



Laerdal CPR Process Update

**2008 OPALS Prehospital
Research Group
Annual Meeting**

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A Proud 50 Year History



A Trusted Partnership



- Began ten years ago with an agreement signed with Hewlett Packard, who became Agilent Technologies and now well known as **Philips Medical Systems**.



HeartStart MRx Monitor/Defibrillator

Ease of use in therapy

- Battery
- Monitor
- Weight
- Q-CPR



What is Q-CPR?



- Q-CPR is a CPR measurement and feedback tool integrated into an ALS monitor/defibrillator to promote high-quality CPR delivery by emergency responders.



System Components



Therapy/CPR Cable

Compression Sensor

Standard Defib Pads

Q-CPR in MRx

Compression measurement

Compression Sensor



Sensor Adhesive Pad

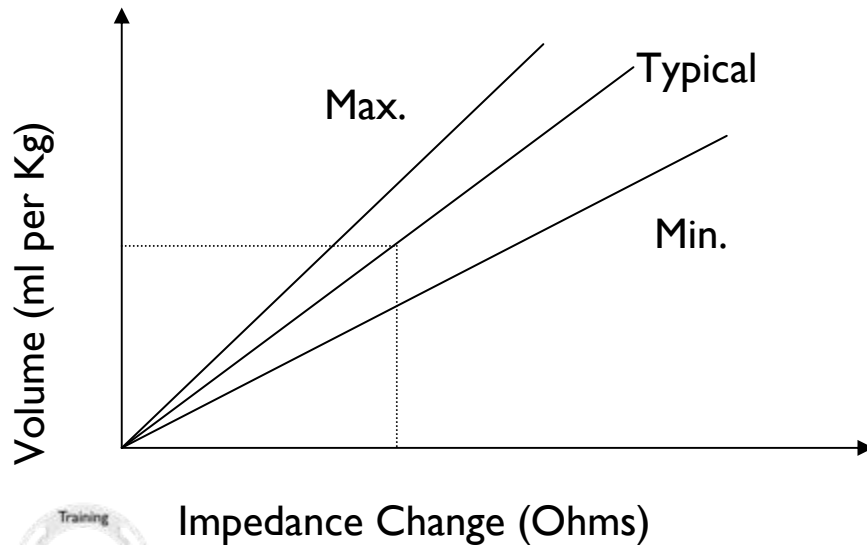
Measurements:

- Compression Depth
- Compression Rate
- Chest recoil
- Compression/release ratio
- No Flow Time (inactivity timer)

Q-CPR in MRx *Ventilation Measurement*

A new role for our multifunction pads...

- Detect changes in chest impedance.
- Detects ventilation.



*This is a new application
of a proven principle*

Real-Time Feedback

Clinical Priorities*

Compressions:

1. Incomplete Release
2. Compression depth shallow
3. Compression rate slow or fast
4. Compression depth deep
5. Duty Cycle

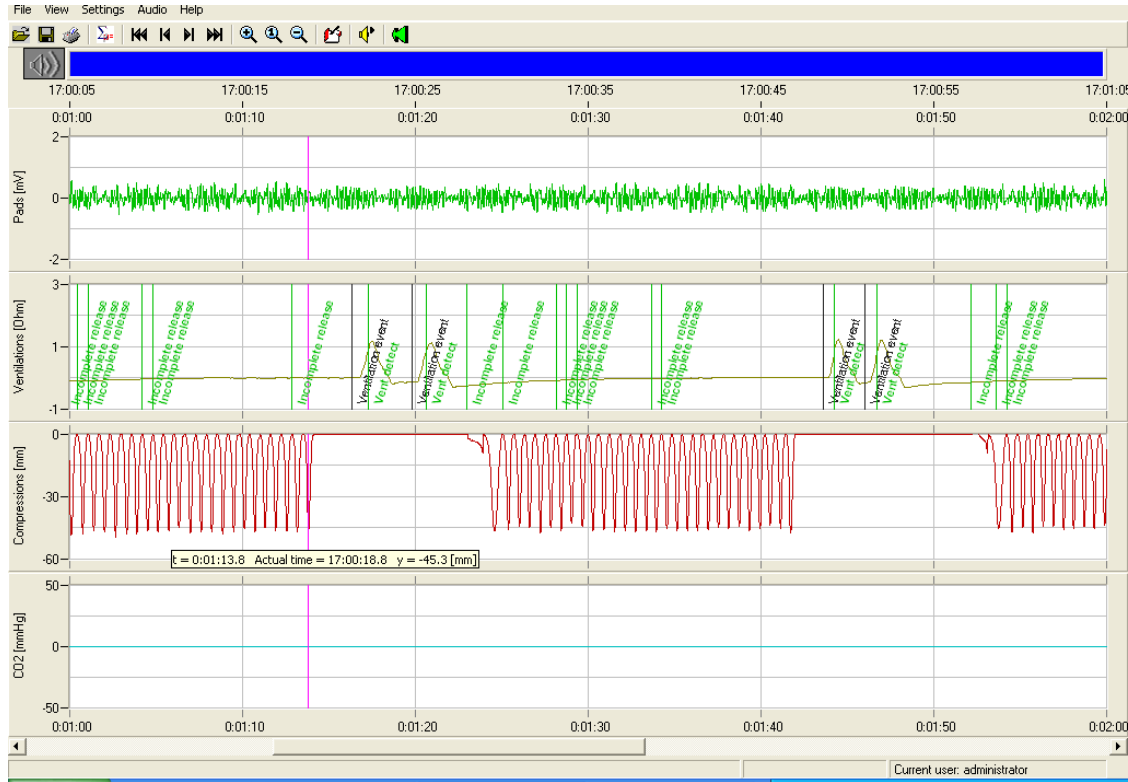
Ventilations:

1. Volume low
2. Frequency high or low
3. Inflation time fast or slow

* These priorities were set based on an evaluation of published research data.

Data Management

Q-CPR Review EVALUATION SOFTWARE:



Q-CPR Captured Data

- Compression Waveform
- Ventilation Waveform
- Ventilation Inflation Time
- Ventilation Volume
- CO2 Waveform
- EtCO2



Data Output

ROC Summary:

#Vent	#Comp	Comp Rate	CPR Fraction	Comp Depth	Comp Release
0	0		0%		
3	37	134	28%	40	29
3	117	140	86%	37	106
3	61	125	48%	36	43
7	38	93	40%	34	27
1	71	94	77%	36	30
3	43	101	43%	44	12
3	94	114	83%	36	77
3	47	120	39%	37	40
9	89	112	81%	38	65
7	20	96	23%	44	0
12	62	92	68%	40	0
1	5	90	100%	43	0
55	687	111	52%	38	432

Event Review Portfolio



Tools on PDA to manage HS1 & FRx w/o removing device from service. 6 languages

Configure AEDs

HeartStart Configure

HeartStart Case Capture

Download case to ER Suite



Review Express Connect

Save & email case
 •6 languages
 •Lets remote site move data to data mgr or MD

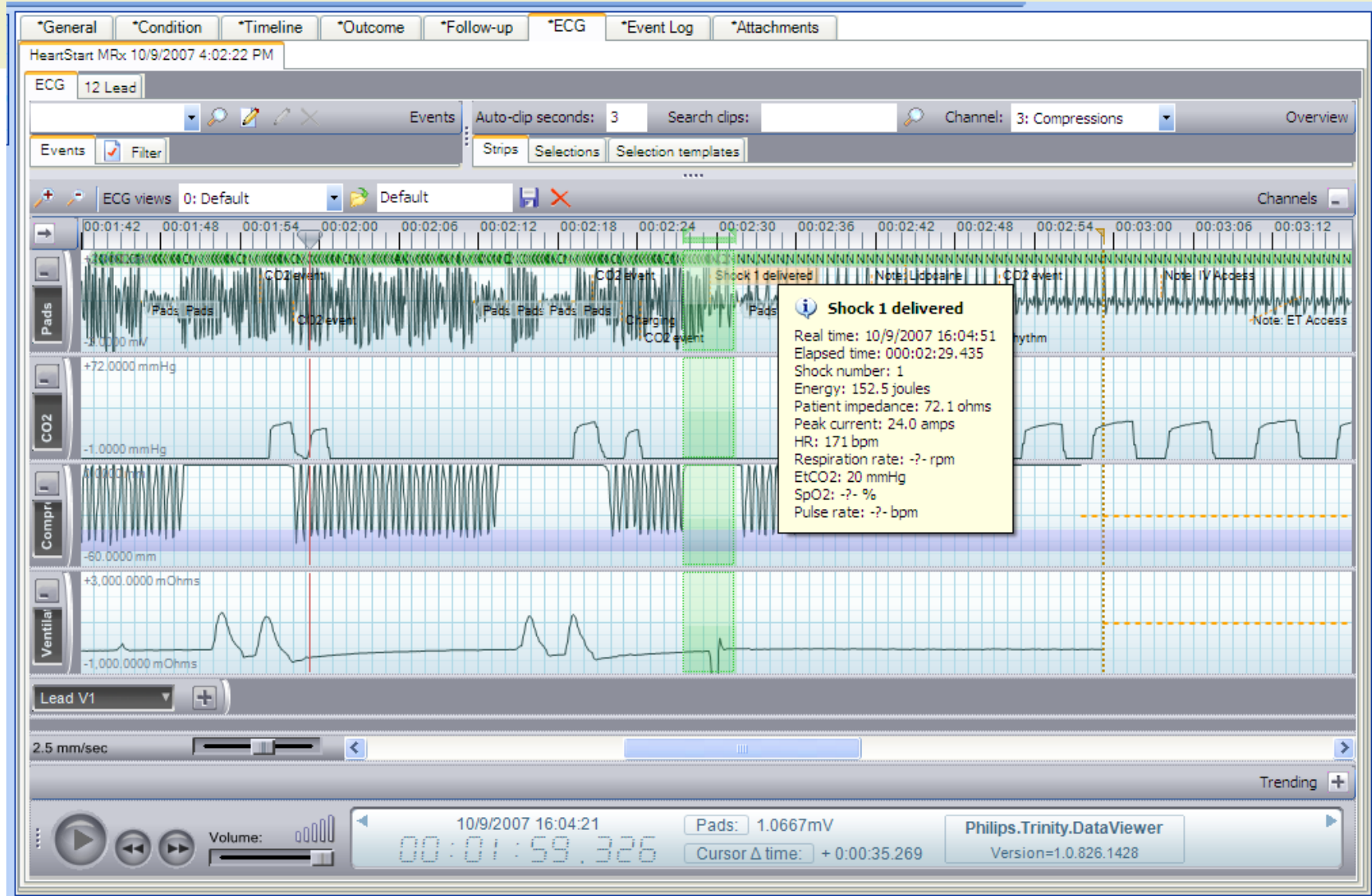
Event Review

- BLS Data Station
- RE Connect +
- Basic annotation.
- Save to DB.
- Configure HSI, FRx

Event Review Pro

- ALS Central Station
- Event Review +
- Comprehensive data entry, DB, & reporting
- Network access
- 12-lead review

Multi-Waveform View Lets You See the Big Picture



The CPRMeter



On / Off
Button

CPRmeter

Calibrate CPR medicine to patient needs

CPR meter with visual feedback at the patient's chest

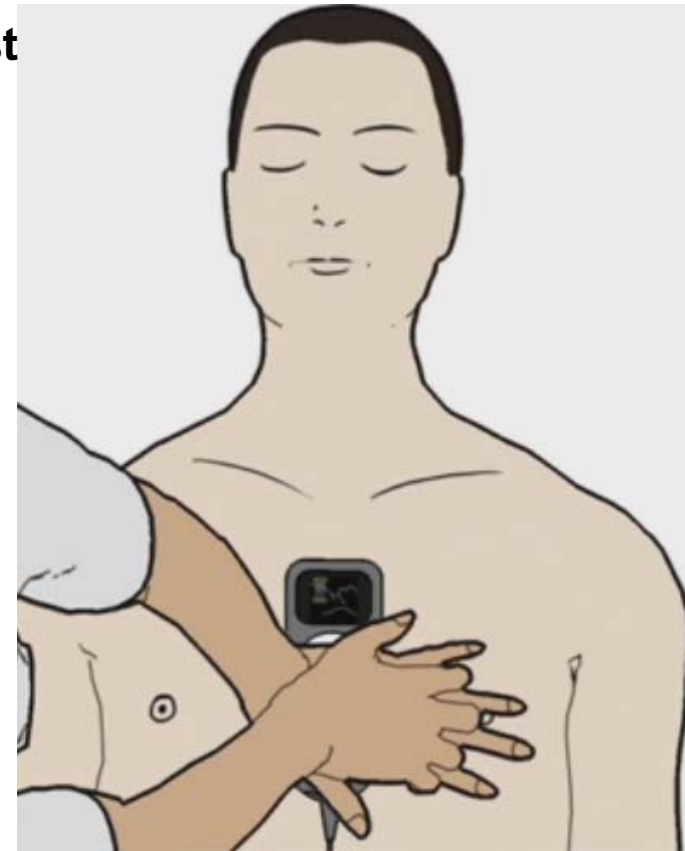
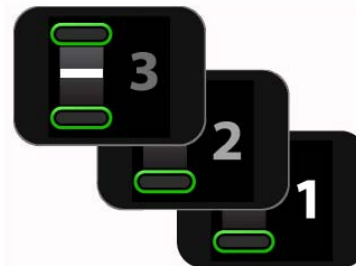
Simple and clear feedback:

- Compression Depth
- Incomplete Release
- Compression Rate

Three levels of feedback:

1. Actual performance
2. Graphical advice
3. Verbal advice (FR3 & MRx)

Audible and visual guidance on CPR protocol. (FR3 & MRx)



Breathe
Breathe



Laerdal
helping save lives

Q-CPR[®] to Improve CPR Quality

- Simple and clear feedback on compression depth and rate.

Good



Too shallow



Incomplete release



To fast



- Audible and visual guidance on CPR protocol.

End compression cycle

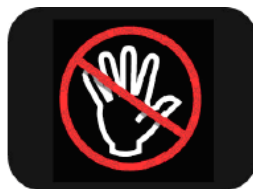


Ventilations



Breathe
Breathe

Analysis – hands off



Stop CPR
Analyzing..

Inactivity



No sign of compressions.
No sign of ventilations.

