

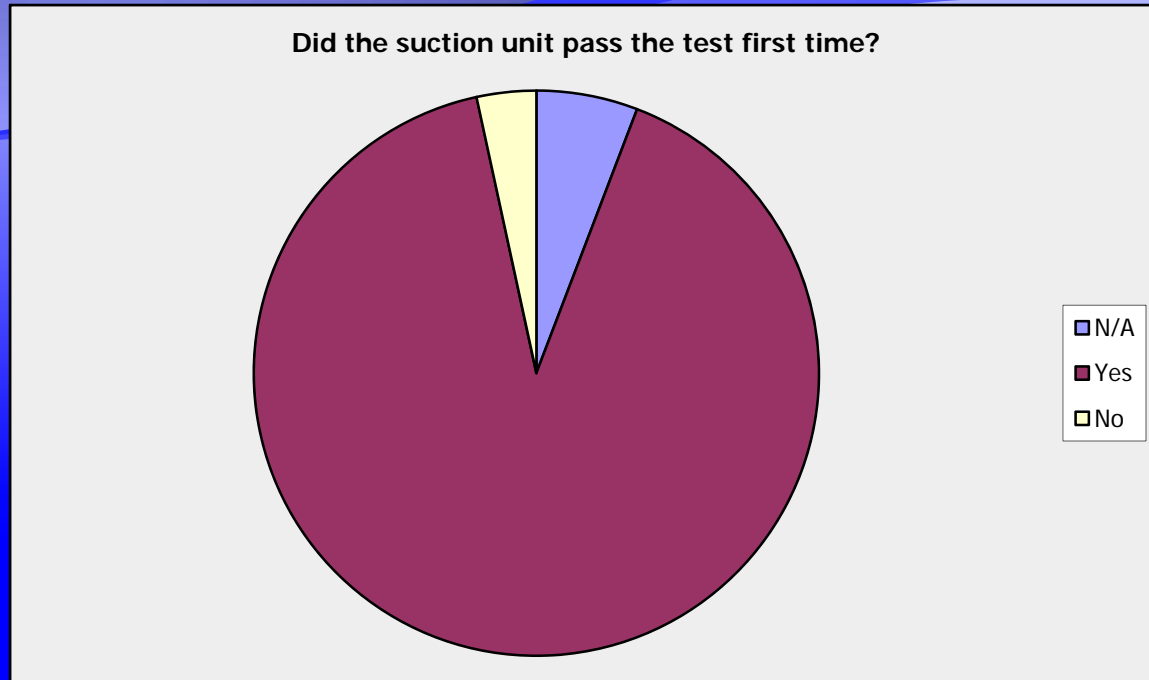


EMSI Region 04 Total Quality Management Committee Suction Machine QA/QI



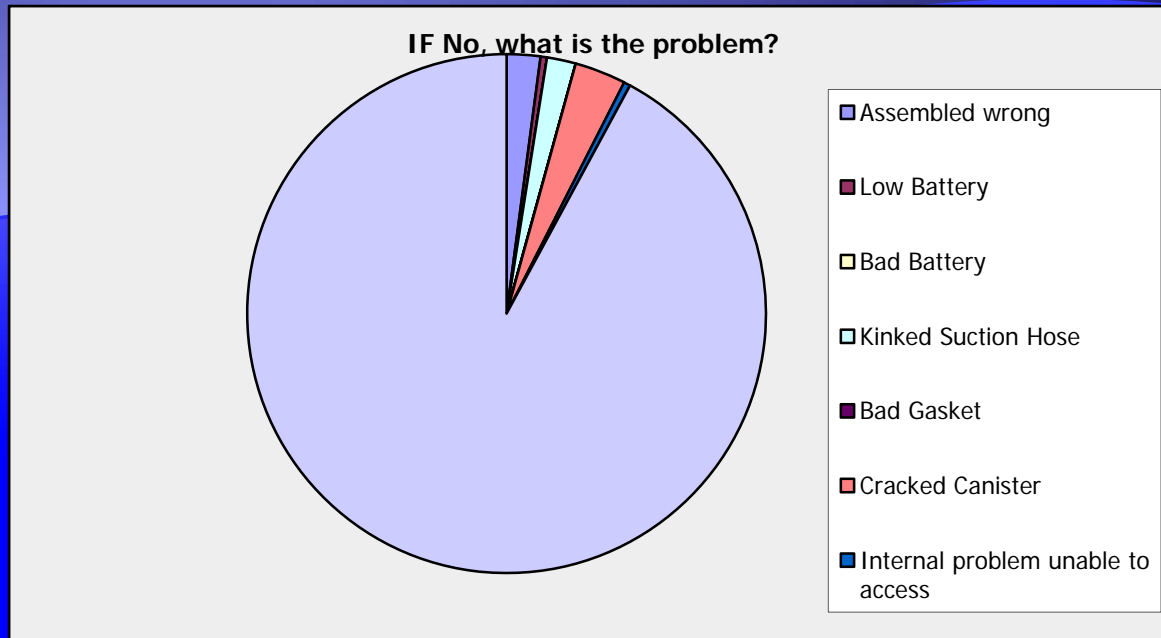
Presented by
The TQM Committee
EMSI Operations Team, Bob Smith
Dr. Richard J Wadas, MD FACEP, TQM Chair
Jim Husar NREMT-P EMSI Clinical Education

Fixed Suction Units



Suction Unit Reporting Form		
Did the suction unit pass the test first time?		
Answer Options	Response Percent	Response Count
N/A	5.8%	62
Yes	90.8%	978
No	3.4%	37
answered question		1077
skipped question		107

Fixed Suction Units



IF No, what is the problem?		
Answer Options	Response Percent	Response Count
Assembled wrong	2.1%	6
Low Battery	0.4%	1
Bad Battery	0.0%	0
Kinked Suction Hose	1.8%	5
Bad Gasket	0.0%	0
Cracked Canister	3.2%	9
Internal problem unable to access	0.4%	1
No problem with this unit	92.2%	260
Other (please specify)		20
	answered question	282
	skipped question	902

Fixed Suction Units

Other Explanations

Loose Fitting

Pressure turned down

Pressure decreased

Incorrect Settings

Bad Canister

Wall gauge was turned down too low

Seal needed to be tightened

Supply line was not tight at the elbow.

The hose from the wall to the canister had a hole in it

Loose canister lid

Canister lid loose

Small crack at the top of the lid

Wrong canister

Missing port cover

Canister not cracked but internal filter clogged ,replaced
new canister

One small cap was off the top

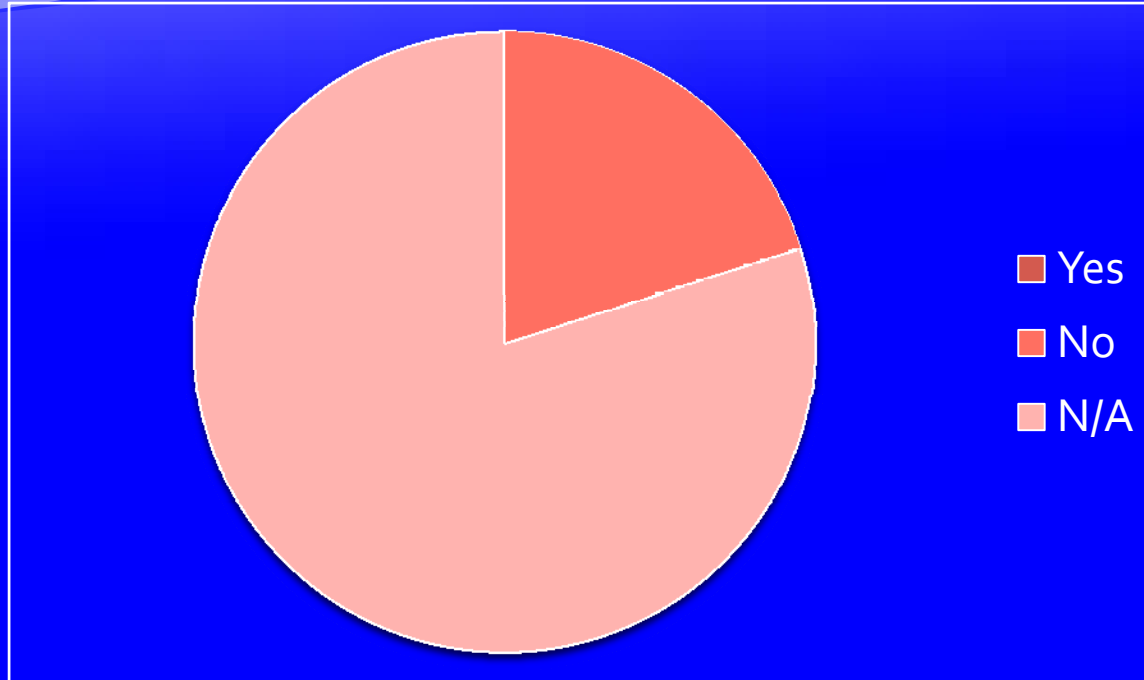
Cracked elbow fitting

Fixed Suction Units

IF repaired, how?	
Answer Options	Response Count
	29
answered question	29
skipped question	1155

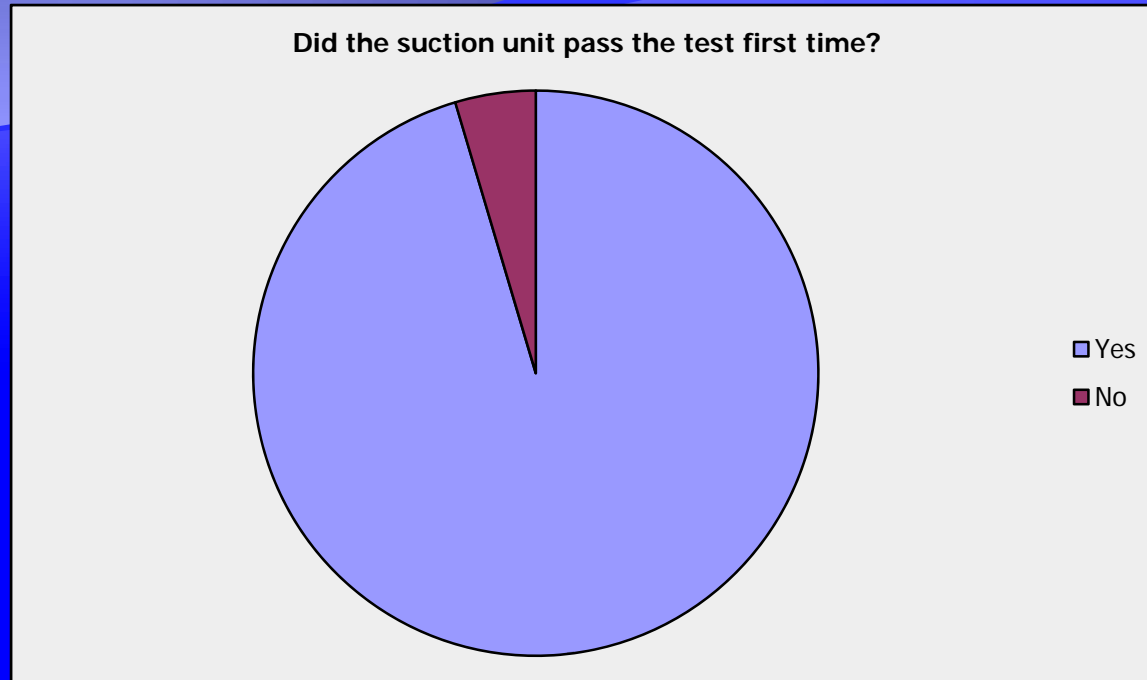
REPLACED SUCTION CANISTER
NEW CANISTER
TIGHTENED FITTING
PRESSURE INCREASED
INCREASED PRESSURE
REPLACED CRACKED CANISTER LID
REPLACED CRACKED CANISTER LID
THE UNIT HAD TO BE MANUALLY ADJUSTED BY KNOB TO ACHIEVE 500 MMHG REQUIREMENT
SWITCHED CANISTER
TURNTD GAUGE UP
CANNISTER LID SNAPPED INTO PLACE ALLOWING VACCUM.
ASSEMBLED PROPERLY
REPLACED THE HOSE
CANNISTER LID APPLIED CORRECTLY
INCORRECT USE OF ELBOW PIECE - REMOVED TO ALLOW SUCTION
REPLACED CANISTER
REPLACED CANISTER LID
REPLACED CANNISTER
NEW CANISTER
JUST PUT SMALL CAP ON
CHANGED TO ANGLE FITTING
REPLACED FITTING
FIXED CANISTER
NEW HOSE
CORRECT SUCTION CANISTER TO CORRECT SUCTION LID

After the repair, did the suction unit pass the second test?		
Answer Options	Response Percent	Response Count
Yes	20.1%	34
No	0.0%	0
N/A	79.9%	135



(One fixed suction unit needed to be replaced)

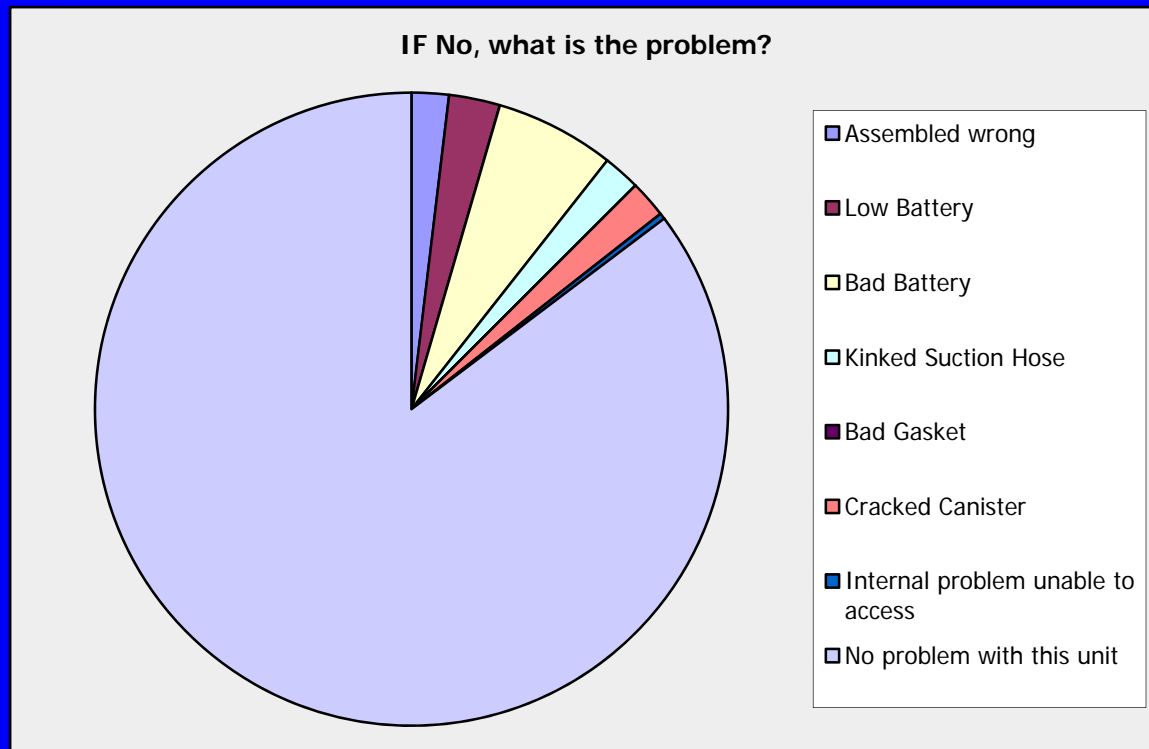
Portable Suction Units



Did the suction unit pass the test first time?		
Answer Options	Response Percent	Response Count
Yes	95.4%	1023
No	4.6%	49
	answered question	1072
	skipped question	112

Portable Suction Units

IF No, what is the problem?		
Answer Options	Response Percent	Response Count
Assembled wrong	1.9%	6
Low Battery	2.6%	8
Bad Battery	6.1%	19
Kinked Suction Hose	1.9%	6
Bad Gasket	0.0%	0
Cracked Canister	1.9%	6
Internal problem unable to access	0.3%	1
No problem with this unit	85.2%	265
Other (please specify)		10
answered question		311
skipped question		873



Portable Suction Units

Other Explanations

Found cracked charging port-intermittently charging

Bad suction tube connection at canister

Loose hose

Charging power supply not working

Broken lid

Missing port cover

Battery replaced preventive maintenance

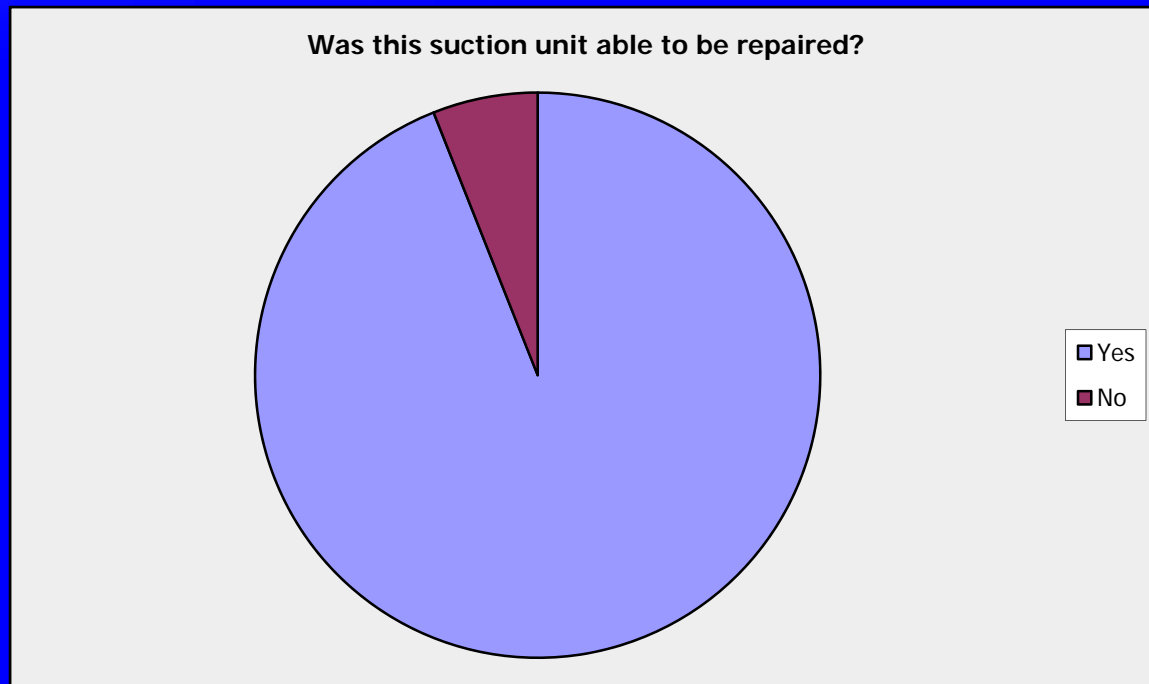
Road dirt

Not returned to charger properly

Charging wire broken

Portable Suction Units

Suction Unit Reporting Form		
Was this suction unit able to be repaired?		
Answer Options	Response Percent	Response Count
Yes	94.0%	47
No	6.0%	3
answered question		50
skipped question		1134



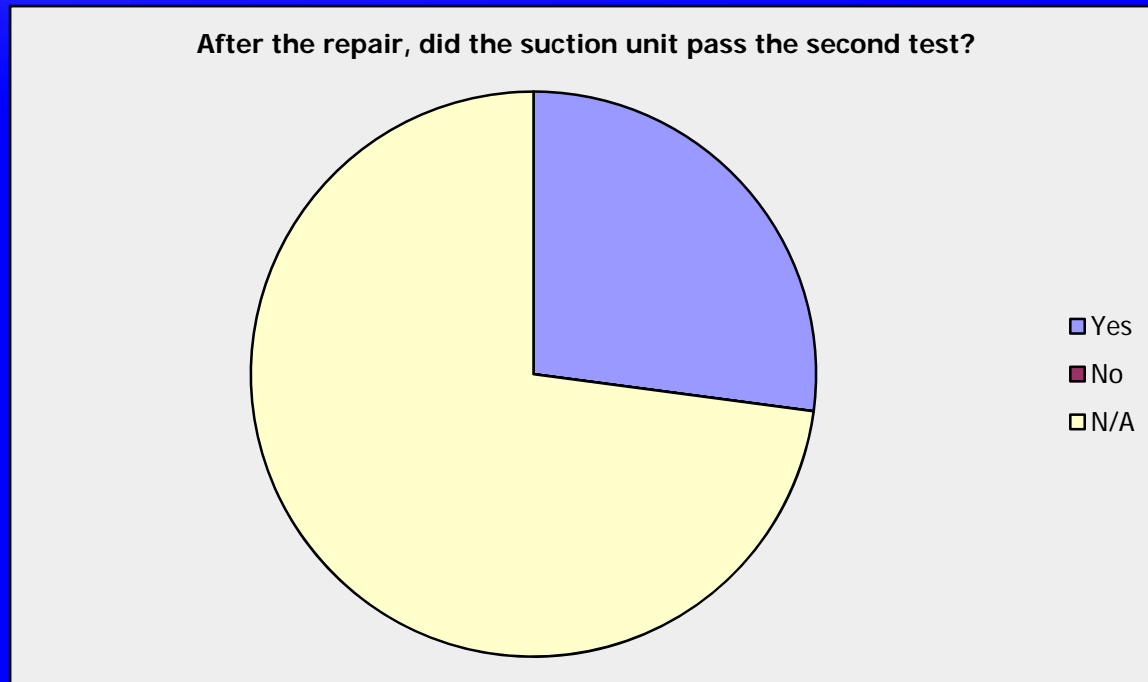
Portable Suction Units/Repairs

Suction Lid was not tightly sealed on suction container. Suction lid was re-secured to the container.	Replaced battery
Batteries replaced	New charging unit in service
REPLACED BATTERY	New tubing attached
Replaced battery	Assembled correctly
Replaced elbow at canister.	Change Batteries
Replaced Battery	New Batteries
Replaced Canister	Replaced lid
Changed Battery	Replaced battery
Batteries changed	Replaced battery
Tubing placed on proper cannister connectors	Replaced lid
Tubing placed on the proper cannister connections	Replaced Hose
Replaced Batteries	Replace Batteries
Replaced the battery	Replace Battery
Replaced Battery	Replaced Batteries
Charged it up	Batteries replaced in suction preventive maintenance
Changed battery	Re-assembled and cleaned
Replaced Canister	Properly replaced
Replaced Canister	Changed the battery
New canister	Changed the battery
Replaced Battery	Added an angle fitting.
Replaced battery	Charged Battery
Replaced with new wire	

IF repaired, how?	
Answer Options	Response Count
	45
answered question	45
skipped question	1139

Portable Suction Units

After the repair, did the suction unit pass the second test?		
Answer Options	Response Percent	Response Count
Yes	27.1%	49
No	0.0%	0



Portable Suction Units

If the unit was unable to be repaired, what was the outcome?	
Answer Options	Response Count
	8
answered question	8

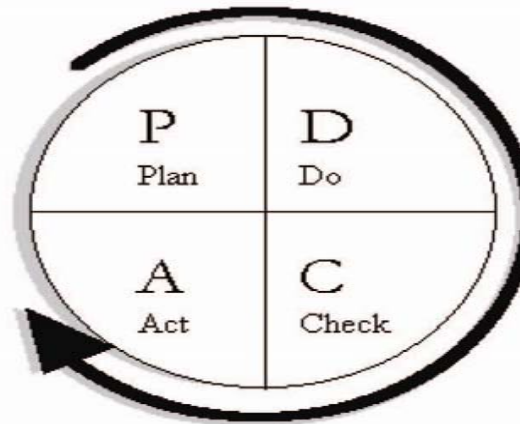
Waiting for repair
New portable suction unit placed in service
Replaced with a new suction unit
Replaced suction with a new suction unit



PLAN– After inspecting numerous ambulances in the region, it was found that there were multiple suction units found not working and not operational. EMSI purchased suction gauges and distributed to all EMS agencies.

DO– All EMS agencies were to check all suction units monthly then quarterly using the gauges provided and report their finding using an online reporting system.

Suction Unit Check Plan-Do-Check-Act (PDCA) QI/QA Cycle



ACT– Once the EMS agency found a problem, the majority of suction units were able to be repaired. There were a few units that needed replaced. With the reporting system in place, it was identified that bad batteries and damaged suction canisters were the main reasons for suction unit failure

CHECK– EMS agencies found numerous portable and fixed suction units not working