

THE EVOLUTION OF PREHOSPITAL TRAUMA CARE

6th Annual McSwain EMS Trauma Symposium

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DISCLOSURES

- I HAVE NO DISCLOSURES

Prehospital Care from Napoleon to Mars: The Surgeon's Role

Norman E McSwain Jr, MD, FACS, NREMT-P

- Presented at the American College of Surgeons (ACS) 89th Annual Clinical Congress , October 2003
- 71st Oration on Trauma
- 31st Scudder Oration
- Charles L. Scudder, MD
 - Born in Kent, CT, 1860
 - One of the founders of the ACS
 - 1st Chair of the ACS Committee on Trauma (ACS COT)

Dominique-Jean Larrey

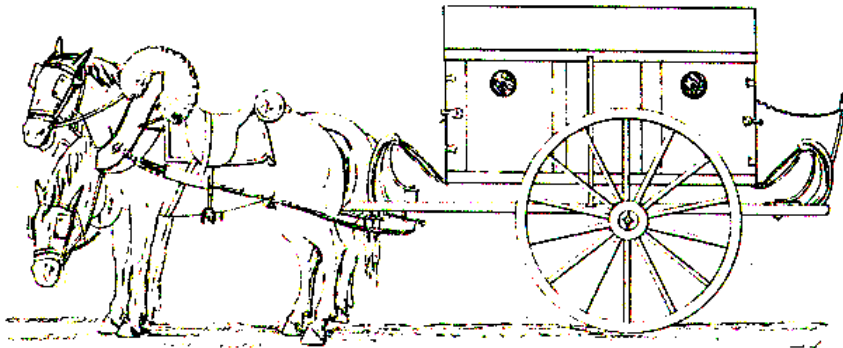


Director of Napoleon's
ambulance service 1797- 98

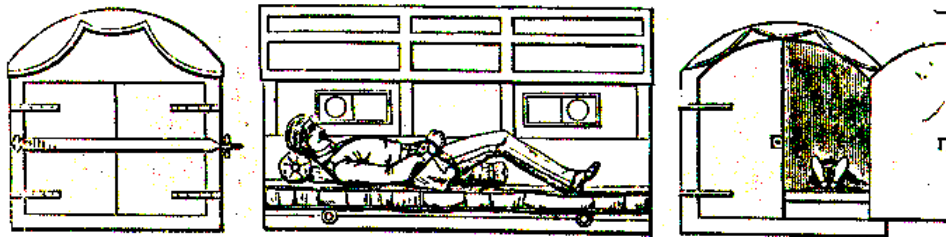
Not unusual for wounded to be
in the field 7-10 days

“At Lemberg.... The remoteness
of our ambulances deprived the
wounded of the requisite
attention.....I was authorized to
construct a carriage which I
called the flying ambulances”

Dominique-Jean Larrey



Larrey's light ambulance that was in use during the Napoleonic Wars.



From left to right: the front, the interior, and the rear views of Larrey's flying ambulance cart.

- “Flying ambulance”
- Trained medical personnel
- Went into battlefield
- Controlled hemorrhage
- Transported to nearby hospital
- Provided care enroute
- Front line hospitals

Improvements by Larrey

- **Battlefield medicine and triage**
 - Rapid response to the field
 - Care provided on scene and en route by trained personnel
 - Rapid transport while providing aid
 - Early transport to aid stations
 - Physician involvement in field care
 - EMS system directed by surgeon
 - Quality assessment of the care given
- **Considered to be the first modern military surgeon**

THEN CAME THE CIVIL WAR...

***THE WAR OF NORTHERN
AGGRESSION***







Illustration of the Great Western Railway, showing the locomotive and train.

WARRIOR VESSEL.
 The illustration depicts a steamship, likely a transport vessel, navigating through a narrow waterway. The ship is shown from a side-on perspective, moving towards the viewer. The water is calm, and the banks are lined with trees and structures. The overall scene conveys a sense of maritime activity and transport during the mid-19th century.



**FIRST CIVILIAN AMBULANCE
SERVICE IN THE UNITED
STATES**



New York City Ambulance Service

- First ambulance service in NYC
- December 1869
- Free Hospital of New York (Bellevue)
- First month 74 calls, 1466 Calls in 1870
- Control
 - Police
 - Public Services and Charities
 - Private institutions themselves
- "A hospital without an ambulance is a hospital without patients" **JAMA 28:36-7. 1897**

WAIT A MINUTE!!!

**The First civilian ambulance
service in the United States
REALLY WAS....**

- **1865**
- **Cincinnati Ohio**
- **Cincinnati General Hospital**

Grady Hospital Ambulance Service



- Mr. Grady's Hospital, Atlanta, Georgia
- Oldest continuously operating hospital based ambulance service in the United States

Charity Hospital Ambulance New Orleans

- A. B. Miles M. D. Surgeon
- *New Orleans Medical & Surgical Journal*, June, 1885
- Carriages by Abbot-Downing, Concord NH
- 1600 pounds required double team to pull
- Carriage finish, mounted on easy springs
- Paneled wood, lined with varnished maple
- “Charity Hospital” in gold lettering on side

M'ENERY ADMINISTRATION

CHARITY HOSPITAL
AMBULANCE

2



Charity Hospital Ambulance New Orleans

- **"Lavish" interior**
 - **Medicine chests**
 - **Boxes for surgical apparatus**
 - **Hooks for lanterns**
 - **Easy bed (litter) trundled in & out**
 - **Separate spring for the bed**

**HOW THINGS HAVE
CHANGED!**



1948



1949





1951



1958



Roy DeSoto John Gage

EMERGENCY!

SEASON ONE

1972







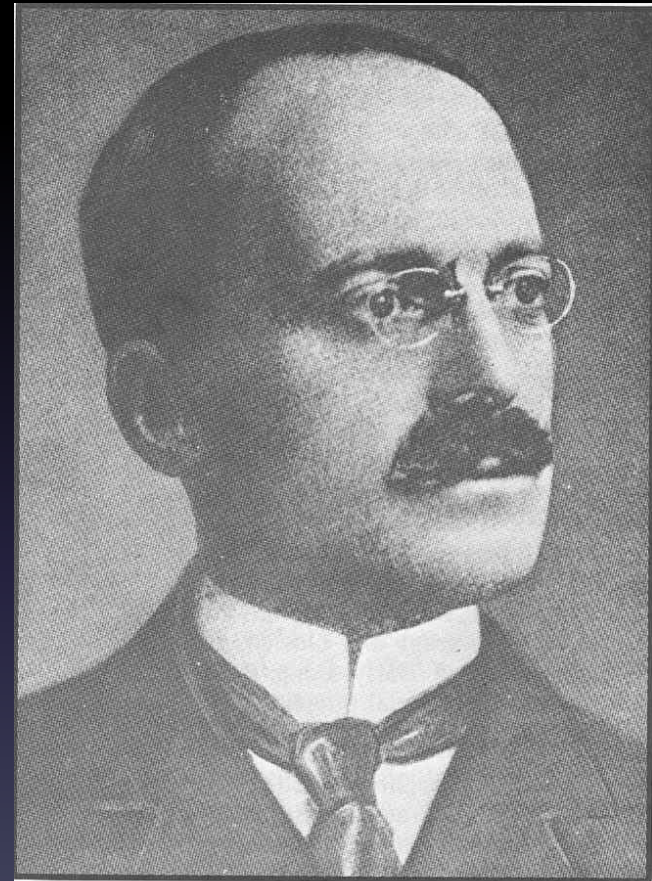


AMERICAN COLLEGE OF SURGEONS (ACS)

- Franklin H. Martin, MD
- Surgery, Gynecology & Obstetrics (SG&O) – 1905
- Clinical Congress of Surgeons of North America - 1910
- Formed the ACS in 1913

Charles L Scudder, MD, FACS (1890-1949)

- **Born August 7, 1860 in Kent, CT**
- **1st Fracture service at the MGH - 1917**
- **1st Chair, Committee on Fractures 1922, Boston**
- **First Oration October 16, 1929**



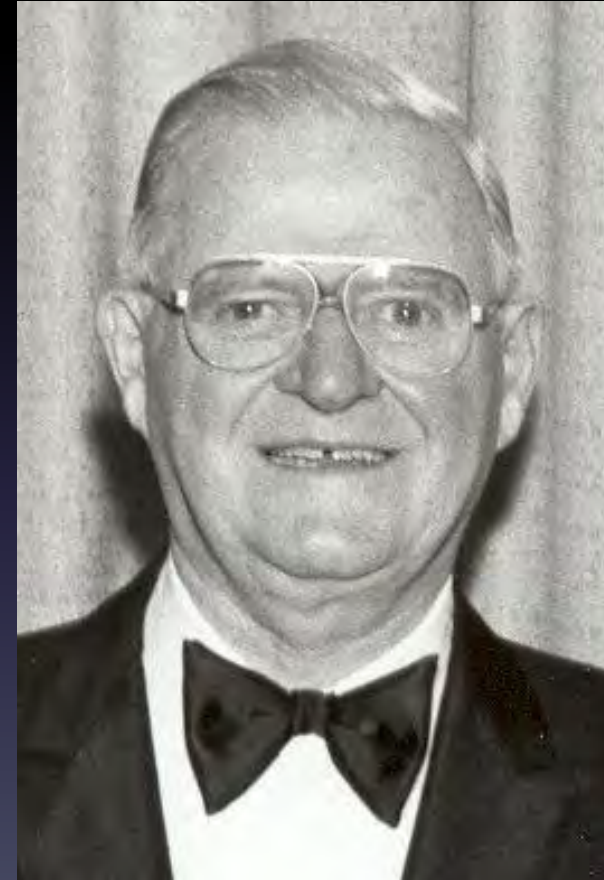
Dr. Scudder

Fraser Gurd, MD

Scudder Orator, 1939

Importance of training individuals in the management of trauma

- Trauma is a team sport
- EMT's are a member of this team
- At least 1/2 of the 'golden hour' is managed by EMT's
- The care provided by EMS should be in our hands as surgeons



Pathophysiology of Trauma

- Energy exchange => Tissue damage, organs are injured and **hemorrhage begins**
- Airway & Ventilation compromise => reduction gas exchange – **Anoxia begins**
- Perfusion reduced – **anaerobic metabolism begins**
- ATP production drops => energy production plummets
- **Shock begins**

THE PATIENT BEGINS TO DIE

Intervention

- Must start in the field
- Cannot wait until the ED or OR
- EMT's are our eyes, ears, and hands
- EMT's must work with us
- Survival is a reflection of how well we have trained our EMT's

***TRAUMA IS A SURGICAL DISEASE FROM
BEGINNING TO END***

PREHOSPITAL CARE IS THE BEGINNING

Philosophy of PHTLS



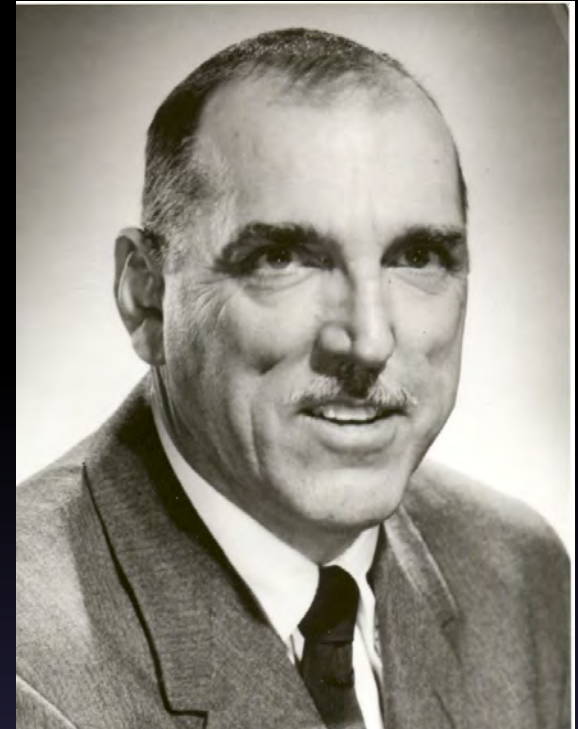
- Judgment based on knowledge
- The EMT's fund of knowledge should be in the hands of the surgeon

**Trauma is a surgical disease
from beginning to end**

J. D. “Deke” Farrington, MD

Scudder Orator 1973

Father of EMS
in the
United States



- Questioned why lessons learned in WWII and Korea weren't incorporated into civilian trauma care
- Established the original 81 hour “first aid” training curriculum
- Prototype of EMT-Ambulance course



1977-1980



- 1976 – James Snyder
- The ACS COT develops the Advanced Trauma Life Support (ATLS) course
 - Pilot course 1977, Auburn Nebraska
- The first course is given by the surgeons who helped develop the course





1981



- Discussions
- EMTs to take ATLS
- Regents
 - Physician only course
 - First hour in the hospital
 - EMT's cannot take
- COT support for EMS course like ATLS
 - Use ATLS course material
 - Use appropriate ATLS slides

PHTLS/ NAEMT Founders



Gary Labeau



Richard Vomacka



Robert Nelson



Norman McSwain

ATLS for Non-Physicians

Three Sources

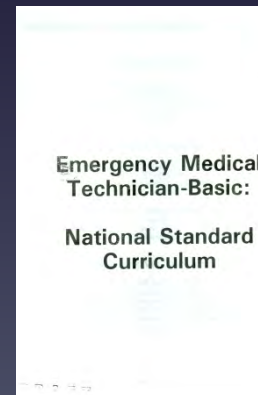
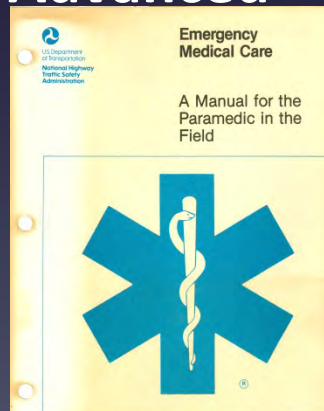
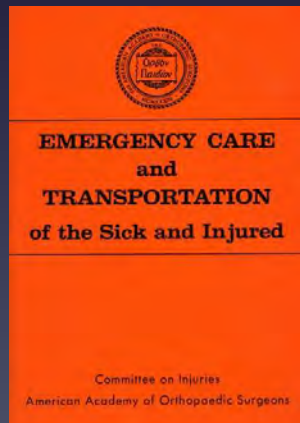
ATLS

Orange Book

National Standard Curriculum

Basic

Advanced



EMERGENCY MEDICAL TECHNICIAN-BASIC: NATIONAL STANDARD CURRICULUM	
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Development of PHTLS

- Course development
 - New Orleans
 - 1981 and 1982
 - Le Richelieu Hotel

Jim Paturas
Bob Nelson
Rick Vomacka
Alex Butman
Jeannie O'Brian
Ann Bellows
Joe Dineen, MD
Norman McSwain, MD



Pilot Programs

- 3 pilots courses
- 1982-3
- Connecticut
- Iowa
- Louisiana



*Extending the hand of education to
those who care for trauma patients.*



Anita Bellows Willis

Norman McSwain
Jim Paturas
Rick Vomaka
Joe Hansen,
Dave Wurtz
John Sigafos



Bar Napkin
Frontier Lounge
Las Vegas, Nevada
1983

PHTLS National Faculty Course

*“Extending the hand of education
to those who care for the trauma patient”*

Jim Paturas
Bob Nelson
Rick Vomacka
Alex Butman
Jeannie O'Brian
Ann Bellows
John Quinlavin
Dawn Orgeron
Joe Dineen, MD
Norman McSwain, MD



Tulane University of Louisiana, School of Medicine - 1983

Development of PHTLS

- Textbook development
 - Washington DC
 - 1984
 - Phoenix Park Hotel



Jim Paturas
Alex Butman
Steve Reinberg
Norman McSwain

Stages of EMS Development in the United States

- **No care & rapid transportation**
 “Scoop & run” (before 1950)
- **Appropriate field management and care en route (1969- 1975)**
- **Trauma patient treated like a cardiac patient with prolonged field time**
 “Stay & Play” (1975- 1985)
- **Definitive field care for the trauma patient**
 “Stabilize and Transport” (1985 to 2005)
- **Major changes in Resuscitation**
 - Military**
 - Civilian**

Appropriate Field Care

- Assess scene & patient
- Keep scene time as short as possible
- Establish airway and ventilation
- Control hemorrhage
- Stabilize fractures
- Package for transport
- Continue care en-route (IV's as indicated)
- Transport to trauma center if available

These are the teachings of PHTLS

William Estes, Jr , MD

Scudder Orator 1953

Trauma Centers

- Importance of a trauma center
- Transportation to trauma center
- Surgeons frequently manage trauma
- Hospital should have resources and personnel with the fund of knowledge to care for these patients



“It is easy for us to practice our craft in the warmth, when it is cold outside; dry, when it is raining; cool, when the sidewalk could fry an egg. Prehospital providers are not so lucky. The floor of my resuscitation bay or my OR does not bump and sway over potholes or rounding curves as I am trying to start an IV, put in an endotracheal tube, or to provide CPR”



Richard Bell, MD
Past Chairman, ATLS

Key Principles To Use

- Oxygenation
- Hemorrhage control
- Do no further harm
- Alleviate pain and suffering

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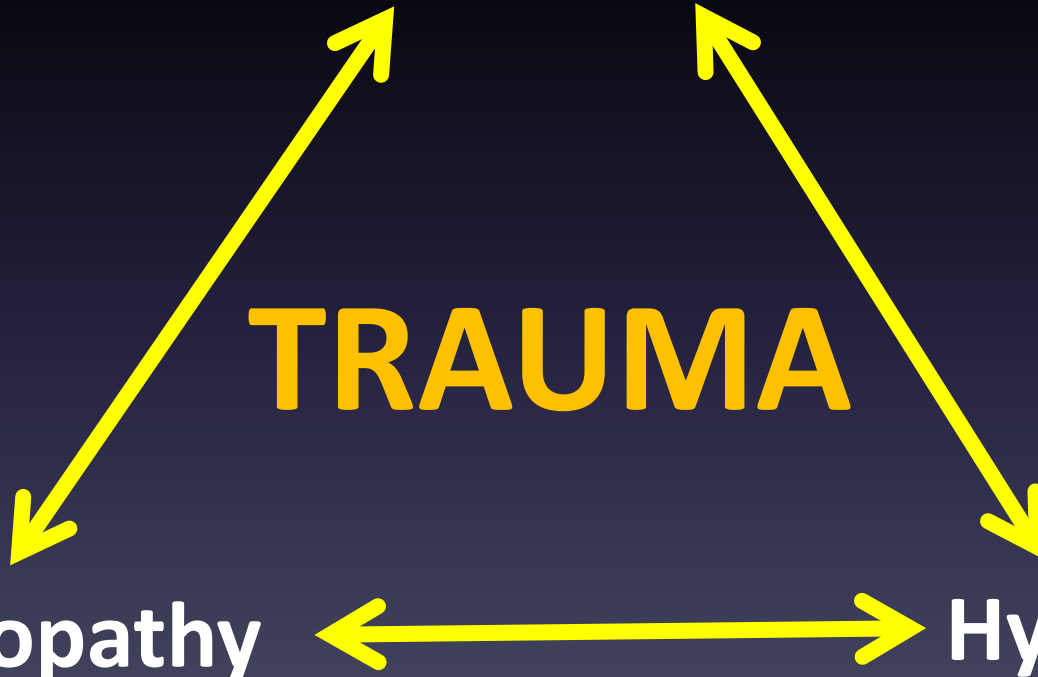
Triangle of Death

Acidosis

TRAUMA

Coagulopathy

Hypothermia



The history of EMS and trauma care has been directly related to war since disagreements between people started

Most improvements in trauma care has occurred during or following war

**“He who desires to practice
surgery must go to war”**

Hippocrates

c. 460 BC – c. 377 BC

**Patient care does not began
in the hospital, rather...**



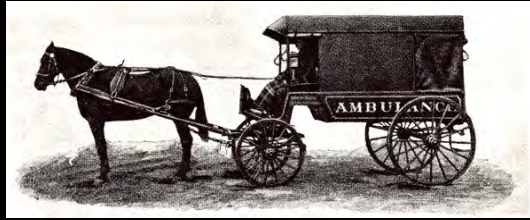
**“The fate of the wounded
rests in the hands of one
who applies the first
dressing.”**

Nicholas Senn, MD

Founder: Association of Military Surgeons 1891

History of EMS

- Larrey era - 1790's to 1865
- Wars, hospitals and mortuaries – 1865 to 1950's
- Farrington era – 1950 to 1970
- Modern Era 1970 to present
- Beyond low earth orbit ?



**Rapid Delivery
of the Patient
to a facility capable of providing
appropriate care**



Hypotensive Resuscitation

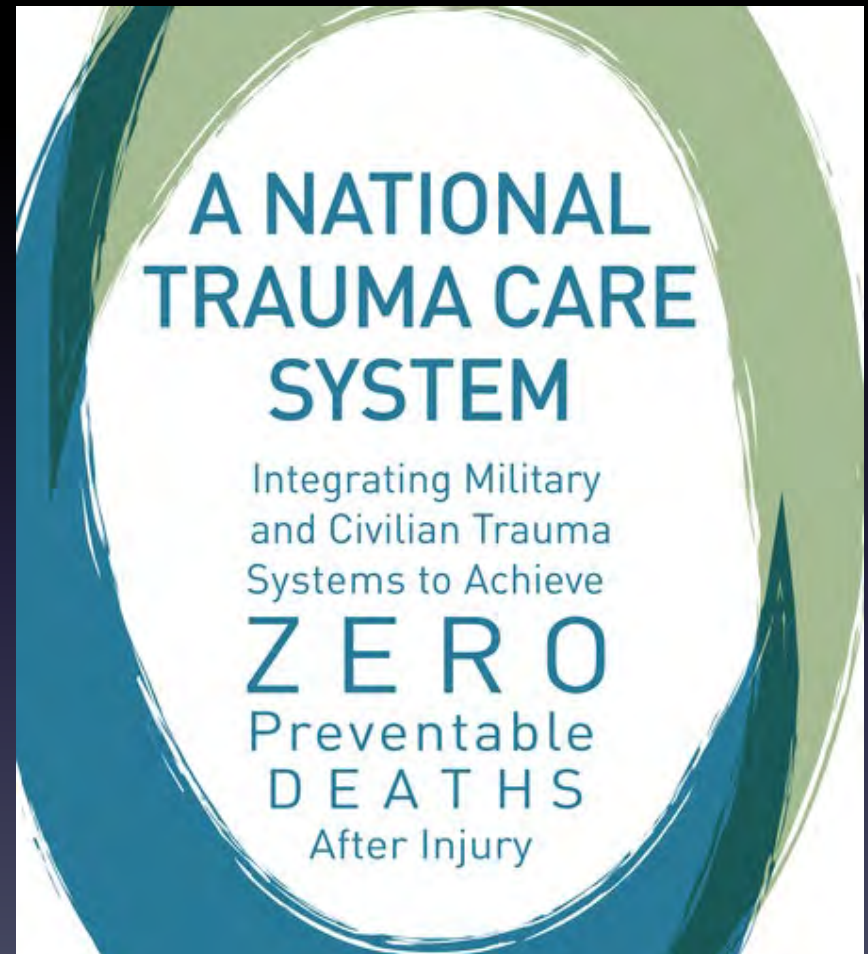
- Heart, brain and lung perfusion
 - Perfusion adequate 80-90 mmHg
- Reduction of hemorrhage
 - “POP THE CLOT”
- HEMORRHAGE IS THE MOST COMMON CAUSE OF DEATH IN THE INJURED PATIENT

Hemorrhage control

- Rapid transportation to Trauma Center
- Experienced and available trauma personnel
- Quickly available Invasive radiology
- Blood, plasma and factors
- Quickly available OR
- VITAMIN “S”

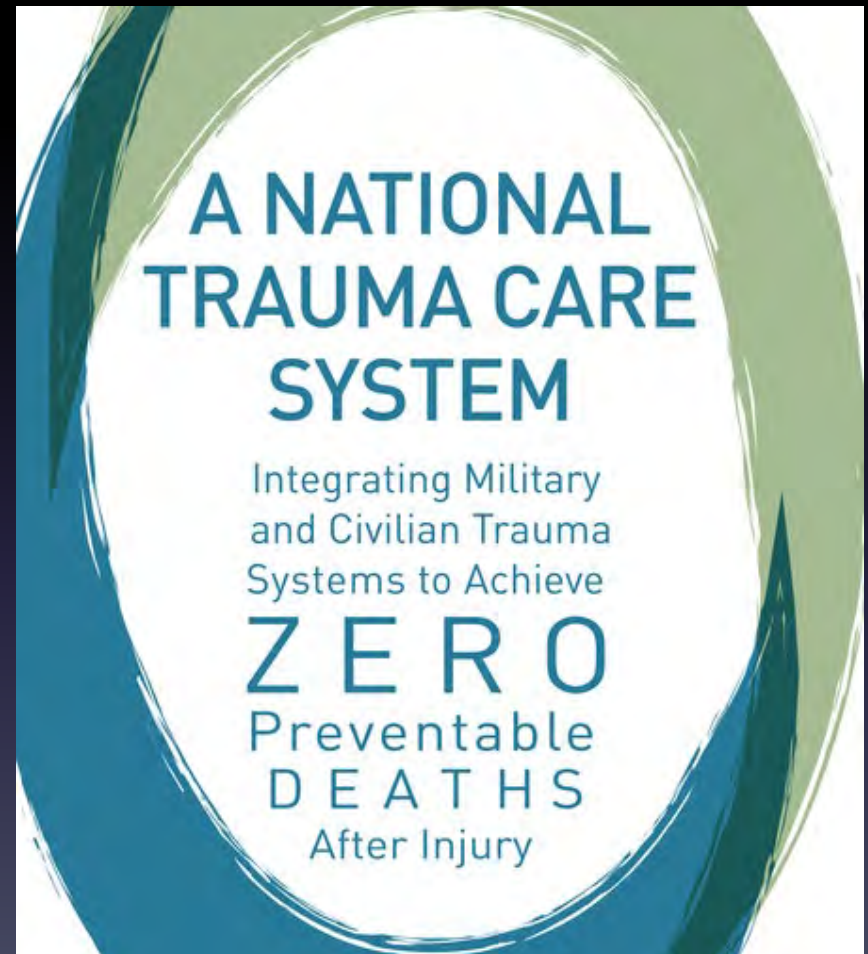
A Bold New Mandate

- National Academies of Sciences, Engineering and Medicine



A Bold New Mandate

“...when it comes to trauma, where you live ought not determine if you live. It is time for a national goal owned by the nation’s leaders: zero preventable deaths after injury.”



DEDICATION



Dr. Norman McSwain (1937-2015) was an extraordinarily valued member of this committee. In honor of his immeasurable contribution to countless military and civilian injured, we humbly dedicate this effort to him. His legacy of training and translating and a laser focus on improving the outcomes of all injured persons permeates every page of this report. We hope he would approve of our efforts.

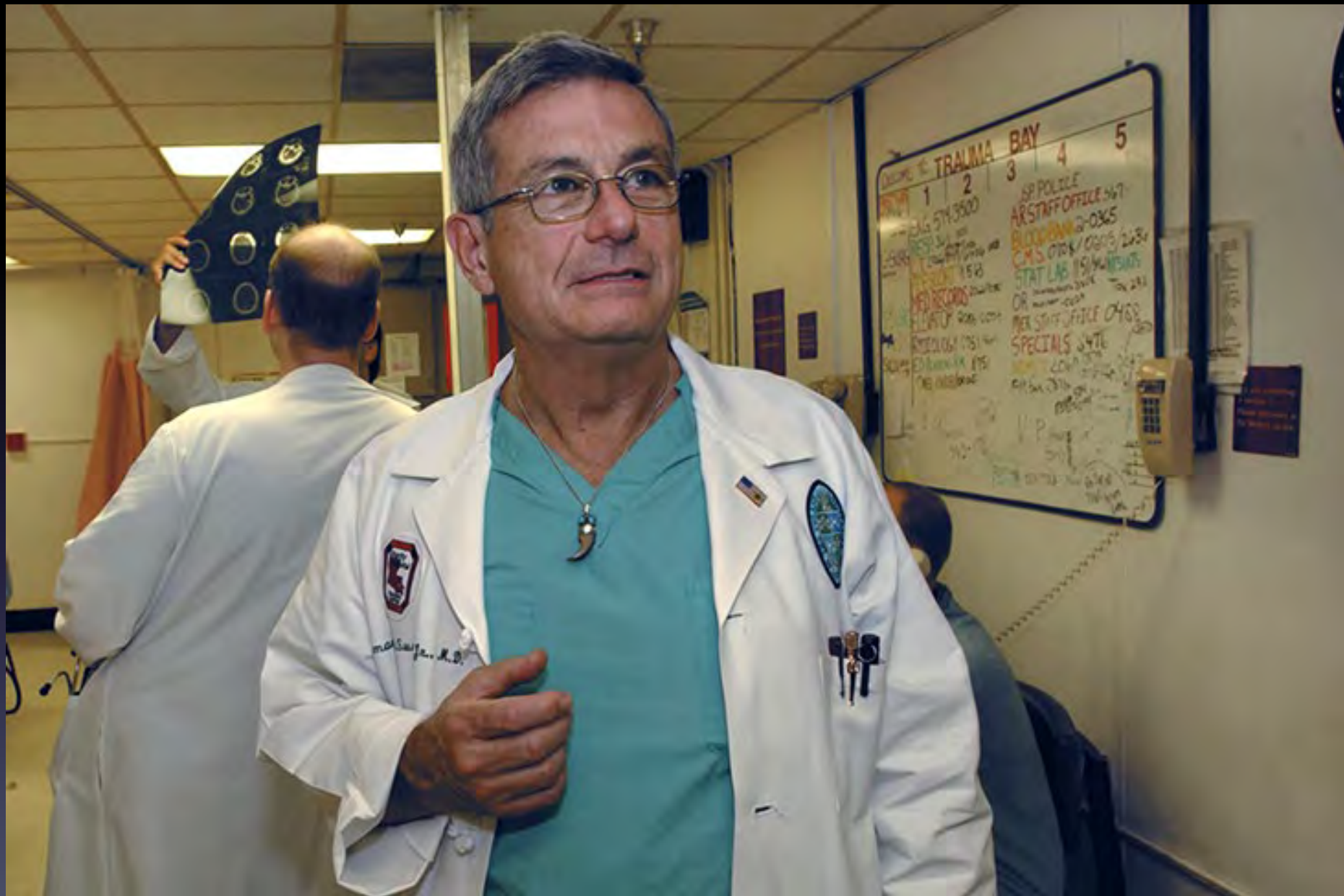
Norman's leadership in all things trauma is legendary. He was a leader who helped establish emergency medical services (EMS) systems around the world. His focus was on rapid, expert

treatment at the scene and speedy transport to qualified trauma centers. There is absolutely no question that his efforts saved an untold number of lives around the world. Very few, if any, physicians have had the impact that Norman had on care of the injured.

ROAD ATLANTA 1970



WHO NEEDS THOSE GUYS FROM "EMERGENCY" – THIS GUY IS THE REAL DEAL!



APRIL 6, 2016

Norman E. McSwain, Jr., MD
Spirit of Charity Trauma Center



Honoring Dr. McSwain's
passionate devotion to
all patients and his
pioneering advancements
in trauma care
and education

"What have you done for the good of mankind today?"



**“What have you done for
the good of mankind lately?”**
– Dr. Norman McSwain

THANK YOU



Norman L. McSwain Jr., M.D.