No Interruptions, Please!

Pit Crew on Steroids

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Wichita-Sedgwick County EMS System
Approach to Resuscitation

• On Scene:
  – Metronome
  – Pit Crew
  – CCR
  – EtCO2
  – Stay and play

• Followup
  – Annotation
  – Crew feedback
Pit Crew

- Stolen from
- Locally modified
  - Compressions vs. Minutes
- Placement: providers and equipment
  - Limit movement
Pit Crew

Consistency
Structure
Efficiency
Accountability
What matters?

• Compressions
• Pause length
• Right-timed defibrillation
Clear Targets

- CPR Ratio of >95-100%
- Compression Ratio of ≥90%
- Pauses <10 seconds
Sacred BLS Triangle & Checklist
## Defined Roles

<table>
<thead>
<tr>
<th>Position #1</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| **Role**    | To facilitate continuous compressions in cardiac arrest and assist with airway/ventilation. Positioned at patient RIGHT. **Assigned** to fire fighter or paramedic on first in unit. | - Assess unresponsiveness/pulselessness and initiate compressions  
- Alternates compressions every 220 compressions with Position #2  
- Counts compressions in 20’s and calls out 17, 18, 19, 20 each time  
- Ventilates with BVM in off cycle (20:1)  
- Assists with airway management as needed |

<table>
<thead>
<tr>
<th>Position #2</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| **Role**    | To facilitate continuous compressions in cardiac arrest and assist with airway/ventilation. Positioned at patient LEFT. **Assigned** to fire fighter or paramedic on first in unit. | - Brings and operates AED or LP 12  
- Initiates metronome  
- Applies oxygen via NRM at high flow  
- Alternates compressions every 220 compressions with Position #1  
- Counts compressions in 20’s and calls out 17, 18, 19, 20 each time  
- Ventilates with BVM in off cycle (20:1)  
- Assists with airway management as needed |

<table>
<thead>
<tr>
<th>Position #3</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| **Role**    | To facilitate airway patency and ventilations. Positioned at Patient HEAD. **Assigned** to fire fighter or paramedic on non-transporting response unit. | - Monitors and manages airway for duration of arrest to ensure patency. Reacts to problems  
- Calls out compressions in increments of 20 (20, 40, 60, 80, 120, 140, 160, 180, 200)  
- Assembles and applies all airway equipment except ETT  
- Applies BVM/OP at 660 compression mark with two handed seal on mask  
- Monitors EtCO₂ values and communicates with team |

**Personnel can rotate in and out of Positions 1, 2, and 3 as needed so long as this does NOT interfere with care or interrupt CPR.**
Backsliding
How did NASCAR do it?

- Review
- Question
- Fine tune
# Compression Fraction

## CCF Across Different Airway Management

<table>
<thead>
<tr>
<th>Airway Intervention</th>
<th>Mean ± SD</th>
<th>p=0.88</th>
<th>Airway Device</th>
<th>Mean ± SD</th>
<th>P=0.92</th>
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</thead>
<tbody>
<tr>
<td>Basic</td>
<td>90.6% ±18.4%</td>
<td></td>
<td>NRB</td>
<td>85.8% ±22.9%</td>
<td></td>
</tr>
<tr>
<td>Advanced</td>
<td>91.2% ±14.2%</td>
<td></td>
<td>BVM</td>
<td>91.4% ±17.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Combitube</td>
<td>91.7% ±18.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ETT</td>
<td>91.0% ±12.9%</td>
<td></td>
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</tbody>
</table>


A-ROID!
Visual Systems

- **Seiton** (orderliness)
  - motion minimized by proper equipment placement

- **Seisou** (cleanliness)
  - environment effectively places and communicates essential information

- **Seiketsu** (standardization)

- **Shitsuke** (discipline)
  - avoid a return to the behavior of the past

AHRQ / Patient Safety
Specifics

• Precharge defibrillator every cycle
• Hand on femoral pulse
• At 220
  – Hands off chest
  – Eyes on monitor
  – Finger on defib button
  – Count
  – No “clear”
• Automatic restart CPR
2013 Sedgwick Outcomes (National)

- Overall survival 11.3% (8.0%)
- Utstein survival 38.6% (24.6%)
  - 94% CPC 1/2 at discharge (88.7%)
# Mechanical Trial

<table>
<thead>
<tr>
<th></th>
<th>n Value</th>
<th>ROSC</th>
<th>CPR Ratio</th>
<th>Compress Ratio</th>
<th>Compress Rate</th>
<th>Compress/Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>8</td>
<td>2</td>
<td>97.0</td>
<td>94.6</td>
<td>108</td>
<td>102.4</td>
</tr>
<tr>
<td>Mechanical + Manual</td>
<td>8</td>
<td>2</td>
<td>96.5</td>
<td>94.4</td>
<td>108</td>
<td>101.5</td>
</tr>
</tbody>
</table>

Note: The values for Mechanical Alone are marked with a question mark.
Putting It Together