

CPR Process

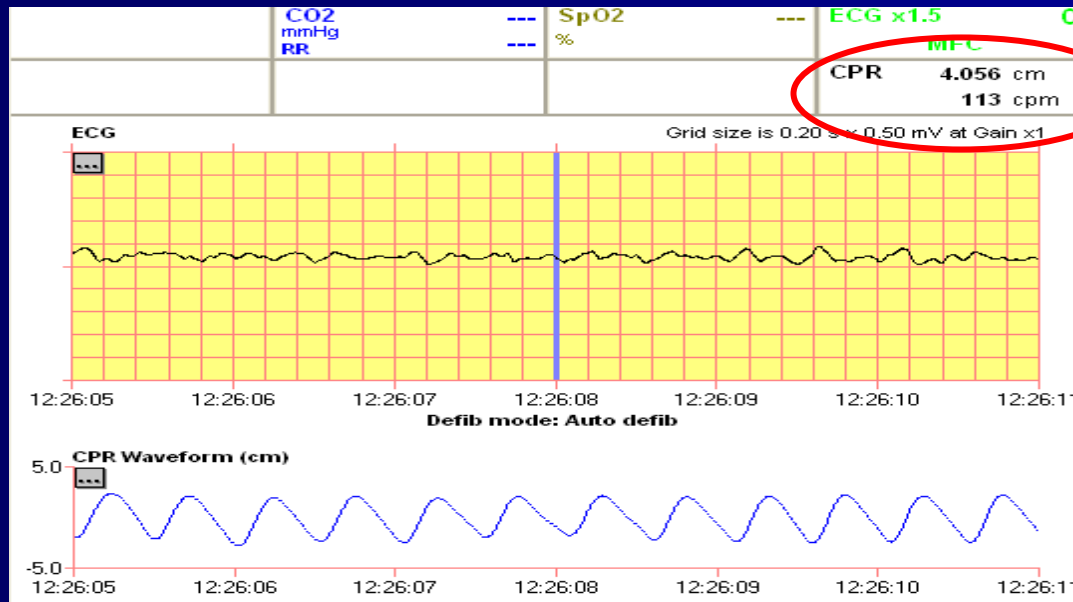
THE NUTS AND BOLTS



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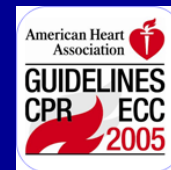


What is CPR Process



Compression Rate
Compression Depth

- Ability to measure parameters stressed in 2005 AHA guidelines



- Once measured, attempt to determine whether parameters impact both CPR performance and survival

Key is Concept of CPR Feedback

- Real time feedback to provider regarding compression depth and compression rate



New CPR D Padz

NEW!





Key Parameters Captured

Minute	Sec. w/c Comp.	Vents	Vents Imped	Vents etCO2	Comp. Count	Comp. Rate	Comp. Fraction	Unanl. Sec.	Mean Comp. Depth	Comp. in Target	Mean CO2
1	21	0	4	0	76	116	65.00 %	0	4.13	100.00 %	0.00
2	8	0	0	0	100	115	86.67 %	0	4.12	100.00 %	0.00
3	19	0	2	0	83	121	68.33 %	1	4.36	97.59 %	0.00
4	24	0	5	0	65	108	60.00 %	0	4.05	93.85 %	0.00
5	41	0	5	0	40	126	31.67 %	1	4.05	100.00 %	0.00
6	27	0	5	0	54	98	55.00 %	0	4.50	72.22 %	0.00

Ventilations

Compressions in one minute Epoch

Compression Rate

CPR Fraction

Mean Compression Depth



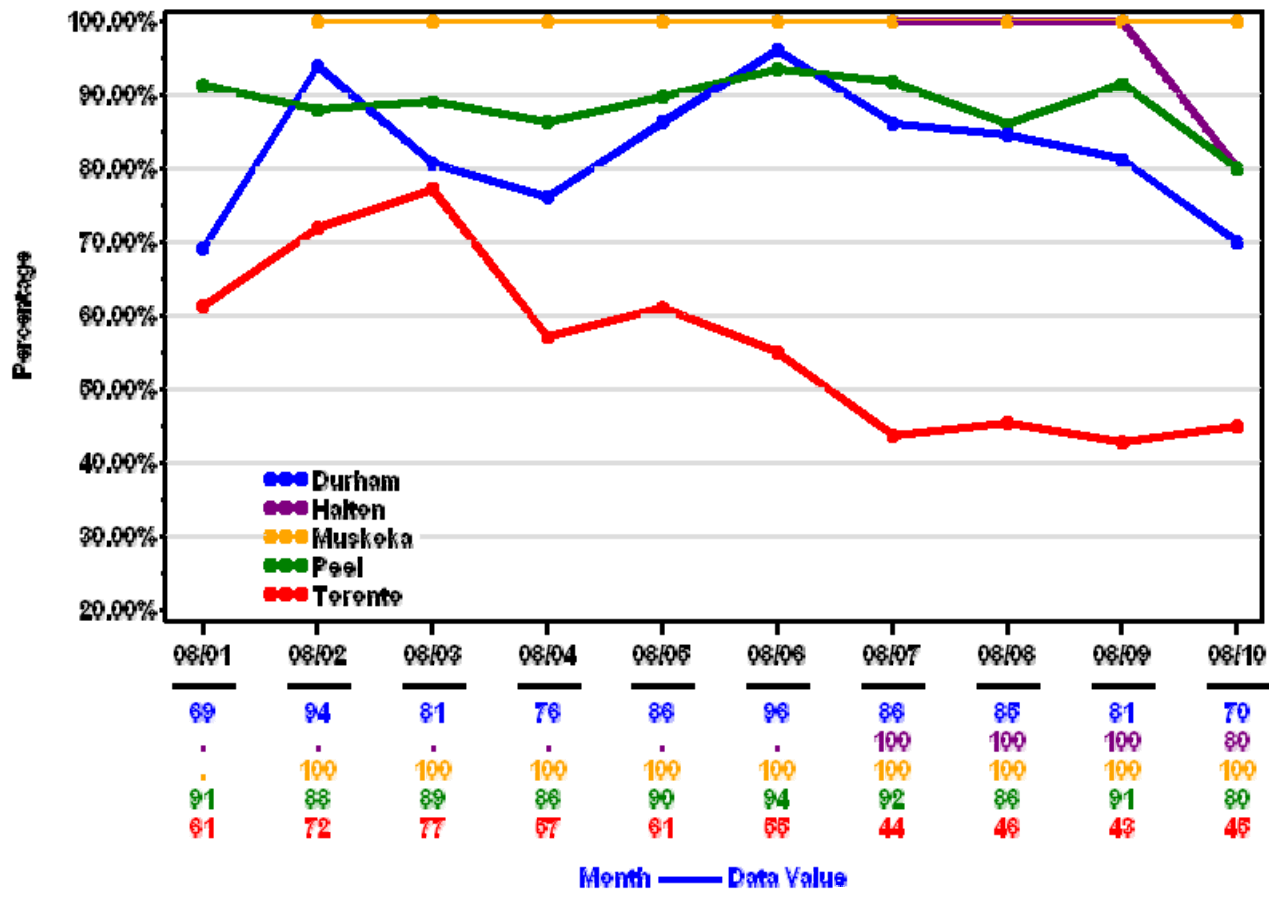
All useless if can't capture CPR process

Must be able to capture CPR process by:

- Data Card
- USB Key
- Serial Port
- Wireless

Data capture must be reliable over time

ZOLL file uploaded - By Month



Zoll Software and CPR Process

- Where do we find our answers?



Start Point : The General Tab

2007-11-22 <Unknown>

2007-11-22 12:25:20

- 12:25:20 Power on
- 12:25:20 Card 1
- 12:25:20 MFC: pads
- 12:25:20 Defib mode: Auto defib
- 12:25:20 Pacer: disabled
- 12:25:20 Sync mode: disabled
- 12:25:20 Defib state: idle
- 12:25:35 MFC: CPR-D Padz
- 12:25:36 Pads on
- 12:25:36 CPR filter: off
- 12:25:40 CPR filter: on
- 12:25:41 Analysis: started
- 12:25:46 CPR filter: off
- 12:25:47 Defib state: charging
- 12:25:50 Analysis: shock advised
- 12:25:50 Defib state: ready
- 12:25:51 CPR filter: on
- 12:25:54 CPR filter: off
- 12:25:58 Shock: 1 120 J
- 12:25:58 Energy delivered: 158.0
- 12:25:58 Patient current: 14.00 A
- 12:25:58 Patient impedance: 98.0
- 12:25:58 CPR filter: off
- 12:26:04 CPR filter: on
- 12:26:36 CPR filter: off
- 12:26:38 CPR filter: on
- 12:27:02 CPR filter: off
- 12:27:03 CPR filter: on
- 12:27:23 CPR filter: off
- 12:27:24 CPR filter: on
- 12:27:40 CPR filter: off
- 12:27:41 CPR filter: on
- 12:27:58 Analysis: started
- 12:28:03 CPR filter: off
- 12:28:04 Defib state: charging
- 12:28:07 Analysis: shock advised
- 12:28:07 Defib state: ready

11 - Cardiopulmonary 2 | 12 - Respiratory | 13 - Respiratory 2 | **14 - Code Quality** | 15 - Admit/Discharge | 16 - C

1 - General | 2 - Entire ECG | 3 - Magnified ECG | 4 - CPR Analysis | 5 - CPR Quality Calculation | 6 - CPR Challenge | 7 -

Case

CPR number:

Start time: 2007-11-22 12:25:20

Data duration: 00:08:05

File name: C:\Documents and Settings\Craig Beers\Desktop\ROC Data Upload-PRPS-20

Comments:

Defibrillator

Device type: E Series (TM) Defibrillator, Biphasic

Serial number: 00002471 Ver:03.01

Device ID: 00000000000

Power on time: 2007-11-22 12:25:20

Adjusted power on time: 2007-11-22 12:25:20

Operator:

Patient

Patient ID / MR number:

Last name:

First name:

MI: Gen:

Sex:

Race:

DOB: 1900-01-01 Unknown

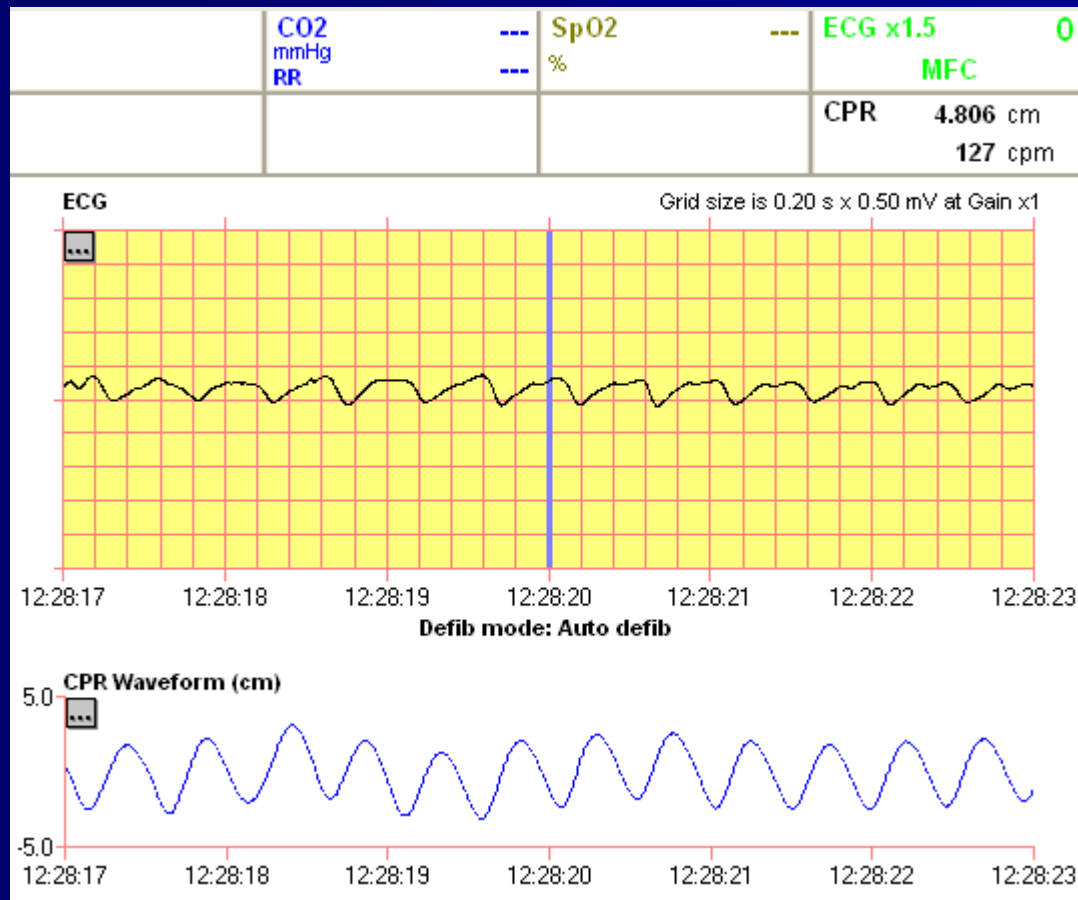
Height: in

Weight: lbs

AutoPulse

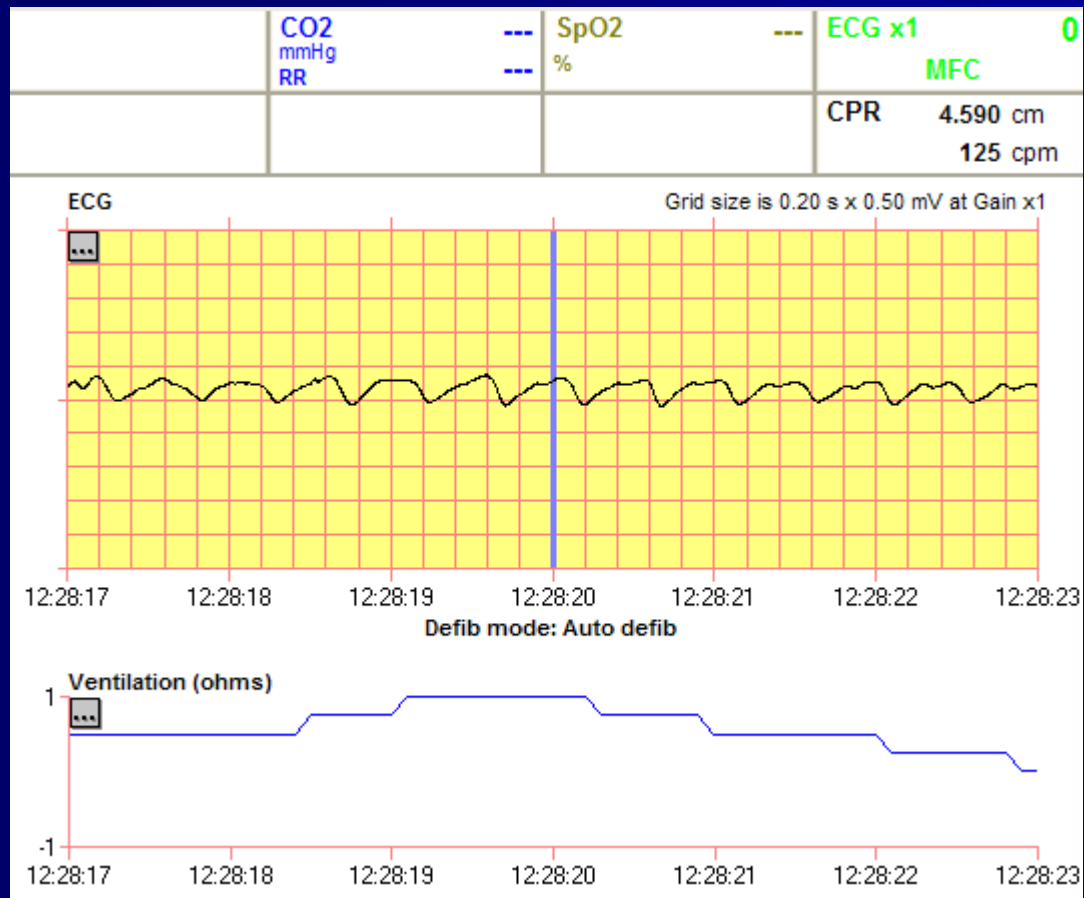


Magnified ECG and CPR Waveform



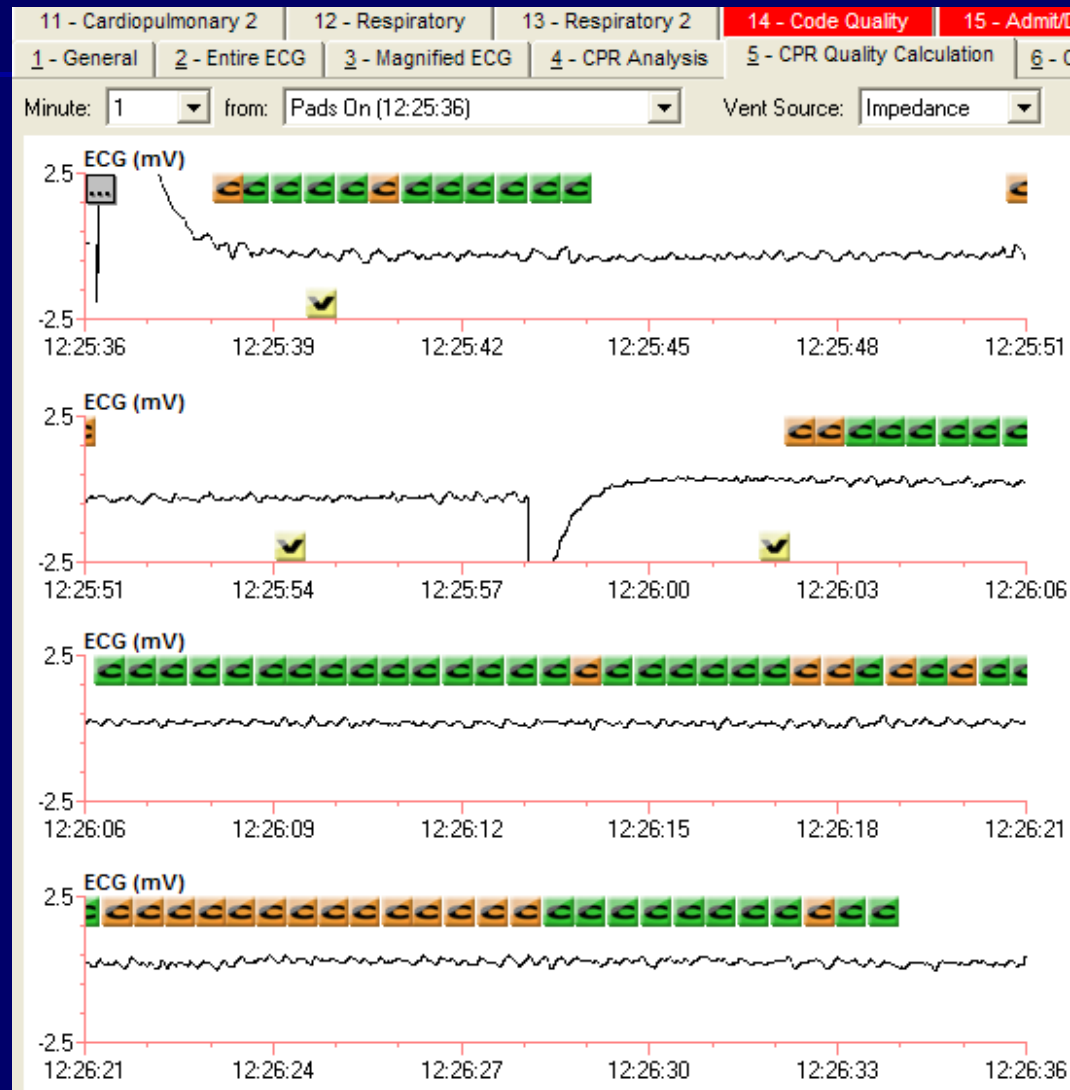


Magnified ECG and Ventilations



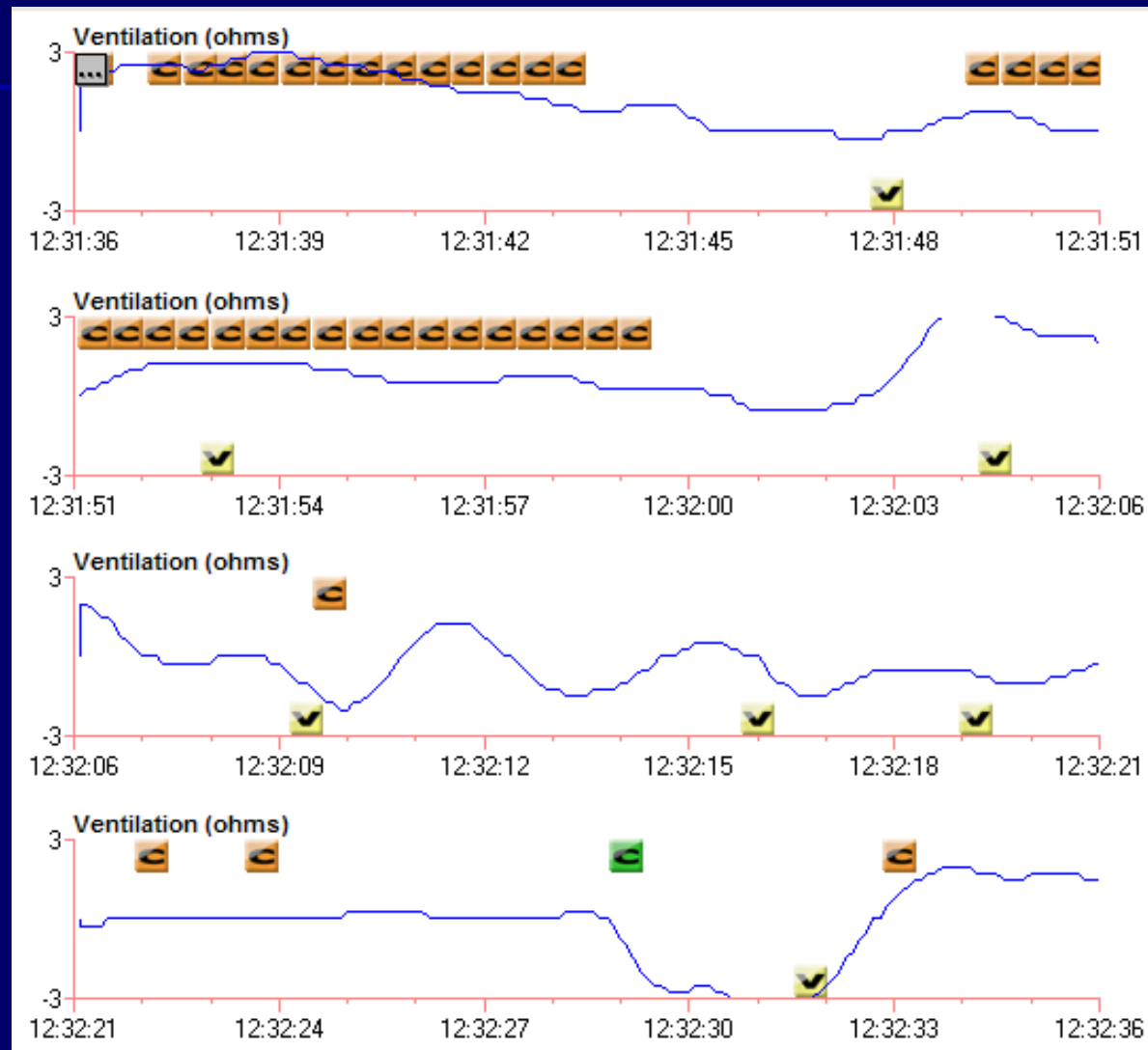


CPR Quality Calculation





CPR Quality Calculation





My Key Parameters

Time to Analysis: Power on to first Analysis

Time	Event
2007-11-22 12:25:20	Power on
12:25:20	Card 1
12:25:20	MFC: pads
12:25:20	Defib mode: Auto defib
12:25:20	Pacer: disabled
12:25:20	Sync mode: disabled
12:25:20	Defib state: idle
12:25:35	MFC: CPR-D Padz
12:25:36	Pads on
12:25:36	CPR filter: off
12:25:40	CPR filter: on
12:25:41	Analysis: started
12:25:46	CPR filter: off
12:25:47	Defib state: charging
12:25:50	Analysis: shock advised
12:25:50	Defib state: ready
12:25:51	CPR filter: on
12:25:54	CPR filter: off
12:25:58	Shock: 1 120 J
12:25:58	Energy delivered: 158.00 J
12:25:58	Patient current: 14.00 A
12:25:58	Patient impedance: 98.00 oh

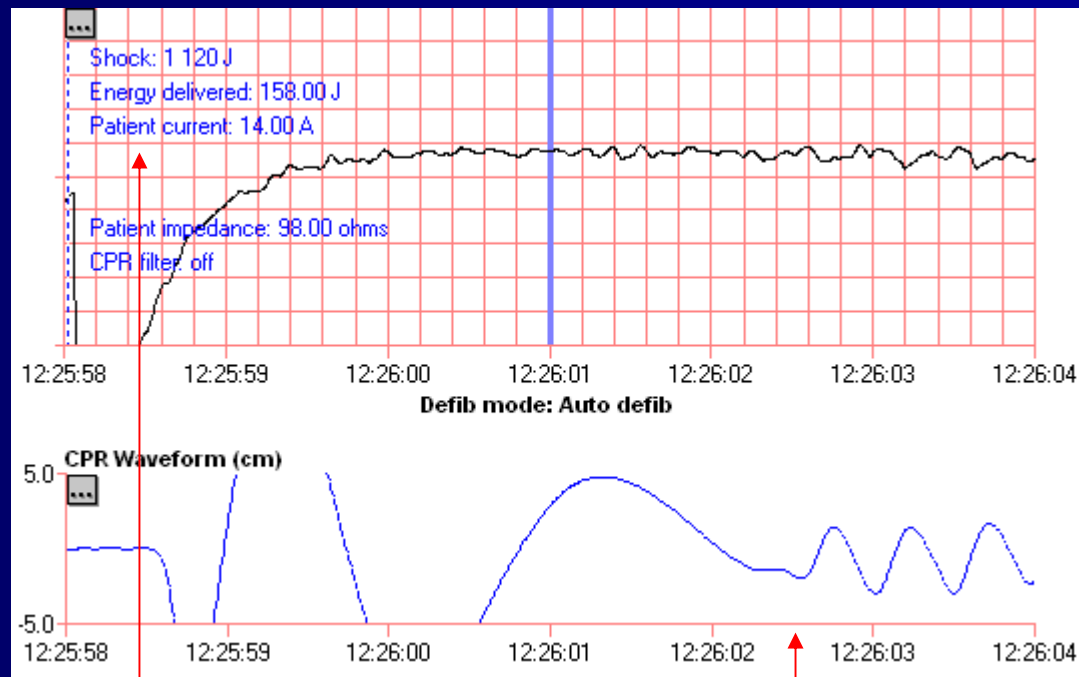
Power On

First Analysis

SHOCK

My Key Parameters

CPR Post Shock: Time to compressions after shock



shock delivered

compressions continued



My Key Parameters

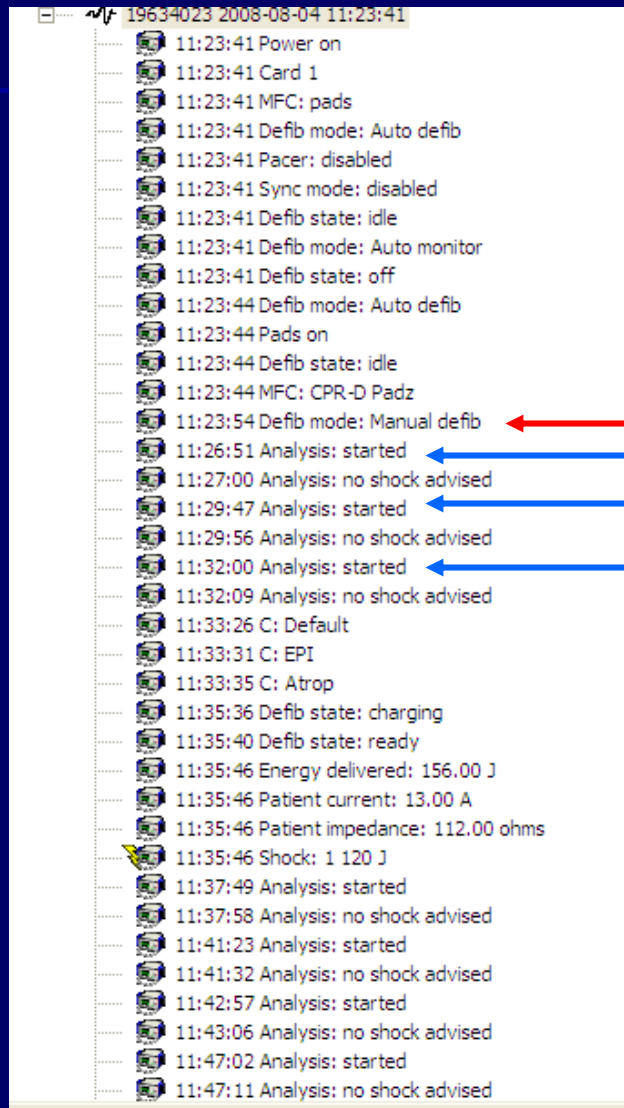
COMPLIANCE WITH PROTOCOL

- Length of CPR between Analyses
- CPR time post shock
- Ventilation rate

Cardiac Arrest Manual Mode vs. Semi-automatic Mode

- Increasing literature on what mode defibrillator is set to
- Manual mode > lower compliance to guidelines, more shocks
- Auto mode > greater compliance to guidelines

Working in Manual Mode



Commit to manual mode

CPR time 2:47 minutes

CPR time 2:56 minutes

Working in Auto Mode

8016461 2008-05-11 12:12:11

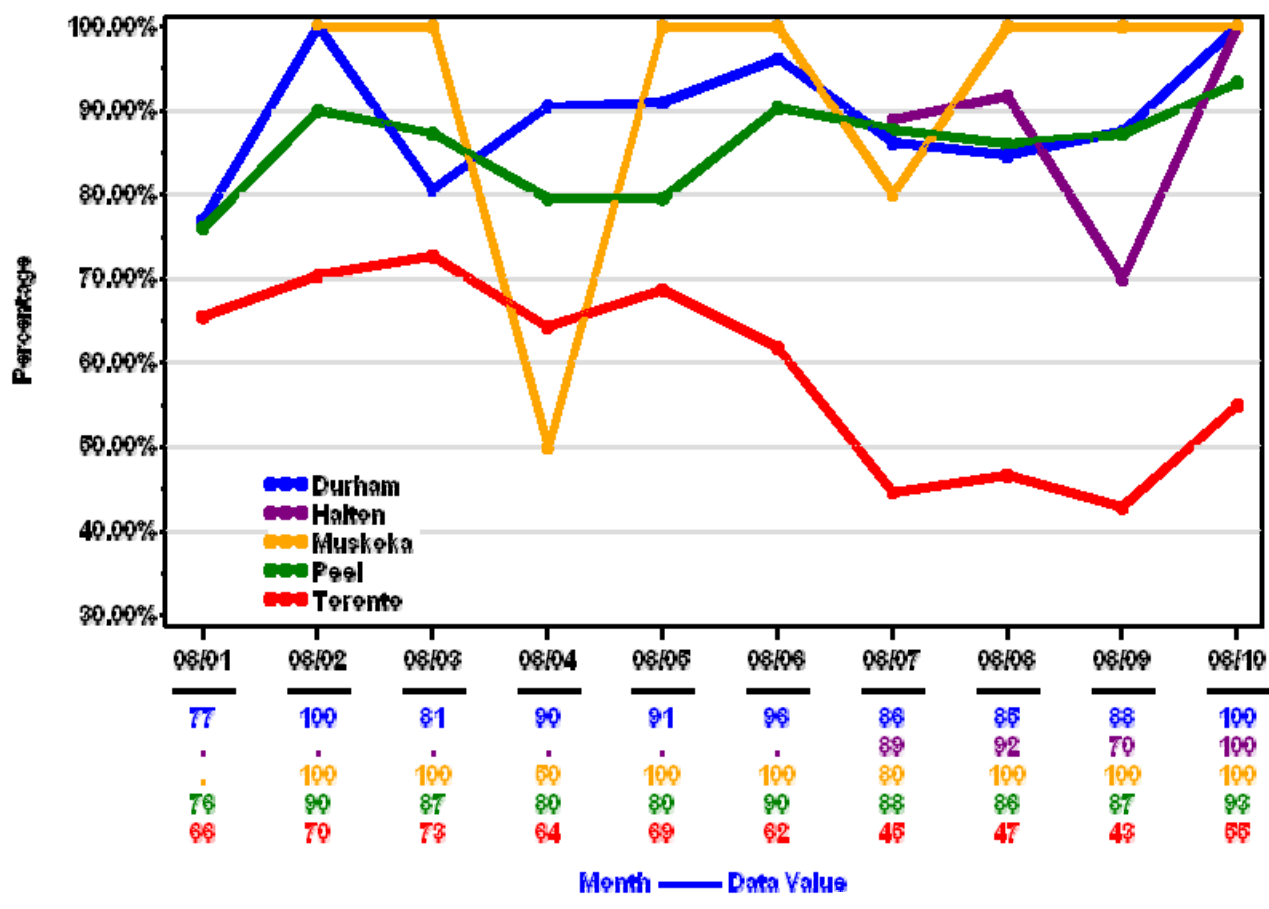
- 12:12:11 Power on
- 12:12:14 CPR-D Padz off
- 12:12:16 Defib mode: Auto defib
- 12:12:16 Prompt: unit OK
- 12:12:17 Prompt: adult pads
- 12:12:19 Prompt: check patient
- 12:12:20 Prompt: attach defibrillation pads to patient's bare chest
- 12:12:35 Prompt: attach defibrillation pads to patient's bare chest
- 12:12:45 CPR-D Padz on
- 12:12:45 Prompt: don't touch patient, analyzing
- 12:12:46 Analysis: started
- 12:12:52 Prompt: don't touch patient, analyzing
- 12:12:55 Analysis: no shock advised
- 12:12:55 Prompt: no shock advised
- 12:12:57 Prompt: start CPR
- 12:13:07 Prompt: push harder
- 12:13:15 Prompt: push harder
- 12:13:58 Prompt: good compressions
- 12:14:12 Prompt: push harder
- 12:14:27 Prompt: push harder
- 12:14:58 Prompt: stop CPR
- 12:14:59 CPR-D Padz off
- 12:15:00 Prompt: check defib pads
- 12:15:00 CPR-D Padz on
- 12:15:01 Prompt: don't touch patient, analyzing
- 12:15:02 Analysis: started
- 12:15:07 Prompt: don't touch patient, analyzing
- 12:15:11 Analysis: shock advised
- 12:15:11 Prompt: shock advised
- 12:15:15 Prompt: don't touch patient
- 12:15:16 Prompt: press flashing shock button
- 12:15:21 Shock: 1 120 J
- 12:15:21 Patient impedance: 130.00 ohms
- 12:15:21 Prompt: shock delivered
- 12:15:23 Prompt: start CPR
- 12:15:34 Prompt: push harder
- 12:16:09 Prompt: push harder

Commit to auto mode

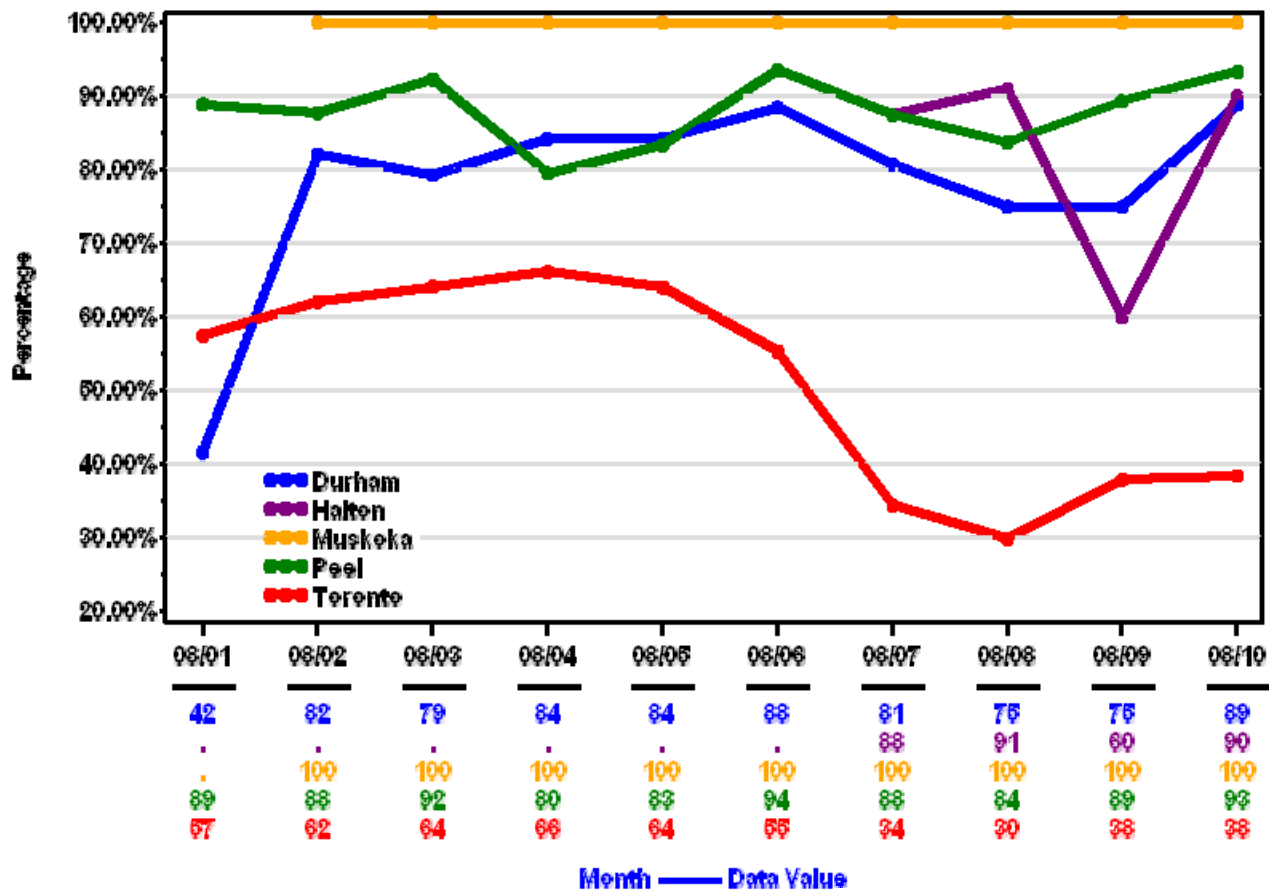
Commit to analysis comment

CPR time 2:07 minutes

Cardiac Arrest Notification Line Activity - By Month



ITD yield - By Month



Thank you!

