

# The Feasibility of Developing an Inpatient Acupuncture Program at a Tertiary Care Pediatric Hospital

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## Abstract

**Objectives:** Use of complementary and integrative health approaches has increased significantly in recent decades, with hospital-based acupuncture programs becoming more common. This article presents the feasibility of developing an inpatient acupuncture program at a pediatric hospital.

**Design and setting:** In January 2014, Seattle Children's Hospital, a tertiary care pediatric hospital serving patients from a five-state region, began a 6-month pilot project offering inpatient acupuncture. During the pilot, inpatient acupuncture and related manual therapies were provided to pediatric patients age 0–23 years who were admitted to Seattle Children's Hospital or were seen for an outpatient surgical procedure.

**Measures:** The following data were collected: the reason for the acupuncture consult, type and number of treatments provided, any reported response to treatment, and any reported adverse events. Patients and referring providers gave feedback via questionnaires.

**Results:** During the pilot program, 338 treatments were provided to 87 patients. High interest, demand, and positive feedback from hospital providers, patients, and families led to the development of a full-time inpatient acupuncture program.

**Conclusions:** The positive response to Seattle Children's inpatient acupuncture program with feasibility and acceptability demonstrated by increasing consults and patient and provider questionnaire data suggest that similar programs may be of interest to other pediatric hospitals.

## Introduction

USE OF COMPLEMENTARY AND INTEGRATIVE MEDICINE has increased significantly in the United States.<sup>1–6</sup> Complementary health approaches may include acupuncture, homeopathy, massage, nutrition, herbal remedies, chiropractic and osteopathic adjustments, and mind–body therapies.<sup>7</sup> Most patients who receive complementary and integrative therapies also receive conventional medical care, which demonstrates the complementary and integrative role of these modalities.<sup>6,8–10</sup>

In 1996, it was estimated that 2% of the pediatric population used some form of complementary and integrative therapy.<sup>1</sup> This reported percentage has increased to 20%–40% among healthy children<sup>2–5</sup> and to 73% among pediatric cancer patients in Washington state.<sup>6</sup> Children with chronic illness are significantly more likely than healthy children to use complementary and integrative health approaches.<sup>10</sup>

In many of these studies, acupuncture therapy use was combined with other complementary and integrative thera-

pies rather than isolated as an individual percentage. A retrospective review of pediatric cancer patients who received acupuncture therapy at Seattle Children's Hospital from 2004 to 2012 found a utilization rate of only 3.2%.<sup>11</sup> That study investigated the use of acupuncture as provided by hospital-credentialed acupuncturists. The researchers did not investigate the use of acupuncture outside of the hospital. Research is available on the effectiveness of acupuncture for a wide variety of conditions in the adult population. Similar research in the pediatric population is limited; however, the body of literature in the pediatric population is growing, with significant contributions pertaining to inpatient populations.<sup>12–14</sup>

## Acupuncture at Seattle Children's Hospital

Seattle Children's Hospital is unique in that it offers several complementary and integrative health approaches, including acupuncture, hypnosis, Reiki, biofeedback, and therapeutic touch, for families interested in a complementary

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approach to their children's care. Acupuncture was first established at Seattle Children's Hospital in 2004 as an outpatient service through the Pain Medicine Program, where it is provided by hospital-credentialed licensed acupuncturists and medical acupuncturists. Acupuncture has been offered in the outpatient clinic 2 days a week since its introduction in 2004; however, inpatient acupuncture did not have an assigned provider daily, and other clinical commitments often prevented the acupuncturists from providing acupuncture treatments regularly to inpatients. This led to infrequent consults for inpatient acupuncture because of the unknown and inconsistent availability of the providers. Many families of children receiving inpatient medical and surgical treatment remained unaware that acupuncture was available and were offered only limited ability to schedule acupuncture if it was desired during their admission. As a result, the inpatient acupuncture was largely underused.

In 2013, the authors proposed a pilot project that would provide inpatients at Seattle Children's Hospital with consistent weekday access to acupuncture therapy. Philanthropic funding allowed for a 6-month duration with assessment of the interest and success of the inpatient acupuncture program. The purpose of this article is to present the feasibility of the development of the inpatient acupuncture service at Seattle Children's Hospital from initial pilot project to the current full-time inpatient program.

## Materials and Methods

### *Preliminary outreach*

Before the beginning of the pilot inpatient acupuncture program, outreach was conducted from September through December 2013. During this time, acupuncture providers attended inpatient rounds with the inpatient pain service several times per week. This allowed an opportunity for primary teams to meet the acupuncture providers and become aware that the acupuncture service would be available for their patients. It also offered an opportunity for communication between primary care teams and acupuncturists, with time to answer any questions or concerns providers had regarding the appropriateness of acupuncture for particular patients or conditions. Additionally, it offered teams an opportunity to ensure patient safety and awareness of acupuncture modality precautions and contraindications related to individual patient status (e.g., immune-compromised, thrombocytopenic, myelosuppressed, pacemaker-dependent).

### *Inpatient acupuncture pilot project*

At the beginning of the pilot program in January 2014, a newsletter was sent to hospital providers informing them of the inpatient acupuncture program. Flyers were placed in team rooms, medical staff break rooms, and inpatient family lounge areas. Presentations were given to all hospital services that requested information and at regional conferences. During the pilot project, inpatient acupuncture was available Monday through Friday from 8 a.m. to noon. Goals during the pilot project included (1) increasing awareness for providers and families of acupuncture therapy as a complementary and integrative health approach and a nonpharmacologic option available to patients, (2) promoting education among hospital staff regarding the use of acupuncture for conditions supported

by evidence-based research, and (3) providing inpatients with greater access to acupuncture with reliability, a quick response time for new consults, and the ability to accommodate requests for multiple treatments per week or treatments provided at specific times (e.g., for postoperative nausea and vomiting, postoperative pain, chemotherapy-induced nausea and vomiting). Questionnaires were administered to referring hospital providers at months 3 and 6 of the pilot program, as well as to families and patients at discharge from their inpatient admission who received acupuncture during the pilot period to obtain feedback on the inpatient service as an element of quality improvement assessment for this new inpatient service.

### *Setting*

Seattle Children's Hospital is a leader in pediatric medicine, delivering world-class care to children from five states—the largest geographic region in the country served by a single pediatric tertiary care center—and advancing new treatments through pediatric research.

### *Acupuncture providers*

The inpatient acupuncture team at Seattle Children's consists of a medical acupuncturist and two licensed acupuncturists with a master's degree or a doctorate in acupuncture and Oriental medicine. Together they offer more than 20 years of combined clinical experience. One provider is scheduled to provide inpatient care daily.

### *Treatment modalities*

The acupuncture service provides both acupuncture and related manual therapies, including acupressure, *tui na*, cupping, and *gua sha*. Acupuncture and manual therapy visits generally take approximately 45–60 minutes to complete, including consultation, assessment, and treatment. Needle retention time ranges from 15 to 30 minutes depending on the age and status of the patient. Manual therapies are typically provided for 15–45 minutes. At initial consultation, acupuncture theory is briefly explained and various treatment modalities are described; these are often demonstrated to patients or families unfamiliar with acupuncture and related therapies. A document stating the scope of practice of a licensed acupuncturist, including possible treatment-related side effects, is reviewed with patients and families, with time allowed to answer any questions or concerns. Acupuncture or related manual therapies are provided only after verbal informed consent from the patient and/or family.

Acupuncture is provided in accordance with the current policy and procedure guidelines at Seattle Children's Hospital: The patient's platelet count must be greater than 20,000 cells/mm<sup>3</sup>; the patient's absolute neutrophil count must be greater than 500 cells/mm<sup>3</sup>; and the patient must not be taking warfarin (Coumadin; Bristol-Myers Squibb) or heparin, including low-molecular-weight heparin (Lovenox; Sanofi). Acupuncture treatments are completed by using Seirin brand needles that are 32–40 gauge (0.16–0.25 mm diameter) and between 13 and 40 mm in length, or with Seirin Pyonex needles (press needles) that are 36 gauge and 0.9–1.2 mm in length. Press needles, or sometimes acupressure magnets, are often used when treating infants, patients who are likely to move during treatments, or patients

who are anxious about regular acupuncture needles. Additionally, **press needles** are often further secured with 3M Kind Removal Silicone Tape, which helps staff identify press needle locations and ensures that needles are not accidentally brushed off or lost.

Acupuncture at Seattle Children’s is provided in accordance with clean needle technique. Basic precautions include not needling medically unstable patients (e.g., patients with respiratory difficulties or cardiac arrest), not needling at any site of infection, and not using electroacupuncture in patients with pacemakers or defibrillators. Special precautions are taken for immune-compromised patients, including skin preparation with chlorhexidine (ChloroPrep; Care Fusion Corp.). If a patient is receiving anticoagulants such as warfarin or heparin, including low-molecular-weight heparin, patients may receive manual therapies such as acupressure or *tui na* instead of acupuncture.

*Data collection*

To gather baseline interest from referring hospital providers, questionnaires were sent to those who had placed a consult for acupuncture from September to December 2013 (before the pilot). Questionnaires were given to referring

providers during the pilot project to assess interest, acceptability, and feasibility of the inpatient program (Fig. 1). Questionnaires were also provided to families and patients who received acupuncture or related manual therapies during the pilot period in order to determine their level of interest and satisfaction with this service and offer an opportunity to provide feedback (Fig. 2).

A database was constructed to prospectively collect information on use of the inpatient acupuncture service during the 6-month pilot project. Collected data included the referral date, name of patient, medical record number, referring provider, number of treatments received, type of treatment received, and the reason for the referral. These data were collected as part of the quality improvement assessment for this pilot project.

**Results**

During the pilot project, the inpatient service acupuncturist was available half-days Monday through Friday. Because of the limited hours, providers had a limited ability to see patients daily or every other day when there were more than four patients currently active in the service. When patients were not seen, 70% of the time this was due to the

**FIG. 1.** Referring provider questionnaire (follow-up). PONV, postoperative nausea and vomiting.

**1. Do you discuss acupuncture/ acupressure with your patients?**  
 Never Rarely Sometimes Often Every time

**2. How many patients have you referred for acupuncture or acupressure in the past 6 months?**  
 1-5 6-10 11-20 >20

**3. Have you presented acupuncture/acupressure as an option and the patient/family was not interested?**  
 Never Rarely Sometimes Often Every time Not sure

**4. Do you feel that acupuncture/acupressure has been helpful for your patients?**  
 Yes No  
 If yes, please explain \_\_\_\_\_

**5. Do you have any hesitations in referring patients for acupuncture?**  
 Yes No  
 If yes, please explain \_\_\_\_\_

**6. What symptoms/conditions did you refer acupuncture/acupressure for?**  
 Pain (please specify below)  
 Post-operative Musculoskeletal Cancer treatment-related Other \_\_\_\_\_  
 Nausea/Vomiting (please specify below)  
 PONV (intraoperative acupuncture) PONV (postoperative acupuncture) Other \_\_\_\_\_  
 Chemotherapy-induced  
 Fatigue Sleep Disturbances Mood Issues Neurologic dysfunction  
 Low blood counts General support Gastrointestinal complaints  
 Palliative care Pain medication dependence/weaning Other \_\_\_\_\_

**7. How many times a week would it be helpful to have acupuncture/acupressure available for your patients?**  
 1x/week 2x/week 3x/week daily

**8. How soon should new consults be seen?**  
 As soon as possible Same day before 5pm Within 24 hours 24-48 hours

**9. Do you have any recommendations for improving the inpatient acupuncture service?**

Please use the back for any additional comments.  
 Thank you!

1. Have you/your child received acupuncture/acupressure as an inpatient at Seattle Children's Hospital?

Yes  No

2. Did you/your child request acupuncture/acupressure or did your child's team mention acupuncture?

You/Your child  Child's team

3. Were there any difficulties in scheduling acupuncture/acupressure therapy?

Yes  No

If yes, please explain \_\_\_\_\_

4. What symptoms or conditions did you/your child receive acupuncture/acupressure for?

Pain (please specify below)  
 Post-operative  Cancer-related  Cancer treatment-related  Other

Nausea/Vomiting (please specify below)  
 Post-operative  Chemotherapy-induced  Other

Fatigue  Sleep Disturbances  Mood Issues  Neurologic dysfunction

Low blood counts  General support  Emergence delirium  Gastrointestinal complaints

Palliative care  Pain medication dependence/weaning  Other \_\_\_\_\_

5. How many acupuncture/acupressure treatments did you/your child receive?

1  2-5  6-10  >10

6. Do you/your child feel that acupuncture/acupressure was helpful?

Yes  No  Not sure

7. Did you/your child have any discomfort or negative experiences with acupuncture/acupressure?

Yes  No  Not sure

If yes, please explain \_\_\_\_\_

8. The acupuncture/acupressure treatment you/your child received today was part of a limited duration pilot project. Would you like to see this service offered for inpatients on a permanent basis?

Yes  No  No opinion

9. How important is cost or insurance coverage in your decision for you/your child to receive this service?

Very  Moderately  A little bit  Not at all  Not sure

10. Would cost or insurance coverage change your interest level in this therapy being offered as an inpatient service?

Yes  No  Not sure

11. For what other symptoms/conditions would you/your child consider receiving acupuncture/acupressure?

Pain (please specify below)  
 Post-operative  Cancer-related  Cancer treatment-related  Other

Nausea/Vomiting (please specify below)  
 Post-operative  Chemotherapy-induced  Other

Fatigue  Sleep Disturbances  Mood Issues  Neurologic dysfunction

Low blood counts  General support  Emergence delirium  Gastrointestinal complaints

Palliative care  Pain medication dependence/weaning  Other \_\_\_\_\_

Any other comments

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIG. 2. Patient/family questionnaire.

limited hours of the service. Scheduling conflicts in the limited morning hours often created additional challenges. When patients were visited but not treated, 53% of the time this was due to scheduling conflicts with other procedures or therapies or to the patient's being asleep at the time of visit.

During the 6-month pilot program, acupuncturists saw 87 patients age 10 months to 23 years and provided 338 individual treatments (186 acupuncture treatments and 152 manual therapy treatments) (Fig. 3). The majority of patients seen were female ( $n = 53$  [61%]) and of adolescent age. Patient ages were as follows: 0–3 years ( $n = 3$  [3%]), 4–6 years ( $n = 1$  [1%]), 6–14 years ( $n = 31$  [36%]), and older than 14 years ( $n = 52$  [60%]). Acupuncture and related therapies included acupuncture, auricular needling, and ear magnets/seeds, acupressure, *Tui Na*, and cupping. The average number of patients with active consults per day was five, with a maximum of nine. An average of four patients were treated per day. Patients received an average of 3.5 treatments each, with a minimum of 1 and a maximum of 22 treatments provided per patient. Patients were referred from the departments of General Pediatrics, Neonatology, Gastroenterology, Palliative Care, General Surgery, Orthopedic Surgery, Hematology and Oncology, Bone Marrow Transplant, Pulmonary and Sleep Medicine, Rehabilitation, and Otolaryngology.

During the pilot project, patients were treated for a variety of symptoms and conditions, including pain (musculoskeletal, postoperative, cancer-related, cancer treatment-related, and other), various pain syndromes (including complex regional pain syndrome and central sensitization), nausea and vomiting (postoperative, chemotherapy-induced, and other), fatigue, sleep disturbance, mood and emotional issues, neurologic dysfunction, general support, gastrointestinal complaints (e.g., inflammatory bowel disease, abdominal pain, constipation), pain medication dependence or weaning issues, and seizure disorder.

#### Questionnaire feedback

Questionnaires were sent to 130 providers who ordered acupuncture consults and all patients and families treated

during the pilot period. There was a 43% return rate from providers and a 70% return rate from patients and families. It was not mandated whether parent or patient completed the questionnaire. Positive feedback was received from the majority of providers and patients who used the service.

**Providers.** Ninety-five percent felt that acupuncture and related manual therapies had been helpful for their patients. None had hesitations in referring patients to the acupuncture service. Ninety-five percent would like to see the inpatient acupuncture service offered for inpatients on a permanent basis.

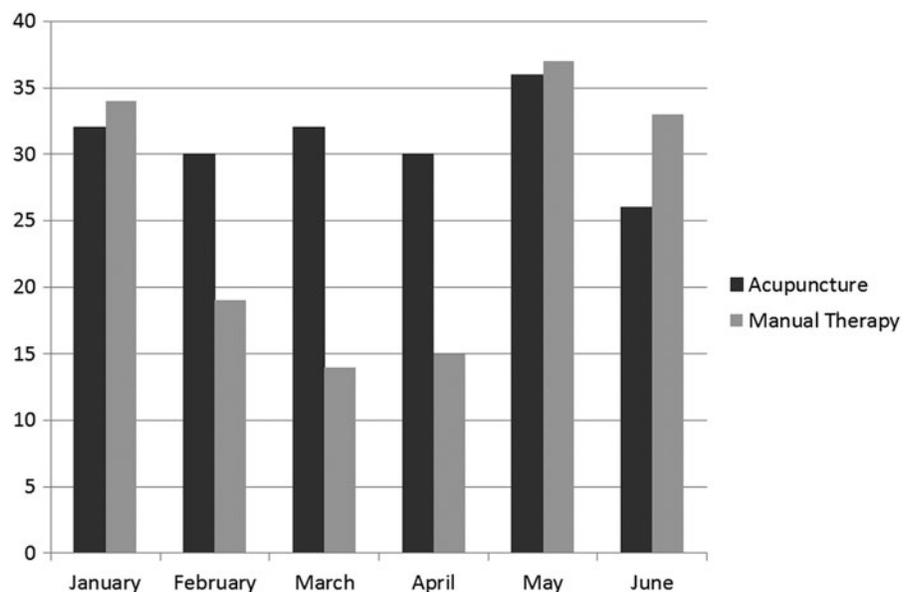
**Patients and families.** Seventy-two percent felt that acupuncture and related manual therapies were helpful, and 24% were not sure. Ninety-seven percent reported no discomfort or negative experience with acupuncture and related manual therapies; 3% were not sure. Fourteen percent reported difficulties in scheduling, including the following: morning hours not convenient to the patient's clinical state, challenges of working around other procedures and therapy schedules with limited morning hours, and absence of weekend hours. Eighty-three percent reported that they would like to see the inpatient acupuncture service offered to inpatients on a permanent basis, and 17% had no opinion.

#### Transition to full-time program

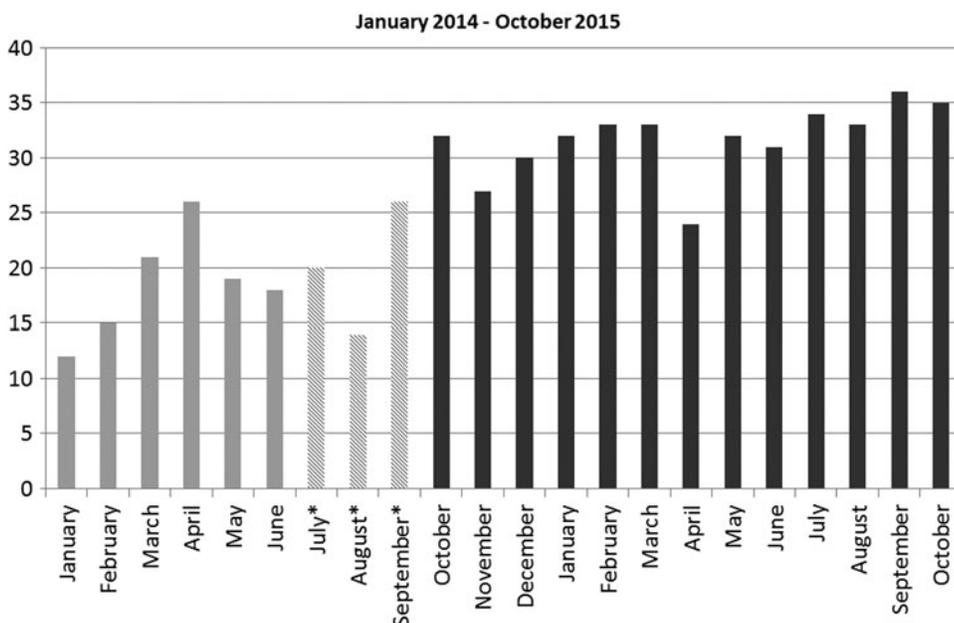
The response to the pilot project was reviewed by hospital administration, which led to the decision to make the service available full days (8 a.m. to 4:30 p.m. weekdays) beginning in October 2014. The limited morning hours of the pilot were carried over during the transition period to full-time program. The interest and demand for inpatient acupuncture has continued to grow since then (Fig. 4).

#### Discussion

The half-day availability of acupuncture for inpatients during the 6-month pilot period allowed the acupuncturists to see 87 inpatients and provide 338 treatments. Patients



**FIG. 3.** Number of acupuncture and manual therapy treatments by month during the pilot period.



**FIG. 4.** Number of new consults per month since start of pilot program.

were seen for a variety of symptoms and conditions, including, most commonly, pain and nausea symptoms. As awareness of this service grew and medical teams were provided with opportunities to learn more about acupuncture, referrals increased. The most common reasons that patients could not be treated included scheduling conflicts with other therapies and procedures, as well as the limited availability in morning hours only, when many patients were asleep. Feedback was received from questionnaires administered to patients and families who used this service and from referring providers. Most returned questionnaires included comments that patients, families, and providers felt the therapies were helpful and that they would like to see the service offered permanently to inpatients.

This positive response led to the beginning of the full-day inpatient service in October 2014. During an 8-hour day, a single acupuncture provider has been able to treat up to 8 patients per day. Since October 2014, the number of patients on the active list to be seen has consistently averaged 11 per day, with a maximum of 22 patients, resulting in most treatments for inpatients occurring 2–3 times per week. Daily treatments can rarely be provided, except in special circumstances such as end-of-life care or acute pain crises. At times of high census, if a second provider was available to help, they did.

Before the pilot project, an official order set for placing inpatient acupuncture consults did not exist. A process was developed at the beginning of the project to make sure inpatient referrals were received quickly. During the transition, the acupuncture service needed to check several locations where consults had been sent in the past in addition to the new order set location to make sure that new consults were received. During this transition period, a small number of referrals were lost in the system.

Inpatients were treated in their rooms in hospital beds, wheelchairs, or recliners. Occasionally patients fell asleep or moved during their treatments, increasing the potential for lost or missing needles. This is potentially more common among pediatric patients, who may be more active than adults

during their treatment. A system was developed to minimize the risk of lost or missing needles, including needle counts at the time of placement and removal; use of press needles with additional tape to further secure the needles to the skin, as well as to identify the needles to nonacupuncture providers who may interact with a patient during their treatment; and the use of both a handheld magnet and magnetic roller for needles that may be lost in the linens or on the floor of a patient's room. A laminated sign was placed on the patient's door to decrease interruptions during a treatment.

Funding to support the further growth of this program continues to be a significant issue. It took a year to approve billing of a code that covers manual therapies such as acupressure and *Tui Na*. This was a significant loss of revenue, given that manual therapy treatments made up 45% of the treatments provided. For many of these patients, acupuncture was not possible because of low blood counts at the time of referral. Additionally, evaluation and management codes are billable codes for initial consultation and re-evaluation; however some institutions, including Seattle Children's, limit evaluation and management codes to billing from MD and DO providers.

Many insurance companies cover acupuncture therapy; however, this coverage varies widely. Given the poor reimbursement rate for acupuncture, the inpatient program has not been financially solvent without financial support from the institution. Changes to the Patient Protection and Affordable Care Act<sup>15</sup> effective in 2014 required all Washington state insurance plans and insurance companies offering insurance in Washington state as part of the health insurance exchange to cover acupuncture. Unfortunately, many other nonexchange insurances do not cover acupuncture (e.g., Medicaid, Tricare). Additionally, insurance companies will sometimes limit coverage on the basis of the conditions being addressed. Providers should recommend that families contact their insurance provider directly with any questions regarding their acupuncture coverage, ideally before considering acupuncture.

Finally, even with the expansion of this program to full days, many inpatients at Seattle Children's cannot be seen as

often as requested (by the patient, family, or referring team) because of a high number of patients and families requesting treatments with only one provider available to the inpatient service per day.

### Conclusion

Nearly all of the 15 hospitals included in the *U.S. News & World Report's* Honor Roll of Best Hospitals 2015–16 state on their websites that they provide some form of complementary and integrative medicine, including acupuncture.<sup>16</sup> More than half of these hospitals belong to the Consortium of Academic Health Centers for Integrative Medicine, whose mission is to advance the principles and practice of integrative medicine within academic institutions.<sup>17</sup> The number of pediatric hospitals offering acupuncture to both the inpatient and outpatient population is much lower, however, with less than half of the 12 hospitals on the Best Children's Hospitals Honor Roll listing acupuncture as an available in-house service on their websites.<sup>18</sup>

It is clear that there is strong interest and demand for acupuncture at Seattle Children's Hospital among patients, families, and referring providers. The institution has recognized this growing demand by offering acupuncture therapy and supporting a full-time inpatient service. The inpatient program fosters interprovider communication, allowing for safe and truly comprehensive and integrative care plans. Families are provided a greater sense of ease knowing that the selected hospital-credentialed acupuncture providers have advanced acupuncture experience, a specialized focus in pediatric care, and knowledge of acute and complex diseases common to both the pediatric and inpatient settings. This article may provide helpful information for hospital staff and administrators at other healthcare facilities who support a similar program.

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### Author Disclosure Statement

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