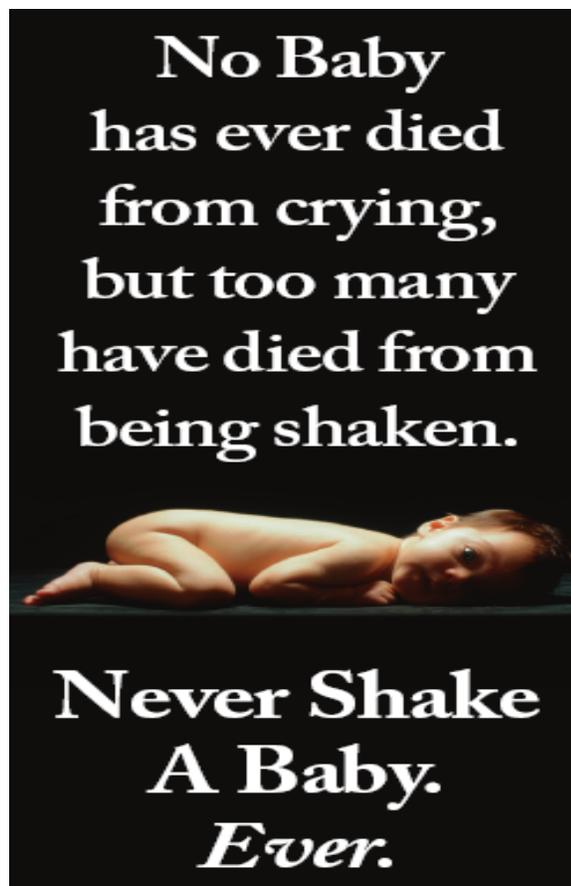


Never Shake a Baby Arizona Annual Evaluation Report

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Executive Summary

Prevent Child Abuse Arizona initiated the Never Shake A Baby program in northern Arizona at the Flagstaff Medical Center and in southeastern Arizona at the University Medical Center in Tucson in the fall of 2003. Never Shake A Baby Arizona, in continuous operation since then, has now offered parent education to over 119,780 Arizona parents. Parent response to Never Shake A Baby education has been very positive since the program's inception; therefore, the primary objective for the past eight years has been to increase the number of hospitals providing the parent education and to expand the program to additional home visiting and other community-based practitioners and programs, and eventually to all parents.

This goal continues to be fulfilled with the addition of hospital nurses; home visitors; Court Appointed Special Advocates (CASAs); Fire Department First Responders; home visiting program staff; local Safe Kids Coalitions; First Things First Regional Family Fun Days in Apache-Navajo, Whiteriver Apache, and Navajo Nation Regions; foster parents; and county public health departments involved in maternal/child health, injury prevention and child care consultation. The Coordinator presented multiple workshops to teen parents; child care workers; Child Fatality Review Committees; high school, community college, and university students in nursing, child development, and infant mental health; and child welfare and juvenile justice personnel. The ripple effect of these people teaching their clients is not quantified in this Evaluation Report, but anecdotally it is significant.

In individual contacts with parents (involving 34,951 families in 2010-2011), Never Shake A Baby Arizona consists of a 15 minutes intervention in which parents of newborns receive education about infant crying as normal behavior, how to soothe crying infants, and how to handle their own frustrations, since crying and the adult frustration it engenders is the most frequent trigger for Shaken Baby Syndrome. Parents also learn about the dangers of shaking babies and methods to avoid shaking. Hospital personnel (primarily nurses) and family service providers are responsible for administering the program. The primary tasks are to solicit parents' participation in program activities that include watching a video, accepting written materials for reference at home, and reading and signing a Commitment Form where they develop a Plan for coping with crying at home and agree to share what they learn with their baby's other caregivers. The educators discuss the dangers of shaking babies and are asked to witness parents signing the Commitment Forms. The goal of Never Shake A Baby is to reduce Shaken Baby Syndrome (SBS), also known as Abusive Head

Trauma (AHT), and to reduce the cost of health care required to treat injuries associated with this type of child maltreatment in Arizona.

FY 2010 data from Arizona Department of Health Services, Bureau of Women's and Children's Health indicate that the number of non-fatal hospitalizations due to abusive head injuries among Arizona infants and young children fell to 29, one of the lowest numbers since ADHS has been keeping SBS/AHT surveillance data. According to the Child Fatality Review Report, the number of deaths attributed to AHT/SBS also fell, to 4, vs. 7 in both 2008 and 2009. Although not all hospitals are implementing the Never Shake A Baby Arizona program, and one year's data does not a trend make, the Never Shake program may be making a difference in reducing the incidence of this form of infant/young child maltreatment.

Initial hospital charges in 2010 for non-fatal hospitalizations due to AHT/SBS totaled \$2,256,718. This represents a dramatic decrease, by nearly half, when compared to 2009 when total charges were \$4,241,327. The average length of stay for an infant remained at 8 days; the percentage of cases covered by AHCCCS rose from 77% in 2009 to 86% in 2010. AHT/SBS cases seen in Emergency Departments increased to 9; perhaps reflecting greater awareness of signs and symptoms, and therefore coding of AHT/SBS visits. With published research from four Children's Hospitals around the US identifying an increase in AHT cases since the start of the economic recession², the need to educate all parents remains vital to share the consequences of abusive head injuries in babies and protective strategies to prevent shaking them.

² An Increase in Abusive Head Trauma during the Current Recession: A Multi-Center Analysis

Rachel P. Berger, Janet Fromkin, Haley Stutz, Kathi Makoroff, Kenneth Feldman, Philip V. Scribano, Tom Songer. Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA; Cincinnati Children's Hospital, Cincinnati, OH; Seattle Children's/Harborview Medical Center, Seattle, WA; Nationwide Children's Hospital, Columbus, OH; University of Pittsburgh School of Public Health, Pittsburgh, PA.

Introduction

Prevent Child Abuse Arizona first contracted with LeCroy & Milligan Associates, Inc. in 2003 to conduct an evaluation of the Never Shake a Baby Arizona (NSBAZ) *pilot* program. The program was initially implemented in northern Arizona at the Flagstaff Medical Center (FMC) in Flagstaff and in southern Arizona at the University Medical Center (UMC) in Tucson in the fall of 2003, and has been in continuous operation since. In 2006, Prevent Child Abuse contracted with Beth Sedlet to manage and report data collected via Commitment Forms submitted from hospitals and community programs.

This report is the eighth in a series of annual evaluation reports. The first report, *Never Shake a Baby Arizona FY2004 Annual Evaluation Report*, presented program implementation findings related to the startup of the pilot program and included recommendations for program improvement. The second and third annual reports, *Never Shake a Baby Arizona Annual Evaluation Reports FY2005 and FY2006*, included program implementation and intermediate outcome findings regarding the participants' recall of the main messages of the Never Shake A Baby Arizona program six months after completion. The evaluation findings in those reports indicated that the program was well-received by parents: **more than 90% found the program helpful and remembered its main messages about the dangers of shaking babies and methods to handle the stress related to babies crying for prolonged periods of time.**

Subsequent evaluation reports provide data on program expansion looking at the number of families in Arizona that received the Never Shake A Baby program statewide, by institution or organization, with updated data on abusive head injuries among Arizona infants and young children from the Arizona Department of Health Services. Electronic Annual Reports can be found at www.nsbaz.org.

Due to Never Shake presentations to high school students since 2009, additional evaluation data in the form of individual, personal feedback on program messages are also included. A student at Alhambra High School (2011) in Phoenix, Arizona said:

“I was really unaware of all the effects that happen by shaking a baby. I am shocked that many people do not have patience with their children. The way she explained the Shaken Child cases were (sic) very moving. It's something that really made me really think of all the poor baby's (sic) that died.”

Another commented:

“When it comes time for me to have children I know what to do if they don’t stop crying. I learned that when you are frustrated to place the baby in a safe place and for the parent to go calm down and in 10 minutes come back to check the baby. When you shake the baby it can cause so many health problems, such as brain damage.”

In addition to clear messages about the dangers of shaking young children, the Never Shake Coordinator also infuses presentations with messages about positive social emotional development for all babies and toddlers so that they get off to a good start in life. The comment below from another High School student reflects this:

“Something I didn’t know was the baby loves to be bundled close to the mom because that how their (sic) used to being. I also didn’t know that the longer you leave the baby alone, it starts feeling insecure. I learned the 5 S’s.”

Program Description

The Never Shake A Baby Arizona program consists of a 15 minute intervention that is conducted in hospitals, homes, and community organizations with parents of newborns and young infants. The premise of the program is that the period just after the baby's birth provides an optimal "teachable moment" wherein parents can be educated about their role in protecting, loving, and finding delight in their babies. The dangers of shaking babies as well as methods to avoid shaking them when frustrated are also discussed. Research suggests that during moments of frustration and stress, particularly associated with babies who cry for prolonged periods of time, parents will recall what they learned from the program and implement strategies they wrote on the Commitment Form Plan instead of shaking their child. Techniques are provided such as wearing the baby in a sling or baby holder, calling a friend or relative for help, or giving parents the permission to let the baby cry (while checking on the baby at least every ten minutes).³

Peer reviewed research of the original New York program conducted by Dr. Mark Dias (2005) supports the basic program premise: "A coordinated, hospital-based, parent education program, targeting parents of all newborn infants, can reduce significantly the incidence of abusive head injuries among infants and children less than 36 months of age."⁴

The Never Shake A Baby Arizona Coordinator oversees program implementation. The initial Coordinator was Phyllis Palla, RN; the second Coordinator was Patrice Heberholst, RN; the current Coordinator is Mary Warren, PhD, IMH-E®(IV). The Coordinator is responsible for grant writing and grant management, contacting hospital/program administration for approval to implement the program, training hospital, home visiting, public health, and parent education staff on the proper implementation and data collection procedures, supplying them with program materials, and requesting that completed Commitment Forms are submitted to the data manager.

In 2006, printed program materials were revised to include a multi-colored door hanger for parents to use at home that highlights tips for soothing a crying child and reducing parental frustration. The 24 hour ChildHelp crisis line telephone number is provided in two places in the door hanger. With

³ For more information go to www.nsbaz.org and www.pcaaz.org

⁴ Dias, M.S.; H. Silberstein; V. Li; K. Smith & K. deGuehery. (2004). *The Infant Shaken Impact Syndrome: A parent education campaign in upstate New York*. Women and Children's Hospital of Buffalo, New York.

funding from the Virginia G. Piper Charitable Trust and the Child Abuse Prevention License Plate Program, materials were reprinted in 2009. The Commitment Form was revised to eliminate the detailed demographic data collection needed for evaluation of the pilot. Instead, in addition to signing the form to indicate that they have received information about the dangers of shaking infants, parents are asked to write down their plan to use when their baby cries inconsolably. This step encourages them to incorporate lessons learned from the video and nurse explanation, and to pass it on to everyone who cares for their child. The Coordinator has worked with hospital Risk Management personnel to customize the Commitment Form to allow submission of signed forms to the Never Shake program for evaluation tracking.

In 2010, the Never Shake A Baby Arizona Public Service Announcement (PSA) workgroup, a collaboration of Phoenix Children's Hospital, the Phoenix Police Department, and Chili Pepper Productions, developed a script and participated in filming an updated and shortened training video as well as a thirty second PSA. New videos have been sent to all implementing hospitals and programs, as well as distributed to cable TV and radio broadcasting sources. The training video is now a crisp five minutes, showing safe sleep practices in addition to infant soothing techniques, with a message from the Phoenix Police Department to add emphasis to the consequences of adult frustration. The video and PSA, in English, Spanish, and closed captioned for the hearing impaired, can be downloaded from www.nsbaz.org. The link has been provided to other websites, i.e., Phoenix Children's Hospital, Arizona Department of Health Services, as well as other states.

The Coordinator continually revises training presentations to incorporate new research findings and to stress consistent, nurturing responses to baby's cries, infant crying as normal child behavior, and parental feelings of delight in their new child. Customized training presentations are available for Emergency Department staff focusing on signs, symptoms, and treatment of AHT. Information is also provided to target audiences about professional resources available at Zero To Three (www.zerotothree.org), the Infant Toddler Mental Health Coalition of Arizona (www.itmhca.org), as well as advice for parents and caregivers from the Fussy Baby Network staff of the Birth To Five Helpline at Southwest Human Development (www.swhd.org).

In hospitals, clinical coordinators, clinical educators, and charge and floor nurses are responsible for administering the program. As part of the newborn discharge process, nurses talk to parents of newborns to request

their participation in program activities that include watching a video, accepting written materials to take home, and reading and signing a Commitment Form with their Plan, agreeing to share what they learn with other caregivers. The nurses also discuss the dangers of shaking babies and are asked to witness parents signing the Commitment Forms. In home visits and community service organizations, families of newborns and older infants are offered the program, and similar procedures are followed.

The program materials highlight the consequences of shaking babies and methods to avoid shaking. The video options available to participants include *Preventing Shaken Baby Syndrome* (the updated video produced under a grant from the International Association of Business Communicators by Chili Pepper Productions), *Babies Cry* (produced by the Shaken Baby Alliance in Texas), *When Your Baby Cries*, which is targeted to Native Americans (produced by the University of Oklahoma Health Sciences Center), and *Portrait of a Promise* (produced by the Children's Medical Center in St. Paul, MN) used in the Banner Hospitals. Spanish-speaking versions of all videos are also available. For parents who speak neither English nor Spanish, UMC provides electronic translation equipment for watching the video. The updated *Preventing Shaken Baby Syndrome* video is also closed captioned for the hearing impaired. Since 2006, multiple copies of the *Preventing Shaken Baby Syndrome* video are provided free of charge.

In non-hospital settings, similar training materials are used, somewhat modified for the audience. For instance, the procedure for collecting and submitting Commitment Forms is deleted from trainings for non-institutionalized settings and workshops.

Abusive Head Injuries among Arizona Infants and Young Children, 2004-2010

The information in this section was provided by ADHS Bureau of Women's and Children's Health (BWCH)⁵. The BWCH compiles annual data based on the abusive head injury fatalities identified in the Arizona Child Fatality Review Program annual reports and on the non-fatal hospitalizations and emergency department visits due to abusive head injuries (shaken infant or shaken impact syndrome). The cases are identified using methods from a study conducted by Dias et al. (2005).⁶ Between years 2004-2007, data for infants and children under the age of two with a code for shaken infant syndrome (995.55) in any of the diagnostic fields were included.

Additionally, cases with a diagnostic code for skull fracture or intracranial injury (800-804.9), retinal hemorrhage (362.81), or intracranial hemorrhage (853.0, 853.1) with an external cause of injury code for known or suspected homicide/assault (E960-E968 and E980-E989) were included.

Beginning in 2008, the hospital discharge database was updated to allow for the collection of up to 25 ICD-9 codes and 6 External cause of injury codes. This is an increase from the previous data layout, which only allowed for up to 9 ICD-9 codes and 1 External cause of injury code. The external cause codes (up to 6) apply to ALL diagnosis codes. Therefore, a patient could have a principal diagnosis that is not an injury, but have a secondary diagnosis that is an injury, and the E code for that secondary diagnosis would be reported.

Additionally, beginning in 2008, hospital coders were required to report external causes of injury on all patients, including those transferred from another facility. Previously, external causes of injury data were only collected on a patient's initial visit for an injury, not any subsequent transfers to other hospitals.

For 2007 and prior discharges, the one external cause of injury code reported was for the principal diagnosis only. If there was a secondary diagnosis on which an E code was appropriate, the state did not collect it. Because of all these changes, comparison is not recommended between data prior to 2008 and data from 2008 and later.

⁵ Schacter, A., *Abusive Head Injuries Among Infants and Young Children 2004-2009, Arizona Department of Health Services, Bureau of Women's and Children's Health, November 2010.*

⁶ Dias MS, Smith K, deGuehery K, et al. *Preventing Abusive Head Trauma among Infants and Young Children: A Hospital-Based, Parent Education Program. Pediatrics.* 2005;115:e470-e477.

In the study by Dias and colleagues (2005), all suspected cases of abusive head injury were reviewed in detail by a multidisciplinary medical team to confirm the nature of the inflicted injuries. For this report on abusive head injury in Arizona during 2004-2010, the number of non-fatal hospitalizations represents *an estimate* because ADHS was unable to conduct an extensive review of medical records for non-fatal cases.

2004

In 2004, there were 29 non-fatal hospitalizations. Sixty-two percent were males (n=18) and 38 percent were females (n=11). The children spent a total of 292 days in the hospital, and the mean length of stay was 10 days. The hospital charges totaled \$1,459,354, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (69 percent, n=20). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$72,967. There were also two emergency department visits due to abusive head injuries. According to the 12th Annual Child Fatality Review Program Report, there were **three confirmed deaths** due to shaken infant syndrome in 2004.⁷

2005

In 2005, there were 34 non-fatal hospitalizations. Sixty-two percent were males (n=21) and 38 percent were females (n=13). The children spent a total of 298 days in the hospital, and the mean length of stay was 8.8 days. The hospital charges totaled \$1,526,626, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (76 percent, n=26). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$58,716. There were also six emergency department visits for abusive head injuries. According to the 13th Annual Child Fatality Review Program Report, there were **three confirmed deaths** due to shaken infant syndrome in 2005.³

2006

There were 22 non-fatal hospitalizations in 2006. Sixty-four percent were males (n=14) and 36 percent were females (n=8). The children stayed a total of 244 days in the hospital, and the mean length of stay was 11 days. The hospital charges totaled \$1,630,998, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (68 percent, n=15). Of the cases for which AHCCCS/Medicaid was the expected payer, the

⁷ Arizona Child Fatality Review Program: <http://www.azdhs.gov/phs/owch/cfr.htm>

³ Ibid.

average cost per hospitalization was \$108,733. There were five emergency department visits for abusive head injuries. According to the Child Fatality Review program, there were **nine confirmed deaths** due to shaken infant syndrome in 2006: seven deaths occurred in Maricopa County; one death in Apache County, and one death in Gila County. There were no deaths reported in Pima and Coconino Counties, where the program has been in effect since 2003.

2007

There were 22 non-fatal hospitalizations in 2007. Fifty-five percent were males (n=12) and 45 percent were females (n=10). The children stayed a total of 248 days in the hospital, and the mean length of stay was 11 days. The hospital charges totaled \$1,566,940, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (68 percent, n=15). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$80,312. There were six emergency department visits for abusive head injuries. According to the 15th Annual Child Fatality Review program, there were **eleven confirmed deaths** due to shaken infant syndrome in 2007.

2008

There were 42 non-fatal hospitalizations in 2008. Sixty-two percent were males (n=26) and 38 percent were females (n=16). The children stayed a total of 492 days in the hospital, and the mean length of stay was 12 days. The hospital charges totaled \$3,664,454, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (71 percent, n=30). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$70,210. There were four emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were **five confirmed deaths due to shaken infant syndrome in 2008, and two confirmed cases of abusive head trauma** that may not have involving shaking. The 16th Annual Child Fatality Review Report, published in November 2009, explains these deaths.⁸ The non-fatal hospitalizations due to abusive head injuries were reported from eight facilities during 2004-2008.

2009

There were 62 non-fatal hospitalizations in 2009. Sixty-one percent were males (n=38) and 39 percent were females (n=48). The children stayed a total of 476 days in the hospital, and the mean length of stay was 8 days. The

⁸ <http://www.azdhs.gov/phs/owch/pdf/cfr2009.pdf>

hospital charges totaled \$4,241,327, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (77 percent, n=48). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$44,932. There were eight emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were **seven confirmed deaths due to shaken infant syndrome in 2008, and four confirmed cases of abusive head trauma** that may not have involving shaking. The 17th Annual Child Fatality Review Report, published in November 2010, explains these deaths. ⁹ The non-fatal hospitalizations due to abusive head injuries were reported from nine facilities during 2005-2009.

2010

There were 29 non-fatal hospitalizations in 2010. Forty-five percent were males (n=13) and 55 percent were females (n=16). (This gender ratio represents a switch.) The children stayed a total of 220 days in the hospital, and the mean length of stay was 8 days (median= 4 days). The hospital charges totaled \$2,256,718, and AHCCCS/Medicaid was the expected payer for the majority of these hospitalizations (86 percent, n=25). Of the cases for which AHCCCS/Medicaid was the expected payer, the average cost per hospitalization was \$77,929 (median=\$27,389). There were nine emergency department visits for abusive head injuries. According to the Child Fatality Review Program, there were four confirmed deaths due to shaken infant syndrome in 2010, and four confirmed cases of abusive head trauma not involving shaking.

⁹ <http://www.azdhs.gov/phs/owch/pdf/cfr2009.pdf>

Table 1 shows non-fatal hospitalizations due to abusive head injury by facility.

Table 1. Non-Fatal Hospitalizations due to Abusive Head Injury by Facility, Arizona 2006-2010

Facility	2006 (n=22)		2007 (n=22)		2008 (n=42)		2009 (n=62)		2010 (n=29)	
	n	N	N	%	n	%	n	%	n	%
Banner Desert Medical Center	1	-	-	4%	4	10%	9	15%	3	10%
Maricopa Medical Center	3	4	4	14%	5	12%	2	3%	3	10%
Phoenix Children's Hospital	10	8	8	45%	18	43%	25	40%	16	55%
St. Joseph's Hospital and Medical Center	4	3	3	18%	10	24%	8	13%	3	10%
Tucson Medical Center	-	2	2	-	-	-	5	8%	-	-
University Medical Center	3	3	3	14%	5	12%	59	15%	4	14%
Flagstaff Medical Center	-	-	-	-	-	-	2	3%	2	3%
Banner Good Samaritan Medical Center	1	-	-	4%	-	-	-	-	-	-
Los Niños Hospital	-	2	2	-	-	-	1	2%	-	-
Scottsdale Shea Hospital	-	-	-	-	-	-	1	2%	-	-

During 2005-2010, the majority of children hospitalized for abusive head injuries resided in Maricopa County. Table 2 shows non-fatal hospitalizations due to abusive head injuries by county of residence.

Table 2. Non-Fatal Hospitalizations for SBS/AHT by County of Residence 2005-2010

County of Residence	2005 (n=34)		2006 (n=22)		2007 (n=22)		2008 (n=42)		2009 (n=62)		2010 (n=29)	
	n	%	n	%	n	%	N	%	n	%	N	%
Apache	3	9%	1	4%	1	5%	-	-	-	-	-	-
Cochise	-	-	-	-	-	-	-	-	-	-	1	3%
Coconino	1	3%	-	-	-	-	3	7%	2	3%	-	-
Gila	-	-	1	4%	-	-	1	2%	-	-	-	-
Graham	-	-	-	-	1	5%	-	-	1	2%	-	-
Greenlee	-	-	-	-	-	-	-	-	-	-	-	-
La Paz	1	3%	-	-	-	-	-	-	-	-	-	-
Maricopa	15	44%	14	64%	16	73%	28	67%	30	48%	20	69%
Mohave	1	3%	-	-	-	-	-	-	2	3%	-	-
Navajo	-	-	-	-	-	-	1	2%	1	2%	2	7%
Pima	6	21%	3	14%	4	18%	5	12%	12	19%	2	7%
Pinal	2	6%	2	9%	-	-	2	5%	6	10%	2	7%
Santa Cruz	1	3%	-	-	-	-	-	-	2	3%	1	3%
Yavapai	3	9%	1	4%	-	-	1	2%	4	6%	1	3%
Yuma	1	3%	-	-	-	-	-	-	2	3%	-	-

The number of non-fatal emergency department visits has been fairly stable (4-6/year) between 2004 and 2008; however, in 2009 and 2010, the number of emergency cases identified as AHT/SBS increased to 8 (2009) and 9 (2010). Likewise, the number of fatalities due to abusive head trauma in infants and young children swung between 3 (2004) and 11 (2007), decreased to five in 2008, increased in 2009 (7) and fell sharply in 2010 to 4. The number of non-fatal inpatient hospitalizations also fell in 2010, to 29. This number showed similar ups and downs between 2004 and 2009, from 29 in 2004 to 34 in 2005 to 22 in 2006, spiking to 42 in 2008, and increasing again to 62 in 2009. As expected, the total hospital costs coincide with the numbers of non-fatal admissions; however, the mean length of stay per year remains at 8 days.

The total charges for inpatient stays due to AHT/SBS in 2010 were \$2,256,718; reflecting fewer non-fatal admissions. The percentage of cases covered under AHCCCS has increased in 2010 to 86%, from 77% in 2009 and 69% in 2004.

According to the ADHS data, the average hospitalization cost per case, for which the expected payer was AHCCCS/Medicaid, was \$72,967 per case in 2004 (69% of cases); \$58,716 per case in 2005 (76% of cases); \$108,733 per case in 2006 (68% of cases); \$80,312 per case in 2007 (68% of cases); \$70,210 per case in 2008 (71% of cases); \$44,932 per case in 2009 (77% of cases); and \$77,929 (86% of 29 cases). Again, due to changes in the way the data are collected, year to year comparisons cannot be accurately made. However, it is clear that the public pays an increasing share of costs for these preventable admissions.

The incidence and cost of hospitalization due to abusive head injuries among young children justifies the need for educating all parents of newborns and young infants about Abusive Head Trauma/Shaken Baby Syndrome. NSBAz messages appear to be effective in lessening the incidence.

Program Goals and Objectives

As demonstrated above, shaking babies can lead to serious injury or death. The emotional and financial toll on families can also be staggering. The continual care required often necessitates that one parent become a full-time caregiver. This can lead to loss of income and tensions in the family, especially among other siblings who may sometimes feel neglected. Tragically, a shaking can also cause the break-up of family relationships.

Although Shaken Baby Syndrome is relatively rare compared to more common childhood diseases and conditions such as asthma or diabetes, the costs are high, and consequences can be, and often are, severe for children and families. The goal of implementing Never Shake A Baby Arizona, therefore, is to eliminate or reduce Shaken Baby Syndrome/Abusive Head Trauma and reduce associated health care and impaired quality of life costs in Arizona. To that end, a primary objective is to expand the program to all birthing hospitals in Arizona as well as to appropriate home visiting programs and community-based organizations in order to educate and reinforce to *all* parents of newborns and young children that crying is normal infant behavior, it is dangerous to shake their babies, there are tips to avoid shaking, and the importance of informing their babies' caregivers about infant crying and the dangers of shaking babies.

A logic model that summarizes the program's major resources, activities, objectives, and goals is presented in Exhibit 1 on the following page.

Exhibit 1. Program Logic Model for Never Shake a Baby Arizona

Resources	Activities	Objectives	Outcomes
Never Shake A Baby Arizona Coordinator	Program implementation oversight	Train nurses, home visitors and community organization service providers on program implementation and data collection procedures	<p>Decrease the incidence of non-fatal and fatal cases of Shaken Baby Syndrome in Arizona</p> <p>Decrease associated health care costs in Arizona</p> <p>Increase quality of life for all children and families</p>
	Program development	Expand program to all Arizona hospitals; expand program to community-based organizations Develop web-based communication	
Hospital nursing staff Community-based organization program providers	Discuss crying and the dangers of shaking babies with parents Provide parents written materials on methods to avoid shaking Show parents video on consequences of shaking/methods to avoid	Educate all parents of newborns and young infants on crying as normal infant development and the dangers of shaking babies and methods to avoid shaking	
	Have parents sign commitment forms Submit signed forms to evaluation team	Parents develop Plan to cope with crying and commit to sharing information with all their babies' caregivers Signed commitment form	
Never Shake Data Manager	Count and verify commitment forms	Report numbers of parents receiving program Monitor program implementation and data collection; work with sites to correct issues	
Funding	Administrative and supply costs	Program sustainability	

Expansion of the Program

In 2009-2010, Never Shake A Baby Arizona experienced steady growth in the number of hospitals and organizations offering services to the parents of newborns and young infants. The table below presents the complete list of organizations currently providing services, and in what year and month the program was initiated. Maricopa Integrated Health System (including the Hospital, Pediatric Emergency Department, Pediatric Outpatient Clinic, and Childbirth Education) and new groups of home visitors, student nurses, child care workers, child development students (high school and university), and court affiliated personnel (judges, CASAs, child welfare personnel, and early intervention providers) were trained in 2010-2011.

All hospitals and organizations offering parent education in 2010-2011 can be seen in the following exhibit. (Some hospitals or organizations have been trained and are not yet implementing the program, have been trained and are not submitting Commitment Forms, or have ceased providing the program.)

Exhibit 2. Hospitals and Organizations offering NSBAZ Education*				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Initial Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Arrowhead Medical Center	Hospital	July 2008		
Banner Desert Medical Center (BDMC) and Cardon Children's Medical Center	Hospital	December 2007	January 2008	
Banner Baywood Medical Center	Hospital	June 2009	January 2010	
Banner Del Webb (BDW)	Hospital	March - April 2009	May 2009	
Banner Estrella Medical Center (BEMC)	Hospital	May 2008	July 2008	
Banner Good Samaritan Medical Center (BGSMC)	Hospital	February 2008	August 2008	
Banner Ironwood	Hospital	October 2010	November 2010	

Exhibit 2. Hospitals and Organizations offering NSBAZ Education*				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Initial Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Banner Thunderbird Medical Center	Hospital	May 2009		
Casa Grande Regional Medical Center	Hospital	October 2008, September 2009		
Cobre Valley Community Hospital (CVCH)	Hospital	March 2008	June 2008	
Flagstaff Medical Center (FMC)	Hospital	July 2003	August 2003	
John C. Lincoln Hospital North Mountain (JCLH)	Hospital	March-April 2008	August 2008	March 2011
Holy Cross Hospital	Hospital	October 2009		
Kingman Regional Medical Center (KRMC)	Hospital	September 2006	November 2006	
Maryvale Hospital	Hospital	February 2007	April 2007	
Maricopa Medical Center (MIHS)	Hospital	December 2010		
Maricopa Medical Center (MIHS)	Outpatient	December 2010		
Mount Graham Regional Medical Center (MGRMC)	Hospital	January 2009	February 2009	
Mountain Vista Medical Center	Hospital	February 2010	March 2010	
Phoenix Baptist Hospital (PBH)	Hospital	January 2007	March 2007	X
Phoenix Children's Hospital (PCH)	Hospital	January 2007	February 2007	
Scottsdale Healthcare Osborn (SHCO)	Hospital	August - September 2007	August 2008	

Exhibit 2. Hospitals and Organizations offering NSBAZ Education*				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Initial Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Scottsdale Healthcare Shea (SHCS)	Hospital	August - September 2007	August 2008	
St. Joseph's Hospital and Medical Center	NyICU	February 2009	November 2009	
St. Joseph's Hospital and Medical Center	Hospital	April 2008	February 2010	
Summit Healthcare, Show Low	Hospital	June 2009	August 2010	
Tucson Medical Center (TMC)	Hospital	May 2007	May 2007	X
University Medical Center (UMC)	Hospital	September 2003	October 2003	
Verde Valley Medical Center	Hospital	September 2010		
Western Arizona Regional Medical Center (WARMC)	Hospital	November 2006	February 2007	
Whiteriver Indian Health Service	Hospital	October 2010	November 2010	
Yavapai Regional Medical Center	Hospital	August - September 2008		
Beautiful Beginnings, Apache/Navajo	Home Visiting	October 2009	March 2010	
Health Start (ADHS), Statewide	Family and children services provider	February 2008	April 2008	
Healthy Families, Statewide	Home Visiting	October 2007	January 2008	
So Phoenix Healthy Start	Home Visiting	February 2010		
Newborn Intensive Care Program, state	Home Visiting	March 2008	May 2009	

Exhibit 2. Hospitals and Organizations offering NSBAZ Education*				
<i>Organization Name</i>	<i>Organization Type</i>	<i>Date of Initial Program Training</i>	<i>Date of Program Initiation</i>	<i>Ceased Providing Program</i>
Nurse Family Partnership, Pima County	Home Visiting	May 2010		
Nurse Family Partnership, Maricopa County	Home Visiting	Nov 2010		
Southwest Human Development (SWHD)	Family and Children services provider	March 2007	May 2007	
Yavapai County Home Visiting Coalition	Home Visiting	August 2010		

*corroborated by submitted Commitment Forms. Other programs may offer Never Shake education; however, they do not routinely submit Commitment Forms.

Expansion of Education

In addition to hospital and home visiting programs, educational presentations in 2010-2011 have also included a workshop for the Navajo Early Childhood Educators Fair, Alhambra High School and ASU Child Development classes, Healthy Mothers Healthy Babies promotoras, Glendale Community College Student Nurses Association members, and attendees at the Mohave Court Teams for Maltreated Infants/Toddlers conference which included judges, child welfare personnel, health care and early intervention practitioners, domestic violence and behavioral health counselors, and CASAs.

A redesigned website at www.nsbaz.org now encourages searches on research articles about shaken baby syndrome, parenting tips to calm crying, videos, training presentations, as well as Arizona specific data on program implementation and evaluation.

The Infant Death Investigation Checklist and AZPOST training video have been transitioned to the Arizona Department of Health Services, Child Fatality Review, to maintain and track their use.

Expansion of Funding

From inception, the Child Abuse Prevention License Plate Program has generously funded Never Shake A Baby Arizona. In 2006, BHHS Legacy added critical funding, in particular to convene the SUIDI Group. Also in 2006, the Arizona Department of Health Services, Bureau of Women's and Children's Health allocated a small portion of the federal Maternal Child Health Grant to enable printing of the new parent education door hangers. In 2009, the Virginia G. Piper Charitable Trust added funds for both program operation and a new printing of the parent education door hangers. In 2010, the Margaret T. Morris Foundation added to operations funds and enabled the replication of the new training videos and PSAs. In 2011, the Phoenix Suns Charities added to operating funds, particularly to increase educational presentations to student nurses and child care workers.

Data Collection and Families Served

Parents are asked to sign a Commitment Form saying they will ensure that they and any caregivers of their babies will use methods to cope with crying babies learned through the program. On the Commitment Form, parents also note actions they could take for themselves to cope with their baby's crying, and list a person or persons they could call for help and support when upset by their babies' prolonged crying. By signing the forms, parents "commit" to sharing the information they learned with their babies' other caregivers. The English version of the Commitment Form is presented in Appendix A (it is also available in Spanish). Each hospital customizes the Commitment Form with their logo. A program sustainability feature is that hospitals reproduce these forms.

The signed forms are mailed to Beth Sedlet, Never Shake A Baby Arizona Data Manager, on a monthly basis along with a data cover sheet stating the number of births for the reporting month in the case of birthing hospitals, or the number of parents eligible to receive the program in the case of community-based organizations. The numbers are then checked and entered into a database. Parent names are not recorded; Commitment Forms are shredded after each monthly report is completed. (To respond to concerns of

hospital legal and risk management departments, some hospitals have modified the Commitment Form to provide additional information giving parents “informed consent” when signing the form.) As part of the sustainability features for Never Shake A Baby, hospitals and community organizations fund clerical and mailing costs for data collection.

Data reports detailing the percentage of births educated about Never Shake A Baby by hospital/community-based program are emailed out to nurse contacts on a monthly basis. Reports are also posted on www.nsbaz.org. Nurse Managers use the monthly reports as a means to continually motivate staff to ensure their hospital/program successfully competes with others to educate close to 90% of all new parents.

In 2010-2011, 34,951 parents were educated prior to being discharged with a newborn. The chart in Appendix B shows how many parents were offered Never Shake A Baby Arizona education by each hospital and home visiting program.

In 2010-2011, 3,175 families were offered Never Shake A Baby Arizona education during home visits by Healthy Families, with another 214 educated by Newborn Intensive Care Program (SWHD) or other county home visiting staff. Even more families were educated by Health Start and other home visiting program staff, although their education numbers cannot be verified by signed Commitment Forms.

Statewide, the total number of families that have received Never Shake A Baby Arizona education since program inception is over now 119,780, with over 7000 families receiving services between 2003 and 2005, over 6200 families receiving services in 2006-07, over 15,500 being educated in 2007-2008, 25,200 educated in 2008-2009, and 32,800 in 2009-2010. The cumulative efforts to educate Arizona parents is shown in the table below, detailing births and parents educated by year from program inception through the 2010-2011 reporting period.

Table 3. Cumulative Program Data					
Year	Total number of births	Number Families who Accepted Program	Number of Families Offered Program	Percentage of Births Offered Education	Percentage of Births Educated
FY 2005 May 2004-April 2005 (includes all data from inception of program in August 2003)	6355	4098	4431	70%	64.48%
FY 2006 May 2005-April 2006	3956	2720	3007	76%	68.76%
FY 2007 July 2006-June 2007	6269	3850	4002	64%	61.41%
FY 2008 July 2007-June 2008	18614	15675	15815	85%	84.21%
FY 2009 July 2008-June 2009	32511	25201	25461	78%	77.52%
FY 2010 July 2009-June 2010	38388	33290	33494	87%	86.72%
FY 2011 July 2010-June 2011	39581	34951	35102	89%	88.30%
Totals to date	145674	119785	121312	83%	82.23%

References

Abusive Head Injuries Among Arizona Infants and Young Children 2004-2010, Schacter, Alana, November 2011, ADHS/BWCH, Injury Prevention.

Arizona Department of Health Services. (2006, 2007, 2008, 2009, 2010). *Child Fatality Review Annual Reports: 13th-18th Annual Reports*. Available at <http://www.azdhs.gov/phs/owch/cfr.htm>.

Rachel P. Berger, Janet Fromkin, Haley Stutz, Kathi Makoroff, Kenneth Feldman, Philip V. Scribano, Tom Songer (2010). *An Increase in Abusive Head Trauma during the Current Recession: A Multi-Center Analysis*: Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA; Cincinnati Children's Hospital, Cincinnati, OH; Seattle Children's/Harborview Medical Center, Seattle, WA; Nationwide Children's Hospital, Columbus, OH; University of Pittsburgh School of Public Health, Pittsburgh, PA

Dias, M.S. & Barthauer. (2001). *Western New York/Finger Lake Regional Shaken Baby education project*. Upstate New York Shaken Baby Syndrome Education Program. Children's Hospital of Buffalo, New York.

Dias, M.S.; H. Silberstein; V. Li; K. Smith & K. deGuehery. (2004). *The Infant Shaken Impact Syndrome: A parent education campaign in upstate New York*. Women and Children's Hospital of Buffalo, New York.

Dias, M.S., Smith, K., deGuehery, K., Mazur, P, Li V, & Shaffer, M. (2005). Preventing abusive head trauma among infants and young children: A hospital-based, parent education program. *Pediatrics*, 115, 470-477

Appendix A: Commitment Form Example
Never Shake A Baby Arizona - Commitment Form

You are your child's best advocate.
We need you to prevent the shaking of your baby.

Commitment Statement:

I have learned that crying is normal for babies, and shaking a baby can cause brain damage or death. I will make sure that anyone who watches my child knows about the dangers of shaking.

Please sign for yourself below:

Mother's Signature _____ date _____

Father's Signature _____ date _____

Witness' Signature _____ date _____

My Plan in case my baby cries a lot:

- take my baby for a walk or a ride in the car
- put my baby in a safe place and let him/her cry
- do what I like to relax myself _____
- other _____

Who I can call for help:

Name of doctor _____

Telephone number _____

Name of family member _____

Telephone number _____

Name of friend _____

Telephone number _____

Note: this statement is not part of the medical record. If found, please return to
Never Shake, c/o Prevent Child Abuse Arizona, P.O. Box 26495, Prescott Valley, AZ 86312

Appendix B: Parents Educated by Hospital/Organization

Families Receiving Never Shake a Baby Education in Arizona FY 2010-2011			
Facility	Number of Births in Hospitals and/or Number of Parenting Families in Organizations Served	Number of Families/Parents Signed Commitment Form	Percentage of Families Accepting Program
BBMC	892	786	88%
BDMC	4722	4508	95%
BDWMC	1753	1532	87%
BEMC	3650	3426	94%
BGMC	4255	3131	74%
BGSMC	5382	4767	89%
BIMC	403	362	90%
CVRMC	352	341	97%
FMC	1264	1125	89%
JCLH	491	428	87%
KRMC	636	346	54%
MIHS	323	243	75%
Maryvale	1224	790	65%
MGRMC	569	517	91%
PCH-Thomas	252	239	95%
PCH- McDowell	678	631	93%
SHCO	1291	1236	96%
SHCS	4361	4061	93%
STJOE	3376	3045	90%
STJOE(NICU)	466	411	88%
SHRMC	934	871	93%
UMC	1825	1720	94%
WARMC	184	159	86%
WIH	75	62	83%
SWHD	196	189	96%
CCFR	27	25	93%
Totals	39581	34951	88%

Site Abbreviations

BB	Beautiful Beginnings
BBMC	Banner Baywood Medical Center
BDMC	Banner Desert Medical Center
BEMC	Banner Estrella Medical Center
BGMC	Banner Gateway Medical Center
BGSMC	Banner Good Samaritan Medical Center
BDWMC	Banner Del Webb Medical Center
CVRMC	Cobre Valley Regional Medical Center
FMC	Flagstaff Medical Center
JCLH	John C. Lincoln Hospital
KRMC	Kingman Regional Medical Center
Maryvale	Maryvale Hospital
MGRMC	Mt Graham Regional Medical Center
MVMC	Mountain Vista Medical Center
PBH	Phoenix Baptist Hospital
PCH	Phoenix Children’s Hospital
SHCO	Scottsdale Healthcare Osborn
SHCS	Scottsdale Healthcare Shea
STJOE	St. Joseph’s Hospital (Phoenix)
STJOE(NICU)	St. Joseph's Hospital (NICU) Phoenix
SWHD	Southwest Human Development (NICP)
SHRMC	Summit Healthcare Regional Medical Center
TMC	Tucson Medical Center
UMC	University Medical Center
WARMC	Western Arizona Regional Medical Center

Appendix C: Families Educated by County

Never Shake Arizona FY 2011 Education Rates by County			
County	Number of Births	Number of Signed Commitment Forms	Percentage of Births Educated
Apache	75	62	
Maricopa	33312	29423	88.33%
Gila	352	341	96.88%
Graham	569	517	90.86%
Cochise	27	25	92.59%
Coconino	1264	1125	89.00%
Mohave	820	505	61.59%
Navajo	934	871	93.25%
Pima	1825	1720	94.25%
Pinal	403	362	89.83%
Totals	39581	34951	88.30%