

Acupuncture as Part of a Pediatric Pain Clinic in a Safety-Net Hospital: Acupuncture Wednesday

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ABSTRACT

Background: Chronic pain impacts 15%–20% of U.S. children. Integrative medicine (IM) services, including acupuncture, are used in many children’s hospitals and pain clinics to address complex chronic-pain syndromes. However, few facilities specifically address chronic pain in underserved pediatric populations.

Objective: The aim of this article is describe the process of establishing an integrative pediatric pain clinic that includes acupuncture therapy in a children’s hospital, and to report acupuncture utilization during the first 6 months.

Methods: A needs assessment was conducted, and its findings led to the assembly of an interdisciplinary integrative team and the establishment of the Pediatric Pain Clinic. Experience from an existing program for IM provided the infrastructure and model for the Pediatric Pain Clinic.

Results: Thirty-six referrals were received, 26 patients underwent initial evaluations, 23 returned for follow-up visits, and 3 have “graduated” pain-free. Nineteen of the 26 patients received acupuncture/acupressure.

Conclusions: A pediatric pain clinic that consists of interdisciplinary biomedical and integrative modalities, including acupuncture, can be successfully established in a safety-net hospital for children with complex pain. The success of an already-existing pediatric acupuncture service within an IM program helped to incorporate acupuncture seamlessly into the hospital’s new Pediatric Pain Clinic.

Key Words: Pediatric chronic pain, Acupuncture and Pediatrics, Integrative Medicine

INTRODUCTION

Pediatric Pain

CONSERVATIVE ESTIMATES suggest that chronic pain impacts 15%–20% of U.S. children,^{1,2} affects more girls than boys, and increases as children move into adolescence.³ Common chronic-pain complaints include migraine, recurrent abdominal pain, and generalized musculoskeletal pain. Chronic pain is affected by numerous psychologic factors, including anxiety, mood issues, anger, and traumas.^{3–13}

Children in low-income areas are particularly vulnerable to ongoing socioeconomic stress, and present with more chronic-pain complaints, compared to peers in higher-income areas.^{4,5} Unaddressed chronic pain in children affects quality of life negatively, increases school avoidance, diminishes social connection, and contributes to high healthcare utilization.^{4–6} Furthermore, heightened emotional states—as well as children’s expectations, perceptions, and fears about pain—might lead to a cycle of chronic pain.⁷

To address this need, children’s hospitals and outpatient clinics across the United States have launched pediatric pain

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clinics tailored for children with complex chronic-pain syndromes. These clinics typically are based on interdisciplinary models.^{8–11} The American Pain Society identified 48 pediatric-pain programs in the United States, with 11 major medical centers listing acupuncture as part of their programs.¹² The majority of these exist within free-standing children's hospitals, and many of these programs incorporate conventional biomedical, behavioral health approaches, and, more recently, complementary and alternative medicine (CAM) and/or Integrative Medicine (IM), including acupuncture.

Previous articles have considered the use of acupuncture for treating pain in pediatric populations,^{13,14–21} and for such indications as chemotherapy-induced nausea and vomiting,²² postoperative nausea and vomiting following tonsillectomy,^{13,23,24} and seasonal allergic rhinitis.²⁵ A review of literature on acupuncture use found it to be “applicable to a pediatric population, and well-tolerated with negative side effects so low as to be inconsequential.”^{26,27} However, inclusion of acupuncture into safety-net hospitals for underserved children appears to be a novel endeavor, as none of the pediatric pain clinics in the American Pain Society have a stated primary focus on providing care for underserved children and adolescents.

The Boston Medical Center

The Boston Medical Center (BMC) is a private, not-for-profit academic medical center in MA—the primary teaching affiliate for Boston University School of Medicine, also in MA—and the largest safety-net hospital in New England. Approximately 70% of patients come from underserved racial or ethnic minority populations,²⁸ where BMC's resources are largely directed to serving low-income families, elderly patients, persons with disabilities, immigrants, and homeless people. The majority of pediatric patients cared for at the BMC face deterrents to healthy development as a result of poverty.

To address these needs and mediate the social determinants of health, the BMC obtained funding from federal agencies, foundations, and philanthropies to sustain a series of innovative programs for pediatric patients. The latest of these innovations is the Pediatric Pain Clinic. Launched in February of 2015, the BMC's new Pediatric Pain Clinic brings an interdisciplinary holistic approach to serve low-income urban children with complex chronic pain, delivering acupuncture together with conventional biomedicine.

In this article, the current authors describe the implementation process of the Pediatric Pain Clinic at the BMC, including integration of acupuncture and the experience of the Clinic's first 6 months in operation.

METHODS

A needs assessment was conducted on the feasibility and potential utilization of a pediatric pain clinic at the BMC.

From August 2013 to April 2014, meetings with medical and nursing staff members from many specialties concluded that an interdisciplinary pediatric pain clinic would be well-received, and that providers were eager to refer patients to such a service. More importantly, experiences from within an already established acupuncture service within the BMC's Program for Integrative Medicine and Health Disparities facilitated the development of the interdisciplinary Pediatric Pain Clinic.

The Interdisciplinary Team

The departments of pediatrics and psychiatry recruited a clinical psychologist, who specialized in cognitive and behavioral interventions as well as hypnosis and biofeedback, to provide improved management and coping strategies for addressing pain. A clinical social worker with experience in interfacing with families of children with sickle-cell disease was also hired.

The existing IM service, which includes acupuncture, had been established 10 years prior within the Program in Integrative Medicine, to accommodate underserved children who would not usually have access to such modalities²⁹ and had gained much acceptance and respect among hospital staff members. The decision was made to extend the integrative service to the BMC's Pediatric Pain Clinic formally, and to enhance its impact.

Partnership with the nearby New England School of Acupuncture (NESA) enabled NESA student interns to deliver supervised acupuncture treatments in the hospital's inpatient unit and outpatient clinics. Prior to engaging with patients, student interns completed 20 months of study at NESA, including a module on pediatrics, and followed all the procedures that an incoming BMC medical staff member is required to learn (e.g., Health Insurance Portability and Accountability Act, electronic health record training). The interns also received 5 additional hours of orientation specific to the pediatric acupuncture service that included techniques to help children accept acupuncture (i.e., tailored breathing exercises and demonstration of noninsertive techniques on children and parents).

Prior to its integration into the Pediatric Pain Clinic, the pediatric acupuncture service had cultivated relationships with physicians and nursing staff members in both the inpatient and outpatient environments, leading to ongoing referrals to acupuncture from pediatrics and adolescent medicine, and from specialists in hematology/oncology, neurology, gynecology and psychiatry.

A Successful Interprofessional Case Management Process

The Pediatric Pain Clinic is held every Wednesday afternoon for new and follow-up patients. Typically, only 4 patients are scheduled to attend this half-day clinic, allowing ample time for clinical evaluation and management by

all providers. Most insurance carriers are accepted and there are no specific out-of-pocket costs to families. The hospital supported the salaries of all clinicians on the team. The NESAs provided its own faculty members who supervised the students and provided all acupuncture supplies.

At the first visit, each patient and the caregivers are interviewed by the medical director, pediatric psychologist, and social worker. At the first follow-up visit the patient receives an individualized pain plan, which often include medication management and physical therapy, and always include behavioral strategies and nonpharmacologic pain-management techniques; during this first follow up visit, strategies are reviewed to assist parents and other caregivers develop appropriate responses to the child's pain.

According to the Gate Theory, pain signals are transmitted more readily²⁸ in response to heightened emotions, focused attention to pain, and catastrophizing behaviors. These maladaptive coping skills and pain complaints may be inadvertently reinforced over time by social and family factors, strengthening the pain signals.⁷ Behavioral interventions assist in blocking the passage of these pain signals to the brain. Interventions such as relaxation techniques, distraction, coping strategies, and cognitive-behavioral therapies are effective for "closing the gate." Other related interventions that are helpful for pain management include biofeedback and hypnosis. These psychologic therapies have long-lasting effects for improving mood and reducing pain.^{29,30} The interdisciplinary team also connects with the patient's school and/or other community agencies that are involved with to ensure continuity of care with regard to the child's pain management.

Pediatric acupuncture and acupressure are made available during Pain Clinic visits, which helps reduce the barriers to care for patients and families. Other Traditional Chinese Medicine techniques, including acupressure, cupping, and *guasha* are also offered to patients. Children age 8 and under usually receive acupressure or acupuncture as tolerated.

RESULTS

The Pediatric Pain Clinic received 36 referrals in the first 6 months of its operation. Twenty-six patients were evaluated and 23 had follow-up visits. Three patients "graduated" successfully from the pain clinic after becoming pain-free. Sixteen patients continued to receive ongoing care with decreasing frequency as their pain was mitigated.

Utilization of Pediatric Acupuncture Services

Thirteen student interns from the NESAs provided 46 treatments. Nineteen of the 26 patients received acupuncture/acupressure. One-third had previous acupuncture experience at the BMC with the pediatric acupuncture team.

There was no gap in pediatric acupuncture service or referral as physicians and nurses transitioned their patients'

outpatient care to the Pediatric Pain Clinic team. Existing institutional relationships between the BMC and NESAs enabled immediate staffing of acupuncture services in the Pediatric Pain Clinic. Preparation of NESAs interns made for their seamless introduction into the new Pediatric Pain Clinic environment.

DISCUSSION

IM has found increasing acceptance in academic medical centers,³¹⁻³⁴ as reflected by the inclusion of IM teams in conventional settings, and IM in medical curricula.³⁵⁻³⁸ The Academic Consortium of Integrative Medicine and Health lists more than 60 academic centers and their affiliates as members,³⁹ with many of the centers including alternative therapy options, such as meditation, massage, and acupuncture.^{40,41} In addition, formal surveys of medical staff members have revealed a substantially positive attitude toward what was once considered a fringe field.⁴²⁻⁴⁴

The BMC needs assessment showed that high regard and acceptance for the existing pediatric acupuncture service made it very likely to succeed as a core service offered in the Pediatric Pain Clinic. Supervised interns from the NESAs had been delivering acupuncture in both the inpatient pediatrics unit and in the ambulatory adolescent clinic on a weekly basis for more than a decade with acupuncturists greeted frequently by the floor nurses with: "Oh, it's Acupuncture Wednesday." It is remarkable that acupuncture has gained such wide acceptance by hospital staff members in a conventional pediatric hospital setting.

Soft Indicators of Acceptability

Pediatric acupuncture continues to grow in acceptance throughout the hospital. Inpatient staff members consistently recommend this service to families. Two unique areas include referrals of patients from the pediatric intensive care unit for pain management, and infants born with neonatal abstinence syndrome from the neonatal intensive care unit.

Outpatient referrals have continued to help the acupuncture program grow, from physicians via the electronic health record and by direct contact with acupuncturists who are present in many clinical settings. The acupuncture team has developed several processes and practices that help integrate them into a biomedical environment. Upon arrival on the inpatient floor, the acupuncture preceptor checks in with the senior residents, alerting them to the availability of the service that day and reviewing potential cases that might benefit from the acupuncture. Acupuncturists put chart information into the electronic health record along with other medical providers, a process that enables collaboration, as team members can be flagged and charts shared.

The current authors' experience was unique in that there was full support from both pediatrics and the Program for

Integrative Medicine and Health Disparities to collaborate in the formation of the Pediatric Pain Clinic. And the integration of acupuncture was greatly facilitated by its prior history that was well-established and respected among the staff members. Proximity of the NESAs was also vital for providing patients' easy access to acupuncture treatments. All of these factors limit the generalizability of the BMC's experience with the successful establishment of its Pediatric Pain Clinic and the integration of its acupuncture services.

CONCLUSIONS

A pediatric pain clinic that consists of interdisciplinary biomedical and integrative modalities such as acupuncture can be implemented successfully into a safety-net hospital to treat children with complex pain. The success of an already-established pediatric acupuncture service at the BMC prepared the pediatrics department to incorporate acupuncture into the Pediatric Pain Clinic. Based on this experience, the authors offer the following insights for the successful inclusion of acupuncture into clinical settings:

- Engage acupuncturists with pediatric experience.
- Include acupuncturists in interprofessional case conferences for continuity of care.
- Provide acupuncturists with access to systems utilized by medical staff members.

Future research is necessary to study the costs, clinical outcomes, and patient satisfaction with acupuncture in a pediatric pain clinic.

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REFERENCES

1. Hechler T, Dobe M, Zernikow B. Commentary: A worldwide call for multimodal inpatient treatment for children and adolescents suffering from chronic pain and pain-related disability. *J Pediatr Psychol*. 2010;35(2):138–140.
2. Goodman JE, McGrath PJ. The epidemiology of pain in children and adolescents: A review. *Pain*. 1991;46(3):247–264.
3. King S, Chambers CT, Huguet A, MacNevin RC, McGrath PJ, Parker L, MacDonald AJ. The epidemiology of chronic pain in children and adolescents revisited: A systematic review. *Pain*. 2011;152(12):2729–2738.
4. Perquin CW, Hazebroek-Kampschreur AA, Hunfeld JA, van Suijlekom-Smit LW, Passchier J, van der Wouden JC. Chronic pain among children and adolescents: Physician consultation and medication use. *Clin J Pain*. 2000;16(3):229–335.
5. Palermo TM. Impact of recurrent and chronic pain on child and family daily functioning: A critical review of the literature. *J Dev Behav Pediatr*. 2000;21(1):58–69.
6. Brandow AM, Brousseau DC, Pajewski NM, Panepinto JA. Vaso-occlusive painful events in sickle cell disease: Impact on child well-being. *Pediatr Blood Cancer*. 2010;54(1):92–97.
7. Palermo TM, Scher MS. Treatment of functional impairment in severe somatoform pain disorder: A case example. *J Pediatr Psychol*. 2001;26(7):429–434.
8. Evans S, Moieni M, Sternlieb B, Tsao JC, Zeltzer LK. Yoga for youth in pain: The UCLA pediatric pain program model. *Holist Nurs Pract*. 2012;26(5):262–271.
9. Boonstra AM, Reneman MF, Schiphorst Preuper HR, Waaksmas BR, Stewart RE. Differences between patients with chronic musculoskeletal pain treated in an inpatient or an outpatient multidisciplinary rehabilitation program. *Int J Rehabil Res*. 2014;37(2):187–191.
10. Logan DE, Carpino EA, Chiang G, et al. A day-hospital approach to treatment of pediatric complex regional pain syndrome: Initial functional outcomes. *Clin J Pain*. 2012;28(9):766–774.
11. Brandow AM, Weisman SJ, Panepinto JA. The impact of a multidisciplinary pain management model on sickle cell disease pain hospitalizations. *Pediatr Blood Cancer*. 2011;56(5):789–793.
12. American Pain Society. Online document at: american-painsociety.org/uploads/getinvolved/PediatricPainClinicList_Update_2.10.15.pdf Accessed July 5, 2015.
13. Rusy LM, Weisman SJ, Hainsworth KR. Developing an inpatient acupuncture treatment in a pediatric hospital. *J Complement Integr Med*. 2013;10(1):205–210.
14. Zeltzer LK, Tsao JC, Stelling C, Powers M, Levy S, Waterhouse M. A phase I study on the feasibility and acceptability of an acupuncture/hypnosis intervention for chronic pediatric pain. *J Pain Symptom Manage*. 2002;24(4):437–446.
15. Filippelli AC, White LF, Spellman LW, Broderick M, Highfield ES, Sommers E, Gardiner P. Non-insertive acupuncture and neonatal abstinence syndrome: A case series from an inner city safety net hospital. *Glob Adv Health Med*. 2012;1(4):48–52.
16. Lin YC, Lee AC, Kemper KJ, Berde CB. Use of complementary and alternative medicine in pediatric pain management service: a survey. *Pain Med*. 2005;6(6):452–458.
17. Waterhouse M, Tsao JC, Zeltzer LK. Commentary on the use of acupuncture in chronic pediatric pain. *J Dev Behav Pediatr*. 2009;30(1):69–71.

18. Tsao JC, Zeltzer LK. Complementary and alternative medicine approaches for pediatric pain: A review of the state-of-the-science. *Evid Based Complement Alternat Med*. 2005;2(2):149–159.
19. Tsao JC, Meldrum M, Kim SC, Jacob MC, Zeltzer LK. Treatment preferences for CAM in children with chronic pain. *Evid Based Complement Alternat Med*. 2007;4(3):367–374.
20. Tsao JC, Evans S, Meldrum M, Altman T, Zeltzer LK. A review of CAM for procedural pain in infancy: Part I. Sucrose and non-nutritive sucking. *Evid Based Complement Alternat Med*. 2008;5(4):371–381.
21. Tsao JC, Evans S, Meldrum M, Altman T, Zeltzer LK. A review of CAM for procedural pain in infancy: Part II. Other interventions. *Evid Based Complement Alternat Med*. 2008;5(4):399–407.
22. Reindl TK, Geilen W, Hartmann R, et al. Acupuncture against chemotherapy-induced nausea and vomiting in pediatric oncology: Interim results of a multicenter crossover study. *Support Care Cancer*. 2006;14(2):172–176.
23. Shenkman Z, Holzman RS, Kim C, et al. Acupressure–acupuncture antiemetic prophylaxis in children undergoing tonsillectomy. *Anesthesiology*. 1999;90(5):1311–1316.
24. Dune LS, Shiao SY. Metaanalysis of acustimulation effects on postoperative nausea and vomiting in children. *Explore N Y*. 2006;2(4):314–320.
25. Ng DK, Chow PY, Ming SP, et al. A double-blind, randomized, placebo-controlled trial of acupuncture for the treatment of childhood persistent allergic rhinitis. *Pediatrics*. 2004;114(5):1242–1247.
26. Jindal V, Ge A, Mansky PJ. Safety and efficacy of acupuncture in children: A review of the evidence. *J Pediatr Hematol Oncol*. 2008;30(6):431–442.
27. Libonate J, Evans S, Tsao JC. Efficacy of acupuncture for health conditions in children: A review. *ScientificWorldJournal*. 2008;8:670–682.
28. Flor H, Rudy TE, Birbaumer N, Streit B, Schugens MM. The applicability of the West Haven–Yale multidimensional pain inventory in German-speaking countries: Data on the reliability and validity of the MPI-D [in German]. *Schmerz*. 1990;4(2):82–87.
29. Eccleston C, Palermo TM, Fisher E, Law E. Psychological interventions for parents of children and adolescents with chronic illness. *Cochrane Database Syst Rev*. 2012;8:CD009660.
30. Palermo TM, Eccleston C, Lewandowski AS, Williams AC, Morley S. Randomized controlled trials of psychological therapies for management of chronic pain in children and adolescents: An updated meta-analytic review. *Pain*. 2010;148(3):387–397.
31. Greeson JM, Rosenzweig S, Halbert SC, Cantor IS, Keener MT, Brainard GC. Integrative medicine research at an academic medical center: Patient characteristics and health-related quality-of-life outcomes. *J Altern Complement Med*. 2008;14(6):763–767.
32. Highfield ES, Barnes L, Spellman L, Saper RB. If you build it, will they come? A free-care acupuncture clinic for minority adolescents in an urban hospital. *J Altern Complement Med*. 2008;14(6):629–636.
33. Highfield ES, Kaptchuk TJ, Ott MJ, Barnes L, Kemper KJ. Availability of acupuncture in the hospitals of a major academic medical center: A pilot study. *Complement Ther Med*. 2003;11(3):177–183.
34. Kligler B, Chesney M. Academic health centers and the growth of integrative medicine. *J Natl Cancer Inst Monogr*. 2014;2014(50):292–293.
35. Brokaw JJ, Tunncliffe G, Raess BU, Saxon DW. The teaching of complementary and alternative medicine in U.S. medical schools: A survey of course directors. *Acad Med*. 2002;77(9):876–881.
36. Cowen VS, Cyr V. Complementary and alternative medicine in US medical schools. *Adv Med Educ Pract*. 2015;6:113–117.
37. Wetzel MS, Eisenberg DM, Kaptchuk TJ. Courses involving complementary and alternative medicine at US medical schools. *JAMA*. 1998;280(9):784–787.
38. Kligler B, Maizes V, Schachter S; Education Work Group, Consortium of Academic Health Centers for Integrative Medicine. Core competencies in integrative medicine for medical school curricula: A proposal. *Acad Med*. 2004;79(6):521–531.
39. Academic Consortium for Integrative Medicine & Health. Online document at: www.imconsortium.org/about/about-us.cfm Accessed June 18, 2015.
40. Garcia-Escamilla E, Rodriguez-Martin B, Martinez-Vizcaino V. Integration of acupuncture into conventional medicine from health professionals' perspective: A thematic synthesis of qualitative studies. *Health (London)*. 2015;March 18:e-pub ahead of print.
41. Duncan AD, Liechty JM, Miller C, Chinoy G, Ricciardi R. Employee use and perceived benefit of a complementary and alternative medicine wellness clinic at a major military hospital: Evaluation of a pilot program. *J Altern Complement Med*. 2011;17(9):809–815.
42. Manek NJ, Crowson CS, Ottenberg AL, Curlin FA, Kaptchuk TJ, Tilburt JC. What rheumatologists in the United States think of complementary and alternative medicine: Results of a national survey. *BMC Complement Alternat Med*. 2010;10:5.
43. McLellan MC, Highfield ES, Woolf AD. Pediatric health care providers' attitudes and referral predictors for therapeutic massage and acupuncture. *Complement Health Pract Rev*. 2005;10(2):119–131.
44. Wahner-Roedler DL, Lee MC, Chon TY, Cha SS, Loehrer LL, Bauer BA. Physicians' attitudes toward complementary and alternative medicine and their knowledge of specific therapies: 8-year follow-up at an academic medical center. *Complement Ther Clin Pract*. 2014;20(1):54–60.

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