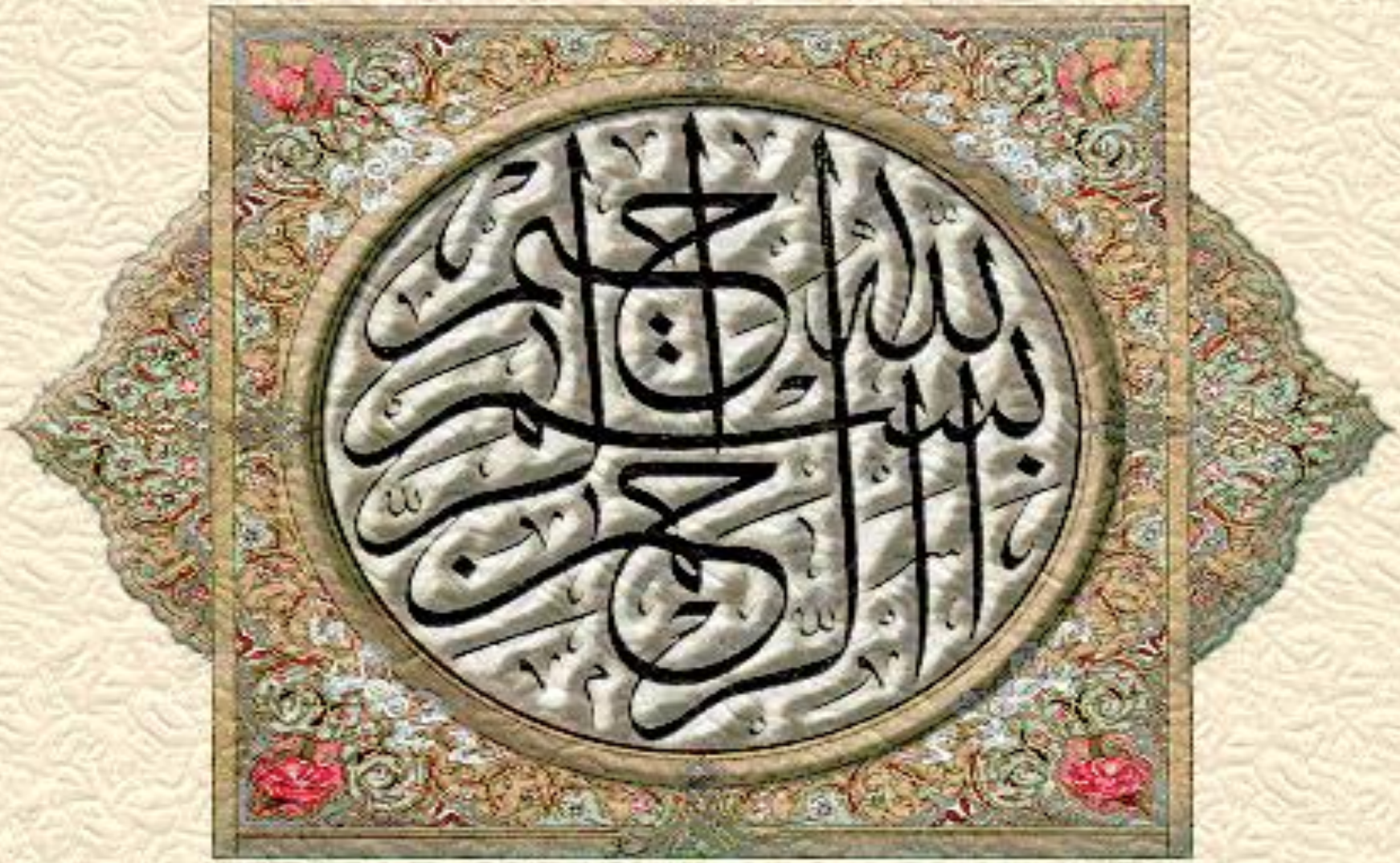

بسم الله الرحمن الرحیم

Triage

Dr. Mohsen Pazouki M.D.

Minimally Invasive Surgical Sciences Research Center
Iran University Of Medical Sciences

Volunteer disaster victims, courtesy of Americorps, are assisted by emergency crews during a training exercise at the old Mile High Stadium in February.


Dr.Mohsen Pazooki

Triage

Is derived from " TRIER "

Since dr. Larry (Bonaparte's dr.) used it for dividing the injured soldiers

Triage

Triage Classification

- In normal conditions :
  - in Field
  - in Hospital
- In disaster :
  - in Hospital
  - in Presurgical Holding
  - in Field

Triage

Hospital Triage

- Goal :

To find high risk patients as soon as possible & to do the appropriate treatment based on their priority

Hospital Triage Systems

- ESI
- CTAS
- ATS
- MTS

MANCHESTER TRIAGE

MANCHESTER TRIAGE

Manchester Triage Scale

Level	Time frame
Level 1	Immediate
Level 2	10 min
Level 3	60 min
Level 4	2 h
Level 5	4 h

1. Identify the presenting complaint and pick an appropriate flow chart from the 52 choices

2.*Gather and analyze information using 6 general key discriminators to determine a level of priority* :

- Life threat (no airway, breathing, and circulation)
- Pain
- Hemorrhage
- Conscious level
- Temperature
- Acuteness (eg, started or acutely worse within the previous 7 days)

Triage

3. *Evaluate and select alternatives, using general and specific discriminators within the flow chart to identify the patient's general acuity*

Triage

CTAS

Canadian Emergency Department Triage and Acuity Scale Implementation Guidelines

Canadian Emergency Department Triage and Acuity Scale Implementation Guidelines

Assessment	Triage Level	Physician assessment	Nurse assessment
Resuscitative	1	Stat	Stat
Emergent	2	<15 min	<15 min
Urgent	3	<30 min	<30 min
Less urgent	4	<1 h	<1 h
Non-urgent	5	<2 h	<2 h

LEVEL I – RESUSCITATION

- **Code/arrest**
- **Major trauma**
- **Shock states**
- **Unconscious**
- **Severe respiratory distress**

Typical patients:

- Non responsive
- Vital signs absent/unstable
- Severe dehydration
- Severe respiratory distress

Triage

LEVEL II–EMERGENT

- Altered mental state
- Head injury
- Severe trauma
- Neonates
- Eye pain
- Chest pain
- Overdose
- Abdominal pain
- GI bleed
- CVA
- Asthma
- Dyspnea
- Anaphylaxis
- Vaginal bleeding / acute pelvic lower abdominal pain
- Serious infections

Triage

LEVEL II–EMERGENT

- Fever (young children)
- Fever
- Children
- Infants less than 7 days old
- Vomiting and diarrhea
- Acute psychosis / extreme agitation
- Diabetes
- Headache
- CVA/abdominal/groin pain
- Severe pain (Pain Scales)
- Abuse/neglect/assault
- Drug withdrawal — severe — (delirium tremens or other)
- Chemotherapy

LEVEL III–URGENT

- Head injury
- Moderate trauma
- Asthma, mild/moderate
- Dyspnea, moderate
- Chest pain
- GI bleed
- Vaginal bleeding and pregnancy
- Seizure
- Acute psychosis and/or suicidal
- Acute pain, severe (8–10/10)
- Acute pain, moderate (4–7/10)
- Vomiting and/or diarrhea: age ≤2 years
- Dialysis (or transplant patients)

LEVEL IV–LESS URGENT

- Head injury
- Minor trauma
- Abdominal pain
- Headache
- Earache
- Chest pain
- Suicidal/depressed
- Corneal foreign body
- Back pain, chronic
- URI symptoms
- Vomiting and/or diarrhea, no signs of dehydration (age >2)
- Acute pain, moderate (scale 4–7/10)

LEVEL V–NON URGENT

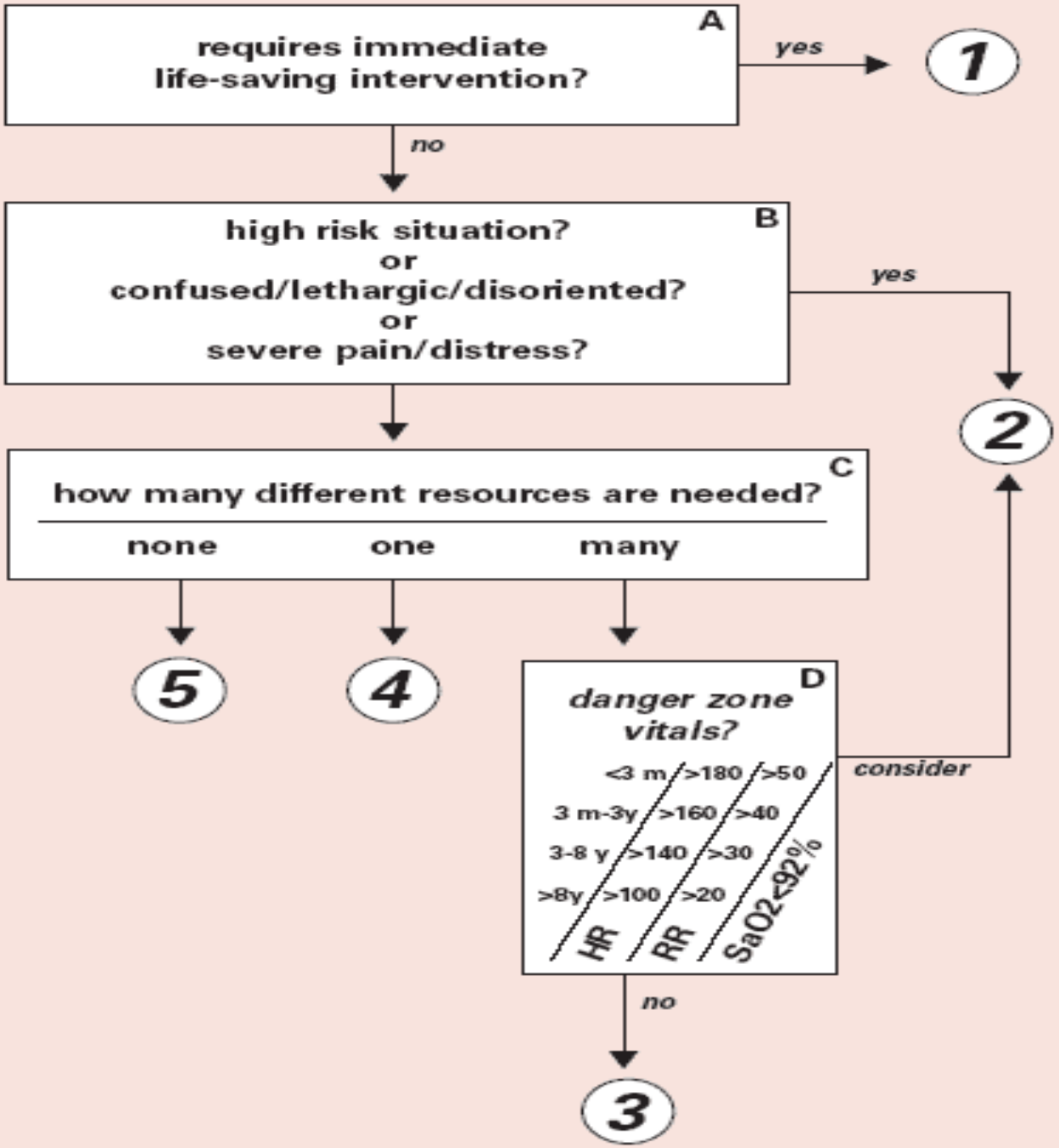
- Minor trauma
- Sore throat, URI
- Vaginal bleeding
- Abdominal pain
- Vomiting alone, diarrhea alone
- Psychiatric

ESI

Emergency Scoring Index

Version 4

Triage


A
requires immediate life-saving intervention?
yes
1
no
B
high risk situation?
or
confused/lethargic/disoriented?
or
severe pain/distress?
yes
2
C
how many different resources are needed?
none
one
many
5
4
D
danger zone vitals?
<3 m >180 >50
3 m-3y >160 >40
3-8 y >140 >30
>8y >100 >20
HR
RR
SaO2<92%
consider
no
3

Resources	*Not Resources*
• Labs (blood, urine) • ECG, X-rays • CT-MRI-ultrasound-angiography	• History & physical (including pelvic) • Point-of-care testing
• IV fluids (hydration)	• Saline or heplock
• IV or IM or nebulized medications	• PO medications • Tetanus immunization • Prescription refills
• Specialty consultation	• Phone call to PCP
• Simple procedure =1 (lac repair, Foley cath) • Complex procedure =2 (conscious sedation)	• Simple wound care (dressings, recheck) • Crutches, splints, slings

A. Immediate life-saving intervention required: airway, emergency medications, or

- other hemodynamic interventions (IV, supplemental O2, monitor, ECG or labs DO NOT count); and/or any of the following clinical conditions:
- intubated, apneic, pulseless, severe respiratory distress, SPO2<90, acute mental status changes, or unresponsive.
- Unresponsiveness is defined as a patient that is either:

(1) nonverbal and not following commands (acutely); or

(2) requires noxious stimulus (P or U on AVPU) scale.

Triage

B. High risk situation is a patient you would put in your last open bed.

- Severe pain/distress is determined by clinical observation and/or patient rating of greater than or equal to 7 on 0-10 pain scale.

C. Resources: Count the number of different types of resources, not the individual tests or x-rays (examples: CBC, electrolytes and coags equals one resource; CBC plus chest x-ray equals two resources).

Triage

D. Danger Zone Vital Signs

- Consider uptriage to ESI 2 if any vital sign criterion is exceeded.

Pediatric Fever Considerations:

- 1 to 28 days of age:

assign at least ESI 2 if temp >38.0 C

- 1-3 months of age:

consider assigning ESI 2 if temp >38.0 C

- 3 months to 3 yrs of age:

consider assigning ESI 3 if: temp >39.0 C

- or incomplete immunizations, or no obvious source of fever

Hospital Triage System

Time		level
Seconds	Resuscitation or Exigent	١
Minutes	Emergent	٢
An Hour	Urgent	٣
6 Hours	Semi-Urgent	٤
24 Hours	Non-Urgent	٥

Triage

Field Triage

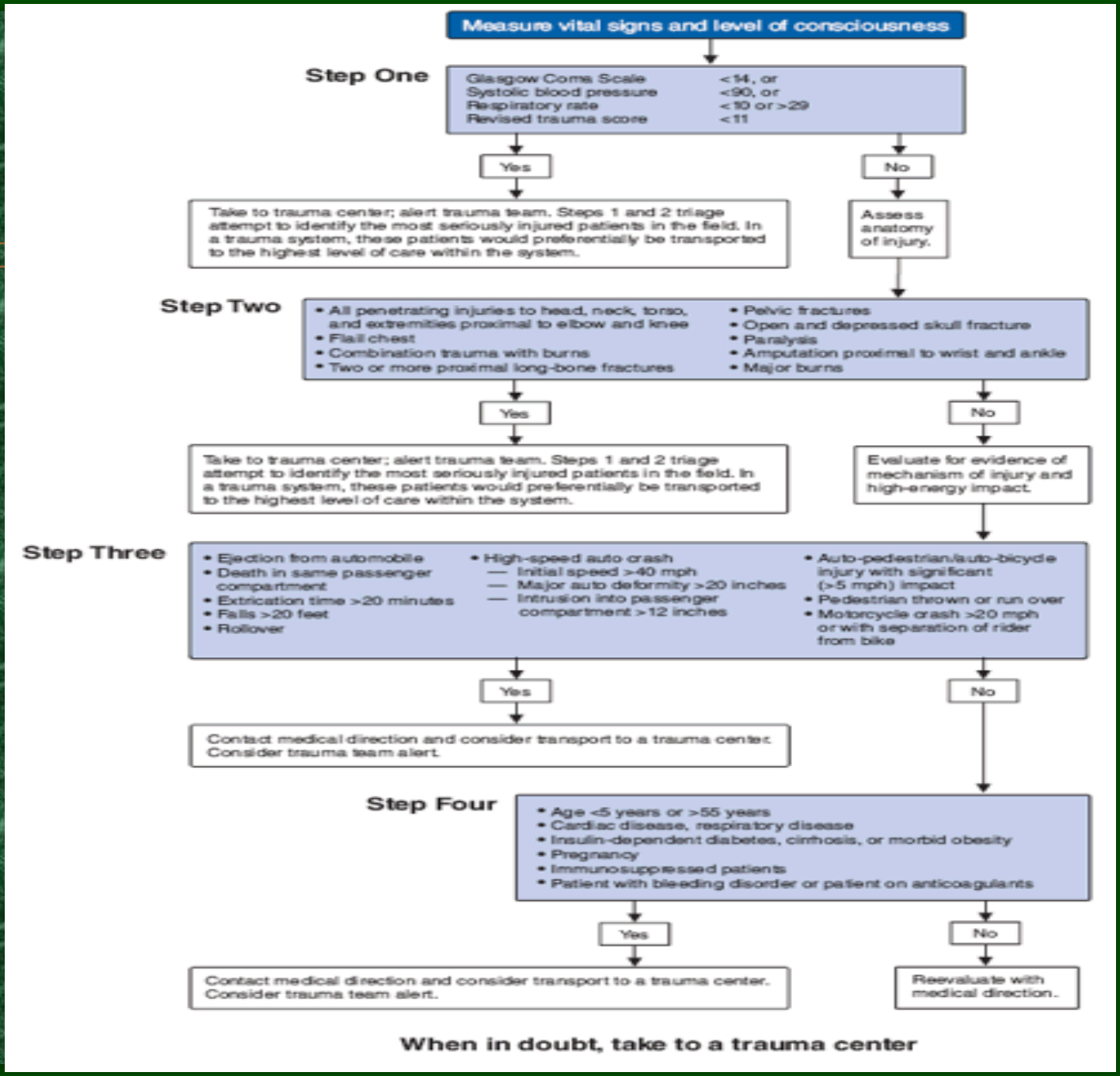
CDC / ACS Triage

National Center for Injury Prevention and Control, CDC

Triage

American College of Surgeons Committee on Trauma (ACS-COT)

ACS 1999


Measure vital signs and level of consciousness
Step One
Glasgow Coma Scale <14, or
Systolic blood pressure <90, or
Respiratory rate <10 or >29
Revised trauma score <11
Yes
No
Take to trauma center; alert trauma team. Steps 1 and 2 triage attempt to identify the most seriously injured patients in the field. In a trauma system, these patients would preferentially be transported to the highest level of care within the system.
Assess anatomy of injury.
Step Two
• All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
• Flail chest
• Combination trauma with burns
• Two or more proximal long-bone fractures
• Pelvic fractures
• Open and depressed skull fracture
• Paralysis
• Amputation proximal to wrist and ankle
• Major burns
Yes
No
Take to trauma center; alert trauma team. Steps 1 and 2 triage attempt to identify the most seriously injured patients in the field. In a trauma system, these patients would preferentially be transported to the highest level of care within the system.
Evaluate for evidence of mechanism of injury and high-energy impact.
Step Three
• Ejection from automobile
• Death in same passenger compartment
• Extrication time >20 minutes
• Falls >20 feet
• Rollover
• High-speed auto crash
— Initial speed >40 mph
— Major auto deformity >20 inches
— Intrusion into passenger compartment >12 inches
• Auto-pedestrian/auto-bicycle injury with significant (>5 mph) impact
• Pedestrian thrown or run over
• Motorcycle crash >20 mph or with separation of rider from bike
Yes
No
Contact medical direction and consider transport to a trauma center. Consider trauma team alert.
Step Four
• Age <5 years or >55 years
• Cardiac disease, respiratory disease
• Insulin-dependent diabetes, cirrhosis, or morbid obesity
• Pregnancy
• Immunosuppressed patients
• Patient with bleeding disorder or patient on anticoagulants
Yes
No
Contact medical direction and consider transport to a trauma center. Consider trauma team alert.
Reevaluate with medical direction.
When in doubt, take to a trauma center

ACS 1999 Step 1
VS & GCS

- GCS < 14
- SBP < 90
- RR < 10 or >29
- RTS < 11

Triage

- Take to trauma center
- Otherwise assess anatomy of injury

ACS 1999 Step 2
Anatomy of Injury

- All penetrating injuries to head, neck, torso and extremities proximal to elbow and knee
- Flail chest
- Combination trauma and burns
- > 1 proximal long bone Fx
- Pelvic Fx
- Open and depressed skull Fx
- Paralysis
- Amputation proximal to wrist and ankle
- Major burns

Triage

ACS 1999 Step 3 Mechanism of Injury

- Ejectionn from automobile
- Death in same passenger compartment
- Extrication time > 20 min
- Falls > 20 feet
- Rollover
- Auto-pedestrian / Auto-bicycle injury with significant impact (>5mph)
- High speed auto crash
  - ✓ Initial speed >40mph
  - ✓ Major auto deformity >20inches
  - ✓ Intrusion into passenger compartment >12 inches
- Pedestrian thrown or run over
- Motorcycle crash >20mph or with separation of rider from bike

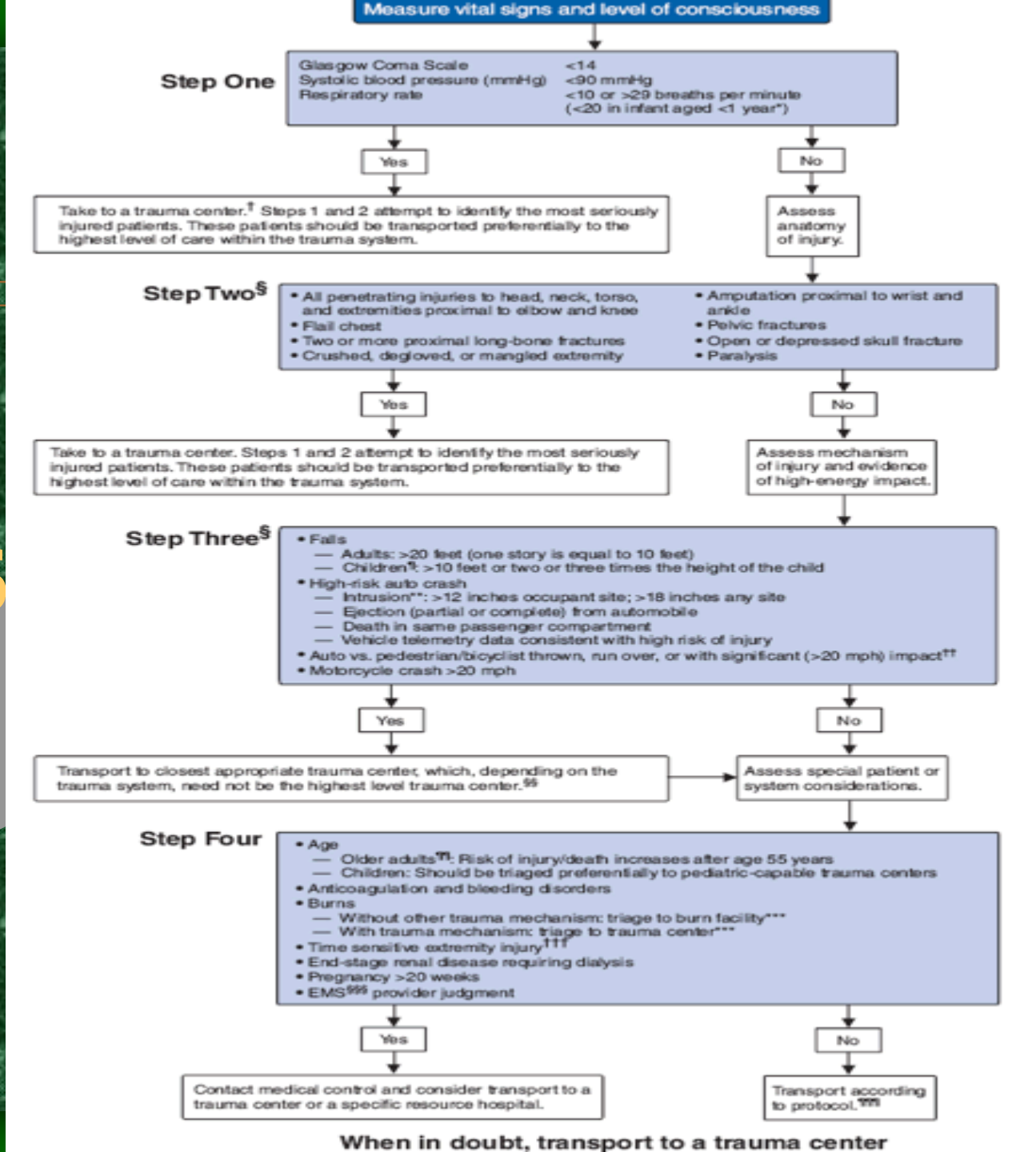
Triage

ACS 1999 Step 4
Special Considerations

- < 5yrs or > 55 yrs
- Cardiac / Respiratory disease
- IDDM
- Cirrhosis
- Morbid obesity
- Pregnancy
- Immunosuppressed
- Bleeding disorder or Pt. on anticoagulants

Triage

ACS 2006


Measure vital signs and level of consciousness
Step One
Glasgow Coma Scale <14
Systolic blood pressure (mmHg) <90 mmHg
Respiratory rate <10 or >29 breaths per minute (<20 in infant aged <1 year*)
Yes
No
Take to a trauma center.† Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the trauma system.
Assess anatomy of injury.
Step Two§
• All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
• Flail chest
• Two or more proximal long-bone fractures
• Crushed, degloved, or mangled extremity
• Amputation proximal to wrist and ankle
• Pelvic fractures
• Open or depressed skull fracture
• Paralysis
Yes
No
Take to a trauma center. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the trauma system.
Assess mechanism of injury and evidence of high-energy impact.
Step Three§
• Falls
— Adults: >20 feet (one story is equal to 10 feet)
— Children¶: >10 feet or two or three times the height of the child
• High-risk auto crash
— Intrusion**: >12 inches occupant site; >18 inches any site
— Ejection (partial or complete) from automobile
— Death in same passenger compartment
— Vehicle telemetry data consistent with high risk of injury
• Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact††
• Motorcycle crash >20 mph
Yes
No
Transport to closest appropriate trauma center, which, depending on the trauma system, need not be the highest level trauma center.§§
Assess special patient or system considerations.
Step Four
• Age
— Older adults¶¶: Risk of injury/death increases after age 55 years
— Children: Should be triaged preferentially to pediatric-capable trauma centers
• Anticoagulation and bleeding disorders
• Burns
— Without other trauma mechanism: triage to burn facility***
— With trauma mechanism: triage to trauma center***
• Time sensitive extremity injury†††
• End-stage renal disease requiring dialysis
• Pregnancy >20 weeks
• EMS§§§ provider judgment
Yes
No
Contact medical control and consider transport to a trauma center or a specific resource hospital.
Transport according to protocol.¶¶¶
When in doubt, transport to a trauma center

ACS 2006 Step 1
VS & GCS

- GCS < 14
- SBP < 90
- RR < 10 or >29 (<20 in infants < 1yr)

Triage

- Take to trauma center
- Otherwise assess anatomy of injury

ACS 2006 Step 2
Anatomy of Injury

- All penetrating injuries to head, neck, torso and extremities proximal to elbow and knee
- Flail chest
- Crushed, degloved or mangled extremity
- > 1 proximal long bone Fx
- Pelvic Fx
- Open and depressed skull Fx
- Paralysis
- Amputation proximal to wrist and ankle

Triage

ACS 2006 Step 3 Mechanism of Injury

- Falls
- ✓ Adults > 20 feet
- ✓ Children > 10 feet or 2-3 times the height of the child
- Auto vs. pedestrian / bicyclist thrown, run over or with significant impact (>20mph)
- Motorcycle crash >20mph
- High risk auto crash
- ✓ Death in same passenger compartment
- ✓ Intrusion >12 inches occupant site; >18 inches any site
- ✓ Ejection (partial or complete) from automobile
- ✓ Vehicle telemetry data consistent with high risk of injury

ACS 2006 Step 4
Special Considerations

- Age
  - ✓ Older adults: risk of injury/ death increases after 55yrs
  - ✓ Children: should be triaged preferentially to pediatric-capable trauma centers
- Bleeding disorder or Pt. on anticoagulants
- Pregnancy > 20 wks
- ESRD
- EMS provider judgment
- Burns :
  - ✓ Without other trauma mechanism triage to burn facility
  - ✓ With trauma mechanism triage to trauma center

Triage

Recommendations of the National Expert Panel on Field Triage, 2011

Guidelines for Field Triage of Injured Patients

January 13, 2012

1. Division of Injury Response, National Center for Injury Prevention and Control, CDC, Atlanta, Georgia
2. Emory University School of Medicine, Atlanta, Georgia
3. University of Washington, Seattle, Washington
4. Oregon Health and Science University, Portland, Oregon
5. Medical College of Wisconsin, Milwaukee, Wisconsin
6. Columbia University Medical Center affiliation at Harlem Hospital, New York, New York
7. University of Michigan Health System, Ann Arbor, Michigan
8. Stony Brook University, Stony Brook, New York
9. University of Mississippi, Jackson, Mississippi

2011 Field Triage Guideline Recommendations

Name of the Guidelines

- "Field Triage Decision Scheme" Or
- "Guidelines For Field Triage Of Injured Patients."

Triage

Step One: Physiologic Criteria

- **Glasgow Coma Scale ≤13, or**
- **SBP of <90 mmHg, or**
- **respiratory rate of <10 or >29 breaths per minute (<20 in infant aged <1 year), or need for ventilatory support.**

- **Glasgow Coma Scale: Criterion Clarified**
- **Need for Ventilatory Support: Criterion Added**
- to retain the SBP<90mmHg threshold in children

Step Two: Anatomic Criteria

- all penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee;
- chest wall instability or deformity(e.g. flail chest);
- two or more proximal long-bone fractures;
- crushed, degloved, mangled, or pulseless extremity;
- amputation proximal to wrist or ankle;
- pelvic fractures;
- open or depressed skull fractures; or
- paralysis

Step Two Changes

- Crushed, Degloved, Mangled, or Pulseless Extremity: Criterion Modified
- Chest Wall Instability or Deformity (e.g., Flail Chest): Criterion Modified
- All Penetrating Injuries to Head, Neck, Torso, and Extremities Proximal to Elbow or Knee: Criterion Modified
- Amputation Proximal to Wrist or Ankle: Criterion Modified
- retain the term "pelvic fractures"

Step Three: Mechanism of Injury

- **falls**
  - **adults: >20 feet (one story = 10 feet)**
  - **children: >10 feet or two to three times the height of the child**
- **high-risk auto crash**
  - **intrusion, including roof: >12 inches occupant site; >18 inches any site**
  - **ejection (partial or complete) from automobile**
  - **death in same passenger compartment**
  - **vehicle telemetry data consistent with a high risk for injury; [event data recorder (EDR) system]**
- **automobile versus pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact; or**
- **motorcycle crash >20 mph**

Step Three changes

- High-Risk Automobile Crash: Intrusion, Including Roof >12 Inches to the Occupant Site; >18 Inches to Any Site: Criterion Modified

Step Three Changes

- No compelling evidence exists to reinstitute prolonged extrication time as a criterion in MOI.
- the previous decision to remove rollover from the 2006 Guidelines was reaffirmed

Triage

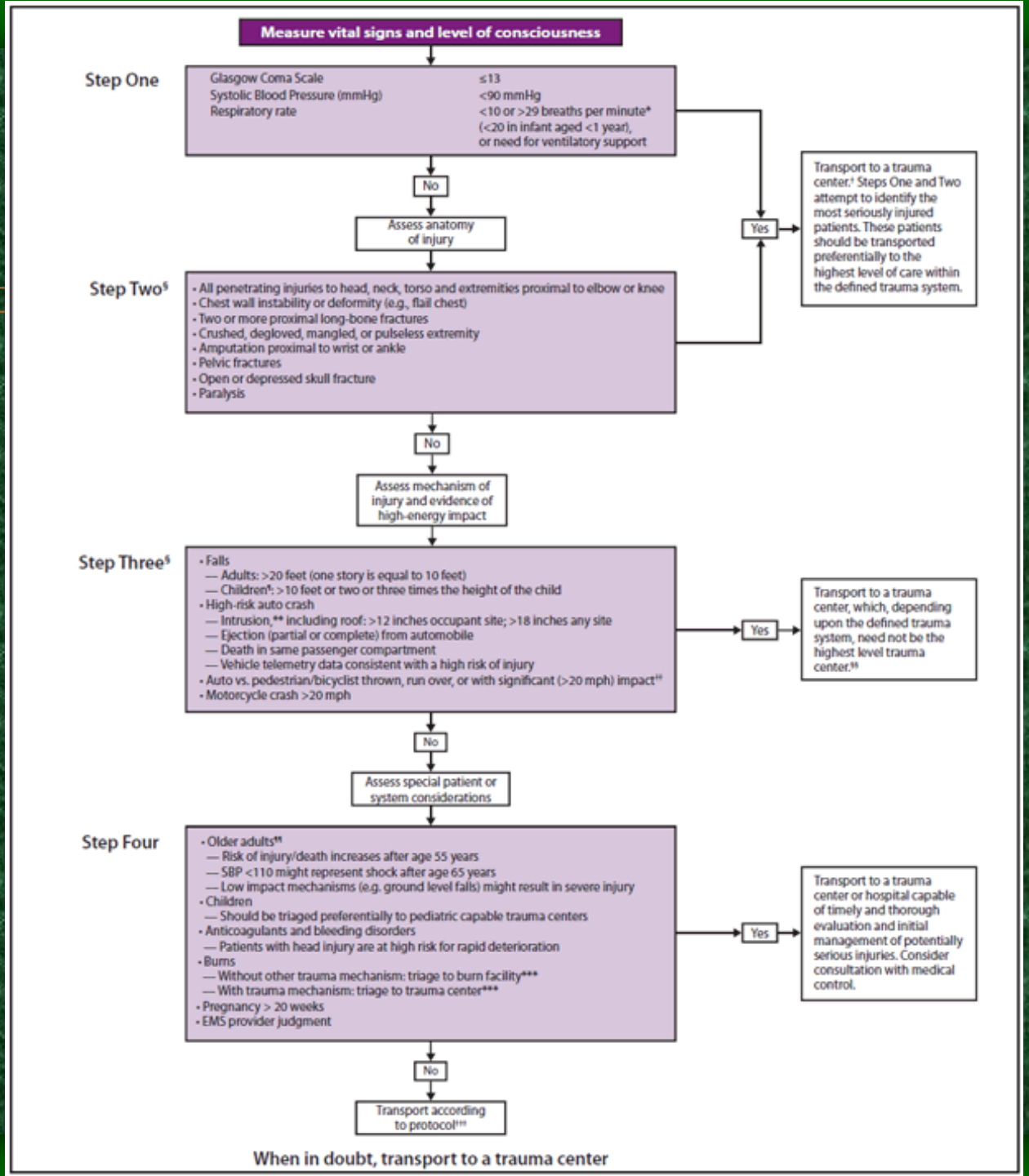
Step Four: Special Considerations

- older adults
  - risk for injury/death increases after age 55 years
  - SBP <110 might represent shock after age 65 years
  - low impact mechanisms (e.g., ground-level falls) might result in severe injury
- children
  - should be triaged preferentially to pediatric capable trauma centers
- anticoagulants and bleeding disorders
  - patients with head injury are at high risk for rapid deterioration
- burns
  - without other trauma mechanism: triage to burn facility
  - with trauma mechanism: triage to trauma center
- pregnancy >20 weeks
- EMS provider judgment

Step Four Changes

- Older Adults: Criterion Modified
- Anticoagulation and Bleeding Disorders: Patients with Head Injury Are at High Risk for Rapid Deterioration: Criterion Modified
- End-Stage Renal Disease Requiring Dialysis: Criterion Removed
- Time-Sensitive Extremity Injury: Criterion Removed

Guidelines for field triage of injured patients United States, 2012




drmohsenp@yahoo.com
THANK YOU