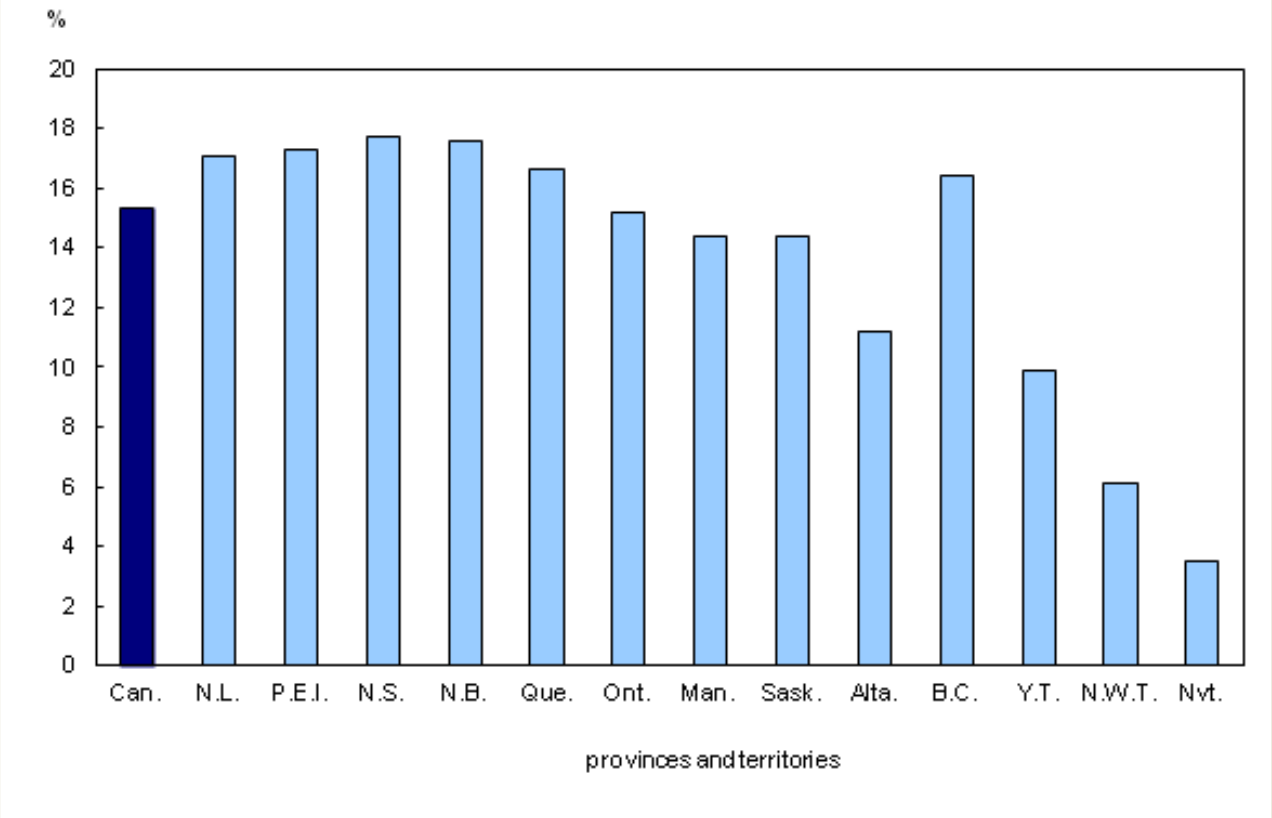
Atlantic Trauma and Emergency Medicine Conference
September 21, 2017

Judah Goldstein PCP, PhD
EHS Research Coordinator

EHS
Emergency Health Services

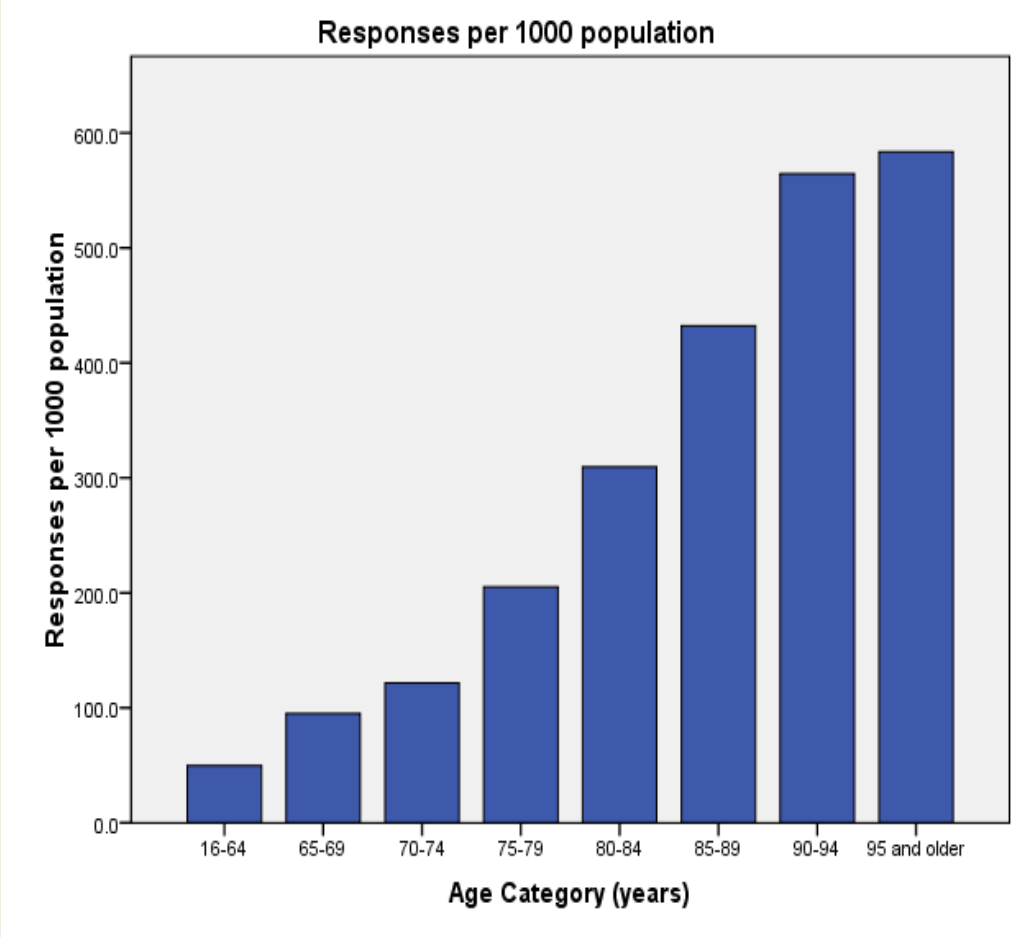
Population Ageing

- The population is ageing
  - NS has the oldest population in Canada



EHS Emergency Health Services

EMS Use in Nova Scotia



Goldstein et al. CJEM

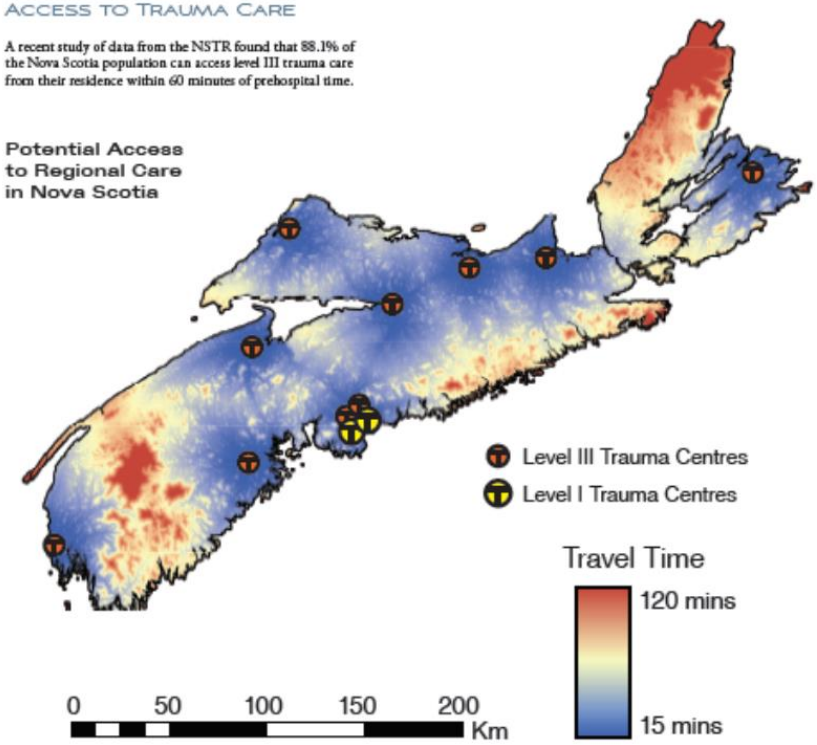

Nova Scotia Health Authority Zones
Cumberland Regional Health Care Centre
Amherst
Aberdeen Hospital
New Glasgow
St. Martha's Regional
Antigonish
Sydney
Cape Breton Regional
Valley Regional
Kentville
Truro
Colchester East Hants Health Centre
Halifax
QEII Health Sciences Centre
IWK Health Centre
NS Medical Examiner Service
Bridgewater
South Shore Regional
Yarmouth
Yarmouth Regional
NSHA Zones
Western
Northern
Eastern
Central
City/Town with regional hospital
nova scotia health authority

Nova Scotia

88.1% OF NOVA SCOTIANS HAVE ACCESS TO REGIONAL TRAUMA CARE WITHIN ONE HOUR OF PREHOSPITAL TIME

ACCESS TO TRAUMA CARE

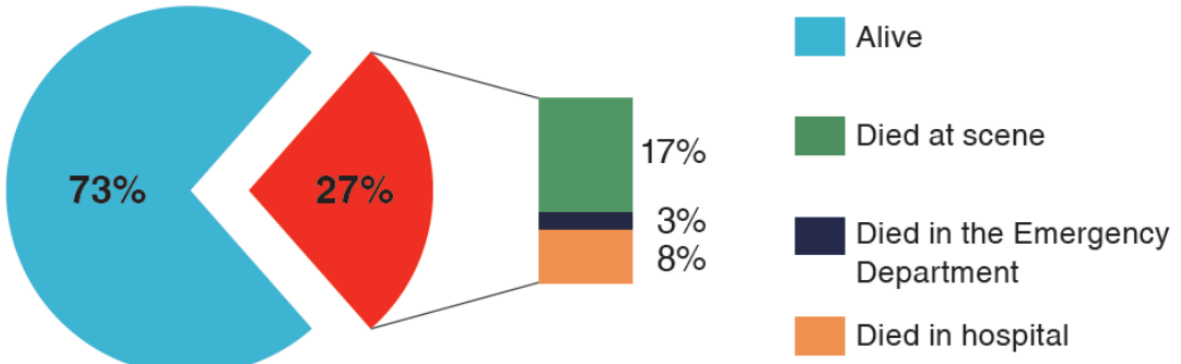
A recent study of data from the NSTR found that 88.1% of the Nova Scotia population can access level III trauma care from their residence within 60 minutes of prehospital time.



Above: Figure created by Dr. Gavin Tansley using data from the NSTR and EHS.

Tansley et al. 2017 CJEM

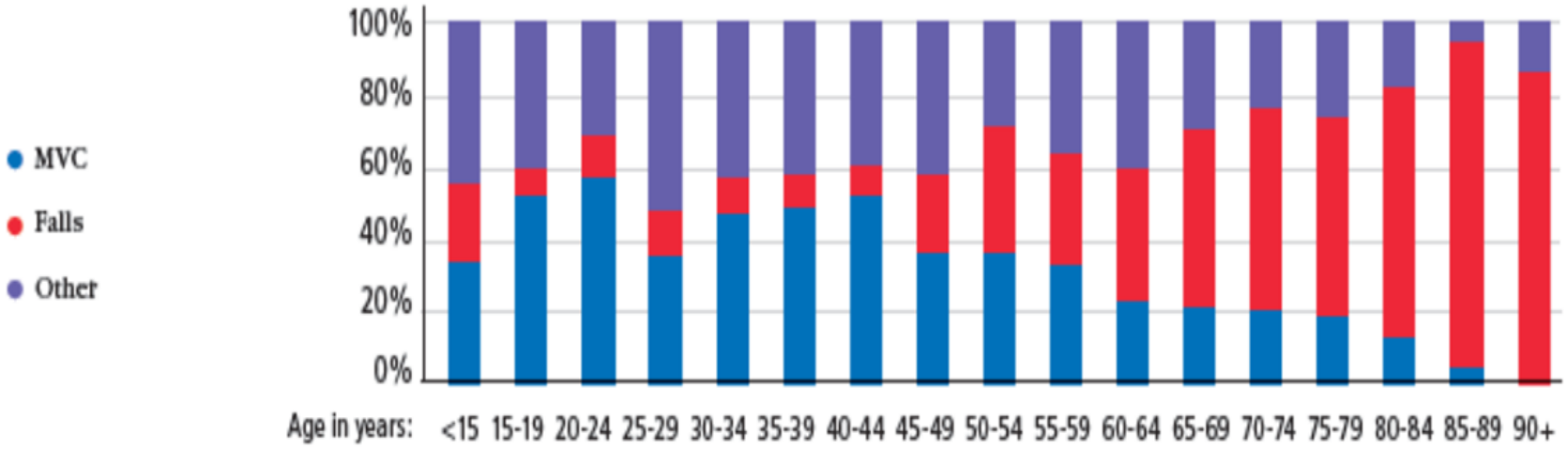
Major Trauma Outcomes 2014-15



Green, Trauma NS

Major Trauma in Nova Scotia:
Most Common Mechanism of Injury by Age Group
(2013/14)

Motor vehicle crashes are most common in the younger age groups, while falls are most prominent in seniors.



Green, Trauma NS

Trauma in Older Adults

- Mortality (adjusting for Injury Severity Scale) increases at **age 70 - geriatric trauma** *(Bonne and Schuerer 2013 Clin Geriatr Med)*
- More older adults living independent, active lives
- Geriatric trauma accounts for 23% of trauma admissions, fifth leading cause of death
- Blunt trauma
- Often under-triaged

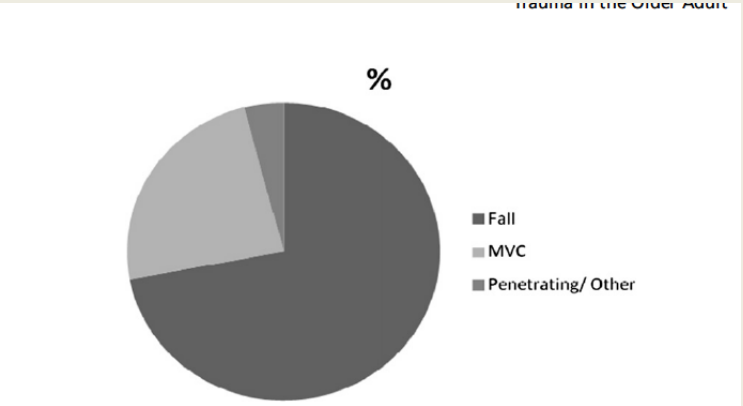


Fig. 1. Pie chart of injury mechanism in the elderly patient. MVC, motor vehicle accident.

EHS
Emergency Health Services

Trauma in Older Adults: Local Data

- Trauma - 14.5% of EMS responses (2010), second most prevalent complaint

Types of Trauma in NS

Age	Penetrating Trauma	Hip Trauma	Head Trauma
65-69	<10	69	76
70-74	<10	86	67
75-79	<10	172	86
80-84	0	251	109
85-89	0	269	99
90-94	0	197	64
95+	0	81	25

Goldstein et al. unpublished

EHS Emergency Health Services

Geriatric Major Trauma
April 1, 2015 – March 31, 2016
All Major Trauma = 884

Gender – 60% Male
Age (mean) – 76.9

Characteristic	Total Cases (n=263)
Expired prior to hospital arrival	31 (12%)
Total Admitted	217 (93.5%)
Common Mechanisms Falls MVC Pedestrian	 171 35 12
Mean Length of Stay	29.2 days
Discharged to LTC (of admitted)	11 (5.1%)
Arrived by air	27 (11.6%)
Treated in Tertiary Care	167 (72.4%

TRAUMA NOVA SCOTIA

Fitness and Frailty

Frailty – multidimensional, extreme vulnerability

- Frailty can be measured by a **deficit accumulation index** (0-1.0) (e.g. 11/44=0.25) (Mitnitski and Rockwood 2001)

What does frailty have to do with trauma?

- Frailty index – strong independent predictor of outcomes (death, LTC placement) in major trauma (Joseph et al. 2014)
- State of health before the injury
- Both acuity and frailty are important

EHS Emergency Health Services

Injury Patterns

- Falls
  - Long bone injuries
  - Head injuries
  - C-spine injuries
  - Pelvic fractures
- MVC
  - Chest (25%)

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- Compared to those <65:
  - Larger % of falls lead to serious injury (e.g. TBI)
  - Same level falls lead to more serious injury
  - More frequent head/neck, chest, pelvic, and extremity injuries
  - Higher fall-related death rate
  - Falls are the most common cause of EMS use in the presence of dementia

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Risk Factors for Multiple Falls

- History of previous falls
- Psychoactive medications
- Impaired hearing or vision
- Poor balance
- Impaired mobility

Fall Management

- Identify the cause (risk factors, collateral, underlying medical cause)
- Assess injuries
- Discuss falls risk
- Plan (referral programs, Lifeline)

EHS Fall Referral Program

- EHS has partnered with Falls Prevention within several communities in Nova Scotia to help identify older adults at risk for serious injury from falls.
- Paramedics identify and enroll people 65y or older whose chief complaint was a fall and are not being transported to hospital.
- Clinical Support Desk assists crews with enrollment – send referral
- Falls Prevention begins follow-up services.

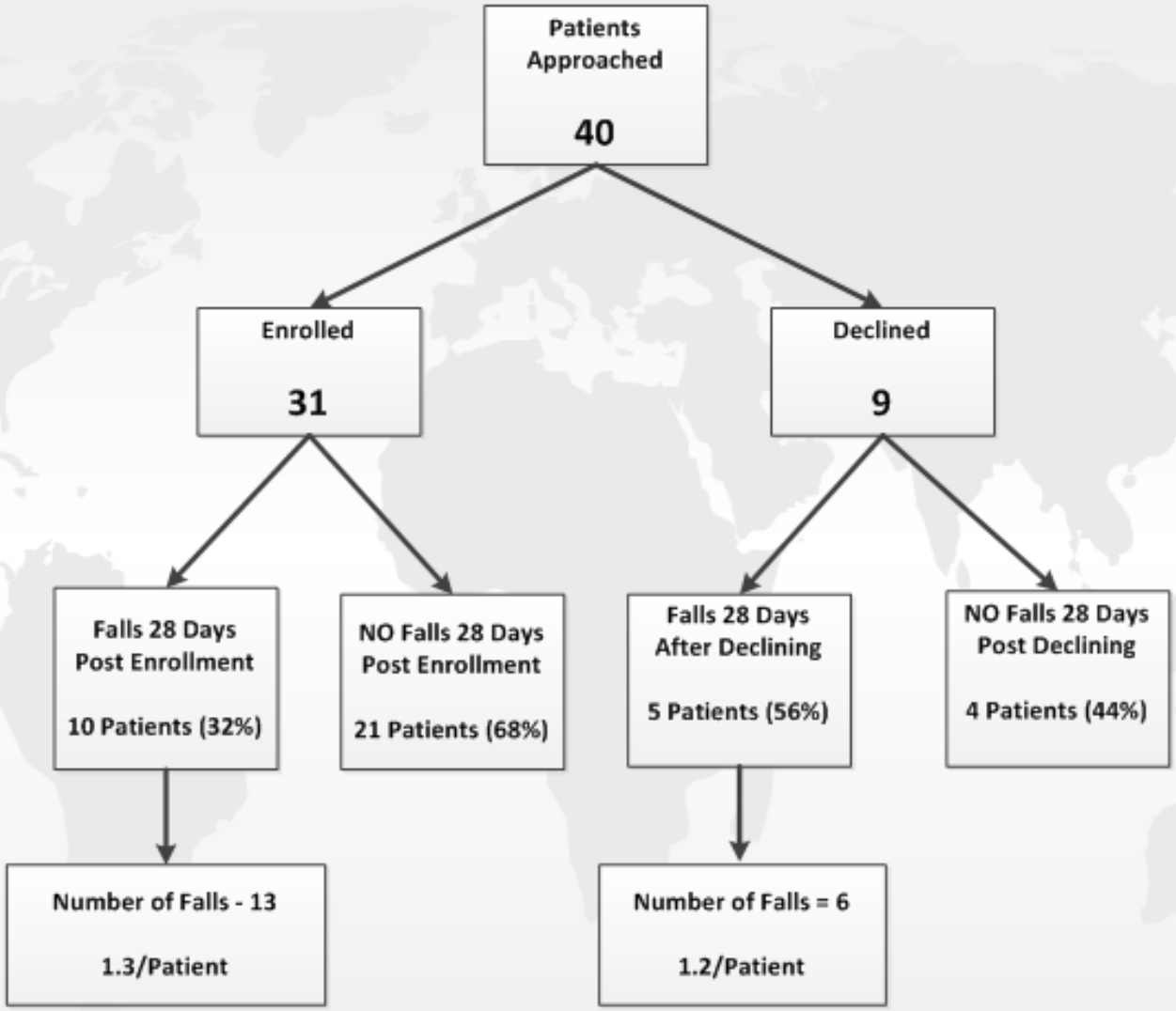
Courtesy of T. Dobson

Information Exchange

Paramedic crews chart information to assist Falls Prevention:

- How often patient falls.
- Recent medication changes or illnesses.
- Condition of residence.
- Care giver support, if any.

Falls Prevention then calls the patient to discuss enrollment plan and schedules a home visit.



Courtesy of T. Dobson

Benefits of Program

- In the past this patient population would be missed.
- Paramedics are ensuring th[illegible] receive timely interventions t[illegible]ent a sentinel event.
- This is [illegible] simple program that makes use of cu[illegible]pacity in delivering extra care.

Are falls programs effective?

Courtesy of T. Dobson

Falls Prevention Programs

Comans et al. 2013 – Observational, pilot study

Population: Older adults (65 years +) living in the community that had a recent fall

Intervention: EMS referral pathway to a community falls-prevention team

Comparison – standard care

Outcome – reduced EMS responses

Results: only 17/638 referrals in two years

- Intensive education on program
- Fallers – mean age 81, 61% female, trip/slip main cause (26%)
- Inappropriate referrals (advanced dementia)

- Issues – lack of study resources, not regionalised, staff turn-over

Conclusion: Falls program did not translate into EMS referrals

EHS Emergency Health Services

Logan et al. 2010 BMJ –RCT

Population: 60 years, live at home, recent fall with EMS use, participants identified post response*

Intervention: multifactorial falls team

Comparison: usual practice

Outcome: falls rate

Results: 204 enrolled

- 55% reduction in rate of falls in intervention group
- Time to first fall less in intervention group

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Emergency Health Services

Novel EMS protocol to safely prevent unnecessary EMS transports: Case Review

- **Eligibility:**
  - Ground level fall
  - Able to consent

- **Tier 3 criteria – Safe for non transport**
  - Simple contusion or skin tear
  - No complaint
  - No obvious injury
  - No hip pain, full ROM
  - Ambulatory
- **<u>Needs to be prospectively refined and validated</u>**

EHS Emergency Health Services

Williams et al. 2014 PEC