

Growing Knowledge Together

*A How-to Guide*

# **Designing & Creating a Journal Club for Oncology Nurses**



# GETTING STARTED

**H**ealth and oncology care are changing rapidly. Oncology nursing practice is influenced by trends in evidence-based practice and nursing-sensitive outcomes, which are components of high-quality cancer care. Journal club programs can enhance the skills of oncology nurses in evaluating the literature and translating research findings to clinical practice, education, administration, and research.



## WHAT IS A JOURNAL CLUB?

A journal club is an open forum for oncology nurses to meet and critically evaluate the oncology nursing literature. A journal club provides an opportunity for oncology nurses in a variety of roles to collaborate and discuss how oncology nursing literature and research can be translated to clinical practice, education, administration, and research.

## WHO CAN BE IN A JOURNAL CLUB?

Journal club membership is open to all individuals who are interested in improving the quality of cancer care and keeping up-to-date with oncology research. Members may include the following.

1. Nurses working in various specialties and disease settings in cancer centers
2. Multidisciplinary team members from a specialty area in cancer care
3. Nursing administrators, educators, clinicians, and researchers within a cancer care setting
4. Members of a local Oncology Nursing Society chapter
5. Nursing students interested in cancer care

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# CREATING YOUR CLUB

The process of creating a journal club will differ depending on the targeted membership. This toolkit focuses on two specific target populations: nurses working within a cancer care setting and nurses who are members of a local Oncology Nursing Society chapter. Follow these steps to create your journal club.



1. Identify a core group to serve as **journal club champions**. The core group assumes ownership for the journal club process. Core group members may include representatives from the target participant groups.
  - a. Core group members from cancer care settings may include representative staff nurses, clinical nurse specialists, administrative leaders, staff educators, nursing faculty, nurse researchers, and other cancer care providers (e.g., oncology social workers, pharmacists, chaplains, physical therapists, occupational therapists, dietitians).
  - b. Core group members from a local chapter may include representatives from a variety of care settings, specialty areas, roles, and educational levels.
2. Define the responsibilities of the core group members. Key roles within the journal club include a facilitator, continuing education coordinator, publicist, time keeper, and evaluator.
  - a. The **facilitator** leads the discussion during the journal club meeting. Everyone in the group must be involved in the discussion to ensure long-term success of the journal club. Following the 12-step process, the facilitator prepares in advance of the meeting.
    - 1) Working with the continuing education coordinator and evaluator of the club, the facilitator identifies an article for club discussion.
    - 2) Reads the article prior to the journal club meeting.
    - 3) Completes the appropriate Clinical or Research Article Review Form (see page 9 or 13).
    - 4) Prepares questions to stimulate group discussion. Potential questions for both clinical and research articles are on pages 11 and 15, respectively.
    - 5) Reviews the guidelines for group participation in the journal club (see page 19).
    - 6) Starts the journal club according to the published timeframe.
    - 7) Introduces the rationale for selection of the article to the target group.
    - 8) Poses an initial question to initiate the discussion.
    - 9) Provides feedback to group participants, responds to questions and comments, questions assumptions, encourages and respects differing viewpoints, encourages discussion by all participants, ensures that individual discussions and total journal club timeframes are observed, and allows adequate time for discussion of application to cancer nursing practice, education, administration, and research.

# CREATING YOUR CLUB

- 10) Summarizes the discussion and implications for high-quality cancer care.
  - 11) Allows time for evaluation of the journal club processes and outcomes.
  - 12) Concludes the journal club meeting according to the published timeframe.
- b. The **continuing education (CE) coordinator** prepares the materials needed to complete the application for CE credits for the journal club, if desired by the target group.

Beginning in February 2009 in the *Clinical Journal of Oncology Nursing (CJON)* and March 2005 in the *Oncology Nursing Forum (ONF)*, articles with discussion questions for journal clubs, some also offering CE credit, have been published. *CJON* articles tend to be more clinically based and *ONF* articles are more research or literature review focused. Two sample articles are included in this toolkit for possible journal club use.

If no CE credits are provided with the article, the CE coordinator is responsible for identifying an approved CE provider and completing the agency-specific application according to the specified timeframe. The Oncology Nursing Society is an approved provider for continuing nursing education. The application can be accessed at [www.ons.org/CNECentral/Approver](http://www.ons.org/CNECentral/Approver).

- c. The **publicist** develops a marketing plan and a calendar for the journal club. He or she communicates the topic, date, and time for each journal club. Posters, flyers (see sample flyer), and e-mails are a few ways to promote the journal club. The publicist may also assist in developing manuscripts, abstracts, and posters of outcomes of the journal club for dissemination to other groups; therefore, experience in research critique and/or writing journal articles would be helpful.
- d. The **evaluator** solicits feedback from participants regarding the process and impact of the journal club on clinical practice, education, administration, and research outcomes. The evaluator collaborates with the CE coordinator to review evaluation forms from programs. Evaluation forms are mandatory for programs that offer CE credit. They are not required for non-CE programs but may provide insightful feedback to the journal club champions. The evaluator may conduct a regular needs assessment to determine topics for discussion at future journal club meetings.



# Journal Club Meeting

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Location: \_\_\_\_\_

Article of Discussion: \_\_\_\_\_

RSVP to \_\_\_\_\_ by \_\_\_\_\_

Join your colleagues for discussion of the above article. Prior to the meeting, please be sure to read the article and answer the review questions.



# OVERCOMING BARRIERS

Address any potential barriers to the success of the journal club (see Table 1). The success of the club depends on advanced preparation by the facilitator and all participants. Be sure to provide participants with guidelines prior to the meeting so that they can be prepared (see page 19).

**Table 1. Potential Barriers to and Solutions for Journal Club Success**

Potential Barrier	Potential Solution
Access to article for discussion	Provide an online or print version of the article in the care setting or post on the chapter's virtual community Web site at least two weeks in advance of the scheduled meeting.
Overwhelming amount of material to review	Subdivide the article by subtopics, inclusive pages, or discussion questions so that groups of participants can focus their preparation for the club.
Schedule for journal club	Set a consistent day, time, and length for the club. Publish the schedule in the clinical setting, in a chapter newsletter, or on the chapter's virtual community Web site. Adhere to the published timeframe. Start and stop on time.
Time to attend	Survey the target group for the most convenient times to hold the journal club. Plan for coverage for staff to attend the club.
Relevance for participants	Focus the article on a challenging clinical scenario in the clinical setting or on topics selected by chapter members.
Perceived personal benefits of participation	Provide continuing education credits for participation. Develop skills in evaluating and translating the literature to practice, education, administration, and research. Meet criteria for performance evaluation or promotion. Become more involved in a local chapter. Earn credits toward oncology nursing certification.
Perceived organizational benefits of participation and support	Meet criteria for Magnet status. Provide a mechanism for translation of literature and research to achieve evidence-based high-quality cancer care. Develop evaluation and translation skills of nursing staff. Provide an alternative programming strategy for local ONS chapters.

# CLINICAL ARTICLE REVIEW FORM

In preparation for your participation in the journal club meeting, please read the assigned article and make some notes to address each of the following questions.

Question	Notes
What is the practice, education, administration, or research question the author(s) is trying to answer?	
What is the purpose of the article? Is it clearly described?	
Is the literature review comprehensive and current?	
Are major issues and concepts related to the question identified and clearly defined?	
Is information missing that is needed to answer the question posed by the author(s)?	
How strong is the study's level of evidence? (See pp. 17–18 for tools in evaluating study strength.)	
What recommendations are made for practice, education, administration, and/or research?	
Are recommendations for practice, education, administration, and/or research supported by the evidence presented in the article?	
How do the author's recommendations compare with practice, education, administration, and/or research policies and procedures in your setting?	
What changes, if any, would you recommend in your setting based on the evidence presented in the article?	
What type of resources and setting processes would be needed to implement your proposed changes?	

# CLINICAL ARTICLE QUESTIONS

Discussion of a clinical article varies based on why the article was selected for the journal club. The following list of questions, not intended to be exhaustive, may be used as a starting point for discussion.

1. What is the clinical problem that is addressed in the article? Why is the problem important to members of the journal club?
2. What is the article type: case study, literature review, or synthesis of the evidence to address the clinical problem?
3. What sources of evidence and search strategies did the authors use to collect the evidence about the clinical problem?
4. What personnel, financial, environmental, and time resources were needed to collect, evaluate, and synthesize the evidence?
5. Was a rating scale used to evaluate the evidence? Which one? What criteria were used to evaluate the evidence?
6. Was a table of evidence used to summarize the findings related to the clinical problem? If so, what criteria were included in the table of evidence?
7. What were the outcomes or recommendations for practice, education, administration, and/or research based on the evidence presented?
8. Which of the recommendations would you consider implementing in your setting? Why or why not?
9. What would be the next steps in applying the information presented in the clinical review article in your setting?

# RESEARCH ARTICLE REVIEW FORM

In preparation for your participation in the journal club meeting, please read the assigned article and make some notes to address each of the following questions.

Question	Notes
What is the research question(s) the author(s) is trying to answer?	
What is the purpose of the research study?	
Has the author(s) identified a conceptual model, framework, or theory for the research study? If so, describe.	
Is the literature review comprehensive and current?	
Are major concepts related to the research question and conceptual model, framework, or theory identified and clearly defined?	
How did the researchers obtain the sample for the study?	
Are the data-collection points and strategies consistent with the stated purpose of the research?	
How did the researchers analyze the data? Were the methods appropriate to answer the research question(s)?	
Are the findings, discussion, and conclusions of the study supported by the data presented in the article?	
How strong is the study's level of evidence? (See pp. 17–18 for tools in evaluating study strength.)	
Do the findings and conclusions of the study support your current cancer care policies and procedures?	
Should the findings and conclusions be applied in your setting? If not, what work needs to be done?	
What resources and processes are needed to implement any proposed changes in your setting?	

# RESEARCH ARTICLE QUESTIONS

A full discussion of a research article would ideally include each of the following questions. However, because of the limitations on a journal club imposed within a clinical setting or local ONS chapter meeting, the facilitator may select specific questions to highlight the article's most relevant points related to clinical practice, education, administration, or research.

1. What is the primary research question the researchers are asking?
2. Why is the research question critical to cancer nursing clinical practice, education, administration, or research?
3. Are secondary research questions asked by the researchers?
4. What do the secondary research question(s) contribute to cancer nursing clinical practice, education, administration, or research?
5. What does the introduction and background tell you about why the study is being done?
6. How does the review of the literature support the need for studying the research question?
7. Does the review of the literature include references that are historic, current, supportive of the conceptual or theoretical model used in the study, and from peer-reviewed sources? Which ones?
8. Which research design was used to answer the research questions or hypotheses? Was the design appropriate to answer the research questions or hypotheses? Why?
9. Who was the target population for the research study?
10. How was the sample for the study determined?
11. How many subjects were recruited to the study and how many subjects completed the study?
12. Was the final sample for the study representative of the target population?
13. Was the sample size sufficient to appropriately power the study results?
14. Was the study a pilot study? If so, what was being piloted?
15. What were the independent variables for the study? How were they defined and measured?
16. What were the dependent variables? How were they defined and measured?
17. Were the conceptual and operational definitions of the variables logically consistent?
18. Were there any extraneous variables in the study? If so, how were they controlled?
19. Did the researchers provide reliability and validity estimates for the measurement instruments based on data from populations similar to the study sample? Were the estimates within acceptable ranges?
20. What were the results of the study? Did the study results include a description of the sample characteristics and answer the research questions or hypotheses?
21. Did the tables and figures present information that complimented and was consistent with the article text?
22. Did the discussion compare and contrast the findings of the study to previous research or current practice?
23. What were the limitations of the study? Were they acknowledged?
24. What were the conclusions of the study? Were the data that were collected consistent with and sufficient to support the conclusions?
25. Can the conclusions be generalized to the target population? Why or why not?
26. What are the implications of the research for nursing practice, education, administration, and/or research?

# STRENGTH OF STUDY DESIGN

A variety of endpoints may be measured in oncology research, and endpoints may be determined within study designs of varying strength. For any therapy, results can be ranked by strength of the study design and strength of the endpoints. Together, the two rankings imply the overall level of evidence. Depending on perspective, different expert panels, professional organizations, or individual physicians may use different cut points of overall strength of evidence in formulating therapeutic guidelines or taking action; however, a formal description of the level of evidence provides a uniform framework for the data, leading to specific recommendations. With that in mind, two different tools for assessing levels of evidence follow.

## Oncology Nursing Society (ONS) Levels of Evidence

ONS LEVEL	LEVEL OF EVIDENCE	EVIDENCE SOURCE
I	1	Qualitative systematic review (also called integrative review) or quantitative systematic review (also called meta-analysis) of multiple, well-designed, randomized, controlled trials of adequate quality
I	2	At least one properly designed, randomized, controlled trial of appropriate size (record if multisite and more than 100 subjects, but not required)
I	3	Well-designed trial without randomization (e.g., single group pre or post, cohort, time series, meta-analysis of cohort studies)
II	4	Well-conducted, qualitative, systematic review of nonexperimental design studies
II	5	Well-conducted case-control study
II	6	Poorly controlled study (e.g., randomized, controlled trial with major flaws) or uncontrolled studies (e.g., correlational descriptive study, case series)
II	7	Conflicting evidence with the weight of evidence supporting the recommendation or meta-analysis showing a trend that did not reach statistical significance National Institutes of Health Consensus Reports Published practice guidelines, for example, from professional organizations (e.g., Oncology Nursing Society, American Society of Clinical Oncology), healthcare organizations (e.g., American Cancer Society), or federal agencies (e.g., National Cancer Institute, Centers for Disease Control and Prevention)
III	8	Qualitative designs Case studies and opinions from expert authorities, agencies, or committees

Note. Levels of evidence range from the strongest evidence at the top to the weakest level of evidence at the bottom.

Note. From "PRISM: Priority Symptom Management Project Phase I: Assessment," by M.E. Ropka and P. Spencer-Cisek, 2001, *Oncology Nursing Forum*, 28, p. 1589. Copyright 2001 by the Oncology Nursing Society. Adapted with permission.

# STRENGTH OF STUDY DESIGN

## NATIONAL CANCER INSTITUTE

### **LEVELS OF EVIDENCE FOR ADULT AND PEDIATRIC CANCER TREATMENT STUDIES IN DESCENDING ORDER OF STRENGTH**

1. Randomized, controlled clinical trials
  - a. Double-blinded
  - b. Nonblinded treatment delivery
2. Nonrandomized, controlled clinical trials
3. Case series
  - a. Population-based, consecutive series
  - b. Consecutive cases (not population-based)
  - c. Nonconsecutive cases

Note. Information courtesy of the National Cancer Institute ([www.cancer.gov/cancertopics/pdq/levels-evidence-adult-treatment/HealthProfessional/page2](http://www.cancer.gov/cancertopics/pdq/levels-evidence-adult-treatment/HealthProfessional/page2)).

# PARTICIPANT GUIDELINES

The success of a journal club depends on the commitment of each participant to prepare and contribute actively to the discussion related to the assigned article. The following guidelines are designed to help participants maximize their experience.



## BEFORE THE JOURNAL CLUB

1. Read the assigned article and enter your notes on the clinical or research article review form prior to the journal club meeting.
2. Arrive on time for the journal club. Be prepared to start discussion of the article.
3. Volunteer to be the time keeper for the journal club.

## DURING THE JOURNAL CLUB

4. Contribute actively to the discussion of the article.
  - a. Share clinical experiences related to the clinical or research question.
  - b. Contribute to the discussion in a nonthreatening, collaborative manner.
  - c. Encourage participation from other group members.
  - d. Reinforce comments that contribute to critical discussion of the topic.
  - e. Redirect discussion to objectives of the journal club.
  - f. Decrease stress and frustration when disagreements occur.
  - g. Respect differing points of views.
  - h. Reflect statements to emphasize areas of agreement.
  - i. Clarify, summarize, and synthesize information.
  - j. Give and ask for information.
  - k. Restate and give examples of concepts being discussed.
  - l. Share how recommendations, findings, and/or conclusions may apply to your setting.

## AFTER THE JOURNAL CLUB

5. Complete the evaluation form for the journal club meeting.
6. Consider facilitating a future journal club discussion.

## APPLY YOUR JOURNAL CLUB INFORMATION

7. Think about the next steps to be taken in applying the information in the article to your own setting, if appropriate.
  - a. Plan a follow-up meeting to explore the potential impact for your setting.
  - b. Assess the feasibility of making changes in your setting.
  - c. Develop and implement a plan for integration of the information into setting standards, policies, and procedures.
8. Write a letter to the editor of the journal in which the article was published to convey your individual reactions or the reactions of the group to the article.

# KEEPING THE CLUB RELEVANT

A journal club format can provide an effective strategy for evaluating the current literature on a specific topic and translating it to cancer nursing practice, education, administration, and research. A variety of strategies can be used to keep the journal club concept fresh, alive, and relevant.



## ALTERNATE FORMATS

1. Game format: terminology bingo (see page 23 for a glossary of research terms), article scavenger hunt, crossword puzzle with research terminology (see page 27), or clinical article Jeopardy!
2. Debate format: Two teams of participants assume a pro or con position to argue for a change in practice, education, administration, and/or research based on information from the article.
3. Conference call format: May be appropriate for participants who are in geographically diverse settings or rural areas. Options may include audio- and/or videoconferencing depending on the technology and resources available to the individual or setting. Costs will vary based on the number of participants, length of time for the program, and plans available through technology providers.
4. Online discussion format: Discussions can be ongoing over a period of time through a moderated list serve, e-mails, or discussion section on the local ONS chapter virtual community to allow participation from a broader group of the target audience.
5. Journal club fair: Present multiple posters, each providing key information regarding a different clinical article or research study. Pick a specific topic or theme for the fair that would be relevant to the journal club participants. The posters can be made by individuals or groups and can remain available for all staff to review.
6. Summary of journal club discussions: Post a summary of the discussions online or in the care setting for review by participants who were unable to attend.

## INCENTIVES TO PARTICIPATE

1. Include time in the journal club meeting for networking and socializing.
2. Offer refreshments for participants: drinks and snacks, brown bag lunch and learn, or pot luck lunch or dinner.
3. Conduct a quarterly raffle among all participants for a free national or local chapter membership.
4. Regularly rotate the focus of the selected article among practice, education, administration, and research.

## APPLICATION TO PRACTICE

1. Combine the journal club with rounds of patients in the care setting experiencing the topic being discussed.
2. Focus on articles related to Centers for Medicare and Medicaid Services nonreimbursement incidents.
3. Plan a subsequent meeting of the journal club to plan and implement a specific change in practice, education, administration, and/or research based on discussions from previous journal clubs.

## PERSONAL GROWTH AND EMPOWERMENT

Encourage journal club participants to volunteer to facilitate the discussion for a future article; it can be an opportunity to mentor participants for leadership roles. As participants become more involved in the process, they are more likely to continue to support the journal club. Experiencing changes in practice, education, administration, and/or research based on recommendations resulting from journal club discussions is empowering.

# GLOSSARY

- Alpha ( $\alpha$ ):** the probability of rejecting a null hypothesis that is true; also symbolized by p
- Analysis of variance:** statistical technique used to examine differences among two or more groups by comparing variability between the groups
- Applied research:** research undertaken to apply its results to a specific problem
- Auditability:** decision trail that is reported in sufficient detail to allow a second researcher, using the original data and decision trail, to arrive at the same conclusion
- Basic research:** research undertaken without reference to particular needs or wants
- Beta ( $\beta$ ):** in statistical testing, this is the probability of a type II error; in multiple regressions, this is the standardized coefficient that indicates relative weights of independent variables
- Bias:** an influencing factor that can change a study's results
- Case study design:** a detailed review of one individual or case
- Causal relationship:** a change in a dependent variable caused by an independent variable
- Cluster sampling:** dividing a population into groups with a subset of the groups selected as a sample
- Cohort:** a group of individuals with a common trait in a study or trial
- Comparative descriptive design:** compares two or more groups in one setting and examines for differences
- Comparison group:** a sample population that does not receive the key element under study
- Conceptual definition:** when a specific concept is defined as a measurable occurrence
- Conceptual model:** used to represent concepts and the relationships among them
- Confidentiality:** management of private data in research so that the subject's protected personal information is not linked to his or her response
- Confirmability:** objectivity; a study's findings can be confirmed by another researcher conducting the same study
- Confounding variable:** a factor in a research study that is a potentially problematic extraneous variable, is not adequately planned for, and confuses the study's outcome and interpretation
- Consent:** a written form used to document a subject's understanding and agreement to participate in a research study
- Control group:** elements or subjects not exposed to the experimental treatment
- Convenience sampling:** a sample population selected because of logistical concerns
- Correlational study:** research in which subjects' scores on two variables are measured to determine whether a relationship exists
- Credibility:** mechanism in qualitative research to represent the reality of the subject; equates to internal validity in quantitative research
- Cronbach's alpha:** an estimate of the reliability of an instrument
- Cross-sectional design:** descriptive, observational study involving one or more subject groups who are evaluated to describe a population of interest, assess a condition, or examine possible correlations

# GLOSSARY

- Demographic variable:** a sociodemographic characteristic used to categorize behaviors or traits
- Dependability:** findings obtained in a qualitative study through the use of explicit and logical methods, compared to reliability in quantitative research
- Dependent variable:** response, behavior, or outcome that is predicted and measured
- Descriptive correlational design:** describes the relationships among variables in a sample
- Descriptive study:** research focusing on certain traits of a population that identifies and explores relationships between variables
- Ethnographic research:** qualitative studies that collect and analyze data about cultural groups
- Evidence-based practice:** conscientious integration of best research evidence with clinical expertise and patient values in the delivery of high-quality cost-effective care
- Experimental design:** used to establish cause-and-effect relationships between independent and dependent variables
- Extraneous variable:** not the variable of interest to a researcher but may influence study results
- Grounded theory research:** qualitative studies that collect and analyze data and then develop a theory grounded in that data
- Hawthorne effect:** psychological response of changing behavior when in a research study
- Hypothesis:** formal statement of the expected relationships between two or more variables
- Independent variable:** treatment, intervention, or experimental activity that is manipulated or varied to create the desired outcome
- Institutional review board:** committee whose goal is to ensure that the rights of research participants are protected
- Interval:** equal distances between data points
- Interval scale:** a measurement scale in which a specified distance means the same thing anywhere on the scale and 0 does not represent the absence of the item being measured
- Iowa model:** method to promote evidence-based practice in clinical settings
- Likert scale:** a scale used in measuring the level of agreement or disagreement with a statement
- Longitudinal design:** research studies involving observations of the same items over a long period of time
- Mean ( $\bar{X}$ ):** value obtained by adding all the scores and dividing by the total number of scores
- Median:** the middle score or value in a group of data
- Meta-analysis:** process of synthesizing and describing the results from numerous, similar studies
- N:** total sample size
- n:** the number of subjects in a subgroup
- Nominal:** categorical level of data
- Nonexperimental design:** a study that examines naturally occurring variations in independent and dependent variables without intervention

# GLOSSARY

**Nonparametric:** statistical technique to measure nominal and ordinal data

**Nonprobability sample:** a sample in which the probability cannot be estimated that each individual will be included in the sample and it cannot be guaranteed that each member of the population has the same chance to be included

**Null hypothesis:** proposal that no difference exists between groups or that no association exists between risk indicator and outcome variables

**Operational definition:** a statement about how an event or behavior will be measured to represent a study's concept

**Ordinal:** ranking, but the interval between data points is not necessarily equal

**Ordinal scale:** a scale in which the order of data points can be determined but not the distance between points

**Parametric:** statistical analysis to measure interval and ratio data sets

**Phenomenologic research:** qualitative studies that examine human experiences through participants' descriptions

**Pilot study:** an initial study of a small sample size that prepares the researchers for a larger study examining a new method or treatment

**Population:** a group of individuals under study

**Power:** probability that a test will not make a type II error

**Probability sampling:** when each individual of a population has a specific likelihood of being selected

**Purposive sampling:** targeting a particular group of people

**p value:** the probability of rejecting a null hypothesis that is true; also symbolized by alpha ( $\alpha$ )

**Qualitative research:** interactive subjective approach used to describe life experiences

**Quantitative research:** formal objective systematic process to describe and test relationships

**Quasi-experimental research:** research in which some independent variables may be manipulated but subjects cannot be randomly assigned to control or experimental groups

**Quota sampling:** a predetermined number of participants from predetermined categories

**Randomization:** each subject has an equal probability to be selected for a sample

**Randomized clinical trial:** a study in which participants are assigned by chance to separate groups that compare different treatments

**Ratio:** highest level of data containing an absolute zero

**Reliability:** consistency of a measure or test from one use to the next

**Replication:** reproducing or repeating a study to determine whether similar findings will be obtained

**Representative sample:** a random sample of participants that are representative of a larger population

**Research:** diligent systematic inquiry or investigation to validate and refine existing knowledge

**Research hypothesis:** a prediction of a study's outcome that is stated when the research question is being formed

# GLOSSARY

**Research question:** the question that states what the researcher hopes to answer

**Rigor:** the quality of being extremely thorough and striving for excellence in research

**Sample:** subset of a population selected for study

**Standard deviation (SD):** average of the variations from the mean

**Stratified random sampling:** when a population is divided into subgroups with a sample selected from each subgroup in proportion to its size in the population

**Systematic review:** comprehensive methodologic review and critical appraisal of quality research studies

**Systematic sampling:** a sample chosen from a population at a regular interval

**Transferability:** degree that the findings of a qualitative study apply to other populations

**Type I error:** when a true null hypothesis is rejected; a decision is made that a relationship exists among variables when it does not.

**Type II error:** when a false null hypothesis is not rejected when it should be; a decision is made that no relationship exists among variables when it does.

**Validity:** accuracy of the measure obtained

**Variability:** the degree to which values are different

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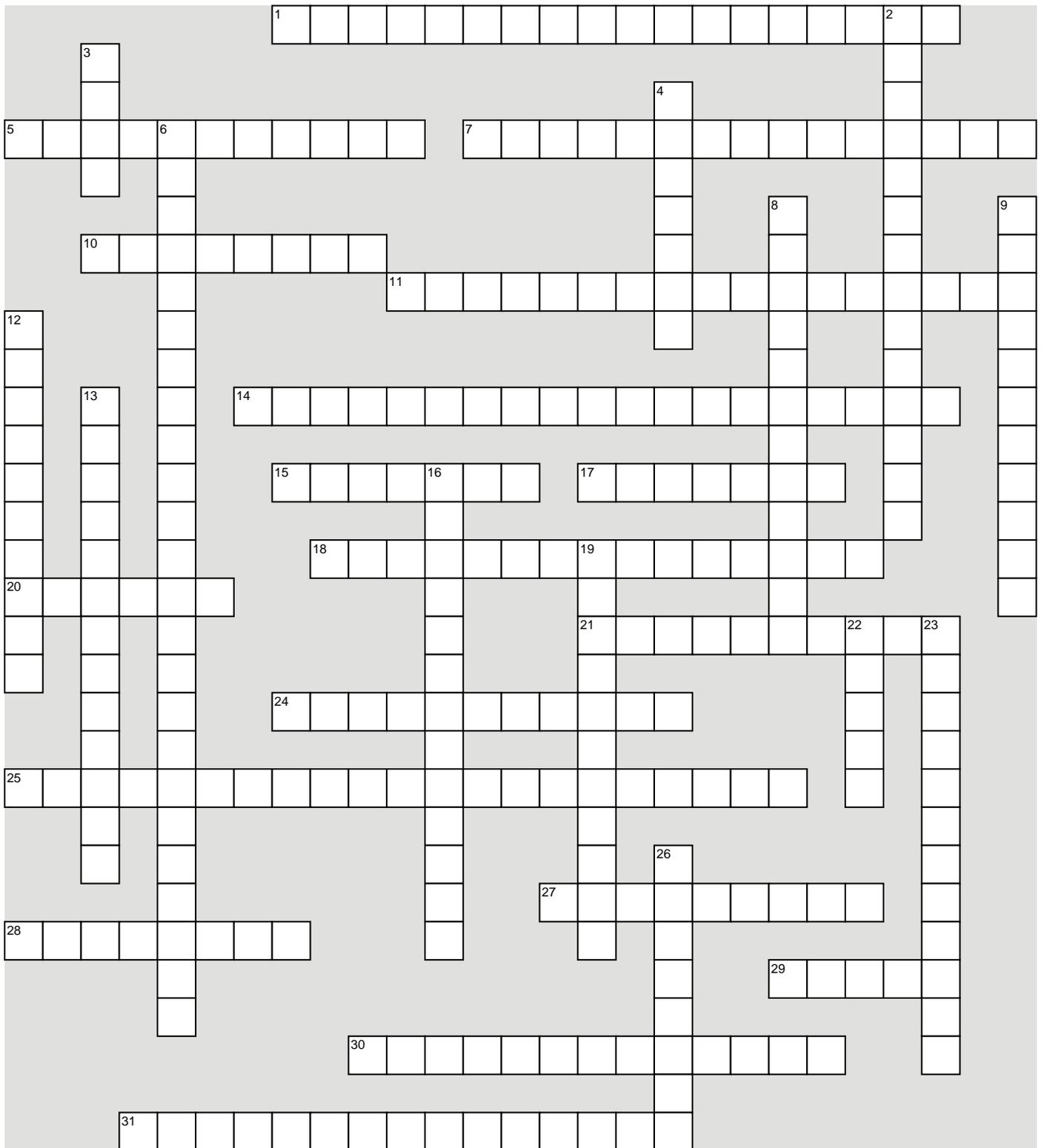
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# TERMINOLOGY CROSSWORD



# CROSSWORD PUZZLE CLUES

## ACROSS

- 1 Statistical technique used to examine differences among two or more groups by comparing variability between the groups
- 5 Interactive, subjective research approach used to describe life experiences
- 7 Psychological response of changing behavior when in a research study
- 10 Equal distances between the data points
- 11 Response, behavior, or outcome that is predicted and measured in research
- 14 Treatment, intervention, or experimental activity that is manipulated or varied to create the desired outcome
- 15 Categorical level of data
- 17 Ranking, but the interval between the data points are not necessarily equal
- 18 Degree that the findings of a qualitative study apply to others
- 20 Subset of the population selected for a study
- 21 Statistical analysis to measure interval and ratio data set
- 24 Consistency of the measure obtained
- 25 Conscientious integration of best research evidence with clinical expertise and patient values in the delivery of quality cost effective care
- 27 Method to promote evidence-based practice in clinical settings
- 28 Diligent systematic inquiry or investigation to validate and refine existing knowledge
- 29 Highest level of data containing an absolute zero
- 30 Findings obtained in a qualitative study through the use of explicit and logical methods; compares to reliability in quantitative research
- 31 Management of private data in research so that the subject's identity is not linked to his or her response.

## DOWN

- 2 Objectivity; a study's findings can be confirmed by another researcher conducting the same study
- 3 Value obtained by summing all the scores and dividing by the total number of scores
- 4 A written form used to document a subject's agreement to participate in a research study
- 6 Committee that ensures research is conducted in an ethical manner.
- 8 Formal objective systematic process to describe and test relationships
- 9 Mechanism in qualitative research to represent the reality of the subject; equates to internal validity in quantitative research
- 12 Formal statement of the expected relationships between two or more variables
- 13 Each subject has an equal probability to be selected for a sample
- 16 Statistical technique to measure nominal and ordinal data
- 19 Reproducing or repeating a study to determine whether similar findings will be obtained
- 22 Striving for excellence in research
- 23 Elements or subjects not exposed to the experimental treatment
- 26 Accuracy of the measure obtained

**ACROSS:** 1—Analysis of variance; 5—Qualitative; 7— Hawthorne effect; 10—Interval; 11—Dependent variable; 14—Independent variable; 15—Nominal; 17—Ordinal; 18—Transferability; 20—Sample; 21—Parametric; 24—Reliability; 25—Evidence based practice; 27—Iowa model; 28—Research; 29—Ratio; 30—Dependability; 31—Confidentiality  
**DOWN:** 2—Confirmability; 3—Mean; 4—Consent; 6—Institutional review board; 8—Quantitative; 9—Credibility; 12—Hypothesis; 13—Randomization; 16—Nonparametric; 19—Replication; 22—Rigor; 23—Control group; 26—Validity

# Restoring Patency to Central Venous Access Devices

**Cynthia Cummings-Winfield, BScN, CON(C),  
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In September 2006, the Oncology Nursing Advisory Board met to discuss the current management of central venous access device (CVAD) occlusions for patients receiving cancer treatment in centers across Canada. The board found inconsistency in practice across the country and advocated for the development of evidence-based, standardized guidelines for the use of thrombolytic agents to clear thrombotic occlusions. PubMed was searched for articles related to catheter occlusion, catheter patency, and catheter complications published from 1997–2007. The board compared institutional and published protocols for thrombolytic treatment of occluded CVADs, in light of a systematic, evidence-based review of the literature on CVAD-related complications. Restoration of CVAD patency, when appropriate, represents a safe, effective, and cost-effective alternative to device replacement and improves patient quality of life. The treatment algorithm presented in this article reflects the board's consensus recommendations for managing thrombotic CVAD occlusions in adult patients with cancer.

**A**ccess to venous circulation is critical for many patients with cancer. Treatment regimens can be complicated, often requiring repeated and reliable venous access. In oncology practice, the most common indication for placing a central venous access device (CVAD) is the delivery of chemotherapeutic medications. However, the same device may be used for the administration of supportive therapies (e.g., antibiotics, antiemetics), blood products, and nutritional supplementation (Wingerter, 2003). CVADs also may be used for withdrawal of blood samples (Wingerter).

Medications and nutrients instilled directly through wide-bore catheters into the superior vena cava can be delivered more efficiently and in larger volumes than would be possible via the peripheral circulation. Fluids instilled into the major veins become diluted rapidly as they emerge from the catheter lumen. This allows for safe and comfortable administration of concentrated solutions, vesicants, or irritants without pain or damage to the vessel wall and with minimal risk of extravasation and chemical phlebitis (Dudrick, 2006). However, CVADs have the potential for complications such as thrombotic occlusion, which can lead to treatment delays and affect patient quality of life (Moureau, Poole, Murdock, Gray, & Semba, 2002).

## Patients With Cancer and Central Venous Access Devices

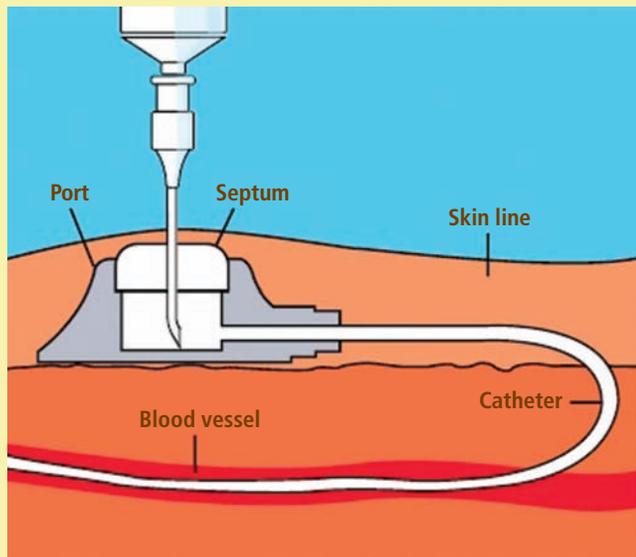
According to the World Health Organization, cancer prevalence is increasing globally, and cancer now is classified under

### At a Glance

- ◆ Central venous access is critical for many patients with cancer for delivery of treatment and supportive care.
- ◆ Replacing dysfunctional central venous access devices (CVAD) is expensive and invasive; therefore, steps to prevent or resolve thrombotic occlusions are essential.
- ◆ Evidence-based guidelines for managing thrombotic CVAD occlusions support oncology nursing practice, promote positive patient outcomes, and reduce costs associated with device replacement.

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*Note.* Implanted ports are placed subcutaneously, often within the anterior chest wall. The operation can be performed under local anesthesia. Implanted ports are accessed via a special noncoring (Huber-type) needle. The catheter enters the venous system as shown, commonly through the subclavian vein. As in other central venous access devices, the catheter tip resides in the superior vena cava.

**Figure 1. Accessing Ports**

*Note.* Image courtesy of Bard Access Systems, Inc. Used with permission.

the framework of chronic diseases (Cancer Care Ontario, 2007; Grunfeld, 2006). Given the complexity and intensity of cancer treatment, long-term central vascular access is a priority for an increasing number of patients. Indeed, an estimated five million CVADs are placed every year in the United States alone (Maki, Stolz, Wheeler, & Mermel, 1997). Although that statistic includes other patient groups that require long-term venous access (e.g., individuals with renal failure requiring hemodialysis), the number of patients with cancer with CVADs is undoubtedly large.

CVADs are inserted with the expectation that they will function until the need for central venous access has passed. Some classes of CVAD can be expected to last more than 18 months (Galloway & Bodenham, 2004); however, many devices are removed prematurely because of a variety of common complications (Galloway & Bodenham).

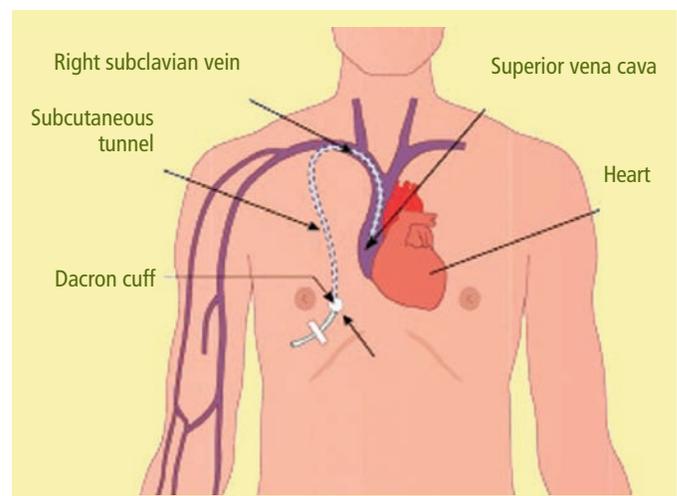
Replacing a dysfunctional CVAD is an expensive and, in many cases, invasive procedure with some inherent risk to the patient. Replacement usually requires a new venous access site and may necessitate surgical or radiologic consultation and sedation, as well as the risk of complications associated with central venous cannulation (Jacobs, Haygood, & Hingl, 2001). Salvaging a device may be quicker than replacing it and may avoid delays in treatment. The cost of device replacement (estimated at \$850–\$1,500, depending in part on the type of CVAD) greatly exceeds that of salvage (Kokotis, 2005). Although the cost of salvage can encompass chair time, a declotting agent, and nursing time, those things intuitively pale in comparison to the cost of replacing a CVAD, which can include interventional radiology time, diagnostic imaging, nursing time, and the price of a new

access device. In addition to financial costs, catheter replacement can pose a clinical risk and affect patients' quality of life. Therefore, nurses and physicians should take appropriate steps to prevent CVAD complications and to salvage dysfunctional CVADs when possible. In particular, thrombolytic treatment is recommended for restoring the patency of devices occluded by fibrin or blood clots.

## Selection of a Central Venous Access Device

CVADs all share a common characteristic of terminating in the distal third of the superior vena cava. The devices fall into multiple categories, distinguished by whether they allow one or more solutions to be administered separately (single-, double-, or multiple-lumen catheters) and by other aspects of their designs that determine how and where they are inserted into the venous circulation and how the devices are used. For instance, catheters, which allow for external access through one or more exposed lumens, should be distinguished from ports, which are implanted under the skin and must be accessed via a special noncoring needle. The type of CVAD used should be chosen based on a variety of considerations, including prescribed therapy, duration of therapy, physical assessment, patient health history, support system and resources, device availability, and patient preference (Registered Nurses Association of Ontario [RNAO], 2004).

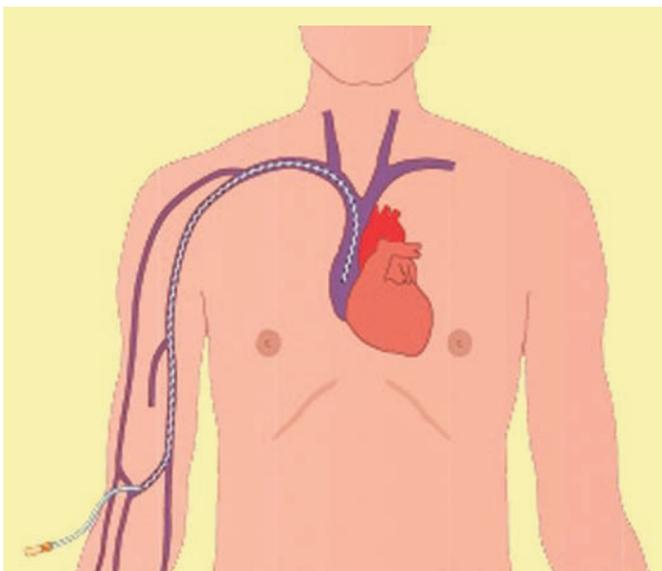
CVADs used in oncology include implanted ports and nonimplanted catheters. The latter group of devices includes central venous catheters, which usually are tunneled through subcutaneous tissue, and peripherally inserted central catheters (PICCs), which are inserted into the major veins of the arm (Galloway & Bodenham, 2004).



*Note.* The catheter tip resides at the junction of the superior vena cava and the right atrium.

**Figure 2. Placement of Central Venous Access Devices**

*Note.* From "Complications Associated With Venous Access Devices: Part One," by H. Hamilton, 2006, *Nursing Standard*, 20(26), p. 44. Copyright 2006 by Clinical Skills Ltd. Reprinted with permission.



*Note.* Peripherally inserted central catheters commonly are placed through one of the major veins of the arm (the cephalic, basilica, or median cubital veins), with the catheter tip residing in the superior vena cava.

### Figure 3. Placement of Peripherally Inserted Central Catheters

*Note.* From "Complications Associated With Venous Access Devices: Part One," by H. Hamilton, 2006, *Nursing Standard*, 20(26), p. 44. Copyright 2006 by Clinical Skills Ltd. Reprinted with permission.

## Implanted Ports

Implanted ports consist of a fluid reservoir with a puncturable septum implanted subcutaneously (see Figure 1) and are best suited to long-term therapy (Galloway & Bodenham, 2004). The devices require surgical or radiologic placement and removal.

## Nonimplanted Central Venous Access Devices

Nonimplanted CVADs may be tunneled or nontunneled. Tunneled CVADs (see Figure 2) are placed through subcutaneous tissue, with an exit site on the chest or abdominal wall and the tip resting in the superior vena cava (RNAO, 2004). The device contains a dacron cuff, which allows for stabilization of the catheter in the subcutaneous tissue and prevents superficial infection (Galloway & Bodenham, 2004). Such catheters require surgical or radiologic insertion, typically into the jugular or subclavian vein or inferior vena cava, and are appropriate for longer-term therapy.

Nontunneled CVADs (PICCs) typically are placed via the cephalic, basilic, or median cubital veins, sparing other sites of venous access (Galloway & Bodenham, 2004) (see Figure 3). PICCs are the least invasive of all CVADs but contain a narrow lumen, which is associated with a greater risk of occlusion than other CVADs. PICCs are associated with a relatively low risk of infection (RNAO, 2004).

## Complications Related to Central Venous Access Devices

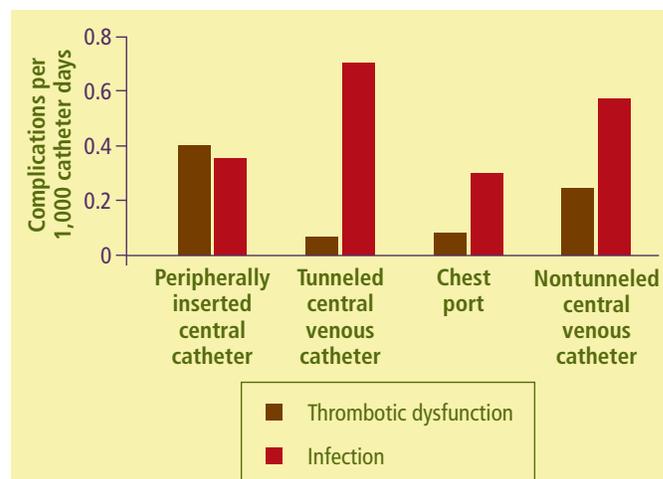
Numerous complications can arise directly from central vein cannulation; however, the incidence of such complications

is difficult to ascertain. Acute complications include pneumothorax, hemothorax, embolization, and cardiac tamponade. Healthcare professionals must recognize such complications by their signs and symptoms and take necessary action, should they occur.

Common complications associated with CVADs include, but are not limited to, infection at the insertion site or within the bloodstream (bacteremia or sepsis, the most severe complication), phlebitis (mechanical or chemical), or extravasation (Hamilton, 2006a). Mechanical obstruction may occur, including pinch-off syndrome, in which the catheter tunneled between the first rib and the clavicle becomes compressed between those bones or the catheter kinks or is improperly positioned (Galloway & Bodenham, 2004; Jacobs, 2003; Kerner, Garcia-Careaga, Fisher, & Poole, 2006). In addition, the device itself may malfunction or be obstructed by a retaining suture that is too tight.

Catheter occlusion can result from extraluminal or intraluminal complications. Extraluminal complications include persistent withdrawal occlusion such that infusion of solutions is possible but aspiration of blood is not possible because of a fibrin sheath. Sluggish infusion of solution and sluggish withdrawal of blood may be caused by an extraluminal fibrin tail. In addition, a mural thrombus can form when fibrin from the injured vessel wall binds to fibrin covering the catheter surface (Forauer & Theoharis, 2003). Intraluminal occlusions may be the result of drug precipitates when incompatible medications are infused through the same catheter lumen without proper flushing. Lipid residues also can build up in an internal catheter lumen. Finally, intraluminal thrombotic occlusions can occur.

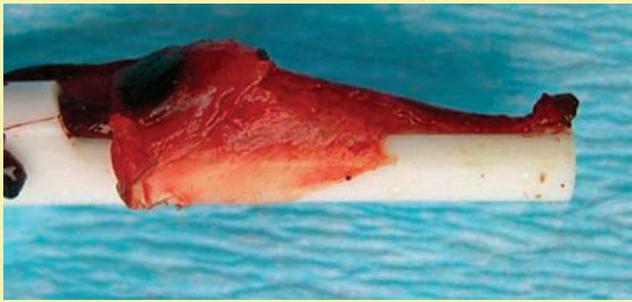
A large-scale study analyzed complications of CVADs used for outpatient home infusion therapy in patients with varying diagnoses, including a small percentage of patients with cancer. Among approximately 50,000 patients (> 2.5 million catheter days), the most common complication observed was loss of



*Note.* The study population included a small percentage of patients with cancer.

**Figure 4. A Large-Scale Analysis of Central Venous Access Device Complications in Individuals Receiving Central Infusions on an Outpatient Basis**

*Note.* Based on information from Moureau et al., 2002.



*Note.* Fibrin begins to accumulate on the external surface shortly after a central venous access device is inserted. When insoluble fibrin deposits form as a sheath near the catheter tip, they can block the flow of medications into the vein (Jacobs, 2003). An extension of this sheath (the fibrin tail seen in the image above) can block withdrawal of blood through the catheter, creating a ball-valve effect.

### Figure 5. A Fibrin Sheath With a Tail

*Note.* Image courtesy of Joy Blacka, RN, of Bard Access Systems, Inc. Used with permission.

patency (CVAD dysfunction from blockage). In particular, nonthrombotic blockage was the single most common cause of loss of patency observed (Moureau et al., 2002), followed by thrombotic blockage and infection. However, not all kinds of CVADs were at equal risk of the different complications. For instance, tunneled CVADs were at relatively high risk of infection but low risk of thrombosis compared with PICCs (Moureau et al.) (see Figure 4).

Astute nursing assessment strategies are required to determine the probable causes of CVAD complications. Once a nurse has identified the cause, he or she must take appropriate actions to salvage venous access. If mechanical and chemical causes are ruled out, empirical treatment with a thrombolytic agent should be attempted. Published guidelines from the Oncology Nursing Society (2004) and the RNAO (2005) support the practice of early intervention to troubleshoot and resolve CVAD occlusions. The guidelines presented in this article are directed specifically at the management of thrombotic occlusions in CVADs.

## Causes and Consequences of Thrombotic Occlusions

Thrombotic occlusions occur when blood or blood elements accumulate within, surrounding, or at the tip of catheters (Jacobs, 2003). Patients may be at heightened risk of thrombosis because of hypercoagulability because of “tumor cell activation of clotting, vessel wall injury, and stasis” (Prandoni, Piccioli, & Griolami, 1999, p. 437) or because of their chemotherapeutic regimens (Jacobs). As well, blood may reflux into a catheter tip as a result of changes in intrathoracic pressure during violent sneezing, coughing, or vomiting (Wingerter, 2003). However, in many cases, CVAD occlusion can be attributed directly to poor infusion technique, specifically to failure to flush lines properly or to use a locking solution appropriate to the device. Incorrect procedure when disconnecting a positive or negative displacement device from a line can have the same effect (Hadaway, 2005).

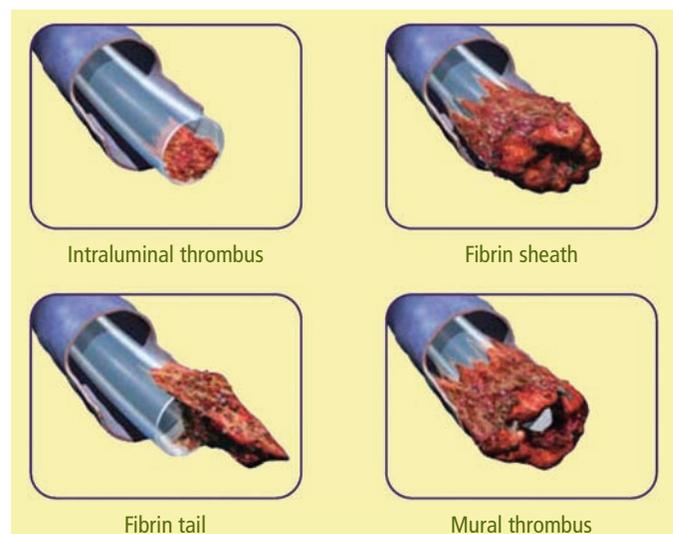
After blood withdrawal, a CVAD must not be allowed to stand without fluid flow or minimal infusion rates (keep the vein open) (Wingerter, 2003) but must be actively flushed with a solution such as 0.9% saline. Push-pause instillation, involving frequent stopping-starting of the flushing solution, should be used to create turbulent flow within the line (Hamilton, 2006b; RNAO, 2005).

In general, thrombi can cause three distinct forms of occlusion that impair fluid instillation, withdrawal, or both. In a withdrawal (ball-valve) occlusion, fluids can be instilled but blood cannot be withdrawn without resistance. Withdrawal occlusions occur because of insoluble proteins (thrombi or fibrin tails) extending from the catheter tip (see Figure 5). They are pulled over and cover the catheter tip as blood flows into the catheter—a so-called ball-valve effect. Partial or incomplete occlusion results in sluggish instillation or withdrawal of blood. A complete catheter occlusion restricts fluid instillation and blood withdrawal. Figure 6 shows different classes of thrombotic occlusion.

Finally, thrombotic material can accumulate inside a port to create a so-called reverse ball-valve effect, blocking instillation while allowing withdrawal.

## Safety and Efficacy of Thrombolytic Treatment

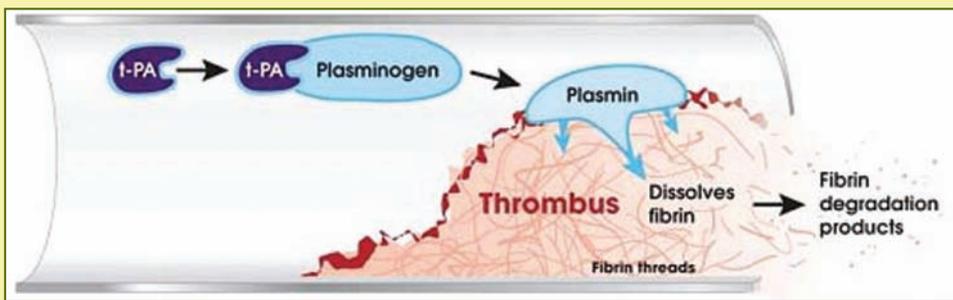
The first report showing that a thrombolytic agent could be used to clear an occluded CVAD (Hurtubise, Bottino, Lawson, & McCredie, 1980) employed streptokinase, an enzyme that is



*Note.* Fibrin deposits, as well as fully formed thrombi, can produce a plug residing within the lumen of a catheter (an intraluminal thrombus) or can form a sock-like sheath that covers the exterior of the catheter tip. The insoluble material can also form a “tail” at the catheter tip, interfering with blood withdrawal. Thrombi forming along the wall of the vein but exterior to the catheter (mural thrombi) also can interfere with fluid flow through the central venous access device.

### Figure 6. Classes of Thrombotic Occlusion

*Note.* Images courtesy of Genentech, Inc. Used with permission.



Recombinant tissue-type plasminogen activator

Converts plasminogen to plasmin, which dissolves fibrin

Breaks down clot

*Note.* Alteplase is a recombinant form of the normal blood component tissue-type plasminogen activator (t-PA), which causes thrombolysis as shown here. t-PA binds to and activates plasminogen, producing plasmin. Plasmin cleaves fibrin, releasing fibrin degradation products and causing the clot to dissolve.

### Figure 7. Degradation of an Intraluminal Blood Clot (Thrombolysis)

*Note.* Image courtesy of Genentech, Inc. Used with permission.

no longer widely used for that purpose (Valji, 2000). For some time, urokinase-type plasminogen activator (u-PA) became the standard of care for that indication. Because of concerns about possible contaminating pathogens in the u-PA available at the time, however, the agent was withdrawn from the market in 1999 (Valji). In its place, clinics now use a different recombinant enzyme, tissue-type plasminogen activator (t-PA, or alteplase, marketed for that purpose as Cathflo® Activase® [Genentech, Inc.]). Unlike the other agents, t-PA binds avidly and specifically to fibrin, one of the major components of a blood clot. t-PA causes thrombolysis by activating plasminogen (present in the circulation and the clot) to generate plasmin, which breaks apart the fibrin protein, thus dissolving the clot (see Figure 7). Anticoagulant agents such as heparin are ineffective against existing clots and cannot be used to restore patency to occluded CVADs (Fedan, 2003).

### Clinical Evidence

In a head-to-head trial, t-PA (alteplase) was shown to be more effective at clearing thrombotic occlusions than nonrecombinant u-PA (Haire, Atkinson, Stephens, & Kotulak, 1994). A newer, recombinant form of u-PA (Abbokinase®, Microbix Biosystems Inc.) has been developed and is expected to be similar to the nonrecombinant form but without the potential contamination risks (Haire et al., 2004). Other agents that could be used for that purpose are being studied (Liu, Jain, Shields, & Heilbrun, 2004; Moll et al., 2006). Alteplase is approved in Canada and the United States for restoring CVAD patency (Genentech, Inc., 2003). Therefore, all recommendations for thrombolytic treatment in this article relate to alteplase.

### Safety of Alteplase Treatment of Occluded Central Venous Access Devices

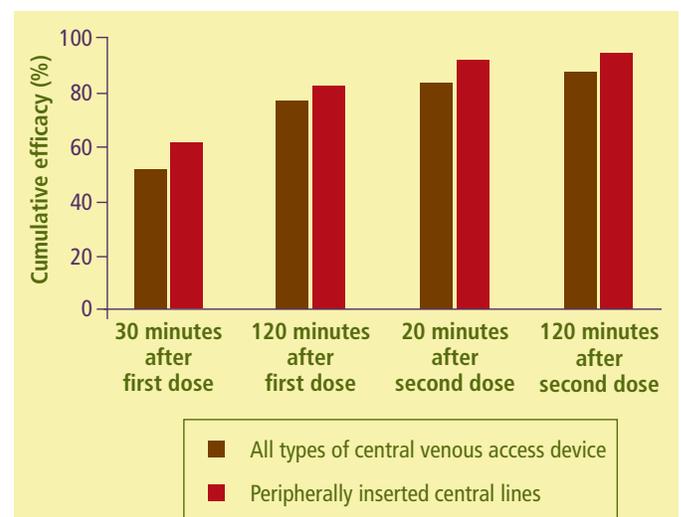
When alteplase is used for CVAD clearance (as with Cathflo), the concentration in the circulation does not reach pharmacologic levels. Any alteplase released into the circulation is metabolized rapidly by the liver (plasma half-life less than five minutes). Therefore, systemic complications such as bleeding

and intracranial hemorrhage are not anticipated. In clinical trials of adult and pediatric patients, no such events have been attributed to alteplase treatment (Blaney et al., 2006; Deitcher et al., 2002). Two cases of major hemorrhage were observed but were not considered to be related to t-PA treatment (Deitcher et al.). Alteplase has not been studied in patients known to be at risk for bleeding.

Therefore, alteplase should be used with caution in patients with known or suspected CVAD infection. In situ decontamination of CVADs has been reported, but device removal should be considered when evidence of CVAD-related infection exists, particularly

*Staphylococcus aureus* bacteremia or candidemia (Galloway & Bodenham, 2004).

Alteplase should be used with caution in patients with thrombocytopenia, other hemostatic defects, or any condition for which bleeding constitutes a significant hazard or would be particularly difficult to manage, as well as with patients who are at high risk for embolic complications. Caution should be exercised with patients who have active internal bleeding or who have had any of the following within 48 hours: surgery, obstetrical delivery, percutaneous biopsy of viscera or deep tissues, or puncture of noncompressible vessels (Middleton & Ruzevick, 2004). Alteplase is contraindicated in patients with known hypersensitivity to the drug or any component of its formulation (e.g., alteplase, L-arginine, phosphoric acid, polysorbate-80) (Genentech, Inc., 2003).



*Note.* In the Cardiovascular Thrombolytic to Open Occluded Lines-2 Trial, one to two standard doses of alteplase were used to restore patency to occluded peripherally inserted central lines and other types of central venous access devices.

### Figure 8. Efficacy of Alteplase Treatment

*Note.* Based on information from Deitcher et al., 2002; Ng et al., 2004.

## Efficacy in Central Venous Access Device Clearance

The efficacy of alteplase in clearing occluded CVADs has been reported to be 87%–90% (Deitcher et al., 2002; Journey-cake & Buchanan, 2006; Ponc et al., 2001). In the various efficacy studies, treatment was applied as many as two times, for one to two hours at each application. The largest of the studies was the Cardiovascular Thrombolytic to Open Occluded Lines–2 (COOL-2) interventional trial (N = 995), which showed 87% efficacy (Deitcher et al.). A subanalysis of the COOL-2 data focusing on the 242 patients with PICCs showed still higher levels of treatment success—93% on a cumulative basis when treated as many as two times (see Figure 8) (Ng, Li, Tu, & Semba, 2004).

The published clinical trials with alteplase have excluded patients with complete CVAD occlusions, when instilling the specified volume of fluid to treat the occlusion was not possible. However, a recent trial of recombinant u-PA has been reported in which totally occluded lines were treated successfully with a variation on the normal CVAD instillation procedure (Haire et al., 2004; Horne, 2004; Kerner et al., 2006). The alternate procedure, requiring a three-way stopcock, is used widely in infusion clinics and has been described extensively (Hamilton,

2006b; Infusion Nurses Society, 2006; Ottawa Hospital, 2006). The standard instillation method (for partial occlusions) and alternate (stopcock) method (for total occlusions) are described in Figures 9 and 10.

## Restoration of Patency

### Institutional Protocols for Treatment of Thrombotic Occlusions

Depending on institutional policies, RNs may require competency validation to manage occluded CVADs. Institutional policies also direct whether a physician's order or a medical directive is required to proceed with a CVAD clearance protocol. An institutional protocol should outline the procedure for the number of instillations and dwell times and whether diagnostic imaging is required.

### Reconstituting Alteplase

Alteplase is provided in sterile vials and must be reconstituted immediately before use. When stored at 2°C–30°C (36°F–86°F), it may be used for intracatheter instillation within

This procedure is to be used when a central venous access device (CVAD) can be instilled directly with fluid. If a blockage does not allow you to introduce at least 2 ml of fluid from a syringe, use the alternate (stopcock) protocol (see Figure 10).

#### 1. Set aside the following materials.

- Gloves
- Sterile gauze pad
- 3 x 10–12 ml Luer lock syringes, one filled with 2 ml sterile 0.9% NaCl
- Antiseptic swabs per institutional recommendation
- 2 x 10–12 ml syringes filled with sterile 0.9% NaCl
- 10–12 ml syringe filled with appropriate amount and type of locking solution, if needed
- Alteplase vial supplied by pharmacy
- Medication label
- Sterile water—10 ml vial
- Positive pressure device (PPD) or appropriate cap, if needed

#### 2. Explain procedure to patient.

#### 3. Perform hand hygiene.

#### 4. Reconstitute alteplase (see above) and aspirate into 10–12 ml syringe.

#### 5. Don protective gloves.

#### 6. Clean connection between catheter and cap using aseptic technique.

#### 7. Attach syringe with alteplase to the catheter end.

#### 8. Unclamp the catheter (unless using a clampless device).

#### 9. Instill the alteplase solution gently and slowly.

#### 10. Reclamp the catheter (unless using a clampless device) and ensure the syringe is secured to the catheter during dwell time.

#### 11. Place a medication label on the catheter, stating, "Dec clotting agent in place. DO NOT USE."

Allow alteplase to dwell in the CVAD for 30 or 120 minutes before checking CVAD patency. Note that the probability of success is decreased with a shorter dwell time.

If clinically appropriate and permitted by institutional policy, a well-secured syringe may be left attached to the end of the catheter during dwell time.

### Evaluating Patency

To check CVAD patency, remove cap and attempt to aspirate declotting agent and blood using an empty 10 ml syringe.

If you can withdraw blood without resistance (3 ml in three seconds):

- Withdraw the declotting agent and 4–5 ml of blood into a 10–12 ml syringe.
- Flush the CVAD with 20 ml of sterile 0.9% NaCl using turbulent flow to clear it of any remaining blood.
- Connect to IV tubing or lock the CVAD with appropriate locking solution.

If you cannot aspirate blood or you experience resistance:

- Reinstill the original dose and allow alteplase to dwell for an additional 90 minutes (for a total of 120 minutes).
- If you are still unable to aspirate blood, repeat procedure with second instillation of alteplase, checking patency again after 30 minutes. If necessary, reinstill the second dose, allowing alteplase to dwell for 90 minutes or overnight, depending on institute procedure.
- If you are still unable to aspirate blood after the second instillation of alteplase and an overnight dwell, notify the physician.

Ensure catheter or extension tubing is clamped and injection cap or dead-end cap is secure and labeled while alteplase treatment is ongoing.

Document the procedure, including the amount of alteplase used, confirmation of occlusion by x-ray, dwell time(s), number of lumens, outcome of the procedure, patient teaching, and how patient tolerated the procedure.

## Figure 9. Standard Protocol for Treating Incomplete or Withdrawal Occlusions in Central Venous Access Devices

This procedure is to be used when the CVAD cannot be instilled directly with fluid. If you are able to introduce at least 2 ml of fluid from a syringe into the line, use the standard protocol (see Figure 9).

1. Set aside the following materials.
  - Gloves
  - Sterile gauze pad
  - 3 x 10–12 ml Luer lock syringes, one filled with 2 ml sterile 0.9% NaCl
  - Antiseptic swabs per institutional recommendation
  - 2 x 10 ml syringes filled with sterile 0.9% NaCl
  - Positive pressure device (PPD)
  - 10–12 ml syringe filled with appropriate amount and type of locking solution
  - Alteplase vial supplied by pharmacy
  - Medication label
  - Sterile water—10 ml vial
  - Sterile three-way stopcock
2. Explain procedure to patient.
3. Perform hand hygiene.
4. Reconstitute alteplase (see above) and aspirate into 10–12 ml syringe.
5. Don protective gloves.
6. Instill alteplase into the line using the following procedure.
  3. Attach the syringe containing the alteplase to one of the ports on the stopcock.
  4. Attach the empty 10–12 ml syringe to the remaining port on the stopcock.
  5. Turn the stopcock OFF to the syringe containing the alteplase.
  6. Gently aspirate the catheter until the plunger of the 10–12 ml syringe is pulled back to the 3–5 ml mark. Clamp while maintaining negative pressure.
  7. Turn the stopcock OFF to the aspirated syringe.
  8. Unclamp the catheter, or, if using a clampless device, turn stopcock to allow the alteplase to be drawn into the central line.
  9. Once the alteplase is drawn into the catheter, turn the stopcock to close the flow. Clamp catheter (unless using a clampless device) and attach to a PPD.
10. Place a medication label on the catheter, stating, “Dec clotting agent in place. DO NOT USE.” Allow alteplase to dwell in the catheter for 30 or 120 minutes before checking CVAD patency. Note that the probability of success is decreased with a shorter dwell time. Proceed with all remaining steps in the standard procedure following “Evaluating Patency.”

#### **Using negative pressure to instill alteplase into a fully blocked line (see Figure 11)**

1. Clamp central line (unless using a clampless device).
2. Remove PPD and attach the Luer lock end of the three-way stopcock to the catheter, making sure the stopcock is in the OFF position.

Repeat instillations can be carried out using the stopcock procedure described above. If the CVAD remains partially occluded but can now be instilled directly using a syringe, it is not necessary to use the stopcock method.

### **Figure 10. Alternate (Stopcock) Protocol for Treating Complete Occlusions in Central Venous Access Devices**

eight hours of reconstitution. To reconstitute Cathflo, inject 2.2 ml of sterile water for injection, USP, into the vial, directing the diluent stream into the alteplase powder. Slight foaming is not unusual. Let the vial stand undisturbed to allow large bubbles to dissipate. Mix by gently swirling until the contents are completely dissolved. Complete dissolution should occur within three minutes. Do not shake. The reconstituted preparation results in a colorless to pale yellow transparent solution containing 1 mg/ml alteplase at a pH of approximately 7.3 (Genentech, Inc., 2003).

#### **Instillation Procedure**

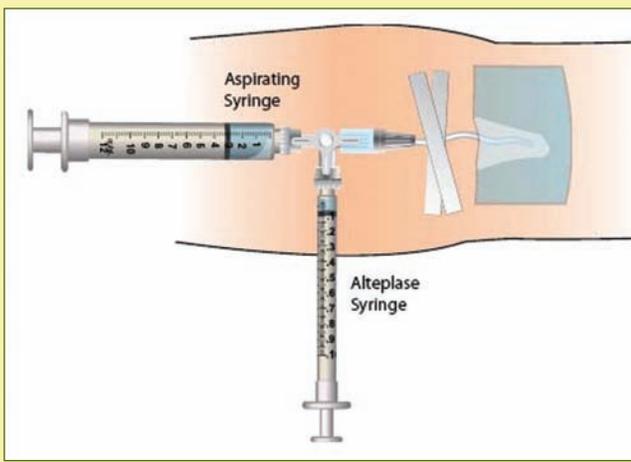
In adult patients, as much as 2 ml of the reconstituted alteplase should be instilled per occluded catheter lumen. However, ascertaining the fill volume for the particular CVAD requiring alteplase instillation is essential. The appropriate method for instillation should be determined by whether the CVAD is partially or completely occluded. For an incomplete occlusion, follow the standard protocol for treating incomplete or withdrawal occlusions (see Figure 9). In the case of a complete catheter occlusion, follow the alternate (stopcock) protocol (see Figures 10 and 11).

Figure 12 presents an algorithm for restoring CVAD patency. The procedure is technically simpler as well as more effective if applied before a CVAD is fully occluded (Shen et al., 2003). Clots that persist for more than seven days become relatively resistant to thrombolytic treatment (Steiger, 2006). Therefore, thrombotic occlusions should be treated as soon as they are identified.

## **Introducing Standardized Procedures to an Oncology Practice**

Institutions are encouraged to adopt these guidelines for managing thrombotic CVAD occlusions. Implementing new clinical practice guidelines can be complex, in part because of the number of multidisciplinary groups that may be affected in a particular practice setting (RNAO, 2002). In general, the process requires commitment at multiple levels within an institution to establish “buy-in” from administrators and patient educators, as well as nurses and physicians in different clinical practice groups. The range of existing practices must be determined, along with the educational and skill-development needs of team members, followed by the design of appropriate educational materials and training to support the integration of clinical practice guidelines. The authors suggest evaluating parameters of change resulting from implementation of clinical practice guidelines, including quality of patient care, patient satisfaction, nursing satisfaction, and cost of care.

Evaluation of clinical practice guidelines should be based on objective, quantifiable measures when possible. Thus, in a review of the effects of implementing the guidelines discussed in this article, changes from baseline should be determined for the number of partial and complete CVAD occlusions, thrombolytic agent dwell time, the number and severity of CVAD-related infections, the number and type of CVADs replaced or removed prematurely, the number of consultations with staff pharmacists, nursing time and costs related to materials, and



*Note.* Connect a three-way stopcock to the catheter using aseptic technique (see protocol). Connect a 10–12 ml Luer lock syringe (aspirating syringe) to one of the free ports and a smaller syringe containing the thrombolytic agent (alteplase syringe) to the remaining port. With the stopcock set so that the alteplase syringe is off, withdraw the plunger of the aspirating syringe to the 3–5 ml mark. Turn stopcock so that the aspirating syringe is off. Gently instill the thrombolytic agent into the catheter from the alteplase syringe.

**Figure 11. Infusing Alteplase Into Occluded Lines Using the Alternative (Stopcock) Method**

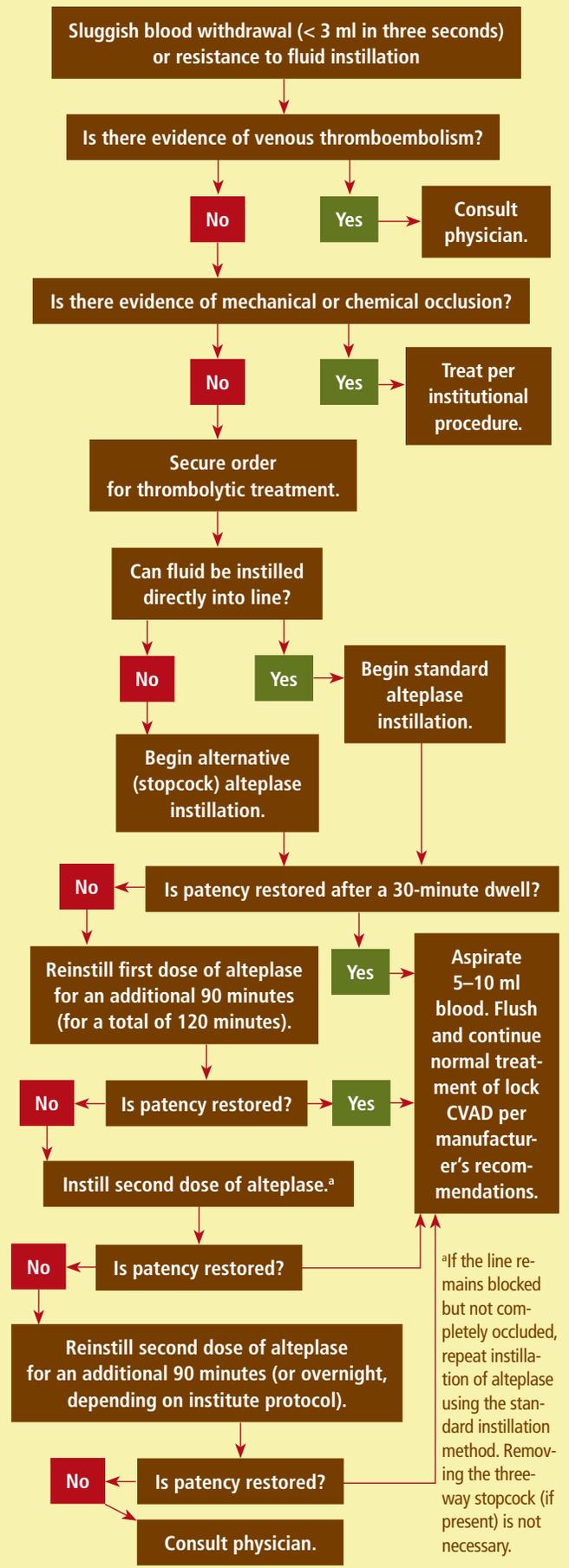
surgery and clinical consultation time. The outcomes should be revisited at regular intervals as infusion nursing practices evolve.

## Implications for Nursing Practice

Nurses require astute assessment skills and sound clinical judgment to identify and successfully manage CVAD complications. They are in a unique position to advocate for and adopt into practice evidence-based clinical practice guidelines to support the management of CVADs. As members of a multidisciplinary team, nurses are important links in the chain of patient care. Economic exigencies, the current nursing shortage, the chronicity of cancer, and the ever-increasing complexity of treatment are driving forces that compel nurses to develop in-depth knowledge of CVAD management. Positive patient outcomes are demonstrated by completion of therapy free of complications and patient satisfaction with care (RNAO, 2005). Table 1 provides a summary of recommendations regarding CVAD occlusions.

## Conclusion

Central venous access is crucial to the delivery of cancer therapy. Proper assessment, use, and maintenance of CVADs prevent treatment delays, as well as potentially life-threatening complications. Restoration of CVAD patency, when appropriate, represents a cost-effective alternative to device replacement and improves patient quality of life. Thrombotic occlusion, a common complication of CVAD use, can be resolved safely and effectively with the thrombolytic treatment procedures described



**Figure 12. Algorithm for Restoring Patency to a Central Venous Access Device**

**Table 1. Summary of Recommendations**

RECOMMENDATION	LEVEL OF EVIDENCE
Take appropriate steps to prevent central venous access device (CVAD) occlusion and to salvage dysfunctional CVADs. Attempt thrombolytic treatment to restore the patency of devices occluded by blood clots. Apply thrombolytic treatment with caution in patients with known or suspected CVAD infection.	II: strong evidence from at least one properly designed, randomized, controlled trial of appropriate size
Use locking solution or positive pressure device, as directed by device manufacturer, to prevent thrombotic occlusions. Apply thrombolytic treatment as soon as possible after complete or partial thrombotic occlusion has been identified (may require diagnostic imaging).	III: evidence from well-designed trials such as nonrandomized trials, cohort studies, time series, or matched case-controlled studies
Select CVAD type based on expected duration of therapy and the least invasive procedure available. Before attempting thrombolytic treatment, review record and, if necessary, consult with pharmacy to identify possible chemical blockage and determine appropriate clearing solution. Use turbulent flow while flushing lines properly to prevent thrombotic occlusions. Attempt thrombolytic treatment on an empirical basis if no mechanical or chemical causes of CVAD dysfunction can be identified. Apply thrombolytic treatment with caution in patients with active internal bleeding, recent surgery, or hemostatic abnormalities.	V: opinions of respected authorities, based on clinical evidence, descriptive studies, or reports of expert committees

in this article. The procedures, based on best clinical evidence, should be standardized in oncology practice so that they can be implemented consistently and evaluated regularly at all centers where CVADs are used.

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### The Oncology Nursing Advisory Board

The Oncology Nursing Advisory Board developed the previous guidelines for management of central venous access device occlusions for patients receiving cancer treatment in centers. The following people were members of the board.

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## Fighting Over Food: Patient and Family Understanding of Cancer Cachexia

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**C**ancer cachexia is a complex chronic wasting syndrome in which muscle and fat are lost as a result of metabolic alterations brought about by interactions between the host and the tumor (MacDonald, Easson, Mazurak, Dunn, & Baracos, 2003). This syndrome is present in approximately 50% of patients with cancer (Tisdale, 2009). Cachexia-related weight loss is caused by more than reduced food intake. As a result of metabolic processes, cancer cachexia typically is characterized by nonintentional weight loss and wasting that is not responsive to conventional nutritional support (Tisdale, 1997). Cachexia has serious implications for patients with advanced cancer and can lead to increased risk of adverse events (Wiedenmann et al., 2008), reduced response to treatment modalities (Muscaritoli et al., 2006), and increased mortality (Wigmore et al., 1996). Therefore, this life-threatening syndrome often is debilitating, underdiagnosed, and undertreated in patients with advanced cancer.

### Background

Cancer cachexia induces physiologic changes in appetite, thus affecting patients' ability to eat (Fearon, Voss, & Hustead, 2006). This is known to be a common source of concern for patients and their families (Hawkins, 2000; Hopkinson & Corner, 2006; Strasser, Binswanger, Cerny, & Kesselring, 2007). Because of concerns over eating, the potential for conflict over food between terminally ill patients and their family members has been reported (Hughes & Neal, 2000; Shragge, Wismer, Olson, & Baracos, 2007). A study conducted in

**Purpose/Objectives:** To investigate tensions over food that exist between patients with advanced cancer with cachexia and their families.

**Research Approach:** Heideggerian phenomenologic inquiry using unstructured interviews.

**Setting:** A regional cancer center in the United Kingdom.

**Participants:** 8 patients with advanced cancer living with cachexia and 8 family members.

**Methodologic Approach:** Singular unstructured interviews were recorded digitally, transcribed verbatim, and analyzed using thematic and interpretative phenomenologic analysis.

**Main Research Variables:** Cachexia and advanced cancer.

**Findings:** A fine line existed between offering food to a patient and forcing a patient to eat; often, conflict arose as a result. Contributors to that conflict focused on reduced dietary intake by the patient and the reaction to food refusal by the family, which frequently led to patients eating to please.

**Conclusions:** This study highlights the anxiety that surrounds eating and the distress it causes to patients and their families. This strain can escalate into arguments over food, causing negative repercussions for patients and their family members.

**Interpretation:** This is the first study to uncover tensions about eating as experienced by patients with advanced cancer and cachexia and their families. Nurses must consider this issue when designing and delivering effective care for this patient population.

the United Kingdom quantified anxiety resulting from reduced appetite in patients with advanced cancer and concluded that, as a result of their anxiety, family members can unwittingly pressure their loved one to eat (Hawkins). That resonates with a Canadian study that examined the nutritional care experiences in advanced

cancer from the perspective of patients, family members, and healthcare providers and identified social exclusion as a central strategy used by patients to avoid the potential for conflict over food from their family members (McClement, Degner, & Harlos, 2004). However, no study has formally investigated the experience of cachexia and its effect on food and feeding. Therefore, the current study sought to explore the experience of this phenomenon.

The data presented within this article are drawn from a larger study that explored patients' and family members' experiences of cancer cachexia (Reid, 2007; Reid, McKenna, Fitzsimons, & McCance, 2009). Findings illuminated six themes that reflected the complex dynamics in the experience of cancer cachexia. One theme focused exclusively on the tensions that exist over food in cachexia, Food Offering Versus Force Feeding. This article will articulate the research findings and shed light on this distressing and emotive issue in patients with advanced cancer with cachexia.

## Methods

### Research Design

Heideggerian phenomenologic research techniques underpinned the current study. Heideggerian phenomenology, which builds on the work of Husserlian phenomenology, reflected the interpretative aim of this research study, which was to enter into the life world of patient with advanced cancer with cachexia (and their family members) and, with the use of the hermeneutic process, interpret their illness events (Thorne, 1997). The assumptions and basic philosophic issues relating to interpretative phenomenology imply pre-understanding, which is linked to the process of interpretation. In using this approach, the study's aim was not merely to describe the research participants' lived experiences but to elucidate the personal meaning of cancer cachexia for each of the research participants.

### Participants

Purposive sampling was used to select patients with advanced cancer with cachexia from inpatient and outpatients units in a regional cancer center in the United Kingdom. All participants were older than 18 years and had the ability to provide informed consent and read and write in English. Patients were eligible for inclusion if they had a confirmed diagnosis of advanced, incurable cancer; had weight loss greater than 10% in the previous six months; perceived weight loss as a problem; and were living at home. Any patient who experienced secondary causes of cancer cachexia (e.g., gastrointestinal obstruction, prolonged nausea or vomiting) was excluded from the study. Patients were asked

to nominate a family member to take part in the study. Family members were eligible for inclusion if they had face-to-face contact with the patient more than five times per week and were identified by the patient as his or her significant other.

### Procedures

The study was approved by the Regional Research Ethics Committee, and governance was gained from the Health Trust where the study was conducted. All participants signed a written consent prior to taking part in the study. Patients were referred to the study by multidisciplinary staff within the regional cancer center. Single unstructured interviews were conducted with each participant in his or her home. Participants were asked to talk about their experience of cancer cachexia. Interview probes included, "What are your thoughts about the weight loss you have experienced?" and "How has your weight loss affected your everyday life?" When a participant mentioned a topic related to cachexia, the primary author, who conducted the interviews, asked follow-up questions, such as, "Can you tell me a little bit more about that?"

The data collection and analysis procedures were stringently monitored to ensure rigor within the study. Specific approaches to uphold rigor included digital recording and verbatim transcription of all interviews. In addition, the interviewer took thorough handwritten field notes of each interview. Those notes were especially relevant because they illuminated the direction of questioning within each interview and provided the necessary context for analysis. The analysis and interpretation of data should be "thick" in that they include the complexities in the data set (Lincoln & Guba, 1985). Therefore, the analysis presented in this study endeavors to display the diversity of viewpoints among the participants.

### Data Analysis

All interviews were transcribed and checked against the original voice file and field notes for accuracy before being read and reread several times. Thematic analysis was conducted across all interviews (Van Manen, 2001). The preliminary analysis of transcripts confirmed the decision to perform interpretative phenomenological analysis (IPA) with eight interview sets (eight patients and their family members) (Smith, Jarman, & Osborne, 1999). Although all themes generated from thematic analysis were identical to those generated from IPA, the aim of conducting IPA was to uncover the depth and nuances of the experience of cancer cachexia by selecting a subsection of transcripts on which to conduct a detailed analysis. The process of conducting IPA involved identifying statements that reflected the participants' experience of cachexia, which were recorded and then arranged

into themes. Emerging themes were listed and any connections between them were established. Next, a table of themes was developed. The themes that emerged from the first interview formed the framework for subsequent interviews, and newly emerging themes were added to the table as they emerged. An iterative approach to data analysis was taken so that all new themes were clarified with prior transcripts and work continued back and forward between the cases in this way. Analysis continued across the data until no new themes emerged.

## Results

Interviews ranged from 42–128 minutes. In total, eight patients and eight family members were interviewed. Participants' (patients and family members) characteristics are displayed in Table 1.

### Reduced Dietary Intake Causes Conflict

Data suggested that reduced dietary intake frequently became a source of conflict between patients and their families, resulting in patients feeling like they were constantly in an environment focused on food from which they could not escape.

Well I'm never hungry as I was telling you, but [my wife and daughter always are] saying, "Eat this now, eat this now." [Looks away and then down to the floor.] A quiet life, love, that's all I need now, so I just eat what I can when they give it to me. It's never enough anyhow; sure, the weight's going off, and the rows [arguments] is going on.

The degree of helplessness evident in the previous account portrays the futility of the situation that patients perceived to exist over food. More notably, the nonverbal communication helps to convey the personal emotional state of this participant. Changes in food preferences and eating habits created conflict. Indeed, in many cases, the family members' focus on food exerted unnecessary pressure on patients to conform and eat. "When his appetite went down . . . we gave off and he started eating then, [but] that was for us. Really I think we were forcing him to eat."

For patients, eating often became a chore. The well-intended behavior of family members frequently had negative repercussions on patients, who typically became upset and angry by the continual focus on food.

They try to feed me everything. It doesn't matter if I want it or not; they'll still make me eat it, and I, that's just, they start me off, I just have to say, "I don't want it." [Lowers verbal volume.] You've no idea, no idea. [The patient sighs and lowers head.]

The desperation and emotional suffering inherent in this situation is particularly distressing, given that this is occurring during the final months of the patient's

**Table 1. Participant Characteristics**

Variable	n	%
<b>Patient gender (N = 8)</b>		
Male	4	—
Female	4	—
<b>Caregiver relationship to patient (N = 8)</b>		
Husband	2	—
Wife	4	—
Sister	1	—
Daughter	1	—
<b>Mean weight loss by cancer diagnosis</b>		
Lung cancer	—	18
Prostate	—	17
Acute myeloid leukemia	—	30
Bile duct	—	13
Cystadenocarcinoma	—	18
Mesothelioma	—	17

life. The defining characteristic of cachexia is that no matter what foods patients consume, they still lose weight. However, family members failed to see weight loss as an inevitable consequence of cachexia. For example, even after changes in the patients' appetite, they continued to encourage maximum oral intake as a means of resolving this crisis: "She still puts a full, full plate down in front of me, you know [shakes head from side-to-side]. I say, 'Well I can only eat what I can eat and that's it.'"

Patients and their family members alluded to patients removing themselves from situations in which the potential for conflict was evident—when food was offered that they did not want or would turn down: "She's right. Sometimes I don't want it and if she goes on then, I'd say, she'd be giving it to you, and I'd say, 'I'm away to bed.' Don't want it, you know." Social isolation and, therefore, avoidance of conflict was a strategy used by some patients as a means of evading disagreements over food. In addition, further action was taken by patients to prevent conflict over eating.

Y'know you're saying to yourself, here [family members] come again. They're going to start again about me eating. Then I'd say to . . . [my husband], you tell them I had such and such, and he'd say okay. I'll tell them. Then they come in and then he tells them the truth.

The desperation experienced from conflict over food was vast for this patient. Indeed, in an effort to avoid further conflict in her family situation, she tried to encourage relatives to collude with and lie for her about what she had eaten throughout the day. While patients often felt dejected and harassed because of this conflict, family members also suffered.

And then when we did have [arguments over food], you felt terrible in yourself [participant's eyes

welled up, looks to the side, clears throat, and then re-establishes eye contact] . . . because you know why should we be having these bust ups?

This account provides insight into the anguish experienced by family members when arguments over food arose. Bickering with a loved one over food was extremely difficult for family members. They expressed their guilt and remorse verbally and nonverbally.

### Eating to Please

Patients described eating as a way of pacifying their family members. They often intimated that they ate, not because they wanted food, but because they wanted to satisfy their family members who were encouraging them to eat: "I do my best to eat it, to please them; it's just to please them like . . . it's hard [to eat]. I never, never feel hungry." Furthermore, patients acknowledged that they did this as a way of avoiding or resolving conflict over food: "I eat something to shut them up. I'll go and take maybe a digestive biscuit or a bit of toast. I'm not hungry; it's just to please them really." Patients wanted to maintain harmony with their family and eating food provided by their family members was a way of achieving that. The focus on food was fundamentally important for family members. The provision of food and nutrition had symbolic significance for patients and their families.

They're constantly on at me [about food]. Constantly, no matter what, anytime they're here; you know, they're just constant. I know they're just worried about me and all. I know that's why they do it.

For patients, family members' focus on food was a sign of their love, concern for their well-being, and compassion toward their ailing health. For family members, the symbolism of giving food mirrored the patients' feelings and the act of buying, preparing, and offering foods that the patients liked was how the family members demonstrated their love and concern for the patients' well-being.

Sometimes he'd take a tin of rice or custard. I always have it in the house now, he enjoys them, and he only has half a tin. I always make sure I have tins of them in the cupboard.

Family members typically kept the patient's favorite foods on hand in an attempt to gain the most benefit from any occasion when their loved one had a craving.

### Reaction to Food Refusal

Family members focused heavily on encouraging patients to regain their health through eating and, when food was rejected or refused by patients, family members offered a variety of responses, including anxiety.

He's our father and we love him and we were panicking because he wasn't eating and we didn't know what to do.

The previous example helps to convey the affection and devotion to their loved one that was evident from all family members. In this study, only patients recognized the futility of eating in relation to cachexia. In contrast, family members viewed food as a vehicle to aid recovery. Thus, when food intake diminished, the family members' natural reaction was one of apprehension and worry as they related the patients' weight loss to reduced oral intake. Interestingly, when food was rejected by patients, the female family members talked most about how this affected them. They responded in two ways. First, they experienced guilt as they described how they continually offered food, even though it was refused; they believed that not offering food might have been viewed as neglect on their part: "I felt it was our fault you know, because he wouldn't eat and we couldn't get him to eat." Second, family members described feeling angry when patients declined food that they prepared: "I made the dinner, made what he liked, always liked and would have always eat, and he said he didn't like it, didn't want it, which I was quite angry at."

Patients' rejection of food was viewed by their family members as a refusal of their provision of support and nourishment. When prepared food was rejected, family members saw it as much more than a refusal of food offered. Family members often experienced feelings of personal rejection of the affection, concern, and consideration they put into the preparation and offering of food.

## Discussion

This study uncovers the complex and emotive situations that surround eating for patients with advanced cancer who have cachexia and their families. In this study, care for patients by their family members centered on the provision of food. Patients explained how that often manifested in a way that their family members exerted unnecessary pressure on them to eat, Food Offering Versus Force Feeding. The "will to nourish" (Hughes & Neal, 2000) appeared to dominate in many families, with members conforming to a perceived nutritional and caring mandate in which the provision of food and the act of feeding were expressions of love and care. The lack of understanding regarding cachexia and the continual focus on food often led to conflict within the patient's family.

Conflict culminated when family members tried to encourage their loved one to eat. To avoid conflict, patients used tactics such as social isolation and lying. These findings mirror and expand on previous research (McClement et al., 2004); they also confirm Holmes's (2001)

theory on conflict resolution, which highlighted four strategies for resolving conflict, including avoidance. That was evident within this study as patients socially isolated themselves when the potential for conflict over food was present. Although previous research has suggested that conflict over food can occur between patients and their families (Holden, 1991), results from the current study outline the negative implications of conflict for patients and their families.

Participants stated that patients ate not because they wanted food, but because they wanted to satisfy their family members and avoid further conflict. This finding supports Stephany's (1991) discussion on terminal illness that suggested that patients eat because they desperately want to please their caregivers. Furthermore, these data are in line with Holmes's (2001) Framework of Conflict Resolution that outlined accommodation as one of four strategies to avoid conflict. In the current study, that was evidenced by patients being willing to sacrifice their needs and give in to family to avoid conflict. The symbolic importance attached to food was evident; food was a sign of the family members' affection and anxiety for the patient's well-being. However, because family members did not understand the physiology and nature of cachexia, they experienced feelings of guilt when they could not persuade their loved one to eat.

Lawrence (1984) proposed that food is the medium through which women demonstrate their love; interestingly, within this study, female family members discussed the emotional connotations linked with their role in food preparation and food offering. Therefore, they often experienced feelings of frustration when food was rejected and felt personally rejected in their attempt to provide nourishment and support their loved one. Holmes (1998) suggested that a patient's failure to eat evoked feelings of anxiety in their family members. In the present study, family members reacted to patients' failure to eat with mixed transitory emotions, including anxiety and despair. In their theory of emotion, Plutchik and Kellerman (1980) suggested that transitory emotions can affect and often drive behavior, an opinion previously confirmed in the cancer literature (Consedine, Magai, Krivoshekova, Ryzewicz, & Neugut, 2004).

Meares (1997) suggested that the degree of anxiety in relation to reduced food intake was related to the caregiver's level of understanding of the terminal nature of the patient's illness. Interestingly, family members expressed the most concern over the patient's failing appetite and did not understand the nature and effect of cachexia. All participants in this study were aware of the terminal nature of the patients' illness. Faced with the image of their loved one fading away, family members appeared to rationalize the patients' weight loss and viewed food as a vehicle to aid recovery. Freud (1936) suggested that rationalization is a defense mechanism

used to prevent the overwhelming anxiety of a situation. Therefore, perhaps family members' defense reaction was to discuss, buy, prepare, and offer foods in a manner usually associated with recovery from illness, rather than acceptance of the terminal nature of cachexia in advanced malignancy. That may help to explain the distressing tensions and disputes that existed around food within this population.

### **Study Limitations**

The sampling procedure for recruiting family members into this study was dependent on the patients identifying and giving consent for their chosen family member to participate. Patients may have been inclined to select a family member whose beliefs concurred with their own. Thus, the views expressed by the family members in this study may not be generalizable to the wider family circle. However, data suggest that although similarities were identified between patients and significant others, overt and distinct differences also existed.

### **Nursing Implications**

In advanced cancer, palliation of cachexia is recognized as a formidable task for nurses (Dewey & Dean, 2008). Data from this study suggest that arguments over food may affect quality of life for the time remaining for patients and may have negative repercussions for family members. Supportive informational interventions are needed for family members to understand that, for patients, food is a means of social enjoyment, rather than a treatment used to help arrest cachexia. Interventions should focus on helping families understand how the patient's altered appetite may contribute to weight loss. However, interventions should help family members distinguish between alterations in appetite that can be explained physiologically and those that are an expected consequence of cachexia over which the patient has minimal control. Emphasis needs to be placed on what family members can do to help a loved one through the illness trajectory. Furthermore, the futility of feeding a patient with cancer cachexia must be understood and is especially pertinent when dealing with the perceived role of food in cachexia. Information interventions should reinforce the ineffectiveness of feeding in cachexia and explain the difference between starvation and cancer cachexia. That would enable family members to understand the characteristics of this phenomenon and acknowledge that the patient's progressive and involuntary weight loss confirms the poor prognosis and movement toward death. As a result, family members may be able to shift their focus from food, thus reducing tension. Such interventions may contribute to patients eating for pleasure and increasing their social interaction rather than to satisfy their family members. In

addition, if family members do not experience feelings of guilt or distress when patients can eat only a small amount of food, patients may be encouraged to socially engage more with their friends and family, particularly at meal times. Most importantly, if family members are informed about the patient's inability to eat, alongside the irreversibility of the weight loss, they may adapt their response to cachexia (focus on food) and move toward acceptance of the terminal nature of the advanced cancer. The incidence and affect of cachexia underscore the value of sensitizing nurses to such issues.

## Conclusion

This study is novel in that it provided the opportunity to be present and interact with patients with advanced cancer experiencing cachexia and their family members. Talking to participants about their experiences of cachexia provided insight into the tensions that exist over food between patients and their families. The focal point of the arguments centered on the quantity of food eaten and were fueled by a lack of understanding

about the role of food in cancer cachexia management. Further research providing supportive informational interventions to patients and their families needs to be conducted. The research should focus on the nature and effect of cancer cachexia and the role of food in cachexia management to evaluate the effectiveness of reducing the conflict over food experienced by this client group.

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## **Journal Club Questions**

This article has been chosen as particularly suitable for reading and discussion in a Journal Club format. The following questions are posed to stimulate thoughtful critique and exchange of opinions, possibly leading to changes on your unit. Formulate your answers as you read the article. Photocopying of this article for group discussion purposes is permitted.

1. How frequently do we care for patients who are cachectic?
2. How often do we have problems with patients who do not or cannot eat?
3. Given the principles covered in this article, what are some of the ways in which we can encourage intake even if the patient is having difficulty with eating?
4. How can we support family members in their struggle to get the patient to eat?
5. This article raises wider issues regarding conflict between patient behavior and family desires. What are our options for addressing these situations? What approaches have worked and which have been less effective?

At the end of the session, take time to recap the discussion and make plans to follow through with suggested strategies.



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