

The Impact of Integrative Medicine on Pain Management in a Tertiary Care Hospital

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Background: Optimal inpatient pain management remains a major institutional and therapeutic challenge. Nontoxic, nonpharmacological approaches to treating pain show promise but have not been widely implemented, nor has their effectiveness been evaluated.

Aims: To evaluate the effectiveness of an inpatient integrative medicine consult service for pain management in 6 settings across an entire tertiary care hospital.

Design: Retrospective, observational study.

Setting: Abbott Northwestern Hospital, a 629-bed tertiary-care hospital in Minneapolis, Minn, that is part of Allina Hospitals & Clinics.

Participants: Approximately 1837 patients hospitalized between January 1, 2008, and June 30, 2009.

Measurements: Pretreatment and posttreatment pain scores on a verbal scale of 0 to 10.

Results: Most patients (66%) had never previously received integrative services. Provision of integrative services had immediate and beneficial effects on pain scores. The average reduction in pain scores was 1.9 points (on a 10-point scale), and the average percentage in pain reduction was approximately 55%.

Conclusions: The formal provision of inpatient integrative medicine had a significant impact on pain scores for hospitalized patients, reducing self-reported pain by more than 50%, without placing patients at increased risk of adverse effects. This was true in all 6 settings. Age, previous use of complementary therapies, and sex did not affect results. Future research must define the appropriate dose of the intervention, the duration of the relief, and the identification of patients most likely to respond to these nonpharmacological treatments. Additionally, future research using the electronic health record will allow quantification of any reduction in total costs, pain medication usage, and adverse events.

Key Words: integrative medicine, pain management

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Optimal inpatient pain management remains a major institutional and therapeutic challenge. Roughly 80% of patients report moderate to severe pain levels after surgery.¹ Since at least 2001, the Joint Commission has held acute care hospitals accountable for the assessment, documentation, and management of pain.^{2,3} This has undoubtedly improved the quality of pain management. Now, health care leaders must face the next

level question: how can institutional policies emphasize effective pain control and simultaneously avoid side effects of opioid medications including respiratory depression, clouded mentation, hypotension, nausea, constipation, dizziness, and presumably, falls?⁴ For many providers, these dueling concerns represent a clinical dilemma that is not well answered when pain management guidelines emphasize pharmaceutical interventions.

The National Quality Forum's recent report, *Safe Practices for Better Healthcare—2009 Update*, establishes the importance of addressing both safety and quality. Specifically, this report queries how the current health care system can better manage pain (improve quality) while simultaneously reducing side effects (improve safety).⁵ The report further states that "There is strong evidence that integrative care can heal and improve basic conventional care by addressing the mind, body and spirit connection."⁶ Integrative medicine (IM) refers to the blend of conventional medical practices and nonpharmacological, complementary practices⁷ by using all appropriate therapeutic approaches to attain optimal health and healing. Integrative medicine strives to achieve wholeness and health as well as cure illness and disease. Recent systematic reviews from the Cochrane Collaboration and others indicate efficacy of various nonpharmacological, integrative approaches for pain management in hospitalized patient populations, including obstetrics,^{8–11} surgical,^{12–14} and postoperative and cancer-related nausea and vomiting.^{15,16} These approaches avoid the adverse reactions associated with the predominate reliance on opioid medications for pain management. Even the Food and Drug Administration's Janet Woodcock, writing in the *New England Journal of Medicine*, has noted that nontoxic, nonpharmacological approaches to treating pain (e.g., mind-body skills development) show promise.¹⁷

Research studies of nonpharmacological, integrative methods to manage pain have shown both efficacy and the potential for reduced risk of side effects (e.g., safety). However, these studies have been silent, if not mute, on the subject of the effectiveness of these approaches. Can these approaches be implemented in real time, across and under real operational and financial constraints within an acute care hospital? Although randomized controlled trials are the accepted standard of clinical research, careful observational studies are invaluable as they provide an opportunity to assess what approaches are acceptable to patients and clinical care providers. They can be implemented in conventional treatment settings¹⁸ and, we contend, could improve pain management.

The purpose of this observational study was to evaluate the effectiveness of an IM medicine pain management approach for patients across an entire tertiary care hospital. We hypothesize that it will be feasible to conduct an IM consult service for pain management across the hospital and that the integrative care will reduce patients' self-reported pain scores.

IM INTERVENTION

The Penny George Institute for Health and Healing (George Institute) is the Integrative Medicine Department at Abbott

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Northwestern Hospital (ANW), a 629-bed tertiary-care hospital in Minneapolis, Minn, that is part of Allina Hospitals & Clinics.

The George Institute receives referrals from physicians and nurses (MD, DO, RN, CNP, and CNS) on a daily basis. A patient, family, or friend can request a referral, but a nurse or physician must approve and submit the referral through the hospital's EPIC-based electronic health record (EHR). Providers can make a referral for any reason; however, the George Institute has preferred referral guidelines for pain, anxiety/stress, elimination problems, nausea or vomiting, and coping with changes in health/well-being. Once a referral is submitted, patients are expected to receive services within 24 to 48 hours of referral.

The IM sessions average 25 minutes in duration and are provided in patients' rooms at no expense to patients. These services include mind-body therapies via relaxation response, acupuncture, acupressure, massage therapy, healing touch, music therapy, aromatherapy, or reflexology. The George Institute employs a total of 21 IM practitioners (19 full-time equivalents) including 6 registered nurses, board certified in their specialty area (e.g., oncology, cardiovascular) and also board certified in holistic nursing, 6 licensed Oriental medicine practitioners, 8 certified massage therapists with an emphasis on acute care massage, and 1 certified music therapist. Practitioners are trained in the principles of IM, the multiple modalities as previously noted, the provision of services based on individual patient needs, and effective collaboration and coordination with other medical professionals.

The George Institute maintains 50 to 60 ongoing referrals and obtains 25 to 35 new referrals daily. An average daily staffing of 10 to 13 IM practitioners provides integrative services to 60 to 65 patients each weekday. Patient populations receive IM in 6 areas of the hospital including cardiovascular, medical/surgical, orthopedics and spine, acute care rehabilitation, oncology, and women's health. New referrals are assigned to an appropriate IM provider, who serves as the care coordinator for the duration of the hospital stay. Ongoing referrals are overseen by the established care coordinator. However, various IM providers may see the patient throughout their hospital stay, depending on the established plan of care and determination of appropriate services.

The George Institute medical director conducts biweekly case conferences with IM practitioners to develop care plans for patients and works closely with other physicians on difficult medical cases. The IM practitioners routinely round with conventional medical practitioners to ensure consistency and coordination of care. All referrals are assigned to an IM care provider each

morning. Whether a specific patient is seen by the provider depends on the number of referrals the provider is assigned, the number of hours the provider works, and the availability of the patient when the provider arrives at the patient's room. Providers chart their visits in the EHR throughout the day at clinical work stations throughout the hospital.

Each patient's initial pain is recorded on a scale of 0 to 10 (with 10 being the most severe pain).¹⁹ After treatment by the IM practitioner, patients report their pain on the scale of 0 to 10. Practitioners are free to use their clinical judgment to provide whatever mix of therapies, within their scope of practice, they deem necessary and therapeutic.

ANALYSIS

This observational study focused on patients who were hospitalized between January 1, 2008, and June 30, 2009, and received services from an IM practitioner for which both pretreatment and posttreatment pain scores were available. The resulting dataset included data for 1837 patients. Data below reflect pain scores recorded as a result of each patient's initial IM session. Because IM services are provided as a routine clinical consult service, we received authorization for a retrospective medical record review from the Allina Hospitals and Clinics institutional review board.

RESULTS

Patients seen by IM practitioners were younger, with a mean age of 47.1 (SD, 16.9) compared with 55.9 (SD, 20.7) for all patients at ANW during this period. A higher proportion of female patients received integrative therapies (78.8%) compared with the percentage of female patients at ANW (58.5%) and those receiving integrative care had shorter length of stays (3.99 as opposed to 4.41). Approximately 66% of the patients reported that this was the first time that they had ever received integrative therapies.

The average reduction in self-reported pain was 1.9 on a scale of 0 to 10. Although this average decrease in pain scores is important, initial levels of pain vary from patient to patient. Thus, a more useful measure of pain management is the percentage reduction in pain, which is derived for each patient's initial level of pain. Accordingly, for a patient presenting with an initial level of pain at 8 and a terminal pain level of 4, there is a resulting 50% reduction in pain. This same metric of pain reduction would result for a patient with an initial level of 4 and a terminal level of 2. Percentage reduction in pain results are presented in Figure 1.

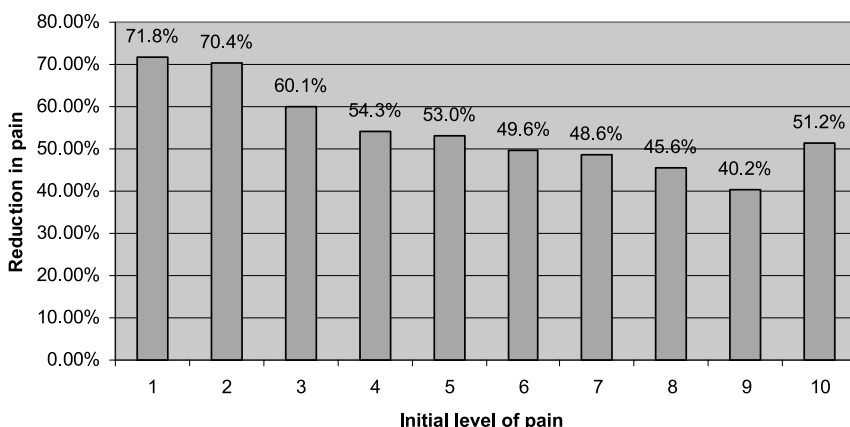


FIGURE 1. The percent reduction in self-reported pain scores as a function of patient's initial pain score.

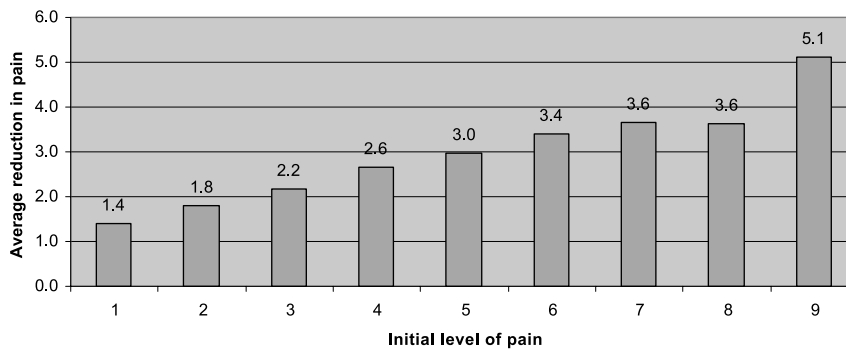


FIGURE 2. The mean reduction in self-reported pain scores as a function of patient's initial pain score.

The resulting average reduction in pain across all patients was 55.8%. As would be expected, we see, generally, a monotonically decreasing effect on pain reduction with the higher levels of initial pain. Thus, those with the lowest initial pain receive the largest percentage of relief. One anomaly to this trend is patients whose preintervention pain scores were 10. These patients had a 51.2% reduction in pain, which is slightly less than the change reported by those with initial pain levels of 6, 7, 8, or 9. However, if we examine the mean reduction in pain as seen in Figure 2, rather than the percentage reduction, we see that the monotonically increasing pattern is retained. This is strong evidence for a ceiling effect for the measurement of pain on a scale of 0 to 10.

DISCUSSION

In this retrospective, observational study, we report that provision of IM had immediate and beneficial effects on pain among hospitalized patients. Specifically, we found that the average reduction in pain scores was 1.9 points (on a 10-point scale). However, more importantly, we note that the average percentage in pain reduction was just more than 55%.

Our findings are consistent with those found in numerous randomized trials of hospitalized patient populations. Briefly, Tusek (1999) found that a multi-day guided imagery intervention managed pretreatment to posttreatment pain scores after cardiac surgery relative to control condition.²⁰ In 2000, Lang and colleagues²¹ reported in *The Lancet* that hypnosis managed pain scores significantly better than a control condition during percutaneous vascular and renal procedures. Several other trials have shown that massage therapy significantly impacts pain scores and pain medications in cancer and surgical populations.²²⁻²⁵ Our results extend previous knowledge by demonstrating that integrative care reduces immediate pain levels by more than 50% and that it can be provided as part of routine clinical care across numerous patient populations including cardiovascular, medical/surgical, orthopedics and spine, acute care rehabilitation, oncology, and women's health.

LIMITATIONS

First, our study used a retrospective observational design, which did not include a control group. There are two lines of criticisms pertinent to this objection. It may be possible that there was a secular trend in pain reduction in the hospital during the 18-month period we studied. However, this would mean that, absent the IM intervention, patients would have experienced, or at least reported, the same reductions in pain that we

found. We think this is unlikely because there were no new pain management initiatives ongoing during this time frame. In addition, the self-selection of patients, either by their own accord or by their providers, to receive a referral limits the generalizability of the findings. Although we agree with this concern, the results of the study show that, in this particular group of patients, there were rather large reductions in self-reported pain. The questions become: would we have seen the same magnitude of pain reduction in a random sample of the hospital's patients or in a random sample of patients experiencing pain? Although we are unable to speculate as to those questions, we do know that for patients who were referred by their providers, their family, or themselves, there were large reductions in self-reported pain. At the very least, our findings suggest that more work needs to be done to identify which patients are most likely to respond to IM interventions.

Second, immediate pain scores were collected by the same IM practitioners who had provided the intervention. Thus, there is a potential for patients to want to please the practitioner by overreporting the beneficial effect of their pain. In contrast, some patients may have been concerned that reporting reduced pain scores might impact their subsequent receipt of pain medications. Thus, they may not have reported the full beneficial effect of the IM therapies. In either case, the documentation of pain by unblinded clinicians, using patient self-report of pain on a scale of 1 to 10, is an accepted procedure for documenting pain and pain management.¹⁹

Third, because the posttreatment assessments were conducted just after the treatment ended, we are unable to determine the duration of the reduction in pain. Given that other investigators have shown acupuncture can retain analgesic effects for up to 2 hours after cesarean section surgery,²⁶ our subsequent examinations will assess pain scores at comparable time points.

Finally, it remains unclear what role the provision of analgesic pain medications may have had on the patients' pre-IM and post-IM pain scores. It is possible that some of the effect of the IM on pain scores could be residual pain management from pain medications. However, this is exactly the point of integrative care. Ultimately, we are less interested in whether integrative care can, or should, replace other forms of pain management but rather can it be used as safely and effectively as current pain management approaches. Our future research will further examine the capacity of integrative therapies to reduce the use of pain medications. Key objectives will include identifying the timing, patient characteristics, and the specific dosing of integrative therapies that are most effective. Likewise, we will refine the effective implementation of these approaches in real time and under real operational and financial constraints within an acute care hospital.

CONCLUSIONS

The formal provision of an inpatient IM consult service has a significant impact on pain scores for hospitalized patients, reducing self-reported pain by more than 50%, without placing patients at risk of adverse effects. Our results extend prior knowledge by demonstrating that integrative therapies are important for immediate pain reduction across many patient populations, including cardiovascular, medical/surgical, orthopedics and spine, acute care rehabilitation, oncology, and women's health. Future research must define the appropriate dose of the intervention, the duration of the relief, and the identification of patients most likely to respond to these nonpharmacological treatments. Additionally, future research, using the EHR, will allow quantification of any reduction in total costs, medication use, and adverse events.

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