Expanding the Period of PURPLE Crying In Texas

Abstract
Abusive head trauma (AHT) is a leading cause of maltreatment-related death in infants. AHT is frequently the result of shaken baby syndrome (SBS), which occurs when a parent shakes a baby, often out of frustration with the baby's intense crying. The Period of PURPLE Crying is a low-cost program gaining popularity across the United States and internationally due to its effectiveness in educating caregivers and improving caregiver responses to crying babies. Due to the vitality of its message and the cost-effectiveness and efficiency of the program, the PURPLE program should be used on a widespread level in Texas hospitals and beyond.

Abusive Head Trauma In Infants
Over the last decade, child maltreatment has been on a steady decline across the country with Texas following a similar trend. However, in 2013, Texas saw 66,398 cases, the highest number of confirmed cases since 2009. Additionally, although child abuse and neglect fatalities also appear to be on the decline, Texas still ranks near the top of the list, with the third highest number of fatalities in 2013 at 156 and the seventh highest rate of maltreatment related fatalities. The youngest children continue to be the most vulnerable to abuse, with victims less than one year old to two years old accounting for the largest percentage of victims across all maltreatment types. Abusive head trauma is one of the leading causes of infant maltreatment fatalities in the United States, with between 1,200 and 1,400 infants sustaining injuries or dying due to the head trauma annually. AHT is frequently the result of someone shaking an infant, a condition commonly known as shaken baby syndrome.

Triggers Leading to AHT
Excessive infant crying has been cited as the most common trigger for AHT perpetration, with infants ages one to three months at the greatest risk. For this reason, numerous studies have focused on the cycle of infant crying and the response of caregivers in order to determine normal infant development behavior and caregiver reactions. Researchers have identified that there is a “normal crying curve” for infants across cultures (Figure 1). Despite varying caretaking styles across cultures, a “normal crying curve” is universal: an infant cries in a strong, unexpected, and unpredictable increasing/decreasing pattern that is unrelated to his or her needs and/or the environment and that resists consolation. Previously described as “colic,” this pattern of behavior has been redefined as part of normal infant development. However, this behavior still challenges and distresses caregivers, and is a frequent cited cause of SBS during early infancy (Figure 2). Prevention programs, such as the Period of PURPLE Crying, are targeting these peaks of crying patterns during the first months of life, as they most closely relate with high rates of AHT.

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Figure 1. Normal crying curve of early infancy (from the National Center on Shaken Baby Syndrome).

Figure 2. Age-specific incidence of publicly-reported cases of SBS (from the National Center on Shaken Baby Syndrome).

Additionally, retrospective reviews of diagnosed cases of AHT reveal the importance of prevention strategies that encompass the child(ren)’s entire community, as the alleged perpetrator of AHT is not always the child’s parent. In fact, non-parental perpetrators tend to cause more severe injuries and account for 77% of the cases of children over one year of age experiencing AHT. Yet studies have consistently shown that for the most vulnerable population, children less than one year of age, biological fathers are overwhelmingly the most common adult perpetrators, followed by partners of parents, biological mothers, and other adult caregivers. For this reason, programs that are universally implemented at birth within a healthcare

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setting and target the child’s entire community of caregivers on educational and coping strategies are most likely to yield the greatest benefits.

**Economic Cost of AHT**

Due to the immediate and long-term consequences of SBS/AHT, the children, their families, society, and the government pay a high price. Approximately 25% of all AHT victims die as a result of their injuries.\textsuperscript{xii} For those children that survive, 80% incur permanent disability. Disability may require medical or personal care, placing an additional emotional and financial strain on them and their families.\textsuperscript{xii, xiii}

About half of AHT cases have been shown to require inpatient hospitalization. AHT is correlated with greater usage of medical care, inpatient and outpatient services, and prescription usage for several years after the diagnosis, which totals an average of $47,952 per child between the incident and age four.\textsuperscript{xiv} Lifelong estimated costs are about $1 million per case for treatment, rehabilitation, custodial care, and judicial costs.\textsuperscript{xv} In Texas, that totals about $191,000,000 each year. In addition, a recent study determined that the lifetime cost for just a single year of confirmed child maltreatment of all kinds and for all victims in the United States is around $5.9 trillion.\textsuperscript{xvi}

**Key Components of the Period of PURPLE Crying**

Due to the identifiable risk behavior (non-accidental shaking) and stimulus (crying) of SBS, most cases of AHT can be prevented.\textsuperscript{iv, vii, x, xi} Specifically developed to reduce the occurrence of AHT, The Period of PURPLE Crying is a low-cost, evidence-based primary program that was designed using comprehensive empirical research connecting the crying curve and the triggers and dangers of AHT.\textsuperscript{xii} Available in ten languages that can easily be provided to any birthing facility, the PURPLE program is delivered by trained professionals to educate new parents, guardians and the community on infant crying and safety behaviors, in order to reduce AHT.\textsuperscript{xii, xvii}

The program is divided into three “doses.” In Dose 1, the parental portion of the PURPLE program consists of a ten-minute DVD and 11-page brochure that employs clear, positive, and multicultural messages viewed in the hospital after giving birth and prior to discharge. Following the viewing, there is a brief three- to four-minute conversation with a trained clinical professional to ensure all questions and concerns are answered during the parent’s initial stay or visit.\textsuperscript{xii, xvii} In Dose 2, the video is taken home and shared with other caregivers or used as a reinforcement, such as in home visiting programs or with physicians and public health practices. Finally, Dose 3 takes the message to the community, through public education and a media campaign on the dangers of SBS and resulting AHT.

**Evaluation & Benefits**

The PURPLE program is a relatively low-cost program for prevention of AHT. Ensuring fidelity through specific professional training, the three doses are administered over the course of two years (Figure 3). The after unit cost per DVD is $2 plus initial execution and administrative costs; we estimate the total per unit to be

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approximately $4.50 and the total for implementation in 50% of Texas birthing hospitals to be $5 million for two years. Over 30 years of extensive evaluations – consisting of more than 32 longitudinal parent focus groups and randomized controlled trials with 4,400 participants from various incomes, racial and cultural backgrounds – have yielded solid evidence that the PURPLE program can provide much needed education to help change behavior that can prevent AHT-related injury and death to our most vulnerable Texans.xii, xvii, xviii, ix

Evidence-Based Outcomes

Studies in both the United States and Canada have indicated that:

- Mothers understood more about normal infant crying;
- Mothers had increased knowledge of the dangers of shaking infants;xx
- Mothers increased walk-away behavior when frustrated, especially during periods of inconsolable crying;xxi
- Parents were more willing to share their education;xxii
- Knowledge is increased, which suggests preventative modification of harmful behaviors, though reduction of verified SBS occurrences is unknown;xxiii
- The program is effective for both Spanish and English speaking mothers;xxiv
- The program may be effective as a secondary prevention program.xxv

At this time, the PURPLE program has been implemented at some level in 49 of 50 U.S. States, including Texas (currently implemented in 46 sites across Texas), and in eight of ten Canadian Provincesvii, xxvi The PURPLE program has expanded greatly and currently exists in 800 locations in North America (see Appendix A).xxvii

Concluding Thoughts & Recommendations

Focusing on prevention methods is the most effective way to protect and promote healthy lives and futures for Texas children. Utilizing The Period of PURPLE Crying can be the first of many prevention programs in a child’s life that sets a child and his or her family on course of healthy development. The Period of PURPLE Crying is cost-effective and efficient, requiring minimal resources and achieving vital results. Strategic plans for reaching families that prefer home births and/or midwives instead of birthing centers or hospitals must also be developed and implemented so that the program can reach these populations as well.

When employed in a continuum of home visiting and other prevention programs, the Period of PURPLE Crying can be even more effective. The Nurse-Family Partnership is a home visiting program that has strong supporting evidence to show its positive effects on prenatal health, birth, maternal health and success, and child health and achievements. Similarly, the Home Instruction for Parents of Pre-school Youngsters, Parents as Teachers, Early Head Start, and AVANCE have shown effectiveness for Texas children and families. Utilizing not one but multiple preventative programs, Texas can further assure a child’s healthy development.

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# Appendix A

## 2-Year Statewide Implementation Proposed Budget

<table>
<thead>
<tr>
<th>PURPLE Cost Description</th>
<th>Admin Cost/Unit</th>
<th>Material Cost/Unit</th>
<th>Projected Births</th>
<th>Projected Home Visiting Clients</th>
<th>Total Participants (50% part.)</th>
<th>Total Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doses 1 &amp; 2: Yr 1 (2016)</strong></td>
<td>$2.56</td>
<td>$2.00</td>
<td>415,000</td>
<td>23,000</td>
<td>219,000</td>
<td>$998,640</td>
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<tr>
<td>Startup cost includes: planning, training, shipping, storage, materials, and hospital coordinator’s time. Based on UNC implementation cost evaluation.</td>
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<tr>
<td><strong>Doses 1 &amp; 2: Yr 2 (2017)</strong></td>
<td>$1.93</td>
<td>$2.00</td>
<td>415,000</td>
<td>23,000</td>
<td>219,000</td>
<td>$860,670</td>
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<td>Includes maintenance cost of materials, shipping, storage, and reduced hospital coordinator time. Based on UNC implementation cost evaluation.</td>
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<td><strong>Dose 3:</strong> Statewide public information campaign (billboard, radio &amp; TV PSAs, Click for babies, printing &amp; publication across major TX cities)</td>
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<td>$1,330,000</td>
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<td><strong>Project Evaluation and Statewide Coordination/Training</strong></td>
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<td><strong>Biennium Total</strong></td>
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</tbody>
</table>
Appendix B

Map of Implementation of Period of PURPLE Crying

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References


xx National Center on Shaken Baby Syndrome. (2009). Randomized controlled trials on the effectiveness of the PURPLE materials: Parallel studies in the state of Washington (USA) and the province of British Columbia Expanding the Period of PURPLE Crying in Texas www.texprotects.org


Ibid.