Clinical-academic partnerships for research serve many purposes beyond conducting clinical studies and advancing the science of nursing practice. These partnerships improve the health outcomes for patients and their families and communities, and they enhance professional development for nurses in many settings and roles—academic and clinical. The academic institution also benefits because the significant clinical issues of the hospital become research priorities for the academic institute.

The major challenges to forming successful academic-clinical partnerships often fall into ownership or responsibility struggles, and may be the result of mismatched expectations. Several actions taken early in the process can help to avoid or eliminate these potential conflicts. Each partner (academic and clinical) has valuable resources to contribute, and a clinical-academic partnership within a research study creates a synergistic effect resulting in improved outcomes. This article discusses in detail the design and outcomes of 2 current studies using successful academic-clinical partnerships as examples, and reviews the important components and resources that help to ensure nurses and the nursing profession gain as much as possible from these relationships and the studies that result from them.

specify the ownership and responsibilities during the planning stages.

Clinical institutions offer not only the clinical expertise in a particular disease area but also the target population. Clinicians are most knowledgeable of urgent and important problems in a clinical area, the study population, potential confounders in the research design, and feasible interventions. Clinicians also help to determine the research priorities for the institution and the profession. Clinical resources are critical for enlisting the services of nurses. The nurses are an essential component of a study design, not only for data collection but also because of their relationship with the patients. Nurses see patients on a daily basis, making it easier to obtain informed consent or collect data from the patient. As a study investigator, it is essential to “buy” nurses’ time as part of the study budget. Nurses are very busy in a clinical environment, thus the time that they are involved in a study has to be accounted for and allocated. Clinicians also serve as the gatekeepers to patients. When an academic investigator approaches a clinical institution to conduct a study, an impression of the investigator “walking in off the street to study our patients” may reside. A strong partnership can help to circumvent these attitudes to establish a more trusting relationship when patients are exposed to personnel other than their healthcare providers.

Clinical centers can also provide physical resources, such as space for data collection and clinical laboratories and expertise. Data collection facilities are a scarce commodity in many clinical centers, but study patients need a quiet place to discuss informed consent and complete questionnaires. If the study requires laboratory or diagnostic tests (eg, magnetic resonance imaging, treadmill, or urine cultures), compliance by study participants is more likely if the facility is located close to where the patient is being treated.

If the clinical institution has a nursing research committee (NRC), it can help expedite the review of the study protocol and elicit support of the director of nursing, nurse managers, and clinical staff, in addition to monitor and support the study in case issues or problems (inevitably) arise. The NRC is also a key player in translating the study findings into standards of care.

Academic institutions have a number of resources, physical and human. Within academic centers are experts in developing and testing theory, including conducting research projects. They also have experts in biostatistics for support with data, management, and analysis, in addition to information technology expertise. For example, a study Web site can be invaluable for not only advertising the study but also offering frequently asked questions for participants, a study intervention (eg, a patient education program), and dissemination of information, such as guidelines for study investigators. Physical resources include research laboratory facilities (eg, exercise laboratories) and the nursing or medical library. Importantly, academic centers may also have a Center for Nursing Research, which provides information on funding opportunities, a scientific review committee to review grant applications before submission, and training programs in conducting clinical studies for research coordinators.

**Examples of Successful Clinical-Academic Partnerships**

Table 1 lists some of our studies conducted with a clinical-academic partnership, and the outcomes for the nursing profession. Clearly, the study results extend far beyond improved patient outcomes. They are the basis of standards of care and practice guidelines. The following sections are a description of 2 current studies using clinical-academic partnerships.

**Delirium in Oncology Patients**

Delirium is an acute alteration in mental state with an unidentifiable or presumed physical cause. The alteration in mental state can manifest as disordered attention or arousal (hyperactive, hypoactive, or mixed) or a change in cognition (memory deficit, disorientation, language disturbance, and perception). The etiology of delirium is biological, not psychological, thus there also needs to be evidence from the patient history, physical examination, and laboratory findings that the disturbance is caused by a direct physiological consequence (eg, a medical condition or substance intoxication or withdrawal). Possible causes of delirium are listed in Table 2.

Delirium is under-recognized and underdiagnosed in hospitalized patients. It develops quickly, over hours to days, and tends to fluctuate throughout a 24-hour time period. This characteristic is important because it helps to distinguish delirium from other disorders with similar presentations, especially for hospital physicians.
Delirium is often labeled by the clinician as acute brain syndrome, acute confusional state, or intensive care unit (ICU) psychosis. Patients or family members may describe it as “sundowning,” “loony,” or “loopy.” In geriatric patients (ie, >65 years), the incidence is 60%; in ICU patients, the incidence is 72%. Overall, in patients with cancer, the incidence is 25%, but for those patients who are terminally ill, the incidence of delirium increases to nearly 90%. Therefore, not surprising, is the 2.2-fold increased length of stay for patients who develop delirium and the increased hospital costs. Franco et al estimate that delirium incurs costs of $4.4 billion per year. Despite the highly documented incidence, delirium is frequently missed or misdiagnosed. It is not uncommon for physicians to ask for psychiatric evaluations for depression when patients are exhibiting signs of delirium.

In the oncology population, the potential for a delirium diagnosis is significant because it suggests a new symptom management issue. On the inpatient oncology units in our hospital, it was observed that our patient fall rates had not changed over the years, although the use of “sitters” as a preventive measure had increased (sitters are employees who constantly observe patients but do not provide any patient care). In discussions with the psychiatric liaison nurse, the importance of delirium as a possible cause of some

### Table 1. Examples of Clinical-Academic Partnerships and their Outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Outcome for Nursing Profession</th>
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<tbody>
<tr>
<td>Comparison of type of line dressings on infection rate, cost, and patient comfort</td>
<td>Resulted in a new protocol and selection of new dressing for patients with central venous catheters.</td>
</tr>
<tr>
<td>Mucositis and the oral care task force</td>
<td>Changed the way mucositis is assessed, and formed a protocol for managing mucositis.</td>
</tr>
<tr>
<td>Characteristics of malignant cutaneous wounds</td>
<td>High-resolution photographs were taken after the course of malignant cutaneous wounds and a standard practice was established for managing wounds.</td>
</tr>
<tr>
<td>BP monitoring during blood product administration</td>
<td>Demonstrated vital signs every 15 minutes during blood product infusions were unnecessary for patients with leukemia and undergoing bone marrow transplant. However, a recent hospital protocol now requires BP measurements every 15 minutes.</td>
</tr>
<tr>
<td>Inpatient/outpatient care continuum*</td>
<td>Now the standard of care in our institution, and led to policy changes in many third-party payers; also serves as a model of care for many other cancer centers throughout the United States.</td>
</tr>
<tr>
<td>Acupressure for chemotherapy-induced nausea†</td>
<td>The negative results allow clinicians to better inform patients when they are exposed to ads on this product.</td>
</tr>
<tr>
<td>Screening initiative for the early detection and management of delirium</td>
<td>Ongoing project described in this manuscript. Developed and implemented a standard of care to screen and manage delirium.</td>
</tr>
<tr>
<td>Mitigating fatigue and other symptoms in patients with cancer by exercise</td>
<td>Ongoing project described in this manuscript. Tested an exercise program during chemotherapy and radiation therapy.</td>
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</table>

* A study of the effect of care delivery on clinical outcomes and quality of life in patients undergoing bone marrow transplant, from strictly inpatient to inpatient/outpatient continuum, depending on the clinical condition of the patient. This study was preaced on the belief that the same group of nurses should be involved in all stages of the continuum. The study measured symptoms, quality of life, family and caregiver burden, clinical outcomes, and cost of care.
† A study of patients on the hemostatic malignancy unit. This was a double-blind, randomized, placebo-controlled trial of an elastic band with a pressure point used to prevent nausea versus the same band applied in the incorrect position, as an adjunct to the normal protocol in managing nausea and vomiting from chemotherapy. The study showed that the acupressure bands were not more effective than placebo in reducing nausea.
BP = blood pressure.

### Table 2. Possible Causes of Delirium

- Metabolic encephalopathies
- Infection
- Neoplasm
- Intoxication by drugs/poison, polypharmacy
- Intracranial space lesions
- Vascular disorders
- Hematological disorders (anemia)
- Head trauma
- Epilepsy
- Allergic response
- Injury by physical agent (eg, radiation or hypothermia)

The identified causes of delirium are numerous and the importance of an inclusive assessment that “rules in” all contributing causes cannot be overstated.
patient falls was agreed upon, but delirium was not currently screened or diagnosed. Thus, a team was formed in collaboration with the Center for Innovation in Patient Safety to design a study of delirium. Funding was acquired through several awards and grants to pay for study expenses.

The objective for this study was to conduct daily delirium screening on 100% of nonvented patients on 1 inpatient unit with the goal of diagnosing, treating, and protecting patients with delirium. More specifically, the objectives included refining and implementing an ongoing educational program for nurses on the prevention, early detection, and treatment of delirium; determining the incidence of delirium; and refining and implementing, as usual nursing practice, a standard of care to address delirium that emphasizes environmental safety, correction of causes, and management of symptoms.

As part of the study design, we included the many stakeholders for the success of this project—the president of the hospital, the director of consultative services for the department of psychiatry, the associate director of clinical affairs for the cancer center, the nurse manager, clinical nurse specialists, psychiatric liaison nurses, the clinical nurses, and staff members of the Center for Innovation in Patient Safety. Even if all of these persons were not directly involved in designing and conducting the study, it was important to gain and maintain their enthusiasm. For example, we provide updates to the hospital president not only on the study progress but also presentations of the study data. This reinforces the importance of the study and reminds him of this activity in his institution.

The initial outcomes of the study were to identify the incidence of delirium on this unit and increase early detection of delirium through screening. Once this was established, the extent of delirium would be documented for the development and implementation of a multidisciplinary protocol.

On the unit, the registered nurse (RN) is responsible for screening of all admitted patients, which includes a baseline Mini-Mental State Examination (MMSE). During the study, the RN screened each patient for delirium twice daily using a standard, valid, and reliable instrument, with at least 10 hours of observation time between screenings. Typically, this was done at 5:00 AM and 5:00 PM. Because the study was observational, patients did not need to be woken for the early morning screening. (Of note, oncology patients have disruptions in consciousness, sensory deficits, and language barriers and are often medically unstable. Their participation would have required a different and likely more time-intensive screening tool.) On an ongoing basis, MMSE scores are obtained as indicated for patients who screen positive for delirium. All data were collected electronically as part of the nurses' online documentation system.

For screening scores of 4 or more symptoms on any 1 screen or the presence of 4 or more symptoms in the 24-hour cumulative score, the delirium protocol directs the RN to notify the physician to establish the diagnosis and post a delirium logo sign on the patient's door and above the bed (the logo does not have the written word "delirium") to alert care providers that the patient screened positive for delirium. The nurse must also implement environmental safety measures to keep the patient safe until the etiology is determined and corrected. Importantly, the nurse educates the patient and family about why the signs are being posted and why the measures are being implemented.

Currently, we have achieved several goals. Using an aggressive screening initiative, the incidence of delirium on this unit has been established and a nursing delirium protocol has been introduced as a standard of care. Nursing documentation of positive delirium screens is in the medical record; however, physician compliance with documentation of the diagnosis of delirium is low, thus coding of delirium is insufficient. Additional data are needed to evaluate the remaining study outcomes of length of stay, charges, patient falls, and sitter hours. Also, because of inconsistent physician compliance with documentation, it is interesting to compare these outcomes in coded cases versus nurse-screened/identified cases. Documentation and coding of delirium as comorbidity are important because delirium is one component of the patient's intensity of care and has potential financial implications.

The next steps in this study process are to publish the results of this pilot study and perform this study in other hospital units, thus comparing data across units.

Cancer-Related Fatigue

Cancer-related fatigue is a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning. It is often accompanied by emotional distress and/or difficulty sleeping. Cancer-related fatigue follows a predictable pattern that can be related to the type of cancer treat-
ment, and patients receiving multimodal treatments (eg, chemotherapy + radiation therapy) are at increased risk. In general, cancer-related fatigue is different from fatigue of healthy individuals in that it is more intense, persistent, and also more likely to be present in the morning. In fact, the quality of sleep for these patients is often not restorative.

Fatigue is the most common unmanaged symptom reported by patients with cancer and is reported to be the most distressing symptom associated with cancer and its treatment. Unfortunately, patients with cancer have come to expect fatigue as part of cancer treatment. They do not spontaneously report fatigue unless prompted or queried, thus it is underdiagnosed and undertreated. Some healthcare professionals have also suggested that patients with cancer do not voluntarily discuss fatigue because they want oncology care providers to focus on their cancer treatment or they do not want to appear to be complaining.

There are few proven treatments for fatigue, other than aerobic exercise and anemia correction by erythropoietin. Since 1991, the Oncology Nursing Society has identified fatigue as a research priority. The study presented here evaluates the effects of a home-based, moderate-intensity exercise program on fatigue and other symptoms during cancer treatment. It developed from a small pilot study of patients with breast cancer that showed significantly less fatigue and emotional distress, in addition to higher functional status, in women who exercised regularly compared to women who were less active during chemotherapy treatment. Based on the initial pilot and 3 subsequent studies, our larger multisite clinical trial is ongoing, using more specific outcomes and measurement instruments, in addition to more diverse sample with a variety of types of cancer.

The intervention being tested consists of a home-based moderate-intensity brisk-walking program in which patients are taught to take their pulse and exercise to achieve 60% to 80% of their maximum heart rate for 20 to 30 minutes per session, 5 to 6 times per week. A home-based intervention (eg, as opposed to going to a health club) was selected because it would be more generalizable, as a home-based program is more accessible for almost everyone. Patients have assessments before and after their cancer treatment program, in addition to a 6-month follow-up evaluation. Patients are stratified based on age, type of cancer, type of cancer treatment, and exercise level at study entry, and randomized to receive usual care (no recommendation to exercise) or usual care plus the exercise intervention. Those patients receiving the intervention are given an actual written prescription for exercise, which is adjusted every 2 weeks (based on a patient visit or phone call by an oncology nurse) to maximize exercise progress. Patients also receive an instructional booklet and video on the walking program.

The current study uses treadmill testing to measure changes in physical functioning and pedometers to measure adherence, offering more precise outcomes than prior studies. In addition, sleep disturbance has been included as an outcome to investigate the relationship between sleep alterations and fatigue. The interdisciplinary team at Johns Hopkins Hospital includes physical therapists, an exercise physiologist, physicians, staff nurses, and nurses from the research project.

The clinical implications of these studies are numerous. The results show that high fatigue levels result in measurable losses in physical functioning, but that fatigue can be managed with a simple moderate exercise program at home. The studies also reiterate the many positive benefits of exercise. However, perhaps most importantly, the results have prompted a paradigm shift among healthcare practitioners from recommending rest to individualized exercise and a focus on health promotion during cancer treatment. Increasingly, oncology care providers no longer think that fatigue must be accepted as an inevitable consequence of cancer treatment.

These studies have also prompted avenues for further exercise research, including determining its effect on functional status, understanding the mechanisms of symptom clusters (fatigue, emotional distress, and difficulty sleeping), determining the most effective type and amount of physical exercise and the timing (during treatment or rehabilitation), and the role of exercise in recurrent disease and survival. It is also important to evaluate other clinical trial designs to improve the quality of data along with addressing adherence issues. If the results continue to support the use of a home-based exercise program, the findings from this multicenter clinical-academic partnership should culminate in clinical practice guidelines to assist oncology nurses in recommending exercise for patients with cancer.
CONCLUSIONS

For the clinical practice nurse, the academic-clinical partnership has important implications in improving patient outcomes, professional development through participation in studies that advance nursing science, and forming the basis for standards of care in nursing practice. Mismatched expectations are often the “Achilles heel” in this partnership, but with thorough and careful agreements on responsibilities and rewards up front, academic and clinical nurses have much to gain from the many resources they bring to this relationship.

ACKNOWLEDGMENTS

Dr Krumm is principal investigator of the Screening Initiative for the Early Detection and Management of Delirium in Oncology Patients study, and it was funded by the Johns Hopkins University School of Nursing Dorothy Evans Lyne Fund.

Dr Mock’s current study of cancer-related fatigue is supported by the National Cancer Institute and the National Institute of Nursing Research (1R01 NR 04991).

REFERENCES