Faculty Report on CASLO Evidence

Program:

CASLO Focus:

☐ Critical Thinking	☐ Oral Communication	☑ Information Literacy
☐ Written Communication	☐ Creativity	☐ Quantitative Reasoning

Student sample has been rated:

☑ Exemplary level ☐ Minimal level

Your course has been selected for this activity because it requires students to demonstrate exit-level proficiency for the indicated program and CASLO. Please consider the following guidelines as you select appropriate evidence of student learning for this activity:

- Select two samples of student work, one that demonstrates exemplary achievement of the CASLO and another that demonstrates achievement at (or near) the minimal level required for the degree. Choose evidence from an "embedded" assignment, project, or exam that normally exists as part of your course.
- Review the statements associated with the relevant CASLO standard (see attached) to assure that the evidence correlates adequately with the CASLO. In general, choose evidence which corresponds to at least fifty percent of the outcome statements.
- Select evidence produced with an appropriate degree of independence. In general, student work directed by prescriptive advice is not appropriate for this activity.

Please briefly describe your assessment of the evidence; identify qualities in the student work that establish its level of achievement for the CASLO:

Outcome 3.1 This group's topic area was wound care in the homeless population. They did some preliminary background reading and searching and then formulated their clinical question according to the PICO format. Their clinical question was: "In the homeless population with infected wounds ans/or leg ulcerations (P), what is the effect of teaching wound care and providing wound care supplies (I) on wound healing and future infections (O) compared with no teaching or wound care supplies (C)?". They refined their clinical question to facilitate efficient literature searching.
Outcome 3.2 This group described their search strategies in the CINAHL and PubMed databases. They included the keywords they used in their searches, and the number of articles they found.
Outcome 3.3 The group followed the instructions for the assignment and input information from the research articles into a table for analysis. They identified the research question / hypothesis, the method, the study variables, measures used, results, limitations and level of evidence. The group submitted a table along with their "keeper" articles for feedback from faculty. They revised their initial table after feedback for the final submission.
Outcome 3.4 This group synthesized the findings from the articles they identified and formed some preliminary conclusions.
Outcome 3.5 The paper was presented in APA format with appropriate citations and references.

Continue on next page.

Please briefly describe course work designed to prepare this student to demonstrate this CASLO:

A one hour presentation on evidence-based practice (EBP) was offered during the students' first week back. Faculty identified topic areas pertinent to care of homeless persons. Students were given a chance to sign-up for the topic of their choice. This group consisted of four persons. If a student didn't sign-up, he or she was assigned to a group. If there were too many students signed up for a particular topic area, students were reassigned to create groups of the appropriate size. Each of the evidence-based practice groups also participated in the health fair for the homeless with a presentation or activity in the same topic area. Each group had a faculty adviser to consult for guidance.

Students were given instructions for the assignment, articles to read on EBP and homelessness, and were referred to the National Council on Health Care for the Homeless website for additional information. A grading rubric was included in the instructions for the assignment. Two 3 hour sessions were made available to the students when they could meet as a group, and also consult with their faculty adviser. A faculty adviser was also available by appointment. The students were advised that if they needed help with the literature search they could consult with their faculty adviser, or the UH Maui College librarian for assistance. A series of due dates was established for parts of the assignment to be posted in Forums in Laulima - first the PICOT question, then the "keeper articles". The faculty adviser gave the group feedback and guidance on their progress. At the same time, the students findings informed their preparation for the health fair for the homeless. The final group paper was submitted to Laulima Assignments.

These students were selected to give a 10 minute presentation of their EBP paper to the rest of their peers and to the course instructors at the Critical Thinking / Clinical Judgment session in December.

Evidence Based Practice Paper

Topic Area

The topic my colleagues and I chose to focus on was wound care in the homeless population. We began our research by performing a database search in CINAHL and PubMed to review what research was available on this topic. Following this search, we formed a clinical question in PICO format. This clinical question was, “In the homeless population with infected wounds and/or leg ulcerations (P), what is the effect of teaching wound care and providing wound care supplies (I) on wound healing and future infections (O) compared with no teaching or wound care supplies (C)?” This clinical question was meaningful to our group because it was deeply rooted in our community and our chosen profession.

According to a 2013 Hawaii state homeless population count, there are an estimated total of 455 unsheltered individuals on the island of Maui alone (Homeless Programs Office, 2013). Therefore, the topic of wound care within this local population is an important one for our community. This clinical question is also important to our group because we are members of the health care industry and teaching is very important in this field. Nurses “empower patients by providing information to enhance wellness and reduce the risk for illness and encourage autonomy by enhancing self-care skills while maintaining a patient-centered approach” (Giddens, 2013, p. 397).

Research Strategies

Research was conducted using the online CINAHL and PubMed databases. Keywords included: homeless persons, wound care, infection, injuries, and wounds. On average, about five to ten results were found. Because of these limited results, no restrictions were placed on how current the published research was. All results were analyzed for quality, methods, and relevance

to our research topic. A total of nine journal articles were selected to support our preliminary answer to the clinical question.

Preliminary Answer

The preliminary answer to our clinical question is that teaching and provision of wound care supplies will improve healing and prevent future infections within the homeless population that have infected wounds or leg ulcerations. The article written by Abdul (2012), offered great insight into where a homeless person's wound may originate. Comorbidities, such as diabetes or poor-motor control, in combination with sleeping on hard surfaces, walking long distances, or suffering from falls were some of the examples presented within the article for origins of homeless individual's wounds. The author also expressed that these individuals needed proper supplies in order for healing to occur. Powell (2011) shared an additional cause of wounds in homeless persons. According to Powell (2011), homeless people are four times more likely to misuse drugs than the general population and infection may be more common in this population because of the unsanitary conditions that these users inject in.

Finnie and Nicolson (2002) described a wound care clinic in Scotland that has shown great results in helping the homeless populations with their wound care treatment. They concluded that individuals who had previously not received wound care were now willing to attend the clinic and comply with treatment and advice (Finnie & Nicolson, 2002). They also observed that the clinic provided an excellent informal setting where health promotion opportunities could be available (Finnie & Nicolson, 2002). Pennington, Coast, and Kroh (2010), described a clinic that provided health care to the homeless population and communicated that baccalaureate-nursing students were the primary providers. This article felt especially relevant to

our topic because our group is comprised of four nursing students who aspired to deliver similar care to our homeless population during a recent health fair event.

The HCH Clinicians' Network article provided excellent teaching ideas and also described how important it is to provide the most simple wound care supplies because homeless individuals are often not capable of carrying "bulky dressing supplies" ("Wound care difficult for homeless patients and providers," 2004, p. 4). The four basic teaching points for wound care treatment that the author provided were (a) if a wound is too wet, dry it; (b) if it's too dry, moisten it; (c) if it's too deep, pack it; and (d) if it's necrotic, debride it ("Wound care difficult", 2004). Billings and Kowalski's (2008) article offered ways in which to improve the competency in care of the homeless by following four key approaches: earn trust, collaborate with patients, respect patients' time, and move at patients' pace.

According to Sen et al. (2009), chronic wounds affect about 6.5 million patients and treatment costs an estimated excess of $25 billion US dollars annually. Several factors predispose homeless persons to developing chronic wounds, such as communal bathing and eating, lack of facilities for washing and toileting, unsafe and unsanitary shelters, exposure to crime and trauma, inadequate nutrition, no place for bed rest, no place to store medications, excessive smoking and drinking, little or no income, and absence of family and other support to help in times of illness ("Wound care difficult", 2004). Chronic or hard-to-heal wounds can also have a significant psychological impact on the patient and decrease the individual's quality of life (Pragnell & Neilson, 2010). The final article, written by Schneller (2012), depicts a nurse's point of view on the importance of providing intermediate care for homeless people to reduce the emergency care they require. Providing wound care before serious infections develop or wounds become chronic are also methods in reducing the requirement for emergency care.

Influence on Nursing Practice

The results of our research have had a significant influence on our nursing practice. We feel that nurses should be heavily involved in the community and therefore caring for homeless individuals is part of our nursing responsibility. Helping these individuals to receive the teaching and the wound care supplies they need should be a priority within the health care system. Because nurses are a vital part of the health care system, it may be a group of nursing students such as us that help to meet these needs.

References

Abdul, A. (2012). Volunteering with london's rough sleepers. *Podiatry Now*: 22-26.

Billings, D. & Kowalkski, K. (2008). Teaching tips: Increasing competency in the care of homeless patients. *Journal of Continuing Education in Nursing, 39*(4).

Finnie, A. & Nicolson, P. (2002). Injecting drug use: Developing a drop-in wound care clinic. *British Journal of Nursing, 11*(12).

"Wound care difficult for homeless patients and providers." (2004). Wound care difficult for homeless patients and providers. *Healing Hands, 8*(3).

Homeless Programs Office & Department of Community Services. (2013, May). *Statewide homeless point-in-time count 2013 methodology and results, H.I.* Retrieved December 1, 2013, from http://humanservices.hawaii.gov/bessd/files/2013/05/2013-Statewide-PIT-Report-5.15.13pdf.pdf

Giddens, J.F. (2013). *Concepts for nursing practice.* St. Lous, MO: Mosby Elsevier.

Pennington, K., Coast, M.J., Kroh, M. (2010). Health care for the homeless: A partnership between a city and a school of nursing. *Journal of Nursing Education, 49*(12). doi:10.3928/01484834-20100930-02

Pragnell, J., & Neilson, J. (2010). The social and psychological impact of hard-to-heal wounds. *British Journal of Nursing, 19*(19).

Powell, G. Wound care for injecting drug users part 1.25. *Nursing Standard, 46.*

Schneller, K. (2012). Intermediate care for homeless people: Results of a pilot project. *Emergency Nurse, 20*(6).

Sen et al. (2009). Human skin wounds: A major and snowballing threat to public health and the economy. *Wound Repair and Regeneration, 17*. doi: 10.1111/j.1524-475X.2009.00543.x

Critique and Research Summary Form

Author/ Number	**Research Question/ Hypothesis**	**Methods**	**Study Variables**	**Measures/ Reliability Validity**	**Results**	**Limitations**	**Decision Reservations**
1. Abdul,Abdulkadir. Volunteering with London's Rough Sleepers:*Podiatry Now* on January,2012 ;22-26.	Can a podiatrist be effective in treating the homeless population's lower extremity wounds?	**Setting**: London, England Homeless outreach program. **Sample**: 3 homeless individuals with unique lower extremity wounds. **Design**: Case Series	**Variables: N/A** **Independent**: wound care treatment provided by podiatrist **Dependent**: Effective treatment of the homeless population's lower extremity wounds	**Instrument**: Case series **Method of Data Collection**: Review of direct observation studies. Combined Homeless and Information Network (CHAIN).	Raised awareness regarding the vulnerable homeless population and the effects of such on wellness and specifically lower extremity wounds.	Small, generalized population (limited to 3 cases). No strict control or manipulation of variables. No quantitative measurable variables.	**Level of evidence**: 6
2. Powell, G. Wound care for injecting drug users part 1.25. *Nursing Standard, 46.*	Can teaching patients about wound causes, treatments, and their rationales promote a positive outcome of fewer wounds and faster healing time?	**Setting**: Hospitals and outreach wound care clinics in England **Sample**: IV drug users and Homeless population **Design**: Literature review	**Variables: N/A** **Independent**: Wound care **Dependent**: Positive outcomes for wound healing	**Instrument**: Literature Review **Method of Data Collection**: Literature review and compilation of data	Holistic and in depth nutritional assessment of patients can facilitate individual teachings of wound cause and treatments with rationales can decrease infection rates and promote faster healing time of infected wounds.	Limited to IV drug users and homeless IV drug users in England; situation may differ from conditions in U.S. No control or manipulation of variables.	**Level of evidence**: 7

Critique and Research Summary Form

3. Billings, D. & Kowalkski, K. (2008). Teaching tips: Increasing competency in the care of homeless patients. *Journal of Continuing Education in Nursing, 39*(4). (Can be viewed at www.nhchc.org/HCH101.)	How can teaching tips on caring for the homeless medical needs help them to transition from hospital to ongoing care once discharged?	**Setting**: Focuses on hospitals across the U.S. focus on teaching tips on creative care planning for patients who have no place to rest, bathe or store medicine. **Sample**: Focuses on homeless population **Design**: Literature Review	**Variables: N/A** **Independent**: Teaching tips on caring for the homeless medical needs. **Dependent**: Helping homeless patients transition from hospital to ongoing care once released from hospital.	**Instrument**: Literary Analysis **Method of Data Collection**: Gathering and compiling relative data	By educating the RNs and the homeless patients, costs for un-compensated care were reduced while improving the health of homeless patients and protecting the general population from exposure to health risks. Community support continues to decline and disappear due to lack of funding.	Compilation of other people's work with no research studies performed to substantiate hypothesis. No control or manipulation of variables.	**Level of evidence**: 7
4. "Wound care difficult for homeless patients and providers". (2004). Wound care difficult for homeless patients and providers. *Healing Hands, 8*(3).	What are the risk factors, wound types, treatment options, and strategies for patient self-care associated with wound care for the homeless population?	**Setting**: N/A (expert opinion) Featured case study took place in HCH Clinic in Billings, Montana) **Sample**: Homeless population in general (+ 1 featured case study participant) **Design**: Expert Opinion	**Variables: N/A** **Independent**: Recommendations for assessments and treatment of wounds **Dependent**: Outcomes for homeless population	**Instrument**: Interviews of experts and case study observation **Method of Data Collection**: Gathering of expert opinions and literature review	Recommendations for proper assessments of wounds and treatment options for the homeless population	These opinions are speculation and have not been tested or implemented to show effectiveness. They do not have a clinical trial to support the effectiveness of the assessments and treatments. No control or manipulation of variables.	**Level of evidence**: 7
5. Finnie, A. & Nicolson, P. (2002). Injecting drug use: Developing a drop-in	Will easy access to a wound care clinic increase the number of homeless individuals	**Setting**: wound care clinic within The Big Issue Scotland in Glasgow, Scotland. **Sample**: 3 homeless	**Independent**: wound care treatment **Dependent**: improved patient outcomes	**Instrument**: Observation and recording of 3 patients attending the wound-care clinic	Individuals who previously received no wound care have accessed specialist provision and	The study had a limited population, with only 3 case studies and one setting. Therefore,	**Level of evidence**: 7

wound care clinic. *British Journal of Nursing, 11*(12).	receiving treatment for their wounds?	individuals needing wound treatment **Design**: Case Series		**Method of Data Collection**: Literature review and observations of patients at the wound-care clinic	have been willing to attend and comply with treatment and advice.	results can't be generalized. A multisite study with a greater population size would offer more substantial results.	
6. Sen et al. (2009). Human skin wounds: A major and snowballing threat to public health and the economy. *Wound Repair and Regeneration , 17*. doi: 10.1111/j.1524-475X.2009.00543.x	It would be beneficial to raise awareness on the immense economic and social impact of wounds in our society and to find resources to understand biological mechanisms underlying cutaneous wound complications.	**Setting**: N/A **Sample**: N/A, but focuses on those who suffer from various types of wounds **Design**: Literature Review	**Variables: N/A** **Independent**: Awareness/Education **Dependent**: increase in resources and research towards wound care	**Instrument**: Review of various pieces of literature **Method of Data Collection**: Literature review (120 references listed) and compilation of data	The immense economic and social impact of wounds in our society calls for allocation of a higher level of research resources to understand biological mechanisms underlying the complexities noted in problem wounds. The rapidly developing field of tissue engineering and stem cell biology represents the backbone of the future of wound sciences.	Limited to collecting information about what has happened in the past and does not provide data about current situation. Also, it does not test how awareness will improve the care of complicated wounds.	**Level of evidence**: 5
7. Pragnell, J., & Neilson, J. (2010). The social and psychological impact of hard-to-heal wounds. *British Journal of*	Hard-to-heal wounds typically present a huge challenge to the clinical team charged with their treatment. Wounds that	**Setting**: N/A; single case study used and setting not identified **Sample**: Case study of single female diagnosed with basal cell carcinoma **Design**: Systematic review of descriptive	**Independent**: wound care treatment **Dependent**: effects on patient's psychological and physical healing	**Instrument**: Case series and literature review **Method of Data Collection**: compilation of literary data, observation, and interview of patient and clinician	Chronic wounds are costly to treat—both in terms of the economic burden on healthcare providers and in terms of the personal cost to the patient.	Conflict of interest, as the article was supported by an educational grant from Mölnlycke Health Care, which manufactures the wound care	**Level of evidence**: 7

Nursing, 19(19).	are extremely painful and/or unsightly can have an extreme psychological impact on the patient, and this can be as crucial a consideration as the complexities involved in managing the physical healing.	literature/Case series study			Xelma is an advanced wound care therapy that has been shown to be both clinically effective and cost-effective in treating hard to heal wounds	treatment used in the article.	
8. Pennington, K., Coast, M.J., Kroh, M. (2010). Health care for the homeless: A partnership between a city and a school of nursing. *Journal of Nursing Education, 49*(12). doi:10.3928/01484834-20100930-02	Can an innovative community partnership such as Project HOPE provide useful information to strengthen partnerships with local organizations working with the homeless population?	**Setting**: Project HOPE (Homeless Outreach Partnered with Education), is a collaborative partnership between the university and the City and County of Denver. **Sample**: 151 homeless individuals seeking help at Project HOPE **Design**: Controlled trial without randomization	**Independent**: age, clothing and supplies given, wound care, referral given, assessment, and season. **Dependent**: demographics, conditions observed, and interventions offered to homeless individuals through Project Hope.	**Instrument**: Single non-randomized study **Method of Data Collection**: Patient records	Through project HOPE, nursing students and their clinical instructors provided a needed service to the community, including assessment, referral, and health education, demonstrating the potential of students to improve health outcomes and access for homeless populations. This project was the first phase of a sustained collaboration between community	More research is needed to determine the potential long-term effects of Project HOPE. This study is limited to a single homeless outreach program, the information gathered would be more significant if it was gathered from multiple sites.	**Level of evidence**: 6

					constituents and nursing education, revealing the power and strength of community and nursing collaboration.		
9. Schneller, K. (2012). Intermediate care for homeless people: Results of a pilot project. *Emergency Nurse, 20*(6).	How does an intermediate care clinic for homeless help reduce emergency department (ED) attendance, ambulance call outs and use of acute care services?	**Design**: Descriptive Study with qualitative information meant for quality improvement	**Independent**: A year-long availability of nurse-led intermediate care for homeless individuals **Dependent**: Reduction of emergency department (ED) attendance, ambulance call outs and use of acute care services.	**Instrument**: Review of the quantitative research findings of a pilot study **Method of Data Collection**: Review of a quantitative study and other applicable journals	Since the homeless intermediate care project (HICP), clients' ED attendance rates have reduced. Clients' problems are identified early so their conditions can be managed by the project team in the community. Overall, the HICP team demonstrates that homeless clients' health outcomes can be improved while ambulance calls, ED attendance, and readmission rates can be reduced.	Limited because the article only reviews a single pilot project for homeless intermediate care, a multisite project review would be more substantiated	**Level of evidence**: 6

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- Select evidence produced with an appropriate degree of independence. In general, student work directed by prescriptive advice is not appropriate for this activity.

Please briefly describe your assessment of the evidence; identify qualities in the student work that establish its level of achievement for the CASLO:

Outcome 3.1 The students in this group project developed an appropriate PICOT question to focus their literature search. Their topic area was hypertension in the homeless population.
Outcome 3.2 The students used effective search strategies to efficiently find useful information in the EBSCO database. They included keywords they used in their search. They found some excellent articles They do not mention using the PubMed database, which instructions recommended as a database to be searched.
Outcome 3.3 The students followed instructions in the assignment to select appropriate "keeper" research articles and analyze them in a table of evidence. The headings for the table included the following: author/article, research question/hypothesis, methods, study variables, measures/reliability validity, results, limitations, and decision about level of evidence. For a few of the articles, they incorrectly identified the study type and level of evidence.
Outcome 3.4 The students were able to describe the results of the articles they analyzed. They were instructed to synthesize the results and formulate a preliminary answer to the PICOT question. When they submitted the paper, they neglected to include the preliminary answer to the PICOT question. Their faculty adviser notified them of this. The group then revised their submission to include the preliminary answer. Their preliminary answer to the PICOT question was not entirely supported by the evidence in the articles they had submitted.
Outcome 3.5 The students cited their references and included a reference list. They presented their work at the critical thinking / clinical judgment session to their classmates and faculty.

Continue on next page.

Please briefly describe course work designed to prepare this student to demonstrate this CASLO:

A one hour presentation on evidence-based practice (EBP) was offered during the students' first week back. Faculty identified topic areas pertinent to care of homeless persons. Students were given a chance to sign-up for the topic of their choice. This group consisted of three persons. If a student didn't sign-up, he or she was assigned to a group. If there were too many students signed up for a particular topic area, students were reassigned to create groups of the appropriate size. Each of the evidence-based practice groups also participated in the health fair for the homeless with a presentation or activity in the same topic area. Each group had a faculty adviser to consult for guidance.

Students were given instructions for the assignment, articles to read on EBP and homelessness, and were referred to the National Council on Health Care for the Homeless website for additional information. A grading rubric was included in the instructions for the assignment. Two 3 hour sessions were made available to the students when they could meet as a group, and also consult with their faculty adviser. A faculty adviser was also available by appointment. The students were advised that if they needed help with the literature search they could consult with their faculty adviser, or the UH Maui College librarian for assistance. A series of due dates was established for parts of the assignment to be posted in Forums in Laulima - first the PICOT question, then the "keeper articles". The faculty adviser gave the group feedback and guidance on their progress. At the same time, the students findings informed their preparation for the health fair for the homeless. The final group paper was submitted to Laulima Assignments.

These students were selected to give a 10 minute presentation of their EBP paper to the rest of their peers and to the course instructors at the Critical Thinking / Clinical Judgment session in December.

Evidence-Based Practice

University of Hawaii Maui College

Health & Illness III

NURS 360

December 2, 2013

Topic Area/ Clinical Question

Our main focus in this research was on how access to consistent care affects frequency of hospitalization with the hypertension crisis among homeless people. We developed PICOT question to search our answer: for the adult homeless population (P), does access to regular blood pressure screening and prescribed medications (I) reduce hospitalization for hypertensive episodes or emergencies (O) compared to individuals who are non-adherent to blood pressure screening and medication regimen (C) over a one-year period (T). Our PICOT question was created to determine the presence of the negative correlation between frequencies of hospital stay caused by hypertension and access to care in one year. This question is meaningful to our group, as future nurses with a developing health care system, because it is important to reduce health care costs by decreasing re-hospitalizations for chronic medical issues that can prevented by regular screening and following medication regimens.

Search Strategies

We used the EBSCO database in the online UHMC library to find the articles to answer our PICOT question. Initial search on the EBSCO search engine resulted in 106 articles with the keywords "homeless hypertension," 7,924 articles were returned using keywords "homeless health care," and 1,153 articles with keywords "homeless access health care," these were narrowed down to 14 peer-reviewed articles that were most relevant to our PICOT question. After consulting with our group, we narrowed down our results to six "keeper" articles, which we inputted into Dr. Marita Titler's Research Critique Summary Form to determine the most pertinent information from each article.

Critical Appraisal of Evidence

Each article we gathered assisted us to formulate a preliminary answer to our PICOT question, while a definitive answer would require a more in-depth review of our articles and other references.

The research article published by American Journal of Public Health focused on the primary care specific to homeless people and its effect on ER visit and management of chronic health problem. This research was conducted by reviewing patient records of homeless people who received the primary care designed for homeless population and those of who received just a general care at a hospital (O'Toole et al., 2010). The results showed significant progress in the control of chronic illnesses including hypertension, and reduction of 40 % in preventable ER visits over 1-year period (O'Toole et al., 2010). Average blood pressure reduction in the group with primary care (-10 mm Hg systolic and -7.4 mm Hg diastolic) was much larger than the one in the group with general hospital care (-4.2 mm Hg systolic and -0.5 mm Hg diastolic) (O'Toole et al., 2010). Although O'Toole et al., (2010) didn't mention specific interventions in the primary care, such as providing blood pressure screening and medications, they stated "much attention has also been placed on improving access to primary and preventive health services" (p. 2493).

Another article from American Medical Association displayed similar research. In this research, they divided homeless patients with chronic illness who were discharged from a hospital into two groups; intervention group with housing program along with on-site case management, and control group with general hospital discharge plan (Sadowski, Kee, VanderWeele, & Buchanan, 2009). Case managers for intervention group arranged right medical care for homeless people as one of interventions, and their chronic illnesses included several cardiac problems, such as hypertension, congestive heart failure, myocardial infarction, and atrial or ventricular arrhythmias (Sadowski et al., 2009). The results were significant as "the intervention group had a reduction of 29% in hospitalizations, 29% in hospital days, and 24% in emergency department visits" (Sadowski et al., 2009, p. 1771).

The article we included published by the American Academy of Nurse Practitioners suggested that medication compliance could be attained through unconventional methods including distributing limited use cellular phones which could utilize automated systems to call and remind clients when to take their scheduled medications. Although small in size, the study resulted in 100% compliance. Unconventional methods are helpful in reaching those who have difficulty in compliance (Burda, Haack, Duarte, & Alemi, 2012).

According to Rabiner and Weiner (2012), and research conducted at Mount Sinai School of Medicine the homeless population and unstably housed suffer disproportionately high rate of poor health outcomes and this requires health professionals to find ways to account for this population. Further, they argue "The causes of homelessness are complex and multifactorial; thus, the solutions to ameliorate it are equally as complex" (Rabiner & Weiner, 2012, p. 586).

The article from the Journal of Community Health Nursing suggested screening clinics for hypertension were best received over TB and foot screenings, as hypertension is a more familiar (Macnee, Hemphill, & Letran, 1996). It was also suggested that hypertension screenings are an effective approach to early detection and treatment in the homeless population (Macnee et al., 1996).

In the article from the Journal of Public Health, it is described that one of the major obstacles to treating hypertension in the homeless population is non-compliance. Although this is also an issue for the general public, it is believed that other factors such as alcohol abuse and availability of medications create a barrier for the homeless population to properly treat hypertension (Kinchen & Wright, 1991).

Preliminary Answer

Our preliminary answer for our PICOT question is that interventions, such as having regular blood pressure checking and access to medications can help to reduce ER visits and hospitalizations caused by hypertensive crisis among the homeless population. All of our keeper articles assisted our answer. According to the article published in the Mount Sinai Journal of Medicine, the causes for homelessness are complex and methods to improve health conditions in this population can be just as complex. While research from the Journal of Community Health Nursing suggests that blood pressure screenings is an appropriate initial intervention and can help to treat hypertension in the homeless community. The research published by American Journal of Public Health was conducted for 1-year period, and it showed significant reduction in ER admissions and blood pressures among homeless people with chronic illness. The research from American Medical Association was conducted for 18 months, and it displayed that the case management including access to medication greatly reduced the number of hospitalization and hospitalizing period among homeless people who had chronic illnesses, such as hypertension and several cardiovascular diseases. The article from the Journal of Public Health suggested that non-compliance is the major barrier to hypertension treatment in the homeless population, while the research from American Academy of Nurse Practitioners suggested that medication compliance can be achieved through unconventional methods including cellular phone reminders. We would need to conduct further research for this topic to definitively answer our PICOT question regarding helping improve cardiovascular health in the homeless population.

Through this research, we found that there are several ways to assist the homeless population with hypertension in order to reduce hospitalizations and achieve better health. These findings will influence our nursing practice and we will support the homeless population with

information we discovered by participating in free blood pressure screenings in the community, and being knowledgeable regarding community resources that are available to assist community members with receiving health care and medications.

Author/article/ Number	Research Question/ Hypothesis	Methods	Study Variables	Measures/ Reliability Validity	Results	Limitations	Decision
Thomas P. O'Toole, et al., *American Journal of Public Health* December 2010, Vol 100, No. 12	Can tailoring primary care to homeless veterans decrease unnecessary ED use and medical admissions and improve chronic disease management.	Setting: the Homeless-Oriented Primary Care Clinic and the general internal medicine Clinics at the Providence VA Medical Center Sample: 177 homeless veterans Design: randomized controlled trial	Independent: Utilization of homeless-oriented primary care including case management Dependent: ED admissions and control of blood pressure, diabetes, and cholesterol	Instrument: a retrospective prolective cohort study Method of data collection: Review of electronic medical records from homeless-oriented primary care clinics and general internal medicine clinics	Patients who received homeless-oriented primary care had greater improvement in hypertension, diabetes, and lipid control while having less non acute ED visits compare to patients who received general internal medical care over 1 year period.	Sample selection had different time frame for intervention group (2006 to 2007) and control group (2004 to 2006) Intervention group had only 79 samples and control group had 98 samples. Sample size is very small.	Level of evidence: 2
Laura S. Sadowski, Romina A. Kee, Tyler J. VanderWeele, David Buchanan, *American Medical Association.* May 6, 2009—Vol 301, No. 17	Do a case management and housing program reduce use of urgent medical services among homeless adults with chronic medical illnesses	Setting: a public teaching hospital and a private, nonprofit hospital in Chicago, Illinois Sample: 407 social worker–referred homeless adults with chronic medical illnesses Design: randomized controlled trial	Independent: On-site case management and housing program Dependent: Hospital visit and stay	Instrument: Intention-to-treat analysis Method of data collection: Review of patients referred by Social worker, Interview at 1, 3, 6, 9, 12 and 18 month	Patients who received on-site case management and long-term housing had fewer days of hospital stay and ED visit than patients who just received general hospital care	Both intervention and control groups had more men than women. Both groups were mostly consist of African American and had much fewer numbers of Hispanic and white people.	Level of evidence: 2

Kinchen & Wright. *American Journal of Public Health.* September 1991, Vol. 81, No. 9	How is medical practice adapted to unique needs of homeless hypertensives.	Setting: established health care clinics for homeless persons in 108 cities Sample: 65 clinic medical directors Design: survey	Independent: recent diagnosis of hypertension Dependent: laboratory tests ordered	Instrument: surveys regarding laboratory test performed on initial evaluation of recently diagnosed hypertensive men, and relative importance of factors impeding compliance in homeless hypertensives Method of data collection: review of surveys of medical directors of health care clinics for homeless	Therapeutic goals similar between results from "normal" clinicians and clinicians from HCH clinics, different measures to achieve them regarding pharmaceutical and non-pharmaceutical measures. Non-compliance is one difficulty to treatment	Sample sizes were small, only including 65 health care clinics for homeless persons.	Level of evidence: 4
Macnee, Hemphill, & Letran. *Journal of Community Health Nursing.* 1996, Vol. 13 No. 3	Are screening clinics an effective approach to disease prevention in a homeless population	Setting: hypertensive-screening clinics, over 9 months Sample: 214 clients at 17 different clinics Design: cohort study	Independent: availability of screening clinics Dependent: utilization of screening clinics and follow-ups	Instrument: short health history and sitting blood pressure with average of two readings Method of data collection: data collected from all homeless individuals that came into the clinic	Hypertensive screening clinics were best received as it is a more well known disease, and are an effective approach to early detection and treatment in a homeless population	Study conducted in 1996, newer follow up studies could provide more relevant information to the current population	Level of evidence: 4
Mark Rabiner, MD, and Amy Weiner, MPH Mount Sanai Journal of Medicine	Health Care for Homeless and Unstably Housed: Overcoming Barriers	Setting: Demographic of homeless in United States and New York. Sample:N/A Design:	Independent Suggestions for solutions for overcoming barriers Dependent:	Instrument: Literary Analysis Method of data collection: Compilation of literature with no research	Further research must be conducted to determine methods that will increase adherence in terms of cost analyses and economic plausibility.	No clinical trials or studies were performed to substantiate the hypothesis of the authors	Level of evidence: 3

79:586–592, 2012		Systematic review of descriptive literature	Outcomes for homeless population	performed to substantiate hypothesis.			
Charon Burda, Mary Haack, Ana C. Duarte, &Farrokh Alemi. American Academy of Nurse Practitioners doi: 10.1111/j.1745-7599.2012.00756.x	Medication adherence among homeless patients: A pilot study of cell phone effectiveness	Setting: Participants were recruited from Health Care for the Homeless in Baltimore City. Participants were the patients of a psychiatric mental health Sample: 10 people Design: Explored the feasibility of daily monitoring medication adherence among homeless psychiatrically ill patients through program-provided cell phones.	Independent: Diagnosis of HTN, Dependent: Positive outcomes from cell phone use in compliance	Instrument: Interactive Voice Response system was used to program the survey that would be distributed to the participants each day Method of data collection: Participants were administered the MINI, the CES-D, and the ASI-Lite before the phone protocol was initiated to corroborate the PMHNPs clinical diagnoses with valid and reliable research instruments.	Study found 100% compliance with prescription administration among participants	Very small sample population	Level of evidence: 3

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Burda, C., Haack, M., Duarte, A. C., & Alemi, F. (2012). Medication adherence among homeless patients: A pilot study of cell phone effectiveness. *Journal of the American Academy of Nurse Practitioners, 24*, 675-681. http://dx.doi.org/10.1111/j.1745-7599.2012.00756.x

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Sadowski, L. S., Kee, R. A., VanderWeele, T. J., & Buchanan, D. (2009, May 6). Effects of a housing and case management program on emergency department visits and hospitalizations among critically ill homeless adults. *Journal of American Medical Association, 301*, 1771-1778. Retrieved from http://jama.jamanetwork.com

(Make as many copies as needed)

Form 7

Critique and Research Summary Form

Author/ Number	Research Questions/ Hypothesis	Methods	Study Variables	Measures/ Reliability Validity	Results	Limitations	Summary: Decision/ Reservations
1.		Setting Sample Design	Independent Dependent	Instruments Methods of data collection			Level of evidence =
2.		Setting Sample Design	Independent Dependent	Instruments Methods of data collection			Level of evidence =

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Marita G. Titler, PhD, RN, FAAN
Director, Research, Quality and Outcomes Management

Assignment Instructions in Laulima Assignments

Follow the instructions in the attachment for the assignment. This is a group assignment due Monday 12/02/13 at 0900 uploaded to **Forums**. You will need to review articles that are attached in order to complete the assignment. See the instructions to determine which articles you must review and which are optional. The Step By Step articles that progress beyond Critical Appraisal of Evidence:Part 2 are optional. There is also a helpful PDF from Ellen Peterson, our librarian with tips on finding research evidence. Ellen has invited students to make an appointment with her for assistance.

Students in each group will have an assigned topic area. Follow the timelines in Forums for submission of your PICOT question, "keeper" research articles you have located, and submission of your written paper. Each group should collaborate with the faculty member assigned to them for developing a clinical question according to the PICOT format. Groups will present their work at the critical thinking / clinical judgment session on 12/12.

There is a sample of an Evidence-Based Practice paper produced by a group of Nurs 360 students that is not related to healthcare for the homeless. The students names have been removed from the paper. Their topic area was Education of Cardiac Patients and Hospital Readmission. The paper and the critique and appraisal of literature are included. Looking over it will give you an idea of what a finished product for this assignment looks like.

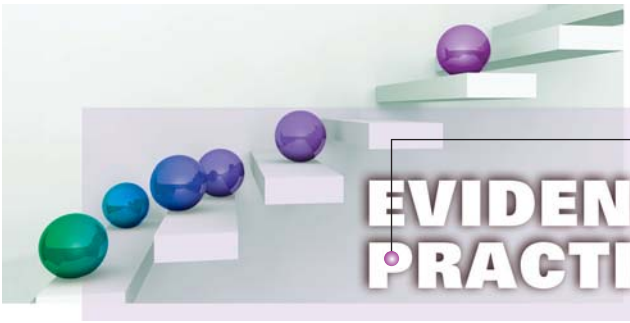
A helpful URL is the link I gave you during lab. In case you haven't see the Health Care for the Homeless 101 Presentation yet, here is the URL. http://www.nhchc.org/training-technical-assistance/online-courses/hch-101/. Other good background information can be found in the article from Nurs 2013 on Homelessness I gave you the link for in lab, and is attached below.
See Forums for the timeline.

Additional resources for assignment

- EBP Step By Step Igniting a Spirit of Inquiry.pdf (249 KB)
- Seven Steps of Evidence Based Practice.pdf (185 KB)
- EBP Asking the Clinical Question.pdf (188 KB)
- EBP Step By Step Searching for the Evidence.pdf (4 MB)
- EBP Step By Step Critical Appraisal of Evidence Part 1.pdf (734 KB)
- Making the Most of Nursing Electronic Resources.pdf (636 KB)
- EBP Step by Step Critical Appraisal of Evidence Part 2.pdf (741 KB)
- EBP Step By Step Critical Appraisal of Evidence Part III.pdf (771 KB)
- EBP Step by Step Planning for Sustainable Change.pdf (756 KB)
- EBP Step by Step Implementing a change.pdf (786 KB)
- EBP Step By Step Rolling Out the Rapid Response Team.pdf (799 KB)
- EBP Step by step Disseminating the Results.pdf (484 KB)
- Sustaining EBP thru Organizational Policies and an Innovative Model.pdf (806 KB)
- Nursing%20Research%20Tips from Ellen Peterson.pdf (1 MB)

- Dr. Marita Titler's Research Critique Summary Form.doc (55 KB)
- Bringing_home_effective_nursing_care_for_the.12[1].pdf (991 KB)
- De-identified EBP Paper Education of Cardiac Patients and prevention of Hospital Readmission.docx (20 KB)
- Deidentified EBP Project Literature Critique and Appraisal Education of Cardiac Patients and Hospital Readmission.docx (17 KB)
- Evidence Based Practice Assignment Nurs 360 rev Fa 13-3.doc (32 KB)

▸ Student view of the assignment "Evidence-Based Practice"



By Susan B. Stillwell, DNP, RN, CNE, Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, and Kathleen M. Williamson, PhD, RN

Searching for the Evidence

Strategies to help you conduct a successful search.

This is the fourth article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every two months to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. See details below.

In the previous article in this series, our hypothetical nurse, Rebecca R., with the help of one of her hospital's expert evidence-based practice (EBP) mentors, Carlos A., learned Step 1 of the EBP process—how to formulate a clinical question. The impetus behind her desire to develop her question, as you may recall in our case scenario, was that Rebecca's nurse manager asked her to search for more evidence to support her idea of using a rapid response team to decrease rates of in-hospital cardiac arrests and unplanned ICU admissions—both of which were on the rise on Rebecca's medical–surgical unit. She learned of the idea of a rapid response team from a study she read on the subject in *Critical Care Medicine*.[1]

Here is the clinical question Rebecca formulated: "In hospitalized adults (P), how does a rapid response team (I) compared with no rapid response team (C) affect the number of cardiac arrests (O) and unplanned admissions to the ICU (O) during a three-month period (T)? Her question, called a PICOT question, contains the following elements: patient population (P), intervention of interest (I), comparison intervention of interest (C), outcome(s) of interest (O), and time it takes for the intervention to achieve the outcome(s) (T). (To review PICOT questions and how to formulate them, see "Asking the Clinical Question: A Key Step in Evidence-Based Practice," March.)

This month Rebecca begins Step 2 of the EBP process, *searching for the evidence*. For an overview of this step, see *How to Search for Evidence to Answer the Clinical Question*.

THE BEST EVIDENCE TO ANSWER THE CLINICAL QUESTION

In their next meeting, Carlos and Rebecca discuss what type of evidence will best answer her clinical question. Carlos explains that knowing the type of PICOT question you're asking (for example, is it an intervention, etiology, diagnosis, prognosis, or meaning question?) will help you determine the best type of study design to search for. Rebecca's PICOT question is an intervention question because it compares two possible interventions—a rapid response team versus no rapid response team.

Need Help with Evidence-Based Practice? Chat with the Authors on May 5!

On May 5 at 1 PM EDT, join the "Chat with the Authors" call. It's your chance to get personal consultation from the experts! Dial-in early! U.S. and Canada, dial 1-800-947-5134 (International, dial 001-574-941-6964). When prompted, enter code 121028#.

Go to www.ajnonline.com and click on "Podcasts" and then on "Conversations" to listen to our interview with Susan B. Stillwell and Ellen Fineout-Overholt.

Determine the level of evidence. Research evidence, also called external evidence, can be viewed from a hierarchical perspective. The best external evidence (that which provides the most reliable information) is at the top of the list and the least reliable is at the bottom (see *Hierarchy of Evidence for Intervention Studies*[2]). The level and quality of the evidence are important to clinicians because they give them the confidence they need to make clinical decisions. The research methodology that provides the best evidence will differ depending on the type of clinical question asked. To answer a question that includes an intervention, such as Rebecca's question, a systematic review of randomized, controlled trials or a metaanalysis in which studies are compared using statistical analysis is the best study design.[2-5] When well designed and executed, these studies provide the strongest evidence, and therefore the most confidence for clinical decision making.

"What happens when there isn't a metaanalysis or systematic review available?" Rebecca asks. Carlos replies that the next-best evidence would be Level II evidence, the findings of a randomized, controlled trial. Carlos reminds Rebecca that when deciding whether to use evidence to support a practice change, it's important to consider both the level and quality of the evidence as well as the feasibility of implementing the intervention.

WHERE TO FIND THE EVIDENCE

Rebecca and Carlos set up an appointment with Lynne Z., the hospital librarian, to learn how to begin searching for the evidence. Lynne tells Rebecca and Carlos that no matter what type of question is being asked, it's wise to search more than one database. Because databases index different journals, searching several databases will reduce the possibility of missing relevant literature.

Select relevant databases to search. To find evidence to answer Rebecca's PICOT question, Lynne recommends searching the following databases:

- the Cochrane Database of Systematic Reviews (CDSR) and the Database of Abstracts of Reviews of Effects (DARE), which are found in the Cochrane Library and can be accessed through the Cochrane Collaboration Web site (www.cochrane.org)
- PubMed, which includes MEDLINE (www.ncbi.nlm.nih.gov/pubmed)
- CINAHL (www.ebscohost.com/cinahl), an acronym for Cumulative Index to Nursing and Allied Health Literature

The CDSR and DARE databases contain systematic reviews and metaanalyses of randomized, controlled trials. The reviews conducted by the Cochrane Collaboration are contained in the CDSR, and abstracts of systematic reviews not conducted by Cochrane are indexed in the DARE. Cochrane reviews are considered to have the strongest level of evidence for intervention questions because they have the best study designs and are generally the most rigorous.

To find other types of evidence, databases other than CDSR and DARE must be searched. Because the intervention—rapid response team—is a multidisciplinary, interprofessional initiative, evidence to answer Rebecca's question may be found in medical as well as in nursing and allied health journals. Therefore, the PubMed database, which contains medical and life sciences literature, and the CINAHL database, which contains nursing and allied health literature, should be searched. Abstracts can be reviewed and accessed free of charge in the Cochrane Library and PubMed databases (although a fee may be required to obtain electronic copies of reviews or articles), but a subscription is required to access CINAHL.

SEARCHING STRATEGIES

Now that Rebecca and Carlos have decided what databases to search, they need to select the keywords they'll use to begin their search.

Choose keywords from the PICOT question. Rebecca and Carlos identify the following keywords from her PICOT question: *hospitalized adults*, *rapid response team*, *cardiac arrests*, and *ICU admissions*. Lynne

How to Search for Evidence to Answer the Clinical Question

1. Identify the type of PICOT question.
2. Determine the level of evidence that best answers the question.
3. Select relevant databases to search (such as the CDSR, DARE, PubMed, CINAHL).
4. Use keywords from your PICOT question to search the databases.
5. Streamline your search with the following strategies:
   - Use database controlled vocabulary (such as "MeSH terms").
   - Combine searches by using the Boolean connector "AND."
   - Limit the final search by selecting defining parameters (such as "humans" or "English").

recommends that in cases when a database has its own indexing language, or controlled vocabulary, the search be conducted with these index terms. In this way, the search will be the most inclusive.

Use database controlled vocabulary. For example, when the keyword *rapid response team* is entered into PubMed, the PubMed database matches it to the controlled vocabulary term "Hospital Rapid Response Team." All articles that contain the topic of hospital rapid response teams can be found by searching with this one index term. Using controlled vocabulary in a search saves time and helps prevent the chance of missing evidence that could answer the clinical question.

If the index terms matched by the database aren't relevant to the searcher's keyword, then the keyword and its synonyms should be used to search the database. It's helpful, though rare, when a keyword and an index term match perfectly. More often, the searcher will need to determine which of several database index terms is closest in meaning to the keyword.

Combine searches. Each keyword in the PICOT question is searched individually. However, keyword searches can result in a large number of articles. For example, a CINAHL search of *cardiac arrest* resulted in more than 2,700 articles and a search of *rapid response team* resulted in 100 articles. But combining the searches using the Boolean connector "AND" (for example, *cardiac arrest* AND *rapid response team*) yielded a more manageable 12 articles that contained both concepts and were more likely to answer the clinical question. (Note that databases index articles on a regular basis; therefore, the same search conducted at different times will likely produce different numbers of articles.)

Rebecca and Carlos want to combine their searches because they're interested in finding articles that contain all of the keywords (*hospitalized adults* AND *rapid response team* AND *cardiac arrests* AND *ICU admissions*). After they enter each keyword into the selected database and search it individually, they'll combine all the searches using the Boolean connector "AND." There's a chance, however, that combining the searches may result in few or even no articles. For example, the first time Rebecca searched PubMed using its controlled vocabulary for her PICOT keywords, and then combined the searches, the database came up with only one article. She decided to refocus her search, hoping that including only the intervention and outcomes keywords, and not the patient population, would produce articles relevant to her clinical issue.

Place limits on the final combined search to further narrow the results. This strategy can eliminate articles written in languages other than English or those in which animals, and not humans, are the subjects. Other limits—such as age or sex of subjects or type of article (such as clinical trial, editorial, or review)—are available; however, placing too many limits on a search may produce too few or even no articles.

Hierarchy of Evidence for Intervention Studies[2]

Type of evidence	Level of evidence	Description
Systematic review or metaanalysis	I	A synthesis of evidence from all relevant randomized, controlled trials.
Randomized, controlled trial	II	An experiment in which subjects are randomized to a treatment group or control group.
Controlled trial without randomization	III	An experiment in which subjects are nonrandomly assigned to a treatment group or control group.
Case-control or cohort study	IV	Case-control study: a comparison of subjects with a condition (case) with those who don't have the condition (control) to determine characteristics that might predict the condition. Cohort study: an observation of a group(s) (cohort[s]) to determine the development of an outcome(s) such as a disease.
Systematic review of qualitative or descriptive studies	V	A synthesis of evidence from qualitative or descriptive studies to answer a clinical question.
Qualitative or descriptive study	VI	Qualitative study: gathers data on human behavior to understand *why* and *how* decisions are made. Descriptive study: provides background information on the *what*, *where*, and *when* of a topic of interest.
Opinion or consensus	VII	Authoritative opinion of expert committee.

CONDUCTING THE SEARCH

Rebecca begins to search the PubMed database for the evidence to answer her PICOT question. She and Carlos will be searching the keywords *rapid response team*, the intervention of interest, and *cardiac arrests* and *ICU admissions*, the outcomes of interest. To follow along, access the PubMed home page at www.ncbi.nlm.nih.gov/pubmed. (Note that because new articles are added to the database regularly, your search results may not match those described here.)

Rebecca starts by using PubMed's Medical Subject Heading (MeSH) database to search for the intervention keyword, *rapid response team*. From the PubMed home page, she clicks on "MeSH Database" (see Figure 1). On the MeSH database screen, she types *rapid response team* in the search field and clicks "Go" (see Figure 2). *Rapid response team* is a direct match to the one MeSH term provided—"Hospital Rapid Response Team" (see Figure 3). Rebecca selects this term by clicking the box next to it and then selects "Search Box with AND" from the pull-down menu. "'Hospital Rapid Response Team' [Mesh]" appears in the search box on the next screen (see Figure 4); Rebecca clicks on "Search PubMed." Her search is performed and results in 19 articles (see Figure 5). She notes that most but not all articles appear to be relevant to the clinical question, and that they date back only to 2009 because the MeSH term "Hospital Rapid Response Team" was recently introduced.

Before Rebecca continues with her MeSH database searches, Lynne suggests that she use *rapid response team* in a separate search because the search will be broader than a MeSH term search and may yield additional useful articles.

From the results page, Rebecca enters *rapid response team* in the search field and clicks "Search." This search produces over 300 articles (see Figure 6); however, many of them still don't appear to be relevant to the clinical question. Lynne reassures Rebecca that eventually combining her searches will help weed out the irrelevant articles. (Because this search produced so many more articles than her MeSH term search, which captured only the most recent articles, Lynne suggests that when Rebecca combines her searches, she use the results of her keyword *rapid response team* search, not her "Hospital Rapid Response Team" search.

Rebecca continues to use the MeSH database to search her two remaining keywords. For each one, she starts back on the PubMed home page (click on the PubMed.gov logo on any results page to get to the home page).

Again, she enters *cardiac arrest* on the MeSH database screen. Of the three MeSH terms provided she selects "heart arrest," which yields over 25,000 articles. Since the keyword *ICU admissions* produces no MeSH terms, Lynne advises Rebecca to search with the keyword *intensive care units*, which matches perfectly with the MeSH term "Intensive Care Units" and yields more than 40,000 articles. After searching her keyword and appropriate MeSH terms, Rebecca has a total of more than 60,000 articles.

Lynne reassures Rebecca that she won't need to read all 60,000 articles. She explains that the next step, combining the searches, will eliminate extraneous articles and focus on the search results specific to the clinical question. Combining the searches by using the Boolean connector "AND" will produce a list of articles that contain all three keywords Rebecca searched.

To combine her searches, Rebecca selects the "Advanced Search" tab at the top of any results page. Each of her searches now appears on the Advanced Search page in the "Search History" box. Lynne reminds Rebecca to clear the search field at the top of the page of any keywords from past searches before combining the final group of searches.

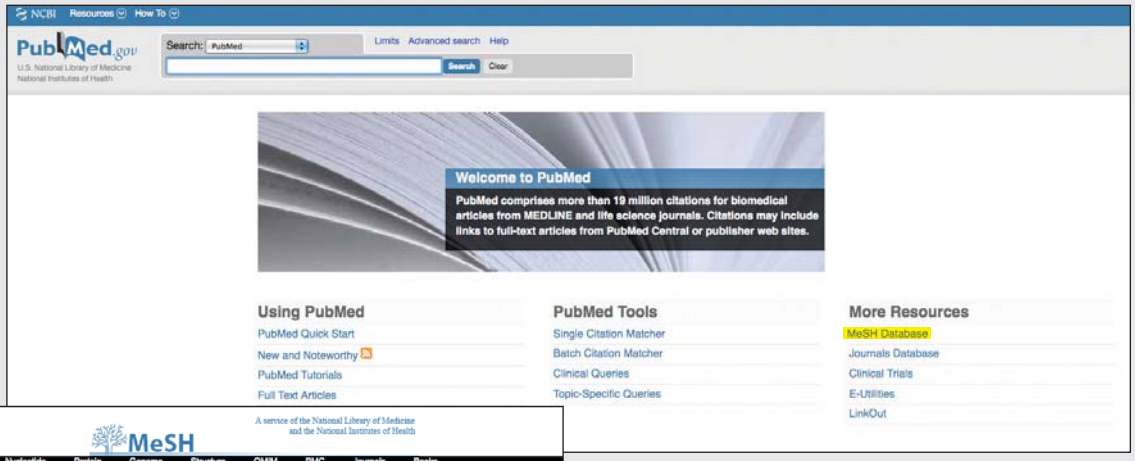
Rebecca clicks on the number assigned to her *rapid response team* keyword search and selects AND from the pull-down "Options" menu. Lynne shows her that the number assigned to her keyword search now appears in the search field at the top of the page. Rebecca continues to select her individual searches and, one by one, their corresponding numbers appear in the field above (see Figure 7). To run the combined searches and view the results, Rebecca selects the "Search" tab.

Her combined search produces 11 articles (see Figure 8), a much more manageable number to review for relevancy to the clinical question than the more than 60,000 articles produced by the individual keyword and controlled vocabulary searches.

Rebecca asks Lynne if she can request the three free full-text articles (see "Free Full Text (3)" under "Filter your results" on the upper right of the results page; Figure 8). Lynne informs her that she can apply any number of limits to her search, including "Links to free full text." However, the more limits applied, the narrower the search, and evidence to answer the clinical question may be missed.

Lynne shows Rebecca where "Limits" can be found on the

Figure 1. Select "MeSH Database" on the PubMed home page.



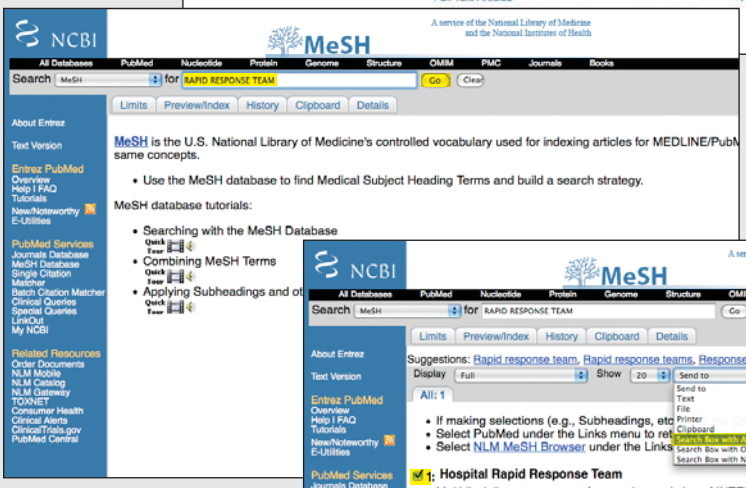


Figure 2. Type *rapid response team* in the search field and click "Go."

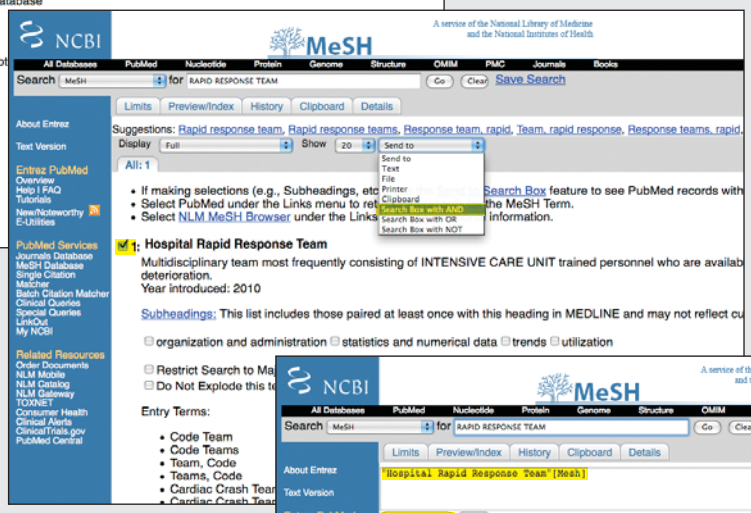


Figure 3. Select the MeSH term "Hospital Rapid Response Team," then select "Search Box with AND" from the pull-down menu.

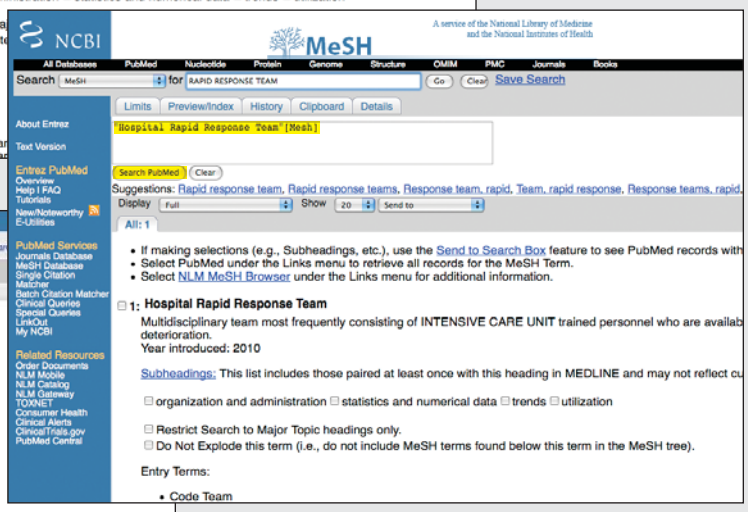


Figure 4. Click on "Search PubMed."

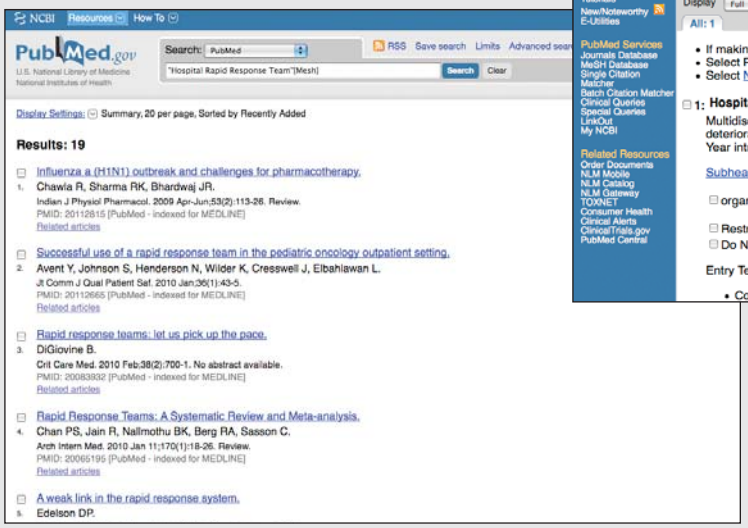


Figure 5. The "Hospital Rapid Response Team" search yields 19 articles.

top of the Advanced Search page (Figure 7). She suggests that Rebecca consider limiting the ages of her population to further reduce her results. If she eliminates the pediatric population, for example, the number of articles produced by her search should decrease. But Rebecca thinks that any articles that include children may be of interest to the nurses on the pediatric unit, so she decides to limit her search to only "Humans" and "English" (Figure 9). Applying these limits to Rebecca's final combined search reduces the results from 11 articles to 10.

Rebecca asks Lynne if any of the articles retrieved in the search are metaanalyses, which she remembers is the best study design to answer her clinical question. Lynne responds that a quick way to find out is by going back to the Limits page and selecting "Meta-Analysis" (see Figure 9). Although this didn't produce any results, limiting the search to "Randomized Controlled Trial" resulted in one article.

As Rebecca's session in searching PubMed concludes, Lynne explains to Carlos and Rebecca that searching is a skill that improves with practice. Moreover, each database may have its own controlled vocabulary and limits. In any search, Lynne emphasizes the importance of

- searching at least two databases
- searching one keyword at a time
- using the database's controlled vocabulary when available
- combining the searches to yield articles that are manageable in number and relate specifically to the PICOT question
- applying "Humans" and "English" limits to the final search

Rebecca is excited to practice her searching skills to find the answer to her clinical question. She and Carlos set up a time to search the Cochrane and CINAHL databases. Carlos reminds Rebecca that although considering the level of evidence when making a clinical decision is important, it's not the only factor. The decision should also be based on the quality of the evidence, the feasibility of implementing a change in the hospital, and a consideration of the patients' values and preferences.

In the next article in this series, to be published in the July issue of *AJN*, Rebecca gathers all the articles relevant to her PICOT question and meets with Carlos to learn how to critically appraise the evidence. You're invited to

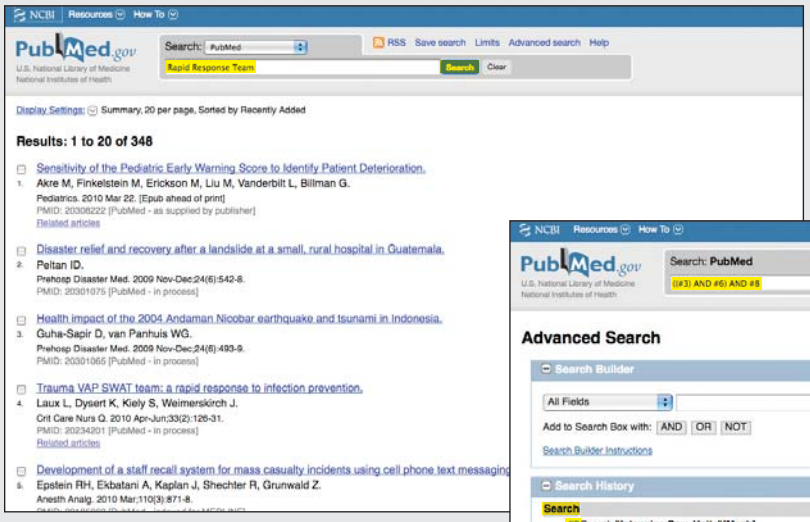


Figure 6. Type *rapid response team* in the search field and click "Search"; this search results in more than 300 articles.

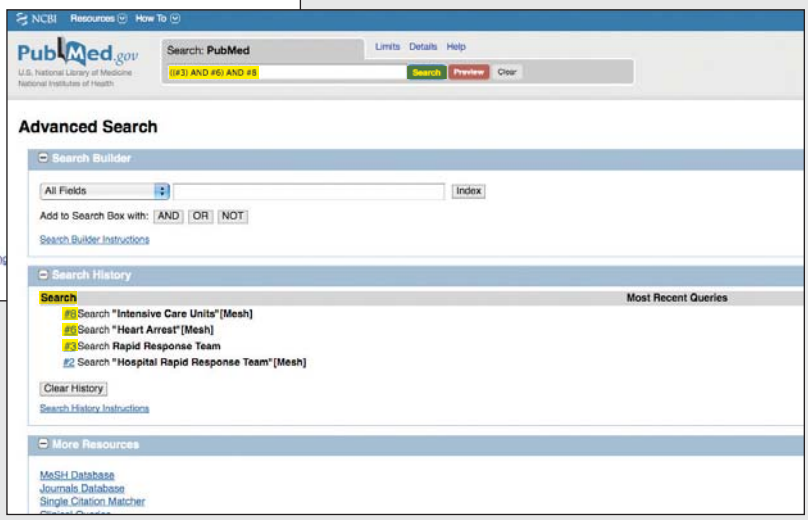


Figure 7. Combine the individual searches.

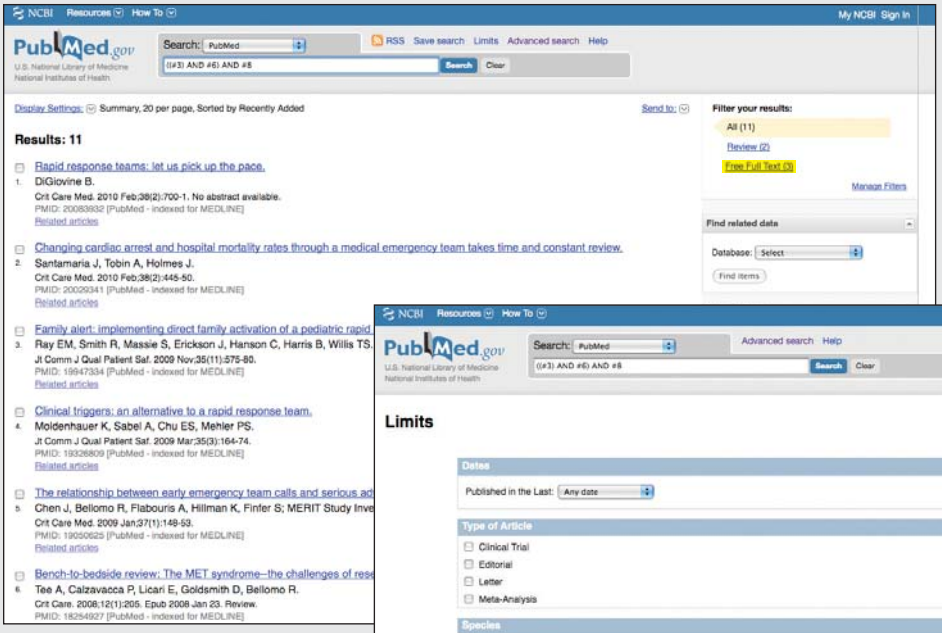


Figure 8. The final results.

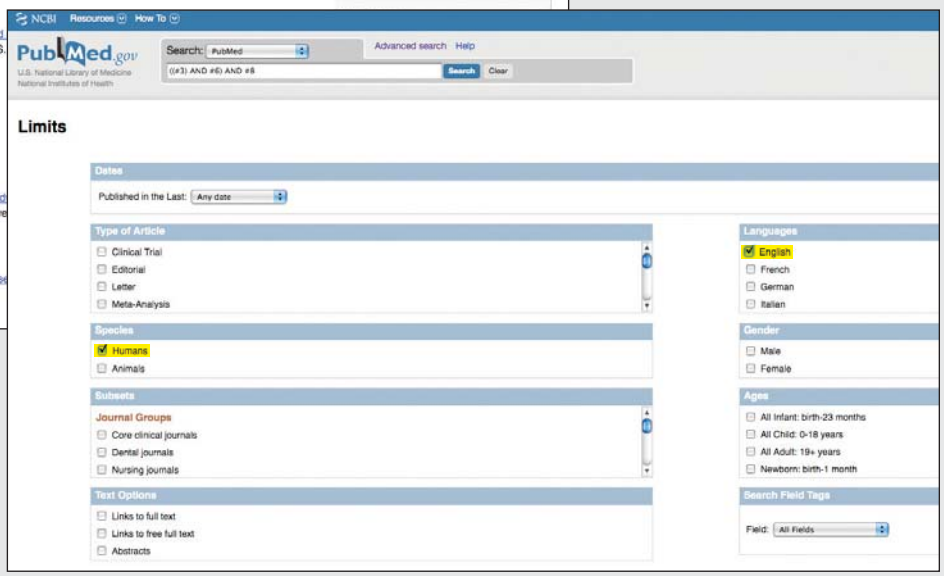


Figure 9. Using limits to narrow the search.

this meeting to learn, along with Rebecca, how to select "keeper" studies that, when synthesized, will help determine if a practice change should be implemented at her hospital. ▼

Susan B. Stillwell is clinical associate professor and program coordinator of the Nurse Educator Evidence-Based Practice Mentorship Program at Arizona State University in Phoenix, where Ellen Fineout-Overholt is clinical professor and director of the Center for the Advancement of Evidence-Based Practice, Bernadette Mazurek Melnyk is dean and distinguished foundation professor of nursing, and Kathleen M. Williamson is associate director of the Center for the Advancement of Evidence-Based Practice. Contact author: Susan B. Stillwell, sstillwell@asu.edu.

Solutions to Our "Practice Creating a PICOT Question" Exercise

Did your questions come close to these?

Scenario 1: A meaning question.

How do family caregivers (P) with relatives receiving hospice care (I) perceive the loss of their relative (O) during end of life (T)?

Scenario 2: An intervention or therapy question.

In patients with dementia who are agitated (P), how does baby doll therapy (I) compared with risperidone (or antipsychotic drug therapy) (C) affect behavior outbursts (O) within one month (T)?

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By Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, Susan B. Stillwell, DNP, RN, CNE, and Kathleen M. Williamson, PhD, RN

Critical Appraisal of the Evidence: Part I

An introduction to gathering, evaluating, and recording the evidence.

This is the fifth article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every two months to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. Details about how to participate in the next call will be published with September's *Evidence-Based Practice, Step by Step*.

In May's evidence-based practice (EBP) article, Rebecca R., our hypothetical staff nurse, and Carlos A., her hospital's expert EBP mentor, learned how to search for the evidence to answer their clinical question (shown here in PICOT format): "In *hospitalized adults* (P), how does a *rapid response team* (I) compared with *no rapid response team* (C) affect *the number of cardiac arrests* (O) and *unplanned admissions to the ICU* (O) during a *three-month period* (T)?" With the help of Lynne Z., the hospital librarian, Rebecca and Carlos searched three databases, PubMed, the Cumulative Index of Nursing and Allied Health Literature (CINAHL), and the Cochrane Database of Systematic Reviews. They used keywords from their clinical question, including *ICU*, *rapid response team*, *cardiac arrest*, and *unplanned ICU admissions*, as well as the following synonyms: *failure to rescue*, *never events*, *medical emergency teams*, *rapid response systems*, and *code blue*. Whenever terms from a database's own indexing language, or controlled vocabulary, matched the keywords or synonyms, those terms were also searched. At the end of the database searches, Rebecca and Carlos chose to retain 18 of the 18 studies found in PubMed; six of the 79 studies found in CINAHL; and the one study found in the Cochrane Database of Systematic Reviews, because they best answered the clinical question.

As a final step, at Lynne's recommendation, Rebecca and Carlos conducted a hand search of the reference lists of each study they retained looking for any relevant studies they hadn't found in their original search; this process is also called *the ancestry method*. The hand search yielded one additional study, for a total of 26.

RAPID CRITICAL APPRAISAL

The next time Rebecca and Carlos meet, they discuss the next step in the EBP process—critically appraising the 26 studies. They obtain copies of the studies by printing those that are immediately available as full text through library subscription or those flagged as "free full text" by a database or journal's Web site. Others are available through interlibrary loan, when another hospital library shares its articles with Rebecca and Carlos's hospital library.

Carlos explains to Rebecca that the purpose of critical appraisal isn't solely to find the flaws in a study, but to determine its worth to practice. In this rapid critical appraisal (RCA), they will review each study to determine

- its level of evidence.
- how well it was conducted.
- how useful it is to practice.

Once they determine which studies are "keepers," Rebecca and Carlos will move on to the final steps of critical appraisal: evaluation and synthesis (to be discussed in the next two installments of the series). These final steps will determine whether overall findings from the evidence review can help clinicians improve patient outcomes.

Rebecca is a bit apprehensive because it's been a few years since she took a research class. She

shares her anxiety with Chen M., a fellow staff nurse, who says she never studied research in school but would like to learn; she asks if she can join Carlos and Rebecca's EBP team. Chen's spirit of inquiry encourages Rebecca, and they talk about the opportunity to learn that this project affords them. Together they speak with the nurse manager on their medical–surgical unit, who agrees to let them use their allotted continuing education time to work on this project, after they discuss their expectations for the project and how its outcome may benefit the patients, the unit staff, and the hospital.

Learning research terminology. At the first meeting of the new EBP team, Carlos provides Rebecca and Chen with a glossary of terms so they can learn basic research terminology, such as *sample*, *independent variable*, and *dependent variable*. The glossary also defines some of the study designs the team is likely to come across in doing their RCA, such as systematic review, randomized controlled trial, and cohort, qualitative, and descriptive studies. (For the definitions of these terms and others, see the glossaries provided by the Center for the Advancement of Evidence-Based Practice at the Arizona State University College of Nursing and Health Innovation [http://nursingandhealth.asu.edu/evidence-based-practice/resources/glossary.htm] and the Boston University Medical Center Alumni Medical Library [http://medlib.bu.edu/bugms/content.cfm/content/ebmglossary.cfm#R].)

Determining the level of evidence. The team begins to divide the 26 studies into categories according to study design. To help in this, Carlos provides a list of several different study designs (see *Hierarchy of Evidence for Intervention Studies*). Rebecca, Carlos, and Chen work together to determine each study's design by reviewing its abstract. They also create an "I don't know" pile of studies that don't appear to fit a specific design. When they find studies that don't actively answer the clinical question but

Hierarchy of Evidence for Intervention Studies

Type of evidence	Level of evidence	Description
Systematic review or meta-analysis	I	A synthesis of evidence from all relevant randomized controlled trials.
Randomized controlled trial	II	An experiment in which subjects are randomized to a treatment group or control group.
Controlled trial without randomization	III	An experiment in which subjects are nonrandomly assigned to a treatment group or control group.
Case-control or cohort study	IV	Case-control study: a comparison of subjects with a condition (case) with those who don't have the condition (control) to determine characteristics that might predict the condition. Cohort study: an observation of a group(s) (cohort[s]) to determine the development of an outcome(s) such as a disease.
Systematic review of qualitative or descriptive studies	V	A synthesis of evidence from qualitative or descriptive studies to answer a clinical question.
Qualitative or descriptive study	VI	Qualitative study: gathers data on human behavior to understand *why* and *how* decisions are made. Descriptive study: provides background information on the *what*, *where*, and *when* of a topic of interest.
Expert opinion or consensus	VII	Authoritative opinion of expert committee.

Adapted with permission from Melnyk BM, Fineout-Overholt E, editors. Evidence-based practice in nursing and healthcare: a guide to best practice [forthcoming]. 2nd ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams and Wilkins.

Critical Appraisal Guide for Quantitative Studies

1. Why was the study done?
   - Was there a clear explanation of the purpose of the study and, if so, what was it?
2. What is the sample size?
   - Were there enough people in the study to establish that the findings did not occur by chance?
3. Are the instruments of the major variables valid and reliable?
   - How were variables defined? Were the instruments designed to measure a concept valid (did they measure what the researchers said they measured)? Were they reliable (did they measure a concept the same way every time they were used)?
4. How were the data analyzed?
   - What statistics were used to determine if the purpose of the study was achieved?
5. Were there any untoward events during the study?
   - Did people leave the study and, if so, was there something special about them?
6. How do the results fit with previous research in the area?
   - Did the researchers base their work on a thorough literature review?
7. What does this research mean for clinical practice?
   - Is the study purpose an important clinical issue?

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may inform thinking, such as descriptive research, expert opinions, or guidelines, they put them aside. Carlos explains that they'll be used later to support Rebecca's case for having a rapid response team (RRT) in her hospital, should the evidence point in that direction.

After the studies—including those in the "I don't know" group—are categorized, 15 of the original 26 remain and will be included in the RCA: three systematic reviews that include one meta-analysis (Level I evidence), one randomized controlled trial (Level II evidence), two cohort studies (Level IV evidence), one retrospective pre-post study with historic controls (Level VI evidence), four preexperimental (pre-post) intervention studies (no control group) (Level VI evidence), and four EBP implementation projects (Level VI evidence). Carlos reminds Rebecca and Chen that Level I evidence—a systematic review of randomized controlled trials or a meta-analysis—is the most reliable and the best evidence to answer their clinical question.

Using a critical appraisal guide. Carlos recommends that the team use a critical appraisal checklist (see *Critical Appraisal Guide for Quantitative Studies*) to help evaluate the 15 studies. This checklist is relevant to all studies and contains questions about the essential elements of research (such as, purpose of the study, sample size, and major variables).

The questions in the critical appraisal guide seem a little strange to Rebecca and Chen. As they review the guide together, Carlos explains and clarifies each question. He suggests that as they try to figure out which are the essential elements of the studies, they focus on answering the first three questions: *Why was the study done? What is the sample size? Are the instruments of the major variables valid and reliable?* The remaining questions will be addressed later on in the critical appraisal process (to appear in future installments of this series).

Creating a study evaluation table. Carlos provides an online template for a table where Rebecca and Chen can put all the data they'll need for the RCA. Here they'll record each study's essential elements that answer the three questions and begin to appraise the 15 studies. (To use this template to create your own evaluation table, download the *Evaluation Table Template* at http://links.lww.com/AJN/A10.)

EXTRACTING THE DATA

Starting with level I evidence studies and moving down the hierarchy list, the EBP team takes each study and, one by one, finds and enters its essential elements into the first five columns of the evaluation table (see Table 1; to see the entire table with all 15 studies, go to http://links.lww.com/AJN/A11). The team discusses each element as they enter it, and tries to determine if it meets the criteria of the critical

Table 1. Evaluation Table, Phase I

First Author (Year)	Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied (and Their Definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Chan PS, et al. *Arch Intern Med* 2010;170(1):18-26.	None	SR Purpose: effect of RRT on HMR and CR • Searched 5 databases from 1950-2008, and "grey literature" from MD conferences • Included only studies with a control group	N = 18 studies Setting: acute care hospitals; 13 adult, 5 peds Average no. beds: NR Attrition: NR	IV: RRT DV1: HMR DV2: CR				
McGaughey J, et al. *Cochrane Database Syst Rev* 2007;3: CD005529.	None	SR (Cochrane review) Purpose: effect of RRT on HMR • Searched 6 databases from 1990-2006 • Excluded all but 2 RCTs	N = 2 studies 24 adult hospitals Attrition: NR	IV: RRT DV1: HMR				
Winters BD, et al. *Crit Care Med* 2007;35(5): 1238-43.	None	SR Purpose: effect of RRT on HMR and CR • Searched 3 databases from 1990-2005 • Included only studies with a control group	N = 8 studies Average no. beds: 500 Attrition: NR	IV: RRT DV1: HMR DV2: CR				
Hillman K, et al. *Lancet* 2005; 365(9477): 2091-7.	None	RCT Purpose: effect of RRT on CR, HMR, and UICUA	N = 23 hospitals Average no. beds: 340 • Intervention group (n = 12) • Control group (n = 11) Setting: Australia Attrition: none	IV: RRT protocol for 6 months • 1 AP • 1 ICU or ED RN DV1: HMR (unexpected deaths, excluding DNRs) DV2: CR (excluding DNRs) DV3: UICUA	HMR CR rates of UICUA			Note: • Criteria for activating RRT

Shaded columns indicate where data will be entered in future installments of the series.
AP = attending physician; CR = cardiopulmonary arrest or code rates; DNR = do not resuscitate; DV = dependent variable; ED = emergency department; HMR: hospital-wide mortality rates; ICU = intensive care unit; IV = independent variable; MD = medical doctor; NR = not reported; Peds = pediatric; RCT = randomized controlled trial; RN = registered nurse; RRT = rapid response team; SR = systematic review; UICUA = unplanned ICU admissions.

appraisal guide. These elements—such as purpose of the study, sample size, and major variables—are typical parts of a research report and should be presented in a predictable fashion in every study so that the reader understands what's being reported.

Usually the important information in a study can be found in the abstract.

As the EBP team continues to review the studies and fill in the evaluation table, they realize that it's taking about 10 to 15 minutes per study to locate and enter the information. This may be because when they look for a description of the sample, for example, it's important that they note how the sample was obtained, how many patients are included, other characteristics of the sample, as well as any diagnoses or illnesses the sample might have that could be important to the study outcome. They discuss with Carlos the likelihood that they'll need a few sessions to enter all the data into the table. Carlos responds that the more studies they do, the less time it will take. He also says that it takes less time to find the information when study reports are clearly written. He adds that usually the important information can be found in the abstract.

Rebecca and Chen ask if it would be all right to take out the "Conceptual Framework" column, since none of the studies they're reviewing have conceptual frameworks (which help guide researchers as to how a study should proceed). Carlos replies that it's helpful to know that a study has no framework underpinning the research and suggests they leave the column in. He says they can further discuss this point later on in the process when they synthesize the studies' findings. As Rebecca and Chen review each study, they enter its citation in a separate reference list so that they won't have to create this list at the end of the process. The reference list will be shared with colleagues and placed at the end of any RRT policy that results from this endeavor.

Carlos spends much of his time answering Rebecca's and Chen's questions concerning how to phrase the information they're entering in the table. He suggests that they keep it simple and consistent. For example, if a study indicated that it was implementing an RRT and hoped to see a change in a certain outcome, the nurses could enter "change in [the outcome] after RRT" as the purpose of the study. For studies examining the effect of an RRT on an outcome, they could say as the purpose, "effect of RRT on [the outcome]." Using the same words to describe the same purpose, even though it may not have been stated exactly that way in the study, can help when they compare studies later on.

Rebecca and Chen find it frustrating that the study data are not always presented in the same way from study to study. They ask Carlos why the authors or journals wouldn't present similar information in a similar manner. Carlos explains that the purpose of publishing these studies may have been to disseminate the findings, not to compare them with other like studies. Rebecca realizes that she enjoys this kind of conversation, in which she and Chen have a voice and can contribute to a deeper understanding of how research impacts practice.

As Rebecca and Chen continue to enter data into the table, they begin to see similarities and differences across studies. They mention this to Carlos, who tells them they've begun the process of synthesis! Both nurses are encouraged by the fact that they're learning this new skill.

The MERIT trial is next in the stack of studies and it's a good trial to use to illustrate this phase of the RCA process. Set in Australia, the MERIT trial[1] examined whether the introduction of an RRT (called a medical emergency team or MET in the study) would reduce the incidence of cardiac arrest, unplanned admissions to the ICU, and death in the hospitals studied. See Table 1 to follow along as the EBP team finds and enters the trial data into the table.

Design/Method. After Rebecca and Chen enter the citation information and note the lack of a conceptual framework, they're ready to fill in the "Design/Method" column. First they enter *RCT* for randomized controlled trial, which they find in both the study title and introduction. But MERIT is called a "cluster-randomised controlled trial," and *cluster* is a term they haven't seen before. Carlos explains that it means that hospitals, not individuals or patients, were randomly assigned to the RRT. He says that the likely reason the researchers chose to randomly assign hospitals is that if they had randomly assigned individual patients or units, others in the hospital might have heard about the RRT and potentially influenced the outcome.

To randomly assign hospitals (instead of units or patients) to the intervention and comparison groups is a cleaner research design.

Keep the data in the table consistent by using simple, inclusive terminology.

To keep the study purposes consistent among the studies in the RCA, the EBP team uses inclusive terminology they developed after they noticed that different trials had different ways of describing the same objectives. Now they write that the purpose of the MERIT trial is to see if an RRT can reduce *CR*, for cardiopulmonary arrest or code rates, *HMR*, for hospital-wide mortality rates, and *UICUA* for unplanned ICU admissions. They use those same terms consistently throughout the evaluation table.

Sample/Setting. A total of 23 hospitals in Australia with an average of 340 beds per hospital is the study sample. Twelve hospitals had an RRT (the intervention group) and 11 hospitals didn't (the control group).

Major Variables Studied. The independent variable is the variable that influences the outcome (in this trial, it's an RRT for six months). The dependent variable is the outcome (in this case, HMR, CR, and UICUA). In this trial, the outcomes didn't include do-not-resuscitate data. The RRT was made up of an attending physician and an ICU or ED nurse.

While the MERIT trial seems to perfectly answer Rebecca's PICOT question, it contains elements that aren't entirely relevant, such as the fact that the researchers collected information on how the RRTs were activated and provided their protocol for calling the RRTs. However, these elements might be helpful to the EBP team later on when they make decisions about implementing an RRT in their hospital. So that they can come back to this information, they place it in the last column, "Appraisal: Worth to Practice."

After reviewing the studies to make sure they've captured the essential elements in the evaluation table, Rebecca and Chen still feel unsure about whether the information is complete. Carlos reminds them that a system-wide practice change—such as the change Rebecca is exploring, that of implementing an RRT in her hospital—requires careful consideration of the evidence and this is only the first step. He cautions them not to worry too much about perfection and to put their efforts into understanding the information in the studies. He reminds them that as they move on to the next steps in the critical appraisal process, and learn even more about the studies and projects, they can refine any data in the table. Rebecca and Chen feel uncomfortable with this uncertainty but decide to trust the process. They continue extracting data and entering it into the table even though they may not completely understand what they're entering at present. They both realize that this will be a learning opportunity and, though the learning curve may be steep at times, they value the outcome of improving patient care enough to continue the work—as long as Carlos is there to help.

In applying these principles for evaluating research studies to your own search for the evidence to answer your PICOT question, remember that this series can't contain all the available information about research methodology. Fortunately, there are many good resources available in books and online. For example, to find out more about *sample size*, which can affect the likelihood that researchers' results occur by chance (a random finding) rather than that the intervention brought about the expected outcome, search the Web using terms that describe what you want to know. If you type *sample size findings by chance* in a search engine, you'll find several Web sites that can help you better understand this study essential.

Be sure to join the EBP team in the next installment of the series, "Critical Appraisal of the Evidence: Part II," when Rebecca and Chen will use the MERIT trial to illustrate the next steps in the RCA process, complete the rest of the evaluation table, and dig a little deeper into the studies in order to detect the "keepers." ▼

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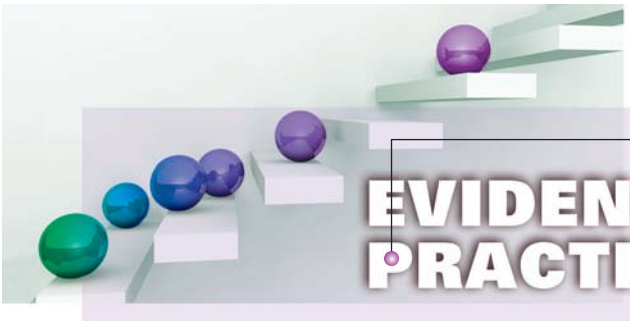

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Critical Appraisal of the Evidence: Part II

Digging deeper—examining the "keeper" studies.

This is the sixth article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

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In July's evidence-based practice (EBP) article, Rebecca R., our hypothetical staff nurse, Carlos A., her hospital's expert EBP mentor, and Chen M., Rebecca's nurse colleague, collected the evidence to answer their clinical question: "In *hospitalized adults* (P), how does a *rapid response team* (I) compared with *no rapid response team* (C) affect *the number of cardiac arrests* (O) and *unplanned admissions to the ICU* (O) during a *three-month period* (T)?" As part of their rapid critical appraisal (RCA) of the 15 potential "keeper" studies, the EBP team found and placed the essential elements of each study (such as its population, study design, and setting) into an evaluation table. In so doing, they began to see similarities and differences between the studies, which Carlos told them is the beginning of synthesis. We now join the team as they continue with their RCA of these studies to determine their worth to practice.

RAPID CRITICAL APPRAISAL

Carlos explains that typically an RCA is conducted along with an RCA checklist that's specific to the research design of the study being evaluated—and before any data are entered into an evaluation table. However, since Rebecca and Chen are new to appraising studies, he felt it would be easier for them to first enter the essentials into the table and then evaluate each study. Carlos shows Rebecca several RCA checklists and explains that all checklists have three major questions in common, each of which contains other more specific subquestions about what constitutes a well-conducted study for the research design under review (see *Example of a Rapid Critical Appraisal Checklist*).

Although the EBP team will be looking at how well the researchers conducted their studies and discussing what makes a "good" research study, Carlos reminds them that the goal of critical appraisal is to determine the worth of a study to practice, not solely to find flaws. He also suggests that they consult their glossary when they see an unfamiliar word. For example, the term *randomization*, or *random assignment*, is a relevant feature of research methodology for intervention studies that may be unfamiliar. Using the glossary, he explains that random assignment and *random sampling* are often confused with one another, but that they're very different. When researchers select subjects from within a certain population to participate in a study by using a random strategy, such as tossing a coin, this is random sampling. It allows the entire population to be fairly represented. But because it requires access to a particular population, random sampling is not always feasible. Carlos adds that many health care studies are based on a *convenience sample*—participants recruited from a readily available population, such as a researcher's affiliated hospital, which may or may not represent the desired population. Random assignment, on the other hand, is the use of a random strategy to assign study

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participants to the intervention or control group. Random assignment is an important feature of higher-level studies in the hierarchy of evidence.

Carlos also reminds the team that it's important to begin the RCA with the studies at the highest level of evidence in order to see the most reliable evidence first. In their pile of studies, these are the three systematic reviews, including the meta-analysis and the Cochrane review, they retrieved from their database search (see "Searching for the Evidence," and "Critical Appraisal of the Evidence: Part I," *Evidence-Based Practice, Step by Step*, May and July). Among the RCA checklists Carlos has brought with him, Rebecca and Chen find the checklist for systematic reviews.

As they start to rapidly critically appraise the meta-analysis, they discuss that it seems to be biased since the authors included only studies with a control group. Carlos explains that while having a control group in a study is ideal, in the real world most studies are lower-level evidence and don't have control or comparison groups. He emphasizes that, in eliminating lower-level studies, the meta-analysis lacks evidence that may be informative to the question. Rebecca and Chen—who are clearly growing in their appraisal skills—also realize that three studies in the meta-analysis are the same as three of their potential "keeper" studies. They wonder whether they should keep those studies in the pile, or if, as duplicates, they're unnecessary. Carlos says that because the meta-analysis only included studies with control groups, it's important to keep these three studies so that they can be compared with other studies in the pile that don't have control groups. Rebecca notes that more than half of their 15 studies don't have control or comparison groups. They agree as a team to include all 15 studies at all levels of evidence and go on to appraise the two remaining systematic reviews.

The MERIT trial[1] is next in the EBP team's stack of studies.

Example of a Rapid Critical Appraisal Checklist

Rapid Critical Appraisal of Systematic Reviews of Clinical Interventions or Treatments

1. Are the results of the review valid?		
A. Are the studies in the review randomized controlled trials?	Yes	No
B. Does the review include a detailed description of the search strategy used to find the relevant studies?	Yes	No
C. Does the review describe how the validity of the individual studies was assessed (such as, methodological quality, including the use of random assignment to study groups and complete follow-up of subjects)?	Yes	No
D. Are the results consistent across studies?	Yes	No
E. Did the analysis use individual patient data or aggregate data?	Patient	Aggregate
2. What are the results?		
A. How large is the intervention or treatment effect (odds ratio, relative risk, effect size, level of significance)?		
B. How precise is the intervention or treatment (confidence interval)?		
3. Will the results assist me in caring for my patients?		
A. Are my patients similar to those in the review?	Yes	No
B. Is it feasible to implement the findings in my practice setting?	Yes	No
C. Were all clinically important outcomes considered, including both risks and benefits of the treatment?	Yes	No
D. What is my clinical assessment of the patient, and are there any contraindications or circumstances that would keep me from implementing the treatment?	Yes	No
E. What are my patients' and their families' preferences and values concerning the treatment?	Yes	No

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As we noted in the last installment of this series, MERIT is a good study to use to illustrate the different steps of the critical appraisal process. (Readers may want to retrieve the article, if possible, and follow along with the RCA.) Set in Australia, the MERIT trial examined whether the introduction of a rapid response team (RRT; called a medical emergency team or MET in the study) would reduce the incidence of cardiac arrest, death, and unplanned admissions to the ICU in the hospitals studied. To follow along as the EBP team addresses each of the essential elements of a well-conducted randomized controlled trial (RCT) and how they apply to the MERIT study, see their notes in *Rapid Critical Appraisal of the MERIT Study*.

ARE THE RESULTS OF THE STUDY VALID?

The first section of every RCA checklist addresses the validity of the study at hand—did the researchers use sound scientific methods to obtain their study results? Rebecca asks why validity is so important. Carlos replies that if the study's conclusion can be trusted—that is, relied upon to inform practice—the study must be conducted in a way that reduces bias or eliminates confounding variables (factors that influence how the intervention affects the outcome). Researchers typically use rigorous research methods to reduce the risk of bias. The purpose of the RCA checklist is to help the user determine whether or not rigorous methods have been used in the study under review, with most questions offering the option of a quick answer of "yes," "no," or "unknown."

Were the subjects randomly assigned to the intervention and control groups? Carlos explains that this is an important question when appraising RCTs. If a study calls itself an RCT but didn't randomly assign participants, then bias could be present. In appraising the MERIT study, the team discusses how the researchers randomly assigned entire hospitals, not individual patients, to the RRT intervention and control groups using a technique called *cluster randomization*. To better understand this method, the EBP team looks it up on the Internet and finds a PowerPoint presentation by a World Health Organization researcher that explains it in simplified terms: "Cluster randomized trials are experiments in which social units or clusters [in our case, hospitals] rather than individuals are randomly allocated to intervention groups."[2]

Was random assignment concealed from the individuals enrolling the subjects? Concealment helps researchers reduce potential bias, preventing the person(s) enrolling participants from recruiting them into a study with enthusiasm if they're destined for the intervention group or with obvious indifference if they're intended for the control or comparison group. The EBP team sees that the MERIT trial used an independent statistician to conduct the random assignment after participants had already been enrolled in the study, which Carlos says meets the criteria for concealment.

Were the subjects and providers blind to the study group? Carlos notes that it would be difficult to blind participants or researchers to the intervention group in the MERIT study because the hospitals that were to initiate an RRT had to know it was happening. Rebecca and Chen wonder whether their "no" answer to this question makes the study findings invalid. Carlos says that a single "no" may or may not mean that the study findings are invalid. It's their job as clinicians interpreting the data to weigh each aspect of the study design. Therefore, if the answer to any validity question isn't affirmative, they must each ask themselves: does this "no" make the study findings untrustworthy to the extent that I don't feel comfortable using them in my practice?

Were reasons given to explain why subjects didn't complete the study? Carlos explains that sometimes participants leave a study before the end (something about the study or the participants themselves may prompt them to leave). If all or many of the participants leave for the same reason, this may lead to biased findings. Therefore, it's important to look for an explanation for why any subjects didn't complete a study. Since no hospitals dropped out of the MERIT study, this question is determined to be not applicable.

Were the follow-up assessments long enough to fully study the effects of the intervention? Chen asks Carlos why a time frame would be important in studying validity. He explains that researchers must ensure that the outcome is evaluated for a long enough period of time to show that the intervention indeed caused it. The researchers in the MERIT study conducted the RRT intervention for six months before evaluating the outcomes. The team discusses how six months was likely adequate to determine how the RRT affected cardiopulmonary arrest rates (CR) but might have been too short to establish the relationship between the RRT and hospital-wide mortality rates (HMR).

Rapid Critical Appraisal of the MERIT Study

1. Are the results of the study valid?

A. Were the subjects randomly assigned to the intervention and control groups? **Yes** No Unknown

Random assignment of hospitals was made to either a rapid response team (RRT; intervention) group or no RRT (control) group. To protect against introducing further bias into the study, hospitals, not individual patients, were randomly assigned to the intervention. If patients were the study subjects, word of the RRT might have gotten around, potentially influencing the outcome.

B. Was random assignment concealed from the individuals enrolling the subjects? **Yes** No Unknown

An independent statistician randomly assigned hospitals to the RRT or no RRT group after baseline data had been collected; thus the assignments were concealed from both researchers and participants.

C. Were the subjects and providers blind to the study group? Yes **No** Unknown

Hospitals knew to which group they'd been assigned, as the intervention hospitals had to put the RRTs into practice. Management, ethics review boards, and code committees in both hospitals knew about the intervention. The control hospitals had code teams and some already had systems in place to manage unstable patients. But control hospitals didn't have a placebo strategy to match the intervention hospitals' educational strategy for how to implement an RRT (a red flag for confounding!). If you worked in one of the control hospitals, unless you were a member of one of the groups that gave approval, you wouldn't have known your hospital was participating in a study on RRTs; this lessens the chance of confounding variables influencing the outcomes.

D. Were reasons given to explain why subjects didn't complete the study? Yes No **Not Applicable**

This question is not applicable as no hospitals dropped out of the study.

E. Were the follow-up assessments long enough to fully study the effects of the intervention? **Yes** No Unknown

The intervention was conducted for six months, which should be adequate time to have an impact on the outcomes of cardiopulmonary arrest rates (CR), hospital-wide mortality rates (HMR), and unplanned ICU admissions (UICUA). However, the authors remark that it can take longer for an RRT to affect mortality, and cite trauma protocols that took up to 10 years.

F. Were the subjects analyzed in the group to which they were randomly assigned? **Yes** No Unknown

All 23 (12 intervention and 11 control) hospitals remained in their groups, and analysis was conducted on an intention-to-treat basis. However, in their discussion, the authors attempt to provide a reason for the disappointing study results; they suggest that because the intervention group was "inadequately implemented," the fidelity of the intervention was compromised, leading to less than reliable results. Another possible explanation involves the baseline quality of care; if high, the improvement after an RRT may have been less than remarkable. The authors also note a historical confounder: in Australia, where the study took place, there was a nationwide increase in awareness of patient safety issues.

G. Was the control group appropriate? Yes No **Unknown**

See notes to question C. Controls had no time built in for education and training as the intervention hospitals did, so this time wasn't controlled for, nor was there any known attempt to control the organizational "buzz" that something was going on. The study also didn't account for the variance in how RRTs were implemented across hospitals. The researchers indicate that the existing code teams in control hospitals "did operate as [RRTs] to some extent." Because of these factors, the appropriateness of the control group is questionable.

H. Were the instruments used to measure the outcomes valid and reliable? **Yes** No Unknown

The primary outcome was the composite of HMR (that is, unexpected deaths, excluding do not resuscitates [DNRs]), CR (that is, no palpable pulse, excluding DNRs), and UICUA (any unscheduled admissions to the ICU).

I. Were the demographics and baseline clinical variables of the subjects in each of the groups similar? Yes No **Unknown**

The researchers provided a table showing how the RRT and control hospitals compared on several variables. Some variability existed, but there were no statistical differences between groups.

2. What are the results?

A. How large is the intervention or treatment effect?

The researchers reported outcome data in various ways, but the bottom line is that the control group did better than the intervention group. For example, RRT calling criteria were documented more than 15 minutes before an event by more hospitals in the control group than in the intervention group, which is contrary to expectation. Half the HMR cases in the intervention group met the criteria compared with 55% in the control group (not statistically significant). But only 30% of CR cases in the intervention group met the criteria compared with 44% in the control group, which was statistically significant ($P = 0.031$). Finally, regarding UICUA, 51% in the intervention group compared with 55% in the control group met the criteria (not significant). This indicates that the control hospitals were doing a better job of documenting unstable patients before events occurred than the intervention hospitals.

B. How precise is the intervention or treatment?

The odds ratio (OR) for each of the outcomes was close to 1.0, which indicates that the RRT had no effect in the intervention hospitals compared with the control hospitals. Each confidence interval (CI) also included the number 1.0, which indicates that each OR wasn't statistically significant (HMR OR = 1.03 (0.84 – 1.28); CR OR = 0.94 (0.79 – 1.13); UICUA OR = 1.04 (0.89 – 1.21). From a clinical point of view, the results aren't straightforward. It would have been much simpler had the intervention hospitals and the control hospitals done equally badly; but the fact that the control hospitals did better than the intervention hospitals raises many questions about the results.

3. Will the results help me in caring for my patients?

A. Were all clinically important outcomes measured? Yes **No** Unknown

It would have been helpful to measure cost, since participating hospitals that initiated an RRT didn't eliminate their code team. If a hospital has two teams, is the cost doubled? And what's the return on investment? There's also no mention of the benefits of the code team. This is a curious question . . . maybe another PICOT question?

B. What are the risks and benefits of the treatment?

This is the wrong question for an RRT. The appropriate question would be: What is the risk of not adequately introducing, monitoring, and evaluating the impact of an RRT?

C. Is the treatment feasible in my clinical setting? **Yes** No Unknown

We have administrative support, once we know what the evidence tells us. Based on this study, we don't know much more than we did before, except to be careful about how we approach and evaluate the issue. We need to keep the following issues, which the MERIT researchers raised in their discussion, in mind: 1) allow adequate time to measure outcomes; 2) some outcomes may be reliably measured sooner than others; 3) the process of implementing an RRT is very important to its success.

D. What are my patients' and their families' values and expectations for the outcome and the treatment itself?

We will keep this in mind as we consider the body of evidence.

Were the subjects analyzed in the group to which they were randomly assigned? Rebecca sees the term *intention-to-treat analysis* in the study and says that it sounds like statistical language. Carlos confirms that it is; it means that the researchers kept the hospitals in their assigned groups when they conducted the analysis, a technique intended to reduce possible bias. Even though the MERIT study used this technique, Carlos notes that in the discussion section the authors offer some important caveats about how the study was conducted, including poor intervention implementation, which may have contributed to MERIT's unexpected findings.[1]

Was the control group appropriate? Carlos explains that it's challenging to establish an appropriate comparison or control group without an understanding of how the intervention will be implemented. In this case, it may be problematic that the intervention group received education and training in implementing the RRT and the control group received no comparable placebo (meaning education and training about something else). But Carlos reminds the team that the researchers attempted to control for known confounding variables by stratifying the sample on characteristics such as academic versus nonacademic hospitals, bed size, and other important parameters. This method helps to ensure equal representation of these parameters in both the intervention and control groups. However, a major concern for clinicians considering whether to use the MERIT findings in their decision making involves the control hospitals' code teams and how they may have functioned as RRTs, which introduces a potential confounder into the study that could possibly invalidate the findings.

Were the instruments used to measure the outcomes valid and reliable? The overall measure in the MERIT study is the composite of the individual outcomes: CR, HMR, and unplanned admissions to the ICU (UICUA). These parameters were defined reasonably and didn't include do not resuscitate (DNR) cases. Carlos explains that since DNR cases are more likely to code or die, including them in the HMR and CR would artificially increase these outcomes and introduce bias into the findings.

As the team moves through the questions in the RCA checklist, Rebecca wonders how she and Chen would manage this kind of appraisal on their own. Carlos assures them that they'll get better at recognizing well-conducted research the more RCAs they do. Though Rebecca feels less than confident, she appreciates his encouragement nonetheless, and chooses to lead the team in discussion of the next question.

Were the demographics and baseline clinical variables of the subjects in each of the groups similar? Rebecca says that the intervention group and the control or comparison group need to be similar at the beginning of any intervention study because any differences in the groups could influence the outcome, potentially increasing the risk that the outcome might be unrelated to the intervention. She refers the team to their earlier discussion about confounding variables. Carlos tells Rebecca that her explanation was excellent. Chen remarks that Rebecca's focus on learning appears to be paying off.

WHAT ARE THE RESULTS?

As the team moves on to the second major question, Carlos tells them that many clinicians are apprehensive about interpreting statistics. He says that he didn't take courses in graduate school on conducting statistical analysis; rather, he learned about different statistical tests in courses that required students to look up how to interpret a statistic whenever they encountered it in the articles they were reading. Thus he had a context for how the statistic was being used and interpreted, what question the statistical analysis was answering, and what kind of data were being analyzed. He also learned to use a search engine, such as Google.com, to find an explanation for any statistical tests with which he was unfamiliar. Because his goal was to understand what the statistic meant clinically, he looked for simple Web sites with that same focus and avoided those with Greek symbols or extensive formulas that were mostly concerned with conducting statistical analysis.

How large is the intervention or treatment effect? As the team goes through the studies in their RCA, they decide to construct a list of statistics terminology for quick reference (see *A Sampling of Statistics*). The major statistic used in the MERIT study is the odds ratio (OR). The OR is used to provide insight into the measure of association between an intervention and an outcome. In the MERIT study, the control group did better than the intervention group, which is contrary to what was expected. Rebecca notes that the researchers discussed the possible reasons for this finding in the final section of the study. Carlos says that the authors' discussion about why their findings occurred is as important as the findings themselves. In this study, the discussion communicates to any clinicians considering initiating an RRT in their hospital that they should assess whether the current code team is already functioning

A Sampling of Statistics

Statistic	Simple Definition	Important Parameters	Understanding the Statistic	Clinical Implications
Odds Ratio (OR)	The odds of an outcome occurring in the intervention group compared with the odds of it occurring in the comparison or control group.	• If an OR is equal to 1, then the intervention didn't make a difference. • Interpretation depends on the outcome. • If the outcome is good (for example, fall prevention), the OR is preferred to be above 1. • If the outcome is bad (for example, mortality rate), the OR is preferred to be below 1.	The OR for hospital-wide mortality rates (HMR) in the MERIT study was 1.03 (95% CI, 0.84 – 1.28). The odds of HMR in the intervention group were about the same as HMR in the comparison group.	From the HMR OR data alone, a clinician may not feel confident that a rapid response team (RRT) is the best intervention to reduce HMR but may seek out other evidence before making a decision.
Relative Risk (RR)	The risk of an outcome occurring in the intervention group compared with the risk of it occurring in the comparison or control group.	• If an RR is equal to 1, then the intervention didn't make a difference. • Interpretation depends on the outcome. • If the outcome is good (for example fall prevention), the RR is preferred to be above 1. • If the outcome is bad (for example, mortality rate), the RR is preferred to be below 1.	The RR of cardiopulmonary arrest in adults was reported in the Chan PS, et al., 2010 systematic review[a] as 0.66 (95% CI, 0.54 – 0.80), which is statistically significant because there's no 1.0 in the CI. Thus, the RR of cardiopulmonary arrest occurring in the intervention group compared with the RR of it occurring in the control group is 0.66, or less than 1. Since cardiopulmonary arrest is not a good outcome, this is a desirable finding.	The RRT significantly reduced the RR of cardiopulmonary arrest in this study. From these data, clinicians can be reasonably confident that initiating an RRT will reduce CR in hospitalized adults.
Confidence Interval (CI)	The range in which clinicians can expect to get results if they present the intervention as it was in the study.	• CI provides the precision of the study finding: a 95% CI indicates that clinicians can be 95% confident that their findings will be within the range given in the study. • CI should be narrow around the study finding, not wide. • If a CI contains the number that indicates no effect (for OR it's 1; for effect size it's 0), the study finding is not statistically significant.	See the two previous examples.	In the Chan PS, et al., 2010 systematic review,[a] the CI is a close range around the study finding and is statistically significant. Clinicians can be 95% confident that if they conduct the same intervention, they'll have a result similar to that of the study (that is, a reduction in risk of cardiopulmonary arrest) within the range of the CI, 0.54 – 0.80. The narrower the CI range, the more confident clinicians can be that, using the same intervention, their results will be close to the study findings.
Mean (X)	Average	• Caveat: Averaging captures only those subjects who surround a central tendency, missing those who may be unique. For example, the mean (average) hair color in a classroom of schoolchildren captures those with the predominant hair color. Children with hair color different from the predominant hair color aren't captured and are considered outliers (those who don't converge around the mean).	In the Dacey MJ, et al., 2007 study,[a] before the RRT the average (mean) CR was 7.6 per 1,000 discharges per month; after the RRT, it decreased to 3 per 1,000 discharges per month.	Introducing an RRT decreased the average CR by more than 50% (7.6 to 3 per 1,000 discharges per month).

[a] For study details on Chan PS, et al., and Dacey MJ, et al., go to http://links.lww.com/AJN/A11.

as an RRT prior to RRT implementation.

How precise is the intervention or treatment? Chen wants to tackle the precision of the findings and starts with the OR for HMR, CR, and UICUA, each of which has a confidence interval (CI) that includes the number 1.0. In an EBP workshop, she learned that a 1.0 in a CI for OR means that the results aren't statistically significant, but she isn't sure what statistically significant means. Carlos explains that since the CIs for the OR of each of the three outcomes contains the number 1.0, these results could have been obtained by chance and therefore aren't statistically significant. For clinicians, chance findings aren't reliable findings, so they can't confidently be put into practice. Study findings that aren't statistically significant have a probability value (*P* value) of greater than 0.5. Statistically significant findings are those that aren't likely to be obtained by chance and have a *P* value of less than 0.5.

WILL THE RESULTS HELP ME IN CARING FOR MY PATIENTS?

The team is nearly finished with their checklist for RCTs. The third and last major question addresses the applicability of the study—how the findings can be used to help the patients the team cares for. Rebecca observes that it's easy to get caught up in the details of the research methods and findings and to forget about how they apply to real patients.

Were all clinically important outcomes measured? Chen says that she didn't see anything in the study about how much an RRT costs to initiate and how to compare that cost with the cost of one code or ICU admission. Carlos agrees that providing costs would have lent further insight into the results.

What are the risks and benefits of the treatment? Chen wonders how to answer this since the findings seem to be confounded by the fact that the control hospital had code teams that functioned as RRTs. She wonders if there was any consideration of the risks and benefits of initiating an RRT prior to beginning the study. Carlos says that the study doesn't directly mention it, but the consideration of the risks and benefits of an RRT is most likely what prompted the researchers to conduct the study. It's helpful to remember, he tells the team, that often the answer to these questions is more than just "yes" or "no."

Is the treatment feasible in my clinical setting? Carlos acknowledges that because the nursing administration is open to their project and supports it by providing time for the team to conduct its work, an RRT seems feasible in their clinical setting. The team discusses that nursing can't be the sole discipline involved in the project. They must consider how to include other disciplines as part of their next step (that is, the implementation plan). The team considers the feasibility of getting all disciplines on board and how to address several issues raised by the researchers in the discussion section (see *Rapid Critical Appraisal of the MERIT Study*), particularly if they find that the body of evidence indicates that an RRT does indeed reduce their chosen outcomes of CR, HMR, and UICUA.

What are my patients' and their families' values and expectations for the outcome and the treatment itself? Carlos asks Rebecca and Chen to discuss with their patients and their patients' families their opinion of an RRT and if they have any objections to the intervention. If there are objections, the patients or families will be asked to reveal them.

The EBP team finally completes the RCA checklists for the 15 studies and finds them all to be "keepers." There are some studies in which the findings are less than reliable; in the case of MERIT, the team decides to include it anyway because it's considered a landmark study. All the studies they've retained have something to add to their understanding of the impact of an RRT on CR, HMR, and UICUA. Carlos says that now that they've determined the 15 studies to be somewhat valid and reliable, they can add the rest of the data to the evaluation table.

Be sure to join the EBP team for "Critical Appraisal of the Evidence: Part III" in the next installment in the series, when Rebecca, Chen, and Carlos complete their synthesis of the 15 studies and determine what the body of evidence says about implementing an RRT in an acute care setting. ▼

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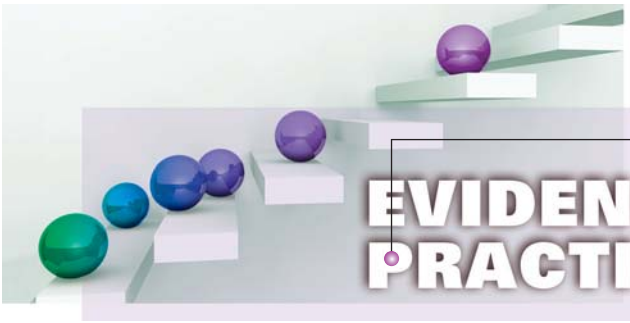

By Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, Susan B. Stillwell, DNP, RN, CNE, and Kathleen M. Williamson, PhD, RN

Critical Appraisal of the Evidence: Part III

The process of synthesis: seeing similarities and differences across the body of evidence.

This is the seventh article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every two months to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. See details below.

In September's evidence-based practice (EBP) article, Rebecca R., our hypothetical staff nurse, Carlos A., her hospital's expert EBP mentor, and Chen M., Rebecca's nurse colleague, rapidly critically appraised the 15 articles they found to answer their clinical question—"In *hospitalized adults* (P), how does a *rapid response team* (I) compared with *no rapid response team* (C) affect *the number of cardiac arrests* (O) and *unplanned admissions to the ICU* (O) during a *three-month period* (T)?"—and determined that they were all "keepers." The team now begins the process of evaluation and synthesis of the articles to see what the evidence says about initiating a rapid response team (RRT) in their hospital. Carlos reminds them that evaluation and synthesis are synergistic processes and don't necessarily happen one after the other. Nevertheless, to help them learn, he will guide them through the EBP process one step at a time.

STARTING THE EVALUATION

Rebecca, Carlos, and Chen begin to work with the evaluation table they created earlier in this process when they found and filled in the essential elements of the 15 studies and projects (see "Critical Appraisal of the Evidence: Part I," July). Now each takes a stack of the "keeper" studies and systematically begins adding to the table any remaining data that best reflect the study elements pertaining to the group's clinical question (see Table 1; for the entire table with all 15 articles, go to http://links.lww.com/AJN/A17). They had agreed that a "Notes" section within the "Appraisal: Worth to Practice" column would be a good place to record the nuances of an article, their impressions of it, as well as any tips—such as what worked in calling an RRT—that could be used later when they write up their ideas for initiating an RRT at their hospital, if the evidence points in that direction. Chen remarks that although she thought their initial table contained a lot of information, this final version is more thorough by far. She appreciates the opportunity to go back and confirm her original understanding of the study essentials.

The team members discuss the evolving patterns as they complete the table. The three systematic

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Table 1. Final Evaluation Table

First Author (Year)	Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied (and Their Definitions)	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Chan PS, et al. *Arch Intern Med* 2010;170(1): 18-26	None	SR Purpose: effect of RRT on HMR and CR • Searched 5 databases from 1950–2008 and "grey literature" from MD conferences • Included only 1) RCTs and prospective studies with 2) a control group or control period and 3) hospital mortality well described as outcome • Excluded 5 studies that met criteria due to no response to e-mail by primary authors	N = 18 out of 143 potential studies Setting: acute care hospitals; 13 adult, 5 peds Average no. beds: NR Attrition: NR	IV: RRT DV1: HMR (including DNR, excluding DNR, not treated in ICU, no HMR definition) DV2: CR	RRT: was the MD involved? HMR: overall hospital deaths (see definition) CR: cardio and/or pulmonary arrest; cardiac arrest calls	• Frequency • Relative risk	13/16 studies reporting team structure 7/11 adult and 4/5 peds studies had significant reduction in CR CR: • In adults, 21%–48% reduction in CR; RR 0.66 (95% CI, 0.54–0.80) • In peds, 38% reduction in CR; RR 0.62 (95% CI, 0.46–0.84) HMR: • In adults, HMR RR 0.96 (95% CI, 0.84–1.09) • In peds, HMR RR 0.79 (95% CI, 0.63–0.98)	Weaknesses: • Potential missed evidence with exclusion of all studies except those with control groups • Grey literature search limited to medical meetings • Only included HMR and CR outcomes • No cost data Strengths: • Identified no. of activations of RRT/1,000 admissions • Identified variance in outcome definition and measurement (for example, 10 of 15 studies included deaths from DNRs in their mortality measurement) Conclusion: • RRT reduces CR in adults, and CR and HMR in peds Feasibility: • RRT is reasonable to implement; evaluating cost will help in making decisions about using RRT • Risk/Benefit (harm): benefits outweigh risks

McGaughey J, et al. *Cochrane Database Syst Rev* 2007;3: CD005529	None	SR (Cochrane review) Purpose: effect of RRT on HMR • Searched 6 databases from 1990–2006 • Excluded all but 2 RCTs	N = 2 studies Acute care settings in Australia and the UK Attrition: NR	IV: RRT DV1: HMR	HMR: Australia: overall hospital mortality without DNR UK: Simplified Acute Physiology Score (SAPS) II death probability estimate	OR	OR of Australian study, 0.98 (95% CI, 0.83–1.16) OR of UK study, 0.52 (95% CI, 0.32–0.85)	Weaknesses: • Didn't include full body of evidence • Conflicting results of retained studies, but no discussion of the impact of lower-level evidence • Recommendation "need more research" Conclusion: • Inconclusive
Winters BD, et al. *Crit Care Med* 2007;35(5): 1238-43	None	SR Purpose: effect of RRT on HMR and CR • Searched 3 databases from 1990–2005 • Included only studies with a control group	N = 8 studies Average no. beds: 500 Attrition: NR	IV: RRT DV1: HMR DV2: CR	HMR: overall death rate CR: no. of in-hospital arrests	Risk ratio	HMR: • Observational studies, risk ratio for RRT on HMR, 0.87 (95% CI, 0.73–1.04) • Cluster RCTs, risk ratio for RRT on HMR, 0.76 (95% CI, 0.39–1.48) CR: • Observational studies, risk ratio for RRT on CR, 0.70 (95% CI, 0.56–0.92) • Cluster RCTs, risk ratio for RRT on CR, 0.94 (95% CI, 0.79–1.13)	Strengths: • Provides comparison across studies for ○ Study lengths (range, 4–82 months) ○ Sample size (range, 2,183–199,024) ○ Criteria for RRT initiation (common: respiratory rate, heart rate, blood pressure, mental status change; not all studies, but noteworthy: oxygen saturation, "worry") • Includes ideas about future evidence generation (conducting research)—finding out what we don't know Conclusion: • Some support for RRT, but not reliable enough to recommend as standard of care

CI = confidence interval; CR = cardiopulmonary arrest or code rates; DNR = do not resuscitate; DV = dependent variable; HMR = hospital-wide mortality rates; ICU = intensive care unit; IV = independent variable; MD = medical doctor; NR = not reported; OR = odds ratio; Peds = pediatrics; RCT = randomized controlled trial; RR = relative risk; RRT = rapid response team; SR = systematic review; UK = United Kingdom

reviews, which are higher-level evidence, seem to have an inherent bias in that they included only studies with control groups. In general, these studies weren't in favor of initiating an RRT. Carlos asks Rebecca and Chen whether, now that they've appraised all the evidence about RRTs, they're confident in their decision to include all the studies and projects (including the lower-level evidence) among the "keepers." The nurses reply with an emphatic affirmative! They tell Carlos that the projects and descriptive studies were what brought the issue to life for them. They realize that the higher-level evidence is somewhat in conflict with the lower-level evidence, but they're most interested in the conclusions that can be drawn from considering the entire body of evidence.

Rebecca and Chen admit they have issues with the systematic reviews, all of which include the MERIT study.[1-4] In particular, they discuss how the authors of the systematic reviews made sure to report the MERIT study's finding that the RRT had no effect, but didn't emphasize the MERIT study authors' discussion about how their study methods may have influenced the reliability of the findings (for more, see "Critical Appraisal of the Evidence: Part II," September). Carlos says that this is an excellent observation. He also reminds the team that clinicians may read a systematic review for the conclusion and never consider the original studies. He encourages Rebecca and Chen in their efforts to appraise the MERIT study and comments on how well they're putting the pieces of the evidence puzzle together. The nurses are excited that they're able to use their new knowledge to shed light on the study. They discuss with Carlos how the interpretation of the MERIT study has perhaps contributed to a misunderstanding of the impact of RRTs.

It's not the number of studies or projects that determines the reliability of their findings, but the uniformity and quality of their methods.

Comparing the evidence. As the team enters the lower-level evidence into the evaluation table, they note that it's challenging to compare the project reports with studies that have clearly described methodology, measurement, analysis, and findings. Chen remarks that she wishes researchers and clinicians would write study and project reports similarly. Although each of the studies has a process or method determining how it was conducted, as well as how outcomes were measured, data were analyzed, and results interpreted, comparing the studies as they're currently written adds another layer of complexity to the evaluation. Carlos says that while it would be great to have studies and projects written in a similar format so they're easier to compare, that's unlikely to happen. But he tells the team not to lose all hope, as a format has been developed for reporting quality improvement initiatives called the SQUIRE Guidelines; however, they aren't ideal. The team looks up the guidelines online (www.squire-statement.org) and finds that the Institute for Healthcare Improvement (IHI) as well as a good number of journals have encouraged their use. When they review the actual guidelines, the team notices that they seem to be focused on research; for example, they require a research question and refer to the study of an intervention, whereas EBP projects have PICOT questions and apply evidence to practice. The team discusses that these guidelines can be confusing to the clinicians authoring the reports on their projects. In addition, they note that there's no mention of the synthesis of the body of evidence that should drive an evidence-based project. While the SQUIRE Guidelines are a step in the right direction for the future, Carlos, Rebecca, and Chen conclude that, for now, they'll need to learn to read these studies as they find them—looking carefully for the details that inform their clinical question.

Once the data have been entered into the table, Carlos suggests that they take each column, one by one, and note the similarities and differences across the studies and projects. After they've briefly looked over the columns, he asks the team which ones they think they should focus on to answer their question. Rebecca and Chen choose "Design/Method," "Sample/Setting," "Findings," and "Appraisal: Worth to Practice" (see Table 1) as the initial ones to consider. Carlos agrees that these are the columns in which they're most likely to find the most pertinent information for their synthesis.

SYNTHESIZING: MAKING DECISIONS BASED ON THE EVIDENCE

Design/Method. The team starts with the "Design/Method" column because Carlos reminds them that it's important to note each study's level of evidence. He suggests that they take this information and create a synthesis table (one in which data is extracted from the evaluation table to better see the similarities and differences between studies) (see Table 2[1-15]). The synthesis table makes it clear that there is less higher-level and more lower-level evidence, which will impact the reliability of the overall findings. As the team noted, the higher-level evidence is not without methodological issues, which will increase the challenge of coming to a conclusion about the impact of an RRT on the outcomes.

Sample/Setting. In reviewing the "Sample/Setting" column, the group notes that the number of hospital beds ranged from 218 to 662 across the studies. There were several types of hospitals represented (4 teaching, 4 community, 4 no mention, 2 acute care hospitals, and 1 public hospital). The evidence they've collected seems applicable, since their hospital is a community hospital.

Findings. To help the team better discuss the evidence, Carlos suggests that they refer to all projects or studies as "the body of evidence." They don't want to get confused by calling them all studies, as they aren't, but at the same time continually referring to "studies and projects" is cumbersome. He goes on to say that, as part of the synthesis process, it's important for the group to determine the overall impact of the intervention across the body of evidence. He helps them create a second synthesis table containing the findings of each study or project (see Table 3[1-15]). As they look over the results, Rebecca and Chen note that RRTs reduce code rates, particularly outside the ICU, whereas unplanned ICU admissions (UICUA) don't seem to be as affected by them. However, 10 of the 15 studies and projects reviewed didn't evaluate this outcome, so it may not be fair to write it off just yet.

Table 2: The 15 Studies: Levels and Types of Evidence

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Level I: Systematic review or meta-analysis	X	X	X												
Level II: Randomized controlled trial				X											
Level III: Controlled trial without randomization															
Level IV: Case-control or cohort study					X	X									
Level V: Systematic review of qualitative or descriptive studies															
Level VI: Qualitative or descriptive study (includes evidence implementation projects)							X	X	X	X	X	X	X	X	X
Level VII: Expert opinion or consensus															

Adapted with permission from Melnyk BM, Fineout-Overholt E, editors. Evidence-based practice in nursing and healthcare: a guide to best practice. 2nd ed. Philadelphia: Wolters Kluwer Health / Lippincott Williams and Wilkins; 2010.

1 = Chan PS, et al. (2010); 2 = McGaughey J, et al.; 3 = Winters BD, et al.; 4 = Hillman K, et al.; 5 = Sharek PJ, et al.; 6 = Chan PS, et al. (2009); 7 = DeVita MA, et al.; 8 = Mailey J, et al.; 9 = Dacey MJ, et al.; 10 = McFarlan SJ, Hensley S.; 11 = Offner PJ, et al.; 12 = Bertaut Y, et al.; 13 = Benson L, et al.; 14 = Hatler C, et al.; 15 = Bader MK, et al.

Table 3: Effect of the Rapid Response Team on Outcomes

	1[a]	2[a]	3[a]	4[a]	5[a]	6[a]	7	8	9	10	11	12	13	14	15
HMR	— adult ↓[b] peds	—	—	—	↓[b]	—	NE	↓[c]	↓[b]	NR	NE	—	↓[c]	NE	↓[b,d]
CRO	NE	NE	NE	NE	↓[c]	↓[b]	NE	NE	↓[b]	↓[c]	↓[b]	↓[c]	NE	↓[c]	↓[c]
CR	↓[b] peds and adult	NE	↓[b]	—	NE	—	↓[b]	↓[c]	NE	NE	NE	NE	↓[b]	NE	NE
UICUA	NE	NE	NE	—	NE	NE	NE	NE	↓[b]	↑[c]	NE	NE	NE	—	↓[b]

1 = Chan PS, et al. (2010); 2 = McGaughey J, et al.; 3 = Winters BD, et al.; 4 = Hillman K, et al.; 5 = Sharek PJ, et al.; 6 = Chan PS, et al. (2009); 7 = DeVita MA, et al.; 8 = Mailey J, et al.; 9 = Dacey MJ, et al.; 10 = McFarlan SJ, Hensley S.; 11 = Offner PJ, et al.; 12 = Bertaut Y, et al.; 13 = Benson L, et al.; 14 = Hatler C, et al.; 15 = Bader MK, et al.

CR = cardiopulmonary arrest or code rates; CRO = code rates outside the ICU; HMR = hospital-wide mortality rates; NE = not evaluated; NR = not reported; UICUA = unplanned ICU admissions

[a] higher-level evidence; [b] statistically significant findings; [c] statistical significance not reported; [d] non-ICU mortality was reduced

The EBP team can tell from reading the evidence that researchers consider the impact of an RRT on hospital-wide mortality rates (HMR) as the more important outcome; however, the group remains unconvinced that this outcome is the best for evaluating the purpose of an RRT, which, according to the IHI, is early intervention in patients who are unstable or at risk for cardiac or respiratory arrest.[16] That said, of the 11 studies and projects that evaluated mortality, more than half found that an RRT reduced it. Carlos reminds the group that four of those six articles are level-VI evidence and that some weren't research. The findings produced at this level of evidence are typically less reliable than those at higher levels of evidence; however, Carlos notes that two articles having level-VI evidence, a study and a project, had statistically significant (less likely to occur by chance, $P < 0.05$) reductions in HMR, which increases the reliability of the results.

Chen asks, since four level-VI reports documented that an RRT reduces HMR, should they put more confidence in findings that occur more than once? Carlos replies that it's not the number of studies or projects that determines the reliability of their findings, but the uniformity and quality of their methods. He recites something he heard in his Expert EBP Mentor program that helped to clarify the concept of making decisions based on the evidence: the level of the evidence (the design) plus the quality of the evidence (the validity of the methods) equals the strength of the evidence, which is what leads clinicians to act in confidence and apply the evidence (or not) to their practice and expect similar findings (outcomes). In terms of making a decision about whether or not to initiate an RRT, Carlos says that their evidence stacks up: first, the MERIT study's results are questionable because of problems with the study methods, and this affects the reliability of the three systematic reviews as well as the MERIT study itself; second, the reasonably conducted lower-level studies/projects, with their statistically significant findings, are persuasive. Therefore, the team begins to consider the possibility that initiating an RRT may reduce code rates outside the ICU (CRO) and may impact non-ICU mortality; both are outcomes they would like to address. The evidence doesn't provide equally

promising results for UICUA, but the team agrees to include it in the outcomes for their RRT project because it wasn't evaluated in most of the articles they appraised.

As the EBP team continues to discusses probable outcomes, Rebecca points to one study's data in the "Findings" column that shows a financial return on investment for an RRT.[9] Carlos remarks to the group that this is only one study, and that they'll need to make sure to collect data on the costs of their RRT as well as the cost implications of the outcomes. They determine that the important outcomes to measure are: CRO, non-ICU mortality (excluding patients with do not resuscitate [DNR] orders), UICUA, and cost.

Appraisal: Worth to Practice. As the team discusses their synthesis and the decision they'll make based on the evidence,

Table 4. Defined Criteria for Initiating an RRT Consult

	4	8	9	13	15
Respiratory distress (breaths/min)	Airway threatened Respiratory arrest RR < 5 or > 36	RR < 10 or > 30	RR < 8 or > 30 Unexplained dyspnea	RR < 8 or > 28 New-onset difficulty breathing	RR < 10 or > 30 Shortness of breath
Change in mental status	Change in LOC Decrease in Glasgow Coma Scale of > 2 points	ND	Unexplained change	Sudden decrease in LOC with normal blood glucose	Decreased LOC
Tachycardia (beats/min)	>140	> 130	Unexplained > 130 for 15 min	> 120	> 130
Bradycardia (beats/min)	< 40	< 60	Unexplained < 50 for 15 min	< 40	< 40
Blood pressure (mmHg)	SBP < 90	SBP < 90 or > 180	Hypotension (unexplained)	SBP > 200 or < 90	SBP < 90
Chest pain	Cardiac arrest	ND	ND	Complaint of nontraumatic chest pain	Complaint of nontraumatic chest pain
Seizures	Sudden or extended	ND	ND	Repeated or prolonged	ND
Concern/worry about patient	Serious concern about a patient who doesn't fit the above criteria	NE	Nurse concern about overall deterioration in patients' condition without any of the above criteria (p. 2077)	Nurse concern	• Uncontrolled pain • Failure to respond to treatment • Unable to obtain prompt assistance for unstable patient
Pulse oximetry (SpO_2)	NE	NE	NE	< 92%	< 92%
Other				• Color change of patient • Unexplained agitation for > 10 min • CIWA > 15 points	• UOP < 50 cc/4 hr • Color change of patient (pale, dusky, gray, or blue) • New-onset limb weakness or smile droop • Sepsis: ≥ 2 SIRS criteria

4 = Hillman K, et al.; 8 = Mailey J, et al.; 9 = Dacey MJ, et al.; 13 = Benson L, et al.; 15 = Bader MK, et al.

cc = cubic centimeters; CIWA = Clinical Institute Withdrawal Assessment; hr = hour; LOC = level of consciousness; min = minute; mmHg = millimeters of mercury; ND = not defined; NE = not evaluated; RR = respiratory rate; SBP = systolic blood pressure; SIRS = systemic inflammatory response syndrome; SpO_2= arterial oxygen saturation; UOP = urine output

Rebecca raises a question that's been on her mind. She reminds them that in the "Appraisal: Worth to Practice" column, teaching was identified as an important factor in initiating an RRT and expresses concern that their hospital is not an academic medical center. Chen reminds her that even though theirs is not a designated teaching hospital with residents on staff 24 hours a day, it has a culture of teaching that should enhance the success of an RRT. She adds that she's already hearing a buzz of excitement about their project, that their colleagues across all disciplines have been eager to hear the results of their review of the evidence. In addition, Carlos says that many resources in their hospital will be available to help them get started with their project and reminds them of their hospital administrators' commitment to support the team.

ACTING ON THE EVIDENCE

As they consider the synthesis of the evidence, the team agrees that an RRT is a valuable intervention to initiate. They decide to take the criteria for activating an RRT from several successful studies/projects and put them into a synthesis table to better see their major similarities (see Table 4[4, 8, 9, 13, 15]). From this combined list, they choose the criteria for initiating an RRT consult that they'll use in their project (see Table 5). The team also begins discussing the ideal make up for their RRT. Again, they go back to the evaluation table and look

Table 5. Defined Criteria for Initiating an RRT Consult at Our Hospital

Pulmonary	
Ventilation	Color change of patient (pale, dusky, gray, or blue)
Respiratory distress	RR < 10 or > 30 breaths/min or unexplained dyspnea or new-onset difficulty breathing or shortness of breath
Cardiovascular	
Tachycardia	Unexplained > 130 beats/min for 15 min
Bradycardia	Unexplained < 50 beats/min for 15 min
Blood pressure	Unexplained SBP < 90 or > 200 mmHg
Chest pain	Complaint of nontraumatic chest pain
Pulse oximetry	< 92% SpO_2
Perfusion	UOP < 50 cc/4 hr
Neurologic	
Seizures	Initial, repeated, or prolonged
Change in mental status	• Sudden decrease in LOC with normal blood glucose • Unexplained agitation for > 10 min • New-onset limb weakness or smile droop
Concern/worry about patient	Nurse concern about overall deterioration in patients' condition without any of the above criteria
Sepsis	
	• Temp, > 38°C • HR, > 90 beats/min • RR, > 20 breaths/min • WBC, > 12,000, < 4,000, or > 10% bands

cc = cubic centimeters; hr = hours; HR = heart rate; LOC = level of consciousness; min = minute; mmHg = millimeters of mercury; RR = respiratory rate; SBP = systolic blood pressure; SpO_2 = arterial oxygen saturation; Temp = temperature; UOP = urine output; WBC = white blood count

over the "Major Variables Studied" column, noting that the composition of the RRT varied among the studies/projects. Some RRTs had active physician participation (n = 6), some had designated physician consultation on an as-needed basis (n = 2), and some were nurse-led teams (n = 4). Most RRTs also had a respiratory therapist (RT). All RRT members had expertise in intensive care and many were certified in advanced cardiac life support (ACLS). They agree that their team will be comprised of ACLS-certified members. It will be led by an acute care nurse practitioner (ACNP) credentialed for advanced procedures, such as central line insertion. Members will include an ICU RN and an RT who can intubate. They also discuss having physicians willing to be called when needed. Although no studies or projects had a chaplain on their RRT, Chen says that it would make sense in their hospital. Carlos, who's been on staff the longest of the three, says that interdisciplinary collaboration has been a mainstay of their organization. A physician, ACNP, ICU RN, RT, and chaplain are logical choices for their RRT.

As the team ponders the evidence, they begin to discuss the next step, which is to develop ideas for writing their project implementation plan (also called a protocol). Included in this protocol will be an educational plan to let those involved in the project know information such as the evidence that led to the project, how to call an RRT, and outcome measures that will indicate whether or not the implementation of the evidence was successful. They'll also need an evaluation plan. From reviewing the studies and projects, they also realize that it's important to focus their plan on evidence implementation, including carefully evaluating both the process of implementation and project outcomes.

As they consider the synthesis of the evidence, the team agrees that an RRT is a valuable intervention to initiate.

Be sure to join the EBP team in the next installment of this series as they develop their implementation plan for initiating an RRT in their hospital, including the submission of their project proposal to the ethics review board. ▼

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EVIDENCE-BASED PRACTICE Step by Step

Evaluating and Disseminating the Impact of an Evidence-Based Intervention: Show and Tell

After the data are gathered and analyzed, it's time to share what you've learned.

This is the 11th article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series has been to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. The final article in the series will be published in the September issue.

In the previous article in this series, Carlos A., Rebecca R., and Chen M. completed the unit-based pilot phase of the rapid response team (RRT) rollout. They found that the RRT worked well, and they are now ready to evaluate its impact on their chosen outcomes. The hospital leadership as well as the staff had agreed upon the following outcomes: code rates outside the ICU (CRO), unplanned ICU admissions (UICUA), and hospital-wide mortality rates (excluding do-not-resuscitate situations) (HMR). Karen H., the nurse from the Clinical Informatics Department, and the pilot unit's quality council representative devised a mechanism to successfully export the RRT data from the electronic medical record (EMR) to a database that would serve as a repository until the data could be analyzed. The other departments collecting RRT outcomes data have been forwarding their information to Rebecca and Chen, who've asked Karen for help in getting this additional data onto the hospital's quality dashboard. Karen suggests that she and the EBP team meet to discuss ways to upload all of the data to one place and create a single comprehensive and regularly available summary of the RRT outcomes.

At that meeting, Karen suggests that the EBP team work out a plan with the Quality/Performance Improvement Department to analyze the data before they're posted on the dashboard, where they'll be available to everyone on the hospital intranet. The EBP team members share their excitement about taking the next step in the EBP implementation process. But when Carlos contacts the director of the department, the director informs him that it may be impossible for quality/performance improvement to take on this project at this time, as their analysts are already overloaded with work. Chen mentions that she's heard that university researchers may be interested in these kinds of projects, and that collaboration with a university might lead to further projects, which could keep the kind of excitement generated by the RRT initiative going. Carlos says that he has some connections at the local university and offers to discuss this opportunity with them.

GATHERING AND EVALUATING THE RESULTS

Carlos calls the dean of research at the hospital's academic partner to inquire about interest in collaborating on the RRT project, particularly from a research perspective. The dean says there's a researcher who is very interested in the processes of codes and may want to get on board with their project. Carlos asks about data analysis and interpretation as part of that collaboration, and the dean replies that the university has resources they can use to accomplish that part of the evaluation process. Carlos lets Rebecca and Chen know of this opportunity and sends an e-mail to Debra P., the faculty researcher, outlining the RRT project and asking if she's interested in participating. Debra responds the next day, indicating her delight to be involved. The EBP team is excited that they'll have this opportunity to partner with the local university and accomplish their goal of performing data analysis.

By Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Lynn Gallagher-Ford, MSN, RN, NE-BC, Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, and Susan B. Stillwell, DNP, RN, CNE

Carlos discusses the initial RRT data with Debra, and they analyze it together. First, they look at the mean outcomes of CRO, HMR, and UICUA that were obtained from the real-time RRT reports. When they compare these outcomes over time, they see that the mean CRO was reduced, but that the mean HMR and UICUA hadn't changed from baseline. Debra asks whether there was any variation in the occupancy rate over the period of the pilot rollout; if there was, then the proportion of patients experiencing codes before and during the rollout might not be comparable. When Carlos replies that the occupancy rate remained consistent, Debra recommends that they conduct an independent *t* test to see if there's a statistically significant difference between CRO before and after the pilot phase. They find that the decrease in CRO is statistically significant, which means that the RRT had a positive effect on this important outcome that most likely wasn't a chance finding. The EBP team can't wait to share this great news with the unit. The team reviews with Debra the code records and RRT comments to determine if there were any RRT processes that might have had an impact on UICUA and HMR, and thereby explain the lack of a change from baseline. The team also provides Debra with questions about how the pilot went (who called the RRT and why? what challenges did the RRT face?) that they believe would be important to ask the stakeholders during the debriefing after the pilot. Debra says that these questions will be very helpful as she looks over the RRT processes. Having them in mind, she can see if the answers exist in the current data, if more data need to be gathered, or if further questions need to be asked.

After taking time to reflect on these processes, the EBP team works with Debra to revise them. Debra explains that it's important to plan the hospital-wide rollout so that all unit managers and staff are confident they understand the protocol, processes, and desired outcomes. They ask Pat M., the manager of the pilot unit, and two of her EBP champions to relate their experiences with the RRT to the executive leadership team, the unit managers' meeting, and the unit council leadership meeting. The unit managers were especially glad to hear Pat's story and her answers to their questions.

As the EBP team continues to discuss plans for a hospital-wide RRT, Debra's suggestions for how to improve the RRT processes in the larger rollout are easily integrated into the plan. For example, she proposes a simple way to examine the outcomes of HMR and UICUA: since ICU deaths were included in the HMR data, she suggests that they ask the Health Information Management Systems/Medical Records (HIMS) Department to compare the ICU deaths that occurred despite the presence of an RRT with those that occurred without an RRT present. Debra explains to the team that these data may help them to have a better picture of the impact of the RRT on HMR. She applies the same approach to UICUA, comparing the ICU admissions of those who'd been treated by the RRT with those who hadn't. She further explains how the team can continue to observe the changes in these two outcomes over time. The EBP team is glad to hear that Debra will continue to help as they collect and analyze these data.

In preparation for the hospital-wide rollout, the EBP council confirms that EBP champions on each unit will be responsible for working with the educators to conduct education sessions about the RRT. Each unit participating in the rollout has already had three in-services on all shifts, posters put up in the bathroom and staff lounge, and an algorithm posted at the unit hub explaining how to call the RRT. Finally, nurses and secretaries from all units are invited to a meeting at which Debra and the EBP team answer all questions

Dissemination Workshop Agenda

Joint session (one hour)
- Dissemination: Purposes and Passions
  - What outcome do you want to achieve by disseminating your results?
  - Discussion
- Methods of Dissemination
  - Determine which method of dissemination is the best match for your message or outcome or both.
  - Determine which method capitalizes on your strengths.
  - Discussion and demonstration or case study

Breakout sessions (one hour)
- Publishing: Who, What, When, Where, and How of Publishing
- Presentations: Effective, Fun Presentations People Will Remember

concerning the procedure for calling an RRT.

After the hospital-wide project begins, the EBP team asks HIMS if all is well with the baseline data and how the outcomes data are being collected. HIMS informs them that indeed the staff is doing a terrific job of entering the data into the EMR. The initial RRT reports indicate that the hospital-wide rollout is going well and that the RRT protocol is being used appropriately. When the EBP team informally interviews EBP council members, they find that everyone is seeing the difference the RRT is making—and not only in the outcomes. Clinicians, for example, are experiencing a difference in how they're helping patients avoid those outcomes. This pleases the EBP team and they look forward to sharing this serendipitous finding.

Presentation Tips

- Keep the outcome that you want for your presentation in mind from the beginning: what do you want the audience to take away?
- Take care with the background and color schemes for your PowerPoint slides. Simple is best.
- Keep your presentation simple, innovative, and interesting. Don't overuse animation or sound.
- Use pictures to enhance, not dominate, the presentation.
- Keep your time frame in mind: usually one slide per minute works well.
- Use no smaller than a 20-point font on a slide if the presentation is for a smaller audience or room, no smaller than a 28-point font for larger rooms or audiences.
- Use text on a slide for sharing highlights and important points, not for everything.
- Revise your presentation at least three to five times before submission.
- Keep backups of the presentation on a jump-drive (or two)
- Have fun as your create YOUR presentation—be unique.

PREPARING TO DISSEMINATE THE RESULTS

As the EBP team discusses how to disseminate the results of their project, they reiterate their commitment to involve the EBP council members, who have made such a major contribution to the project's success. Debra suggests that they hold a special meeting with unit managers to answer their questions, and to give them an overview of the dissemination plan, including the impact it may have on each unit's budget. The meeting with the managers turns out to be a lively discussion about the value of dissemination and its related costs. The managers are concerned that presenting the results of the RRT intervention at conferences is not a budgeted item for this year; they're also concerned about the challenges these opportunities will present, such as being able to support the scholarship of those clinicians whose work is accepted.

The EBP team reflects on what a difference just asking and answering the right question has made in their hospital.

The EBP team helps the unit managers to understand that each time a clinician presents an aspect of the RRT process or outcome, the unit and hospital get positive exposure. Eventually most managers agree that dissemination is a worthwhile investment and commit to be as creative and flexible with their budgets as possible as they plan for the next fiscal year. They discuss how important it is to support these new learning and development opportunities for their staff. One unit manager, however, says that there's no way she can support anyone from her unit presenting at a conference. The EBP team informs her that several manuscripts about the RRT will be submitted for publication, which creates the perfect opportunity for those who wish to contribute, but who may not have the budget this year, to support the presentations.

The EBP team decides to hold a continuing education workshop on dissemination. They invite the EBP council members to come and bring anyone from their units who has been involved in the RRT project and is interested in contributing to presentations or publications about it. In preparing to conduct this class, the team makes a list of the aspects of the RRT project that would be important to include in a presentation or publication or both. They work out an agenda for the workshop (see *Dissemination Workshop Agenda*). Rebecca, Chen, and Carlos are excited about sharing the outcomes of first the pilot and then the rollout to the whole hospital. They are thrilled that they've made such a difference in their hospital's culture, as well as in patient outcomes.

MAKING DISSEMINATION PLANS

The EBP council, the educators, the RRT, and the EBP team, along with Debra, meet to discuss how to plan for dissemination of the project and its results. They discuss first putting the results of

the pilot and then of the hospital-wide RRT rollout on the hospital's intranet. Carlos invites Karen from clinical informatics to join them to discuss the possibility of having an "EBP Corner" on the intranet, where updates can be provided for the latest EBP events. Karen says this is very doable and that she'll get back to them in a couple of days on how to set this up and how they'll be able to contribute to it. Carlos agrees to take the lead for this aspect of the dissemination project.

The EBP council, with mentorship from Rebecca and Chen, expresses the desire to present the RRT project at a professional meeting. The group decides that one of the annual EBP conferences across the country would be the best place to share this project. Debra offers to help council members review the variety of EBP conferences and discuss which would be the best match. She asks them to consider which audience would like to hear about their project and where it could have a meaningful impact. She offers to join them when they start to write and then submit an abstract, and, if it's accepted, to help them put together the presentation. She also shares tips she's used that have served her well (see *Presentation Tips*).

To the EBP team's great delight, the chief nursing officer pops into the council meeting and tells everyone that she wants to submit this project to the American Organization of Nurse Executives (AONE) annual meeting. She's so excited about the synergy between leadership and staff that she believes this is just what participants at AONE need to hear. Carlos asks the members of the RRT if they'd like to discuss the possibility of presenting their experience at the annual Institute for Healthcare Improvement (IHI) meeting, which he tells the group may be a good venue for this project. They readily discuss sharing how their transdisciplinary team worked together to improve outcomes and other issues from the project that would interest IHI participants. They all agree to engage in this discussion further as the project continues.

Amid all this activity, Rebecca and Chen remind Carlos that there are clinicians who would rather publish than present. Carlos and Debra meet with those who are interested in publishing to provide an overview of the publishing process (see *Publishing Tips*). They assure those individuals who feel they don't write well enough to publish in a journal that they'll do fine as part of a team.

With plans in hand, the teams of clinicians begin to prepare their abstracts or manuscripts. The presenting teams submit their abstracts to their respective conferences. The writing teams take a little longer to prepare their manuscripts, while their team leaders call or write the journals they've selected to see if there's any interest in articles on various aspects of the RRT. The EBP team reflects on their initial PICOT question and on what a difference just asking the right question and answering it appropriately has made in their hospital.

Join the EBP team next time as they complete the hospital-wide rollout and make the RRT a hospital policy. In so doing, they will learn how to create system-wide sustainable change. ▼

Publishing Tips

- Know the purpose of your manuscript.
- Determine the audience for your manuscript.
- Determine the journal that best matches the purpose of your manuscript.
- Obtain the author guidelines for this journal.
- Review several journal articles from this journal; noting the structure of these articles can help with structuring your manuscript.
- Send a query letter to the editor.
- Develop an outline for your manuscript; be as descriptive and detailed as possible.
- Divide writing the outline among the authors; all authors should contribute to the manuscript.
- Write, read, rewrite, reread, rewrite, reread, and rewrite your manuscript. Have others read the manuscript and provide feedback; now is the time to get critical feedback to assist in the successful submission to a journal.
- Decide on a relevant title that would compel you to read the manuscript.
- Reread and revise one last time.
- SUBMIT—although rewriting has moved your manuscript toward perfection, don't wait for it to be entirely perfect. Expect journal reviewers to have suggestions and criticism.
- Believe in your message and its benefit to the reader.

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By Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Susan B. Stillwell, DNP, RN, CNE, and Kathleen M. Williamson, PhD, RN

Igniting a Spirit of Inquiry: An Essential Foundation for Evidence-Based Practice

How nurses can build the knowledge and skills they need to implement EBP.

This is the first article in a new series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this new series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every two months to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we'll schedule "Ask the Authors" call-ins every few months to provide a direct line to the experts to help you resolve questions. Details about how to participate in the calls will be published with January's *Evidence-Based Practice: Step by Step*.

Do you ever wonder why nurses engage in practices that aren't supported by evidence, while not implementing practices substantiated by a lot of evidence? In the past, nurses changed hospitalized patients' IV dressings daily, even though no solid evidence supported this practice. When clinical trials finally explored how often to change IV dressings, results indicated that daily changes led to higher rates of phlebitis than did less frequent changes.[1] In many hospital EDs across the country, children with asthma are treated with albuterol delivered with a nebulizer, even though substantial evidence shows that when albuterol is delivered with a metered-dose inhaler plus a spacer, children spend less time in the ED and have fewer adverse effects.[2] Nurses even disrupt patients' sleep, which is important for restorative healing, to document blood pressure and pulse rate because it's hospital policy to take vital signs every two or four hours, even though no evidence supports that doing so improves the identification of potential complications. In fact, clinicians often follow outdated policies and procedures without questioning their current relevance or accuracy, or the evidence for them.

Every day, nurses perform interventions (for example, administering medication, positioning, suctioning) that should stimulate questions about the evidence supporting their use.

When a spirit of inquiry—an ongoing curiosity about the best evidence to guide clinical decision making—and a culture that supports it are lacking, clinicians are unlikely to embrace evidence-based practice (EBP). Every day, nurses across the care continuum perform a multitude of interventions (for example, administering medication, positioning, suctioning) that should stimulate questions about the evidence supporting their use. When a nurse possesses a spirit of inquiry within a supportive EBP culture, she or he can routinely ask questions about clinical practice while care is being delivered. For example, in patients with endotracheal tubes, how does use of saline with suctioning compared with suctioning without saline affect oxygen saturation?

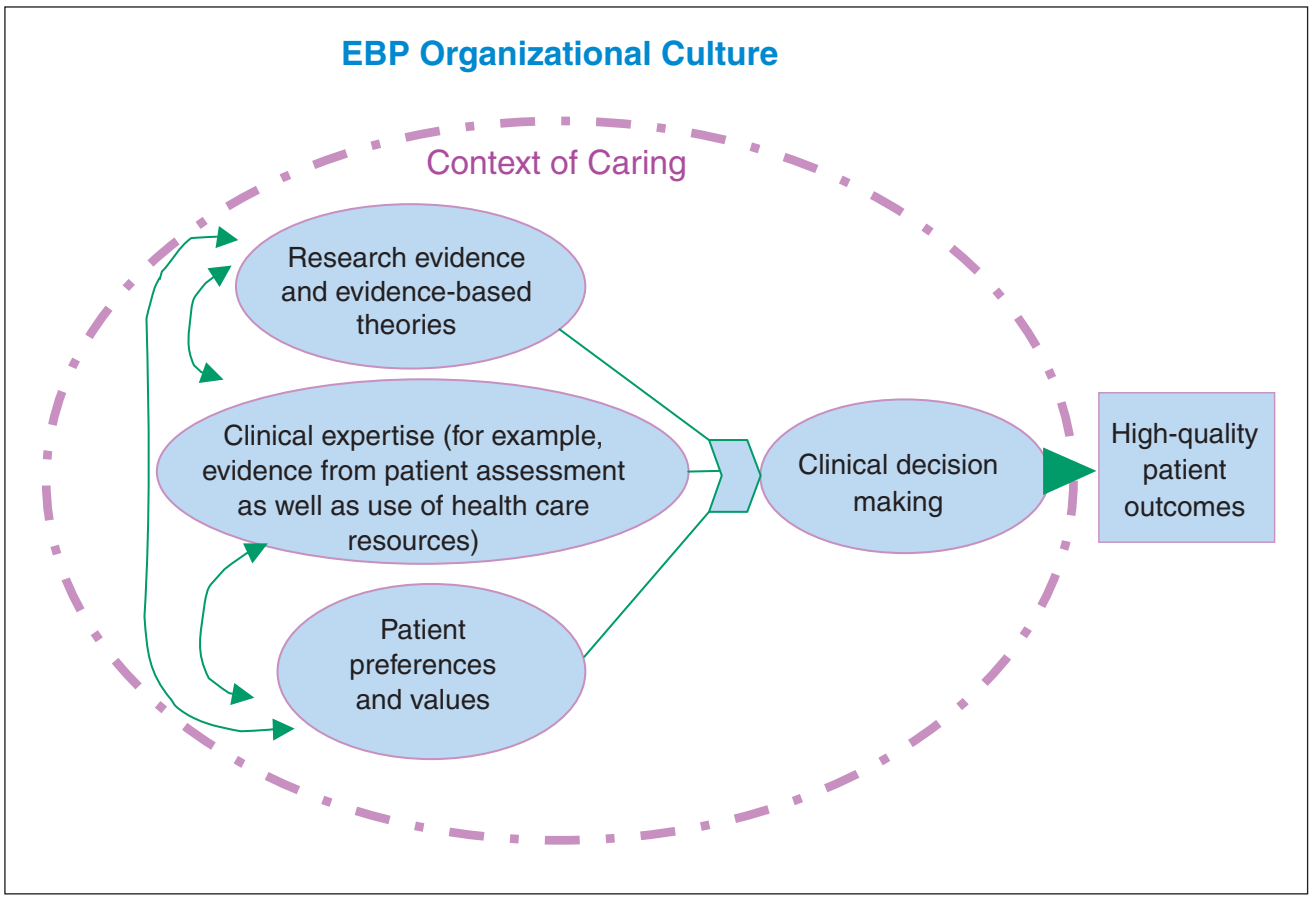

Figure 1. The EBP Paradigm: the merging of science and art. EBP within a context of caring and an EBP culture results in the highest quality of health care and patient outcomes. © Melnyk and Fineout-Overholt, 2003.

In patients with head injury, how does elevating the head of the bed compared with keeping a patient in a supine position affect intracranial pressure? In postoperative surgical patients, how does the use of music compared with no use of music affect the frequency of pain medication administration?

The Institute of Medicine has set a goal that by 2020, 90% of all health care decisions in the United States will be evidence based,[3] but the majority of nurses are still not consistently implementing EBP in their clinical settings.[4] To foster outcomes-driven health care in which decisions are based on evidence, providers and health care systems need a comprehensive approach to ensure that their results are measured.[5] Without EBP, patients don't receive the highest quality of care, health outcomes are seriously jeopardized, and health care costs soar.[6] Findings from recent studies also indicate that when nurses and other health care providers engage in EBP, they experience greater autonomy in their practices and a higher level of job satisfaction.[7] At a time when this country is facing the most serious nursing shortage in its history, empowering nurses to routinely engage in EBP may lead to less turnover and lower vacancy rates, in addition to improving the quality of health care and patient outcomes.

To accelerate the use of EBP by nurses and other health care providers, some insurers have instituted pay-for-performance programs that offer clinicians incentives to follow evidence-based guidelines. And Medicare no longer reimburses hospitals for treating preventable hospital-acquired injuries or infections (such as falls, pressure ulcers, or ventilator-associated pneumonia). Although these measures should improve the overall quality of care in our hospitals, it's well known that extrinsic motivators are typically not more successful in facilitating a change in behavior than intrinsic motivators. Therefore, for EBP to accelerate and

thrive in the U.S. health care system, nurses must have

- a never-ending spirit of inquiry and consistently question current clinical practices.
- strong beliefs in the value of EBP.
- knowledge of and skills in EBP along with the confidence to use it.
- a commitment to deliver the highest quality evidence-based care to patients and their families.

In addition, health care institutions must sustain a culture that embraces EBP, including providing clinicians the support and tools they need to engage in evidence-based care.

EBP is a problem-solving approach to the delivery of health care that integrates the best evidence from well-designed studies and patient care data, and combines it with patient preferences and values and nurse expertise.[8, 9] However, there's no magic formula for what percentage of a clinical decision should be based on evidence or patient preferences or nurse expertise. The weight given to each of these three EBP components varies according to the clinical situation. For example, evidence-based guidelines might indicate that a young child with an ear infection receive amoxicillin and clavulanate (Augmentin) if the infection hasn't resolved with amoxicillin. However, if the child dislikes the taste and it's likely that the medication won't be taken, patient preference should outweigh the best practice guideline and an alternative antibiotic should be prescribed.

Although EBP may be referred to as evidence-based medicine, evidence-based nursing, or evidence-based physical therapy within various disciplines, we advocate referring to all of these as *evidence-based practice*, in order to stimulate transdisciplinary evidence-based care and avoid the specialized terminology that can isolate the various health professions.

When nurses implement EBP within a context of caring and a supportive organizational culture, the highest quality of care is delivered and the best patient, provider, and system outcomes are achieved (see Figure 1).[10] Despite outcomes being substantially better when patients receive evidence-based care, nurses and other health care providers often cite barriers that prevent its delivery, including[10, 11]

- inadequate EBP knowledge and skills.
- a lack of EBP mentors to work with providers at the point of care.
- inadequate resources and support from higher administration.
- insufficient time, especially when there are demanding patient caseloads and staffing shortages.

Conversely, a number of factors facilitate the implementation of EBP, including[8, 12, 13]

- EBP knowledge and skills.
- belief in the value of EBP and the ability to implement it.
- a culture that supports EBP and provides the necessary tools to sustain evidence-based care (for example, access to computer databases at the point of care and time to search for evidence).
- EBP mentors (advanced practice clinicians with expertise in EBP and organizational and individual behavior-change strategies) who work directly with clinicians at the point of care in implementing EBP.

Once nurses gain EBP knowledge and skills, they realize it's not only feasible within the context of their practice setting, but that it reignites their passion for

Questions that Spark a Spirit of Inquiry

- *Who* can I seek out to assist me in enhancing my evidence-based practice (EBP) knowledge and skills and serve as my EBP mentor?
- *Which* of my practices are currently evidence based and which don't have any evidence to support them?
- *When* is the best time to question my current clinical practices and with whom?
- *Where* can I find the best evidence to answer my clinical questions?
- *Why* am I doing what I do with my patients?
- *How* can I become more skilled in EBP and mentor others to implement evidence-based care?

Strategies for Building a Spirit of Inquiry

Write "WHY?" on a poster and place it in the staff lounge or restroom to inspire questions from nurses about why they're engaging in certain practices with their patients. Gather the responses in an answer box. After one month, take the responses and arrange them according to common themes. Address the themes in a staff meeting.

Review and answer the *Questions that Spark a Spirit of Inquiry*. Create a poster with these questions and post them where your colleagues will see them. Think about these clinical questions when caring for your patients.

their roles and assists them in delivering a higher quality of care with improved patient outcomes. We use the term *Step Zero* to refer to the continual cultivation of a spirit of inquiry as an essential foundation for EBP, and we recommend the routine use of a standard set of questions in practice (see *Questions that Spark a Spirit of Inquiry*) and the use of the strategies in *Strategies for Building a Spirit of Inquiry*.

Remember, EBP starts with a spirit of inquiry (Step Zero). As you embark on this wonderful journey to promote the highest quality of care and the best outcomes for your patients, reflect upon Step Zero, the EBP paradigm, and how *you* practice care. The *Case Scenario for EBP: Rapid Response Teams* will provide a context for learning EBP throughout the next several columns. We'll use this case in each column to focus on successive steps of the EBP process. In the meantime, we encourage you to answer the *Questions that Spark a Spirit of Inquiry* and implement two *Strategies for Building a Spirit of Inquiry* in order to start your own EBP journey and begin building a spirit of inquiry with your colleagues at work. ▼

Step Zero refers to the continual cultivation of a spirit of inquiry.

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Case Scenario for EBP: Rapid Response Teams

You're a staff nurse on a busy medical–surgical unit. Over the past three months, you've noticed that the patients on your unit seem to have a higher acuity level than usual, with at least three cardiac arrests per month, and of those patients who arrested, four died. Today you saw a report about a recently published study in *Critical Care Medicine* on the use of rapid response teams to decrease rates of in-hospital cardiac arrests and unplanned ICU admissions. The study found a significant decrease in both outcomes after implementation of a rapid response team led by physician assistants with specialized skills.[14] You're so impressed with these findings that you bring the report to your nurse manager, believing that a rapid response team would be a great idea for your hospital. The nurse manager is excited that you've come to her with these findings and encourages you to search for more evidence to support this practice and for research on whether rapid response teams are valid and reliable.

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EVIDENCE-BASED PRACTICE Step by Step

Implementing an Evidence-Based Practice Change

Beginning the transformation from an idea to reality.

This is the ninth article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every other month to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. Details about how to participate in the next call will be published with May's *Evidence-Based Practice, Step by Step*.

In January's evidence-based practice (EBP) article, Rebecca R., our hypothetical staff nurse, Carlos A., her hospital's expert EBP mentor, and Chen M., Rebecca's nurse colleague, began to develop their plan for implementing a rapid response team (RRT) at their institution. They clearly identified the purpose of their RRT project, the key stakeholders, and the various outcomes to be measured, and they learned their internal review board's requirements for reviewing their proposal. To determine their next steps, the team consults their EBP Implementation Plan (see Figure 1 in "Following the Evidence: Planning for Sustainable Change," January). They'll be working on items in checkpoints six and seven: specifically, engaging the stakeholders, getting administrative support, and preparing for and conducting the stakeholder kick-off meeting.

Strategies to Engage Stakeholders

- Spend time and effort building trust.
- Understand stakeholders' interests.
- Solicit input from stakeholders.
- Connect in a collaborative way.
- Promote active engagement in establishing metrics and outcomes to be measured.

ENGAGING THE STAKEHOLDERS

Carlos, Rebecca, and Chen reach out to the key stakeholders to tell them about the RRT project by meeting with them in their offices or calling them on the phone. Carlos leads the team through a discussion of strategies to promote success in this critical step in the implementation process (see *Strategies to Engage Stakeholders*). One of the strategies, *connect in a collaborative way*, seems especially applicable to this project. Each team member is able to meet with a stakeholder in person, fill them in on the RRT project, describe the purpose of an RRT, discuss their role in the project, and answer any questions. They also tell each stakeholder about the initial project meeting to be held in a few weeks.

In anticipation of the stakeholder kick-off meeting, Carlos and the team discuss the fundamentals of preparing for an important meeting, such as how to set up an agenda, draft key documents, and conduct the meeting. They begin to discuss a time and date for the meeting. Carlos suggests that Rebecca and Chen meet with their nurse manager to update her on the project's progress and request her help in scheduling the meeting.

SECURING ADMINISTRATIVE SUPPORT

After Rebecca updates her manager, Pat M., on the RRT project, Pat says she's impressed by the team's work to date and offers to help them move the project forward. She suggests that, since they've already invited the stakeholders to the upcoming meeting, they use e-mail to communicate the meeting's time, date, and place. As they draft this e-mail together, Pat shares the following tips to improve its effectiveness:

- communicate the essence and importance of the e-mail in the subject line
- write an e-mail that's engaging, but brief and to the point
- introduce yourself
- explain the project

- welcome the recipients to the project and/or team and invite them to the meeting
- explain why their attendance is critical
- request that they read certain materials prior to the meeting (and attach those documents to the e-mail)
- let them know whom to contact with questions
- request that they RSVP
- thank them for their participation

Before they send the e-mail (see *Sample E-mail to RRT and Stakeholders*), the team wants to make sure they don't miss anyone, so they review and include all of the RRT members and stakeholders. They realize that it's important to invite the manager of each of the stakeholders and disciplines represented on the RRT and ask them to also bring a staff representative to the meeting. In addition, they copy the administrative directors of the stakeholder departments on the e-mail to ensure that they're fully aware of the project.

PREPARING FOR THE KICK-OFF MEETING

The group determines that the draft documents they'll need to prepare for the stakeholder kick-off meeting are:

- an agenda for the meeting
- the RRT protocol
- an outcomes measurement plan
- an education plan
- an implementation timeline
- a projected budget

To expedite completion of the documents, the team divides them up among themselves. Chen volunteers to draft the RRT protocol and outcomes measurement plan. Carlos assures her that he'll guide her through each step. Rebecca decides to partner with her unit educator to draft the education plan. Carlos agrees to take the lead in drafting the meeting agenda, implementation timeline, and projected budget, but says that since this is a great learning opportunity, he wants Rebecca and Chen to be part of the drafting process.

Drafting documents. Carlos tells the team that the purpose of a draft is to initiate discussion and give the stakeholders an opportunity to have input into the final product. All feedback is a positive sign of the stakeholders' involvement, he says, and shouldn't be perceived as criticism. Carlos also offers to look for any templates from other EBP projects that may be helpful in drafting the documents. He tells Rebecca

Sample E-mail to RRT and Stakeholders

To: ICU Nurse Manager, 3 North Nurse Manager, Respiratory Therapy Director, Medical Director of ICU, Director of Acute Care NP Hospitalists, Director of Spirituality Department

cc: EBP Council Chair, VP Nursing, VP Medical Affairs, ICU Nursing Director, Medical–Surgical Nursing Director, Finance Department Director, Communications Department Director, Risk Management Director, Education Department Director, HIMS (Medical Records) Director, Quality/Performance Improvement Director, Clinical Informatics Director, Pharmacy Director

Subject: Invitation to the Rapid Response Project Stakeholder Kick-off Meeting

Good afternoon. I would like to introduce myself. My name is Rebecca R. I am a staff nurse III on the 3 North medical–surgical unit. You have either spoken with me or with one of my colleagues, Carlos A. or Chen M., about an important evidence-based initiative that will help improve the quality of care for our patients. The increasing patient acuity on our unit and throughout the hospital, and the frequent need for patients to be transferred to the ICU, prompted us to ask important questions about patient outcomes. For the past few months, Carlos, Chen, and I have been investigating how our hospital can reduce the number of codes, particularly outside the ICU. We have conducted a thorough search for and appraisal of current available evidence, which we would like to share with you.

Our team and our managers would like to invite you to participate in a kick-off meeting to discuss an exciting evidence-based initiative to improve the quality of patient care in our hospital. The meeting will be held on March 1, 2011, at 10 AM in the Innovation Conference Room on the 2nd floor. It is very important that you attend this meeting as you have been identified as a critical participant in this project. We need your input and support as we move forward. So please plan to attend the meeting or send a representative. To ensure that we have sufficient materials for the meeting, please RSVP to Mary J., unit secretary on 3 North.

I want to thank you in advance for your help with and support of this project. I look forward to seeing you at the meeting. If you have any questions, please feel free to contact me or any of the RRT project team members.

Rebecca R. and the RRT Project Team

RRT Protocol Draft for Review

Current evidence supports the effectiveness of an RRT in decreasing adverse events in patients who exhibit specific clinical parameters. Evidence-based recommendations include that RRTs should be available on general units of hospitals, 24 hours a day and seven days a week, staffed by intensive care clinicians, and activated based on established clinical criteria. The RRT serves a dual purpose of providing both early intervention care to at-risk patients and education in recognizing and managing these patients to clinical staff.

The RRT is available to respond to and assist bedside staff in caring for patients who develop signs or symptoms of clinical deterioration.

RRT Members
RRT members are all ACLS certified. They include:
Team Leader: Acute Care NP Hospitalist (credentialed in advanced procedures)
Team Members: ICU RN
Respiratory Therapist (trained in intubation)
Physician Intensivist (ICU MD on call and available to the RRT)
Hospital Chaplain

Initiation of RRT Consult
An RRT consult can be initiated by any bedside clinician. Consults should be initiated based on the following patient status criteria.

RRT Consult Initiation Criteria

Pulmonary
Ventilation: Color change (pale, dusky, gray, or blue)
Respiratory distress: RR < 10 or > 30 breaths/min, or Unexplained dyspnea, or New-onset difficulty breathing, or Shortness of breath
Cardiovascular
Tachycardia: Unexplained > 130 beats/min for 15 mins
Bradycardia: Unexplained < 50 beats/min for 15 mins
Blood pressure: Unexplained SBP < 90 or > 200 mmHg
Chest pain: Complaint of nontraumatic chest pain
Pulse oximetry: < 92% SpO_2
Perfusion: UOP < 50 cc/4 hr
Neurologic
Seizures: Initial, repeated, or prolonged
Change in mental status: Sudden decrease in LOC with normal blood sugar Unexplained agitation for > 10 min New-onset limb weakness or smile droop
Sepsis
Clinical indicators of sepsis: Temperature > 38°C
HR > 90 beats/min
RR > 20 breaths/min
WBC > 12,000, < 4,000
Nurse's concern about overall deterioration in patient's condition without any of the above criteria.

Scope of the RRT
The RRT can be expected to perform any/all of the following interventions:
Nasopharyngeal/oropharyngeal suctioning
Oxygen therapy

Initiation of CPAP
Initiation of nebulized medications
Intravenous fluid bolus(es)
Intravenous fluid bolus(es) with medication
CPR

The RRT can be expected to perform any/all of the following invasive procedures:
Endotracheal intubation
Intravenous line insertion
Intraosseous line insertion
Arterial line insertion
Central line insertion

RRT Consult Procedure

1. Assess patient relative to the above criteria.
2. If any of the above criteria are identified, initiate the RRT consult by calling *5-5555*. The operator will request the caller's location, the patient's name, the patient's location, and the reason for RRT activation. This call will generate both pages to the RRT members and an overhead announcement.
3. The RRT will arrive within five minutes (or less) of the call.
4. Be prepared to provide the RRT with appropriate information about the patient using the SBAR communication method. (See standardized communication protocol no. *7*.)
5. While awaiting the arrival of the RRT, consider initiating any/all of the following actions:
   - Call for a colleague to help you
   - Set up oxygen apparatus
   - Set up suction apparatus
   - Call for the code cart to be brought to the area
   - Communicate with the patient's family (if present); tell them what you're doing and why and that someone will be here shortly to help them
   - Obtain proper documentation tools to be used during the RRT consult

RRT Arrival

When the RRT arrives:

1. Provide information as indicated above.
2. Participate in the care of your patient and remain with the patient and the RRT.
3. Assist the RRT as needed.
4. Document activities, interventions performed, and patient responses to interventions.
5. Work with the chaplain to ensure that the patient's family is informed of the situation at intervals.
6. Assist in arranging for transfer of the patient to a higher level of care if indicated.
7. Provide a detailed report to the nurse accepting the patient on the receiving unit, utilizing the SBAR communication method.

ACLS = advanced cardiac life support; cc = cubic centimeters; CPAP = continuous positive airway pressure; CPR = cardiopulmonary resuscitation; hr = hours; HR = heart rate; ICU = intensive care unit; LOC = level of consciousness; MD = medical doctor; min = minute; mmHg = millimeters of mercury; NP = nurse practitioner; RN = registered nurse; RR = respiratory rate; RRT = rapid response team; SBAR = situation-background-assessment-recommendation; SBP = systolic blood pressure; SpO_2 = arterial oxygen saturation; UOP = urine output; WBC = white blood count.

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Table 1. Plan for Measuring RRT Success (Draft for Discussion)

Outcome	Measurement	Source/Owner
CRO	• Codes outside of the ICU	• EMR
Mortality rates: HMR and NIM	• Hospital mortality rates by unit	• Discuss at meeting
UICUA	• ICU admissions ○ planned ○ unplanned	• EMR; ICU admissions database; check box needed to indicate planned and unplanned
Return on RRT investment (cost of RRT compared with savings due to RRT)		
1. Cost of RRT • Personnel • Supplies	• RRT personnel cost/hour	• Billing data • RRT response time and end time as recorded on the RRT data documentation tool
2. Savings due to RRT • Cost of UICUA • Number of UICUA prevented	• UICUA cost/day • LOS for average UICUA • Number of UICUA prevented	• Billing data • Disposition of RRT call as recorded on the RRT data documentation tool

CRO = code rates outside the ICU; EMR = electronic medical record; HMR = hospital-wide mortality rates; ICU = intensive care unit; LOS = length of stay; NIM = non-ICU mortality; RRT = rapid response team; UICUA = unplanned ICU admissions.

and Chen that he's confident they'll do a great job and shares his excitement at how the team has progressed in planning an EBP practice change.

RRT protocol. Chen starts to draft the RRT protocol using one of the hospital's protocols as a template for the format, as well as definitions and examples of protocols, policies, and procedures from other organizations and the literature. She returns to the articles from the team's original literature search (see "Critical Appraisal of the Evidence: Part I," July 2010) to see if there is information, previously appraised, that will be helpful in this current step in the process. She recalls that the team had set aside some articles because they didn't directly answer the PICOT question about *whether* to implement an RRT, but they did have valuable information on *how* to implement an RRT. In reviewing these articles, Chen selects one that's a review of the literature, though not a systematic review, that includes many examples of RRT membership rosters and protocols used in other hospitals, and which will be helpful in drafting her RRT protocol document.[1] Chen includes this expert opinion article because the information it contains is consistent with the higher-level evidence already being used in the project. Using both higher and lower levels of evidence, when appropriate, allows the team to use the best information available in formulating their RRT protocol.

As she writes, Chen discovers that their hospital's protocols and other practice documents don't include a section on supporting evidence. Knowing that evidence is critically important to the RRT protocol, she discusses this with the clinical practice council representative from her unit who advises her to add the section to her draft document. He promises to present this issue at the next council meeting and obtain the council's approval to add an evidence section to all future practice documents. Chen reviews the finished product before she submits it for the team's review (see *RRT Protocol Draft for Review*[1-10]).

Outcomes measurement plan. Based on the appraised evidence and the many discussions Rebecca and Chen have had about it, Chen drafts a document that lists the outcomes the team will measure to demonstrate the success of their project, where they'll obtain this information, and who will gather it (see Table 1). In drafting this plan, Chen realizes that they don't have all the information they need, and she's concerned that they're not ready to move forward with the stakeholder kick-off meeting. But when Chen calls Carlos and shares her concern, Carlos reminds her that the document is a draft and that the required information will be addressed at the meeting.

Education plan. Rebecca reaches out to Susan B., the clinical educator on her unit, and requests her help in drafting the education plan. Susan tells Rebecca how much

she enjoys the opportunity to work collaboratively with staff nurses on education projects and how happy she is to see an EBP project being implemented. Rebecca shares her RRT project folder (containing all the information relative to the project) with Susan, focusing on the education about the project she thinks the staff will need. Susan commends the team for its efforts, as a good deal of the necessary work is already done. She asks Rebecca to clarify both the ultimate goal of the project and what's most important to the team about its rollout on the unit. Rebecca thoughtfully responds that the ultimate goal is to ensure that patients receive the best care possible. What's most important about its rollout is that the staff sees the value of an RRT to the patients and its positive impact on their own workload. She adds that it's important to her that the project be conducted in a way that feels positive to the staff as they work toward sustainable changes in their practices.

Susan and Rebecca discuss which clinicians will need education on the RRT. They plan to use a variety of mechanisms, including in-services, e-mails, newsletters, and flyers. From their conversation, Susan agrees to draft an education plan using a template she developed for this purpose. The template prompts her to put in key elements for planning an education program: learner objectives, key content, methodology, faculty, materials, time frame, and room location. Susan fills the template with information Rebecca has given her, adding information she knows already from her experience as an educator. When Rebecca and Susan meet to review the plan, Rebecca is amazed to see how their earlier conversation has been transformed into a comprehensive document (see the *Education Plan for RRT Implementation* at http://links.lww.com/AJN/A19).

Agenda and timeline. The team meets to draft the meeting agenda, implementation timeline, and budget. Carlos explains the purposes of a meeting agenda: to serve as a guide for the participants and to promote productivity and efficiency. They draft an agenda that includes the key issues to be shared with the stakeholders as well as time for questions, feedback, and discussion (see the *Rapid Response Team Kick-off Meeting Agenda* at http://links.lww.com/AJN/A20).

Carlos describes how the timeline creates a structure to guide

Table 3. RRT Project Budget Draft (Draft for Discussion)

Annual Costs						
Item	**Projected Cost/Unit**	**No. Units Needed**	**Cost/Year**	**Cost Center**	**Approval Needed**	**Notes:**
RRT pagers	$30/month	8/month	$2,880	Administration	VP Nursing	
Data collection	RRT leader, $45/hour	1 hour/month	$540	Hospitalist	VP Medical Affairs	
Data entry	Administrative assistant, $15/hour	1 hour/month	$180	Nursing administration	Medical–surgical director	
Data analysis	Data manager, $21/hour	1 hour/month	$252	Quality	Quality manager	
First Year Start-Up Costs						
Education prep	Advanced practice nurse, $45/hour 2 Project leaders, $30/hour Nurse manager, $40/hour	6 hours 6 hours each 2 hours	$270 $360 $80 ***Total = $710***	3 North Nursing	3 North Nurse manager	Unit educators will schedule their time to provide the in-services. No additional cost.
Education delivery	80 Staff members, $30/hour (average rate)	1/2 hour each	$1,200	Departmental education budgets	Department managers	This is the cost for the pilot unit only.

the project (see Table 2 at http://links.lww.com/AJN/A21). The team further discusses how it can maintain the project's momentum by keeping it moving forward while at the same time accommodate unexpected delays or resistance. There are a few items on the timeline that Carlos thinks may be underestimated—for example, the team may need more than a month to meet with other departments because of already heavily scheduled calendars—but he decides to let it stand as drafted, knowing that it's a guide and can be adjusted as the need arises.

With the RRT protocol, staff will be intervening earlier to improve patients' outcomes.

Budget. Carlos discusses the budget with the team. Rebecca shares a list of what she thinks they'll need for the project and the team decides to put this information into a table format so they can more easily identify any missing information. Before they construct the table, they walk through an imaginary RRT call to be sure they've thought of all the budget implications of the project. They realize they didn't include the cost of each employee attending an education session, so they add that figure to the budget. They also realize that they're missing hourly pay rates for the different types of employees involved. Carlos tells Rebecca that he'll work with the Human Resources Department to obtain this information before the meeting so they can complete the budget (see Table 3).

REVIEWING THEIR WORK

The next time they meet, the EBP team reviews the agenda for the meeting and the documents they'll be presenting. The clerical person on Rebecca and Chen's floor (sometimes called the unit secretary) has kept a record of who's attending the meeting and the team is pleased that most of the stakeholders are coming. Carlos informs the team that he received notification that their internal review board submission has been approved. They're excited to check that step off on their EBP Implementation Plan.

Carlos suggests that they discuss the kick-off meeting in detail and brainstorm how to prepare for any negative responses to their project that might occur. Rebecca and Chen remark that they've never considered that someone might not like the idea of an RRT. Carlos says he's not surprised; often the passion that builds around an EBP project and the hard work put into it precludes taking time to think about "why not." The team talks about the importance of stopping occasionally during any project to assess the environment and participants, recognizing that people often have different perspectives and that everyone may not support a change. Carlos reminds the team that people may simply resist changing the routine, and that this can lead to the sabotage of a new idea. As they explore this possible resistance, Rebecca shares her concern that with everyone in the hospital so busy, adding something new may be too stressful for some people. Carlos tells Rebecca and Chen that helping project participants realize they'll be doing the same thing they've been doing, just in a more efficient and effective way, is generally successful in helping them accept a new process. He reminds them that many of the people on the RRT are the same people who currently take care of patients if they code or are admitted to the ICU; however, with the RRT protocol, they'll be intervening earlier to improve patients' outcomes. The team feels confident that, if needed, they can use this approach at the kick-off meeting.

CONDUCTING THE KICK-OFF MEETING

Rebecca and Chen are both nervous and excited about the meeting. Carlos has made sure they're well prepared by helping them set up the meeting room, computer, PowerPoint presentation, and handout packets containing the agenda and draft documents. The team is ready, and they've placed themselves at the head of the table so they can be visible and accessible. As the invitees arrive, they welcome each one individually, thanking them for participating in this important meeting. The team makes sure that the meeting is guided by the agenda and moves along through the presentation of information to thoughtful questions and a lively discussion.

Join the EBP team next time as they launch the RRT project and tackle the real-world issues of project implementation. ▼

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EVIDENCE-BASED PRACTICE Step by Step

Following the Evidence: Planning for Sustainable Change

The EBP team makes plans to implement an RRT in their hospital.

This is the eighth article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every other month to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. Details about how to participate in the next call will be published with May's *Evidence-Based Practice, Step by Step*.

After the evidence-based practice (EBP) team of Rebecca R., Carlos A., and Chen M. synthesized and appraised the evidence they found to answer their clinical question, they concluded that rapid response teams (RRTs) were effective in reducing both code rates outside the ICU (CRO) and non-ICU mortality (NIM), excluding patients with do not resuscitate (DNR) orders (see "Clinical Appraisal of the Evidence: Part III," November 2010). They also decided that a reduction in unplanned ICU admissions (UICUA) may be a reasonable outcome to expect. In addition, they chose the members of their RRT: an advanced practice nurse, a physician, an ICU staff nurse, a respiratory therapist, and a chaplain.

The team's next step is to develop a plan to implement an RRT in their hospital. They begin by planning how to collect baseline data on their chosen outcomes so they can evaluate the RRT's impact on those outcomes. Carlos explains to the team that measuring outcomes, typically before and after implementing an intervention, is essential to documenting the impact of the EBP implementation project on health care quality and/or patient outcomes.[1] Rebecca adds that they'll also need to consider cost as an outcome and must plan for how to capture the costs of the RRT as well as evaluate the cost savings for positive changes in CRO, NIM, and UICUA.

THE IMPLEMENTATION PLAN

Rebecca and Chen are excited about the plan to implement an RRT in their hospital and tell Carlos how much they appreciate his ongoing support. Carlos checks in often with the team now that the project is under way. His experience as an expert EBP mentor has taught him the importance of assessing the team's progress at frequent intervals to see how he can support them.

To help the team develop a detailed plan for implementing an RRT in their hospital, Carlos provides them with an EBP Implementation Plan template that he used in his EBP Graduate Certificate Program (Figure 1). This plan was developed using the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model, in which EBP mentors are key facilitators of sustainable change. Carlos explains that even though they now have a template to guide them in the process, EBP implementation can be unpredictable. The team cannot anticipate all of the challenges or organizational nuances they may encounter in launching an RRT in their hospital.

Preliminary checkpoint catch-up. The team reviews the template, beginning with the Preliminary Checkpoint, to determine which steps they've already taken and which they'll need to prepare for going forward. They've already completed checkpoints one through four, but two steps in the preliminary checkpoint still need to be addressed: identifying key stakeholders and acquiring approval from the internal review board (IRB; sometimes called the ethics review board, or the human subjects or ethics committee). The team members discuss their roles in the project and agree that these may evolve as the implementation plan develops.

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Key stakeholders. Carlos tells Rebecca and Chen that considering who would be stakeholders in a project—in this case, those individuals or groups that may be affected by or can influence the implementation of an RRT—is a step that's often overlooked. He explains that *active stakeholders* are those people who have a key role in making the project happen. *Passive stakeholders* are those who may not be actively involved in the project but who could promote or stymie its success. Carlos advises the team to consider all potential stakeholders, as theirs is an organization-wide project and some stakeholders may not be obvious. He asks Rebecca and Chen to think about the outcomes of the project and to which stakeholders throughout the hospital they'd be important. The team discusses that, as staff nurses, they don't always think about their work from an organizational standpoint. Carlos says that thinking about the project in an organization-wide context will help them figure out who needs to be on the team. He provides examples of stakeholders who would not only be critical to the RRT process but who might also have connections that could be important to the project's success. For example, connecting with key councils (practice, quality, critical care) or work groups (education, communications) may provide access to already-established processes for introducing a policy into the organization.

The team preliminarily identifies the members of their RRT, patients, staff nurses, and administrators as active stakeholders. They identify the finance, risk management, and education departments, midlevel managers, and the chief executive and chief nursing officers as potential passive stakeholders. The team agrees that although these may not be all of the stakeholders—more may be identified as planning continues—they're likely key players who need to be included in the implementation plan for now. Carlos tells the team that it's important to keep thinking about who will impact the project and whom the project will impact, so that everyone who needs to be on board with the plan is brought on early.

IRB approval. Carlos explains that an IRB is charged with making sure that subjects involved in a research study are safe and that the research is conducted in such a way that the findings are applicable to a broader population than just those in the study, which is known as *generalizability.*[2] The team discusses whether they need to submit their implementation plan to their hospital's IRB for approval, since they're not conducting research. Although they'll be collecting outcomes data to evaluate whether they're achieving the expected outcomes cited in the literature, their evidence-based RRT intervention is a best practice improvement project, not a research study. Still, Carlos stresses that the team has an obligation to publish how their evidence-based intervention works in their hospital. He reminds them that the seventh step in the EBP process is to disseminate results so others can learn how a project was implemented and evaluated (the process) and whether the outcomes identified in the literature were obtained (the *project outcomes*, or end points) (see "The Seven Steps of Evidence-Based Practice," January 2010). Carlos tells Rebecca and Chen that if they're going to publish their project, they'll need to submit their implementation plan for IRB approval. Moreover, they cannot collect their baseline data without prior IRB approval. The team discusses that when they write up their project, they can address some of the issues they had with the reporting of implementation projects in the literature, such as how differences in the formatting of these reports makes it hard to synthesize the data (see "Clinical Appraisal of the Evidence: Part III," November 2010). For these reasons, the team feels it's essential that they publish their project, so they'll pursue IRB approval.

Considering who would be stakeholders in a project is a step that's often overlooked.

Before the team begins writing up their implementation plan (which they will reformulate as an IRB proposal), they discuss an essential assumption they hold, which is that all patients who enter a hospital sign a "consent for treatment" expecting clinicians and others caring for them to provide the best care possible. Although patients may not refer to their care as *evidence-based practice*, the EBP team feels strongly that patients' expectations reflect professional practice in which daily decisions are made based on the best evidence available. With this expectation and their decision to publish the project in mind, the team discusses that the outcomes data will be used in a way that wasn't covered in the consent for treatment. Thus, the IRB review of their proposal should reveal any ways in which publishing the outcomes of the project could put recipients of the practice change at risk. In effect, the IRB would be reviewing the plan to make sure that the data from those patients

Figure 1. EBP Implementation Plan Template

ARCC EBP Implementation Plan		
PICOT Question:		
Team Members:		
EBP Mentor and Contact Info:		
Preliminary Checkpoint	• Who are the stakeholders for your project ○ Active (on the implementation team) and Supportive (not on the team, but essential to success) • Identify project team roles and leadership • Begin acquisition of any necessary approvals for project implementation and dissemination (for example, system and unit leadership, internal review board [IRB]) • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint One	• Hone PICOT question and assure team is prepared • Build EBP knowledge and skills • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Two	• Conduct literature search and retain studies that meet criteria for inclusion • Connect with librarian • Meet with implementation group – TEAM BUILD • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Three	• Critically appraise literature • Meet with group to discuss how completely evidence answers question; pose follow-up questions and re-review the literature as necessary • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Four	• Meet with group • Summarize evidence with focus on implications for practice and conduct interviews with content experts as necessary to benchmark • Begin formulating detailed plan for implementation of evidence • Include who must know about the project, when they will know, how they will know • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Five	• Define project purpose—connect the evidence and the project • Define baseline data collection source(s) (for example, existing datasets, electronic health record), methods, and measures • Define postproject outcome indicators of a successful project • Gather outcome measures • Write data collection protocol • Write the project protocol (data collection fits in this document) • Finalize any necessary approvals for project implementation and dissemination (for example, system leadership, unit leadership, IRB) • ***Begin relationship with EBP Mentor***	Notes:

Checkpoint Six (about midway)	• Meet with implementation group • Discuss known barriers and facilitators of project • Discuss strategies for minimizing barriers and maximizing facilitators • Finalize protocol for implementation of evidence • Identify resources (human, fiscal, and other) necessary to complete project • Supply EBP Mentor with written IRB approval and managerial support • Begin work on poster for dissemination of initiation of project and progress to date to educate stakeholders about project—get help from support staff • Include specific plan for how evaluation will take place: who, what, when, where, and how, and communication mechanisms to stakeholders • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Seven	• Meet with implementation group to review proposed poster • Make final adjustment to poster with support staff • Inform stakeholders of start date of implementation and poster presentation • Address any concerns or questions of stakeholders (active and supportive) • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Eight	• Poster presentation (preferred event is a system-wide recognition of quality, research, or innovation) • LAUNCH EBP implementation project • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Nine	• Midproject meet with all key stakeholders to review progress and provide outcomes to date • Review issues, successes, aha's, and triumphs of project to date • ***Begin relationship with EBP Mentor***	Notes:
Checkpoint Ten	• Complete final data collection for project evaluation • Present project results via poster presentation—locally and nationally • ***Celebrate with EBP Mentor and Agency Leadership***	Notes:
Checkpoint Eleven	• Review project progress, lessons learned, new questions generated from process • ***Consult with EBP Mentor about new questions***	Notes:

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who receive the intervention will be treated confidentially.

The team discusses that their RRT intervention is supported by studies of RRTs that were submitted to and approved by their respective IRBs; that the IRB approvals of these RRT projects lends confidence to their intervention. Rebecca and Chen know it's important that their plan be reviewed, but they express concern about how to engage the IRB process. Carlos tells them that the IRB has several forms available to assist clinicians and researchers in pinpointing those aspects of their study or project that may increase risk of any kind to the people involved. The team seeks out more information on their hospital's Web site and finds the appropriate form for an implementation project. They agree to complete the form together as they develop their implementation plan.

Checkpoint five and forward. As the team moves on to Checkpoint Five in the EBP Implementation Plan template, Carlos talks to them about the critical importance of defining the purpose of the project.

Purpose of the project. A clearly defined purpose sets the entire planning process in motion, Carlos says; it's the touchstone of the project that the team can return to periodically to ensure they're on course. The team agrees that the purpose of their project is *to implement and evaluate the effectiveness of an RRT in their hospital.*

Baseline data collection. Carlos tells the team that collecting data prior to implementation of the RRT is important because it will help determine the extent of any already existing problems as well as enable the evaluation of the project outcomes.[3] He explains that various data are generated within the hospital, which he calls *internal evidence*. The sources for these data are in various locations and are referred to in a variety of ways, such as: quality management, risk management, finance, and human resources departments; clinical systems; operational systems; and electronic medical records/information technology (see Table 1). Carlos tells the team that internal evidence that's collected for federal and state agencies or for regulatory and specialty organizations, such as the American Nurses Credentialing Center's Magnet Recognition Program, can also be used as outcomes. As an example, he provides reports from their hospital's quality committee that include data for CRO, UICUA, and overall hospital mortality. Chen asks what it will require to get data only for NIM. Carlos replies that he'll have to find out which department in the hospital creates quality committee reports and ask if NIM data can be culled from the overall hospital mortality data. He explains that there are many data repository systems within the hospital and that each system may collect different data and may require a different way of requesting those data. Carlos helps the team understand that obtaining data may be complicated at times, but one's success greatly depends on knowing whom to ask.

To help the team capture the outcomes data they'll need to obtain at baseline and again after the project, Carlos recommends they work with the information technology and finance departments. Chen asks if putting the outcomes in a chart would help to clearly outline the "who, what, when, where, and how" of baseline data collection. The team agrees that this would help them understand the financial outcomes (sometimes referred to as the business case), the process and structure of the project,[4] and the patient outcomes that will be measured at the end of the project (see Table 2).

The process. The team discusses how to ensure that the process of implementing an RRT in their hospital goes well. Rebecca reminds the team about their and the MERIT trial authors' observations on how the MERIT trial was conducted, particularly on how the RRT protocol was implemented.[5] (The control hospitals' code teams may have functioned as RRTs, which could explain why there was no difference between the control group and the intervention group; see "Critical Appraisal of the Evidence, Part II," September 2010). She asks the group for ideas about how they can collect data on the process of

Table 1. Potential Sources and Types of Internal Evidence

Source of Data	Type of Data
Quality Management	Hospital quality indicators Nursing quality indicators Patient satisfaction Regulatory/accreditation requirements
Risk Management	Incident reporting Medication errors Sentinel events Patient complaints
Finance	Admission, transfer, and discharge data Billing and coding, capital and operation budgets Medicare-severity diagnosis-related groups (MS-DRGs) Cost and return on investment data
Clinical Systems	Monitoring devices and equipment
Operational Systems	Patient tracking and flow Staffing and scheduling
Electronic Medical Records/ Information Technology	Patient history Patient assessment Diagnostic test results Medication regime Plan of care
Data collected, submitted to and benchmarked with outside sources	National Database of Nursing Quality Indicators Centers for Medicare and Medicaid Services Patient satisfaction survey organizations

Table 2: Considerations in Measuring Outcomes for the RRT Implementation Project

Making the Case	Data Needed for an RRT	Processes/Outcomes to Be Measured
The strategic case: Evaluate project in relation to its impact (high volume, high risk, high cost) and the strategic priorities of the organization (business plan, accreditation, reimbursement, licensing)	Hospital strategic plan; CRO, UICUA, and NIM data; and expected targets for these data, if identified	• CRO, UICUA, and NIM before (and after) implementing a system-wide RRT
The business case (financial outcomes): Calculate net return on investment—for example, cost of project minus cost offset by reducing identified outcomes	Actual cost assessed for supplies, staff education, RRT members providing the service, other infrastructure for the RRT team (special process for calling an RRT, for example), identified outcomes	• Cost savings from prevention of CRO, UICUA, and NIM before (and after) implementing a system-wide RRT
The resources case (assess/identify resources needed to achieve outcomes):	Identification of:	
Infrastructure: Policies, procedures, documentation systems, and data-reporting processes	Policy for how to activate RRT: • Define who will write policy • List committees needed to approve policy • List processes for rolling out new policy	• Policies and protocols developed to facilitate RRT • Documentation systems adjusted to accommodate RRT record • Electronic data reporting available to capture RRT process and outcome
Supplies: New equipment or supplies needed for the project	Equipment required for early intervention care	• Redo code cart to add RRT box containing supplies/equipment that may expedite early intervention care
Human resources: Identify departments that will be supporting the project (such as, nursing, respiratory, physicians, information systems, purchasing, education, pastoral care)	Human resources support for hiring personnel to fill RRT roles or to backfill positions vacated to fill RRT	• RRT members evaluation of their role
Process measures to achieve outcomes (sometimes called process outcomes): Staff education plan, project data collection, staff and family feedback	Staff education plan RRT project data collection tool Staff feedback tool Family feedback tool	• Staff education completion rates • Quality of RRT project events, such as how RRT protocol was followed • Effectiveness of RRT project events • Timeliness of project events, such as time frame from call to RRT arrival • Family and staff response to how RRT is delivered (the intervention protocol) • Outcomes of each RRT call

CRO = code rates outside the ICU; NIM = non-ICU mortality; RRT = rapid response team; UICUA = unplanned ICU admissions.

implementing the RRT to demonstrate that they have done it well. Carlos says that how well they implement the intervention is called the *fidelity of the intervention*. He recommends keeping good notes on the work being done. They talk about the need to develop a project data collection tool that staff can use when calling the RRT. Chen volunteers to develop this form, using similar forms in the literature they reviewed as a basis. Carlos suggests that maybe Chen should see if anything new has been published, since it's been a few months since they completed their literature search.

The team talks about the importance of measuring the costs and benefits of the RRT, especially its benefits divided by the costs, which Carlos notes is called its return on investment (ROI). Carlos suggests that the team meet with the finance department to discuss their plan to measure the costs and ROI of an RRT. Rebecca volunteers to be responsible for obtaining the financial data and requests that Carlos be available for support, if needed,

to which he readily agrees. Chen agrees to work with Carlos to ensure that data on CRO, UICUA, and NIM are systematically collected and to focus on the *process outcomes* (how well the RRT project is implemented). For example, if there was a breach in protocol implementation—in how well the RRT protocol was delivered to the active stakeholders, for instance—that breach could lead to an outcome that was different from what was expected. This unexpected outcome may not be because the RRT intervention didn't work, but because of a glitch in the process: the RRT protocol wasn't delivered as planned.

As work on the project is planned and discussed, the roles of the team naturally begin to fall into place. As part of formulating the implementation plan, they discuss what questions about data collection they'll need to ask in order to measure their outcomes of CRO, UICUA, and NIM (see *Questions to Ask in Preparation for Data Collection*). Carlos reflects back on the definitions and measures the team discussed in their appraisal of the evidence and how the different definitions of mortality (whether it included DNR cases, for example) led to some confusion about comparing the impact of an RRT on that variable (see "Critical Appraisal of the Evidence: Part II," September 2010). He explains the importance of how the data are measured (what mechanisms are used, for example, and why and how to know they're good methods for measuring the data). He says that in order to determine the impact of an EBP project such as the implementation of an RRT, the data must be measurable (able to be counted), accessible (the team has access to the data), and user friendly (understandable and able to be used without difficulty). Chen and Rebecca decide they want to create a data collection plan that meets all of these criteria. With the questions on data collection to guide them, they realize that multiple disciplines within the hospital (not only nursing) will be involved in helping to collect the baseline data for the project.

From the team's discussion, Rebecca and Chen put together a preliminary plan for evaluating the RRT project, keeping the following key areas in mind: the strategic case, business case, resources case, and process measures (see Table 2). They also add the following process outcomes to their plan: the number of staff educated on the RRT, the number of RRT calls, the primary reasons for calling an RRT, and family and staff satisfaction with the RRT process.

In the March column, join Rebecca, Chen, and Carlos as they move through the next several steps of the EBP implementation process, including identifying and planning for the barriers they may encounter as the EBP change is rolled out, as well as providing system-wide education on the intended use and expected outcomes of an RRT. ▼

Questions to Ask in Preparation for Data Collection

- How are the outcomes defined?
- What data will be used to measure the outcomes?
- Who "owns" the data needed for this project?
- Who will (or already does) generate the data needed for the project?
- What special clearances are required to access the data?
- What are the restrictions for sharing these data?
- Who will be responsible for collecting the data?
- When will the data be collected?
- Where are the data located in the hospital?
- How will the evidence-based practice (EBP) team access the data?
- How will the EBP team store the data?
- What program will the EBP team use to analyze the data?
- Who will help the EBP team with data analysis?
- How will the EBP team manage the data (data entry, cleaning, labeling)?

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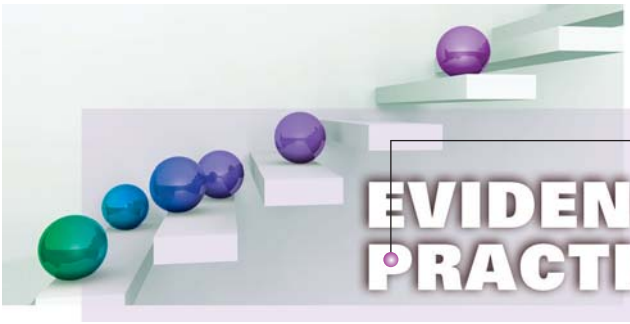

EVIDENCE-BASED PRACTICE Step by Step

Rolling Out the Rapid Response Team

The pilot phase begins.

This is the 10th article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every other month to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Chat with the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. See details opposite.

In March's evidence-based practice (EBP) article, Rebecca R., our hypothetical staff nurse, Carlos A., her hospital's expert EBP mentor, and Chen M., Rebecca's nurse colleague, conducted their stakeholder kickoff meeting to explain to rapid response team (RRT) members and stakeholders the details of their plan to implement an RRT at their institution. At the meeting, the stakeholders were engaged and supportive, offering valuable feedback and suggestions to enhance the project. By the end of the meeting, all RRT members and their respective managers committed to participate. No major changes were made to any of the draft documents; however, one minor adjustment was made when the advanced practice nurse (APN) hospitalist suggested that the EBP team include all the systemic inflammatory response syndrome (SIRS) criteria in the RRT protocol.

Among the many commitments made by stakeholders to move the project forward were the following:

- The Finance Department representative offered, during the discussion of RRT project outcomes, to determine the cost per day of unplanned ICU admissions (UICUA) and to create a report to establish the baseline average length of stay for the UICUA in their hospital (for a list of outcomes, see Table 1 in "Implementing an Evidence-Based Practice Change," March).
- The Health Information Management Systems/Medical Records Department representative committed to create a data documentation tool to facilitate the collection from completed RRT records of the following: code rates outside the ICU, RRT response time and duration, UICUA, and RRT events that prevent ICU stays.
- The vice president of medical affairs and the APN hospitalist agreed to notify the hospital's medical staff of the RRT project in a letter and in the staff's monthly newsletter; they also agreed to address any questions medical staff might have about the project.
- The Quality/Performance Improvement Department director suggested that she, Carlos, Rebecca, Chen, and the project's pilot unit quality council representative have a follow-up meeting to organize the outcomes data collection and reporting processes needed to demonstrate the success of the project.

After the meeting, Rebecca, Chen, and Carlos reviewed how it went and were pleased by what they had accomplished as a team. Now they're ready to begin the RRT implementation, guided by their overall plan and by the project timeline they'd created earlier.

PREPARING FOR THE RRT PILOT LAUNCH

As they get ready to initiate the pilot project, Rebecca, Chen, and Carlos refer to the EBP Implementation Plan (see Figure 1 in "Following the Evidence: Planning for Sustainable Change," January) to determine their next steps. They already identified their own clinical unit as the RRT pilot unit and involved their nurse manager and clinical educator, so they've completed checkpoint six. Now they prepare a "to do" list of the activities they need to complete prior to the RRT pilot launch (see *'To Do' List for RRT Pilot Rollout*).

By Lynn Gallagher-Ford, MSN, RN, NE-BC, Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, and Susan B. Stillwell, DNP, RN, CNE

Rebecca and Chen attend their unit's upcoming staff meetings to introduce the evidence-based RRT project to the staff nurses. They ask the unit's clinical educator, Susan B., to attend too, so she can share the schedule for the RRT education program; that way, staff can plan to attend one of the in-services before the RRT project begins. At the staff meetings, the EBP team explains the project, the reasons for and importance of the pilot phase that will take place on their unit, and expresses appreciation for their colleagues' support.

Although the staff is supportive of the project, they're concerned about being the "test" unit. The EBP team acknowledges these concerns and, after the staff meetings are over, discusses them with the unit's nurse manager, Pat M. Carlos suggests that they implement the RRT only on the day shift for the first week of the project so that Rebecca and Chen can be available to the staff during the first RRT calls. He says the presence of the EBP champions during initial RRT implementation on the unit is critical, because they can

- provide expertise and education.
- support their staff colleagues.
- monitor RRT response time.
- observe interactions between the RRT and staff.
- obtain immediate feedback about the RRT process.
- identify any problems with the RRT process.
- speak with any resisters to the RRT project.
- work with the nurse manager (or other departmental leadership) to address resistance.
- make timely adjustments to the RRT process, if needed.
- provide immediate feedback to the RRT and staff.

Pat agrees and commits to using the small number of budgeted per diem staff hours needed to allow Rebecca and Chen to adjust their work hours during the first week of the rollout.

Rebecca meets with the Quality/Performance Improvement Department director and quality council representative to make a plan for outcomes data collection, analysis, and reporting. At the meeting, the quality department director describes a tool her department uses to present outcomes data, called a "dashboard." Resembling the dashboard of a car, the tool schematically portrays the status of a number of quality initiatives and how they're progressing toward meeting their goals; it makes it possible to get a comprehensive and concise picture of many critical performance indicators at a glance. They discuss the project outcomes to be measured, how they'll obtain the raw data, and the estimated amount of RRT data they can expect. The quality department director and council representative agree that the volume of data seems relatively small, and they offer to enter the raw data into the clinical unit's quality/performance improvement database so it can be included on the dashboard if Rebecca and Chen forward it to them by the 15th of each month. Rebecca and Chen enthusiastically commit to this monthly timeframe.

Next, Rebecca and Chen meet with the Clinical Informatics Department nurse, Karen H., to discuss creating a data documentation tool for staff and RRT members to use that can be accessed from the electronic medical record. They describe the RRT project to Karen and share the protocol with her. After reviewing the documents and getting answers to her questions, Karen recommends that rather than create a whole new tool for this project, they modify their current code blue documentation tool. Karen and the team review the code sheet together and agree that modifying the current tool makes sense because

- it's more efficient than creating a new tool.
- it'll be easier for staff to learn the revised tool since it's based on one with which they're already familiar.

Karen commits to creating the documentation tool, but tells Rebecca and Chen that it'll be at least two weeks before she can begin because there are many other informatics projects ahead of theirs in the queue. This two-week delay isn't a problem for Rebecca and Chen. They have designed flexibility into their implementation plan; therefore, this wait will not push back the rollout. The RRT documentation tool is delivered in two weeks as promised, so Susan B., the clinical

Need Help with Evidence-Based Practice? Chat with the Authors on May 10!

On May 10 at 1 PM EST, join the "Chat with the Authors" call. It's your chance to get personal consultation from the experts! Dial-in early! U.S. and Canada, dial 1-800-947-5134 (International, dial 001-574-941-6964). When prompted, enter code 121028#.

'To Do' List for RRT Pilot Rollout

- Attend pilot unit staff meetings
- Create poster and/or flyer to inform staff of rollout date
- Order "RRT Launch" buttons
- Meet with Quality/Performance Improvement Department director and unit-based quality council representative
- Meet with Clinical Informatics Department to develop electronic data documentation tool
- Make sure collecting outcomes measures is possible
  - o Finance Department follow-up
  - o Health Information Management Systems/Medical Records Department follow-up
- Check with RRT members to make sure they're ready to go

educator, is able to include it in the in-services, which are conducted on schedule.

Days before the RRT pilot's official rollout, Rebecca, Chen, and Carlos meet to review their final preparations, check in with Pat, the nurse manager, and Susan, the clinical educator, and post the RRT rollout flyers around the unit (see *RRT Rollout Flyer*). Rebecca and Chen tell Carlos they want to create a "spirit of celebration" on the morning of the rollout to get people excited about it. They decide to bring breakfast and give out "RRT Launch" buttons on rollout day. Carlos agrees that it's a great idea to try to make the first day of a new process positive and memorable. He particularly likes the idea of giving out buttons that will serve as visual triggers that something new and exciting is about to happen.

THE RRT PILOT ROLLOUT

On the first day of the rollout, Rebecca, Chen, and Carlos are on the unit before the day shift begins. They decorate the lounge, invite the staff to enjoy a complimentary breakfast when they take their break, and give every staff member a button to remind them to spread the word that it's RRT Launch Day.

A patient is stabilized. Although the first three days begin and end with no RRT calls, on the fourth day, while Rebecca is working, one of her nurse colleagues, Jessica T., approaches and asks her to come and look at a patient she thinks is decompensating. As they proceed to the patient's room, they take a copy of the RRT protocol from the nurse's desk as a guide. Jessica, the bedside nurse, assesses her patient and determines that the patient meets the criteria for calling the RRT. She follows the RRT protocol step-by-step, while Rebecca stays close by to support her. The team arrives within five minutes and there is a flurry of activity. Jessica and the RRT all work together to care for the patient. As a result of their timely interventions, the patient is stabilized and remains on the unit.

As a result of the RRT's timely interventions, the patient is stabilized and remains on the unit.

After most of the RRT members leave, Jessica, Rebecca, and the ICU nurse on the RRT sit together for a few minutes to debrief the RRT call and experience. The ICU nurse tells Jessica what a great job she did assessing and caring for her patient. Jessica appreciates the compliment and feels good about the RRT intervention and outcome. Rebecca tells both nurses how well they shared their knowledge and skills to turn a potentially challenging situation into a wonderful learning experience. The nurses express to Rebecca how satisfying it was to know they were giving this patient the best care possible. Rebecca is pleased by how well the RRT process worked and how positive the experience was for everyone involved. Rebecca calls Carlos and Chen to share with them the great success of their first RRT consult. The EBP team is happy the first test of the RRT intervention is over and that it was a success!

A patient codes. The RRT pilot continues to proceed well until its third week, when Chen arrives at work and finds that a patient coded on the unit the day

RRT Rollout Flyer

RAPID RESPONSE TEAM
STARTS AUGUST 1, 2011

Key Points to Remember:

An RRT consult can be initiated by any bedside clinician.
The RRT will arrive within five minutes (or less) of the call.
The full RRT protocol is posted at the nurses' station and in the policy book.

RRT consult procedure:

1. **Assess** patient using the RRT protocol.
2. If any RRT criteria are identified, **initiate** the RRT consult by **calling 5-5555.** The operator will request your location, the patient's name, the patient's location, and the reason for RRT activation.
3. **Provide** the RRT with information about the patient using the SBAR reporting protocol.

While waiting for the RRT to arrive:

Initiate any/all of the following actions:

- Call for a colleague to help you.
- Set up oxygen apparatus.
- Set up suction apparatus.
- Call for the code cart to be brought to the area.
- Communicate with the patient's family (if present); tell them what you're doing and why and that someone will be there shortly to help them.
- Obtain proper documentation tools to be used during the RRT consult.

When the RRT arrives:

1. **Provide** information using SBAR.
2. **Participate** in the care of your patient and remain with the patient and the RRT.
3. **Assist** the RRT as needed.
4. **Document** activities, interventions performed, and patient responses to interventions.
5. **Ensure** that the patient's family is informed of the situation at reasonable intervals.
6. **Assist** in arranging for transfer of the patient to a higher level of care if indicated, and **provide** a detailed report to the receiving nurse, using SBAR.

If you have any questions, please contact **Rebecca or Chen @ x1234.**
Thank you for your support of this evidence-based initiative!

before and was transferred to the ICU; the RRT was never utilized. Chen contacts Carlos and shares this information and her concerns with him. Carlos offers to review the patient's chart that afternoon with the APN hospitalist to determine if this patient had been an appropriate RRT candidate and what, if any, follow-up would be appropriate.

Carlos meets with Rebecca, Chen, and Pat, the nurse manager, the following day to discuss his findings. He informs them that the patient was indeed an appropriate candidate for an RRT consult; however, there's no clear indication in the documentation as to why the RRT wasn't called by the staff nurse who cared for the patient that day. They decide that Pat and Rebecca will talk with the staff nurse, Joanne S., to hear why, from her perspective, the RRT consult wasn't initiated. When Pat and Rebecca meet with Joanne, they ask her first whether she had attended an RRT in-service and had known the RRT was available.

"Yes, I went to the in-service," Joanne says, "but I never thought about the new RRT thing the other day." She continues: "I've been a nurse for 25 years and I know when a patient is going bad, how to call a code, and that our ICU is always there when needed." In response to Rebecca's further questions: was there a particular reason Joanne chose not to use the RRT, would she be willing to use it in the future, and what would be helpful in encouraging her to use it in the future, Joanne responds, "I'm not opposed to new ideas; after all, there's a new idea on this unit every day, for goodness' sake! I might use this new team someday, but I have to see how it works for other people first. I'm just not sure about it yet."

Pat M. recognizes that this is a critical moment in the EBP project implementation process where she, as nurse manager, needs to provide leadership. She recalls a list of key strategies Carlos had shared with her regarding the manager's role in the successful implementation of an EBP project (see *Managers' Key Strategies to Promote Successful Implementation of an EBP Project*). She utilizes several of these strategies in her discussion with Joanne, particularly those that focus on her expectations of both leadership and staff. Joanne agrees to review the RRT criteria and protocol. Rebecca reminds Joanne that the purpose of the RRT is to improve patient outcomes. Joanne says she'll try to remember to use it next time.

After the meeting with Joanne, Pat and the EBP team meet and agree that this missed opportunity wasn't related to the RRT process. Instead, it concerned a single individual who seemed to be resistant to a change in practice. They decide that there's no need to follow up with the entire staff at this time, and that Rebecca will check in with Joanne in a few days. Carlos reminds the team that resistance to change is common and that paying timely, direct attention to situations like Joanne's is an effective strategy to get and keep everyone on board with an evidence-based project. Carlos congratulates Pat and the EBP team on their handling of this situation.

While they're together, the team uses this opportunity to review how the project is proceeding overall and to update their EBP Implementation Plan. After they check off several items in checkpoints seven, eight, and

Managers' Key Strategies to Promote Successful Implementation of an EBP Project

1. Become an expert on the EBP project and activities implemented on the unit.
2. Communicate information about the EBP project with staff as early and often as possible.
3. Encourage staff feedback about the EBP project.
4. Speak positively about the EBP champion(s) and the EBP project.
5. Demonstrate, through actions, support of the EBP champion(s) and the EBP project.
6. Set clear expectations for staff regarding the EBP project and related activities.
7. Provide support and resources to staff as the EBP project is implemented and integrated.
8. Be present and available to staff during critical phases of EBP project implementation.
9. Hold staff accountable to the EBP project and related activities.
10. Provide timely follow-up or redirection if evidence-based activities are not carried out (whether it be by an individual or group).
11. Acknowledge staff efforts toward successful implementation of the EBP project (highlight specific staff if possible).
12. Celebrate milestones during the EBP project.

nine, such as addressing stakeholder concerns, launching the project, and reviewing its progress, they turn back to Pat and ask her for any feedback on the launch. She says that she's been talking with the nursing staff and attending physicians regularly over the past three weeks and is excited to share with the team that the feedback has been overwhelmingly positive. Pat believes that the team's extensive planning has been critical to the project's success. Pat ends by saying, "In my opinion, there have been no real problems or major setbacks."

Rebecca tells the team that she has communicated with both the Health Information Management Systems/Medical Records Department director and the Finance Department manager, and they've been successful in collecting the data they committed to collect at the kickoff meeting. Chen has been following up on how well the electronic data documentation tool has been working for the staff and RRT members. Some minor adjustments were made on the tool by the clinical informatics team over the three-week pilot; however, overall, the tool has worked very well. The EBP team agrees that the success of the experience on the pilot unit has made them confident about rolling out the program hospital-wide. They make a special note to continue to monitor the RRT processes as utilization of the RRT in the hospital increases. As the final step in the pilot, the EBP team contacts each of the key stakeholders to obtain feedback about the pilot and inform them of the hospital-wide rollout.

THE HOSPITAL-WIDE ROLLOUT

When the EBP team meets to plan the hospital-wide rollout, they discuss the feedback they received from stakeholders, pilot unit leadership, and staff. They confirm that each member of the RRT is prepared for the hospital-wide rollout to begin. Carlos then leads the team through a structured discussion of how they'll roll out the RRT protocol to all hospital units. They determine that to replicate their pilot unit success, they'll need the buy-in of the nurse manager and clinical educator on every unit and to identify an RRT staff nurse champion on each unit. The EBP team decides to request time to introduce the project and present the proposed timeline at next month's nurse manager, clinical educator, and EBP council meetings in order to finalize the hospital-wide rollout plan with these key individuals.

To replicate their pilot unit success, they'll need the buy-in of the nurse manager and clinical educator on every unit and to identify an RRT staff nurse champion on each unit.

When Rebecca and Chen attend the council meetings, they find that most of the participants are already aware of the RRT project, as it has received much attention and praise throughout the hospital over the past several months. The nurse managers are eager to adopt the program on their units, and they commit to support and promote the project. They also ask some excellent questions. The pediatric manager asks, "Will the RRT respond to pediatric patients and newborns in the nursery?" The obstetrics manager asks, "Will the RRT respond to obstetric patients who are having nonobstetrical clinical problems?" The endoscopy suite manager asks, "Can we call the RRT for outpatients?" Rebecca and Chen don't have immediate answers for all of these questions. They tell the nurse managers that they'll take their questions back for the whole EBP team to discuss and promise they'll have answers within a week. The clinical educators are very supportive of the project and Susan B. has already begun to work with them to plan their staff in-services. The EBP council representatives are also quite positive: they tell Rebecca and Chen that they've discussed the RRT project and unanimously decided they'll be "the best RRT champions ever." The EBP team is pleased with the enthusiasm and support from every group. They feel confident about proceeding with the EBP implementation process and rolling out the RRT hospital-wide.

Join the EBP team next time to learn the results of the hospital-wide rollout, how outcomes data were collected and evaluated, and about their plans to disseminate the results of their experiences so others can learn from them. ▼

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By Bernadette Mazurek Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN, Ellen Fineout-Overholt, PhD, RN, FNAP, FAAN, Lynn Gallagher-Ford, MSN, RN, NE-BC, and Susan B. Stillwell, DNP, RN, CNE, ANEF

Sustaining Evidence-Based Practice Through Organizational Policies and an Innovative Model

The team adopts the Advancing Research and Clinical Practice Through Close Collaboration model.

This is the 12th and last article in a series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When it's delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved. The complete EBP series is available as a collection on our Web site; go to www.ajnonline.com and click on Collections.

In July's evidence-based practice (EBP) article, Rebecca R., Carlos A., and Chen M. evaluated the outcomes of their rapid response team (RRT) implementation project. Their findings indicated that a significant decrease in one outcome, code rates outside the ICU, had occurred after implementation of the RRT. This promising finding, together with many other considerations—such as organizational readiness; clinician willingness; and a judicious weighing of all the costs, benefits, and outcomes—encouraged the EBP team to continue with plans to roll out the RRT protocol throughout the entire hospital system. They also began to work on presentations and publications about the project so that others could learn from their experience and implement similar interventions to improve patient outcomes.

USING EVIDENCE TO INFORM ORGANIZATIONAL POLICY

Because Rebecca, Carlos, and Chen are concerned about whether the implementation of an RRT can be sustained over time in their hospital, they want to take the necessary steps to create a hospital-wide RRT policy. Therefore, they make an appointment with their hospital's director of policies and procedures, Maria P., to share the outcomes data they've gathered from their project and to discuss the project's success so far. Maria is impressed by the rigor of the team's sequential EBP process and the systematic way in which they've gathered the outcomes data. She reminds them that the measurement of outcomes (internal evidence) plus rigorous research (external evidence) result in the best evidence-based organizational policies to guide the highest quality of care in health care institutions.

It only takes one passionate, committed person to spearhead a team vision to improve care for patients and their families.

Maria volunteers to assist the team in writing a new evidence-based policy to support having an RRT in their hospital. She suggests that each recommendation in the policy be supported by evidence. Maria explains that once the policy is written, it needs to be approved by the hospital-wide policy committee, representing all of the health disciplines. Maria emphasizes that transdisciplinary health care professionals and administrators should routinely be involved when planning and implementing evidenced-based organizational policies. She also reminds the EBP team that translating evidence and evidence-based organizational policies into sustainable routine clinical practices remains a major challenge for health care systems.

The new RRT policy written by Rebecca, Carlos, and Chen with Maria's help is approved by the hospital-wide policy committee within three months. Now the

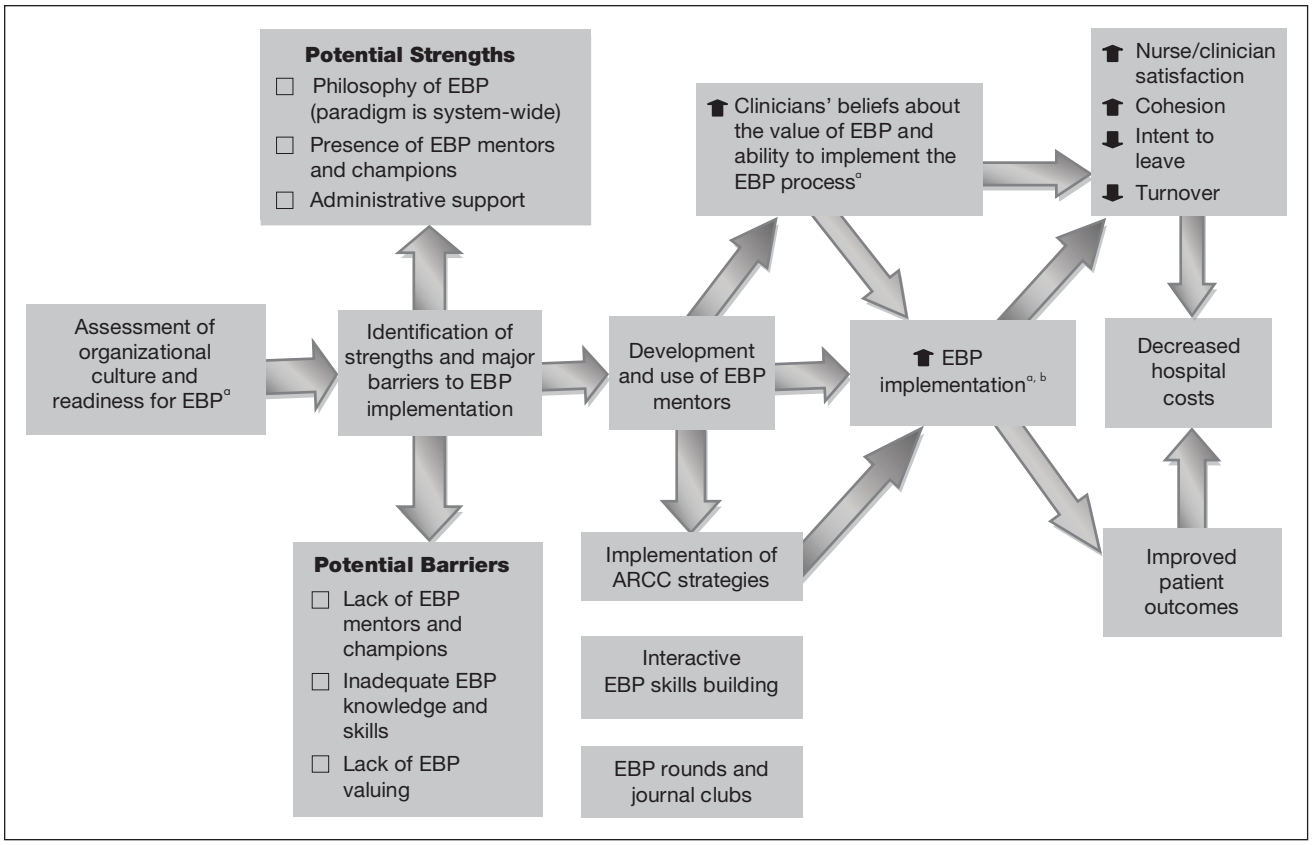

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Figure 1. The ARCC Model for System-Wide Implementation and Sustainability of EBP
ARCC = Advancing Research and Clinical Practice Through Close Collaboration; EBP = evidence-based practice.
[a] Scale developed.
[b] Based on the EBP paradigm and using the EBP process.

challenge for the team is to work with clinicians across the hospital system to implement it. The EBP team schedules a series of presentations throughout the hospital to introduce the new RRT policy. They rotate the days and times of this in-service to capture as many direct care clinicians as possible. To ensure that all clinicians are educated on the new policy, a database is created to track in-service attendees, and each hospital unit is asked to appoint a volunteer to deliver the presentation to any clinicians who missed it. Posters are created and buttons designed as visual triggers to remind staff to implement the new policy.

Throughout this process, the EBP team learned that dissemination of evidence alone doesn't typically lead clinicians to make a sustainable change to EBP, and they were impressed by how important it was to have unit-based champions reinforce the new policy.[1] They also learned that it's critical to have an organizational culture that supports EBP (such as evidence-based decision making integrated into performance expectations, up-to-date resources and tools, ongoing EBP knowledge and skills-building workshops, and EBP mentors at the point of care) in order for clinicians to consistently deliver evidence-based care.[2]

Since the process they followed worked so well, the team believes that their hospital needs to adopt a model to guide and reinforce the creation of a culture to sustain the EBP approach they had initiated through this project. They review several EBP process and system integration models and decide to adopt the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model because its key strategy to sustain evidence-based care is the presence of an EBP mentor (a clinician with advanced knowledge of EBP, mentorship, and individual as well as organizational change). With Carlos's success as an expert EBP mentor, and the mentorship model working so well, they believe that developing a cadre of EBP mentors system-wide is key to the ongoing

implementation and sustainability of EBP in their organization.

SUSTAINING AN EBP CULTURE WITH THE ARCC MODEL

In reviewing the ARCC model, the EBP team finds that its aim is to provide hospitals and health care systems with an organized conceptual framework to guide system-wide implementation and sustainability of EBP for the purpose of improving quality of care and patient outcomes. In addition, this model can be used to achieve a "high reliability" organization (one that delivers safe and high-quality care), decrease costs, and improve clinicians' job satisfaction. Four assumptions are basic to the ARCC model[3]:

- Both barriers to and facilitators of EBP exist for individuals and within health care systems.
- Barriers to EBP must be removed or mitigated and facilitators put in place in order for individuals and health care systems to implement EBP as a standard of care.
- For clinicians to change their practices to be evidence based, both their beliefs about the value of EBP and their confidence in their ability to implement it must be strengthened.
- An EBP culture that includes EBP mentors is necessary in order to advance and sustain EBP in individuals and health care systems.

The first step in the ARCC model is to assess the organization's culture and readiness for EBP (see Figure 1). From that assessment, the strengths and limitations of implementing EBP within the organization can be identified. The key implementation strategy in the ARCC model is the development of a cadre of EBP mentors, who are typically advanced practice nurses or clinicians with in-depth knowledge of and skills in EBP and in individual behavior change and organizational culture change. These individuals, whether expert system-wide mentors, advanced practice mentors, or peer mentors, are focused on helping point-of-care clinicians to use and sustain EBP and to conduct EBP implementation, quality improvement, and outcomes management projects. When clinicians work with EBP mentors, their beliefs about the value of EBP and their ability to implement it increase, and this is followed by a greater achievement of evidence-based care.[4]

Developing a cadre of EBP mentors system-wide is key to the ongoing implementation and sustainability of EBP in an organization.

The ARCC model contends that greater implementation of EBP results in higher job satisfaction, lower turnover rate, and better patient outcomes. A series of studies now support the empirical relationships in the ARCC model.[4-8]

The ARCC model has been and continues to be implemented in hospitals and health care systems across the country with excellent results in quality of care and patient outcomes. Valid and reliable instruments, such as the EBP Beliefs and EBP Implementation scales,[6] are used to measure key constructs in the model and, together with organizational culture and readiness for EBP, help to determine the model's effectiveness.[6]

The EBP team discusses how all the elements of the ARCC model are an excellent fit for their organization. They decide to make a recommendation to the Shared Governance Steering Committee that this model be adopted, not only for the nursing department, but for all disciplines throughout the organization.

THE EBP JOURNEY HAS JUST BEGUN

This series presented a case involving a hypothetical medical–surgical nurse and her colleagues to illustrate how EBP can be successfully implemented to improve key patient outcomes. It's important that the process start with an ongoing spirit of inquiry, and that nurses always question the evidence behind the care we provide and never settle for the status quo. Never forget that it only takes one passionate, committed person to spearhead a team vision to improve care for patients and their families. It also takes persistence through the "character builders" that are sure to appear as the vision comes to fruition.

Although the EBP team has successfully completed their RRT implementation project and its incorporation as a hospital-wide policy, their EBP journey has just begun. In fact, only days after the project's completion, Rebecca asked Carlos another great PICOT question: "In critically ill patients, how does early ambulation compared with delayed ambulation affect ventilator-associated pneumonia in the ICU?" Carlos looked at her and replied, as a great mentor does, "I will help you search for the evidence and we will find

the answer to your question—because EBP, not practices steeped in tradition, is the *only* way we do it here!" ▼

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The authors have disclosed no potential conflicts of interest, financial or otherwise.

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Rev 9/13

UNIVERSITY OF HAWAII MAUI COLLEGE
ADN NURSING PROGRAM
NURS 360 WI

EVIDENCE-BASED PRACTICE ASSIGNMENT
5.2 Points of Course Grade

Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data, with clinical expertise, and patient preferences and values. (Melnyk, Fineout-Overholt, Stillwell and Williamson. 2010).

1. For this assignment, you will join a group of your classmates in a topic area. Each student in the group should review the attached articles in assignments in Laulima:

Making the Most of Nursing's Electronic Resources
Evidence-Based Practice Step By Step Articles:
Igniting a Spirit of Inquiry: An Essential Foundation for Evidence-Based Practice
The Seven Steps of Evidence-Based Practice
Asking the Clinical Question: A Key Step in Evidence-Based Practice
Searching for Evidence
Critical Appraisal of the Evidence: Part 1

The remaining articles in assignments attachments develop this topic in more depth and are recommended, but not required.

2. Each group should work together to generate a clinical question of meaning to them related to nursing practice in the group's topic area according to the PICOT format – Patient, Intervention, Comparison, Outcome, Time – which is explained in the Evidence-Based Practice Step by Step article "Asking the Clinical Question: A Key Step in Evidence-Based Practice Searching for Evidence". You may confer with faculty on your clinical question.

3. The group members should search for current clinical practice guidelines, with keywords from the PICOT clinical question, on acceptable sites such as the Agency for Healthcare Quality and Research (AHRQ), Center for Disease Control (CDC), American Heart Association (AHA). Group members should choose keywords from the PICOT clinical question to search databases such as CINAHL which is available through the Maui College Library, PubMed which is available at www.ncbi.nlm.nih.gov/pubmed, and Google Scholar. Refer to the Step by Step article "Searching the Evidence" to narrow and limit your search.

4. Group members should perform a critical appraisal of the evidence according to the approach in the Step by Step Article "Critical Appraisal of Evidence: Part 1". If possible, by critical appraisal, reduce the number of research articles you are using to 5 to 7. Faculty are aware that you have not been required to take statistics or nursing research yet, but you should be able to complete an evaluation table similar to the table in the article.

5. Based on the guidelines your group has identified and the research articles you have appraised as valuable, together formulate a preliminary answer to your clinical question.

6. For your group written assignment, do the following:

a. State the topic area, and the clinical question your group developed in the PICOT format. State what prompted your group to select that clinical question, and what is meaningful to your group about that clinical question. **0.8 points**

b. Describe your search strategies including what keywords you used in what sites and databases, how many results you got, and how you narrowed and limited your searches and how many results you got. **0.6 points**

c. Develop a table to show critical appraisal of 5 to 7 research studies according to the Table in "Critical Appraisal: Part 1" . **0.6 points**

d. Submit copies of the clinical practice guidelines and the 5 to 7 research studies your group identified as "keepers". **0.6 points**

e. Formulate the preliminary answer to your clinical question. Identify what contribution each of the studies you identified as a "keeper" contributed to your preliminary answer. A definitive answer would necessitate more in depth review of the research evidence. State how your findings may or may not influence your nursing practice. Be sure to include your reference list.

0.6 points

f. Be prepared to present your group's work to your fellow classmates.

7. Submit your group's written assignment in Laulima in Assignments prior to the critical thinking session by Monday 12/02/13 at 0900. For the written assignment a, b, and e should be no more than a total of 2 typed pages. In addition include the table, and copies of the guidelines and research articles.

This assignment was developed with reference to the following articles:

Dee, C. (2005). Making the most of nursing's electronic resources. *American Journal of Nursing,105, 79-85.*

Fineout-Overholt, E., Melnyk, B.M., Stillwell, S.B., Williamson, K.M. (2010). Critical appraisal of the evidence: part 1. *American Journal of Nursing,110, 47-52.*

Melnyk, B.M., Fineout-Overholt, E., Stillwell, S.B., Williamson, K.M. (2009). Igniting a spirit of inquiry: an essential foundation for evidence-based practice. *American Journal of Nursing, 109, 49-52.*

Melnyk, B.M., Fineout-Overholt, E., Stillwell, S.B., Williamson, K.M. (2010). The seven steps of evidence-based practice. *American Journal of Nursing, 110, 51-53.*

Ross, A.M., Noone, J., Luce, L.L., Sideras, S.A. (2009). Spiraling evidence-based practice and outcomes management concepts in an undergraduate curriculum: a systematic approach. *Journal of Nursing Education, 48, 319-326.*

Stillwell, S.B, Fineout-Overholt, E., Melnyk, B.M., Williamson, K.M. (2010). Asking the clinical question: a key step in evidence-based practice. *American Journal of Nursing,110, 58-61.*

Stillwell, S.B, Fineout-Overholt, E., Melnyk, B.M., Williamson, K.M. (2010). Searching for the evidence. *American Journal of Nursing,110, 41-47.*


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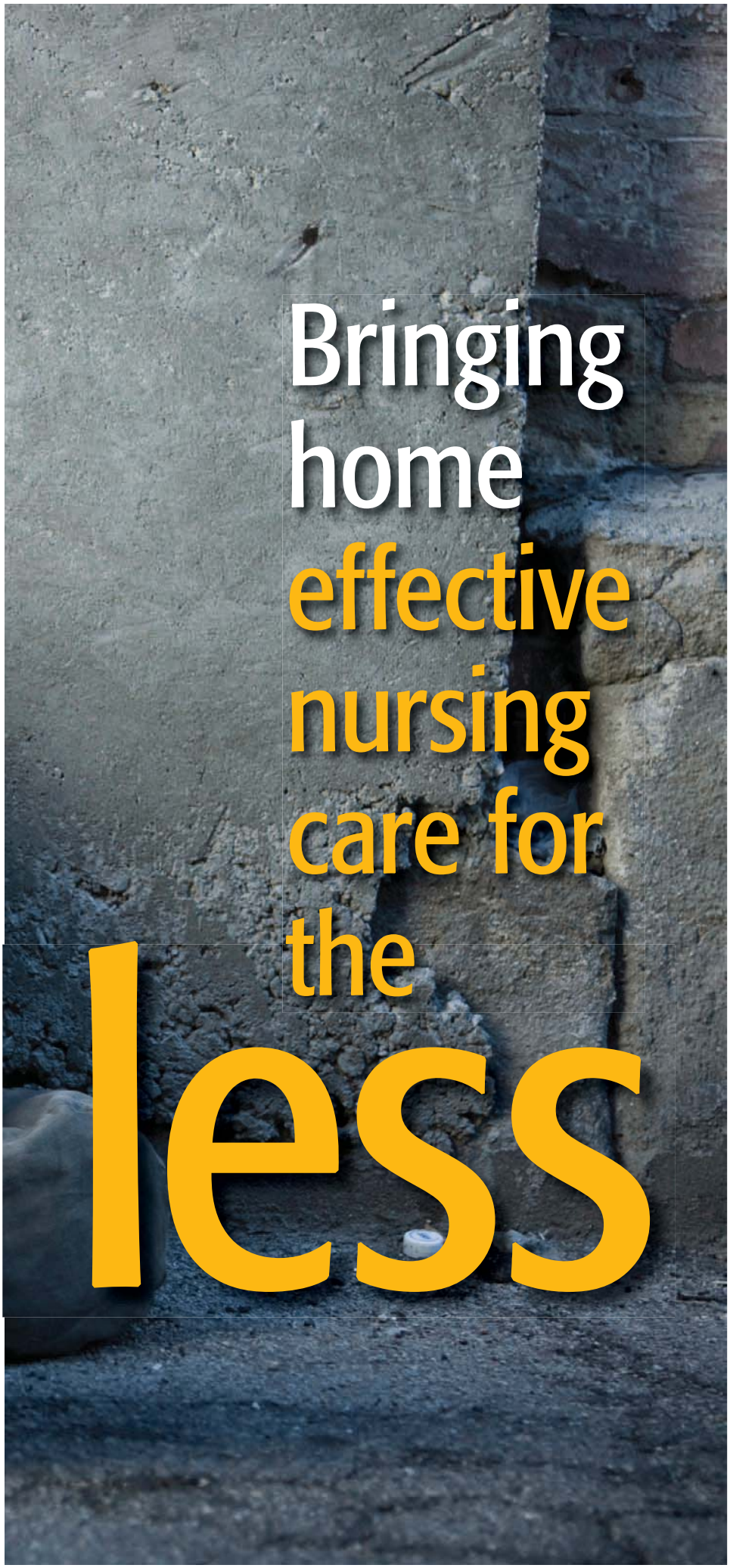

Bringing home effective nursing care for the less

By Lois Gerber, MPH, BSN, RN

"I LIVE WITH SLEEP DEPRIVATION every day; it makes me moody, angry, and unable to concentrate. It's a miserable way to live!" said Mr. H, 35 and single, sitting across from me in a local shelter. Homeless for 18 months, he was wearing ragged pants and a hooded sweatshirt, which he'd picked up at the Salvation Army. Although his clothes looked clean, his strong body odor permeated the air. Speaking in a soft monotone and avoiding eye contact, he clenched his fists and continued, "We're all different. I hate when people stereotype us as lazy, crazy, evil, or stupid. I have 3 years of college."

Nurses working in any public, private, or veterans' hospital are responsible for providing homeless persons realistic plans for follow-up and appropriate referrals to community agencies on discharge. Nurses working in jails and prisons should develop discharge plans that include referrals for housing and healthcare before inmate release. The Joint Commission mandates all patients receive safe discharge from healthcare facilities.[1]

This article explores the health problems of homeless people like Mr. H, how these health problems can impact other people, and how nurses can best care for these vulnerable patients.

RUBBERBALL/ISTOCKPHOTO

Sobering facts

Homelessness kills! This multidimensional problem harms the health of both homeless people and the general public. The many communicable diseases that homeless people contract may lead to outbreaks that later become serious public health hazards. Evidence suggests appropriate public health interventions can prevent and control the spread of disease.[2]

In 2011, about 636,000 people, more men than women, were homeless in the United States, a decrease of 1% from 2009.[3] A report the same year reported 1 in 50 children was without a home.[4] Over the last decade, the number of homeless families, many headed by single mothers in their 20s, has increased significantly. Many of these women have left a domestic situation because of physical and/or mental abuse.[5,6] One study found about 25% of the gay and lesbian population and 15% of bisexuals reported homelessness compared with 3% of the heterosexual population.[7]

The prevalence of physical illnesses, including infectious diseases, among homeless persons ranges from 33% to 55%. Their average life expectancy is 44 years compared with 78 years for the general U.S. population.[1] Their age-adjusted mortality is three to six times higher than for people with housing.[1] Homelessness affects single people, families, and children in both urban and rural areas, although in farm communities, family and friends are more likely to offer temporary housing and other assistance.[5]

In urban renewal efforts to create more attractive neighborhoods, many single room occupancy (SRO) hotels were eliminated, which increased the number of homeless people. Deinstitutionalization of the chronically mentally ill from public psychiatric hospitals and the high unemployment rate both exacerbated the problem.[5] For more insight into the root causes of homelessness, see *Understanding two types of poverty*.

Understanding two types of poverty[5]

The poverty of homelessness can be broken down into two subtypes: *crisis poverty* and *persistent poverty*.

- *Crisis poverty* impacts people whose lives are riddled with hardship and struggle; their homelessness is transient with episodic stays in shelters and temporary housing. The root causes of *crisis poverty* are lack of employment opportunities, obsolete job skills, lack of education, and domestic violence.
- *Persistent poverty* refers to chronically homeless people who are likely to have mental and physical disabilities, which often exist along with alcohol and drug abuse, family estrangement, lack of a high school education, and poor social skills.

Concurrent problems

The persistently homeless live in constant chaos, confusion, and fear. Trauma from head injuries, gunshot wounds, stab wounds, lacerations, and/or fractures is a significant cause of death and disability.[5] Hypothermia in the winter and dehydration in the summer are of particular concern.

Homeless people also experience higher rates of chronic disease, comorbidities, and physical limitations than the general population. For example, many vision issues aren't addressed.[8] Most homeless people have at least one chronic illness and untreated health problems to which they've adjusted. Many have adjusted to the functional disabilities of their chronic health problems.[1,5,8] (See *Zero in on chronic conditions*.) For example, Ms. T, a middle-aged homeless woman visiting the shelter, spoke of long-term untreated digestive problems that she "just lives with."

From 20% to 25% of homeless people have mental health illnesses.[9] Some deny mental illness and refuse treatment.

Substance abuse is a common comorbidity.[11] Eighty-four percent of homeless men and 54% of homeless women have alcohol use disorders compared with 8% of the general population.[1,10] Although 13% of the homeless are employed, physical and mental illnesses hinder the ability of most homeless people to earn enough to meet daily needs.[6,7]

Zero in on chronic conditions

Homeless people have disproportionately high rates of these chronic conditions:

- arthritis
- asthma
- chronic obstructive pulmonary disease
- diabetes
- HIV/AIDS
- hypertension
- peripheral vascular disease
- pneumonia
- STIs
- tuberculosis (TB).[5,6,10]

The mental health diagnoses most often identified in the homeless are the following:

- bipolar disorder
- dementia
- depression
- personality disorder
- posttraumatic stress disorder
- schizophrenia.[5,6]

Special populations, special concerns

Among the homeless, veterans, former convicts, and minority groups are disproportionately represented. Homeless pregnant women have high rates of sexually transmitted infections (STIs) and drug addiction and are at risk for complex health problems. Their infants are more likely to be born prematurely and have lower Apgar scores.[5]

Children younger than age 5 are at high risk for developmental delays and impaired brain development. Most homeless children have more physical, mental health, and learning problems than poor children who are housed.[5]

Homeless teens may be runaways attempting to escape physically or sexually abusive home environments. They may exchange sex for food, clothing, and shelter, which

increases their risk for HIV/AIDS, STIs, and unintended pregnancy.[5]

Homeless youth come from all socioeconomic levels of society, not only from poor households, and are more likely to live outdoors than older homeless people. Many experience physical or sexual victimization after leaving their homes.[12] Some are transitioning from foster care.[3] Depression and suicidal ideation are common. These youth need reunification with families or supportive residential housing.[12]

Unique characteristics

All homeless people are vulnerable physically, socially, psychologically, and spiritually; they experience higher rates of violence, homicide, and suicide than the housed. Children, women, and older adults are the most defenseless.[5,10,13]

Many habits of homeless people, such as panhandling, infrequent bathing, and obtaining food from dumpsters, conflict with cultural norms. Often enduring conditions that would incapacitate others, homeless people may derive a sense of achievement from their survival skills they didn't experience in the mainstream world.

Those who value the common theme of self-survival have learned to rely on only themselves and their peers. Some lead a nomadic life and spend a large part of each day finding food and shelter with little thought or planning for the future.

Although detached from the broader community, they honor relationships with each other and tend to share resources among themselves. They may fear losing their street skills if they assimilate into the mainstream or accept societal assistance. Many blame fate or bad luck for their situations but hope for a change in their present circumstances.[7,14]

Nursing considerations

Nurses may feel powerless and frustrated when caring for homeless patients. These patients' frequent ED visits and poor adherence to discharge instructions can contribute to burnout in nurses.[1] Yet nurses who learn about this culture's unique needs are in a pivotal position to improve healthcare for this population.

Nurses need to understand their personal values and beliefs before serving this population.[5] The everyday lives of healthcare providers and the homeless are so different that they can become cultural strangers, often avoiding contact with each other because of mutual fears. Some healthcare providers prescribe treatment and offer professional advice in hospitals, clinics, or shelters without understanding a patient's lifestyle or knowing if the patient lives on the street, in a wooded area, under a bridge, or in an SRO, parked car, railcar, tent, abandoned building, or cave.[5,11]

According to R. Gonzales, director of operations of Halifax Urban Ministry, a multiservice agency serving the homeless in Daytona Beach, Fla., most homeless people protect the place where they live, even if it's outdoors, and carefully hide their things somewhere nearby.[15]

Ms. T said, "Waterproof backpacks are essential. And bikes. I sold my blood and an envelope of Keflex to buy a two-wheeler." Both items facilitate a homeless person's ability to move around within the community.[15]

Healthcare for the homeless is provided in various settings—shelters, hospital EDs, store-front clinics, churches, and mobile van units. Appointments shouldn't be required. Although it's not always feasible, the multidisciplinary team/case-management approach works best to prevent patient involvement with multiple providers and fragmentation of care.[11]

Outreach and case-finding is important. Building rapport is easier if patients are met on their own turf—shelters, soup kitchens, and on the street. Be aware of common factors that hinder treatment and work to overcome them. (See *Barriers and obstacles to treatment*.) Because the overall picture for each person, family, and community differs, care needs to be planned according to each person's potential.[6,10]

Barriers and obstacles to treatment[5,6,10]

Keep in mind that a homeless patient may face these hurdles:

- lack of transportation
- lack of telephone service
- alienation from the healthcare system
- lack of preventive care
- literacy difficulties
- poor nutrition
- feelings of stigma
- multiple day-to-day stressors
- disorganization
- difficulty keeping appointments and adhering to medical plans
- immigration issues.

Take enough time and exercise patience to develop a trusting, nonjudgmental relationship that conveys respect, dignity, and value. Treat each person as an individual and avoid stereotyping. Follow up on promises. Be aware of the patient's body language and respond appropriately. Follow the patient's lead and respect his or her comfort level when making eye contact and entering personal space. Speak in a calm manner, especially if the patient appears tense or nervous. Communicate in the person's primary language; if necessary, use a medical interpreter.[6,13]

Listen to the patient's stories to find common themes. Storytelling helps people create their own identities and bring the past to the present. Often-repeated stories may offer clues to the patient's concerns and anxieties and alleviate feelings of confusion.[16] On many occasions, Ms. T recounted anecdotes from her previous work experience as an administrative assistant to a business executive. These stories, whether they're true or not, illustrate her need for respect and validation of her intelligence and contributions to society.

Ask simple, open-ended questions with enough uninterrupted time for the patient to answer. An interesting way to start a conversation is, "What would make your day better right now?" Let the patient set the pace of

the interaction and follow his or her lead, being aware of eye contact and personal space. Tailor questions to the patient's housing and behavioral situation. Establish clear guidelines and appropriate personal boundaries.[1] Set limits on disrespectful comments, sexual innuendo, and obscene language. At times, making the hand gesture T signifying "time out" helps here. If not, make a firm statement. Personal safety is a concern for nurses working independently because some homeless people occasionally behave unpredictably.[10]

Physical and psychosocial assessment can be challenging. Focus first on basic life care needs. Pay special attention to the patient's teeth, skin, and feet because homeless people have limited access to dental care, bathing facilities, and food.[1] Be alert for signs of substance abuse such as needle marks and nasal abnormalities.[13] Assess for signs and symptoms of malnutrition, infectious diseases, lice, and scabies. Illicit drug use and risky sexual behaviors, including prostitution, increase the likelihood of infectious diseases such as HIV, hepatitis B and C, and STIs.

People residing in overcrowded living conditions have a higher incidence of airborne infections, especially tuberculosis and influenza.[2,6] An uncommon but serious transmissible relapsing illness is *Bartonella quintana*, a louse-borne disease that causes fever, rash, bone pain, and splenomegaly. Complications include bacteremia and endocarditis.[2,17]

Assessment and intervention

Assess the patient's mental health for clarity of thought, emotional affect, and aggressive tendencies. Identify areas of self-esteem, self-empowerment, and assertiveness, no matter how small, and determine the patient's personal, social, and day-to-day living skills. Focus and build on the patient's talents and strengths rather than on weaknesses. Identify coping skills and areas of resilience—what worked before and what didn't. Prioritize problems.[6,10]

Most homeless people protect the place where they live, even if it's outdoors, and hide their things somewhere nearby.

Create viable care plans that are individualized and interdisciplinary. For acutely ill patients, coordinate appropriate intervention with medical facilities, mental health crisis units, or detoxification care.[1]

For those not needing immediate care, develop patient-centered goals, expressed in the patient's language and frame of reference. The goals should belong to the patient, not the nurse. Make initial goals simple, concrete, and short term. A very basic goal would be a return visit to the clinic the following day. Registering for an identification card this afternoon is another example. Start at the beginning of the process instead of the hoped-for end result.[10] Patients must understand the goals and believe they're attainable. Many homeless people may not be able to sustain interest in long-range endeavors. Their focus is the present day.

Chronic and infectious diseases should be managed with clear-cut treatment plans and medication schedules. Be aware that the patient may sell his or her prescribed medications on the streets. Offer regular infectious disease screenings in shelters using multidisciplinary teams. Some of these screenings should be unannounced to cover people who'd stay away because they're afraid or reluctant to interact with healthcare workers. If possible, give patients with terminal illnesses the opportunity for shelter and hospice-type interventions to relieve pain and suffering in a supervised setting.[2,10,18]

Coordination of care is imperative. Obtain previous records and identify any support persons in the patient's life.[10] Services shouldn't conflict or duplicate each other; "one-stop shopping" and follow-up with an assigned case manager is optimal.[13] If that's not possible, link services together to avoid fragmentation. Using the electronic medical record and following Health Insurance Portability and Accountability Act guidelines, patient health information can be shared with all providers so that treatment plans and patient progress toward goals are managed more effectively.[6,13]

If available, use telehealth tools to communicate patient-specific data from mobile clinics to hospitals and healthcare provider offices.[19] The U.S. Department of Housing and Urban Development's software program, *Homeless Management Information System*, can be used to record and store information about homeless people.[20]

Investigate and network with the various disciplines and social service agencies that offer emergency overnight shelter, food, hygiene products, and clothing, such as the Salvation Army, United Way, churches, and soup kitchens.[5,6] Coordinate services with city and county health departments, churches, and volunteer groups such as the Interfaith Hospitality Network. Refer homeless patients and those living in poverty to these community agencies.

The paperwork maze is a tremendous problem. Give patients detailed information about required paperwork, as well as agency locations, travel options, and the name of a contact person. Simply providing food, a safe place for 7 or 8 hours of uninterrupted sleep, and an opportunity to shower improves patients' receptiveness to these services.[5,6,14]

Learn about educational opportunities, job training programs, and free legal services. Refer patients to appropriate housing programs (emergency, transitional, or permanent). If appropriate, contact Habitat for Humanity and religious groups in the community. Agencies with comprehensive housing plans to address homelessness provide various options—emergency overnight shelter, transitional housing, permanent housing, and supportive housing (subsidized living arrangements with supportive services in place to meet the patients' needs).[5,21,22]

Counsel patients to apply for state and federal programs such as Medicare, Medicaid, welfare, Head Start, Supplemental Security Income (SSI) program, and food stamps. Typically, identification cards validating the person's name, birth date, and Social Security number are required.[21] Some city governments or programs working directly with the homeless provide these free of charge.

Monies from the McKinney-Vento Homeless Assistance Act, a federal program providing funds for outpatient health services, may be available. Families with children are eligible to receive shelter and nutritional assistance from the Women, Infants and Children (or WIC) program, a federal program from the U.S. Department of Agriculture.[5] Temporary Assistance to Needy Families is a further resource. Serious psychiatric and physical disability can qualify patients for SSI.[11] The Homeless Emergency and Rapid Transition to Housing (or HEARTH) Act, signed into law in May 2009, consolidates the government's competitive grant programs and increases resources to prevent homelessness.[20] (See *Tapping resources for more information*.)

Measure progress, provide positive reinforcement, and adjust goals when necessary in a nonjudgmental way. Evaluate the success of the care plan objectives in measurable terms using evidence-based practice criteria.[10,13]

Nurse-managed health clinics (NMHC), especially those that serve only the homeless, provide a cost-effective solution for delivering healthcare to this population. Primary healthcare providers may be NPs with prescriptive authority, well prepared for the role.[11] Other team members include dentists, physicians, substance abuse counselors, pharmacists, and psychologists. Nurses working in outreach and case management can act as liaisons between the homeless and NMHC staff. These one-on-one relationships will increase the patients' participation in health screening and health promotion programs. NHMCs can provide clinical sites for nursing students and may operate under the aegis of hospitals, universities, or community colleges.[1,23] The Patient Protection and Affordable Care Act of 2010 includes funding for nurse-managed centers.[13]

Community health nurses can act as case-finders and referral sources for the homeless and near-homeless. School nurses can identify and intervene with homeless students or those at risk and can offer educational programs on the needs of this population to the student body. Parish nurses can act as a resource for persons needing shelter and educate the church congregation on the characteristics of this elusive culture.

Focus on prevention

For most people, mental, physical, and financial problems precede homelessness; homelessness rarely comes first.[6] In 2011, the federal poverty guideline was $22,350 for a family of four.[5] To reduce the risk of homelessness, identify and intervene with individuals and families living in poverty and marginal situations, such as families residing together in "doubled up" situations.[3] Assess for insect, mouse, or rat infestation; lack of running water; inadequate heating and air conditioning; malfunctioning plumbing; and the absence of a telephone. Refer patients to emergency assistance programs for help with rent and/or utility bills. Teach health promotion behaviors, such as using condoms, and screen for such diseases as tuberculosis, anemia, diabetes, and hypertension.[5,24]

Advocacy is important. Volunteer.[14] Talk to members of professional nursing organizations, political leaders, and the general public about the needs of the homeless and strategies to provide health screening and care in a humanitarian and cost-effective manner. Mobile units with multidisciplinary teams are one option; another is accessible and convenient "brick and mortar" locations.[25] Many homeless people prefer to remain in their own neighborhoods.

Each chronically homeless person who cycles in and out of homelessness and institutional care costs tens of thousands of dollars annually.[25] Offer documentation to local leaders showing that permanent supportive housing coupled with supportive care saves money because of the decreased financial burden on hospitals, mental health services, police and criminal justice resources, and substance abuse detoxification and treatment centers.[25] Government block grants are available.

Crossing the divide

Homelessness today is a multifaceted public health problem. The Department of Health and Human Services outlined several goals related to homelessness in *Healthy People 2020*: achieve health equity, eliminate disparities, and create healthy social and physical environments.[26] Even though future research is essential to determine nursing's role in how to best reach these goals, nurses have the skills and abilities to address this

Tapping resources for more information

Check out these websites for more ways to help homeless patients:

- National Alliance to End Homelessness: http://www.endhomelessness.org
- National Health Care for the Homeless Council: http://nhchc.org
- U.S. Department of Housing and Urban Development: http://portal.hud.gov.

serious issue in a humanitarian and cost-effective manner.[14] Bridging the divide between the housed and the homeless will improve the health and well-being of society at large.

Now what about Mr. H, the man in the shelter? Toward the end of my conversation with him, he jammed his fists in his sweatshirt pockets, saying, "I've gotta get out of here," as he stomped out the door. Unfortunately, residents in the community where he lives may experience the fallout from his anger and anxiety. I hope he'll return to the shelter for healthcare, counseling, and outreach services. Nursing care of the homeless must focus on both the needs of the individual patient and the population at large.[6] ■

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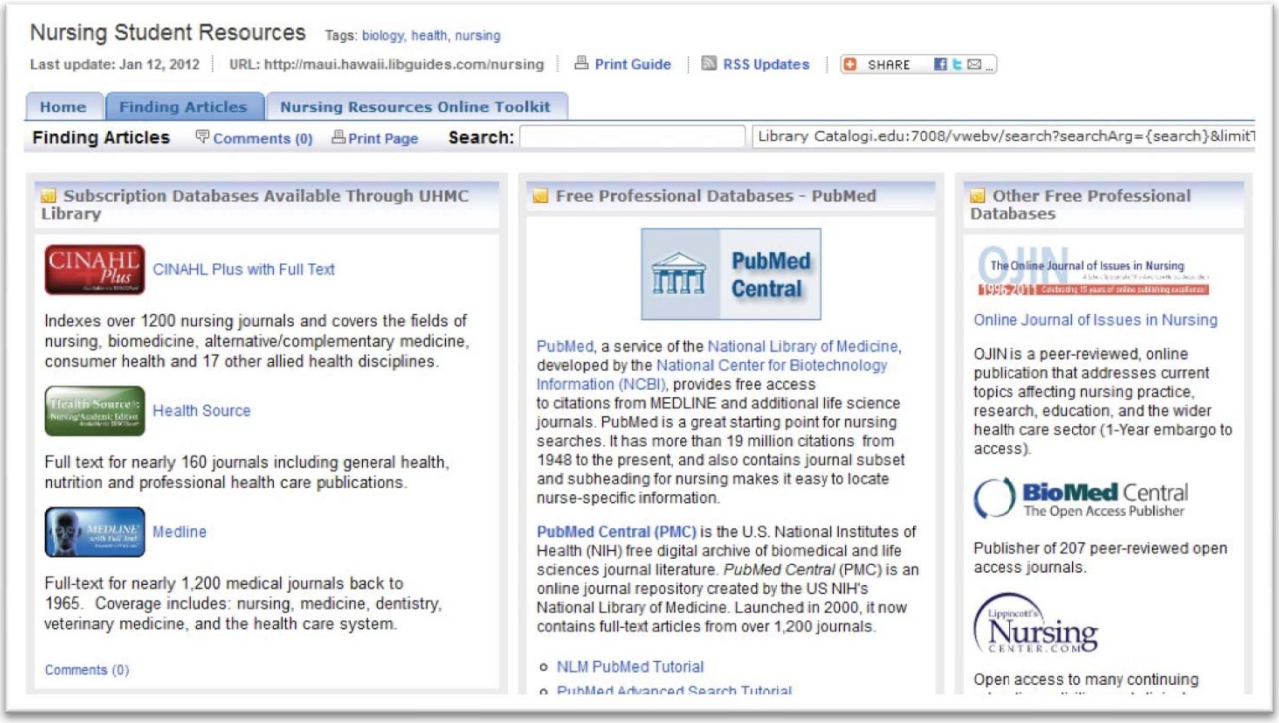

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