

## BOARD OF REGENTS MEETING

Harborview Paramedic Training Program

This will be a fifteen minute oral report for information only. Following the presentation, there will be five minutes allowed for public questions directed to the presenter.

*Attachments*

- 1) Presenter Bios
- 2) Michael K. Copass, MD Paramedic Training Program Surgical Airway Lab Presentation

## Presenter Bios



### **David Carlbom, MD**

Associate Professor of Medicine, Pulmonary Critical Care  
Director, Michael K. Copass, MD Paramedic Training Program  
Medical Director, Harborview Sepsis Program  
Harborview Medical Center, University of Washington

[dcarlbom@uw.edu](mailto:dcarlbom@uw.edu)

### **Education and Training**

B.A. in Philosophy, Whitman College, Walla Walla, WA 1991.

M.D., University of Washington School of Medicine, Seattle, WA 1997.

Internship, University of Colorado Internal Medicine Residency, Denver, CO, 1998.

Residency, University of Colorado Internal Medicine Residence: Primary Care Emphasis, Denver, CO, 2000.

Fellowship, Pulmonary and Critical Care Medicine, University of Washington, Seattle, WA, 2007.

### **Clinical Interests**

- 1) Improving delivery of critical care services in the Pre-hospital and ED to make the transition of critical care from the field through the ED to the ICU a seamless experience.
- 2) Paramedic identification and treatment of sepsis and severe infection.

### **Research Interests**

- 1) Non-invasive measurement of perfusion and shock states
- 2) Barriers to implementation of critical care in ED
- 3) Paramedic performance of critical care
- 4) Best methods for teaching paramedics, students, and residents assessment and therapy of critically ill patients

Born in Seattle, Dr. Carlbom came to medicine from firefighting. He first began working at Harborview in the Emergency Department at age 18, returning as a medical student and resident. He is now an Associate Professor in the Division of Pulmonary Critical Care and the Director of the Michael K. Copass, MD Paramedic Training Program. His interest is in teaching resuscitation, and he is a regional expert on sepsis and post-resuscitation care. He has publications in airway education, sepsis, and therapeutic hypothermia. He is recognized as a clinical and education leader, and spends time educating paramedics, students, residents, fellows, nurses and colleagues. In 2015, he was awarded the Dr. Paul B. Beeson Award from the University of Washington Department of Medicine. This award is given by medicine residents in recognition of outstanding clinical teaching and for exemplifying scholarliness, humility, compassion, and integrity.



**David M. Anderson, D.V.M.**

Executive Director, Health Sciences Administration  
Institutional Official, UW Animal Care and Research Program  
Clinical Associate Professor, Department of Comparative  
Medicine, University of Washington

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David M. Anderson is a laboratory animal veterinarian and pathologist who holds the position of Executive Director of Health Sciences Administration and Institutional Official for the University of Washington Animal Care and Use Program. Dr. Anderson's current responsibilities as Executive Director for Health Science Administration provide opportunities for leadership across a broad scope of University research and operational activities. Health Science Administration provides administrative oversight and financial supervision for three interdisciplinary research Centers as well as departments with responsibility for animal use in research and education, environmental health and safety, facilities and academic support, risk management, student and staff health care, and strategic communications.

Dr. Anderson has directed a significant portion of his career towards biomedical research, specifically through development and implementation of animal models to address complex issues of human health and biology. As the former Director and Principal Investigator at the Washington National Primate Research Center, Dr. Anderson's research focused on issues related to nonhuman primate models of AIDS with special emphasis on the neuropathology associated with the mechanisms of pathogenesis of the disease. Dr. Anderson previously served as attending veterinarian for nonhuman primates at the WaNPRC, providing multiple opportunities to serve as a resource and colleague for faculty, staff and post-doctoral fellows from the Department of Comparative Medicine.

# Michael K. Copass, MD Paramedic Training Program Surgical Airway Lab Presentation University of Washington Board of Regents: 11 February 2016

## Pre-hospital Care in Seattle

### **One of first paramedic systems in US**

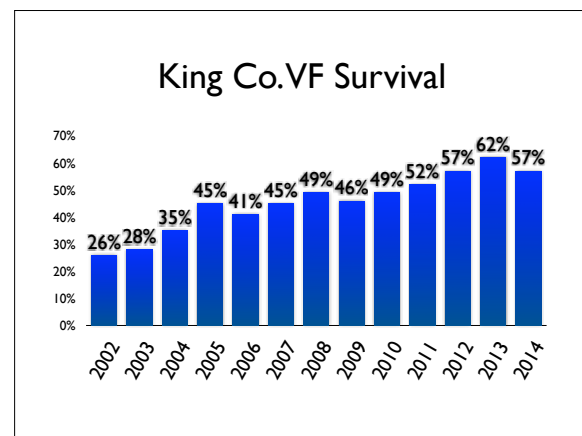
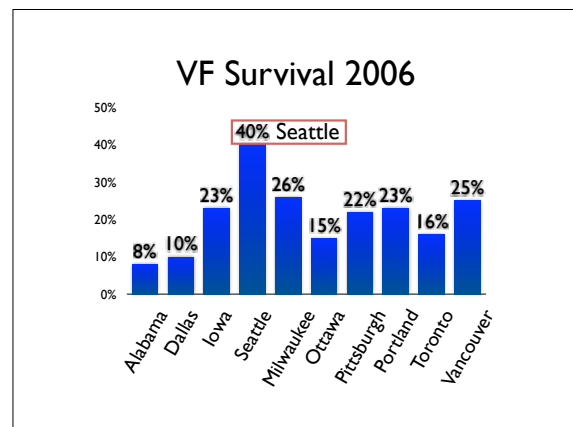
In 1969, cardiologist Dr. Leonard Cobb obtained a federal grant to begin caring for patients in the streets utilizing firefighters with special medical training. The grant sought to answer two questions: 1) Can non-physicians be trained to provide Advanced Life Support care? and 2) Can lives be saved? In collaboration with the Seattle Fire Department, Dr. Cobb recruited firefighters who were taught by physicians the care of the cardiac patient, and the first paramedics began responding on March 7, 1970. The patients that historically died at home now were resuscitated and received ICU-level care in the field under the watchful eye of Paramedics. The Paramedics became the top-tier of a community-based EMS system that involves the citizen, the Dispatcher, the Firefighter Emergency Medical Technician and the Mobile Intensive Care Paramedic.

### **Cardiac Arrest Outcome**

Cardiac arrest is the most intensive medical condition for the pre-hospital care system. Despite evidence-based guidelines and a focus by most EMS systems on caring for the unconscious and unresponsive patient, a great deal of variation in outcome remains 40% in Seattle to as low as 8% in other regions of the US for in 2006 for cardiac arrest due to the most favorable abnormal heart rhythm: ventricular fibrillation (VF).

Seattle and King County have worked tirelessly using robust QI and research methods to improve the care of cardiac arrest. Survival of patients who suffer a witnessed collapse with ventricular fibrillation has increased from 20% in 1970's to a peak of 62% in 2014. The national average is 16%.

Multiple reasons exist for this success, including the community participation in care with bystander CPR, the strong physician leadership of the EMS system, ongoing research and quality improvement, a culture of excellence, and a unique training model.

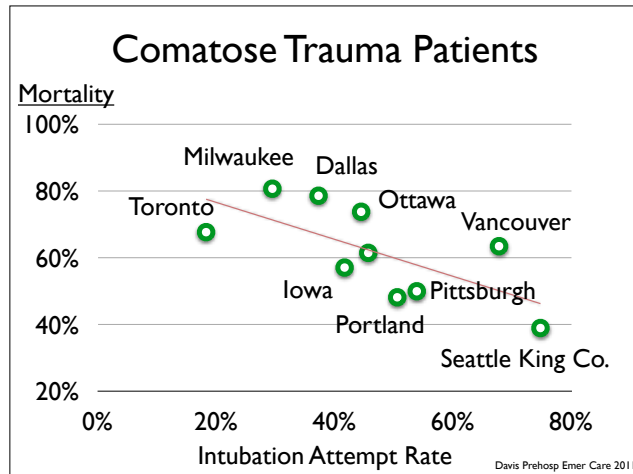


### **Pre-hospital Intubation in Seattle**

One of the foundations of caring for a critically ill patient is to secure an airway: a cuffed tube in the trachea. This controls emesis, prevents aspiration and affords gas exchange of oxygen and carbon dioxide. Our paramedics have been performing this skill since 1970 with good success.

While a relatively rare event, intubation (placing an endotracheal tube in the trachea) occurs with some regularity in our community. Intubation represented only 1.4% of EMS responses (6.2% of paramedic responses) but a total of 7523 patients in King County outside of Seattle had intubation attempted over a 5-year period. Of these 99% were intubated successfully. Numbers for the Seattle Fire Department are similar. Intubation success rates for children are 97%. This success is due to the intense training program and the frequency with which paramedics perform the procedure.

When caring for trauma patients, intubation rate is associated with improved patient outcomes. Cities with a higher rate of intubation had lower adjusted mortality across the entire cohort of comatose trauma patients.



## Cricothyrotomy

### Procedure

Cricothyrotomy is a surgical procedure to place a tube in the trachea when the patient cannot be oxygenated or ventilated by any other means. This procedure is lifesaving. It is the final step of securing an airway, and if it is not successful the patient will die. It is a universally dreaded procedure as it is both technically and emotionally challenging and requires intense focus and self-discipline.

The frequency of this technique has decreased over time, and is performed only on those patients in whom there are no other options.

### Educational Model

Beginning in the late 1970's, after the death of a young patient because the paramedics did not have the ability to perform cricothyrotomy, Paramedic Training began using an anesthetized animal research model in collaboration with Comparative Medicine to teach paramedics this essential emergency airway procedure. The model was selected to facilitate the richer understanding of the properties of live tissue. The elastic properties of skin and fat as well as the presence of blood are key components to understand. The procedure is often made more difficult by the presence of airway secretions and blood; paramedics need to understand how to manage these challenges.

In addition to the properties of live tissue, managing the real stress of interacting respectfully with a living creature while leading a team is a critical determinant to the success of the procedure. When we use a simulated trachea model prior to the lab, students do not have to overcome a racing heart, dry mouth, or the stifling sense of time that they do in the lab.

The Institutional Animal Care and Use Committee closely regulates the activity, providing oversight by both annual renewals of the teaching and a full re-application for renewal every three years. Instructors pass strict animal use education sessions, and each session is monitored by Comparative Medicine staff who only care for the animals and are not involved in the cricothyrotomy teaching.

## **Inanimate Models**

Although we search regularly, we have not been able to locate a simulation model that achieves the educational needs outlined above. We continue to partner with others within and outside of UW to seek a model that can match the teaching of the current animal model. I hope that in the future there will be a realistic simulation that allows us to stop using the anesthetized animal model.

## **Commentary**

### **Expert Perspective**

See attached letters from Drs. Bulger and Moe.

**Eileen Bulger, MD FACS**  
Professor of Surgery  
University of Washington  
Chief of Trauma  
Harborview Medical Center

**Kris S. Moe, MD FACS**  
Professor & Chief  
Division of Facial Plastic and  
Reconstructive Surgery  
Departments of Otolaryngology and  
Neurological Surgery

### **Paramedic Perspective**

See attached letter from Paramedic Sawdon.

**Mark Sawdon, MICP**  
Paramedic, King County Medic One

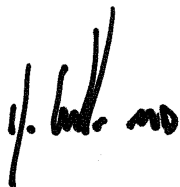
### **Patient's Perspective**

Patient privacy precludes detailed description, but there exist numerous survivors who would have died if not for this life-saving procedure.

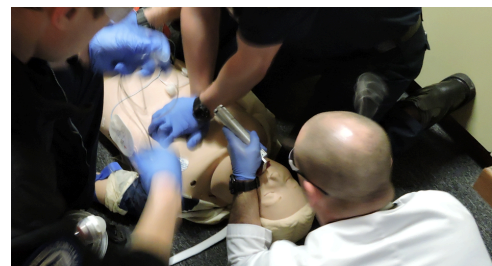
## **Conclusion**

I think we have answered Dr. Cobb's research questions of 1969. Paramedics can be trained to provide critical care; they do so in challenging conditions outside the hospital. Lives are saved by the skilled teamwork of emergency care in our community.

Respectfully,



David Carlbom, M.D.  
Director, Michael K. Copass, MD Paramedic Training Program  
Medical Director, Harborview Sepsis Program  
Associate Professor of Medicine, Pulmonary Critical Care  
Harborview Medical Center, University of Washington



January 13, 2016

David Carlbom, MD  
Director, Paramedic Training  
Harborview Medical Center

Dear Dr. Carlbom,

I am writing in support of the ongoing training of the paramedic students in the life saving skill of emergent cricothyrotomy using an animal model. Airway management remains one of the fundamental interventions that is the difference between life and death for patients with airway obstruction. Time is of the essence and delays in establishing a definitive airway can not only result in death, but also in severe anoxic neurologic injury. We are blessed in Seattle/King County by having the highly skilled paramedics available to our citizens and I can personally attest to many lives that have been saved by the quick action taken by our paramedics in these challenging circumstances.

The oral intubation success rate of our paramedics is among the best in the country at over 98%. However, when intubation fails, rescue maneuvers such as the surgical cricothyrotomy are essential. As a trauma surgeon, I have personally had to perform several surgical cricothyrotomies and they are the most stressful procedures given the circumstances. I believe it is vital that our medics get hands-on experience with this technique using live tissue models. Much of this procedure must be done by feel given the limited vision in a bleeding patient and no manikin can simulate this experience. The paramedic students need the experience of performing this procedure with live tissue so that when faced with a human patient and only minutes to intervene they can act quickly and with confidence to save a life.

Thank you for the phenomenal training program that you have developed that is the model for the rest of the country.

Sincerely,



Eileen Bulger, MD  
Professor of Surgery, University of Washington  
Chief of Trauma, Harborview Medical Center

January 21, 2016

David Carlbom, MD  
Director, Paramedic Training  
Harborview Medical Center

Dear Dr. Carlbom,

I am sending this letter to express my strongest support your continued use of a live animal model for the teaching of emergent cricothyrotomy to paramedic students.

As a Head & Neck Surgeon, I am often called to perform tracheotomy and emergent airway for patients with airway obstruction. I can tell you from personal experience that there is currently no model that provides an experience that is even close to performing these procedures on a live patient / animal. The properties of live tissue – particularly the flexibility, malleability, and elastic properties are critical to understand, as are the presence of blood and airway secretions that are critical determinants in the successful of the procedure, ie saving lives.

Cricothyrotomy is an essential emergent airway procedure for paramedics to be able to perform in an efficient, effective and reliable fashion. It is critical that we train them for this in the most realistic way possible so they can continue to provide world-class lifesaving care to the citizens of our area.

Please let me know if there is anything I can do to help you in this regard.

Best regards,



Kris. S. Moe, M.D., FACS  
Professor and Chief,  
Division of Facial Plastic and Reconstructive Surgery  
Departments of Otolaryngology and Neurological Surgery



01/16/2016

To whom it may concern,

Recently I had the responsibility to conduct a surgical airway on a female suffering from angioedema secondary to an ACE inhibitor reaction. The patient was conscious and alert but rapidly deteriorating before our eyes. Unable oxygenate or ventilate the patient, we quickly moved to the surgical airway in an effort to save this patient's life. I would like it to be known that without my recent surgical airway lab training I am not sure I could have performed this activity as quickly or as confidently as I was able to on this day. During this training I reviewed the steps to the procedure, the initial location of landmarks, and the feeling and use of the tools. The mild anxiety created, the ability to actually feel the anatomy of the airway after the cut was made, and most importantly the feeling of cutting through actual tissue was absolutely critical in my success in securing a patent airway for this patient. In my opinion this training, conducted in this specific manner is what saved this person's life.

Mark Sawdon

Paramedic, King County Medic One