



London Health Sciences Centre

Southwest Ontario Regional Base Hospital Program



Out-of-Hospital Termination of Resuscitation

Utility and Implications for Your Practice

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Objectives

- Explain the difference between medical and traumatic arrests
- Summarize evidence supporting out-of-hospital termination of resuscitation (TOR)
- Formulate a plan of action between PCP and ACP medics on the scene of a cardiac arrest
- Relate key information to provide to a base hospital physician when patching for a TOR
- Discuss steps a paramedic can take when giving death notification

Outline

- Case presentation
- Field pronouncement versus TOR
- Traumatic versus medical arrests
- Research for out-of-hospital TOR
- Medical TOR directive
- Scene plan of action/teamwork
- Trauma TOR directive
- Death in a public place
- Death notification

Case Presentation

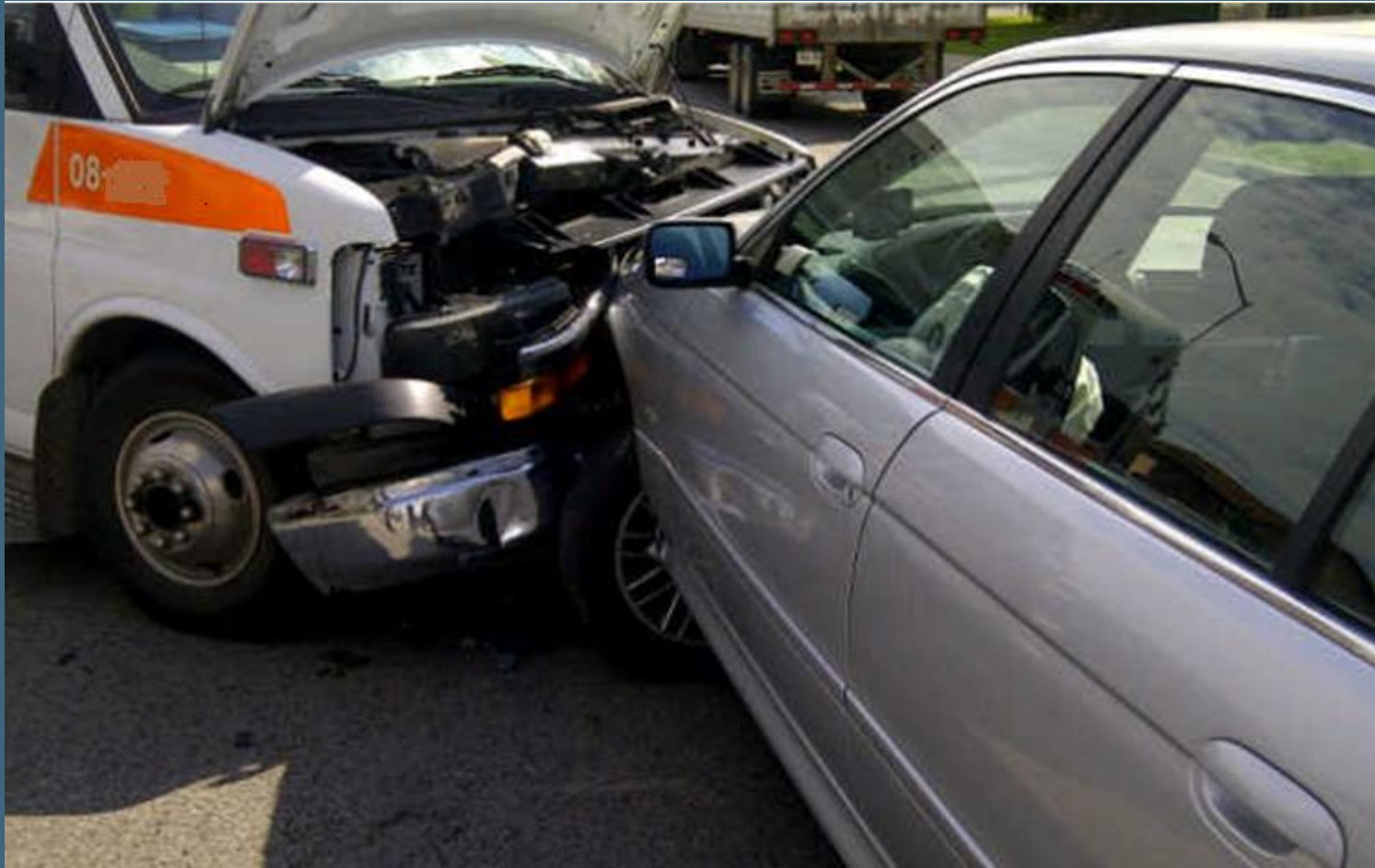
- Code 4 Notification – PCP crew
- 66 y.o. male – unresponsive
- Became nauseated after dinner and found 30 min later on floor of bathroom
- Son called 911, initiated CPR

- After crew arrival, CPR continued and 3 no-shocks indicated
- Patched for a medical TOR and were successful

Rewind case to last year..

- PCP crew completes fourth analysis and moves to transport patient to the hospital for advanced life support care

Initially a single patient transfer..



Now an MCI..



TYPES OF ARREST

Traumatic Cardiac Arrest

- Deterioration associated with trauma has several possible causes:
 - Hypoxia
 - Injury to vital structures
 - Severe head injury
 - Hypovolemia
- Studies demonstrate those who do survive have prompt transport, treatable penetrating injuries, and are typically young

Medical Cardiac Arrest

- Long list of causes but most common are:
 - Cardiac (up to 60%)
 - Ischemic heart disease
 - Structural heart disease
 - Non-cardiac (35–40%)
 - Non-traumatic bleeding (aorta, ICH, GI)
 - Toxicologic
 - Drowning
 - PE

Termination of Resuscitation

- Out-of-hospital cardiac arrest has a very low survival rate to hospital discharge
- Transporting all patients results in inappropriate utilization of valuable resources
- Also exposes paramedics and the public to dangers of high-speed transport

Dangers of Transport..

Deadly Ambulance Crash Could Spur Change

Widow Doesn't Want Anyone Else

POSTED: 11:38 am CST December 1
UPDATED: 11:54 am CST December 1



Peter Hooy



Vehicle crash in Paisley

Field Pronouncement vs. Medical TOR

Field Pronouncement (ACP)

- Patch following 3rd analysis for further direction from BHP

Prior to Medical TOR (PCP)

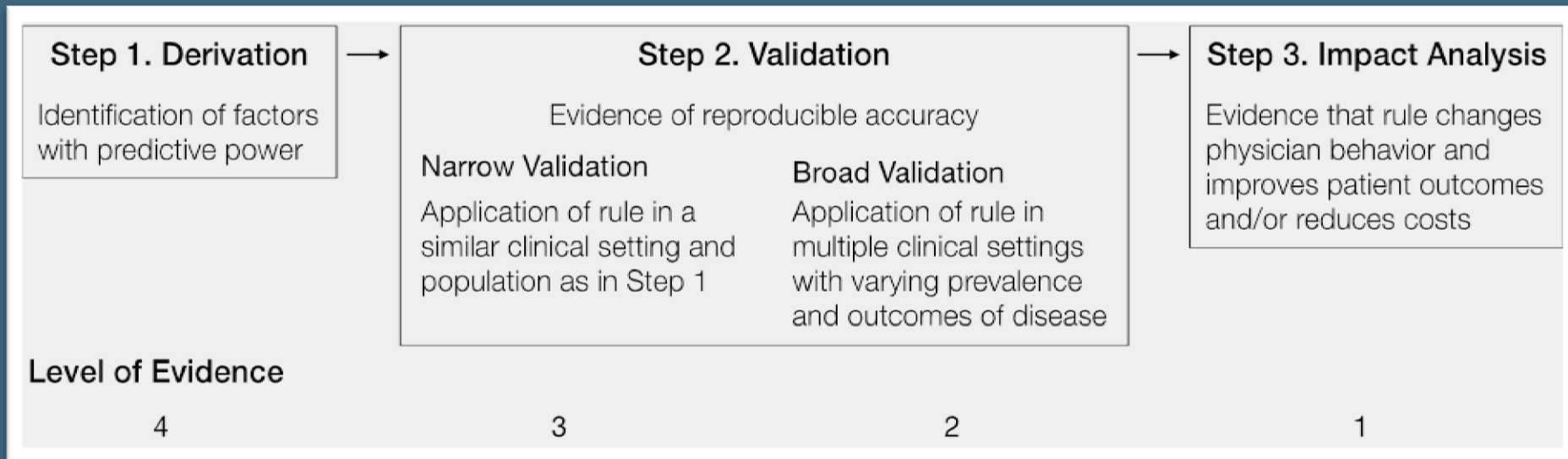
- Transport to ED

Medical TOR (PCP)

- Patch following 3rd analysis if criteria is met

Clinical Decision Rules

- Tools that quantify individual contributions of various components of history, physical, and lab values to predict likely response to treatment



REVIEW OF THE EVIDENCE FOR PRE-HOSPITAL BLS-TOR

Validation of a rule for TOR in out-of-hospital cardiac arrest

• NEJM, 2006

Population

- All pts with OHCA receiving exclusively BLS care in Ontario
- 1240 pts enrolled, mean age 69.2, 69% male, 57.4% witnessed, mean response time 8.0min

Design

- Prospective, observational validation study
- BLS-TOR rule applied to all pts but all transported

Validation of a rule for TOR in out-of-hospital cardiac arrest

• NEJM, 2006

Outcomes

- Pronounced in ED, died after admission, discharged home – cerebral performance category 6 months

Exclusion Criteria

- Prior DNR, non-cardiac arrest

Results

- 776/1240 received 'TOR'
- 3 survived with good neurological outcome
- PPV death 99.5%, 62.6% drop in transport rate

Comparison of TOR guidelines for BLS

• Annals of EM, 2006

Population

- All pts with OHCA receiving exclusively BLS care in Ontario
- 13 684 pts enrolled, mean age 69.1, 67.3% male, 52.2% witnessed, mean response time 8.5 min

Design

- Retrospective validation using a cohort from 1988–2003
- 3 guidelines validated with cohort data

Comparison of TOR guidelines for BLS

- Annals of EM, 2006

BLS-TOR

- No ROSC, no shocks, unwitnessed

Petrie Rule

- Initial asystole, EMS response >8min

Marsden Rule

- Non shockable rhythm, no ROSC, no CPR 15min, asystole for 10 seconds

Comparison of TOR guidelines for BLS

• Annals of EM, 2006

Outcomes

- Survival to hospital discharge – cerebral performance of survivors

Exclusion Criteria

- Obvious signs of death, non–cardiac arrest

Comparison of TOR guidelines for BLS

• Annals of EM, 2006

Results

- BLS TOR Rule
 - NPV 100%, 50.5% drop in transport
- Petrie Rule
 - NPV 99.9%, 9.4% drop in transport
- Marsden Rule
 - NPV 100%, 18.5% drop in transport

Comparison of TOR guidelines for OHCA in Singapore EMS

• Resuscitation, 2006

Population

- Consecutive adults with OHCA who received BLS care
- 2269 pts, mean age 61.1, 68.4% male, 65.3% unwitnessed, EMS response 12.0min

Design

- Retrospective validation of cohort study 2001–2004
- Same three rules validated

Comparison of TOR guidelines for OHCA in Singapore EMS

• Resuscitation, 2006

Outcomes

- Survival to hospital discharge or survival to 30 days post arrest

Exclusion Criteria

- Obvious signs of death

Comparison of TOR guidelines for OHCA in Singapore EMS

• Resuscitation, 2006

Results

- BLS TOR Rule
 - NPV 99.6%, 68.7% drop in transport
- Petrie Rule
 - NPV 99.7%, 31.6% drop in transport
- Marsden Rule
 - NPV 99.8%, 63.9% drop in transport

Level of Evidence

- In the setting of exclusively BLS care, the BLS-TOR rule meets 'level 2' criteria for clinical decision rules
 - Can be used in various settings with confidence
 - Validated in either one large prospective study or in several smaller studies that differ from one another

REVIEW OF EVIDENCE FOR PRE-HOSPITAL ALS-TOR

Prehospital TOR in cases of refractory OHCA

• JAMA, 2008

Population

- Prospectively enrolled OHCA in 19 EMS systems
- 5556 pts, mean age 64.4, 60.0% male, 51.5% unwitnessed

Design

- Retrospective validation of using a registry database 2005–2008
- BLS– and ALS–TOR rules externally validated
- All pts received ALS care

Prehospital TOR in cases of refractory OHCA

• JAMA, 2008

BLS-TOR Rule

- No ROSC, no shocks, unwitnessed

ALS-TOR Rule

- No ROSC, no AED/shock before transport, unwitnessed by EMS/bystanders, no bystander CPR

Prehospital TOR in cases of refractory OHCA

• JAMA, 2008

Outcomes

- Survival to hospital discharge – cerebral performance at discharge

Exclusion

- Obvious signs of death or traumatic arrest

Prehospital TOR in cases of refractory OHCA

• JAMA, 2008

Results

- BLS TOR Rule
 - PPV 99.8%, 47.1% drop in transport
- ALS TOR Rule
 - PPV 100%, 21.7% drop in transport

Independent Evaluation of an out-of-hospital TOR CDR

• Academic EM, 2008

Population

- Prospectively enrolled OHCA in Arizona
- 21 80 pts, mean age 64, 65% male, EMS response 5.5 min

Design

- Retrospective cohort analysis 2004–2006
- BLS–TOR rule evaluated
- Majority of pts received ALS care

Independent Evaluation of an out-of-hospital TOR CDR

• Academic EM, 2008

Outcomes

- Survival to hospital discharge – cerebral performance of survivors

Exclusion Criteria

- Obvious signs of death or traumatic arrest

Results

- 1160 pts
- PPV 99.9%, 69% drop in transport

Validation of a universal prehospital TOR CDR for ALS and BLS providers

• Resuscitation, 2008

Population

- Prospectively enrolled OHCA in Ontario with ALS or BLS care
- 2415 pts, mean age 69.4, 63% male, 62% unwitnessed

Design

- Retrospective validation using registry data from 2006–2007
- BLS– and ALS–TOR rule evaluated

Validation of a universal prehospital TOR CDR for ALS and BLS providers

• Resuscitation, 2008

Outcomes

- Survival to hospital discharge but had met either BLS- or ALS-TOR criteria

Exclusion Criteria

- DNR, non-cardiac etiology, obvious signs death, under 18 y.o.

Validation of a universal prehospital TOR CDR for ALS and BLS providers

• Resuscitation, 2008

Results

- BLS TOR Rule
 - PPV 100%, 54.4% drop in transport
- ALS TOR Rule
 - PPV 100%, 31% drop in transport

Conclusions

- In OHCA receiving only BLS care, only BLS–TOR rule has been prospectively validated in a rigorous fashion to warrant widespread use
- In OHCA receiving mixed/ALS care, neither TOR rules have been appropriately validated to warrant widespread use
 - Robust preliminary findings of ALS–TOR rule holds promise in these settings

2011 ALS PATIENT CARE STANDARDS

Medical TOR

Applies to all medical VSA

- Of cardiac & asphyxial origin
- Includes hanging, drowning, electrocution

Patient Indications

- ≥ 18 years
- No ROSC
- No Shock
- Unwitnessed Arrest

**Mandatory Patch Point
Following 3rd analysis**

(Advanced Life Support Patient Care Standards., 2011)

Medical TOR in a Public Place

****Unusual circumstance**

- 2 Options:
 - Call for TOR and discuss the situation with the BHP
 - Move pt to the truck and call for TOR

PCP:ACP MedTOR Teamwork

- PCP Crew First on Scene
 - ACP crew to take over pt care IF patch for MedTOR has not yet occurred
 - PCP to continue with patch for MedTOR if ACP crew arrives during patch
 - ACP crew may begin treatment while PCP crew attempts to obtain MedTOR via patch
 - ACP crew to respect PCP MedTOR if granted

Trauma TOR

VSA due to severe blunt OR penetrating trauma (Age \geq 16)

CPR until pads applied

Apply defib pads

Analyze/Interpret Rhythm

Shock Advised/VT/VF

Transport

No Shock Indicated/Asystole/PEA

Asystole

Patch for TOR

PEA (HR $>$ 0)

Transport \geq 30min

Patch for TOR

Transport $<$ 30min

Transport

(Advanced Life Support Patient Care Standards., 2011)

THE PATCH REQUEST

Patch Sheet

Service/Location:

Medic Name/Number/Level:

Run #:

Patient Age/Gender:

**I AM CALLING FOR A TERMINATION OF RESUSCITATION
ORDER FOR A MEDICAL/TRAUMA PATIENT**

Incident Hx/Mechanism of Injury:

Physical Assessment:

Medical TOR

- Pt \geq 18 with no palpable pulses
- Arrest unwitnessed, No ROSC,
No Shocks delivered

Trauma TOR

- Pt \geq 16 with no palpable pulses
- No defibrillation delivered
- Pt asystolic, **OR** HR>0 &
Transport >30min

BH Physician Name:

Time of Death:

Patch Sheet #

(Advanced Life Support Patient Care
Standards., 2011)

LET'S TALK ABOUT DEATH

Previous Training and Knowledge

- Level of difficulty increases as your level of training does not match a situation
- There is some research but definitely not hard science – *art* of medicine
- We all do it a little differently
- Certain core elements we all share

The Setup

- You enter a room of people you have never met... and have to deliver the worst possible news
- You have no idea the family dynamics, or even who you should address
- Rapport must be established quickly however you cannot delay delivering the message

The Delivery

- Focus on closest family members
- Within 1 minute of talking, deliver news
 - “I have horrible news, I’m sorry to tell you that your loved one has died..”
- Nothing they could have done would have made a difference (even if not entirely true)
- Recap method

Words to Use

- Be direct, no ambiguity
- DIED, DEAD, DEATH, PASSED AWAY
- No cliché terminology
- ‘Sorry’ is okay

Post Delivery

- Be quiet.. just be there
- Family will break silence
- Offer to answer questions, further condolences
- Leaving can be awkward

Common Errors

- Talking too much
- Over-explaining or using medical jargon
- Being impatient to leave

Concluding Remarks

- The BLS–TOR and combined trauma TOR are there for your and your patient’s best interest
- Patients who fit these criteria have an incredibly small chance at meaningful survival
- Patch if you are ever in an uncertain situation
- Take the time to speak with family members in an appropriate fashion

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