

A Process Model for Evidence-Based Literature Syntheses

Dana N. Rutledge, PhD, RN, Judith A. DePalma, PhD, RN,
and Mary Cunningham, MS, RN, AOCN®

Purpose/Objectives: To describe the development and implementation of the Triad Model of Research Synthesis, developed as a mechanism to produce systematic literature reviews that can serve as sources of evidence for decision making in health care.

Data Sources: Authors' recollections of the development and implementation process over a one-year period during 2002. Tracking forms were completed by members of three triad teams as they compiled research syntheses on clinical topics: pharmacologic treatment of dyspnea, assessment of sleep disturbances in patients with cancer, and exercise as an intervention for cancer-related fatigue.

Data Synthesis: The systematic literature review process includes the following steps: (a) organize, search the literature, and focus the research synthesis question; (b) critique the selected literature; (c) synthesize the evidence; and (d) write. On average, triad members spent hours that were equivalent to full-time work during the year (excluding completion of manuscripts) on the synthesis projects. Hours spent varied by member role and with each phase of the process.

Conclusions: Performing a research synthesis using the triad model was a productive and resource-intensive experience that points to the need for negotiating resources prior to embarking on such an exercise.

Implications for Nursing: Given a group of highly motivated nurses and others with adequate time and resources, this model can be effective when developing systematic reviews about a variety of topics. Literature syntheses developed can be used as evidence for clinicians and others to develop practice protocols and other evidence-based care guidelines.

Key Points . . .

- ▶ Developing a written research synthesis is a time-consuming and resource-intensive experience.
- ▶ Products of research synthesis work benefit from contributions by nurses in multiple professional roles (e.g., clinical practice, education, research).
- ▶ Using the Triad Model of Research Synthesis, practice-focused syntheses of evidence are produced through the collaborative efforts of advanced practice clinicians, educators who understand the role of advanced practice nurses, and researchers who understand how to critically appraise research studies and synthesize findings across studies.

prepared nurses who are crucial to the EBP process because of their clinical expertise, knowledge of systems within the clinical setting, and ability to facilitate interdisciplinary clinical improvement projects. APNs can foster the EBP process because of their role within healthcare settings and offer a unique perspective of care ranging from the individual patient and family level to the broader population level. Researchers offer expertise about methods for fully capturing the nature and quality of the evidence on a clinical topic. Educators teaching graduate students are aware of the capabilities of APNs related to synthesis work and also understand the expertise of researchers. The vision of the triad model was that members of a triad would work together in mutual respect toward completion of a literature synthesis.

Evidence-based practice (EBP) is a new paradigm in health care that recently has emerged in the international healthcare literature. Originally referred to as evidence-based medicine (Rutledge & Grant, 2002), EBP easily applies to nursing and other healthcare professions because it incorporates the application of best evidence by clinical experts who value the individuality of the patient and family. EBP is "a total process beginning with knowing what clinical questions to ask, how to find the best practice, and how to critically appraise the evidence for validity and applicability to the particular care situation. The best evidence then must be applied by a clinician with expertise in considering the patient's unique values and needs. The final aspect of the process is evaluation of the effectiveness of care and the continual improvement of the process" (DePalma, 2000, p. 115).

Ideal implementation of the EBP process requires the collaboration of nurses from clinical practice, education, and research. Advanced practice nurses (APNs) are master's-



Dana N. Rutledge, PhD, RN, is an associate professor at California State University in Fullerton. At the time this article was written, Judith A. DePalma, PhD, RN, was a senior research associate at the Oncology Nursing Society in Pittsburgh, PA. Currently, DePalma is an assistant professor in the Department of Nursing at Slippery Rock University in Pennsylvania and president at JADePalma Consulting in Pittsburgh. Mary Cunningham, MS, RN, AOCN®, is the director of pain and palliative care services at the Ellis Fischel Cancer Center in Columbia, MO. (Submitted June 2003. Accepted for publication September 25, 2003.)

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Critical problems in implementing EBP include the size and complexity of the research base and clinicians' lack of access to best evidence (Haynes & Haines, 1998). Other problems are nurses' lack of time for reading and going to libraries, lack of understanding of primary research, and lack of skills in accessing computerized databases and literature reviews (Rutledge, Mooney, Grant, & Eaton, 2004). Also, resources may not be available for accessing computerized databases and acquiring needed articles. According to Droogan and Cullum (1998), "It is likely that most nurses engaged in clinical practice get little or no time for reading during their working day . . . and most rely on reviews to deliver synopses of current knowledge in accessible and manageable formats" (p. 13).

Literature reviews are playing a larger role in the accumulation of clinical knowledge (Cooper & Hedges, 1994b) given the growing size of the research base and the problems of inaccessibility and shortage of time already mentioned. A systematic research literature synthesis aims to integrate primary research to allow generalizations about a topic (Cooper & Hedges, 1994b). These generalizations can offer insight into clinical conditions or problems, guiding busy nurses in practice situations. Unfortunately, current professional literature provides a limited number of such systematic reviews. With the growing need for evidence-based clinical practice guidelines, systematic reviews can serve as an important source of accessible evidence. When reviews are available, they must be appraised critically for the rigorosity of the review, that is, how systematic the process was and the feasibility of applying the practice recommendations in the particular practice setting.

Advanced Practice Nursing Retreat: Grounding in Evidence-Based Practice and Strategic Planning

In December 2001, six APNs with an interest in EBP^a and a doctorally prepared nurse consultant familiar with EBP and systematic reviews met for two-and-one-half days at an APN retreat sponsored by the Oncology Nursing Society (ONS) (Lynch, 2004). The mission of this project team was to develop and implement a project related to EBP that could be completed during the calendar year 2002. The consultant^b who had been the project team leader for the Web-based ONS EBP Resource Center led work group members toward an understanding of EBP as a process and product (Rutledge & Bookbinder, 2002). The process of EBP (see Figure 1) includes focusing on a clinically relevant topic, finding the best relevant evidence, critically appraising the evidence and synthesizing it into something useful, implementing pertinent findings in practice, and evaluating effectiveness of the implementation. Products

^a Jane Clark, PhD, CGNP, RN, AOCN®, nurse consultant, Decatur, GA; Mary Cunningham, MS, RN, AOCN®, Ellis Fischel Cancer Center, Columbia, MO; Josephine Hawkins, RN, MSN, AOCN®, Barnes-Jewish Hospital and Siteman Cancer Center, St. Louis, MO; Kyle-Anne Hoyer, MSN, RN, AOCN®, formerly of Deaconess Billings Clinic, Billings, MT, currently with Glaxo Wellcome, Denver, CO; Margaret Joyce, RN, MSN, AOCN®, Cancer Institute of New Jersey, New Brunswick; and Carrie Tompkins Stricker, MSN, CRNP, AOCN®, University of Pennsylvania Cancer Center, Philadelphia

^b The consultant was paid an honorarium for work completed for the Advanced Practice Nurse Retreat but not for follow-up work.

- Problem identification
- Search for evidence
- Critique and synthesize evidence
- Implement practice changes
- Evaluation

Figure 1. Evidence-Based Practice Process

of EBP may be program development, evidence-based screening and assessment, standards of care, policy and procedure changes, or clinical practice guidelines.

After discussing EBP, the APNs decided that they would develop three clinically relevant literature syntheses in areas where a gap existed. A gap was defined as an area where studies had been completed, no current guidelines existed, and a current literature review was unavailable. The initial focus areas were pharmacologic treatment of dyspnea, assessment of sleep disturbances in patients with cancer, and exercise as an intervention for cancer-related fatigue. Each of the APNs on the project team selected one of the three topics, so that each topic had two APNs with one serving as leader or facilitator of the topic group. Based on discussions about the process of completing a systematic literature review, the APNs determined that to succeed in undertaking these practice-focused syntheses of evidence, they would need the expertise of at least two others: an educator who understood the role of APNs and a researcher who understood how to critically appraise research studies and synthesize findings across studies. Therefore, the Triad Model of Research Synthesis was developed (see Figure 2). The timeline proposed for the completion of the synthesis manuscript included 12 months of work, with manuscripts due at the end of 2002.

Developing a Systematic Review: Background

A systematic review provides a "concise, current, rigorous synthesis of best available research evidence about a clinical problem" (Ropka & Spencer-Cisek, 2001, p. 1588). In recent

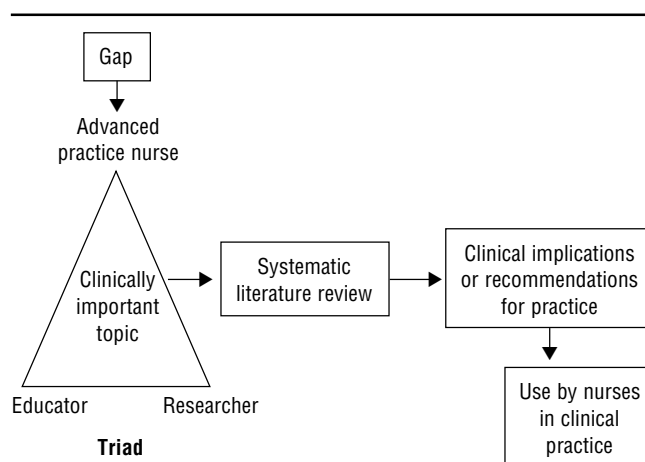


Figure 2. Oncology Nursing Society Triad Model of Research Syntheses

years, reviews have been categorized as either qualitative (narrative) or quantitative, also called meta-analyses (see Inset). Both types summarize the results of primary studies, can produce high-quality results, and are demanding to produce (Cook, Mulrow, & Haynes, 1997; Mulrow & Cook, 1998; Ropka & Spencer-Cisek). Review quality depends on how careful reviewers are in minimizing their own error and bias in compiling findings across studies (Cook et al., 1998). As with conducting research, developing systematic reviews is not a simple process, carrying much of the need for methodologic rigor while balancing practical feasibility (Cooper & Hedges, 1994a; Mulrow & Cook).

Members of the APN-EBP project team decided to conduct qualitative systematic reviews with the eventual aim of publication. Qualitative systematic reviews do not statistically summarize research findings. The review process described by the Priority Symptom Management (PRISM) project (Ropka & Spencer-Cisek, 2001) was used in planning the triads' work. The triads also used the Web-based ONS EBP Resource Center (www.ons.org) as a tool to ensure that they focused on the clinical utility of the evidence reviewed. Because of the EBP framework for this project, triads decided to analyze published reviews that related to their topics as part of the synthesis process. The rationale for this was that the groups' work would be facilitated by being able to view other written reviews and conclusions from similar literature. The steps of the synthesis process, followed by all triads, and the activities involved within each are described in detail throughout this

article. The complexity of such an undertaking and the challenge of working with a multirole team across distant geographic locations are demonstrated by the detailed description of work involved with each phase.

Phase I. Organize, Search the Literature, and Focus the Research Synthesis Question (January–May)

In this early phase, triad members organized and became a cohesive work group. Each pair of APNs solicited help from a researcher with expertise in the content area and an educator who worked with APNs. Over approximately six to eight weeks, the APNs in each triad recruited these new team members, explaining the goals of the triad to each member. Once established, these triad groups stayed together throughout the yearlong process. In one group (dyspnea), the educator was forced to withdraw because of competing demands. Fortunately, this occurred early and a new educator agreed to join the group. In another group (sleep), the researcher asked that a doctoral student working on a dissertation on the topic be added to the triad, totaling five members.

Following triad formation, the comprehensive search for potentially relevant studies from nursing and other literature became the focus. One APN from each group became the triad leader, initiating communication, coordinating conference calls, retrieving minutes, and, in general, facilitating the work. These leaders also communicated with the project team chair regarding group progress. Conference calls and electronic mail were the predominant communication tools. This organizational phase lasted from January through April or May because of communication issues and the iterative nature of the searches that were done. Issues consisted of slow initial communication as triads were being formed and the need to establish communication flow within triads and with ONS and the consultant.

Each group enlisted the assistance of the ONS librarian in searching computerized databases and posing a specific question that could be addressed with a systematic literature review. The librarian guided each triad through a series of searches that ended when the group determined that an appropriate and available body of literature had been identified. Appropriateness was determined by content (reading abstracts) and volume (approximate workload estimates). Inclusion and exclusion criteria for manuscript selection varied by group but were explicit. For example, the group examining fatigue decided to include only research that dealt with fatigue as a major outcome or variable, thereby excluding research in which fatigue was addressed only minimally (e.g., as one item in a measure of physical functioning). The care with which the search was done helped to prevent bias based on choice of studies. One limitation in the methods used by the triad groups was the potential for publication bias; that is, studies were not retrieved unless they were accessible via the computerized databases. Initially, all triads decided not to include presentations or dissertations, accepting the fact that unpublished data may be more likely to have "negative" results than those which are published (Cook et al., 1993).

During these search activities, each triad group had unique experiences. The group investigating dyspnea initially found 292 articles searching for pharmacologic treatment of dyspnea and identified 91 articles as potentially useful. After talking

Glossary of Terms

Hierarchy of evidence: the composite of a group of levels or types of evidence that evaluate the ability of a research design to confirm cause-and-effect relationships; a hierarchy may or may not take into account the quality of individual studies and does not address the overall strength of the collective body of evidence (e.g., Agency for Healthcare Research and Quality type of evidence).

- Evidence obtained from meta-analysis of randomized controlled trials
- Evidence obtained from at least one randomized control trial
- Evidence obtained from at least one well-designed controlled study without randomization
- Evidence obtained from at least one other type of well-designed quasi-experimental study
- Evidence obtained from well-designed nonexperimental studies, such as comparative studies, correlational studies, and case studies
- Evidence obtained from expert committee reports or opinions, or clinical experiences of respected authorities.

Level of evidence: the extent to which a study design can confirm a cause-and-effect relationship

Qualitative or narrative literature review: an overview of primary studies whereby results are summarized but not statistically combined (Lau et al., 1998)

Quantitative or meta-analytic literature review: an integration of primary studies whereby statistical methods are used to combine the results of multiple studies (Lau et al., 1998)

Systematic review: an overview of primary studies whereby the methods used in the review are explicit (e.g., inclusion or exclusion criteria) and, thus, are reproducible (Craig & Smyth, 2002); usually produces an answer to a question by bringing together findings from studies looking at the same or similar topics (Earlam et al., 2000).

Table of evidence: summary table of scientific evidence that addresses a clinical problem

with ONS research staff, the triad members decided that this number was too great based on the resources and time frame allotted for the project. They narrowed their search to “nebulized morphine use in chronically ill patients with breathlessness or dyspnea” based on categorization of the 91 articles. The focused search led to the retrieval of 20 research studies and one systematic review as sources of evidence. The sleep triad discovered that samples within published research literature commonly did not include patients with cancer, had sleep as a secondary (not primary) focus, and were predominately of descriptive design. During the search phase, sleep triad members decided that they would write two articles to thoroughly discuss their topic: (a) a description of normal sleep and sleep disturbances and (b) a description of disturbed sleep in patients with cancer. The fatigue triad found a focused body of literature and, therefore, spent the least amount of time in the search phase.

This phase ended when the group requested full-text articles based on the decisions they had made. As groups worked through this phase, the members became acquainted with one another and began to consider how the literature would be divided once they retrieved all of the articles for analysis.

Phase 2. Critique the Selected Literature (May–August)

Once the individual studies that would make up the evidence for the synthesis were requested, staff at ONS compiled them and sent copies to individual triad members. The critique phase of the process began when members received these articles and started reading them. Discussion during the retreat and the organizational phase had determined that triads would use the guidelines proposed on the Web-based ONS EBP Resource Center for critically appraising the studies and review articles. Content in the resource center emphasizes the appraisal of individual studies for scientific merit and usefulness with a tool commonly called “tables of evidence” (see Figure 3).

Each triad individually determined distribution of the reading assignments. The sleep group was unique in two ways: One APN was doctorally prepared and, with the inclusion of the doctoral student, had five members, whereas all other tri-

ads had four members. They paired an APN with another triad member, and each pair compiled articles and made tables of evidence. The doctoral student in this group read all of the materials. In the fatigue and dyspnea triads, each member read assigned articles and made tables of evidence for the articles. Using word-processing software, a designee from each triad compiled all individual tables into a “meta-table” of evidence, which was a very time-consuming process.

During the critique phase, the triads focused primarily on scientific merit. A great deal of time was spent discussing the multiple hierarchies of evidence^c (Briss et al., 2000; Hadorn, Baker, Hodges, & Hicks, 1996; Ropka & Spencer-Cisek, 2001; Stetler et al., 1998) that have been developed (see Inset). The resource center does not espouse one hierarchy of evidence but allows users to select their own criteria for appraising scientific merit. Hierarchies of evidence were used to allow readers of research to judge and utilize the most powerful or strongest form of evidence. They also allow an evaluation of the presence of bias in studies appraised (Wortman, 1994) and may be most appropriate in meta-analyses. Thus, “hierarchy of evidence applies only to questions about the effectiveness of therapies or interventions and these are only one, albeit important, type of clinical question” (Newman & Roberts, 2002, p. 93). Hierarchies have been criticized for a variety of reasons (Lohr & Carey, 1999), not the least of which is that the ranking often ignores the rigor of the research and the generalizability of the findings. For example, qualitative research usually is relegated to the level of “expert opinion,” no matter how well done the research is (Evans & Kowanko, 2000). The sleep triad had the most difficulty during

^c Readers interested in learning more about the different ways to evaluate the strength of the evidence are recommended to review a recent report, Systems to Rate the Strength of Scientific Evidence, which is available by calling the Agency for Healthcare Research and Quality (AHRQ) Publications Clearinghouse at 800-358-9295 or e-mailing ahrqpubs@ahrq.gov. This report also is available in a downloadable zipped file (200+ pages). In addition, an executive summary and a fact sheet are available online or through the AHRQ Publications Clearinghouse.

For Methods

Title, Year, Authors, and Source	Purpose, Hypotheses, and Study Questions	Measurements and Operational Definitions of Variables		Sample	Design and Level of Evidence
		Independent	Dependent		

For Utility

Findings	Fit With Setting, Sample, Other	Unknown Factors Related to Practice	Risk Issues	Resource Issues

Figure 3. Generic Tables of Evidence

Note. Based on information from Stetler et al., 1998.

this phase because most of the research articles in their evidence base were nonexperimental studies and, therefore, were not even considered evidence in some hierarchies.

Another time-consuming part of the critique phase was determining how to use previous syntheses. Although utilization-focused integrative review evaluation has been discussed (Oxman, Cook, & Guyatt, 1994; Stetler et al., 1998), the purpose for which the triad groups desired review appraisal differed in that they wanted to incorporate reviews as part of the evidence. The fatigue triad found several reviews of its topic and assigned one person to review these and frame conclusions across reviews. A specific table of evidence was created just for reviews. The dyspnea triad reviewed all of the individual randomized controlled studies from a published Cochrane review^d to validate the results from its own perspective.

All triad members agreed that the actual reading of articles was notably stress-free, aided by using the tables as a structure and the knowledge that the whole group would be viewing and analyzing these tables.

Phase 3. Synthesize the Evidence (August–October)

Triad members sought to make sense out of the studies and reviews they had gathered, read, and appraised. All agreed that using tables of evidence was necessary and useful. However, as has been discovered before by others who study synthesis work, the heterogeneity of evidence (e.g., study designs, samples, measures) can have both positive and negative consequences (Mulrow, Langhorne, & Grimshaw, 1998). Heterogeneity allows examination of consistency of findings across studies, enhancing the probable understanding of feasibility, acceptability, and actual usefulness of a practice. However, it also introduces ambiguity (Mulrow et al.) and forces reviewers to make judgments on the order of the “apples and oranges” comparison. That is, which findings are the most appropriate to use? Use of the triad model enabled discussion across roles in nursing and assisted groups in making these judgments.

When they began experiencing cognitive dissonance, triad members first believed that the problem lay with their choice of hierarchy of evidence. The sleep triad, in particular, had difficulty in applying the selected hierarchy to the predominately descriptive studies they reviewed. Following group discussion via conference calls, contact with the consultant, and determination that the studies they reviewed were designed rigorously, they were able to draw conclusions based on study findings. The other two groups were satisfied with their choice of hierarchy, probably because the evidence for their topics came from predominately experimental or quasi-experimental studies. Application of the hierarchy was relatively easy with such studies.

Synthesis involved compiling all of the results and determining the effects of methodologic issues along with differ-

ences or inconsistencies across studies. The dyspnea triad went through each manuscript, and all members discussed the results using tables of evidence. Consensus about the conclusions that could be drawn from each study then was sought. The sleep triad submitted the paired tables of evidence to one APN, who established conclusions across the evidence. The exercise triad divided up the literature as follows.

- The research studies were reviewed by the researcher and one APN (the researcher already synthesized the material for a book chapter).
- All review articles were reviewed by one APN and either a researcher or an educator.

Most triad members commented on the brevity of this phase, as contrasted with the previous two phases. During this phase came the deliberation about the major conclusions that could be drawn and the clinical implications of the findings to be stated in the synthesis. The interaction of viewpoints of triad members added richness and depth to this cognitive exercise and prevented the bias that is inherent in the professional role because the reviewer’s background can affect ratings and reviews of studies (Lohr & Carey, 1999).

Phase 4. Write

After the triads determined that consensus had been reached about the conclusions that could be drawn from the evidence, each outlined a plan for manuscript development. Triads also had to make a major decision about how to divide, categorize, and present the findings most appropriately for the topic and staying true to the evidence. Some evidence lent itself to presentation by common variables or themes and others by common methodologic components such as interventions and sample. Then, each triad had to identify the first author and determine how to write the manuscript. The exercise and dyspnea triads split their manuscripts so that each triad member was accountable for a section. The sleep triad produced outlines for two manuscripts and assigned a primary author to each, with the group agreeing to give feedback to drafts shared through electronic mailing. During this phase, conclusions and clinical implications were reconfirmed and prioritized.

Use of External Resources

During the year of synthesis work, the consultant was an active participant in conference calls for the original EBP APN Project Team and calls with the triad leaders and the project team chair but did not participate in calls for the individual triad groups. She fielded questions and assisted group members with problem solving. For example, during difficulties with the hierarchies of evidence (critique phase), she distributed several hierarchies and discussed why they were not very effective for nonexperimental research studies. The consultant also communicated via electronic mail with triad leaders on a variety of topics from group membership and workload issues to synthesis content questions. She received and processed triad member tracking sheets that documented time and activities of each group member during the synthesis work. These tracking sheets enabled evaluation of the type of activities that occurred during each phase of the synthesis process.

Members of the ONS Research Team and the ONS librarian were available to the triads. One member of the Research Team was assigned to each triad. The senior research associate,

^dA Cochrane systematic review is an up-to-date summary of reliable evidence of the benefits and risks of a particular treatment. Cochrane reviews are published in the Cochrane Library and are available through the Internet or quarterly on CD-ROMs. See www.cochrane.org.

who had both clinical and academic experience with EBP as well as serving as the research liaison for all ONS evidence-based projects, participated in many conference calls for two of the triads and was the contact for the project team chair. Triad members agreed that having this senior research associate actively participate at the triad level was critical to project success. She served as a motivator, identifying accomplishments at times when group members were seeing only frustration. She kept triads on track with the EBP process, helping the dyspnea group to focus its initial search. She helped to categorize evidence for the sleep triad. Lastly, she read manuscripts as requested, serving as a critical editor.

The ONS librarian's expertise was key to ensuring a comprehensive search of appropriate bibliographical databases. The librarian also coordinated the interdisciplinary acquisitions and worked with the senior research associate to facilitate processes at ONS. During the searches, he used her as a first-line resource in seeking clarification.

Other ONS resources used during the model implementation were funding and arranging conference calls and funding to obtain, package, and mail materials and articles.

Time Involvement in Synthesis Projects

All triad members were asked to complete quarterly tracking sheets. Ten of 13 possible respondents submitted tracking sheets. Respondents included three APN chairs of triad groups, two APNs, two educators, and three researchers. Because of the small numbers and the missing data,^c discussion of findings is done using descriptive statistics.

Figure 4 shows the average amount of time spent for the year by triad role and phase (except writing) for this synthesis work. At a glance, educators and researchers spent more time on the search and critique phases, whereas for APNs, project management took as much or more time than the synthesis work. As previously noted, the synthesis phase was surprisingly quick for all triad members, accounting for an average of only 7%–13% of time spent. In the search phase, researchers reported spending proportionately fewer hours

(9%) than other triad members, but in the critique phase, they spent more (81%). This makes sense, given that their critical appraisal and research expertise was especially relied on during the activities of this phase. An estimate of the proportion of time spent on writing is not included in Figure 4 because only one group (sleep) had begun writing during 2002 (when tracking information was available). They did estimate the hours spent prior to manuscript submission and reported working for an average of 11 hours per week for six months. Hours reported for this phase were in larger blocks of time (e.g., two to three 8- to 10-hour days) than that reported for other phases. The sleep triad wrote two manuscripts, with a researcher (doctoral student) being primary author on one and the APN (nonchair) being primary author on the other.

Actual hours are not described because in this attempt to track, the authors believe the members may have overestimated their time. For example, the average total hours reported for triad leaders (APN or chair) were 3,770, with a range of 1,430–5,200. This works out to more than a full-time job (52.5 hours per week), which is probably what it felt like for these leaders who focused on getting their triads to accomplish their task, as well as actively contributing to the task itself.

Project management was a category created to capture time spent doing group process types of activities (e.g., writing or reading minutes, pursuing phone contacts). APNs or chairs of the triads reported spending an average of 29 hours per week throughout the year on these activities. Although this figure may be overestimated, the time-consuming nature of this logistics work needs to be taken into account by others who consider using the Triad Model of Research Synthesis in other settings or with other groups.

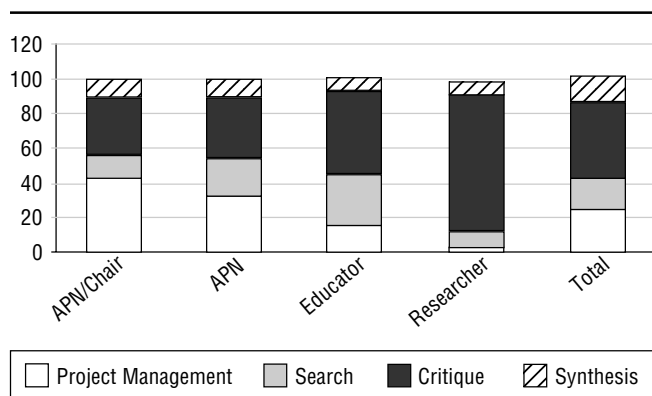
Intratriad Resources

Producing syntheses by nurses in differing roles, some of whom have never met, was resource intensive, required coordination of efforts, and was facilitated by the resources provided by ONS. Although at the retreat the consultant had warned the eager APNs and novices in processes related to EBP, none of the APNs was prepared for the amount of time and intensity of work involved in producing a research synthesis. Each phase of work required a major time commitment by all members of the triads. Time also was spent, but not tracked, by the consultant, senior research associate, and ONS librarian. This intensity of time required of volunteers has been noted as a problem in other synthesis work, for example, with clinical guideline development (Royal College of Nursing Institute, 1999).

Another critical resource to the success of this synthesis work includes the access to appropriate expertise. The model allowed for the advanced clinician, educator, and researcher to work together and incorporate their role-related experiences, but the content expertise that was a part of each group was not an integral part of the initial model. This content expertise came from having people in the group who already were familiar with the topic and literature. This expertise assisted the group in having a jump-start on the process. The content expertise of the consultant was important in facilitating process issues throughout the effort.

In beginning the search and focusing on a topic, the knowledge and resources of the ONS librarian were essential. He

^c Data was considered incomplete if not available for all time periods.



APN—advanced practice nurse

Figure 4. Percentages of Time Spent by Role in Triad and by Process

Note. Because of rounding, percentages may not total 100.

facilitated quick turnaround as consensus was sought in each group related to what would comprise the evidence. The librarian was able to complete computerized database searches, distribute them electronically, and take part in conference calls as triad members reviewed the potential evidence bases. The iterative nature of this start-up phase was strengthened by the use of one librarian who teamed with triad members in accomplishing their goals. The librarian aided group members by packaging and distributing requested manuscripts to workplaces and home offices. Because interlibrary loans and other document retrieval services can be expensive and time consuming (Hearn, Feuer, Higginson, & Sheldon, 1999), this was important for saving costs and time for triad participants and could be provided by support of a healthcare institution's librarian or professional organization.

Although not guaranteed by the triad model, individuals embarking on any similar task need to evaluate administrative support for time and resources that will be required. Having triad members working in supportive environments will decrease attrition when the workload gets heavy and time commitments (outside of regular work) are high. Many triad members in this project were employed in academic settings where publication of synthesis products is favored in terms of job requirements, but all members used personal time for the majority of their effort.

Also important to the success of the triad model is the grounding in EBP that was established at the retreat. Serving as facilitators to the model implementation were triad members' understanding of

- What constitutes strong evidence
- The necessity of systematic critical appraisal of research studies
- How to maintain focus on a selected topic
- Synthesis across study findings with an emphasis on clinical reality.

Debriefing

As the triad groups concluded their work, several thoughts were shared. One researcher stated,

This was a wonderful opportunity to see how APNs, educators, and researchers can work together to produce what I consider to be an "ultimate" product—the review and synthesis of the literature for use by clinicians. This was an exemplary, synergistic process—and hopefully, other nursing groups/associations will follow suit to optimally address patient care problems.

Another researcher noted, "I used the model in my class . . . and it went very well as a learning tool." An APN reported,

I think the idea of bringing people with complementary skill sets to the process is a good one. Our team was lucky in that we had a number of participants who cut across more than one role. . . . I think that all of us felt that we learned something from the other people in the group. [Also,] the idea of having people from different parts of the country to work together is good for the process . . . we moved beyond a regional perspective.

An educator mentioned that her APN/chair "did a great job of providing the resources we needed . . . especially facilitating

getting ONS to send us copies of the articles so we all were looking at the same things."

Many triad members reported thinking that the process could be improved at the synthesis phase by having all members meet in one location. They noted that this face-to-face interaction would facilitate the development of clinically relevant recommendations and implications based on the evidence.

Expertise Needed

Clinician: Advanced practice nurse or any RN stakeholder who

- Assumes the responsibility of leading the triad
- Has authority or access to authority to implement practice change
- Has experience with the identified problem or patient population
- Appreciates the role of research.

Educator: Staff developer or academic who

- Has expertise in adult learning or patient teaching
- Has expertise in the process to change practice
- Can design an evaluation plan for impact of practice change
- Appreciates the role of research.

Researcher: Clinically based individual or academic who has expertise in

- Research process
- Critiquing and synthesizing
- Measurement, especially outcomes
- Designing projects.

Finding Triad Members

- Target local talent when possible.
- Consider contacting
 - Similar clinical sites in a local geographic area
 - Larger, comprehensive clinical sites with roles needed
 - Academic institutions
 - Local professional groups, possibly nononcology, but relevant to the clinical issue.
- Use Oncology Nursing Society (ONS) resources.
 - Local chapters
 - Chapters through the Virtual Community Discussion Forum
 - Appropriate special interest groups through the Virtual Community Discussion Forum
 - ONS Expert Database by contacting the ONS Research Team or the ONS Education Cancer Care Issues Team

Key Resources Needed

- People
 - Librarian
 - Possible members of triad (people with access to data reports or knowledge of pertinent processes or systems [e.g., continuous quality improvement, risk management, case management])
 - Clerical support
 - Support: key administrators
 - Time: assurance of some release time
 - Remote access: conference calls and e-mail
 - Internet access
 - Key Web sites that offer resources or evidence (e.g., National Cancer Institute, Agency for Healthcare Research and Quality, Cochrane Library, National Comprehensive Cancer Network)
 - Evidence-based practice Web sites that offer guides to the process (e.g., ONS Evidence-Based Practice Resource Center at www.ons.org)
 - Data access to internal and external reports for benchmarking
 - Funding for duplicating and fees for journal articles outside of own library
 - On-site meeting room, as needed
 - Process to disseminate results internally and externally
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Figure 5. Tips for Forming Triads

Conclusions

Performing a research synthesis using the triad model was a stimulating and rewarding experience. Given a group of highly motivated nurses with adequate time and resources, this model can be effective in leading toward systematic reviews about multiple topics (see Figure 5). However, the group is quite cognizant of the current realities in health care and realizes that, in most situations, expending time and resources to develop integrated reviews is not feasible. Instead of promoting integrative review production, APNs should focus on how to critically appraise and evaluate existing systematic reviews. However, such a focus assumes that APNs are cognizant of available courses and resources about systematic reviews.

Describing the use of the Triad Model of Research Synthesis has provided insight into the process of determining, identifying, and interpreting evidence related to clinical topics in oncology care. Contributions of APNs, educators, and researchers were vital in developing integrative interpretations of evidence on specific clinical problems. Implementation of the triad model illustrates the central role that ONS and other professional organizations can play to support the development of literature syntheses and, eventually, to make EBP a reality.

Author Contact: Dana N. Rutledge, PhD, RN, can be reached at drutledge1@cox.net, with copy to editor at rose_mary@earthlink.net.

References

- Briss, P.A., Zaza, S., Pappaioanou, M., Fielding, J., Wright-de Aguiro, L., Truman, B.I., et al. (2000). Developing an evidence-based guide to Community Preventive Services—Methods. *American Journal of Preventive Medicine*, 18(1 Suppl.), 35–43.
- Cook, D.J., Guyatt, G.H., Bhan, G., Clifton, J., Buchinham, L., Willan, A., et al. (1993). Should unpublished data be included in meta-analyses? Current convictions and controversies. *JAMA*, 269, 2739–2753.
- Cook, D.J., Mulrow, C., & Haynes, R.B. (1997). Systematic reviews: Synthesis of best evidence for clinical decisions. *Annals of Internal Medicine*, 126, 376–380.
- Cook, D.J., Mulrow, C., & Haynes, R.B. (1998). Synthesis of best evidence for clinical decisions. In C. Mulrow & D.J. Cook (Eds.), *Systematic reviews: Synthesis of best evidence for health care decisions* (pp. 1–4). Philadelphia: American College of Physicians.
- Cooper, H., & Hedges, L.V. (Eds.). (1994a). *The handbook of research synthesis*. New York: Russell Sage Foundation.
- Cooper, H., & Hedges, L.V. (1994b). Research synthesis as a scientific enterprise. In H. Cooper & L.V. Hedges (Eds.), *The handbook of research synthesis* (pp. 3–14). New York: Russell Sage Foundation.
- Craig, J.V., & Smyth, R.L. (Eds.). (2002). *The evidence-based practice manual for nurses*. Philadelphia: Churchill Livingstone.
- DePalma, J.A. (2000). Evidence-based clinical practice guidelines. *Seminars in Perioperative Nursing*, 9(3), 115–120.
- Droogan, J., & Cullum, N. (1998). Systematic reviews in nursing. *International Journal of Nursing Studies*, 35, 13–22.
- Earlam, S., Brecker, N., & Vaughan, B. (2000). *Cascading evidence. Achieving skills in evidence-based practice*. Philadelphia: Adis International.
- Evans, D., & Kowanko, I. (2000). Literature reviews: Evolution of a research methodology. *Australian Journal of Advanced Nursing*, 18(2), 33–38.
- Hadorn, D.C., Baker, D., Hodges, J.S., & Hicks, N. (1996). Rating the quality of evidence for clinical practice guidelines. *Journal of Clinical Epidemiology*, 49, 749–754.
- Haynes, B., & Haines, A. (1998). Barriers and bridges to evidence-based clinical practice. *BMJ*, 317, 273–276.
- Hearn, J., Feuer, D., Higginson, I.J., & Sheldon, T. (1999). Systematic reviews. *Palliative Medicine*, 13(1), 75–80.
- Lau, J., Ioannidis, J., & Schmid, C.H. (1998). Quantitative synthesis in systematic reviews. In C. Mulrow & D.J. Cook (Eds.), *Systematic reviews: Synthesis of best evidence for health care decisions* (pp. 91–102). Philadelphia: American College of Physicians.
- Lohr, K.N., & Carey, T.S. (1999). Assessing “best evidence” issues in grading the quality of studies for systematic reviews. *Journal on Quality Improvement*, 25, 470–479.
- Lynch, M.P. (2004). Progress and challenges in oncology advanced practice: The 2001 Oncology Nursing Society Advanced Practice Nursing Retreat. *Oncology Nursing Forum*, 31, 33–34.
- Mulrow, C., & Cook, D.J. (Eds.). (1998). *Systematic reviews: Synthesis of best evidence for health care decisions*. Philadelphia: American College of Physicians.
- Mulrow, C., Langhorne, P., & Grimshaw, J. (1998). Integrating heterogeneous pieces of evidence in systematic reviews. In C. Mulrow & D.J. Cook (Eds.), *Systematic reviews: Synthesis of best evidence for health care decisions* (pp. 103–112). Philadelphia: American College of Physicians.
- Newman, M., & Roberts, T. (2002). Critical appraisal 1. Is the study good enough for you to use findings? In J.V. Craig & R.L. Smyth (Eds.), *The evidence-based practice manual for nurses* (pp. 86–113). Philadelphia: Churchill Livingstone.
- Oxman, A.D., Cook, D.J., & Guyatt, G.H. (1994). Users’ guides to the medical literature. VI. How to use an overview. *JAMA*, 272, 1367–1371.
- Ropka, M.E., & Spencer-Cisek, P. (2001). PRISM: Priority Symptom Management Project. Phase I—Assessment. *Oncology Nursing Forum*, 28, 1585–1594.
- Royal College of Nursing Institute. (1999). *Clinical practice guidelines. The recognition and assessment of acute pain in children. Technical report. Appendix 1. Methods of obtaining papers and data extraction*. London: Author.
- Rutledge, D.N., & Bookbinder, M. (2002). Processes and outcomes of evidence-based practice. *Seminars in Oncology Nursing*, 18, 3–10.
- Rutledge, D.N., & Grant, M. (2002). Evidence-based practice in cancer nursing. Introduction. *Seminars in Oncology Nursing*, 18, 1–2.
- Rutledge, D.N., Mooney, K.H., Grant, M., & Eaton, L. (2004). Implementation and refinement of a research utilization course for oncology nurses. *Oncology Nursing Forum*, 31, 121–126.
- Stetler, C.B., Morsi, D., Rucki, S., Broughton, S., Corrigan, B., Fitzgerald, J., et al. (1998). Utilization-focused integrative reviews in a nursing service. *Applied Nursing Research*, 11, 195–206.
- Wortman, P.M. (1994). Judging research quality. In H. Cooper & L.V. Hedges (Eds.), *The handbook of research synthesis* (pp. 97–109). New York: Russell Sage Foundation.

For more information . . .

- Oncology Nursing Society Advanced Practice Nurse Virtual Community
<http://apn.ons.wego.net>
- Oncology Nursing Society Evidence-Based Practice Centers
<http://onsopcontent.ons.org/toolkits/ebp/index.htm>
- Evidence-Based Practice Centers
www.ahrq.gov/clinic/epc

Links can be found at www.ons.org.