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Nurse's Notes



Nurse's Notes Editorial Board & Contributors Past and Present

Front to Back, Left to Right:

Row 1-Wendy Tucik-Micek, Michelle Bassett, Karen Bogdan, Judi Cavanaugh, Kim Wroble, Lynn Curran. Row 2-Lynn Hennessy, Irene Tranowski, Susan Cusack, Martha Winter, Debbie O'Connell, Sue Heslop. Row 3-Eileen Golden, Sandra Clark, Sue Barry, Nick Schneider, Colleen Leake, Cheryl Lefauver, Joanne Mazurski. Row 4- Gail Gorecki, Colleen Perez, Mike Moonan

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From the Desk of Lynn...

Lynn Hennessy, MS, MBA, RN, NEA-BC, vice president, chief nurse executive



As 2014 draws near to an end, I take inventory of all we have accomplished over the last 12 months. Too many to list, the following are a small representation of many incredible accomplishments:

- Advocate Christ Medical Center opened our new Outpatient Pavilion in March, allowing us to better serve our community.
- Advocate Christ Medical Center and Advocate Children's Hospital-Oak Lawn became one of only five facilities in Illinois to receive a third Magnet designation for nursing excellence.
- Advocate Christ Medical Center was rated a Top 100 Hospital in the country and a top 15 major teaching hospital by Truven Health Analytics.
- U.S. News & World Report ranked Advocate Christ Medical Center third among all Chicago and Illinois Hospitals
- Advocate Christ Medical Center is one of only 20 sites globally – and the 1st in Illinois – participating in a clinical trial to using a new technology that allows physicians to “see” inside a patient’s artery as they remove fatty material blocking it due to peripheral artery disease.
- Healthgrades again recognized Advocate Christ Medical Center with a Distinguished Hospital Award for Clinical Excellence, rating us in the top 5 percent of hospitals nationally.
- Becker’s included Advocate Christ Medical Center in their list of “100 Hospitals with Great Heart Programs.”
- Advocate Christ Medical Center received a Hospital Safety Score of “A” from the Leapfrog Groups.

Some may think with these impressive accomplishments that we have met our goal of becoming a highly reliable organization for our patients, associates and physicians. However, we are still on our journey of becoming the best environment for patients to heal, associates to work and physicians to practice, ***always***.

We have heard from you, our associates, through Culture of Safety, Patient Satisfaction, Physician Engagement, Associate Engagement survey tools and leadership rounding that staffing is unreliable; all too often, the number of staff scheduled is not what shows up. Most associates realize that our shortages in staffing are due to a variety of reasons such as call-ins, leaves of absence, vacations, vacant positions, and high volumes and that our leaders frequently struggle to cover those vacancies.

Compounding the issue, we have become a leaner organization over the last two years. Today, one associate’s absence is more impactful than in years past. Realizing this, nursing leadership is working hard to develop and implement strategies to ensure we have the right mix of staff to care for our patients, at the right time, in the right place, ***always***.

In 2013, Advocate Christ Medical Center took initial steps towards implementing a float pool with a dual goal of providing immediate relief for units experiencing shortages and reducing time to fill vacant positions. A robust float pool allows managers to recruit and immediately fill vacated positions using experienced candidates from the pool. Not only can the position be filled immediately, but also very little orientation will be needed. In the first phase, six nurses were hired. Phase two began with a very successful recruitment fair in early August of 2014 with a total of twenty nurses hired for medical/surgical, telemetry and intensive care unit (ICU). All but the ICU nurses have completed orientation. We also added eight patient care information associates (PCIA’s) to the float pool in August of this year to alleviate sitter need.

Our float pool is currently comprised of 35 nurses, 10 PCIA’s and 20 care companions.

This team is strong and growing to meet the staffing needs across our Christ Medical Center and is just one of our strategies to aid in the ebb and flow of our staffing demands. Our goal is to eventually grow the pool to cover all nursing areas. I will continue to update you on all site and system strategies that will aid in staffing relief, such as a system float pool, in the coming months.

Float pools will assuredly ease future staffing concerns, but our current surgical growth and expansion has also provided a need to hire experienced operating room (OR) nurses. If you refer any non-Advocate, experienced OR nurse that we hire into our OR, based on your referral, both you and the candidate are eligible for a bonus. The referring associate will receive \$3,000 for the first referral, \$4,000 for the second, \$5,000 for the third, and so on. For more details, please call Vilija Johnson, staffing consultant, at extension 41-5460. I have also temporarily lifted the BSN requirement for any **experienced** OR nurses to work in our main OR only. If you know of any potential candidates, please let them know of this opportunity.

Please know, I hear you and will continue to work with you to improve your quality of work life. If you have ideas to share, please e-mail or call me at lynn.hennessy@advocatehealth.com or extension 41-4079.

Wishing all of you and your loved ones have a blessed holiday season and that the New Year brings us all new hope and new beginnings.

Be Responsive -

Listen and respect needs with kindness, patience and respect.

Keep Calm and Chip In for Nursing Research!

Courtney A. Remezas, BSN, RN-BC,

4 east west, co-chair professional clinical practice council

LEARN Model:
Research



Exemplary Professional Practice

The 7th annual Chip In for Nursing Research golf outing took place at Water's Edge Golf Course in Worth, IL on September 17th, 2014. This annual event brings many Advocate employees and sponsors together to assist in raising money for nursing research at Advocate Christ Medical Center and Advocate Children's Hospital-Oak Lawn. The Chip In for Nursing Research Committee, who contributed many hours to plan and organize this incredible event, hosted this annual event.

The weather could not have been more perfect for a golf outing! One hundred and forty-four attended the golf outing, setting the record for highest attendance thus far! Last year, over \$40,000 was raised from the event—and 2014 is set to exceed expectations, with donations totaling over \$53,000.00 this year! Participants spent the beautiful afternoon out on the green, competing in various hole contests, such as attempting to "Out-Drive the Executive," our chief nurse executive, Lynn Hennessy, in addition to playing the game of golf. Golfers were also able to "Buy a Pro," which let a pro's drive count as the tee shot for that hole. The pro scored a "Hole in One" for our vascular advanced practice nurse, Michelle Nellett! This was a first in our pro's career at Water's Edge.

The raffle baskets were something to be admired, with prizes ranging from wine and gift certificates to spa treats and weekend getaways. The silent auction was a crowd pleaser, offering Chicago Bulls and Blackhawks tickets among other great items. A special thanks goes out to Connie Fulayter, the clinical information management specialist from the adult surgical heart unit (ASHU) for assisting in securing more than \$15,000.00 in donations, and Dr. Pappas for donating Chicago Blackhawks tickets. The Professional Clinical

Practice Council (PCPC) assisted again this year with the sale of the Chip In golf ball tags, which raised \$3,767.75. First place in golf ball tag sales goes to the ASHU, with second place going to 6EW, and third place going to Pain Center. Your dedication is admirable!

Congratulations to the winners of the 2014 Chip In for Nursing Research golf outing contests! Tim Ingolia won the Men's Longest Drive, and Teri Novak won the Women's Longest Drive. Tony Ingram was the Man Closest to the Pin, and Laura Tatoes was the Woman Closest to the Pin. The award for the Longest Putt goes to Margaret Cyle. Thank you for your skill and participation! The winning foursome was Jonathon Chernick, Justin Howard, Jason King and Tim O'Rourke.

On behalf of the 2014 Chip In Committee, we would like to genuinely thank each individual who participated in this event! Nursing research allows us to advance our practice, create the best outcomes for our patients, and partner in excellence. We are grateful for your generous donations, time, and efforts! We look forward to seeing you out on the green in 2015, as we continue to "Chip In" for nursing research.



Moving Up in the World

Laura Rosner, BSN, RN-BC, assistant clinical manager, cardiac/pulmonary rehabilitation and Carol Pisano, BSN, RN, CCRN, manager, heart failure clinic

LEARN Model:
Environment



Structural Empowerment

The Cardiac/Pulmonary Rehabilitation program and Heart Failure (HF) Clinic have been two very important and growing outpatient services for the Heart and Vascular Institute. These programs had outgrown their space in the main hospital several years ago. If you ever visited these areas you would have seen just how tight the space was for the patients and staff with little room for comfort or privacy. The new outpatient pavilion (OPP) was an opportunity to provide improved space and room for growth. The managers and staff of these two departments put a lot of thought and details into the planning for these two new homes. How has the first few months gone for both of these areas?

Cardiac Pulmonary Rehab has experienced a very smooth and successful transition. The main issues that caused some concern for our patients were related to patients finding their way and registration. The change in location and processes was made easier by the kind staff in the OPP. The previous cardiac pulmonary rehab

department was difficult to find and took up no more than 500 square feet in a windowless room. It was a cramped and crowded environment that offered little patient privacy and no waiting area at all. In March 2014, all of that changed. The department now has over 2,000 square feet of space that has been beautifully and thoughtfully designed. The new space has easy parking, valet, guest services, a large waiting area, and of course a large exercise area with new equipment and windows! Our patients tell us and write in their surveys how pleased they are with their "new home." The positive comments and increased attendance rates show that our patients are benefitting from our new and improved space.

The HF Clinic went from 12 to 15 chairs and an exam room. The major difference is in the amount of space, privacy and comfort for the patients. The room has several windows which provide a wonderful and open feeling for the patients and staff. Each bay has

a computer, a television and chairs for family members. The patients have been happy with the move and when rounding these are some of the comments: "I love the new space, much better for the patients and staff," "valet and the parking garage has been easy to navigate," "what a beautiful building and room." The registration staff and guest services have been great partners and have helped to create a warm and engaging experience for the patients who follow-up in the HF Clinic. There were a few bumps in the road at the beginning. Some of the patients went to the old clinic despite getting information in a letter, some were not sure about parking and used the valet at the main hospital, and all of the patients who follow-up in the HF Clinic never used a waiting room. Like any change there is an adjustment period but the overall feeling is that we have "moved up in the world" to the new OPP and both patients and staff are adjusting well. ▼

About Float Pool Nursing

Karen Bogdan, MS, RN, CCRN, CNML, director nursing finance & patient logistics and Donna Lang, MS, RN, NEA-BC, manager clinical bed management & nursing resource office

LEARN Model:
Leadership



Exemplary Professional Practice

Our newly developed float pool is continuing to expand to address the staffing needs throughout the adult hospital. With a goal of hiring twenty nurses, an open house was held in August where qualified applicants were interviewed and hired on-the-spot. Float pool nurses are trained to provide safe, compassionate care in multiple units. Our nurses are oriented in their choice of one of the following specialty group(s): medical/surgical, behavioral health, telemedicine and intensive care unit(s).

Not unit-based, our float pool nurses demonstrate a high degree of flexibility and adaptability, as their daily assignments are determined by the staffing needs of the medical center. It is important to note, float

pool nurses, like the majority of unit-based nurses maintain a full-time equivalent (FTE) and are benefit eligible, accruing paid-time off (PTO). Our nurses, complete a comprehensive orientation based on their specific specialty area and are oriented on all units where they will eventually float. They attend and complete all the same required education as unit-based nurses.

Working under the direction of the nursing resource office, our nurses are assigned to units that are not staffed as required based on census and acuity, usually due to call-offs. Their adaptability allows this team of nurses to cover a variety of patient care areas, throughout the medical center.

Currently, twenty-eight nurses strong, we plan to increase our team within the next several months and over the next few years. Our goal is to provide unit coverage for call-offs, vacancies and high volumes on both dayshift and nightshift. Additionally, we will be able to support units within the new patient tower, as units increase their bed capacity and nursing staff. Welcoming and supporting our float pool nurses will contribute to successful team work and positive patient outcomes. ▼

Nurses Attend Sigma Theta Tau International Honor Society of Nursing Biennial Convention

Theresa Zaplatosch, BSN, RN, assistant clinical manager 7 east, Advocate Christ Medical Center

LEARN Model:
Research

New Knowledge,
Innovations & Improvements



Sigma Theta Tau International Honor Society of Nursing held its 42nd Biennial Convention from November 16 to 20, 2013. Thanks to the generous sponsorship of the Nursing Research and Education Fund, three nurses were able to spend a day at the conference. May Marasigan, BSN, RN, 7 west and I accompanied Cheryl Lefaiver PhD, RN to Indianapolis and attended the convention on November 18th.

The day began with a presentation by Tilda Shalof, critical care nurse and author of *A Nurse's Story*. Armed with more than twenty years of nursing experience, Shalof shared her continued passion for nursing through the use of stories. Through her humorous reflections, Shalof encouraged all nurses to remember the reasons they became nurses and to use their enthusiasm to become politically active for our profession. She believes that nurses' involvement in decision making will ultimately lead to better patient outcomes, as well as the advancement of our profession.



Left to Right: Cheryl Lefaiver, PhD, RN, CCRP, Theresa Zaplatosch, BSN, RN, May Marasigan, BSN, RN

For the rest of the day, we were able to choose from a plethora of clinical, evidence-based practice, leadership, and scientific presentations. One such presentation discussed the relationship between assertiveness and nursing burnout. According to Ronda Binder DNP, a study done at the University of Texas at Arlington College of Nursing showed that among nurses who worked while also attending school, those who were least assertive suffered higher degrees of

burnout. She defined the characteristics of burnout as emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment. To help combat burnout, the study suggests assertiveness training classes for nurses as well as other stress relieving programs including exercise or dance classes. The knowledge gleaned from this study can help nurses recognize burnout in themselves as well as others. By practicing assertiveness we can combat the effects of burnout, serve as a positive role model, and promote staff retention.

The overall theme of the conference was that nurses must employ research based evidence to improve their practice. It was inspiring to spend the day among so many bright minds and encouraging that nurses can be so empowered by advancing their education. ▼

Risky Business:

WARNING: Personal Notes May Not Be Protected

Martha Winter, RNC, MJ, CPHRM, director, risk management

One conversation risk management never wants to hear concerns health care workers keeping personal notes regarding hospital events in electronic devices or written forms. NEVER keep your own personal notes regarding a patient's care. All facts regarding care or related to specific events should be documented in the patient's medical record. In a civil/legal case, personal notes are included in the request for production of documents, which is part of the discovery (written investigation) process. Legal counsel can object to producing personal information, however, the judge will decide if a motion to compel must be directed. All evidence is generally admissible if it is relevant to prove facts in a case before the court.

Therefore, physicians, nurses and all associates should be aware that personal notes outside the patient's medical record are generally not protected. This includes journals, e-mails (even those between managers, supervisors, administration and risk management), letters, planner notes, cell phone information and text messages. To the courts, there is no protectable privacy or confidentiality to any material posted on social media sites. If you mix business e-mail with personal e-mail be prepared to expose all your personal account information for review should the need arise in a legal matter. Only statements prepared as "attorney-client" or "insurance work product" can be protected. An e-mail sent to a colleague may involve someone in a matter of which they were not associated with

previously. Patient Safety Event Forms (MIDAS reports) are generally not protected and therefore, should only contain facts; the same information that would be included in the medical record. Protection of documents and information under the Illinois Medical Studies Act only applies to materials used in the course of internal quality control for the purpose of improving patient care and safety as directed by a quality committee.

Remember, risk management is a resource to all and can be consulted if you have any documentation issues or questions regarding the protection of documents. We are available 24/7 at 41-RISK (7475) or during off shifts through the page operator. ▼

LEARN Model:
Environment

Exemplary Professional Practice



2nd Quarter, 2014 Daisy Award Winners

Sue Dedic, BSN, RN, PCCN – congestive heart failure (CHF) clinic

The Daisy Award is to pay special tribute to the special human consideration nurses give their patients every day as a very important part of the healing process. Sue is a nurse in the CHF clinic who provides excellent care. What stands out, however, is the compassion and giving spirit she provides to the patients and families. It is something that you feel the very minute you meet Sue. She has been instrumental in how she is able to help the patients and families cope and deal with heart failure. It is the little things that she does that many of the patients and families have told me about that made such a difference. She frequently visits them if they are admitted to the hospital and gives them a little beany baby to cheer them up. She sends beautiful sympathy cards from the clinic when the patient has died. A family member recently told me that the card

meant so much to her and she put it on her refrigerator to remind her how kind and compassionate everyone was to her dad. I know that Sue has gone to the patient's homes to drop off an important prescription or something they left at the clinic. I recently saw Sue with a patient's 6-year old son. She let him pick out a beany baby for himself and he was so happy! I know that meant a lot to the patient.

Through it all, Sue has also been dealing with an abundance of personal health issues among her immediate family. Sue is a pillar of strength for all of them. You would never know the stress and burden that she has been under, yet she comes to work with a smile on her face and provides a caring and compassionate presence to all. Sue exemplifies all that Daisy represents. We are so fortunate to have such a remarkable nurse in the CHF Clinic.



Jeff Hermadek, BSN, RN, CCRN – medical intensive cardiac care unit (MICCU)

My mom was a patient of "Tall Jeff" during the last days of her life. When mom entered MICCU she was very scared and was having an extremely difficult time breathing along with congestive heart failure. Jeff was her nurse for the next two days and for her last day. He was so gentle and kind to mom and very professional. On that first day, one of my sisters saw Jeff just holding my mom's hand to reassure her.

He listened to her and to us, her five daughters. We felt that he was an advocate for us all, as well as mom. He listened to every doctor's assessment and was there after doctors left to help explain to us or to mom what was happening. He joked that he could "talk trach," so com-

munication with mom was made easier. Mom loved to laugh and as we gently joked around with mom, he did too. You could see mom enjoying his attention. He spoke directly to her with respect. We could see that mom trusted Jeff. When mom made her last decisions about the end of her life, we knew she was going to die. Mom and the rest of my family were truly grateful that Jeff was to be her nurse on her last day. We knew that Jeff would do his best to make her transition easy and peaceful.

I say that God sent mom some "Angels" to help her through her last days. One of the most important "Angels" was Jeff. We will always remember the compassion and kindness that Jeff showed to our family. Advocate Christ Medical Center should be very proud of him.



Katie Wilk, BSN, RN, CPN – 4 Hope

Katie Wilk is a very compassionate bedside nurse who goes above and beyond for her patients. She is recognized very often by the families for giving that extra special touch to her patients. Katie is empathetic and is a great listener to her patients and families.

I remember one specific patient who was very difficult to reach and had many outbursts and the parents and staff were unable to control this autistic child. The child climbed into a cabinet in the room and shut the door. Katie sat on the floor and very patiently gave the child a set of 2 choices to choose from ...talk with the door open

or get out of the cabinet. Then she gave him another 2 choices from which to pick....and kept giving him choices until he elected to come out of the cabinet and talk to the doctors. The mother was so appreciative of Katie's patience and understanding Katie showed her son.

Katie is good with relating to the patients because she takes the time to get to know them and understand their situation. Katie is exactly the kind of nurse that Patrick Barnes would have loved to care for him!!!



Advocate Nurses “Step Forward” at the Edwards Hospital Annual Evidence-Based Practice (EBP) Conference and the National Teaching Institute (NTI)

Debbie Heine, BSN, RNC, Michelle Nellett, MSN, APN, CCRN, CCNS and Kathy Kamba, BSN, RN, CCRN

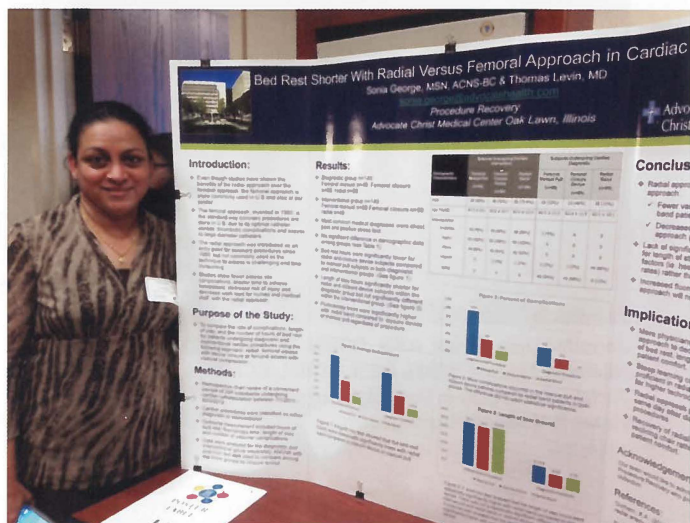
LEARN Model:
Research

New Knowledge,
Innovations & Improvements



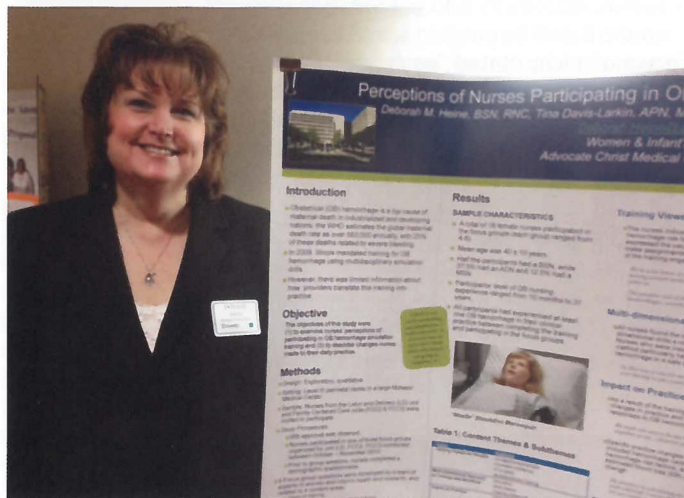
Advocate Christ Medical Center nurses had the opportunity to share their knowledge and support for evidence-based practice as we attended and presented at the Tenth Annual Evidence-Based Practice (EBP) Conference at Edward Hospital in Naperville, IL on October 26, 2013. The conference while held on a Saturday was well attended especially by nursing students from various colleges in the area.

Sonia George, MSN, ACNS-BC presented a poster on her retrospective study, “Bed rest shorter with radial versus femoral approach in cardiac catheterization” at the Edwards EBP Conference. “The conference was very interesting. There was a wide range of participants from student nurses to new graduates to seasoned nurses. Many nurses stopped by to learn more about the radial approach, how long we have been doing this and the outstanding outcomes. It was interesting to know that we are far ahead of the game in utilizing research to practice and use the findings to develop order sets.” Sonia was also impressed with the research involvement of new nurses at some institutions.



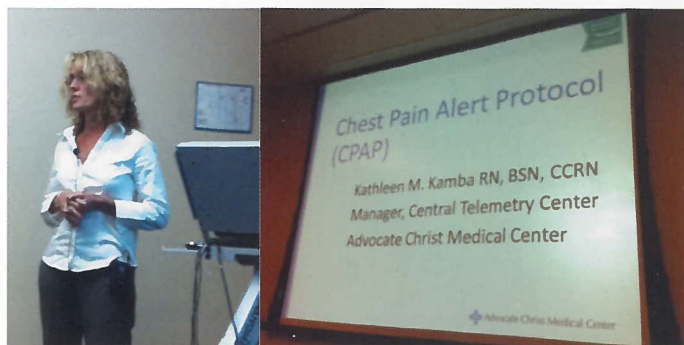
Sonia George, MSN, ACNS-BC, procedure center

Debbie Heine had the privilege of presenting a poster presentation of my qualitative research, “Perceptions of nurses participating in obstetrical hemorrhage simulation training.” Two nursing students that had their clinical rotation at Christ Medical Center Labor and Delivery stopped at her poster to let her know what a positive experience they had during their rotation through the Women and Infant’s Health Services Division. It was exciting to know the department and division had made a positive impression on these nursing students.”



Debbie Heine, BSN, RNC, labor and delivery

Kathleen Kamba, BSN, RN, CCRN and manager, central telemetry center at Christ Medical Center presented “Team approach for inpatient chest pain alert protocol (CPAP) leads to successful outcomes” at one of the breakout sessions. Kathy enjoyed her first experience sharing her project at the conference. Kathy’s project was included in the Magnet re-designation document as a project exemplar demonstrating an improvement in care because of nurse involvement on a committee. “I enjoyed the conference. The students were inquisitive and interested in the CPAP process. I thought it would have been more experienced nurses but the audience was captive and small enough to develop dialogue.” After submitting her abstract to this conference she submitted her project abstract to the prestigious National Teaching Institute (NTI) and Critical Care Exposition national conference for consideration and it was accepted for a poster presentation!



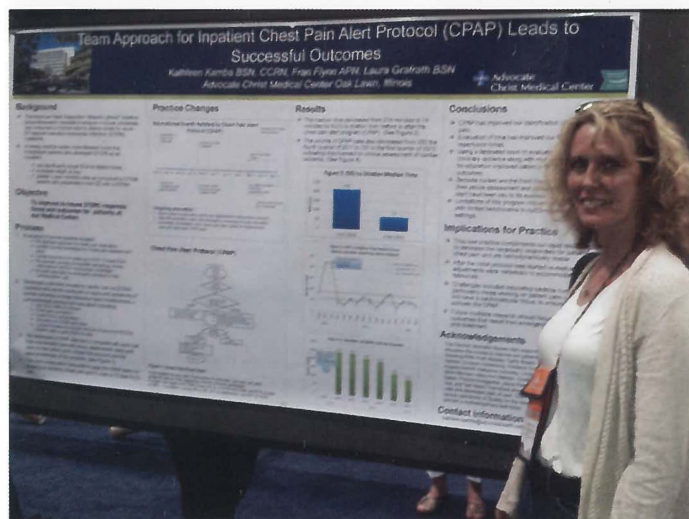
Kathleen Kamba, BSN, RN, CCRN and manager

Continued on Next Page

Advocate Nurses “Step Forward” *continued*

NTI is the American Association of Critical Care Nurses (AACN) annual national conference in which over 6,500 critical and progressive care nurses from across the country attend. This year it was held in Denver, Colorado in May, 2014. NTI is action packed from start to finish -with supersessions that were inspirational focusing on decreasing stress, improving communication, true collaboration, effective decision making and meaningful recognition. Each day multiple concurrent sessions, posters, and events were offered on evidence-based practice, research, education, and patient management. This past year's theme created by outgoing president, Vicky Good, was to “Step Forward”-Vicky stated “each time we step forward- we lead and reaffirm with confidence that we are nurses.” She has encouraged nurses throughout the past year to step forward and take new risks driven by our visions and dreams.

We had the opportunity to step forward and present both at the poster session and a concurrent session. The poster by Kathy Kamba, BSN, CCRN; Fran Flynn, APN; and Laura Grafath, BSN was entitled, “Team approach for inpatient chest pain alert protocol (CPAP) leads to successful outcomes.” This team demonstrated the effectiveness of education and awareness and the importance of early assessments on symptomatic ischemic chest pain.



Kathleen Kamba, BSN, RN, CCRN, manager, central telemetry center

The podium session presented by Michelle Nellet, APN, CCRN, CCNS and (former Advocate employee), Jennifer Dole, APN, CCRN, CCNS, “Making the cold foot connection: What's your next step in analysis of peripheral arterial disease,” focused on advanced vascular assessment and evaluation techniques for peripheral arterial disease and the importance of early recognition and accurate diagnosis.

This was a great opportunity to not only highlight the work being done at Christ Medical Center demonstrating how effective our teams work together but also an opportunity to network with other nurses in different hospital settings and discuss the challenges we all face in health care. Those who attend NTI will often say – their knowledge is enhanced and their enthusiasm for critical care nursing is rejuvenated. The authors whole-heartedly agree and feel very fortunate to have been given the opportunity to present and attend.



Jennifer Dole, MSN, APN, CCRN, CCNS (left) and Michelle Nellet, MSN, APN, CCRN, CCNS (right) Atrial Fibrillation & Vascular Surgery Heart & Vascular Institute

The Advocate Christ Medical Center/Advocate Children's Hospital-Oak Lawn nurses continue to impact and support research and evidence-based practice while being a positive influence to not only student nurses but our new graduates, staff and patients.

PICC Line Insertion Partnership in Children's Hospital Leads to Dramatic Cost Savings

Kim Wittmayer, MS, APN, PCNS-BC, RN-BC

LEARN Model:
Research

New Knowledge,
Innovations & Improvements



The ability to obtain and maintain reliable intravenous (IV) access is an essential but sometimes elusive goal in pediatric inpatient medicine. For children requiring several days or even weeks of IV infusion therapy, peripheral inserted central catheters (PICC) may be the ideal access. PICC lines have long been established as reliable and safe for pediatric patients. Bedside PICC placement has had less than ideal success in the pediatric world as compared to adults who have had documented success in the high 90 percent range. Barriers encountered during PICC line insertion include vessel caliber, age of the patient, and the inability for patients to cooperate and remain still for the procedure. Prior to the establishment of the Pediatric Sedation Service, the Vascular Access Device (VAD) team inserted PICCs without any sedation.

A dedicated Pediatric Sedation Service was established at Advocate Children's Hospital, Oak Lawn in May 2010, under the guidance of Dr. Bottari, with the goal to reduce pain

and anxiety as much as possible during a wide range of procedures including PICC line insertion. All bedside PICC lines at Advocate Children's Hospital, Oak Lawn were inserted by the VAD team and all moderate sedations were performed by a dedicated pediatrician. Each candidate for sedation had a full history and physical performed by the pediatrician on the Sedation Service documenting not only the suitability of the patient for sedation but also American Society of Anesthesiology status (ASA), airway documentation, and nothing by mouth (NPO) status.

Between January 1, 2011 and December 31, 2011 at Advocate Children's Hospital, Oak Lawn, 189 bedside PICC lines were attempted. Of these, 79 were attempted with sedation provided by the Sedation Service and 110 were attempted without sedation. The success rate was 94 percent with sedation versus 75 percent without. These results are consistent with the prior success by the VAD team before the insti-

tution of the Sedation Service: 77 percent (2008), 75 percent (2009) and 77 percent (2010).

The dramatically improved success of PICC insertion can be directly related to the addition of moderate sedation. The average cost of each bedside PICC insertion is \$1,300 while the average cost of a PICC insertion by interventional radiology (IR) is \$2,600. Neither of these prices includes the cost of the interventionist, anesthesiologist, or the sedationist. Not only is there an immediate cost savings, but also a savings in avoidable days. If bedside failure occurs, the patient has to wait one to several days to have the PICC attempted by IR, increasing the burden on the patient, family, and hospital. It is clear that the partnership of the VAD nurses and a pediatrician providing sedation for bedside PICC placement has led to overwhelming success and decreased costs.

STEPS Promotions, Certifications and Research Recognized

LEARN Model:
Novice to Expert



Structural Empowerment

In addition to recognizing STEPS promotions and nursing certifications, the nurse recognition ceremony recognizes nurses who have recently completed their nursing degree, institutional review board application approval and nurses acknowledged for other reasons.

NCII STEPs Promotions

Desiree Carney, RN, CPN
Dawn Corey, BSN, RN, CAPA
Kathleen McGuire, BSN, CCRN
Megan Okon, BSN, CCRN
Sheila Pepito, BSN, RN, PCCN
Marcia Rivera, BSN, CPAN
Nicole Sinovich, BSN, RNC-BC
Patricia St. Clair, BSN, CRRN
Rebecca Swieszcz, BSN, RN
Colleen Vanderwarren, BSN, RN, CRRN



NCIV STEPs Promotions

Jaime Biagioni, BSN, CCRN
Michelle Bouchard, BSN, RNC-NIC



Daisy Award

Sue Dedic, BSN, RN, PCCN
Jeff Hermanek, BSN, RN, CCRN
Kathleen Wilk, BSN, RN, CPN



Continued on Page 11

2014 Rehabilitation Achievement Awards

*Irene Tranowski, MSN, RN, CRRN, clinical practice partner, 6 south and
Gail Alexander-Loizon, MS, CTRS*

LEARN Model:
Environment



Exemplary Professional Practice

On Friday, September 19, 2014 the Rehabilitation Department at Advocate Christ Medical Center and Advocate Children's Hospital-Oak Lawn celebrated its 32nd Annual Rehabilitation Achievement Awards Ceremony. Dr. Roy Adair, Chair and Medical Director of Rehabilitation Services, emceed the event where six recipients were honored for their outstanding achievements. In presenting these awards, the rehabilitation staff wanted to acknowledge their strength-of-character, determination, and positive adjustment which they demonstrated not only during their inpatient rehabilitation, but also to their adaptation to home and community life.

The awards were presented to Hailie Zavala and Dylan Rhodes from Pediatric Rehabilitation, and Andrew Cichon, Richard Sorley, Emmett Eggleston and Michael Jezior from the Adult Physical Rehabilitation program. Each of these persons displayed remarkable courage and determination in overcoming disabilities related to trauma or medical conditions.

Hailie Zavala and Dylan Rhodes were both victims of motor vehicle accidents. Hailie suffered multiple fractures, pain, and the loss of her mother. Dylan sustained a traumatic brain injury. Andrew Cichon, a construction worker fell off of a roof and sustained complete paraplegia. He is currently living independently with his wife and 5 children. Richard Sorley, had a subdural hematoma and suffered a stroke along with other medical complications. Richard is retired and lives with his very supportive wife and family. Emmett Eggleston had several strokes and is fighting acute myeloid leukemia (AML), a serious blood cancer. He spoke of the excellent care he received while at Christ Medical Center and praised the support of his family. Michael Jezior is a Chicago fireman who suffered a stroke while on duty. With the quick response of his fellow firemen, he received treatment. He is currently back at work and recently went on a trip out of the country by himself.

Each of the recipients had an amazing story that shows just how strong you can be when faced with many unexpected challenges. The four criteria for nominating a former patient are as follows:

1. Demonstrated high level of motivation and participation in the rehabilitation program.
2. Achieved their highest level of independence while on the rehabilitation unit.
3. Successfully adjusted to their home environment as a person with a disability.
4. Exhibited optimal community reintegration after discharge.

We commend these patients for overcoming the odds and being a true inspiration to all of us. Each one of these individuals were faced with many issues related to their disability and always pushed themselves to do more to gain their highest level of independence. It was an honor and a privilege to assist them in achieving their goals during their rehabilitation journey. ▼



STEPS Promotions, Certifications and Research Recognized *continued*

Newly Certified Nurses

Critical Care MICCU

Victoria Shrader, BSN, RN, CCRN

SSU

Vishaun Lawrence, MSN, RN, FNP-BC, FNP-C

8 east/west

Aneesha Taylor, MSN, RN, FNP-C

Heart and Vascular Institute Cardiac Cath Lab

Cathy Wozny, BSN, RN, CV-BC

Medical Surgical/PSAS/Procedure Center 5 east

Susan Cusack, BSN, RN, NE-BC

Mary Sumner, BSN, RN-BC

7 east/west

Amy Cascone, BSN, RN-BC

Jennifer Harris, BSN, RN-BC

Theresa Zaplatosch, BSN, RN-BC

Neurosciences Institute/Bone & Joint Institute 6 east/west

Kristen Gustafson, BSN, RN-BC

Latonya Holley, BSN, RN-BC

6 south

Colleen Vanderwarren, BSN, CRRN

Surgical Services PACU

Melanie Larson, BSN, RN, CPAN

Women & Infants Health Services 3 east/west

January McNeal, BSN, RN-BC

Michelle Young, BSN, RN-BC

Advocate Children's Hospital 2 Hope

Megan McKenzie, BSN, RN, CPN

PICU

Katherine Foy, BSN, RN, CCRN

Pediatric Emergency Center

Caitlin Cross, BSN, RN, CPEN



Degree Completion

Critical Care Hemodialysis

Caryn Smith, MA, BSN, RN, OCN

MICCU

Angeline Brooker, BSN, RN

Rebecca Swieszcz, BSN, RN

Lisa Zagorski, MSN, APRN, FNP-BC

SSU

Lee-Anne Millas, MSN, BSN, RN

8 east/west

Anita Acheampong, BSN, RN

Anne Daniels, MSN

Jalwa Odeh, MSN

Medical Surgical/PSAS/Procedure Center Procedure Recovery

MaryCarol Goodman, BSN, RN

4 east/west

Sandra Gula-Gleason, BSN, RN

Lauren Lestarczyk, MSN, RN

Jackie Mason, MSN, RN

5 east

Gregory Johnson, MSN, PNP-BC

5 south

Chloe Haney, MSN, FN-BC

7 east/west

Kari Sullivan, MSN

Natasha Wallace, MSN, RN-BC

Surgical Services Day Surgery

Ann Marie Cook, BSN, RN

Surgery

Ruth Jaraczewski, BSN, RN

Outpatient Pavilion Surgery

Bridget Shaffer, MBA, BSN, MS, RN, CNOR

Pre/Post Surgery

Diane Cooper-Fruhstuck, MSN, RN, CNOR

Ursula Singleton, MSN, RN-BC

Advocate Children's Hospital NICU

Colleen Brennan, BSN, RN, PCA

Melanie Waszak, BSN, RN, PCA

4 Hope

Lauren Heffernan, BSN, RN

Pediatric Emergency Center

Judy Arway, MSN, RN, CPEN



Nursing Research - IRB Submissions

Project Title:

Examination of Outcomes for Breast Cancer Survivors Participating in the Clinical Evidence – Based Exercise Program, BC2 (Breast Cancer Boot Camp)

Principal Investigator

Laurie Shellito, MPH, MBA, PT

Sub-Investigator

Barbara Fuller, MAOL, CLT-LANA, PT

Margaret "Peggy" Kupres, MA, BSN, RN, CBPN-IC



Project Title:

Retinopathy of Prematurity: Comparison of Pain Using Two Eyelid Retractors
**Awarded the 2014 Barbour Research Scholarship*

Principal Investigator

Debra Skopec, BSN, RN, NIC-BC

Sub-Investigator

Phyllis Lawlor-Klean, MS, APN/CNS, RNC



Nursing Research - IRB Submissions

Project Title:

Continuous Infusion Versus Bolus Dosing for Pain Control After Pediatric Cardiothoracic Surgery

Principal Investigator

Jamie Penk, MD

Sub-Investigator

Kimberly Wittmayer, APN, RN,
Christine Steffensen, Pharm.D., MA,
Cheryl Lefaiver, PhD, RN, CCRP,
Joan Hoffman, MD,
Imran Sajan, MD,
Dhaval Patel, MD,
Melissa Nater, MD,
Andrew VanBergen, MD

Coordinator

Bonnie Hughes, BSN, RN, CCRCI



Project Title:

Melody Transcatheter Pulmonary Valve, Model PB 10 (Stented Bovine Jugular Vein Valve) [PB1016] and the Ensemble [HDE]

Principal Investigator

Alexander Javois, MD

Sub-Investigator

Dhaval Patel, MD

Coordinators

Julie Connolly, BSN, RN, CCRN

Laura Dudek, BSN, RN, CCRN



Nurse's Notes Contact Hour

The Role of End Tidal CO₂ Monitoring for Adult Hospitalized Patients

Sharon McKinney, M.A., RRT-ACCS, education specialist, adult respiratory

HOW TO EARN CONTACT HOURS

1. Read the Contact Hour article and take the test at the end of the article.
2. Complete the entire answer form. (Answer forms may be photocopied.) **DEADLINE:** Answer forms must be received in the Clinical Education Department no later than, March 1, 2015.
3. Return the answer forms through in-house mail or fax to:

MAIL: Clinical Education Room 8232P

FAX: Ext. 41-5640

SCORES: To earn 1 contact hour of continuing education, you must achieve a score of 80% (8 of 10 correct). Certificates indicating successful completion will bear the publication date of Nurse's Notes. If you do not pass the test, your answer sheet will be returned for you to correct and resubmit prior to deadline.

ACCREDITED: Advocate Health Care (OH-368, 10/1/2014) is an approved provider of continuing nursing education by the Ohio Nurses Association (OBN-001-91), an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

CONTACT HOURS: This CNE activity is being offered for 1.0 contact hour.

The provider of the activity has disclosed in writing or verbally there is no conflict of interest declared by the planners and presenters/content specialists.

QUESTIONS: Contact Clinical Education at Ext. 41-4409

Answers to the 2014 Volume 14, Issue 2 Contact Hour Quiz: Understanding Alarm Fatigue

1. False positive alarms resulted in a change in the management of the patient what percent of the time?
 - a. 5 percent
 - b. 10 percent
 - c. 1 percent**
 - d. Less than 1 percent
2. A smart alarm
 - a. Analyzes the multiple parameters in a patient's condition**
 - b. Allows monitor information to be communicated to cell phones, pagers
 - c. Conveys a sense of urgency by varying the sound levels and type of alarm
 - d. Continually reset themselves based on averaging the patient's parameters
3. Alarm fatigue occurs as the result of an excessive number of alarms desensitizing staff which results in sensory overload
 - a. True**
 - b. False
4. Alarm noise can
 - a. Overwhelm individuals due to sound level
 - b. Increases patient anxiety
 - c. Impacts the patient's overall perception of the quality of care
 - d. All of the above**
5. The most common false positive alarm in an intensive care is
 - a. Cardiac monitor
 - b. Ventilator monitor
 - c. Pulse oximetry monitor**
 - d. Bed alarm
6. One of the easiest ways to ensure a reduction in alarms is to change electrodes daily, ensuring proper skin preparation.
 - a. True**
 - b. False
7. In an evaluation of monitor use, the following outcomes were noted:
 - a. Reduction in code blue
 - b. Reduction of 89 percent of audible alarms
 - c. Improved patient satisfaction
 - d. All of the above**
8. Reducing the SpO₂ alarm from 90 to 80 percent
 - a. Increased the number of alarms by 10 percent
 - b. Decreased the number of alarms by 10 percent
 - c. Increased the number of alarms by 80 percent
 - d. Decreased the number of alarms by 80 percent**
9. Strategies for improving care delivery include:
 - a. Turning off infusion pumps
 - b. Customizing alarm parameters**
 - c. Keeping med-surg patients on telemetry as long as possible
 - d. Changing electrodes only when needed on adult patients
10. The 2011 Clinical Alarms Summit's goal is that no patient would be harmed by an adverse alarm event by:
 - a. 2015
 - b. 2016
 - c. 2017**
 - d. 2018

The Role of End Tidal CO₂ Monitoring for Adult Hospitalized Patients

Sharon McKinney, M.A., RRT-ACCS, education specialist, adult respiratory

End Tidal CO₂ (etCO₂) measurement plays a larger role in the hospital than ever before. This article strives to give the reader an understanding of the basics of etCO₂, and the role of etCO₂, with some hospital applications.

End Tidal CO₂

What is End Tidal CO₂? End Tidal CO₂ (etCO₂) is a noninvasive measurement of carbon dioxide at the end of expiration. It may be expressed as 'PetCO₂' (partial pressure of end tidal CO₂). A tidal breath is the amount of air inhaled and exhaled (so named for the similarity of the tides of the ocean), and 'end tidal' refers to the end of the expiratory phase just before the pause which normally occurs before inhalation. Measurements of CO₂ (a by-product of metabolism), are important to determine if a patient is ventilating adequately, and etCO₂ monitoring allows for a noninvasive measurement. This could in turn allow for a decrease in more invasive procedures like arterial blood gases, where the partial pressure of arterial CO₂ is measured (PaCO₂). Arterial blood gases done by needle puncture carry a slight risk of hematoma, bleeding, bruising, pain, nerve damage, and arterial spasm, and arterial lines for continuous measurement carry the risk of thrombus formation and infection.

The readings for etCO₂ will not usually match the reading of PaCO₂. Both measurements have normal values of 35-45mmHg, but there is a difference between them of approximately 2-5mmHg due to the normal ventilation-perfusion (V/Q) mismatch in the lung. Therefore, etCO₂ allows *trending* of PaCO₂—it is a clinical estimate of PaCO₂ because if there is a change in the measured etCO₂, there is usually a corresponding change in PaCO₂, absent the condition of a faulty monitoring line. It is important to note that because V/Q matching in critically ill patients is often abnormal, etCO₂ values must be evaluated cautiously.

When speaking of carbon dioxide, the prefix, 'capno' is commonly used in words. 'Capno' is derived from a Greek word for 'smoke, vapor, soot'. The ancient Greeks believed there was a combustion engine inside the body that gave off smoke in the form of the breath. A relationship today with these words can be imagined when thinking of a person who has been smoking cigarettes for a long time; this usually causes a chronic rise in carbon dioxide in the body because of an inability to rid the body of it.

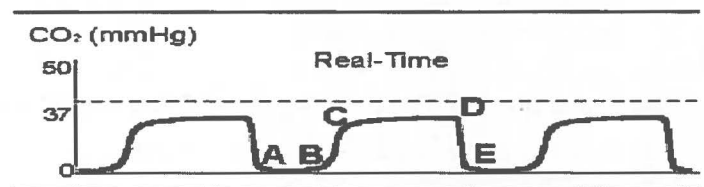
If there is only a CO₂ number being measured/monitored, it is called capnometry. If there is only a waveform presented, it is a capnogram. Capnography is the measuring and monitoring of both. This is considered quantitative measuring, as opposed to qualitative, which uses color changes on chemically treated paper to indicate the presence of carbon dioxide. The use of both numerical values and waveforms is essential to more accurately determine the patient's status; the use of one over the other can be misleading and result in false conclusions that could result in wrong treatments.

Regarding capnometry:

- An etCO₂ reading of <35mmHg indicates alveolar hyperventilation, found in patients who breathe faster than normal, for example, those with sepsis, pulmonary fibrosis, or experiencing a panic attack.
- An etCO₂ >45mmHg are experiencing hypoventilation, and the causes are many. There may be a severe exacerbation of their asthma or emphysema, or may have slowed their breathing due to pneumonia, sedatives, obesity, tumors, etc. A patient with an abnormally high etCO₂ reading is said to be hypercapnic.

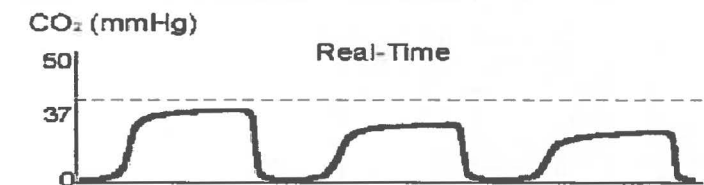
End Tidal CO₂ Waveforms

When evaluating a capnogram, the shape of the waveform is taken in to consideration; its height and width as well as the overall shape tell a story. Here is an example of a normal etCO₂ waveform:

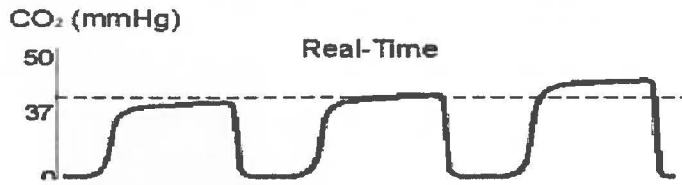


A-B=Beginning of exhalation, B-C=Early exhalation, C-D=Late exhalation, D=End-tidal CO₂ level, D-E=Inspiration

In general, if the waveform is quite short, too much CO₂ is expired and the patient is hyperventilating. If the waveform is tall, CO₂ is accumulating because the patient is hypoventilating. Here are typical examples of both:

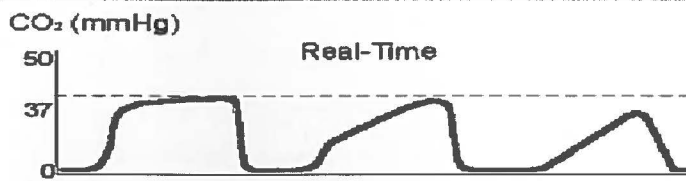


This patient is **hyperventilating**, typically from increased RR and/or tidal volume, hypoxemia, metabolic acidosis, anxiety, hypothermia

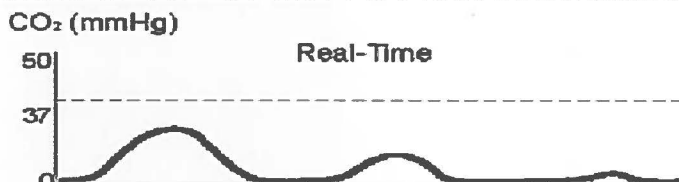


This patient is **hypoventilating**, typically from decreased RR and/or tidal volume, sedation, narcotic overdose, hyperthermia

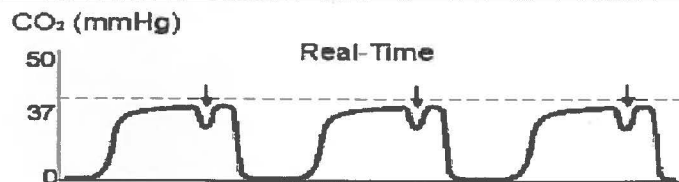
In addition, you may want to become familiar with a few other common etCO₂ waveforms.



This patient has an **obstruction**, typically from bronchospasm (asthma, COPD), foreign body airway obstruction, partially occluded/kinked artificial airway, faulty/blocked bag-mask valve



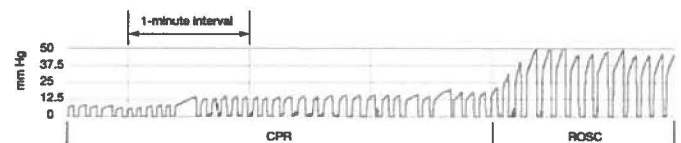
This patient may have **apnea, an esophageal intubation, cardiac arrest, pulmonary embolism, CO₂ adaptor disconnection**



This patient is **waking up** from sedation. The dip in the waveform in a patient who has received paralytics and/or sedation indicates an effort to take a spontaneous breath. Also known as a "curare cleft".

Noteworthy changes have occurred in the recognition of capnography in the recent years. The American Society of Anesthesiologists (ASA) requires capnography to be used to monitor ventilation during moderate to heavy sedation. And, in 2010, the American Heart Association (AHA) recommended the use of continuous quantitative waveform capnography throughout the peri-arrest period. It can be used to confirm endotracheal tube placement and for monitoring cardio-pulmonary resuscitation quality and detecting return of spontaneous circulation (ROSC) based on etCO₂ values.

CPR and ROSC



Highlights of the 2010 AHA Guidelines for CPR and ECC

Monitoring Methods

There are two ways to monitor through a sensor device; mainstream or side stream. With mainstream devices, the sensor consists of the sample cell and infrared bench placed at the airway. This location reflects in real-time the partial pressure of carbon dioxide within the airway.

Side stream devices aspirate a sample of gas from the breathing circuit through a six to eight foot long small bore tube at a flow rate that may vary as much as $\pm 20\%$. This sample is then often passed through a water trap and drying tubing prior to being analyzed in a sample cell. Using a remote location results in a delay time of up to several seconds. The sampling tube typically hangs free between the breathing circuit and monitor where it is vulnerable to being crushed, kinked and may be damaged during machine movement.

EtCO₂ can be monitored through a filter line attached to a ventilator, a BiPAP/CPAP device, an oxygen mask, or a nasal cannula. At Advocate Christ Medical Center, side stream filter lines are used more often than mainstream filter lines, and there are many side stream styles available. If the patient is being monitored for etCO₂ for several hours or more, the filter line of choice should be one with a substance capable of keeping the line dry and clean; the filter lines with the yellow tips contain Nafion[®], which has the unique property of removing moisture from the air sample which is passing through the gas line without affecting the gas concentration. For the most part, each style of side stream filter line is available in orange or yellow; the orange does not contain the Nafion[®] substance and should be used for short-term applications, which is generally a few hours depending on moisture and secretion content.

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When using etCO₂ monitoring with a ventilator, a filter line is placed in line with the ventilator circuit. The location of the sampling port varies and may range anywhere from an elbow connected to an endotracheal tube to the wye connector. For example, it may be placed on the ventilator side of an in-line filter or humidified moisture exchange (HME). This results in a drier sampling tube with the inherent risk of significant distortion of the capnographic waveform and lower end-tidal values. It may be also placed on the patient side of the filter resulting in possible accumulation of condensate and patient secretions in the sampling system (Goodman, 2001, Hardman, 1997). If the monitoring is done closer to the exhalation of the patient, the readout from each breath is more responsive, but the risk of a contaminated filter line increases.

When monitoring etCO₂ on a patient who is not on a ventilator, a filter line is placed as a nasal cannula, with or without an oxygen mask. There is more than one style. Nasal cannula choices include:

- A cannula that does not deliver any oxygen; it only samples the exhalation through the nose.
- A cannula which can deliver oxygen through a separate line while still sampling the exhalation through the nose.
- Another cannula has a 'scoop' under the nasal cannula to catch the exhalation coming from the mouth. This selection is available with the oxygen line option. This may be the best choice for the obstructive sleep apnea (OSA) patient if snoring because that would be an indication of mouth breathing.

When monitoring etCO₂ with a patient who is using a BiPAP/CPAP device, the best option is the cannula that does not have the oxygen line attached; all the oxygen needs are being met by the BiPAP/CPAP, and only the monitoring is needed. Choose the one with or without the scoop, but be aware there is a lot of airflow in a BiPAP/CPAP mask, and readings, while possibly not accurate, may still be useful for trending. This situation may be best used for patients who have OSA and are released from the post-operative recovery area but still require some monitoring due to increased sedation levels.

EtCO₂ monitoring may be done by a patient intensive care unit (ICU) monitor or a stand-alone device. Here at Christ Medical Center, we use both devices. When the ICU monitor is present, a module is used to connect the filter line from the ventilator or the patient to the monitor. When an ICU monitor is not present, such as in a cardiopulmonary resuscitative effort on the patient floors, the stand-alone device is used. It resembles a continuous pulse oximetry device, and indeed, measures oxygen saturation when an oximetry probe is placed on the patient's finger, in addition to heart rate, respiratory rate, and etCO₂ levels.

This stand-alone device can be ordered through the Christ Medical Center electronic charting system and delivered by the equipment processing department, where they are stored. But some areas of the hospital have the stand-alone device kept within their area, where it is regularly used with patients who are receiving procedural sedation.

Patients who may benefit from etCO₂ monitoring

One example of a patient who will typically hypoventilate, and therefore benefit from etCO₂ monitoring is the patient with obstructive sleep apnea.

Obstructive Sleep Apnea (OSA)

What is obstructive sleep apnea? Obstructive sleep apnea (commonly called 'OSA'), occurs when breathing pauses while asleep because the airway has become narrowed or partly blocked.

When sleeping, all of the muscles in the body become more relaxed. This includes the muscles that help keep the throat open so air can flow into the lungs. Normally, the throat remains open enough during sleep to let air pass by. However, some people have a narrow throat. When the muscles in their upper throat relax during sleep, the tissues close in and block the airway. This stop in breathing is called apnea. The Greek word 'apnea' literally means 'without breath'.

Loud snoring is a telltale symptom of sleep apnea. Snoring is caused by air squeezing through the narrowed or blocked airway. However, not everyone who snores has sleep apnea. Other factors also may increase the risk:

- A lower jaw that is short compared to the upper jaw
- Certain shapes of the roof of the mouth (palate) or airway that cause it to collapse more easily
- Large neck or collar size (17 inches or more in men and 16 inches or more in women)
- Large tongue, which may fall back and block the airway
- Obesity
- Large tonsils and adenoids in children that can block the airway

Hypoventilation occurs in various degrees of OSA, depending on its severity. The CO₂ will usually rise in the patient during apneic periods, acting as an early indicator of a patient's respiratory condition. Traditionally, pulse oximetry has been used to help identify those who are hypoventilating, using the assumption that the pressure of oxygen in the blood will drop as the patient slows (and possibly stops) breathing. But a drop in the oxygen saturation reading provided by the device may take several minutes, whereas the etCO₂ reading is nearly immediate. And, unlike pulse oximetry, the capnogram remains stable during patient motion and is reliable in low-perfusion states.

Patients with OSA are at higher risk of postoperative hypoxemia, respiratory failure, ICU transfers, and longer hospital stay. It is estimated that between 1990 and 1998, there was a 12-fold increase in the diagnosis of OSA in surgical outpatients (Kaw, 2012). A significant number of patients with sleep apnea may present for surgery without receiving a prior diagnosis. Although published guidelines exist, OSA is often neither suspected preoperatively nor considered clinically relevant enough to warrant preoperative screening or intervention. Any inpatient and any adult outpatient at Christ Medical Center who will receive centrally acting anesthetic and/or analgesic agents is screened for OSA preoperatively in an effort to reduce post-op respiratory failure. They are evaluated for the need of etCO₂ monitoring at all stages of the operative process. Specifically, in the postoperative phase, the PACU utilizes etCO₂ monitoring as a way to determine if the patient is ready to transfer out of the unit.

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Sleeping on the back (supine position) can cause the airway to become blocked or narrowed, and this is a typical operative position. Other procedures may require less-than-optimal positioning in regards to keeping the airway fully open in patients who do not have an invasive airway.

Procedural Sedation

Respiratory depression and subsequent respiratory failure is more common as of late due to an older and sicker patient population who undergo procedures with moderate and deep sedation in a setting outside of the traditional operating room.

Sometimes a patient drifts from a conscious state into an unconscious one during these procedures. Hypoventilation may occur as a consequence of the sedation and possible airway obstruction. Capnography provides a very early warning of this, and may therefore increase the safety of the procedure to the patient because interventions can be started earlier. If this hypoventilation is corrected early, hypoxia and its many detriments may not occur.

There is an increased use of propofol for quick recovery (and shortened length of stay) to reduce overall costs, particularly in the area of endoscopy. This practice can result in respiratory depression and failure, and apnea, for the patient. Capnography can be a very simple, useful modality to use in these instances.

Patient-Controlled Analgesia (PCA)

The Joint Commission has noted that health care professionals' concern about opioid-related respiratory depression is one of the barriers to adequate pain management, and steps have been taken to improve the safety of PCA so that both medication safety and the quality of postoperative care can improve.

Capnography provides the earliest indication of opioid-induced respiratory depression. It is important to monitor changes from a baseline EtCO₂ level. As the EtCO₂ level starts to increase, early intervention and changes in medication can be made. Capnography monitoring should be used for all patients receiving PCA, not only for those at heightened risk of toxicity.

During PCA use, oxygen saturation usually is maintained, even at a low respiratory rate, so that pulse oximetry might fail to detect respiratory deterioration, particularly if a patient is receiving supplemental oxygen. Because ventilation and oxygenation are separate processes, monitoring oxygenation by pulse oximetry is not a substitute for monitoring ventilatory function by capnography. Capnographic monitoring can anticipate a patient's desaturation by warning of a decrease in respiratory rate and rise in etCO₂.

Patients whose pain is unrelieved from initial PCA therapy are at high risk for oversedation and respiratory depression from increased doses. The use of continuous pulse oximetry and capnography reduces this risk.

Subsequent Steps

Many hospitals have adopted the use for capnography for at-risk patients, especially those with OSA, patients undergoing procedural sedation, and those on PCA. Christ Medical Center has a program in place for the use of capnography for surgical patients with OSA, has wide-spread use of the technology for procedural sedation, and has a plan in place to begin the use of capnography on the PCA pumps. Safety for our patients is greatly enhanced by the use of capnography.

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The Role of End Tidal CO₂ Monitoring for Hospitalized Patients

Volume 14, Issue 3 Contact Hour Quiz

- End Tidal CO₂ is also known as:
 - PaCO₂
 - PetCO₂
 - PaO₂
 - PaetCO₂
- The normal values for PaCO₂ are 35-45mmHg. The normal values for etCO₂ are:
 - 30-50mmHg
 - 32-42mmHg
 - 35-45mmHg
 - 45-55mmHg
- Capnography is:
 - The numeric value of etCO₂ levels
 - The waveform of etCO₂ levels
 - The art of fancy writing
 - Both the numeric value and waveform of etCO₂ levels
- A patient with an abnormally high etCO₂ reading is said to be:
 - Hypercapnic
 - Hypocapnic
 - Normocapnic
 - Precapnic
- A patient whose etCO₂ capnogram shows taller than normal waveforms is likely to be:
 - Hypoventilating
 - Hyperventilating
 - Obstructing
 - Waking up
- The best filter line style to use with a CPAP patient, who is sleeping with open mouth is:
 - Inline with the ventilator circuit
 - Nasal cannula with supplemental O₂ line
 - Nasal cannula with a 'scoop' to catch nasal and oral exhalations
 - No filter line at all; the monitoring is completely useless with CPAP
- An easy way to quickly recognize hypoventilation and subsequently prevent hypoxia is:
 - Pulse oximetry
 - Arterial blood gas puncture
 - Capnography
 - Invasive ventilation
- An indication that a patient may have OSA is:
 - Anorexia
 - Loud snoring in the obese patient
 - Pulmonary embolism
 - Alopecia
- Use of capnography in procedural sedation is particularly promoted by:
 - American Society of Anesthesiologists (ASA)
 - American Heart Association (AHA)
 - American Association for Respiratory Care (AARC)
 - American Association of Colleges of Nursing (AACN)
- For patients on PCA, safety of the patient may be compromised by:
 - The use of capnography to prevent hypoventilation
 - The use of capnography in conjunction with capnography
 - Excessive levels of sedation to control pain
 - The use of capnography to recognize decreased respiratory rate and oxygen saturation

Your Answers: Please submit to Clinical Education

INA CE # _____
The Role of End Tidal CO₂ Monitoring for Adult Hospitalized Patients

- | | | | | |
|-----|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 2. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 3. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 4. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 5. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 6. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 7. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 8. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 9. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |
| 10. | a. <input type="radio"/> | b. <input type="radio"/> | c. <input type="radio"/> | d. <input type="radio"/> |

(Please print clearly)

Minutes to read & answer quiz _____

Name: _____ Credentials: _____

Unit/Department: _____

Hospital Name: _____

Address: _____

City: _____ State _____ Zip _____

Phone #: _____

E-mail: _____

Evaluation

At the end of this article

- | | | |
|--|---------------------------|--------------------------|
| 1. Define capnography. | yes <input type="radio"/> | no <input type="radio"/> |
| 2. List 3 causes of obstructive sleep apnea. | yes <input type="radio"/> | no <input type="radio"/> |
| 3. Identify 3 types of patients who would benefit from capnography. | yes <input type="radio"/> | no <input type="radio"/> |
| 4. Were the objectives relevant to the goal of this program? | yes <input type="radio"/> | no <input type="radio"/> |
| 5. Was the teaching method effective? | yes <input type="radio"/> | no <input type="radio"/> |
| 6. Did this offering meet your objectives? | yes <input type="radio"/> | no <input type="radio"/> |
| 7. Content was presented without bias of any commercial product or drug. | yes <input type="radio"/> | no <input type="radio"/> |

Additional comments/suggested future topics:
