NEW HAMPSHIRE

Emergency Medical Services CPAP Equipment Grant

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NH DIVISION OF Public Health Services
Improving health, preventing disease, reducing costs for all

FIRE STANDARDS AND TRAINING
NH
EMERGENCY MEDICAL SERVICES

Purpose Statement

The purpose of the program is to reduce morbidity and mortality and provide a substantial healthcare savings in the treatment of congestive heart failure in small and rural New Hampshire communities by assisting the EMS services in these communities to obtain a Continuous Positive Airway Pressure (CPAP) machine for treating congestive heart failure patients in respiratory distress at the EMT-Intermediate and Paramedic provider level.

Continuous Positive Airway Pressure (CPAP) Versus Intubation
Which would you prefer?

http://www.emsworld.com/article/article.jsp?id=1738&siteSection=20

http://airway.jems.com/2011/03/rethinking-eti/

Background

- **17-21% :** The amount that Various pre-hospital studies have shown that the use of CPAP to treat acute respiratory distress related to congestive heart failure, or CHF, can reduce mortality compared to traditional treatments and reduces in the number of patients who need to be intubated.
- **28%:** The number studies show out all patients on a ventilator that will develop Ventilator Acquired Pneumonia (VAP) with a mortality rate of 27% (8 out of every 100 people on a ventilator).
- **$41,300:** The average billed hospital charge, according to one study, for treating a patient with VAP compared to those without. Some patient care costs for treating VAP can run into the hundreds of thousands of dollars. In many cases, CMS will no longer reimburse cost fro treating hospital acquired VAP-a cost that must be absorbed by the hospitals.
- **$9,317:** the amount a significant study in Houston found for an average overall health care savings per pre-hospital CPAP.
- **$1,000:** the cost of a CPAP startup kit, including machine, case, pressure hose, two sets of tubing and headgear and two small, medium and large masks each. This is a substantial investment for many small and rural EMS services. No additional reimbursement from CMS, but costs approximately $50 in disposable supplies for each use.
- **2009:** the state of NH changed its EMS protocols to allow EMT-Intermediates, the most common type of Advanced Life Support provider in NH's small and rural communities, to administer CPAP to CHF patients. All EMS services operating at the EMT-Intermediate or Paramedic level will be required to have CPAP capabilities by 2013.

Project Description/Methods

- Purchase 20 CPAP units with Rural Health Flex Grant funding and distribute them through a grant application process to small and rural EMS services in NH. Usage and impact will then be evaluated using the NH statewide EMS electronic patient care data system.

- The grant application process will serve multiple benefits in addition to a means to determine which services will receive the CPAP machines. Those benefits include:

  1. Services will have a chance to practice and easier grant application process with the hopes that they will gain confidence and apply for larger federal grants to benefit their service.
  2. Services will need to gather data about their EMS system and responses for the grant application. This will introduce some services to the ability to look at and evaluate their own data, something services can do now, but frequently haven't done because of ignorance or being intimidated by the system.
  3. Additional grant application points are awarded for services based on the number of providers they have that are members of the NH EMT association. This will help boost awareness and membership for this important organization.

- Grant applications were then reviewed by a panel consisting of a the Flex Coordinator, who had a background in EMS, the Chief of the Bureau of EMS, the president of the NH EMT association and the president of BoundTree Medical Corp, who provided the CPAP kits.

Key Dates

- **2008:** Flex Grant Year
- **FEBRUARY 2009:** Grant Applications Released
- **APRIL 2009:** Grant Applications Closed
- **MAY 2009:** CPAP Unit Awarded
- **JUNE 1, 2009:** CPAP Units in Service

Budget

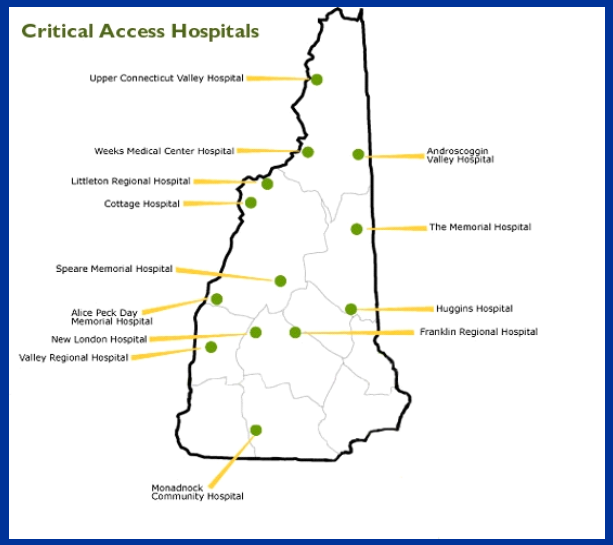
- **$20,000:** Flex Funds for 20 CPAP Kits

Outcomes/Desired Outcomes

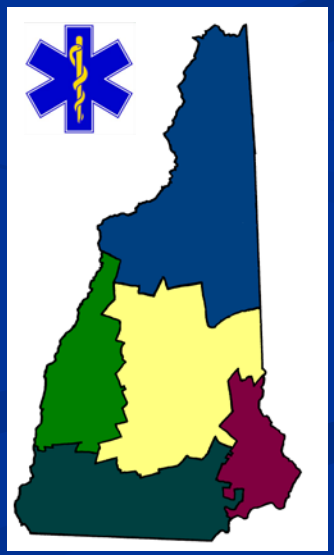
- **20 CPAP Units:** Total given out to 18 services and one CAH Emergency Department.
- **Each Kit Contains:** a CPAP machine, carry case, high-pressure oxygen hose, two headsets and tubing and two each of small, medium and large CPAP masks.
- **Two CPAP units were awarded to Rural Regional EMS Service:** the only regionally organized EMS service in NH that also serves the most rural and remote populations in the northern part of the state.
- **CAH Emergency Department receiving a CPAP** unit is also the smallest and most remote ED in the state and services the same population as the regional service who received two CPAP units. This would allow for continuity of care from EMS to the ED and allow the EMS ambulance to go back in service with their CPAP unit while the patient continued the therapy at the receiving ED.
- **90 Patients:** number of patients receiving CPAP use by awarded units to date.
- **$838,530:** Total Healthcare cost savings based upon $9,317 per-use savings determined in Houston prehospital study time 90 patients to date.
- **25.2/90:** **P**otential prevented VAP patients *if* all 90 CPAP cases had been intubated.
- **7/90:** Potential prevented mortality rate from VAP patients above.

Service Area Impacted

- Total Communities benefiting from EMS services obtaining a CPAP unit: **49**
- Total Communities benefiting who are designed “Rural” by the NH SORH: **48**
- Total population impacted (2007 OEP estimates): **94,390**
- NH Hospitals who have received a patient with these CPAP units: **10/26**
- NH receiving hospitals who are also CAHs: **7/13**



NH Critical Access Hospitals



NH EMS Regions

Lessons Learned

- Linkage outcome from hospitals is still difficult to get. Full benefits of CPAP intervention difficult to determine without hospital outcome linkage.
- Consult with EMR system administrators to align questions with the way data and reports are available in the system before asking services to extract EMS data from their EMR system. Some of the data requested in the grant application needed BEMS staff time to help services extract it, which could have been avoided with better prior coordination.
- Running the EMS reports identified a weakness in a data element in the EMT system that made it hard to an EMS call that was treated at the BLS versus the ALS level. This lead to a change in the EMR system to resolve this issue.
- Make sure your scoring methods are relatively easy to follow to speed the scoring process with grant reviewers. Scoring took nearly a month waiting for all the score to come in for 20 applications time four reviewers.
- Allow for additional training of recipients if necessary. While the intended benefiting providers were intended to be EMT-Intermediates, many of the CPAP use cases were still by Paramedics working with the services, who are more comfortable with the equipment and procedure, even though it is a very benign and non-invasive procedure.

Next Steps

- Ongoing tracking of CPAP use by these services.
- Expand tracking of CPAP use to whole state.
- Establish outcome linkage with hospitals.
- Provide an additional grant of 10 units prior to the required equipment procurement date.

Partners

New Hampshire Division of Public Health Services, Rural Health and Primary Care

New Hampshire State Bureau of Emergency Medical Services

New Hampshire Association of Emergency Medical Technicians

BoundTree Medical