Child Life Specialists Decrease Procedure Time, Improve Experience, and Reduce Fear in an Outpatient Blood Drawing Lab (CLS Decrease Procedure Time)

Kirsten Getchell, MS, CCLS1, Kate McCowan, MS, CCLS1, Erin Whooley, MS, CCLS1, Christine Dumais, EdM, CCLS1, Addie Rosenstock, MS, CCLS1, Alexandra Cole, MPH1, and Michele DeGrazia PhD, RN, NNP-BC, FAAN2,3

Abstract
Children can experience extreme fear when undergoing medical procedures, including blood draws. A growing body of evidence points to the benefits of Child Life Specialists supporting children throughout medical procedures in various medical settings. This prospective cohort study aimed to describe the impact of Child Life Specialist facilitated play on children’s fear and caregiver satisfaction in an outpatient blood drawing lab. A nonrandomized convenience sample of 150 children and their caregivers were enrolled. Seventy-five patients received the Child Life Specialist intervention during their blood draw, while the remaining 75 patients were enrolled as controls. Children and caregivers in the intervention group spent less time in the procedure room, with a median time of 3 min (interquartile range: 2-5) as compared to 5 min (interquartile range: 5-6; \( P < .001 \)) for the control group. Caregivers in the intervention group reported the atmosphere (\( P = .032 \)) and experience (\( P < .001 \)) more positively, and children reported lower fear scores (\( P = .007 \)) as compared to the control group. The findings of this study suggest that Child Life Specialist interventions in pediatric outpatient blood drawing labs improve satisfaction and reduce fear.

Keywords
child life, phlebotomy, patient experience, fear, patient satisfaction

Introduction
Providers who deliver pediatric care rely heavily on results obtained from blood samples taken in outpatient blood drawing labs. However, children and their caregivers (parents, guardians, or others responsible for the child’s care) report that children not only experience extreme fear when having blood drawn by venipuncture but that this fear can lead to dissatisfaction with the care they receive (1, 2). This experience in outpatient blood drawing labs can also influence the child’s future health care encounters (3).

Literature suggests that Child Life Specialist (CLS), professionals trained in child development, family systems, and evidence-based supportive interventions, can positively affect the child and caregiver experience in the healthcare milieu (4). CLS create desirable child and caregiver experiences, impacting psychosocial outcomes for the betterment of children (5). CLS are an essential part of the multidisciplinary healthcare team, collaborating to meet the needs of the children, caregivers, and the staff they serve in various settings (6, 7). In their most recent position statement, the American Academy of Pediatrics recommends that providers determine the effects of CLS on patient and family satisfaction (7).

1 Boston Children’s Hospital, Boston, MA, USA
2 Neonatal Intensive Care Unit, Boston Children’s Hospital, Boston, MA, USA
3 Harvard Medical School, Boston, MA, USA

Corresponding Author:
Kirsten Getchell, Boston Children’s Hospital, 300 Longwood Ave., Boston, MA 02115, USA.
Email: kirsten.getchell@childrens.harvard.edu

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Studies show that procedure time and number of staff during a procedure often decrease when nonpharmacological interventions are utilized (8, 9). CLS use nonpharmacological interventions (tools) such as preparation and distraction to help their patients cope with fear. Their developmentally appropriate preparation materials include pictures or coloring books, tours, medical play, teaching dolls, board games, art drawings, and relaxation or coping exercises (10). CLS also use behavioral distraction techniques such as assorted visuals, breathing techniques, comfort measures, and diversonal talk to provide children and caregivers a sense of control when they rehearse before a procedure. This preparation and education of children and caregivers for various procedures can have a positive or beneficial impact on understanding, anxiety, and satisfaction (11–13).

In 2015, a CLS was recruited to prepare and support children and their caregivers in the outpatient blood drawing lab within a large urban pediatric healthcare center. This was the first time a CLS was permanently positioned within the lab. The purpose of this study was to describe the CLS’ impact on the child’s fear and caregiver satisfaction in the lab. This study aimed to compare the child’s fear and caregiver satisfaction when children ages 5 to 12 years received CLS facilitated play compared to when they did not receive CLS facilitated play.

**Methods**

**Setting and Sample**

This single-center prospective cohort study was conducted in the outpatient blood drawing lab located within an urban free-standing quaternary care 404-bed academic children’s hospital in the Northeastern United States. A nonrandomized convenience sample of English-speaking caregivers with developmentally appropriate children aged 5 to 12 years was enrolled. Half of the children were enrolled during the hours when the CLS was present. The remaining children were enrolled when the CLS was absent from the lab.

**Human Subjects**

The medical center’s scientific review committee and Boston Children’s Hospital Institutional Review Board approved the study (IRB-P00025170). Children and caregivers from both the intervention and control groups who completed all study requirements received a gift card of $20 as a token of appreciation for their participation.

**Procedures**

Before initiating the study, all study team members and outpatient blood drawing lab staff received education about the study’s purpose, aims, and relevant study procedures.

English-speaking caregivers of developmentally appropriate children aged 5 to 12 were informed of the study when entering the lab. If the caregivers and their children agreed to learn more about the study, the research assistant (RA), who was not blinded to study group assignment, reviewed the study, and obtained verbal consent. Verbal assent was ascertained from children 7 to 12 years of age. The control group was consented and enrolled when there was no CLS coverage in the lab, and the intervention group was consented and enrolled when a CLS was present in the lab.

Following enrollment of the control group participants, the RA, child, and their caregiver remained in the waiting room until the laboratory administrator called their name. When the child’s name was called to have their blood drawn, the RA observed the caregiver and child throughout the blood draw. Following enrollment of the intervention group, the RA observed the child and caregiver as they met with the CLS while in the waiting room. The CLS encouraged the child to participate in medical play and preparation using teaching dolls, books, pictures, and diversonal activities while waiting for his or her blood draw. In addition, the CLS identified and rehearsed coping strategies to use with the child during the blood draw. The CLS and RA accompanied the child and caregiver to the procedure room to have their blood drawn. Prior to leaving the procedure room, the CLS helped the child cope and recover from the blood draw using play.

For both study groups, the RA recorded the patient wait time between the time of arrival to the lab and being called into the procedure room, time spent in the procedure room, and whether the child needed an adult to restrain them during the blood draw on the Case Report Form. Following the blood draw, the RA administered the Children’s Fear Scale (CFS) to the child. They also provided the caregiver with a Patient Satisfaction and Experience Survey, which included questions on their perception of their child’s comfort. Following completion of all measures, the family received a token of appreciation for their participation.

**Measurement.** The CFS was adapted from the Faces Anxiety Scale to measure fear in children undergoing painful medical procedures and was used in this study to measure participants’ fear (14). The CFS consists of 5 sex-neutral faces ranging from no fear to extreme fear. The participants indicate which face correlates with how scared they are. In 2011, McMurtry et al. validated the CFS with a sample of 100 children undergoing venipuncture. Test–retest reliability of the child’s fear ratings on the CFS was highly correlated immediately following and 2 weeks after the venipuncture event (1). Construct validity of the CFS was also confirmed by comparing CFS fear scores with another validated tool for measuring fear, the Children’s Anxiety and Pain Scale, immediately after and 2 weeks following a venipuncture event (1).

The investigator-developed Patient Satisfaction and Experience Survey used in this study included questions that addressed the study aims combined with patient satisfaction surveys used in the phlebotomy and radiology departments. The final survey included 7 questions. A sample of 10 phlebotomy staff members and 5 caregivers tested the
survey to achieve face validity. Feedback from these staff and caregivers ensured the readability of the survey questions and that collected information would reflect caregivers’ experiences with their visit to the lab. During the face validation process, one item, #3, was revised for clarity.

**Data management.** The secure web application REDCap was used for managing the data (15,16). The Patient Satisfaction and Experience Survey was provided to caregivers using the portable tablet. All data were entered directly into REDCap and secured behind the hospital’s firewall.

**Data analysis.** Data were electronically transferred to IBM® SPSS Statistics Version 24 for data analysis. The CFS was used as the primary outcome in the power analysis. The sample size of 150 children provided 80% power to detect a mean difference of 0.69 units in fear between the control and experimental groups ($P$-value of .05). Descriptive statistics were used to describe the sample and both study groups on demographic and clinical characteristics. Comparisons between the control and experimental groups on demographic or clinical characteristics were analyzed using $t$ tests and Wilcoxon-Mann-Whitney tests for continuous variables, and $\chi^2$ or Fisher tests for categorical variables.

**Results**

A total of 150 children and their caregivers participated in the study, with 75 children and caregiver dyads each in the control and intervention groups. Children were enrolled in the study on Mondays and Fridays between the hours of 8:00 AM and 4:30 PM. Over half of participants from both the control and intervention groups were enrolled between 8:00 AM and 2:00 PM (76% and 80%) and on Tuesdays, Thursdays, and Fridays (83.9% and 90.7%; Table 1).

**Table 1. Days and Times of Blood Draws.**

| Day of Blood Draw | Control (n = 75) | Intervention (n = 75) | P value |
|-------------------|-----------------|-----------------------|---------|
| Monday            | 7 (9.3%)        | 9 (12.0%)             | .40*    |
| Tuesday           | 34 (45.3%)      | 23 (30.7%)            |         |
| Wednesday         | 5 (6.7%)        | 8 (10.7%)             |         |
| Thursday          | 19 (25.3%)      | 20 (26.7%)            |         |
| Friday            | 10 (13.3%)      | 25 (33.3%)            |         |

| Time of Blood Draw | Control (n = 75) | Intervention (n = 75) | P value |
|--------------------|-----------------|-----------------------|---------|
| 8:00AM-10:59AM     | 33 (44.0%)      | 50 (66.7%)            | .009*   |
| 11:00AM-1:59PM     | 24 (32.0%)      | 10 (13.3%)            |         |
| 2:00PM-4:59PM      | 18 (24.0%)      | 15 (20.0%)            |         |

*Fisher exact test.

**Table 2. Time, Number of Individuals in Procedure Room, and Needed to Restrain.**

| Median (IQR)               | Control (n = 73*) | Intervention (n = 75) | P value |
|---------------------------|-------------------|-----------------------|---------|
| Waiting Time              | 14 min (7, 23)    | 12 min (8, 18)        | .680**  |
| Time in Procedure Room    | 5 min (5, 6)      | 3 min (2, 5)          | <.001*c |
| # of Individuals in Room  | 4 individuals (4, 5) | 5 individuals (4, 5) | .156*c |
|                           | n (%)             |                       |         |
| 3                         | 10 (13.3%)        | 4 (5.3%)              |         |
| 4                         | 37 (49.3%)        | 31 (41.3%)            |         |
| 5                         | 22 (29.3%)        | 31 (41.3%)            |         |
| 6                         | 6 (8.0%)          | 9 (12.0%)             |         |
| # of Individuals Needed to Restrain | 2 individuals (2, 2) | 2 individuals (1, 2) | <.001*d |
|                           | n (%)             |                       |         |
| 1                         | 12 (16.0%)        | 36 (48.0%)            |         |
| 2                         | 63 (84.0%)        | 38 (50.7%)            |         |
| 3                         | 0 (0%)            | 1 (1.3%)              |         |

*a2 missing.

**bMann-Whitney U test.

*cChi-square test.

*dFisher exact test.
There was no difference found between the study groups regarding previous blood draws and the number of children prepared (ie, having discussed what it means to have their blood drawn) by their caregivers for blood draws. More caregivers rated the blood draw waiting room atmosphere as good to excellent in the intervention group compared to the control group (97.3% vs 88%; \( P = .032 \)). No differences in the perception of waiting room time between the control and intervention groups were found. The intervention group’s caregivers rated their child as very comfortable or somewhat comfortable during the blood draw (70.7% vs 49.3%; \( P = .005 \)) and after the blood draw (92% vs 74.7%; \( P = .007 \)), which was significantly better when compared to the control group. Additionally, more caregivers in the intervention group as compared to the control group reported their child’s experience as much better or better than expected (85.3% vs 45.4%; \( P < .001 \)) (Table 3).

### Table 3. Patient Satisfaction and Experience Survey, and Children’s Fear Scale.

|                                      | Control (n = 75) | Intervention (n = 75) | \( P \) value |
|--------------------------------------|-----------------|-----------------------|--------------|
| Patients who had experienced a previous blood draw |                 |                       | .229*        |
| Yes                                  | 67 (89.3%)      | 71 (94.7%)            |              |
| No                                   | 8 (10.7%)       | 4 (5.3%)              |              |
| Patients who were prepared by caregivers for blood draw & |                 |                       | .139*        |
| Yes                                  | 31 (41.3%)      | 22 (29.7%)            |              |
| No                                   | 44 (58.7%)      | 52 (70.3%)            |              |
| Atmosphere in waiting room           |                 |                       | .032*        |
| Excellent                            | 15 (20.0%)      | 24 (32.0%)            |              |
| Very good                            | 23 (30.7%)      | 31 (41.3%)            |              |
| Good                                 | 28 (37.3%)      | 18 (24.0%)            |              |
| Fair                                 | 6 (8.0%)        | 2 (2.7%)              |              |
| Poor                                 | 3 (4.0%)        | 0 (0%)                |              |
| Wait for blood collection            |                 |                       | .415*        |
| Much shorter than I expected         | 18 (24.0%)      | 20 (26.7%)            |              |
| Somewhat shorter than I expected     | 9 (12.0%)       | 16 (21.3%)            |              |
| Satisfactory, as I expected          | 29 (38.7%)      | 27 (36.0%)            |              |
| Somewhat longer than I expected      | 14 (18.7%)      | 10 (13.3%)            |              |
| Much longer than I expected          | 5 (6.7%)        | 2 (2.7%)              |              |
| Child’s overall level of comfort during procedure |             |                       | .005*        |
| Very comfortable                     | 18 (24.0%)      | 36 (48.0%)            |              |
| Somewhat comfortable                 | 19 (25.3%)      | 17 (22.7%)            |              |
| Neither uncomfortable nor comfortable| 2 (2.7%)        | 5 (6.7%)              |              |
| Somewhat comfortable                 | 25 (33.3%)      | 11 (14.7%)            |              |
| Very uncomfortable                   | 11 (14.7%)      | 6 (8.0%)              |              |
| Child’s overall level of comfort after procedure |          |                       | .007*        |
| Very comfortable                     | 32 (42.7%)      | 50 (66.7%)            |              |
| Somewhat comfortable                 | 24 (32.0%)      | 19 (25.3%)            |              |
| Neither uncomfortable nor comfortable| 8 (10.7%)       | 1 (1.3%)              |              |
| Somewhat uncomfortable               | 6 (8.0%)        | 1 (1.3%)              |              |
| Very uncomfortable                   | 5 (6.7%)        | 4 (5.3%)              |              |
| Children’s Fear Scale Response       |                 |                       | .007*        |
| 0: not scared at all                 | 19 (25.3%)      | 29 (38.7%)            |              |
| 1                                    | 11 (14.7%)      | 23 (30.7%)            |              |
| 2                                    | 16 (21.3%)      | 10 (13.3%)            |              |
| 3                                    | 12 (16.0%)      | 4 (5.3%)              |              |
| 4: most scared possible              | 17 (22.7%)      | 9 (12.0%)             |              |

*Chi-square test.

b\( n = 74 \) for intervention group.

cFisher exact test.

**Patient Satisfaction and Experience Survey**

There was no difference found between the study groups regarding previous blood draws and the number of children prepared (ie, having discussed what it means to have their blood drawn) by their caregivers for blood draws. More caregivers rated the blood draw waiting room atmosphere as good to excellent in the intervention group compared to the control group (97.3% vs 88%; \( P = .032 \)). No differences in the perception of waiting room time between the control and intervention groups were found. The intervention group’s caregivers rated their child as very comfortable or somewhat comfortable during the blood draw (70.7% vs 49.3%; \( P = .005 \)) and after the blood draw (92% vs 74.7%; \( P = .007 \)), which was significantly better when compared to the control group. Additionally, more caregivers in the intervention group as compared to the control group reported their child’s experience as much better or better than expected (85.3% vs 45.4%; \( P < .001 \)) (Table 3).

**Children’s Fear Scale**

When evaluating fear of the blood draw, children in the control group reported being more fearful of the blood draw (3 or 4 on the fear scale) compared to children in the intervention group (38.7% vs 17.3%; \( P = .007 \)).

**Discussion**

In this study, caregivers of children who received CLS interventions with blood draws reported higher satisfaction scores,
indicated their children were less fearful and spent less time in
the procedure rooms than children who did not receive the inter-
ventions. These findings are important since pediatric patients
have identified venipuncture as one of the most feared experi-
ences in healthcare, and most children will experience one or
more blood draws in childhood (2, 17).

**Patient and Family Experience/Satisfaction**

Play, preparation, and procedural support are tools utilized by
CLS that increase coping strategies and improve patient and
caregiver experience and satisfaction with their care (4). The
present study adds to the growing body of knowledge by
demonstrating CLS improve patient and caregiver experience
and satisfaction. Thus, it fills an important gap related to the
role of the CLS in an outpatient blood drawing lab. Observed
improvements across various domains included a more pos-
itive atmosphere, increased patient comfort, and an overall
more positive experience.

CLS, when located in procedural settings, can impact
waiting room environments and the overall patient experi-
ence. As stated by Wilson et al, a CLS in a waiting room helps
to create an atmosphere where “self-esteem is enhanced
and therapeutic medical education takes place.” (6) (p82).
Similarly, Alcock et al demonstrated the importance of the
CLS in the emergency department, showing that parents
exposed to a CLS played more with their children because
the CLS modeled developmentally appropriate interventions
to pass the time while waiting (18). Wilson also demonstrated
that CLS have a positive influence on environmental factors
in an ambulatory waiting room (19).

Although no published studies have described the role
of CLS related to patient and caregiver experience in an outpa-
tient blood drawing lab in a pediatric healthcare setting, the
benefits of child life presence in other settings such as inpa-
tient medicine and radiology have been described. For exam-
ple, in a programmatic review of CLS practices in a
pediatric radiology department, McGee describes CLS as
having a multifaceted role, including the psychological prep-
oration of the child, parent participation, and education of
healthcare providers on age-appropriate interventions.
In addition, McGee describes CLS as key to increasing ef-
iciency and fostering a positive experience by reducing the
stress on children, caregivers, and the medical team (20).

In 2014, Tyson et al conducted a rigorous prospective
evaluation of the impact of CLS in a pediatric imaging
department. They enrolled 137 children 1 to 12 years old
scheduled to undergo an imaging procedure. Intervention
and control groups were randomly assigned. Using a Likert
scale instrument for measurement, statistically significant dif-
ferences between the intervention and control groups were
found in 19 of 24 measures. Findings revealed a positive
impact of a CLS on parent, staff, and child satisfaction; and
parent and staff perceptions of child comfort and distress
(21). Additionally, using focus groups, Drayton et al exam-
ined 18 pediatric nurses’ perceptions of the CLS role in a
24-bed pediatric inpatient unit. Drayton’s findings showed
that involvement by the CLS led to a positive healthcare
experience for the children, families, and staff and added
value to the care provided on the unit as perceived by the
nurses (22).

**Procedure Time**

The present study revealed that participants in the interven-
tion group spent less time having their blood drawn than the
control group, suggesting it is more efficient to have a
CLS in the lab. Spending less time in the procedure room
improves throughput, reducing wait times for patients in
line. Studies show that reduced wait time for medical care
can improve patient experience and satisfaction (23, 24).
As patient throughput improves, more patients can be sched-
uled. Improved throughput, coupled with a reduction in the
number of individuals to provide restraint, can increase ef-
iciency and decrease operating costs in the outpatient blood
drawing lab.

**Fear**

The present study revealed a statistically significant reduction
in fear for children receiving the CLS intervention. This is
reassuring since many studies have revealed negative impli-
cations of pediatric fear and needle pain (3, 25, 26). For
example, Heden et al examined the relationship between
fear and pain levels during venipuncture procedures in chil-
dren. They found that according to parents, children experi-
enced more fear than pain, even after a topical anesthetic
was applied. Fearful patients tend to be less cooperative,
which can impact the success of a blood draw procedure
(27). The investigators suggested a focus be placed on fear-
reducing interventions such as those delivered by CLS to
address this issue.

Fear and pain experiences can influence individuals’
medical care approaches throughout their lifetime. Pate
et al linked childhood pain in the medical setting to adult
fear, pain, and missed medical appointments (3). Thus, by
reducing fear, CLS have the ability to improve the overall
health outcomes for patients.

CLS’ impact on anxiety, a term closely related to and
sometimes used synonymously with fear, has also been
examined. In 2006, Brewer et al implemented a double-blind
intervention study of 142 children, 5 to 11 years old, under-
going otolaryngology surgery. CLS preoperatively prepared
children using a validated “Child Drawing: Hospital” instru-
ment. Children in the intervention group had a statistically
significant reduction (P=.04) in anxiety scores (28). In
another study, Piazza et al surveyed 128 phlebotomists
who reported that patient and parent anxiety accounted for
most of the challenges encountered during a pediatric
blood draw. Approximately half of the phlebotomists had
no training in child development (29). Therefore, a CLS
intervention can extend beyond the child and caregiver,
affecting staff members performing the blood draw procedure. A CLS may improve the experience in a blood drawing lab for staff, caregivers, and children by decreasing fear and anxiety through developmentally appropriate support and education.

Strengths and Limitations

Strengths of this study include the prospective study design and moderate sample size. However, if repeated, there are some limitations for investigators to consider in the interpretation of this study. One explicit limitation of this study was the lack of demographic data. Modifications to the consenting process unintentionally precluded the collection of demographic data. This is important because a child’s age and sex may influence their ability to cope with medical procedures. Goodenough et al found that a child’s intensity and unpleasantness toward venipuncture were highly correlated with age (30). Furthermore, venipuncture unpleasantness scores of females >7 years of age were significantly higher than intensity ratings for males (30). In this study, it is not known if study group age and sex differences could have influenced this study’s results.

There was also a statistically significant difference in the time of day participants had their blood drawn between the 2 study groups. It is conceivable that a child may have a mounting level of fear over the course of a day while waiting for their blood to be drawn; this is an opportunity for future research.

Another potential limitation of this study was that the RA collecting data for both study groups were not blinded to the study intervention. However, the RA was not a staff member of the blood drawing lab or CLS team and therefore did not have a vested interest in the outcome of this study.

Areas for future study include collecting demographic data and data from non-English speaking families on specific CLS interventions. Analyzing demographic data could help to determine which interventions are most effective for children of differing ages, genders, races, and ethnicities. Additionally, it would be beneficial to collect the number of venipuncture attempts and caregiver anxiety (31–34). Child life presence has the potential to impact the number of venipuncture attempts and caregiver anxiety. A recommendation to strengthen future studies on CLS in the blood drawing lab could include randomizing participants to study groups.

This study did not examine the use of topical analgesics; these products can decrease the pain significantly (35). Future studies could examine the added value of CLS when using topical analgesics. Focusing future studies on pain perception during CLS interventions will help increase our understanding of CLS’ impact during painful procedures. Furthermore, this study did not examine if the interaction of a CLS has a lasting effect on future blood draws. A repeated measures design should be considered for future studies.

Conclusion

Our findings suggest that CLS implement necessary interventions to help children cope with venipuncture in the phlebotomy lab. Distraction and preparation by a CLS help to improve the overall patient experience and throughput, which have efficiency and cost-saving implications in procedural areas. As such, CLS should be considered as integral members of the medical care team wherever pediatric venipuncture occurs.

Authors’ Note

This study was approved by the Boston Children’s Hospital Institutional Review Board. All of the procedures in this study were conducted in accordance with the Boston Children’s Hospital Institutional Board approved protocols. Verbal informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article. Kate McCowan is primary coinvestigator.

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ORCID iDs

Alexandra Cole, MPH https://orcid.org/0000-0001-5587-1338
Michele DeGrazia, PhD, RN, NNBP-BC, FAAN https://orcid.org/0000-0002-7362-3394

References

1. McMurtry CM, Noel M, Chambers CT, McGrath PJ. Children’s fear during procedural pain: preliminary investigation of the Children’s Fear Scale. Health Psychol. 2011;30:780-8. doi:10.1037/a0024817
2. Hart D, Bossert E. Self-reported fears of hospitalized school-age children. J Pediatr Nurs. 1994;9:83-90.
3. Pate JT, Blount RL, Cohen LL, Smith AJ. Childhood medical experience and temperament as predictors of adult functioning in medical situations. Children’s Health Care. 1996;25:281-98. doi:10.1207/s15326868chc2504_4
4. Boles J, Fraser C, Bennett K, Jones M, Dunbar J, Woodburn A, et al. The value of certified child life specialists: Direct and downstream optimization of pediatric patient and family outcomes. 2020.
5. Palmer S, Ipsen T. Caring for our children: A look at patient experience in a pediatric setting. The Beryl Institute. 2020.
6. Wilson B, Hausslein E, McCormick D. The pediatric office—new directions for the care of families. Children’s Health Care. 1982;11:82-3. doi:10.1207/s15326888chc1102_8

7. Romito B, Jewell J, Jackson M. Child life services. Pediatrics. 2021;147. doi:10.1542/peds.2020-040261

8. DeLoach Walworth D. Procedural-support music therapy in the healthcare setting: a cost-effectiveness analysis. J Pediatr Nurs. 2005;20:276-84. doi:10.1016/j.pedn.2005.02.016

9. Sánchez Ferrer F, Grima Murcia MD, Lopez-Pineda A, Juste Ruiz M, Orozco Beltran D, Carratala-Munuera C, et al. Effects of watching cartoons during an echocardiography on infants and preschool children. A prospective randomized study. Front Pediatr. 2019;7. doi:10.3389/fped.2019.00184

10. Justus R, Wyles D, Wilson J, Rode D, Walther V, Lim-Sult N. Preparing children and families for surgery: Mount Sinai’s multidisciplinary perspective. Pediatr Nurs. 2006;32:35-43.

11. Sandy NS, Nguyen HT, Ziniel SI, Minnillio BJ, Penna FJ, Franceschi AM, et al. Assessment of parental satisfaction in children undergoing voiding cystourethrography without sedation. J Urol. 2011;185:658-62. doi:10.1016/j.juro.2010.09.120

12. Gursky B, Kestler LP, Lewis M. Psychosocial intervention on procedure-related distress in children being treated for laceration repair. J Dev Behav Pediatr. 2010;31:217-22. doi:10.1097/DBP.0b013e3181d5a33f

13. Johnson AJ, Steele J, Russell GB, Moran R, Fredericks KP, Jennings SG. Decreasing pediatric patient anxiety about radiology imaging tests: prospective evaluation of an educational intervention. J Child Health Care. 2009;13:370-82. doi:10.1177/1367493509344826

14. McKinley S, Coote K, Stein-Parbury J. Development and testing of a Faces Scale for the assessment of anxiety in critically ill patients. J Adv Nurs. 2005;41:73-9. doi:10.1046/j.1365-2648.2003.02508.x

15. Harris PA, Taylor R, Minor BL, Elliot V, Fernandez M, O’Neal L, et al. The REDCap consortium: building an international community of software platform partners. J Biomed Inform. 2019;95:103208. doi:10.1016/j.jbi.2019.103208

16. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42:377-81. doi:10.1016/j.jbi.2008.08.010

17. Bright Futures. Recommendations for Preventive Pediatric Health Care. Itasca, IL: American Academy of Pediatrics; 2021.

18. Alcock D, Goodman J, Feldman W, McGrath PJ, Park M, Cappelli M. Environment and waiting behaviors in emergency waiting areas. Child Health Care. 1985;13:174-80. doi:10.1207/s15326888chc1304_5

19. Wilson JM. Future of play in health care settings. Child Health Care. 1988;16:231-7. doi:10.1207/s15326888chc1603_17

20. McGee K. The role of a child life specialist in a pediatric radiology department. Pediatr Radiol. 2003;33:467-74. doi:10.1007/s00247-003-0900-2

21. Tyson ME, Bohl DD, Blickman JG. A randomized controlled trial: child life services in pediatric imaging. Pediatr Radiol. 2014;44:1426-32. doi:10.1007/s00247-014-3005-1

22. Drayton NA, Waddups S, Walker T. Exploring distraction and the impact of a child life specialist: perceptions from nurses in a pediatric setting. J Spec Pediatr Nurs. 2019;24:e12242. doi:10.1111/jspn.12242

23. Xie Z, Or C. Associations between waiting times, service times, and patient satisfaction in an endocrinology outpatient department: a time study and questionnaire survey. Inquiry. 2017;54:46958017739527. doi:10.17757/0046958017739527

24. Bleustein C, Rothschild DB, Valen A, Valatis E, Schweitzer L, Jones R. Wait times, patient satisfaction scores, and the perception of care. Am J Manag Care. 2014;20:393-400.

25. Hamilton JG. Needle phobia: a neglected diagnosis. J Fam Pract. 1995;41:169-75.

26. Kennedy RM, Luhmann J, Zempsky WT. Clinical implications of unmanaged needle-insertion pain and distress in children. Pediatrics. 2008;122:S130-133. doi:10.1542/peds.2008-1055e

27. Hedén L, von Essen L, Ljungman G. Children’s self-reports of fear and pain levels during needle procedures. Nurs Open. 2020;7:376-82. doi:10.1002/nop2.399

28. Brewer S, Gleditsch SL, Syblik D, Tietjens ME, Vacik HW. Pediatric anxiety: child life intervention in day surgery. J Pediatr Nurs. 2006;21:13-22. doi:10.1016/j.pedn.2005.06.004

29. Piazza J, Merkel S, Neusiuss H, Murphy S, Gargaro J, Rothberg B, et al. It’s not just a needlestick: exploring phlebotomists’ knowledge, training, and use of comfort measures in pediatric care to improve the patient experience. J Appl Lab Med. 2019;3:847-56. doi:10.1373/jaml.2018.027573

30. Goodenough B, Thomas W, Champion GD, Perrott D, Taplin JE, Von Baeyer CL, et al. Unravelling age effects and sex differences in needle pain: ratings of sensory intensity and unpleasantness of venipuncture pain by children and their parents. Pain. 1999;80:179-90. doi:10.1016/s0304-3959(98)00201-2

31. Sanchez Cristal N, Staat J, Chatham R, Ryan S, McNair B, Grubenhoff JA. Child life reduces distress and pain and improves family satisfaction in the pediatric emergency department. Clin Pediatr (Phila). 2018;57:1567-75. doi:10.1177/0011399518798386

32. Jacobsen PB, Manne SL, Gorfinkle K, Schorr O, Rapkin B, Redd WH. Analysis of child and parent behavior during painful medical procedures. Health Psychol. 1990;9:559-76. doi:10.1037/0278-6133.9.5.559

33. LaMontagne LL, Wells N, Hepworth JT, Johnson BD, Manes R. Parent coping and child distress behaviors during invasive procedures for childhood cancer. J Pediatr Oncol Nurs. 1999;16:3-12. doi:10.1177/104345429901600102

34. Bergomi P, Scudeller L, Pintaldi S, Dal Molin A. Efficacy of non-pharmacological methods of pain management in children undergoing venipuncture in a pediatric outpatient clinic: a randomized controlled trial of audiovisual distraction and external cold and vibration. J Pediatr Nurs. 2018;42:e66-72. doi:10.1016/j.pedn.2018.04.011

35. Rogers TL, Ostrow CL. The use of EMLA cream to decrease venipuncture pain in children. J Pediatr Nurs. 2004;19:33-9. doi:10.1016/j.jpedn.2003.09.005