

***The OPALS
Prehospital Research
Group***



ONTARIO PREHOSPITAL ADVANCED LIFE SUPPORT STUDY

Annual Site Investigators Meeting - 2006

The Resuscitation Outcomes Consortium Studies:

Monitoring CPR Process



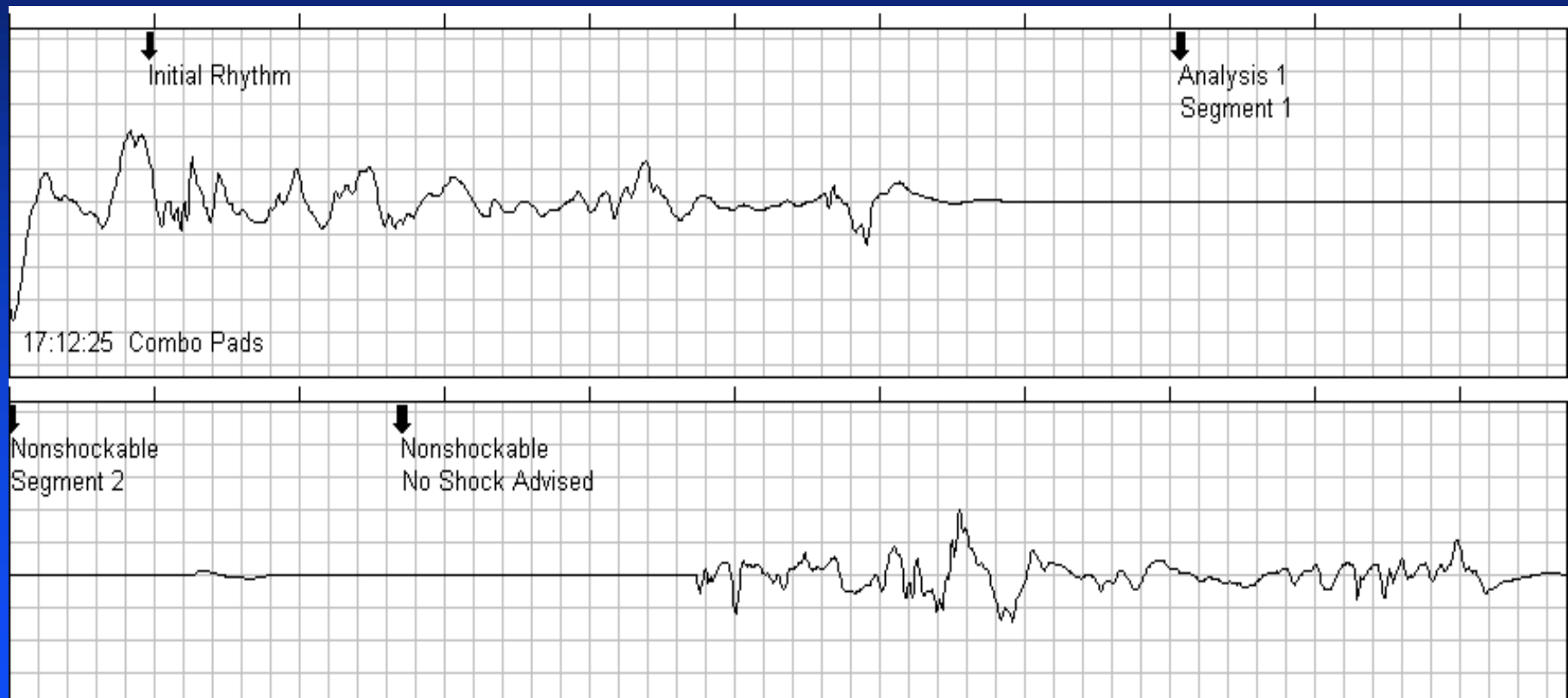
What Do We Capture?

- Initial cardiac arrest rhythm (VF, VT, PEA, asystole,)
- Type of monitoring device used
- “Power On” time, “Pads placed” time, time of termination of resuscitation or time of ED arrival.
- 5 full minutes of CPR

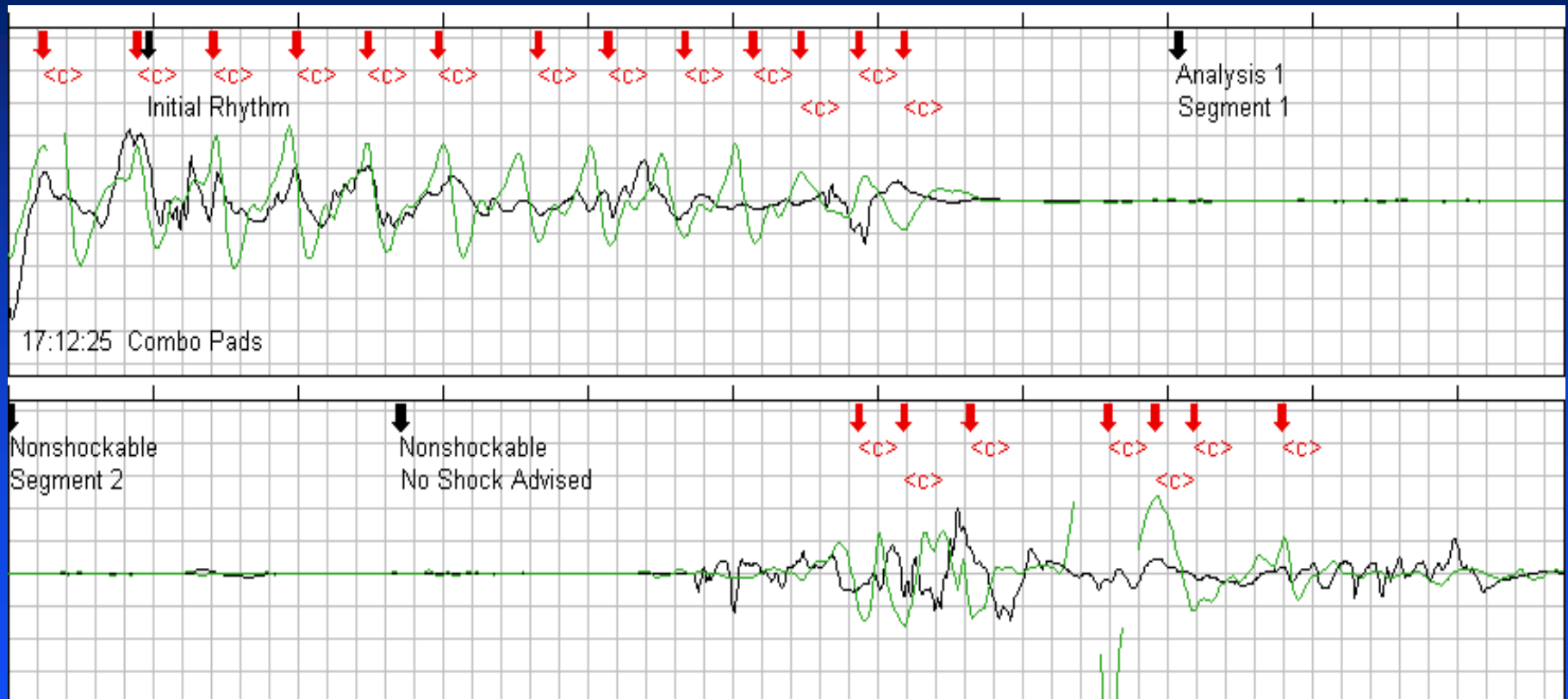
How Do We Do It?

- **Cases are received via email from each Base Hospital**
- **Case is downloaded into appropriate software**
- **Strips are analyzed for compressions and ventilations**
- **Data report produced and data is entered into web based Epistry screen**

Download File From Base Hospital (Medtronic)



Impedance Wave Form (Medtronic)



CPR Quality Measurements Medtronic

Device Type:

Power On:

Device Config:

Incident ID:

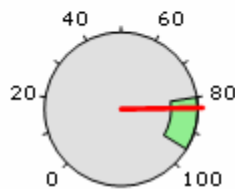
CPR Annotations Edited?

Duration:

Report Generated:

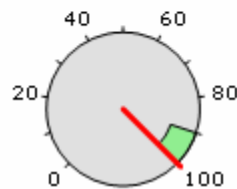
Statistical Parameters:

CPR Ratio
(/total time)



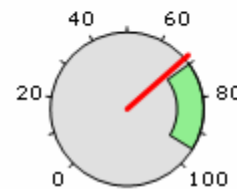
1:25 / 1:42 = 83 %

Prompted CPR Ratio
(/AED-prompted CPR time)



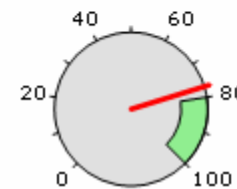
1:00 / 1:00 = 100 %

Compressions Ratio
(/total time)



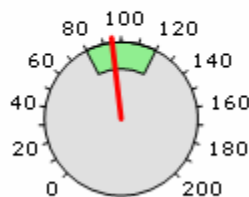
1:10 / 1:42 = 68 %

Prompted Compressions Ratio
(/AED-prompted CPR time)



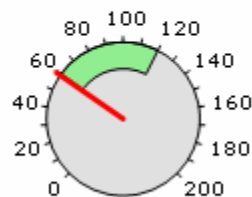
0:46 / 1:00 = 77 %

Compression Rate



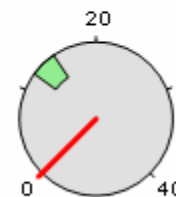
95/minute

Compressions/minute



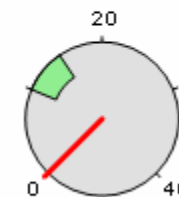
59/minute

Ventilation Rate



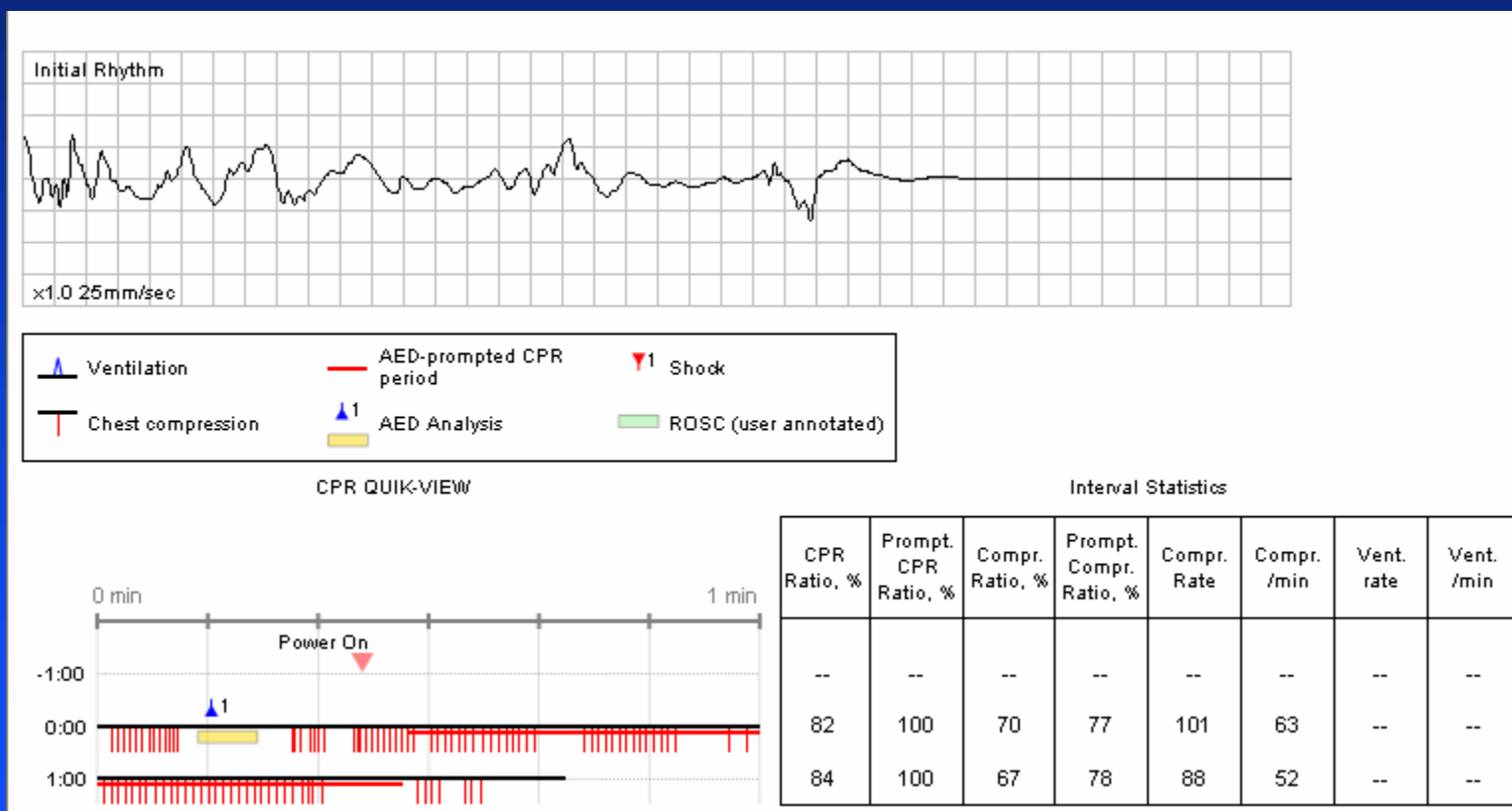
--

Ventilations/minute

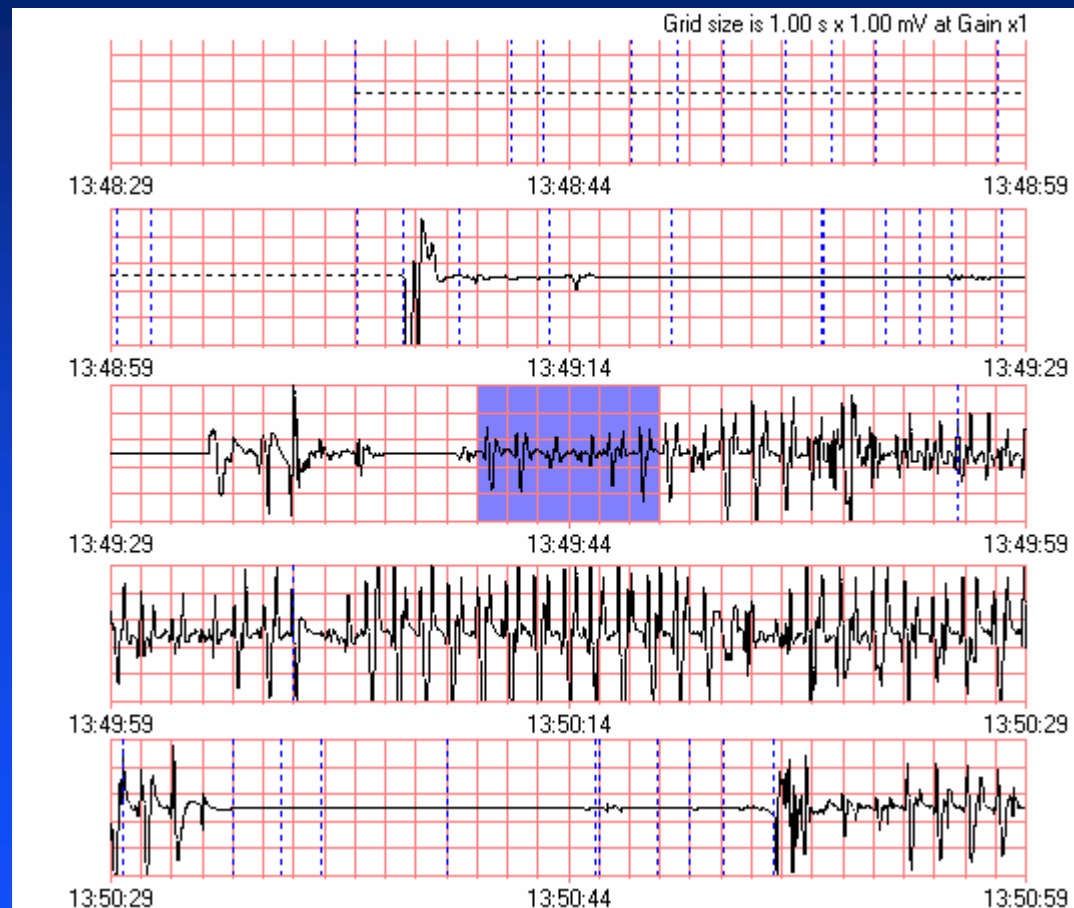


--

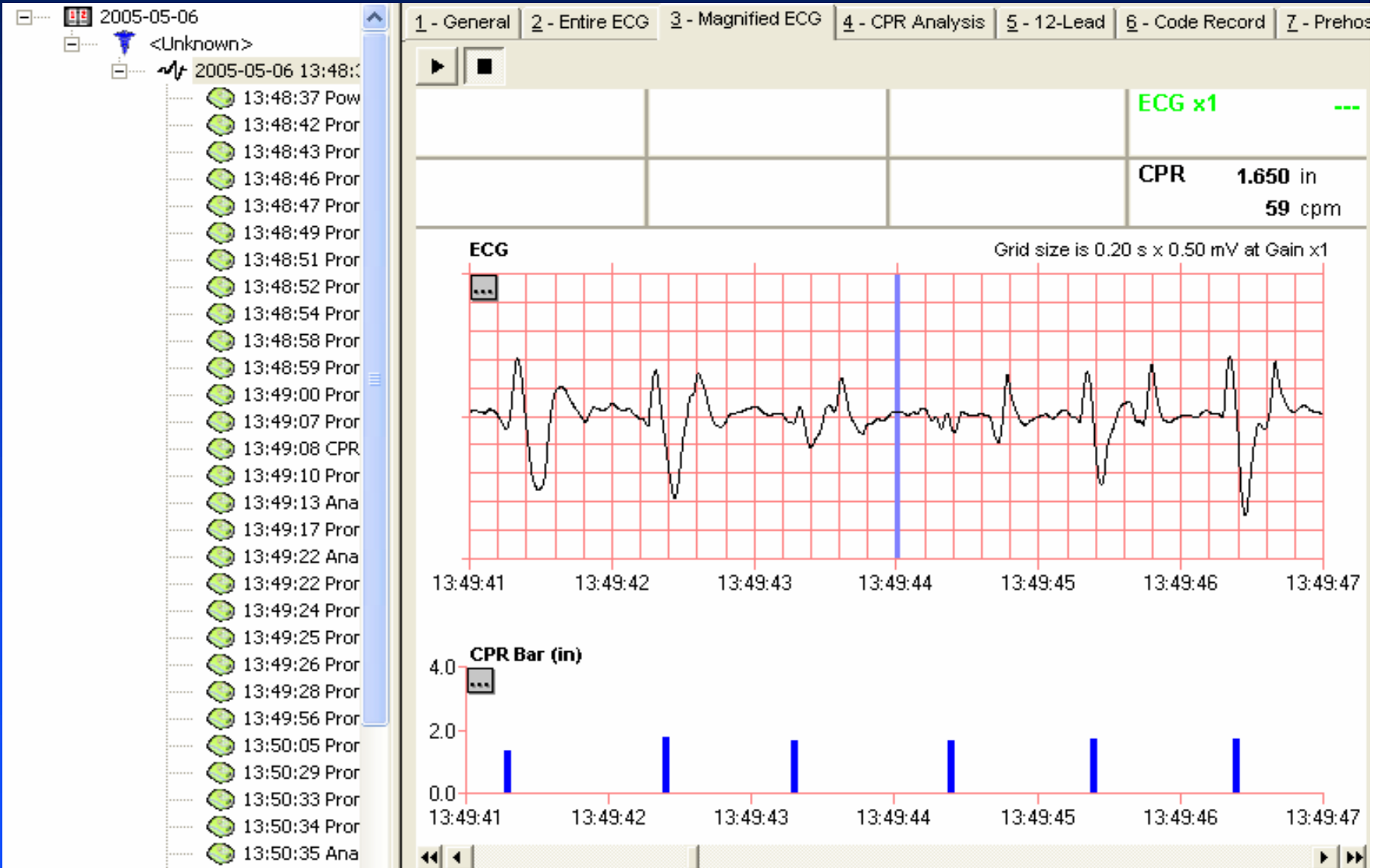
CPR Quality Measurements Cont'd



Download File From Base Hospital (Zoll)



Compression Depth (Zoll)



CPR Quality Report (Zoll)



CPR Quality Report (Zoll)

Summary

CPR summary

Case duration:	00:04:20	Time in CPR:	00:01:39 (38.08 %)
Time to first CPR:	00:01:00	Time out of CPR:	00:02:41 (61.92 %)
Total compressions:	107	CPR quality in target:	0.00 %

Compressions summary

Depth:

Mean:	1.83 in
Standard deviation:	0.29 in
Above target zone:	32 (29.91 %)
In target zone:	62 (57.94 %)
Below target zone:	13 (12.15 %)

Rate:

Mean:	59.44 cpm
Standard deviation:	21.30 cpm
Above target zone:	2 (1.87 %)
In target zone:	1 (0.93 %)
Below target zone:	104 (97.20 %)

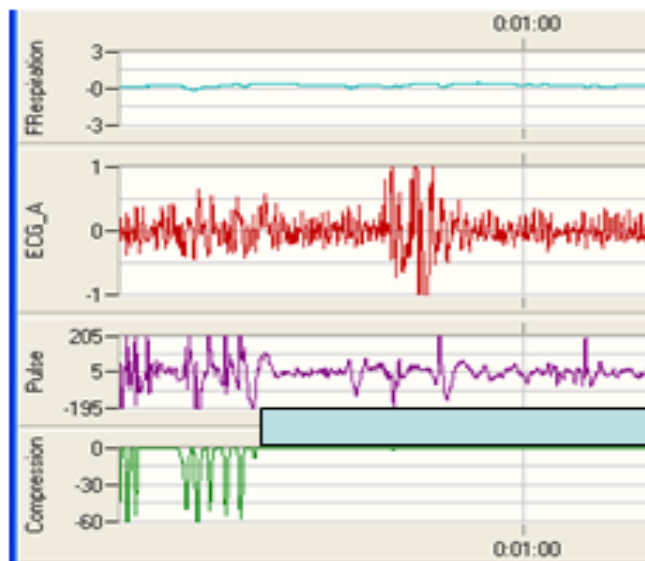
Phillips Laerdal Output



- data card collects all incident data related to CPR feedback and defibrillation event information
- Data is downloaded in to Sister Studio for incident review, QA/QI and research purposes

Output Overview (Philips/Laerdal)

A screenshot of SISTER Studio – a custom made viewer and analysis tool.



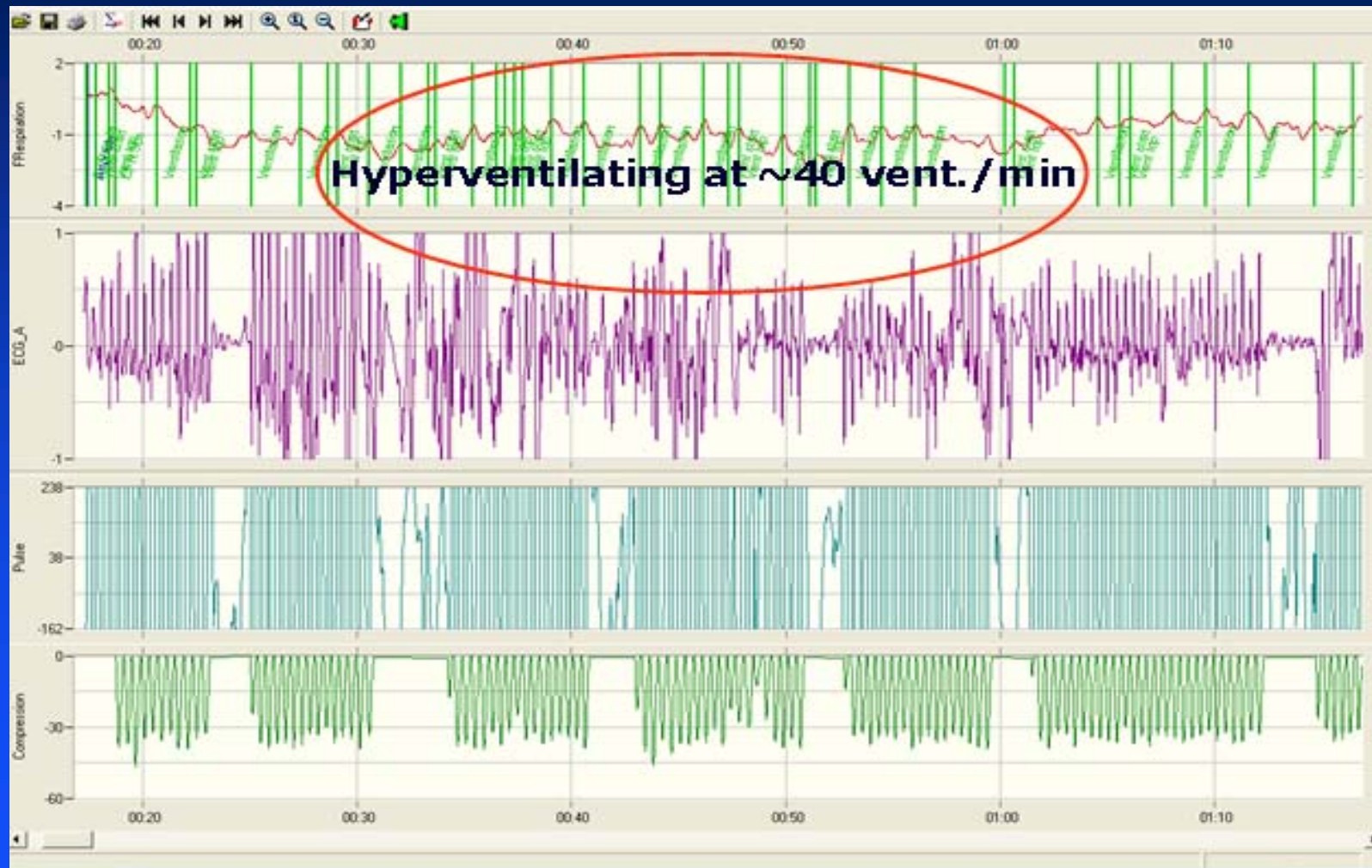
The upper panel shows **ventilation signals** (scale in $m\Omega$), filtered from compression and ECG artefacts.

The middle two panels shows **ECG** – here VF – and **impedance signals**.

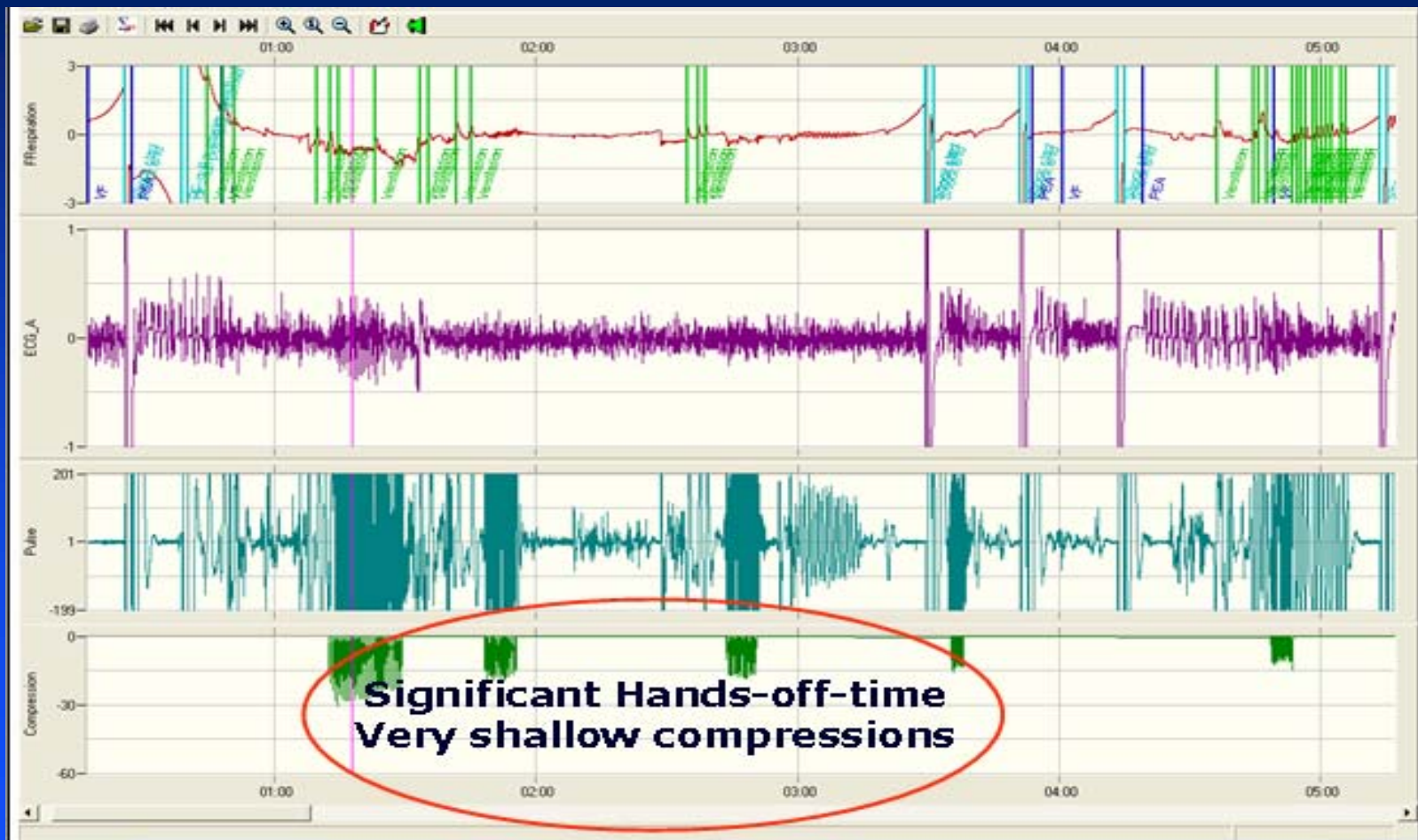
The lower panels shows **compressions** in mm, scale 0-60 mm.

The pauses between compressions was defined as **No Flow Time**

Hyperventilation (Philips/Laerdal)



Sample of Poor Compressions (Philips/Laerdal)



Philips Laerdal Report

Event data downloaded to a spreadsheet

No	Start	Length	CompCount	CompOK	CompToKeep	CompToShell	CompDepIn	CompIncompl	CompRate	CompDC	IntCount	IntI	IntDZ	NFT	NFR
X	00:15.0	05:00.0	325	291	1	33	42	2	91	32%	81	894	964	28	28%
0	00:15.0	00:30.0	7	7	0	0	42	0	93	36%	2	1010	836	25	83%
1	00:45.0	00:30.0	22	19	1	2	41	0	92	33%	5	898	900	15	52%
2	01:15.0	00:30.0	34	33	0	1	43	0	96	32%	4	796	1032	8	29%
3	01:45.0	00:30.0	33	24	0	9	40	0	90	31%	3	793	703	8	28%
4	02:15.0	00:30.0	38	36	0	2	43	0	88	32%	13	771	863	4	16%
5	02:45.0	00:30.0	46	46	0	0	44	0	91	33%	13	867	733	0	0%
6	03:15.0	00:30.0	11	8	0	3	36	0	87	33%	9	785	978	21	72%
7	03:45.0	00:30.0	40	36	0	5	42	2	88	30%	12	919	854	2	9%
8	04:15.0	00:30.0	46	44	0	2	44	0	92	34%	12	1006	1131	0	0%
9	04:45.0	00:30.0	47	38	0	9	42	0	94	32%	8	1108	1961	0	0%
a	00:15.0	00:30.0	7	7	0	0	42	0	93	36%	2	1010	836	25	83%
b	02:15.0	00:30.0	42	40	0	2	43	0	88	32%	12	809	866	1	6%
Sum	00:13.7	36:29.2	867	796	1	100	42	2	96	33%	63	1136	2082	157	7%

How Are We Doing?

- 2 Sites submitting on a regular basis
- Analysis has been done on a total of 52 OPALS cases (5 minute duration each)
- Important to participate ASAP as this data will be required for the ROC PRIMED interventional trial.

Thank You

Medtronic

Zoll Data Systems

Philips-Laerdal Medical Systems