Time to Get With The Guidelines® for Resuscitation?

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Sr. Staff RN – CTICU – Albany Medical Center
EMS Coordinator – Saratoga County, NY
Albany Medical Center:

- Albany, NY (150 miles north of NYC)
- 651 beds (2 campuses)
- 7,007 employees (FTEs)
- 34,623 admits, 549,546 outpt visits, 69,846 ED visits
- LOS 5.9, occupancy 86.5%
- 21 CPA/month (Cardio Pulmonary Arrests)

330 RRT/month (Rapid Response Team/MET calls):
- Adult 300
- Pedi 28
- Neonatal 2
CLEAR (Clinical Emergencies and Resuscitation) QIT:

- Meets monthly
- Reviews: CPA, RRT, Code Gray
- Interdisciplinary
- Sets policies on response, management, equipment and supplies for emergencies
CLEAR Challenges:

- 1989 – esophageal intubations
- 1992 – SHAM codes
- 1995 – crash carts
- 1998 – EMTALA
- 2000 – AEDs, Time
- 2003 – Benchmarking, RRT, POCE
- 2005 – IO, families calling RRT
- 2010 – EtCO$_2$, secret shoppers
Get With The Guidelines - Resuscitation

> GWTG-R started 1999 as NRCPR (Natl Registry for CPR)
  - Collect resuscitation data from hospitals nationwide
  - Develop evidence-based guidelines for inpatient CPR

> Web based data collection/analysis tool
  - Cardio Pulmonary Arrests (CPA)
  - Medical Emergency Team (MET) or Rapid Response Team (RRT)
  - Acute Respiratory Compromise (ARC)

> www.heart.org/quality
Assessing Quality in Resuscitation:

> Dead or Alive not very specific outcomes
> What processes contribute to good outcomes?
Assessing Quality in Resuscitation:

> Dead or Alive not very specific outcomes
> What processes contribute to good outcomes?

**Gold POCE (Process of Care Exceptions):**

- Compressions within 1 minute (2 min. neonates >10min)
- Event monitored or witnessed
- Defibrillation less than 3 minutes
- Device confirmation of ET placement
Additional Process of Care Exceptions

- IV/IO epi or vasopressin within 5 min to pulseless adults
- IV/IO epi to pedi/newborn/neonates within 5 min
- Vasopressin not given to pedi/newborn/neonates
- Defib provided for VF/pulseless VT
- Shock energies appropriate:
  - Biphasic $\geq$ 120 joules (12+ yo or 50+ kg)
  - Monophasic = 360 joules (12+ yo or 50+ kg)
  - Initial shock $\geq$ 2 joules/kg (< 12 yo and < 50 kg)
  - Subsequent shocks $\geq$ 4 joules/kg (< 12 yo and < 50 kg)
  - All shocks $\leq$ 10 joules/kg (< 12 yo and < 50 kg)
- Shocks $\geq$ 2 minutes apart
- Invasive airway inserted in newborn/neonates
Outcomes

If an adult is admitted to the hospital, and suffers a cardiac arrest, how likely is the patient to survive to hospital discharge?
Outcomes on Television

In a review of television dramas, Diem & colleagues¹ found that:

- The initial survival rate was 75%
- Survival to discharge rate was 67%

According to the National Registry of Cardiopulmonary Resuscitation, the reality of in hospital resuscitation survival is much different.

In data collected from over 300 participating hospitals, the median survival rate is:
Survival following In-Hospital Arrest:

1. 18%
2. 34%
3. 60%
4. 82%
5. 99%
Outcomes and the Public

> The general public has an inflated perception of CPR success.
> Most people believe CPR works 60-85% of the time.
> These figures affect perceptions of the lay community and healthcare workers.
2006 In-Hosp Arrest Survival

AMC
- Dead: 71.3%
- Alive: 28.7%

All Others
- Dead: 78.3%
- Alive: 21.7%
2013 In-Hosp Survival (to date)

<table>
<thead>
<tr>
<th></th>
<th>AMC</th>
<th>All Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>68.2%</td>
<td>75.8%</td>
</tr>
<tr>
<td>Alive</td>
<td>31.8%</td>
<td>24.2%</td>
</tr>
</tbody>
</table>
Interesting NRCPR Findings

<table>
<thead>
<tr>
<th>First documented pulseless rhythm</th>
<th>Pedi CPA (n=880)</th>
<th>Adult CPA (n=36902)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asystole</td>
<td>350 (40)</td>
<td>13024 (35)</td>
<td>.006</td>
</tr>
<tr>
<td>VF or pulseless VT</td>
<td>120 (14)</td>
<td>8361 (23)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>VF</td>
<td>71 (8)</td>
<td>5170 (14)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Pulseless VT</td>
<td>49 (6)</td>
<td>3191 (9)</td>
<td>.001</td>
</tr>
<tr>
<td>PEA</td>
<td>213 (24)</td>
<td>11963 (32)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Unknown</td>
<td>197 (22)</td>
<td>3554 (10)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

JAMA, January 4, 2006 – Vol 295, No 1 (50-57)
Another Very Recent GWTG Discovery

> Where do most cardiac arrests occur?
  - Community OR
  - Hospital

> ~ 175,000 per year out of hospital
  - ROC data (Nichol et al, JAMA 2008)

> ~ 200,000 per year in hospital
What other opportunities exist?
Are arrests predictable?

> 54/64 (84%) antecedent events 8 hours before arrest. 92% mortality

-Schein; Chest 98: 1990

> 99/150 (66%) antecedent events 8 hours before arrest. 91% mortality

-Franklin; CCM 22: 1994

> 24/47 (51%) premonitory signs general med-surg floors 24 hours pre arrest

-Smith; Resuscitation 37: 1998
Predictors for arrest in 4 hours

> Evidence basis:
  - HR < 45 or > 139
  - SBP < 90
  - RR < 8 or > 30 (sustained)
  - Acute change in LOC
  - Staff member seriously worried about patient

- Hodgetts; Resuscitation 54: 2002
- Cretikos; Resuscitation 73: 2007
Sudden death in the community

“Moby Pig” circa 1971
Hospitals Form ‘SWAT’ Teams To Avert Deaths

Averting crisis on the floors
RRT Increasing

Total RRT – Albany Medical Center Hospital

<table>
<thead>
<tr>
<th>Year</th>
<th>RRT</th>
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<tbody>
<tr>
<td>2005</td>
<td>23</td>
</tr>
<tr>
<td>2006</td>
<td>931</td>
</tr>
<tr>
<td>2007</td>
<td>1014</td>
</tr>
<tr>
<td>2008</td>
<td>1215</td>
</tr>
<tr>
<td>2009</td>
<td>1588</td>
</tr>
<tr>
<td>2010</td>
<td>1950</td>
</tr>
<tr>
<td>2011</td>
<td>2656</td>
</tr>
</tbody>
</table>
AMC Jan 2006 – Jun 2008

> 2514 RRT calls for 1895 patients
> Range 80-110 per month
> Evenly distributed over days of week and hours of the day/night
> Average RRT duration 41 minutes
> 13 patients died during RRT
Significant differences...

<table>
<thead>
<tr>
<th>Outcome data</th>
<th>AMC</th>
<th>others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior ICU discharge</td>
<td>29.1%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Resulted in ARC event</td>
<td>9.7%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Not transferred</td>
<td>73.0%</td>
<td>49.5%</td>
</tr>
</tbody>
</table>

AMC compared to 300+ beds (mixed)
How to Intervene Earlier?

> Data driven (names, dates, times, places…)

> Deaths were not in patients with:
  - Prior ICU discharge
  - ARC events
  - Those not transferred back to an ICU

> Deaths seemed to have been anticipated by families!
Families?

> Allow patients, family members and significant others to call RRT
Reaction from Administration:
Other RRT Opportunities for Improvement:

- RRT visits each patient discharged from ICU every day until d/c
- RRT follows up daily on every RRT patient
Epi within 5 minutes

- Process of Care Exception (POCE)
- Increasing number
  - Initially solved by adding surgical fellow to code team
  - 2 years later, numbers again increased
  - Surgery cites “vasculopathies” and bariatric cases
- Data used to implement IO program
- Problem solved (GWTG data)
GWTG-R Logistics:

> Web based data collection & reporting
> Abstractors certified (protects data quality)
> Similar platform to GWTG Stroke, HF…
Community Page

Get Started!

Resuscitation

Trainings

Advanced Reporting: Learn more about using measures interface features such as filters, display options, and exporting your reports to PDF and Excel.

Downloading: Learn how to quickly access your data in a spreadsheet format

HF: An introduction to the HF tool, including navigating the system, entering data, and running reports

Report Writer: Create customized reports on your data

Stroke: An introduction to the Stroke tool, including navigating the system, entering data, and running reports

Uploader 2.0: Step-by-step instructions on the file creation and upload processes

Resuscitation: An introduction to the Resuscitation tool, including navigating the system, entering data, and running reports

My Hospital

Start Date  AHA Baseline Date
TOTAL  1234

Snapshot

<table>
<thead>
<tr>
<th></th>
<th># of Hospitals:</th>
<th># of Records:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td>857</td>
<td>661840</td>
</tr>
<tr>
<td>NCDR</td>
<td>90</td>
<td>21718</td>
</tr>
</tbody>
</table>

Reminder!
Outcome is a vendor for ACTION Registry-GWTG.
For more information please click the FAQ link under Resources.
### Snapshot

<table>
<thead>
<tr>
<th>Condition</th>
<th># of Hospitals</th>
<th># of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>AtrialFib</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>902</td>
<td>914920</td>
</tr>
<tr>
<td>NCDR</td>
<td>88</td>
<td>33500</td>
</tr>
</tbody>
</table>

- **Resuscitation - Patients**: 729, 521831
- **Resuscitation - CPA**: 36990
- **Resuscitation - ARC**: 309557
- **Resuscitation - MET**: 393
- **Resuscitation - PCAC**: 276861

*Last updated 09/12/2013 at 04:00*
**GWTGRecogGroup**

**GWTG Recognition Group**

**Recognition**
- CPA: Percent pulseless cardiac events monitored or witnessed
- CPA: Time to first chest compressions $\leq 1$ min in adult and pediatric patients, and newborn/neonates $\geq 10$ min old
- CPA: Time to first chest compressions $\leq 2$ min in newborn/neonate $< 10$ min old
- CPA: Device confirmation of correct endotracheal tube placement
- CPA: Time to invasive airway $\leq 2$ min in newborn/neonates
- CPA: Time to first shock $\leq 2$ min for VF/pulseless VT first documented rhythm

**Quality**
- ARC: Device confirmation of correct endotracheal tube placement
- ARC: Invasive airway inserted in newborn/neonatal events
- ARC: Time to first assisted ventilation $\leq 1$ min
- ARC: Time to invasive airway $\leq 2$ min in newborn/neonates
- CPA: Chest compressions provided
- CPA: Defibrillation shock provided for VF/pulseless VT rhythm
- CPA: Initial shock energy $\geq 2$ joules/kg ($<12$ yrs old AND $<50$ kg)
- CPA: Invasive airway inserted in newborn/neonates
- CPA: IV/IO Vasopressin bolus appropriately not administered to pediatric patients or newborn/neonates
- CPA: Time to IV/IO Epinephrine bolus administered to pediatric patients or newborn/neonates $\leq 5$ min
- CPA: Time to IV/IO Epinephrine/Vasopressin bolus administered to pulseless adults $\leq 5$ min
- CPA: Shock energy $\leq 10$ joules/kg ($<12$ yrs old AND $<50$ kg)
- CPA: Subsequent shock delivered $\geq 2$ min after previous shock
- CPA: Subsequent shock energy $\geq 4$ joules/kg ($<12$ yrs old AND $<50$ kg)

**Reporting**
- ARC: Reason ARC event ended
- CPA: Adult and pediatric patients with pulseless cardiac events who died and had DNAR status declared and/or Life support withdrawn
- CPA: Adult patients with pulseless cardiac events who survived and CPC scores at hospital discharge
- CPA: VF/Pulseless VT Shocks
- CPA: CPR Quality

**SAVE THE REPORT OPTIONS (OPTIONAL)**

Save Measure, Format, Period, and Filter and Display Options for future reports...
2007: DNR Not Addressed

CPA: Adult and pediatric patients with pulseless cardiac events who died and had DNAR status declared and/or Life support withdrawn
2009: DNR Not Addressed

CPA: Adult and pediatric patients with pulseless cardiac events who died and had DNAR status declared and/or Life support withdrawn

Percent of Patients

DNAR Status

Life Support Withdrawn

Pulseless cardiac arrest patients who died that had DNAR status declared and/or Life support withdrawn

- My Hospital - 01/01/2009 - 12/31/2009
- All Hospitals - 01/01/2009 - 12/31/2009
- All NY Hospitals - 01/01/2009 - 12/31/2009
- Bed Size for CPA - 500+ Beds - 01/01/2009 - 12/31/2009
Was It Sustained? 2010-2013

CPA: Adult and pediatric patients with pulseless cardiac events who died and had DNAR status declared and/or Life support withdrawn

Pulseless cardiac arrest patients who died that had DNAR status declared and/or Life support withdrawn

- My Hospital – 01/01/2010 – 12/31/2013
- All Hospitals – 01/01/2010 – 12/31/2013
- All NY Hospitals – 01/01/2010 – 12/31/2013
- Bed Size for CPA – 500+ Beds – 01/01/2010 – 12/31/2013
What else?
What’s In It For You?

> Benchmarking
> Analysis
> Improvement
CONCLUSIONS
Each survival and neurologic outcome after inhospital cardiac arrest has improved during the past decade at hospitals participating in a large national quality improvement registry, funded by the American Heart Association.
Is This Fudge?

> Are outcomes good/better because of preventable codes?

> **NO**: hospitals with high survival rates had less codes!

> Affected by Nurse-patient ratio

AHA Guidelines - 2013

Pre, Intra, Post arrest recommendations:

1. Real time feedback at the point of care
2. Shock early, don’t interrupt CPR, avoid hyperventilation, optimize depth
3. BENCHMARK
Pre Arrest Recommendations

- Accessible, standard defibs & code carts, 2 min shock
- CPR feedback at the point of care
- Process of care data collected and reviewed
- RRT, Code Team: trained and regularly evaluated
- All staff trained in CPR including AED
- Identify at-risk patients (tele guidelines, consider vests)
- DNAR

American Heart Association
Intra Arrest Recommendations

> Evaluate quality of CPR
> Defib in 2 minutes or less
> Minimize interruptions in CPR (10 seconds max)
> Avoid hyperventilation
> Optimize compression depth
Post Arrest Recommendations

> Systematic care
> TH
> PCI
> Optimize hemodynamics
> Treat seizures (prophylaxis not recommended)
> Glucose control
> Recognize futility ➔ withdrawal ➔ organ donation
The Biggest Recommendation

> Benchmark

> Public Reporting!
GWTG-Resuscitation Summary

www.mikemcevoy.com

> Data
> Benchmarking
> Analysis

Questions?