

## Rural ED Staffing in the Era of Physician Shortage - Certification & EM Workforce Section Newsletter, May 2011

---

Dr. Alex J. Beuning, Regional Emergency Services Medical Director Luther-Midelfort Mayo Health System

System competence. This has been an important concept in the development of a new Emergency Department (ED) staffing model designed for three rural hospitals within Luther-Midelfort Mayo Health System. These rural EDs were traditionally covered by local family physicians, but providing highly competent providers regularly was becoming nearly impossible by 2005. Increasing clinic and hospital demands for family physicians, difficulty recruiting family physicians with adequate emergency experience and continuing changes in the practice of emergency medicine all contributed to this state of affairs. Despite these inexorable forces pulling family physicians away from the emergency department, it was not until after repeated staffing crises and years of quality concerns with locum tenens physicians that other options for ED staffing were seriously considered. This article describes how a model for emergency care with dedicated emergency medicine trained advanced clinical practitioners [Q1] (i.e. physician assistants and nurse practitioners) evolved and how developing both system and clinical competence in these providers became part of the vision for providing outstanding care to our patients.



Family physicians had been used to primarily staff the emergency departments for years. ED care was often an after-thought for these family physicians who all covered the ED in addition to their busy clinic, hospital and nursing home practices. After 60+ hour work weeks, they often had no time or energy to focus on the emergency department or pre-hospital EMS. Much of the time spent in the ED was on weekends, evenings after a full day of clinic or while running back and forth from clinic during the day. Even the rural hospital's emergency department medical directors, who were also the local ambulance medical directors, had almost no dedicated time in these areas. It was all scraped out of time which should have been spent with family or catching up on sleep.

The three rural emergency departments in the Luther-Midelfort system (Bloomer, Osseo and Barron, Wisconsin) saw about 1800, 1800 and 4500 patient visits per year in 2005. Like urban emergency departments, many patients utilized the emergency department for minor complaints because of inability to access the clinic due to insurance issues or hours of operation. In many ways, the "small town" care delivered was extremely efficient compared to the urban ED. The flow of care between clinic and emergency department was often seamless with only a few local family physicians to cover the practice and coordinate patient care between the ED and clinic. The care was often the same, just the location

was different. With truly sick patients, often the same doctor would get the call from the worried relative, see the patient in the ED admit and follow them in the hospital and do their follow-up visit in the clinic after hospital discharge. When this worked out, everyone was pleased. This Norman Rockwell vision of the small town family physician made consideration of the inevitable changes being pressed by modern clinic practice difficult. Many family physicians went to medical school just for these types of interactions and some patients expected their physician to be ever vigilant and available.

The care for the occasional critically ill patient was different. The patient would often be frantically stabilized in our emergency department and a helicopter summoned. The staff would visibly relax when the sound of the helicopter echoed through the hospital walls and they would quickly stand aside when the paramedics entered the room. Usually things went well despite the panic. When they did not, the press of deferred clinic and hospital duties often interfered with quality assurance or improvement activities such as thoughtful debriefing or peer review, writing a new care protocol or reviewing national guidelines. Sometimes it happened but usually the physician would quickly forget the case under the weight of daily responsibility. Since the only nursing administrator to push these activities also dealt with the hospital and nursing home, it was easy to let the quality improvement activities slide. After returning from a conference with ideas for ED improvement, there was no one to focus and actually do the work to make it happen and educate the staff about the change. So improvements were infrequent and inefficiently spread. The care for critical patients was often dependent on which nurse and doctor was covering that day, or how quickly the helicopter arrived. An inexperienced physician with a new nurse on a snowy day could be fatal.

Some of the local family physicians enjoyed emergency medicine and were skilled in advanced life support and critical procedures such as intubation, surgical airway skills, chest tubes, lumbar punctures and central lines. Many were not and waited anxiously for the helicopter, praying they were not grounded by a snowstorm during their shift. The clinic mid-level providers called upon to take ED "first call" on occasion often called their backup physician the minute an ambulance toned out. At other times, the ED was covered by an agency physician to allow the local family doctors a week vacation or time away for CME. During these times, other problems arose. Some locum tenens physicians were clinically competent, but others were not. As a group they had poor patient satisfaction and generated many complaints unlike the local family physicians that knew the community well and cared about the practice. Most also had little knowledge of local hospital or referral network protocols and procedures, i.e., "system competence". As the clinic practice became busier and more complex with electronic records and increasing documentation requirements, dependence upon agency physicians grew. While attempting integration of the rural emergency departments into Luther-Midelfort system clinical initiatives such as a STEMI program or system administrative initiatives such as a uniform approach to peer review or customer service complaints, it became clear the system was broken and needing fixing.

At this same time, several rural family physicians and nurses from the Luther-Midelfort system took a CALS (Comprehensive Advanced Life Support) course. It was taught by a group of dedicated family doctors, emergency physicians, nurses and physician assistants from Minnesota who had taken a head on approach to these care problems. The CALS program recognized the need for improved training in critical care concepts and procedures for family physicians and mid-level providers who covered their small town emergency rooms. The providers and nurses returned from their first CALS course with long lists of improvements for our rural emergency departments. These included a new CALS airway cart, various new equipment and uniform processes for rapid sequence intubation and trauma patients. Several participants enjoyed the experience so much that they even became CALS instructors and helped start the Wisconsin CALS chapter, the first of several state chapters outside of Minnesota.

As is typical of the energy derived from a conference, it quickly wanes after return to the daily grind. Despite some initial improvements in equipment and increased comfort with critical situations amongst some providers and nurses, it was clear that the change was by no means uniform a year after this first CALS course. Some people learned quickly and came home better able to care for patients or continue the learning process which CALS had started. Others did not. None of the locum tenens physicians or nurses was required to take CALS in their contracts. One of the main goals of CALS is a team based approach to emergency care, and some of the team members were still playing from a different sheet of music. Also, no administrator or medical director had the time to monitor and verify that quality changes stuck. It became clear that the lessons of CALS needed to be systematized.

Importantly, the Luther-Midelfort administration was also very concerned about quality improvement and dependable staffing models in the rural EDs. Ed Wittrock, the Vice President for the rural hospitals affiliated with Luther-Midelfort and John Larson, MD, the board chairman and assistant medical director for the rural hospitals were both supportive of change and led a redesign of the rural emergency departments with a goal of creating an integrated regional network of Emergency Services within the Luther-Midelfort system. As part of the process, multiple stakeholders in the system were interviewed, including family physicians, clinic ACPs, hospital nurses, local EMS providers and patients. A budgetary analysis of various staffing models was also completed, comparing models from ACPs to Residency Trained, Board Certified Emergency Physicians. Modifications to the administrative structure required to make this change successful were also analyzed.

The adopted model included the following goals:

1. All ED providers and nurses will be employees of the system.
2. Providers staffing will be primarily physician assistants and nurse practitioners (ACPs) with emergency medicine experience.
3. All ED staff will be dedicated to the ED.
4. Hire and staff ED technicians to assist nurses and providers.

5. Promote ACP supervisor at each site to standardize staffing and local adoption of clinical processes.
6. Hire a regional ED medical director tasked to improve and standardize clinical processes, staff training and clinical quality measurements and connect the rural hospital EDs with Luther Hospital.
7. The regional ED medical director will work ED shifts in all four sites to improve connection between the sites.
8. The regional ED medical director will lead a monthly multi-disciplinary peer review and meeting to promote continuous improvement.
9. The regional ED medical director will develop an annual conference for ED mid-level providers to promote continuing education and system competence.
10. The system will mandate CALS and ACLS certification amongst all nurses, ED providers and family physicians backing up the ED.
11. The system will develop courses in high risk, low frequency procedures for ED providers and nurses such as RSI, procedural sedation and ultrasound guided central venous access.
12. Implementation of a PACS system to allow radiology assistance from our main hospital to rural EDs.
13. Hire a dedicated ED director at each site.
14. The ACP supervisors, regional ED medical director, EMS representatives and ED directors from each site, including Luther Hospital, will meet monthly to coordinate important clinical and administrative initiatives.
15. Dedicated Human Resources staff focused on recruiting ED ACPs.
16. Senior administrators from each site will support the ED redesign structure.
17. Open new Urgent Care option at our low volume sites.

With the stroke of a pen, our regional site EDs began to transform from a relative after-thought to a portion of our health system which was being actively managed and continuously improved by people dedicated to emergency medicine. Through this process, many within the system have come to realize that in the arena of emergency medicine, where a skilled team is required to prepare for and manage critical situations in the midst of complex systems of care, a well trained physician is important, but not sufficient. Even a good team by itself is insufficient. The ED team needs a tremendous amount of support to be successful, such as regular skill training, well maintained equipment, comprehensive medical records, updated care protocols based upon current evidence, quality improvement and a seamless connection with other portions of the health care system. A good administrative structure is necessary to make sure these systems are built and maintained. ACPs trained in both emergency medicine and system competence are well suited to this system and are easier to find and train than physicians.

With these systems in place, the ED staffing was almost secondary. Not quite, of course. In general, an experienced, residency-trained, Board Certified Emergency Physician (BCEP) is certainly more qualified to manage the flow and complexity of ED patients than a physician assistant or nurse practitioner. The reality is, however, that the cost and lack of availability of BCEPs made their use in our rural EDs prohibitive. The volume would not support hiring them even if they were available and willing to move to a rural community. Also, most BCEPs were trained in urban centers with multiple specialists and vast resources immediately available.

This is not the case with many ACPs, who often are more comfortable with the resource poor environment than many BCEP. Given the CALS model of care, competent ED-dedicated nurses and ED technicians, skills training with their own equipment, thorough knowledge and utilization of local and receiving hospital protocols and support from local family physicians, our ED ACPs give excellent care. Over the first two years of the ED redesign, volumes increased dramatically (see attached graphs). Equally important, patient satisfaction rose, clinical outcomes improved, and satisfaction with our rural EDs increased with all constituencies of the care system - our local family physicians, receiving hospital specialists and BCEPs. Anecdotally, air transport services colleagues had once said that the rural EDs were often just “band-aid stations”. After these changes were implemented, they noticed that they no longer needed to “take over crashing patients” on arrival. True to the CALS vision for rural emergency care, these critical patients were increasingly “stabilized and well packaged”. Intubations, NG tubes, Foley catheters, IV/IO lines and appropriate medications were completed and transport times were much quicker as a result. STEMI, stroke and trauma outcomes improved. Sepsis, pneumonia, DKA and chest pain protocols were utilized more uniformly.

Local family physicians were available to admit patients, handle obstetrical issues presenting to ED and consult on complex medical patients or patients with chronic problems requiring close outpatient follow-up. They were also paid to back up the ED provider and be available in the event of high volumes. For Level 1 trauma cases the local family physicians were available within 30 minutes, more than satisfying Wisconsin state trauma criteria. The state goal was tightened to 15 minutes, but even with that more rapid response time, the ED team usually had the patient’s initial evaluation and stabilization complete or well on its way by the time the physician arrived from home. Each of these cases was looked at closely and areas of improvement spread to all of the ED providers by the ED medical director and mid-level supervisors.

Providing this system of care does require a significant investment. Each ACP hired was required to have two years of ED experience, but despite this many came in with an inadequate skill set. The system committed to sending each provider to essential courses and to verify skills and knowledge before seeing patients independently. These included:

1. CALS didactic and benchmark lab course
2. PALS and ACLS every 2 years and ATLS every 4 years
3. Luther-Midelfort Rapid Sequence Intubation and Procedural Sedation courses (supervised by ED medical director)
4. Emergency Ultrasound training
5. Luther-Midelfort Ultrasound guided central line training
6. Working with BCEP in several month rotation through Luther Midelfort main ED
7. Skills check list reviewed with ED ACP supervisor /ED Medical Director with specific courses (i.e. laceration repair, etc) based upon need
8. Rotate through clinic with back up family physicians

9. Shadow existing ED ACP in rural ED for minimum of 1 month before seeing patients independently
10. ED medical director and/or local supervising physician review all charts
11. Regular attendance of monthly peer review and annual ED conference
12. Encouraged to participate in ED specific CME continually through system purchase of ED Audio Digest, EMRAP and other CME audio programs
13. EMR, PACS- Radiology, MUSE- EKG and other system computer training
14. Review of system policies and protocols relating to ED

Including wages paid while trainees were not seeing patients independently, it is estimated that the average new ED ACP hired costs the system at least \$30,000. The large investment, along with the specialized skill set these ACPs develop, encourages higher salaries to aid in retention. When combining this with the cost of paying family physicians to back up the ED, there has been no large financial savings with switching to ACPs over using family physicians. However, making this investment also improves care, gives breathing room to busy rural family physicians and attracts ACPs who genuinely enjoy emergency medicine and appreciate relative autonomy and life long learning. These are exactly the type of ACPs needed to make this model successful. It also creates a tight knit group of providers who assist each other in learning and support each other through the travails of an emergency medicine career. Hopefully, it will also aid in recruitment and retention over time.

Telemedicine equipment was also purchased, connecting the rural ED providers with our BCEP at Luther Hospital in Eau Claire, WI. The rural ED providers also rotated through the busy Eau Claire ED, both to develop system knowledge and cement relationships with ED BCEP and referral center specialists. After a few years, the rural EDs and Luther ED have increasingly become almost one group, serving a system of hospitals rather than isolated entities focused on their own four walls. As patients cross these system boundaries, the interconnection between sites is helpful to both providers and patients.

Medicine is clearly changing. The demographics of our patients and health care workers are changing as well. Emergency medicine is being affected by these changes almost more than anywhere else. On one hand, more patients are using the ED as a primary care clinic. On the other hand, the pace of innovation and evidence based medicine is making it difficult for any individual provider or nurse, regardless of level of training or aptitude, to stay current in its practice without a system to help. Rural emergency departments will quickly become obsolete "band-aid stations" if they do not adapt to these changes, both in the market place for providers and in the administrative support of ED care processes. The CALS course is very important and helped start the Luther-Midelfort EDs on their way to making these improvements, but administrative support and financial investment in the rural ED is the key to systematizing the lessons learned in CALS.

In summary, this experience of staffing rural emergency departments with ACPs based on a CALS model of care has been a tremendous success. However, staffing with ACPs should be considered with caution.

If they had been hired without adequate system orientation, training in high-risk/low-frequency procedures and adequate medical direction and administrative support, it is quite possible that the experiment would have ended in failure. The natural barriers to replacing physicians with ACPs exist and cannot be overstated. Only through a thoughtful approach to maintaining clinical quality and system improvement, can a program such as this hope to be truly successful.

[View PowerPoint Presentation](#)

**Q & A: A conversation with Dr. Alex J. Beuning, Regional Emergency Services Medical Director, Luther-Midelfort, Mayo Health System**

Q: Is Advanced clinical practitioner (ACP) an accepted standard term and abbreviation or is this term made-up and unique to your system locally vs. term mid-level provider?

A: I must confess that I am not certain about the origin of the term ACP. In the beginning of our ED redesign project, we decided that we would allow both Physician assistants (PA) and nurse practitioners (NP) to apply for these positions. For simplicity, we used the term mid-level provider to refer to all of them. Somewhere within our organization, the term ACP (Advanced Clinical Practitioner) was introduced to replace the term mid-level provider. When I search on the definition of ACP, this appears to have quite variable usage, so I would consider this to be our local system term at this point and substitute mid-level provider or (PA and NP) in its place if that is preferred in your context.

Q: I am interested in further detail on the Emergency Ultrasound training. Please describe to our readers the initial training, continuing education, monitoring process including credentialing and quality assurance for the mid-level providers/ACPs.

A: We already had an active emergency ultrasound program at our emergency department in Eau Claire, WI, led by Dr. Susan Cullinan, one of the board certified emergency physicians at that site. After purchasing ultrasound equipment for our three rural emergency departments, our ACPs began taking turns attending a required three day emergency ultrasound course at Gulf Coast Ultrasound Institute in Florida. The ACPs then sent their completed scans to Dr. Cullinan for review and feedback. We continued to do group continuing education during our monthly peer review program on FAST exams and also created a group ultrasound guided central venous catheter course. We set a goal of 150 reviewed scans, with a minimum of 50 abdominal and 50 cardiac, prior to credentialing the provider in emergency ultrasound (with focus on FAST and venous access). Currently, we have one ACP who has completed his 150 exams and is credentialed. He has begun to assist Dr. Cullinan in reviewing the scans from other regional site ACPs, who are on the path to credentialing. Scans can be saved in our radiology program, PACS. These can be reviewed during our peer review meetings as needed.

Q: What are the volume and staffing/coverage statistics and level trauma center status for the main ED?

A: Luther-Midelfort, Mayo Health System is current name of the hospital/clinics in this system, but name change will be occurring soon to unify naming within the Mayo Health System. Volume at Luther-Midelfort's main Emergency Department in Eau Claire is about 27,000 visits per year. It is a level 2 trauma center, with double physician coverage from 9am-2am daily, and solo physician coverage from 2am-7am daily. ACP coverage is from 7am-12am daily.

Q: Are the ACP Supervisor ED and Medical Director same or two different positions?

A: ED ACP supervisor and Regional ED Medical Director are two separate positions. I am currently the Regional ED medical director. Originally, each site had an ACP supervisor, but currently we are changing the structure to one regional ACP supervisor and an ACP lead position to assist with local scheduling issues and other local issues at each site.

Q: Who does shadowing of new ACPs?

A: After the initial few months with the BCEP at the main Eau Claire ED, the current ACPs, the ACP supervisor and the regional ED medical director shadow the new ACP to orient them to the position at the rural ED, assist them in patient care as needed and thus assess their ability to manage the ED without immediate in-house support. The decision to allow the new ACP to "go solo" with telephone backup from the family physician and/or telephone/telemedicine backup from the Eau Claire BCEP is a collaborative one between all parties involved, including the candidate themselves.

Q: What is relative cost "paying family physicians to back up ACP" versus doing ED shift work directly? Also what do you see as the positive long-term benefits of this staffing model?

A: We certainly do have a reduced hourly rate for ACPs relative to physicians. However, the hourly rate paid to the family physician for backing up the ED + the hourly rate for the ACP is approximately equivalent to the hourly rate for a family physician to cover the ED. This certainly may vary from market to market, but this has been our experience.

When factoring in the additional costs associated with training these ACPs, the cost may actually be higher in the short run. In the long run, however, we have seen increased ED volumes, improved patient satisfaction, reduced work load/stress on our rural family physicians, development of urgent care services at our very low ED volume sites and improvement in ED quality measures.

Q: How did the ED redesign with the mid-level provider/ACP staffing model impact patient volume and satisfaction?

Patient satisfaction dramatically improved with Press-Ganey data scores in the top 10% of the nation for all three sites over the last three years. I would like to add a major point which is clear in the graphs- the fact that this staffing model allowed us to open new Urgent Care option at our low volume sites, Osseo & Bloomer. Dedicated ED staff and low ED volume allows providers to work both Urgent Care schedules and ED in adjacent location.

Q: How long has the current mid-level provider/ACP staffing been in place?

A: The new staff model was implemented during 2007 and took 18 months to complete.

**Editor's Comment:**

This article is based upon a presentation given by the author in October, 2010. Dr. Beuning recounts the historical staffing challenges in low volume EDs and the subsequent rationale and development of a collaborative model of care in a network of rural, small town low volume EDs in northern Wisconsin. Its early improvements and successes in clinical care processes, specifically stabilization of the occasional critical patients, and patient acceptance and satisfaction are highlighted. The key use of system change and regionalization is noteworthy. The issues of long term sustainability, cost effectiveness and more rigorous outcomes analysis are beyond the scope of this article. As such, this is a work-in-progress about the use of mid-level health care providers (nurse practitioners and physician assistants) in emergency medicine. Nevertheless, this article's main significance is to provide a working case study which highlights an innovative model for training and use of mid-level health care providers in a multi-site regionalized emergency medicine delivery system.

**BOD Liaison Comment:**

I think the article is interesting and will probably elicit some strong reactions. It seems that the change has improved process and patient satisfaction. What is more difficult to judge is the actual quality of care delivered. Since the number of cases where life or death issues arise is generally small it may be difficult to find meaningful measures of quality. Unfortunately what is most easy to measure like time to thrombolytic or time and selection of antibiotics for pneumonia may not be the best differentiator of the quality of care of the provider. So I would say that before judging this model a success it would be good to agree upon what we mean by a success. It may well be better than what existed before but is it better than other options that might be possible? Also we need to recognize that the author may not be impartial. Like many approaches for staffing, this approach will require an impartial analysis of the risks and benefits before we can decide whether to support it or not.