

SFBA RTCC

A FOCUS ON RE-TRIAGE
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What is Re-Triage

- A subset of transfers into the trauma system for *immediate availability* of a higher level of care or *emergent specialty care*
- Primary triage occurs in the field and is guided by well defined triage tools
 - 2011 Guidelines for Field Triage of Injured Patients
 - Sasser SM, Hunt RC, Faul M, et al; Center for Disease Control and Prevention
- Secondary Triage (Inter-hospital transfer)
 - Less well defined
 - Chapter 4, Resources for Optimal Care of the Injured Patient offers a list of "Criteria for Consideration of Transfer."
 - Many LEMSAs have adopted guidelines to identify the need for "urgent" and "emergent" criteria.

Provides instructions for rapid transport arrangements

Identifies patient indications for rapid re-triage

Defines patients for urgent transfer

Provides guidance for choosing transport agency resource level

SFBA CLASSIFICATION (Rev 06/15/14)
 Trauma Transfer Procedure and Criteria

Category	Criteria	Resource Level
Emergency Transfer	Life-threatening injury or illness requiring immediate transport to a higher level of care.	Level 1
Urgent Transfer	Injury or illness requiring transport to a higher level of care within a specified time frame.	Level 1
Standard Transfer	Injury or illness requiring transport to a higher level of care.	Level 1
Non-Emergent Transfer	Injury or illness requiring transport to a higher level of care.	Level 1

System Performance

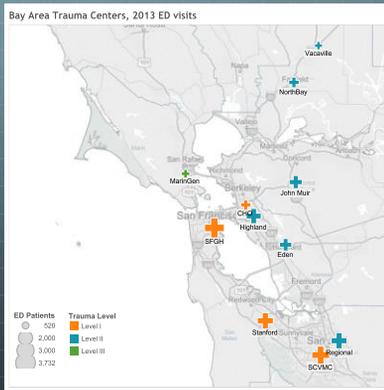
- How do we measure how well we get transferred patients into the system?
 - Retrospective review of transfer patients
 - Development of ongoing, concurrent quality measures
- How do we improve our performance as a system?
 - Develop a consistent message
 - Deliver the message through education
 - Deliver the message through feedback on performance

Retrospective Review

- Evaluation of all 2013 patients from each trauma center
- Development of a single database at Stanford, populated with de-identified patient records from each trauma registry
- Evaluate what data points are currently available and readily collected that will help us improve and evaluate the re-triage process
- Evaluate performance and outcomes of transferred patients compared to patients triaged directly to a trauma facility
- Identify variables that should be collected in the registry to evaluate and improve the re-triage process

Retrospective Review

- Special Thanks to the Social Emergency Medicine Group at Stanford University Medical School
 - Ewen Wang
 - Associate Director Pediatric Emergency Medicine
 - Elizabeth Pirrotta
 - EM Data Management & Analysis Specialist
- Trauma Registrars



Retrospective Review

- Evaluation of all 2013 patients from each trauma center
- Making progress
- Development of a single database at Stanford, populated with de-identified patient records from each trauma registry
- Done

Retrospective Review

- Evaluate what data points are currently available and readily collected that will help us improve and evaluate the re-triage process
- NTDB and TQIP require very little data on retriage and trauma transfers
- Most centers collect very little specific to transfers
- Although EMSA, LEMSAs, ACS and other bodies recognize that rapid retriage is an essential part of a successful system, there is no consistent & formal collection of data points to evaluate process and outcome measures of performance in our registries.

Retrospective Review

- | | |
|--|---|
| <ul style="list-style-type: none"> ED Documentation of <ul style="list-style-type: none"> Documentation of pre-hospital or ED resuscitation SBP<90 Documentation of pre-hospital or ED resuscitation GCS<9 Penetrating injury to the head, chest or abdomen | <ul style="list-style-type: none"> ED Treatments <ul style="list-style-type: none"> Electrical Countershock Repair of Heart or pericardium Pericardiotomy Tracheostomy/cricothyroidotomy Ventriculostomy |
|--|---|

Retrospective Review

- | | |
|---|--|
| <ul style="list-style-type: none"> ED Treatment Group <ul style="list-style-type: none"> Bag/ETT Assist Bag/LMA Assist BVM Cardiopulmonary Resuscitation (CPR) Mechanical Ventilation End-Tidal CO₂ ET Intubation Ventilator | <ul style="list-style-type: none"> ED Treatment Group <ul style="list-style-type: none"> Cryoprecipitate FFP, Fresh Frozen Plasma Massive Transfusion Packed Cells (PRBC) Platelets Transfusion of Other Urgent O Neg |
|---|--|

Retrospective Review

- 18772 records in database
- 11 trauma centers
- Each trauma center collects and stores data slightly different so it is a complex task to combine each registry into a unified dataset
- Evaluate performance and outcomes of transferred patients compared to patients triaged directly to a trauma facility

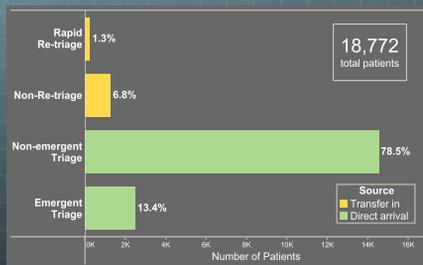
Retrospective Review

- Evaluate performance and outcomes of transferred patients compared to patients triaged directly to a trauma facility
- What is the median time from arrival at the referring center to the arrival at a trauma center for all transferred patients compared to the rapid re-triage patients?
- How does the mortality rate for the rapid re-triage patients compare to patients that meet similar screening data points that were triaged to a trauma center primarily?
- Can we use this information to build a better tool to monitor this assessment?

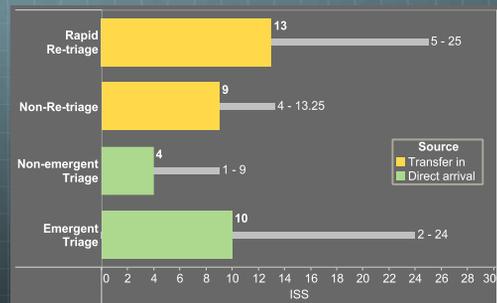
Early Results

- Data from 10 of the 11 trauma Centers
- 18,772 patients were included in the database
- 1740 (9.3%) were transfers
- 234 (13.4%) of transfers had rapid re-triage criteria
- 62 (3.6%) of transferred patients died
- 47 (2.7%) transferred patients were rapid re-triage and died
- Reviewed ISS, Admission Rates
- LOS, Mortality Rates
- Penetrating vs Blunt

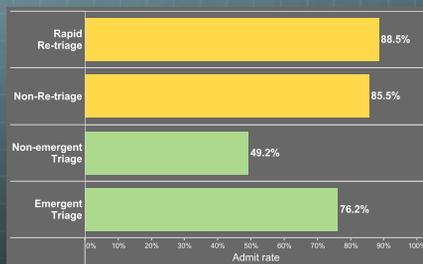
Triage & Arrival Status Groups



Median ISS



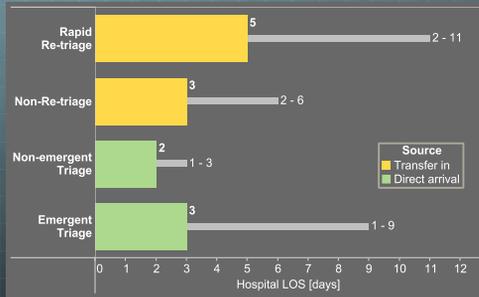
Admit rate



ICU vs. Ward admit rate



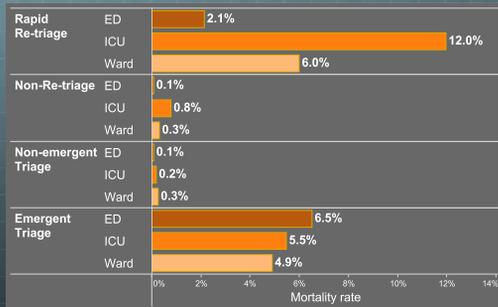
Median Hospital LOS



Mortality rate



Where did patients die?



Elapsed time

	Rapid Re-triage	Non re-triage transfer	Triage directly to TC
N	234	1259	17,021
% with recorded times	75%	78%	62%
Median ISS (IQR)	13 (5-25)	9 (4-13)	5 (1-9)
Mortality	47 (20%)	15 (1.2%)	498 (2.9%)
Time in to time out at TF, m	123 (56-213)	193 (122-275)	
Time in TF to time in TC, m	171 (89-264)	253 (173-343)	
Travel time TF to TC, m	38 (25-58)	42 (28-70)	
Travel time scene to TC, m			18 (13-25)

Time by Mortality

of Rapid Re-triage Patients	Died	Survived
N	47	187
Median ISS (IQR)	26 (17-38)	10 (4-18)
Time in to time out at TF, m	146 (81-216)	113 (56-211)
Time in TF to time in TC, m	191 (111-260)	165 (90-258)
Travel time TF to TC, m	39 (28-51)	38 (24-59)

Blunt vs Penetrating

of Rapid Re-triage Patients	Blunt	Penetrating
N	124	110
Median ISS (IQR)	17.5 (10-26)	7 (1-14)
Mortality	39 (32%)	8 (7.3%)
Time in to time out at TF, m	170 (114-234)	69 (46-140)
Time in TF to time in TC, m	204 (152-301)	110(66-230)
Travel time TF to TC, m	45 (27-65)	36 (22-52)

- If penetrating injury patients can have 70 minute Time in to Time out transfer times, is this a transport agency problem? Why are the blunt trauma transfers so long?
- How quickly does the decision to transfer occur?

Summary of Findings

- 🌐 Rapid Re-triage patients are
 - 🌐 Sicker (higher ISS)
 - 🌐 More likely to be admitted (overall and to ICU)
 - 🌐 Have longer LOS (mean and median)
 - 🌐 More likely to die (overall)
 - 🌐 More likely to die late deaths (in ICU)
- 🌐 Blunt trauma transfer (rapid re-triage) patients
 - 🌐 Have higher ISS's
 - 🌐 Have higher mortality rates
 - 🌐 Have longer transfer times

System Performance

- 🌐 Identify variables that should be collected in the registry to evaluate and improve the re-triage process
 - 🌐 Discussed with Lancet
 - 🌐 Very easy to build a custom regional "transfer in/PI" page to evaluate transfer performance, particularly if each TC will use the same page
 - 🌐 Cost is limited since it can be spread evenly across all eleven (now 12) trauma centers

System Performance

Retriage Criteria Data Points

- | | |
|---|---|
| <ul style="list-style-type: none"> 🌐 Blood Pressure/Perfusion <ul style="list-style-type: none"> 🌐 Any systolic BP < 90 at the referring facility or in transport 🌐 Transfusion of any blood products prior to TC arrival 🌐 Resuscitation with > 2 liters at the referring facility | <ul style="list-style-type: none"> 🌐 Neurologic 🌐 Any GCS < 9 prior to arrival at the TC 🌐 Any 2 documented 2 point GCS deterioration at the referring facility 🌐 Any documented open skull fracture 🌐 Any documented anisocoria |
|---|---|

System Performance

Retriage Criteria Data Points

- | | |
|---|---|
| <ul style="list-style-type: none"> 🌐 Anatomic 🌐 Penetrating Injury to <ul style="list-style-type: none"> 🌐 Head 🌐 Neck 🌐 Chest 🌐 Abdomen 🌐 Flank or Back 🌐 Ischemia or loss of pulse in any extremity | <ul style="list-style-type: none"> 🌐 Transfer Times 🌐 Time of arrival at transferring facility 🌐 Time first transfer request received at TC 🌐 Time patient left transferring facility 🌐 Time patient arrived at TC 🌐 Mode of transport |
|---|---|

System Performance

Retriage Criteria Data Points

- 🌐 **Other Data**
 - 🌐 Studies performed at the transferring facility
 - 🌐 Procedures performed at the transferring facility
 - 🌐 Common identifiers/code for referring facilities
 - 🌐 Availability of referring facility records
 - 🌐 Availability of transport agency records

System Performance

- 🌐 **Education**
 - 🌐 Development of a common message
 - 🌐 EMSA looking at system-wide re-triage
 - 🌐 Develop common goals
 - 🌐 Evaluate different processes for best practice
 - 🌐 Develop strategies for broad comprehensive delivery of the message
 - 🌐 State Summit
 - 🌐 Regional Meetings
 - 🌐 Trauma Centers and "Buddy" hospitals



QUESTIONS?