Improving CPR performance in the Emergency Department through Feedback and Data

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EvergreenHealth Emergency Department

- 54,000 Annual ED Visits
- 27 ED Physicians
- 100+ Nursing/ED Staff
- Level III Trauma Center

- NE King and South Snohomish County Residents
- Relationship Redmond Medic One
Identified Problem - Consistent CPR?

- **How was the quality of CPR in Emergency Department?**

- **What was our compression rate?**

- **What was our hands-on compression ratio?**
Get With the Guidelines Registry

Data collected from hospitals across the U.S.

Advantages
- Robust registry
- Benchmarking
- Decision support

Data focused on
- CPR quality
- Defibrillation events
- Post arrest care
- Antecedents to the arrest
Get With the Guidelines Registry

Was performance of CPR monitored or guided using any of the following? (Check all that apply)
- None

If CPR mechanics device (e.g. accelerometer, force transducer, TFI device) used:
- Yes
- No
- Not Documented

Was a team debriefing on the quality of CPR provided completed after the event?
- Yes
- No
- Not Documented

Percent of chest compressions with complete release:
- (%)
- Not Documented

Average Ventilation Rate:
- (per minute)
- Not Documented

Longest Pre-shock pause:
- (seconds)
- Not Documented
2013 Consensus Statement Recommendation

“...resuscitation data from the defibrillator or any other device or source documentation that captures data at the scene should be used for feedback to the team.”

Circulation, 2013
Developing a Culture of High Quality CPR

Circulation, 2010
We Started To Look At the Data.....
Intra-Arrest Review

Compression fraction

Goal: at least 80%!

2.12 / 2.57 = 75%

Compression Rate
136/minute

Table:

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<thead>
<tr>
<th>Interval</th>
<th>Compr. Ratio, %</th>
<th>Compr. Rate</th>
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<tbody>
<tr>
<td>0-1 min</td>
<td>73</td>
<td>134</td>
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<td>137</td>
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<tr>
<td></td>
<td>50</td>
<td>137</td>
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</table>
Intra-Arrest Review

Custom Initial Rhythm

7:23 / 7:38 = 97%

135/minute

CPR QUIK-VIEW

Interval Statistics
Any Issues Here?

CPR QUIK-VIEW

Interval Statistics

<table>
<thead>
<tr>
<th>Compr. Ratio, %</th>
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<td>97</td>
<td>103</td>
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Shock | Time  | Energy | Pre-shock CPR Pause | Post-shock CPR Pause |
------|-------|--------|---------------------|----------------------|
1     | 2:16  | 200J   | 0:03                | 0:03                 |
2     | 4:59  | 360J   | 0:58                | 0:03                 |
The Process of Analysis & Feedback

- CodeSTAT training for ED Annotator

- All CPR cases reviewed at EHMC Code Blue Committee (ED, RT, nursing and Cardiac Team)

- All CPR cases reviewed at ED Quality Committee

- CPR report given to treating ED MD

- CPR report displayed in staff lounge for staff to review
Real-Time Advantage
After Giving Feedback

- What about the rate?
- Compression Fraction?
After Giving Feedback

Device Type: LIFEPAK 12
Power On: 7/7/2014 1:15:15 PM
CPR Annotations Edited: Yes
Device Configuration: 0005KKG3GG7R
*Times have been adjusted by the system

Duration: 00:57:28
Incident ID: 2014070713151500-KEI
Statistical Parameters: 1000-0300-3000-05

Compressions Ratio
(total time)

Compression Rate

10:02 / 10:30 = 95%
112/minute

Initial Rhythm

x1.0 25mm/sec

Ventilation  AED-prompted CPR period  Shock
Chest compression  AED Analysis  ROSC (user annotated)

CPR QUIK-VIEW

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<th>Compr. Rate</th>
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After Giving Feedback
TrueCPR

Device Type: TrueCPR
Power On: 4/16/2015 4:26:59 AM
CPR Annotations Edited: No
Device Configuration: *
*Times have been adjusted by the system

Duration: 00:15:18
Incident ID: 2015041604271100-27020
Statistical Parameters: 1000-0300-3000-05

Compressions ratio
(total time)

40 60 80
20 0 100

12:47 / 15:05 = 85 %

Compression rate

80 100 120 140
40 0 160 200

110/minute

Compression depth

2 0 4

1.7 in

Compressions with target depth

20 40 60

80 0 100

208 / 1395 = 15 %

Good compressions

40 80

196 / 1395 = 14 %

Summary
Questions