Calling 911 at 91!
Geriatrics and EMS Interface

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No financial disclosures of conflicts of interest

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Objectives

- Understand pearls/pitfalls in triage of geriatric patients
- Describe community paramedic programs
- Review best practices for prehospital care of geriatric patients

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Background

- Over 20% of the population by 2040
- Falls most common mechanism of injury
- Motor vehicle collisions second most
- Age and physiologically related challenges
- Worse outcomes in geriatric patients, irrespective of mechanism

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Triage

- Current schemes permit under triage
- Allow for paramedic judgement

RED CRITERIA

High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
• Penetrating injuries to head, neck, torso, and proximal extremities • Skull deformity, suspected skull fracture • Suspected spinal injury with new motor or sensory loss • Chest wall instability, deformity, or suspected flail chest • Suspected pelvic fracture • Suspected fracture of two or more proximal long bones • Crushed, degloved, mangled, or pulseless extremity • Amputation proximal to wrist or ankle • Active bleeding requiring a tourniquet or wound packing with continuous pressure	**All Patients** • Unable to follow commands (motor GCS < 6) • RR < 10 or > 29 breaths/min • Respiratory distress or need for respiratory support • Room-air pulse oximetry < 90% **Age 0–9 years** • SBP < 70mm Hg + (2 x age in years) **Age 10–64 years** • SBP < 90 mmHg or • HR > SBP **Age ≥ 65 years** • SBP < 110 mmHg or • HR > SBP

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

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YELLOW CRITERIA

Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash – Partial or complete ejection – Significant intrusion (including roof) • >12 inches occupant site OR • >18 inches any site OR • Need for extrication for entrapped patient – Death in passenger compartment – Child (age 0–9 years) unrestrained or in unsecured child safety seat – Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height > 10 feet (all ages)	**Consider risk factors, including:** • Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers **If concerned, take to a trauma center**

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

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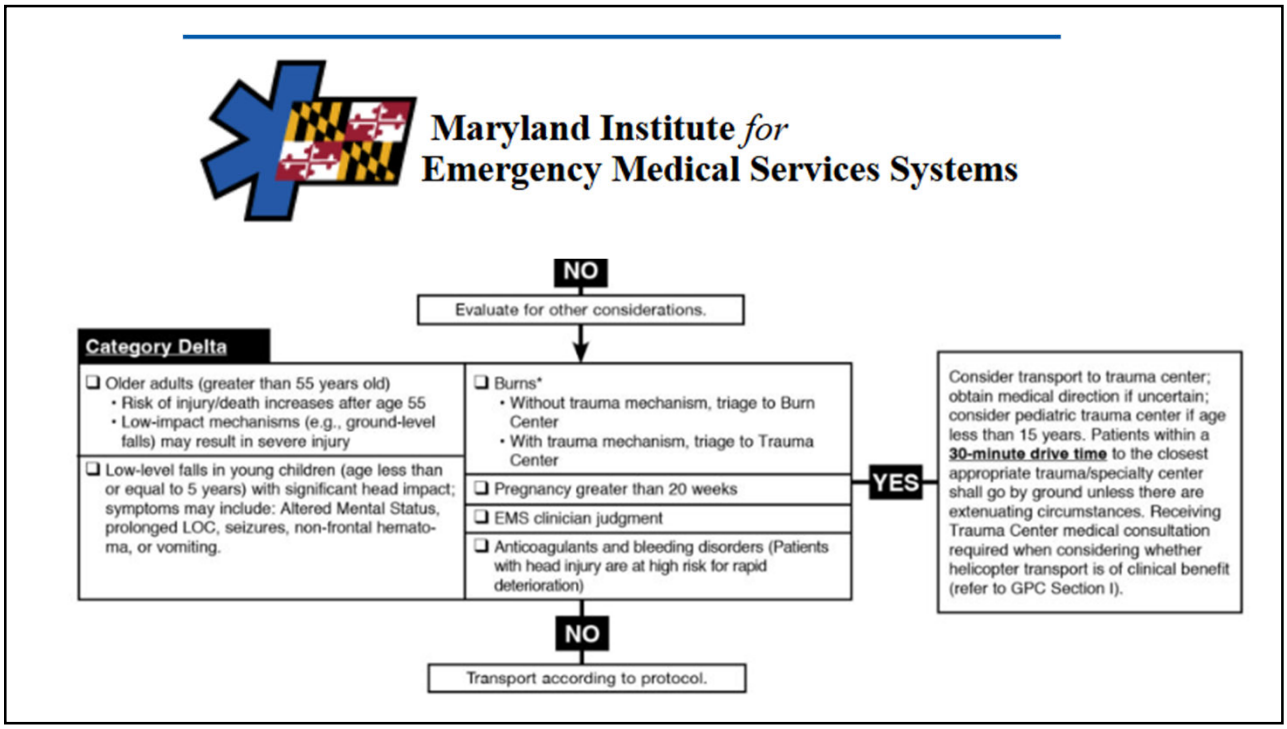

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Bumping Up Against the Age Barrier

- Ohio pioneered age specific criteria
- Criteria integrated into National Field Triage Decision Scheme

Category	Ohio Guidelines (Pre-2015)	National NFTDS (2011)	National NFTDS (2021)
Structure	4-step sequential algorithm	4-step sequential algorithm (Steps 1-4)	2-category risk-based system (High Risk/Moderate Risk)
Physiologic Criteria	GCS ≤10; If GCS >10, any 2 of: HR <50 or >120 bpm, SBP <80 mmHg or absent radial pulse, RR <10 or >24 breaths/min	GCS ≤13; SBP <90 mmHg; RR <10 or >29 breaths/min	Motor GCS <6; SBP <110 mmHg (age ≥65y); HR >SBP (age ≥10y); Respiratory distress; SpO2 <90%
Geriatric-Specific Modifications	SBP threshold raised to **100 mmHg** (vs. 90 mmHg); GCS changed to ≤14 (vs. ≤13); Added: long	SBP <110 mmHg noted as potentially representing shock after age 65y (Step 4 special	SBP <110 mmHg for age ≥65y (moved to high-risk criteria); Age >55y and >65y as special criteria

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Benefits

- Improved sensitivity for detection of severely injured older adults
- SBP<110 mm Hg criteria moves into high risk physiological criteria
- Incentivizing paramedic judgement

HOSPITAL TRAUMA TEAM

Box 1. Geriatric Trauma Activation Criteria

- GLF for patients on antithrombotic agents
- SBP less than 110
- Heart rate above 90
- SI greater than 1
- GLF patients not on anticoagulants with GCS < 14 and signs of head trauma

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Triage Take Aways

- Encourage trauma center referrals when appropriate
- Educate paramedics about age related physiologic changes
- Relative hypotension can occur at "normal" pressures
- Mechanism not well correlated with injury severity
- Elder abuse linked to significantly increased risk of death

National Trauma Field Triage Guidelines

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Frailty Index

- Association with ICU admission
- Association with mortality
- Increased hospital LOS

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Frailty: PRISMA-7

Tool	Key features	Evidence of predictive accuracy	Strengths	Limitations/barriers to prehospital use
PRISMA-7 (Programme on Research for Integrating Services for the Maintenance of Autonomy)	-7-item questionnaire -Self-reported -Screens for disability and comorbidity	-AUC: 0.88 -Sensitivity: 84%, Specificity: 78% -Best at distinguishing pre-frail vs. frail (AUC: 0.71)	-High diagnostic accuracy -Short administration time -Strong inter-rater reliability ($r = 0.75$) -Effective in ED triage settings	-Not yet validated for EMS use -Dependent on patient response -No digital tool for EMS application -Requires further feasibility testing in prehospital settings

- Lack of prehospital validation
- Lengthy assessment
- Need for additional training and education

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Beyond Emergency Response

Reducing 9-1-1 Emergency Medical Service Calls By Implementing A Community Paramedicine Program For Vulnerable Older Adults In Public Housing In Canada: A Multi-Site Cluster Randomized Controlled Trial

CERTIFIED COMMUNITY PARAMEDIC
KNOWLEDGE.EXPERIENCE.EXCELLENCE
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PREHOSPITAL EMERGENCY CARE
OFFICIAL JOURNAL OF THE NATIONAL ASSOCIATION OF EMS PHYSICIANS
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Community Paramedic Study

- Randomized controlled trial
- 15 intervention sites, 15 standard of care
- 30 total subsidized housing sites (Age 55 and older)
- Weekly paramedic drop ins

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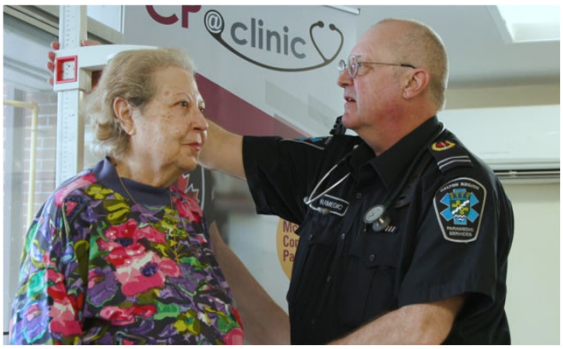
Improve older adults' health and quality of life, and reduce their social isolation

Better **connect** older adults with primary care, and community resources

Reduce the economic burden of avoidable 911 calls by older adults

CP@clinic©



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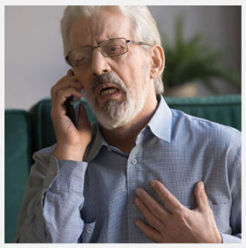
CP@clinic Reduces 911 Calls by 19-25%

The average number of ambulance calls per month was **significantly lower** in buildings that had CP@clinic compared to control buildings without CP@clinic, across **multiple** communities.



- **19%** less calls in the CP@clinic multi-site randomized controlled trial[1]
- **22%** less calls in 3 intervention buildings in Hamilton, ON[2]
- **25%** less calls in the CP@clinic pilot study[3]

This reduction in 911 calls may allow for the reallocation of ambulances for those who are in greater need

CP@clinic Improves Quality of Life

Those who attended CP@clinic showed significant improvements in:

- self-care (washing & dressing themselves)[1]
- ability to engage in "usual activities"[1,2], and
- pain and discomfort[1]

There was a significant QALY gain ranging from 0.05 - 0.15 for those attending CP@clinic sessions[1,2]
QALYs: Quality-Adjusted Life Years

Improved quality of life can lead to older adults developing better coping skills and increased resiliency

***Quality-adjusted life years (QALYs) are a common measure used to assess whether a drug, intervention, or program can increase or decrease the number of years in good health lived by participants. QALY is defined as one year of life lived in perfect health.*[4]

Increase in quality adjusted life years
Cost savings to the system
Shared data base/coordination of care
Improved blood pressure

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General Considerations

PHYSIOLOGIC

Atypical response to trauma
Higher systolic targets?
Less physiologic reserve
Medication interactions
Potential for delirium

ANATOMIC

Frailty
Brittle bones
Dentures
Less neck flexibility

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General Considerations

ENVIRONMENTAL

Keep patients warm
Impaired thermoregulation

SOCIAL

Bring medicines
Family contact for collateral

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BEST PRACTICES GUIDELINES
GERIATRIC TRAUMA MANAGEMENT

THE **COMMITTEE** ON **TRAUMA**

- ABCDE(F)
- Occult hypotension
- Increased use of laboratory markers
- Modify doses of RSI agents
- Warmed IV fluids
- Skin breakdown occurs in < 2 hours (Cervical collars!)

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Case Scenario

82 yo F ground level fall, landed on his back
Hx of HTN, DM, CAD
Reports right sided CP
BP: 134/72, P: 92, R: 20, Sp02: 94%
Pain to palpation of right chest
Pelvis stable
Ambulatory

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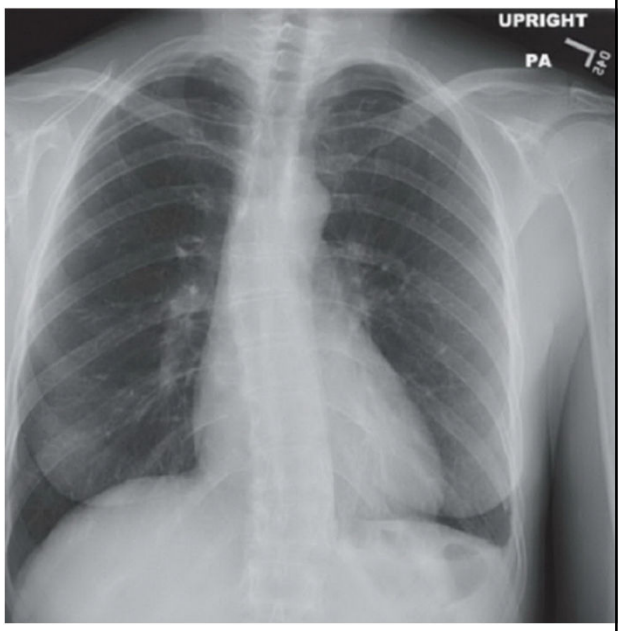
Case Scenario

- **Transport to community hospital**
- **Patient reported worsening SOB and chest pain**
- **BP: 90/systolic upon arrival, P: 82, Sp02 83%**
- **Diminished lung sounds**
- **Retroperitoneal bleed**
- **Review of medications= DOAC use**



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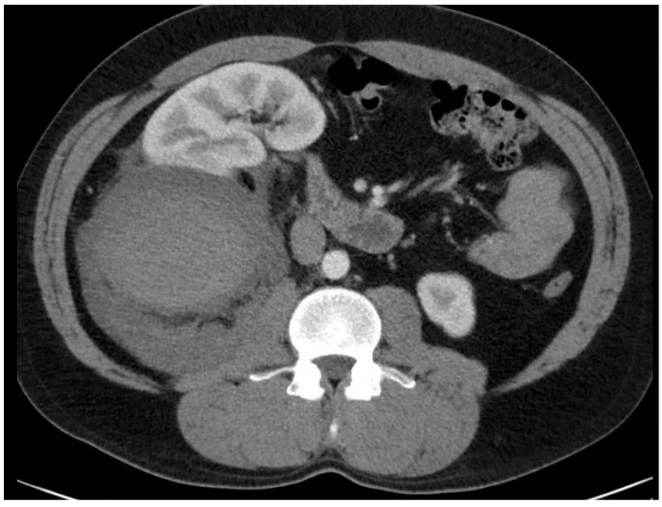
Rib Fractures, So What?

- Increased hospital LOS
- Risk for intubation
- Need for pain control
- Rehabilitation
- Downstream complications



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Summary

- Under triage in EMS is common
- Lower threshold for trauma activation
- Appreciate physiology unique to elderly patients
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