



Safe to Sleep  
Hospital Initiative  
Parent Survey Results  
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## Introduction

In early 2016, the Georgia Department of Public Health (DPH) announced the Georgia Safe to Sleep Hospital Initiative as part of a multi-pronged statewide safe infant sleep campaign. By May 2016, 78 of 78 birthing hospitals in the state had pledged to participate.<sup>1</sup> The core goal of the campaign is to educate all caregivers of infants about the ABCs of safe sleep in order to reduce the incidence of sleep-related infant deaths:

- Babies should sleep **Alone** in their own sleep space, preferably in the parents' room.
- Babies should be placed on their **Back** to sleep.
- Babies should sleep in a **Crib**.<sup>2</sup>

DPH provided partner hospitals with safe sleep information (an implementation guide plus technical assistance) and educational materials to be distributed to families and newborns to help protect infants from sleep-related deaths. Hospital personnel were educated about safe infant sleep and encouraged to model and discuss safe infant sleep with parents through multiple media before the families left the hospital. Under the initiative, all mothers and newborns receive an infant sleep gown with "This Side Up" printed on the front and a *Sleep Baby Safe and Sound* board book to encourage caregivers to follow safe sleep practices. DPH also provided hospitals with travel bassinets to be distributed to families of Medicaid-funded births, as well as to uninsured and self-pay births. Feedback from hospitals was overwhelmingly positive regarding the usefulness of the materials and support provided by DPH. In response to the initiative, the majority of hospitals have updated their practices and policies to model safe sleep practices.

Through a process evaluation of the hospital initiative, these additional key findings were observed:

- 1) Prior to implementing the DPH initiative, 44.3% of hospitals reported having a safe infant sleep policy in place; as of January 2017, 87.3% of hospitals report having a safe infant sleep policy in place or in progress.
- 2) Of the 39 safe infant sleep policies reviewed, 48.7% of policies specifically referenced the AAP 2011<sup>1</sup> (or 2016<sup>2</sup>) recommendations with another 20.5% referencing AAP 2005 recommendations.<sup>3</sup>
- 3) Of the 39 safe infant sleep policies reviewed, 92.3% specified the type and/or content of patient education on safe sleep.
- 4) At the time of this report, DPH program staff reported that 82.3% of hospitals completed staff training and 74.7% reported requiring ongoing staff training.

The process evaluation concluded that DPH had achieved its major program goals.

The purpose of this current evaluation is to identify the safe sleep information and materials received by parents from the hospitals, as well as assess parental knowledge and behaviors regarding safe infant sleep. Further analyses identify the family characteristics

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<sup>1</sup> Birthing hospital 79 opened and joined the initiative in September 2016.

<sup>2</sup> [www.georgiasafetosleep.org](http://www.georgiasafetosleep.org)

and Georgia Safe to Sleep Hospital Initiative components that are most closely associated with positive safe sleep knowledge and behaviors.

### **Parent surveys**

Postcards (N=20,588) were mailed to the majority of mothers of infants born between August 7 – October 11, 2016, inviting them to participate in an online or phone survey. Although the intent was to reach all parents of newborns during this time period, logistical issues such as mailing errors and limitations on postcard supply prevented us from reaching out to the total number of newborn parents during this time period (N=23,821). Eligibility criteria included being the primary caretaker of an infant between 1-6 months old who was born in Georgia. All respondents completing at least 50% of the survey are included in this analysis, resulting in a sample size of 420 respondents, representing ~2% of parents who were contacted. Survey topic areas included: characteristics of the respondents, information and materials received from the birthing hospital, self-reported safe sleep knowledge and behaviors, and opportunities for parents to provide additional comments and information on their infant sleep practices.

### **Respondents**

**Table 1** displays the demographic characteristics of the survey respondents, and the last column contains characteristics of mothers of all infants born during the study period.<sup>3</sup> The vast majority of respondents (98%) indicated their relation to the infant as “Mother.” The average age of the parent was 30 years, while the average age of the infant was 7.8 weeks. Approximately 56% of respondents had children living in the home in addition to the infant, with an average of 1.88 children in the home. The survey population contained 128 Medicaid recipients (30%) and 292 non-Medicaid recipients. Seventy-four percent of respondents reported being married. The majority of respondents identified as White, with 20% and 16% identifying as Black or Other, respectively.<sup>4</sup> Overall, the sample was highly educated, with 56% possessing at least a four-year degree. When compared to mothers of all infants born during the study period, the respondent sample (98% of which were mothers) contained a higher proportion who were married, white, and educated and a lower proportion of Medicaid recipients.

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<sup>3</sup> Blank fields in the “All Mothers” column represent data that were not available.

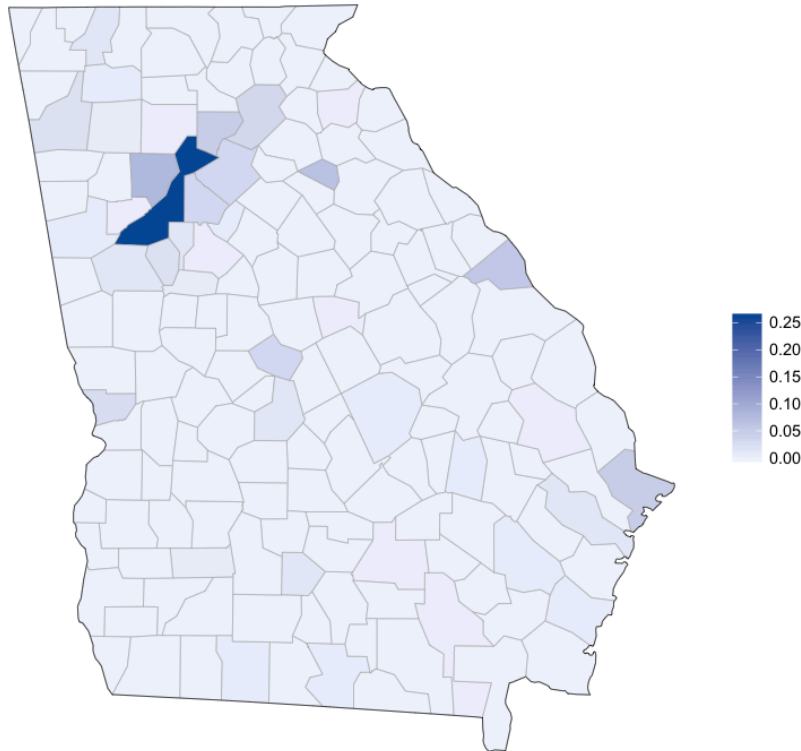
<sup>4</sup> The category of “Other” includes all other races besides “White” and “Black”, all combinations of races, and all who declined to answer.

**Table 1: Demographic Characteristics**

<b>Survey Respondents (N=420)</b>			<b>All Mothers (N=23,821)</b>
<b>Characteristic</b>	<b>Average</b>	<b>(Range)</b>	<b>Average</b>
Respondent age (98% mother)	30 years	(16-44)	28.2 years
Baby age	7.8 weeks	(4-24)	--
Number of children in home	1.88 kids	(1-9)	--
	<b>Number (n)</b>	<b>Percentage (%)</b>	<b>Percentage (%)</b>
Medicaid	128	30	45.6
Married	309	74	55.6
Focus child is only child in home	183	44	--
Race			
White	269	64	56.5
Black	85	20	34.4
Other	66	16	9.1
Ethnicity			
Hispanic	51	12	14.2
Not Hispanic	369	88	85.8
Education			
< High school	21	5	14.3
High school/GED	60	14	29.3
Some college	76	18	--
Tech graduate	25	6	--
4yr degree	123	29	--
> 4yr degree	115	27	--
Location of birth			
Urban	378	90	84.5
Rural	26	6	15.5
Home	7	2	--
Unknown	9	2	--

Ninety percent of births took place in a hospital in an urban county, while 6% took place in rural counties.<sup>5</sup> There were seven home births (2%). **Figure 1** illustrates the proportion of the hospital births from this sample that occurred in each county. The geographic distribution of survey respondents throughout the state is comparable to the geographic distribution of all births during this time period.

**Figure 1: Proportion of sample births, by county**



The parent survey also measured risk for postnatal depression,<sup>6</sup> level of fatigue,<sup>7</sup> breastfeeding practices, and the infant's sleep behavior. **Table 2** reports the number of respondents and percentage of respondents for each characteristic. Thirteen percent of the sample scored at risk for postnatal depression. These findings are in line with other research literature that has stated approximately 13%–19% of new mothers report depression during the postpartum period; a recent analysis of Georgia PRAMS respondents found that 15% of mothers reported postpartum depression symptoms.<sup>8,9,10</sup> The majority

<sup>5</sup> Urbanicity was determined according to OASIS: <http://oasis.state.ga.us/>

<sup>6</sup> Edinburgh Postnatal Depression Scale

<sup>7</sup> PROMIS Fatigue Scale SF-4a

<sup>8</sup> Banti S, Mauri M, Oppo A, et al. From the third month of pregnancy to 1 year postpartum. Prevalence, incidence, recurrence, and new onset of depression. Results from the perinatal depression-research & screening unit study. *Compr Psychiatry* 2011; 52: 343–351.

<sup>9</sup> Le Strat Y, Dubertret C and Le Foll B. Prevalence and correlates of major depressive episode in pregnant and postpartum women in the United States. *J Affect Disord* 2011; 135: 128–138.

<sup>10</sup> Salm Ward TC, Kanu FA, Wagner Robb S. Prevalence of stressful life events during pregnancy and its association with postpartum depressive symptoms. *Archives of Womens Mental Health* 2017; 20: 161-171.

of respondents indicated that their infant allows them to get a reasonable amount of sleep and characterized their infant’s sleeping ability as either “Very well” or “Well.” Ninety-two percent of respondents reported breastfeeding their infant for at least a short period of time, which is higher than national breastfeeding rates of 80% and Georgia rates of 70.4%.<sup>11,12</sup>

**Table 2: Maternal and Newborn Characteristics**

<b>Characteristic</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
Postnatal depression risk	54	13
Fatigue level (increasing order)		
1	66	16
2	247	61
3	50	12
4	41	10
How well does your baby sleep?		
Very well	145	36
Well	154	38
Somewhat well	97	24
Poorly	7	2
Very poorly	1	0
My baby lets me get a reasonable amount of sleep	333	83
How often does your baby cry?		
Never	4	1
Hardly ever	82	20
Sometimes	241	60
Often	66	16
Very often	9	2
Breastfeed	386	92

### **Information and Materials Received in the Hospital**

The Georgia Safe to Sleep Campaign aims to provide all mothers with safe infant sleep information and materials in the hospital. DPH provided hospitals with safe to sleep educational materials for parent education, including flip charts, posters, and other types of handouts. Additionally, all birthing hospitals in Georgia were provided with materials to distribute to mothers and newborns. Infant sleep gowns with “This Side Up” messaging and *Sleep Baby Safe and Sound* board books were to be distributed to all mothers and

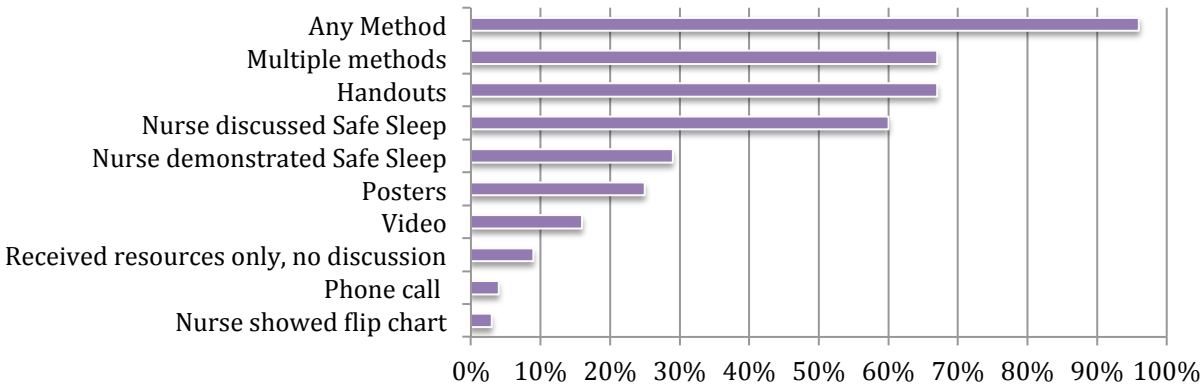
<sup>11</sup> CDC. (2017). Nutrition, physical activity and obesity data, trends and maps. [www.cdc.gov/nccdphp/DNPAO/index.html](http://www.cdc.gov/nccdphp/DNPAO/index.html). Accessed 23 January 2017.

<sup>12</sup> Anderson AK, Kanu FA, Mwaura MM, Salm Ward TC. Trends in breastfeeding and infant sleep practices in Georgia, Under review, submitted 1/27/17; *Maternal & Child Health Journal*.

newborns, while travel bassinets were to be given to all Medicaid families and uninsured/self-pay families.

**Almost all survey respondents (95%) reported receiving safe sleep information and/or materials in the hospital, and 91% characterized the information received as either “Somewhat helpful” or “Very helpful.”**<sup>13</sup> Additionally, 87% of respondents stated that they had received specific information on infant sleep position (back to sleep), and 73% of respondents reported receiving information about infant sleep location (room sharing not bed sharing). Eighty-two percent of parents indicated that they had shared Safe Sleep recommendations with others who care for their infant. **Figure 2** illustrates the methods through which parents reported receiving Safe Sleep information. The majority of respondents reported receiving information through more than one method.

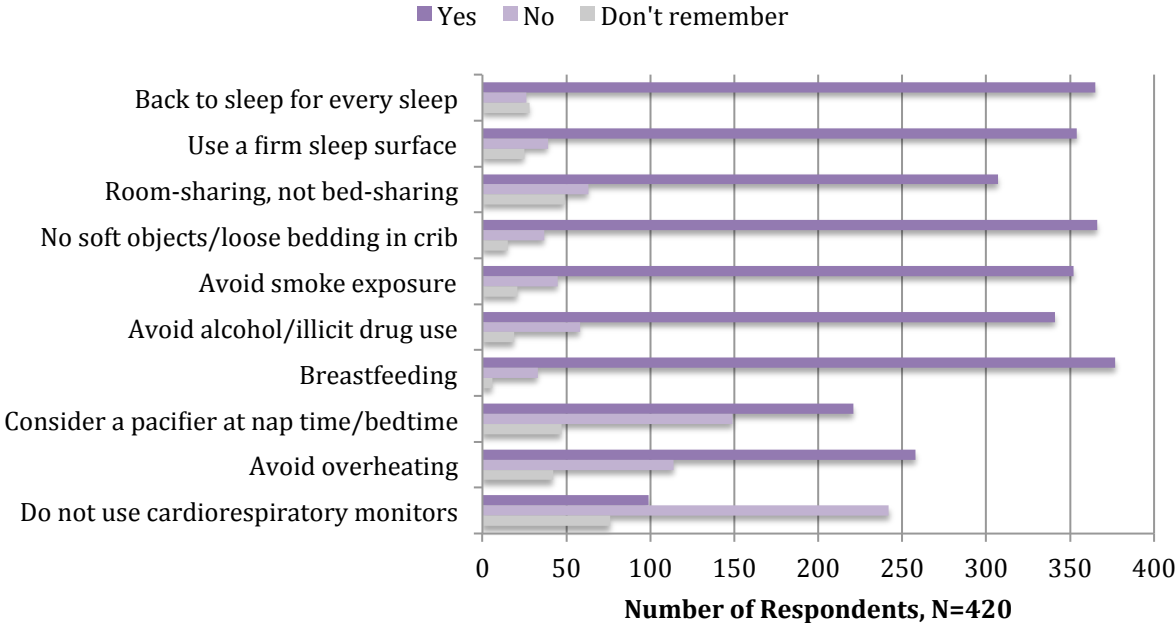
**Figure 2: Safe Sleep information methods in the hospital**



Survey respondents were asked about the specific safe infant sleep recommendations received at the hospital. **Figure 3** identifies each recommendation and reports the number of respondents who answered “Yes”, “No”, or “I don’t remember” when prompted about receiving the recommendation in the hospital.

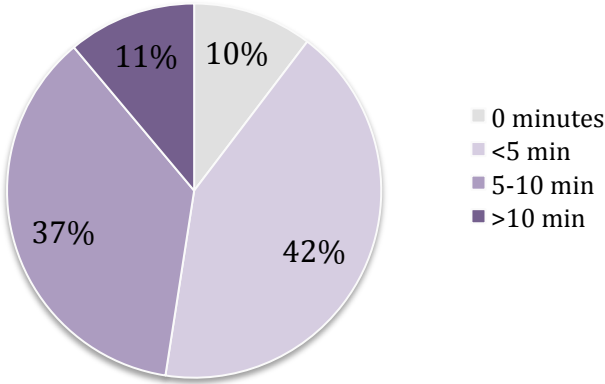
<sup>13</sup> Full analysis of information and materials received in the hospital can be found in the Appendix.

**Figure 3: “Did you receive the following safe sleep recommendations?”**



Of the survey respondents who answered the question “How much time did hospital staff spend talking to you *specifically* about safe sleep, such as where and how to put your baby to sleep?” (n=387), 90% reported that hospital staff spent time discussing safe sleep with them. **Figure 4** details the amount of time spent discussing safe sleep with hospital staff.

**Figure 4: Time spent discussing safe sleep with hospital staff**



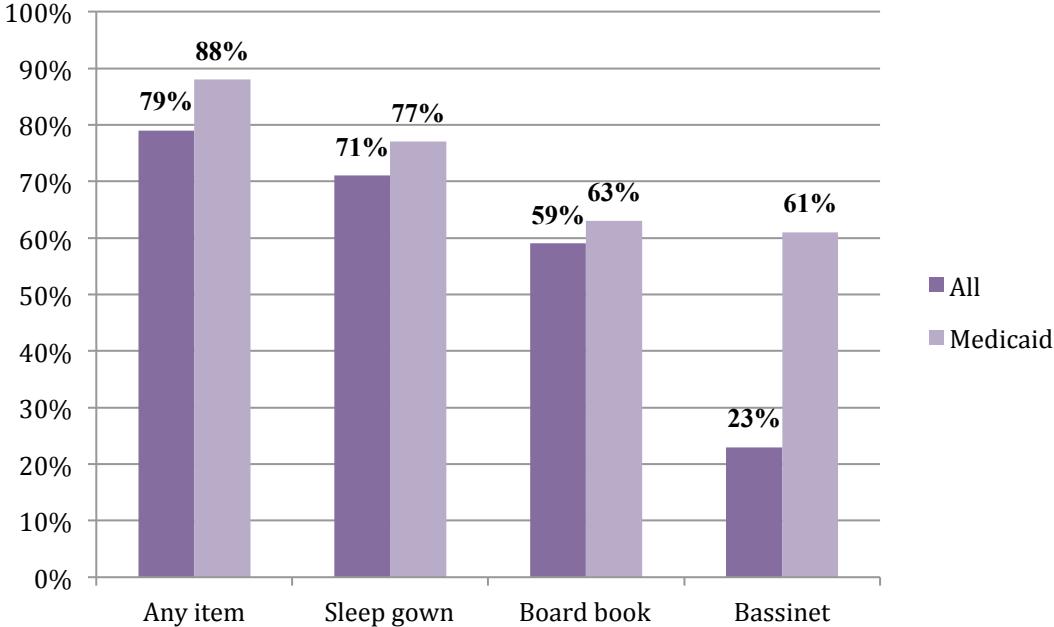
The parent survey asked respondents about the safe sleep items received from the hospitals, and 79% of all respondents (including 88% of Medicaid respondents) reported receiving at least one of the three Safe to Sleep Hospital Initiative items: the sleep gown, board book, or bassinet.<sup>14</sup> **Figure 5** shows the percentages of all respondents and of Medicaid respondents receiving each item. Medicaid respondents tended to be more likely

<sup>14</sup> Though all birthing hospitals in the state pledged to participate, implementation rates varied among hospitals.



to receive items from the hospital, and 61% of Medicaid respondents received a bassinet. Nineteen non-Medicaid individuals reported receiving a bassinet from the hospital; however, only four of these respondents self-identified their insurance status as “Private insurance.”

**Figure 5: Percentage of respondents receiving Safe to Sleep items**



**Outcomes: Safe Sleep Knowledge and Behavior**

The parent survey measured six safe sleep outcomes, including two knowledge outcomes and four behavior outcomes. All outcomes were binary, receiving either a “Yes” or “No” designation. Potential predictor variables for each outcome were identified from the survey.<sup>15</sup> The tables in this section report the odds ratios, p-values, and significance for select variables of interest, and the full logistic regression results for each outcome can be found in the Appendix.

**Safe Sleep Knowledge**

The parent survey asked two questions specific to safe sleep knowledge: 1) The recommended infant sleep position (back to sleep) and 2) the recommended sleep location (room share, not bed share).

**Ninety percent (90%) of all survey respondents identified the correct recommended sleep position for healthy babies as “On the back only,” and 85% of respondents identified the correct recommended sleep location for healthy babies as “In parents’ room, on a separate sleep surface.” Table 3 reports the characteristics significantly**

<sup>15</sup> Due to the high number of variables, all potential predictor variables for each outcome were subjected to Akaike information criterion (AIC) in order to select the highest quality logistic regression model for each outcome. Because AIC was used for each outcome, the models for each outcome may contain different variables and different sample sizes.

associated with parental knowledge. Medicaid status was not a significant predictor of safe infant sleep knowledge. Older parents were more likely to have knowledge of “Back to sleep,” as well as parents giving birth in hospitals in urban counties. Additionally, parents receiving board books tended to be more likely to know the recommended sleep position. Parents identifying as Black or Other were less likely than parents identifying as White to know the recommended sleep position. Parents who received information about room sharing in the hospital were more than twice as likely to know the recommendation for room sharing, and survey respondents who were married tended to be more likely to know this recommendation.

**Table 3: Knowledge of Safe Sleep recommendations**

	Odds	p value	Sig <sup>a</sup>
<b>Knowledge (Back to sleep)</b>			
<b>90%, n=399</b>			
Parent age	1.93	0.001	***
Board book	2.05	0.055	.
Urban	3.29	0.028	*
Race:Black	.26	0.003	**
Race:Other	.36	0.033	*
<b>Knowledge (Room share)</b>			
<b>85%, n=410</b>			
Received info - room share	2.27	0.004	**
Married	1.73	0.083	.

NOTES: Survey items with low response rates were dropped from the regression analysis in order to retain a reasonable sample size. All ordinal variables are coded in increasing order.

<sup>a</sup> Statistical significance levels are indicated as follows: . = 10%; \* = 5%; \*\* = 1%; \*\*\* = 0.1%

### Safe Sleep Behavior

The parent survey asked several questions specific to safe sleep behavior, and this analysis examines four infant sleep behaviors among respondents: 1) Infant sleep position (Back to sleep); 2) Whether the infant usually sleeps alone in his or her crib (Baby sleeps alone); 3) If the crib is in the parents’ room (Room sharing); and 4) Whether the infant usually sleeps in an adult bed (Baby sleeps in adult bed). **Table 4** reports the characteristics associated with each safe sleep behavior. The first three behaviors are positive safe sleep behaviors, while the fourth is unsafe, negative behavior. Medicaid status was not a significant predictor of safe infant sleep practices or unsafe infant sleep behavior.

#### Behavior: Infant sleep position

When selecting the position in which they most often put their infant to sleep, 89% of respondents follow recommendations by laying their infant down to sleep on his or her back. There is a high correlation between the knowledge of the safe sleep recommendation and the practice of “back to sleep.” Parents who put their infant to sleep in a crib (as opposed to an adult bed) are about four times more likely to place their infant on his or her back. Additionally, parents whose infants sleep better are significantly more likely to practice “back to sleep.” Parents who identify as Black are less likely to place their infant on his or her back than parents who identify as White.

### Behavior: Baby sleeps alone

Seventy-seven (77%) percent of respondents indicated that they put their infant to sleep alone in his or her crib either “Often” or “Always.” Babies who cried more often were less likely to be put to sleep alone. Parents who received information on back to sleep and on room sharing in the hospital were significantly more likely to put their infant to sleep alone.

### Behavior: Room share

For respondents who indicated that their infant slept alone at least occasionally, 76% indicated that the crib was in the parent’s room. **Parents who received a bassinet in the hospital were almost four times more likely to room share than parents who did not receive a bassinet.** Additionally, parents who practiced room sharing were also more likely to be older, breastfeed, possess knowledge about room sharing recommendations, and put their infant to sleep in a crib. Parents who reported room sharing also reported an increased risk for postnatal depression and were less likely to have an infant that allowed them to get a reasonable amount of sleep.

### Behavior: Baby sleeps in adult bed

When asked where their new baby usually slept in the last two weeks, 24% of respondents indicated that their infant usually slept in an adult bed. **Parents who received any information or materials from the hospital were almost 90% less likely to put their infant to sleep in an adult bed than parents who did not receive information or materials from the hospital.** Parents with higher levels of education were also less likely to put their infant to sleep in an adult bed. Parents who reported breastfeeding also tended to be more likely to allow their infant to sleep in an adult bed, though this was not significant at the 5% level (p-value = 0.08). Parents identifying as Black or Other were significantly more likely to place their infant to sleep in an adult bed than parents who identified as White, with parents identifying as Other being almost six times more likely to place their infant to sleep in an adult bed.

**Table 4: Safe Sleep behavior**

	Odds	p value	Sig <sup>a</sup>
<b>Positive behavior</b>			
<b>Behavior (Back to sleep)</b>			
<b>89%, n=398</b>			
Knowledge - back to sleep	3.71	0.002	**
Baby sleeps in a crib	4.26	0.001	***
Baby sleeps well	1.73	0.013	*
Race:Black	0.32	0.004	**
Race: Other	0.86	0.768	
<b>Behavior (Baby sleeps alone)</b>			
<b>77%, n=392</b>			
Received info - back to sleep	2.29	0.020	*
Received info - room share	1.86	0.027	*
How often does baby cry?	.61	0.006	**

<b>Behavior (Room share)</b>			
<b>76%, n=389</b>			
Parent age	1.42	0.021	*
Received bassinet	3.74	0.005	**
Breastfeed	2.89	0.056	.
Knowledge - room share	4.71	0.000	***
Risk for postnatal depression	3.03	0.031	*
Baby lets parent get reasonable sleep	.25	0.003	**
Baby sleeps in a crib	2.53	0.032	*
<b>Negative behavior</b>			
<b>Behavior (Baby sleeps in adult bed)</b>			
<b>24%, n=381</b>			
Education level	.74	0.003	**
Receive any info/materials	.13	0.000	***
Breastfeed	2.75	0.076	.
Race:Black	2.97	0.002	**
Race:Other	5.93	0.000	***

NOTES: Survey items with low response rates were dropped from the regression analysis in order to retain a reasonable sample size. All ordinal variables are coded in increasing order.

<sup>a</sup> Statistical significance levels are indicated as follows: . = 10%; \* = 5%; \*\* = 1%; \*\*\* = 0.1%

### Medicaid Respondents

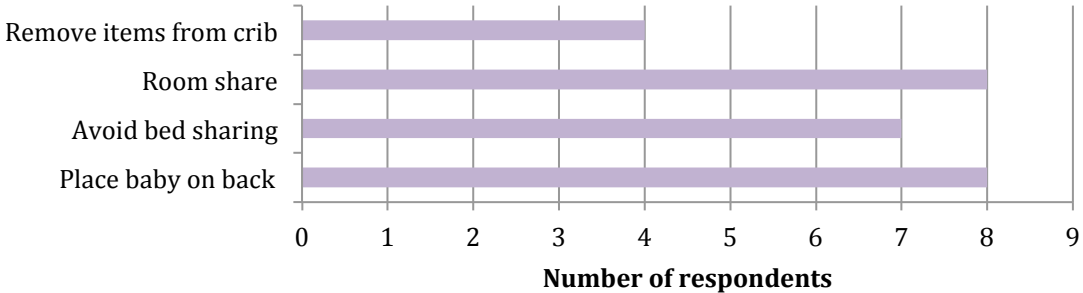
A sub-analysis of Medicaid respondents was conducted to determine if receiving hospital items, especially the bassinet, was associated with safe sleep practices. **When examining infant sleep behaviors among Medicaid respondents, parents who received an infant sleep gown were five times more likely to place their infant on his or her back to sleep**, though this finding was not statistically significant at the 5% level (p-value = 0.062). Medicaid parents who reported breastfeeding were 17 times more likely to report placing their infant on his or her back to sleep (p-value = 0.020). When analyzing infant sleep location, **Medicaid parents receiving bassinets were 84% less likely to put their infant to sleep in an adult bed** (p-value = 0.002). Conversely, Medicaid respondents were significantly *more* likely to sleep with their infant in an adult bed if the focus infant was the only child in the home (p-value = 0.023) and if they reported lower scores for how well their infant slept (p-value = 0.001).

### Additional Comments from Parents

Survey comments about the materials and information received were very positive, with participants expressing particular appreciation for the sleep gown and detailing instances in which they informed other caretakers about safe sleep using the hospital materials. Twenty-eight respondents gave examples of how they had improved their infant sleep behavior as a result of the Safe Sleep Hospital Initiative. **Figure 6** summarizes the most common safe sleep behaviors learned. Eight responses included learning to place their infant on his or her back to sleep, and seven parents indicated that they had planned to

bed-share but had learned from hospital personnel that the baby should sleep alone. Eight respondents mentioned learning about room sharing for the first year, and four responses revealed that parents learned to remove items like stuffed animals or bumper pads from cribs.

**Figure 6: Safe Sleep Behaviors Learned from Hospitals**



Approximately 16% of respondents also provided informative feedback on their personal safe sleep beliefs and behaviors, with most respondents describing safe infant sleep behavior and appreciation for the hospital initiative. A minority of these respondents used the survey comment section to give explanations for not practicing “back to sleep,” with the most common reasons being reflux and that their infant only sleeps well on his or her stomach. A small number of parents also used this section to justify bed sharing, citing the convenience of having the baby near when he or she cries at night. A sample of comments received are available in the Appendix.

**Limitations of the Evaluation**

The sample size of the parent survey was 420 respondents, which represented approximately 2% of the total births during the survey period. While this sample is relatively representative geographically and ethnically, respondents were markedly more educated than the general population of Georgia.<sup>16</sup> Additionally, Medicaid-covered births accounted for nearly half of total births during the survey period, while only 30% of survey respondents were Medicaid recipients. Thus, the results of this survey may not be generalizable to the parents of all newborns in Georgia during the study period.

An additional limitation of this evaluation is its cross-sectional design. Because baseline knowledge and behaviors were not surveyed in a pre-test, it is not possible to assess knowledge or behavior *change* resulting from the Georgia Safe to Sleep Hospital Initiative. The conclusions of the regression analyses performed in this evaluation are limited to assessing the *association* of the initiative’s components to the outcomes of interest; no outcomes can be directly attributed to the initiative.

While the Georgia Safe to Sleep Hospital Initiative focused on educating ALL parents in Georgia, we know that some sub-groups are at higher risk for engaging in unsafe sleep practices and for experiencing sleep-related infant deaths. For example, analyses of Georgia

<sup>16</sup> American Community Survey, US Census, 2015.

PRAMS data found higher rates of unsafe sleep practices among mothers who: identified as Black or other race or ethnicity (compared to White), were younger, had lower education, and received Medicaid.<sup>17</sup> DPH reported that 68% of sleep-related infant deaths in 2010-2013 were Medicaid recipients, and the Child Fatality Review Panel found higher proportions of sleep-related infant deaths among infants who were: Black (compared to White), younger, and had younger parents.<sup>18</sup> The purpose of this evaluation was to sample all parents; therefore our respondents may not accurately represent sub-groups at highest risk for sleep-related infant deaths.

## **Conclusions and Recommendations**

The results of the parent survey are encouraging, as the vast majority of respondents reported knowledge of safe infant sleep and the practice of safe sleep behaviors. Receiving information about room sharing in the hospital was strongly correlated with both knowledge and behaviors regarding safe infant sleep location. Additionally, receiving the bassinet was significantly correlated with room sharing in the sample population and with avoiding bed sharing in the Medicaid population.

The survey findings also identified barriers to the practice of safe sleep behaviors. In this sample, babies who cried more often were less likely to be placed to sleep alone in his or her crib. This finding fits with previous literature, which identified soothing a crying infant as a common reason for bed sharing.<sup>19</sup> Previous research has found mixed results regarding the association between breastfeeding and bed sharing; however, a systematic review found that the most commonly cited reason for bed sharing was to facilitate breastfeeding.<sup>20</sup> In this sample, parents who room shared reported an increased risk for postnatal depression and were less likely to have an infant who allowed them to get a reasonable amount of sleep. Some studies have suggested a connection between sleep behaviors and postnatal depression,<sup>21</sup> while others found no significant relationship.<sup>22,23</sup> Among a recent sample of Georgia PRAMS respondents, no significant relationship was found between sleep behaviors (bed-sharing) and depressive symptoms.<sup>24</sup> Paul et al found that room-sharing was associated with less reported sleep for infants and more likelihood

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<sup>17</sup> Georgia Department of Public Health. Safe sleep fact sheet, Georgia, 2004-2013. 2016. [https://dph.georgia.gov/sites/dph.georgia.gov/files/related\\_files/site\\_page/GA%20PRAMS\\_Safe%20Sleep\\_DataBased\\_FactSheet.pdf](https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/GA%20PRAMS_Safe%20Sleep_DataBased_FactSheet.pdf) Accessed 27 June 2017.

<sup>18</sup> Georgia Child Fatality Review Panel. 2014 Annual Report. 2016. [https://gbi.georgia.gov/sites/gbi.georgia.gov/files/related\\_files/site\\_page/2014%20CFR%20Annual%20Report.pdf](https://gbi.georgia.gov/sites/gbi.georgia.gov/files/related_files/site_page/2014%20CFR%20Annual%20Report.pdf) Accessed 27 June 2017.

<sup>19</sup> Salm Ward TC. Reasons for mother-infant bed-sharing: A systematic narrative synthesis of the literature and implications for future research. *Matern Child Health J* 2015; 19: 675-690.

<sup>20</sup> Salm Ward TC. Reasons for mother-infant bed-sharing: A systematic narrative synthesis of the literature and implications for future research. *Matern Child Health J* 2015; 19: 675-690.

<sup>21</sup> Brenner RA, Simons-Morton BG, Bhaskar B, Revenis M, Das A, Clemens JD. Infant-parent bed sharing in an inner-city population. *Arch Pediatr Adolesc Med* 2003; 157: 33-39.

<sup>22</sup> Broussard DL, Sappenfield WM, Goodman DA. The Black and White of infant back sleeping and infant bed sharing in Florida, 2004-2005. *Matern Child Health J* 2012; 16: 713-724.

<sup>23</sup> Salm Ward TC, Ngui EM. Factors associated with bed-sharing for African-American and White mothers in Wisconsin. *Matern Child Health J* 2015; 19: 720-732.

<sup>24</sup> Salm Ward TC, Robb SW, Kanu F. Prevalence and characteristics of bed-sharing among Black and White infants in Georgia, 2004-2011. *Matern Child Health J* 2016; 20: 347-362.

to bed-share throughout the night.<sup>25</sup> In our sample, parents who identified as Black or Other were more likely to place their infant to sleep in an adult bed; these results are also corroborated by previous research.<sup>26,27</sup>

In order to overcome the limitations listed, we recommend an additional evaluation with a pre/post design in order to capture knowledge and behavior changes attributable to the Georgia Safe Sleep Campaign. A pre-survey should be administered to the parent before the focus infant's birth, and a post-survey should be given while the focus infant is between one and six months of age. Additionally, efforts should be made to ensure a robust, representative survey sample. Incentives or different survey modalities could be considered to increase sample size, especially among Medicaid recipients who may not have access to web-based surveys.

Future analyses of the Georgia Safe to Sleep Hospital initiative could further explore parental beliefs and practices regarding safe infant sleep through targeted focus groups. Detailed feedback on parents' experience with the campaign could also be recorded, such as receptiveness to the messaging or barriers associated with receiving safe sleep education in the hospital. Targeted focus groups could also help determine whether the barriers identified in this sample are also present among sub-groups at higher risk for engaging in unsafe sleep practices. It is also possible that detailed monitoring of infant death data could provide evidence of effectiveness, though attribution of any decrease in infant deaths to the Georgia Safe to Sleep Campaign is unlikely to be statistically established.

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<sup>25</sup> Paul IM, Hohman EE, Loken E, Savage JS, Anzman-Frasca S, Carper P, Marini ME, Birch LL. Mother-infant room-sharing and sleep outcomes in the INSIGHT Study. *Pediatrics* 2017.

<sup>26</sup> Salm Ward TC. Reasons for mother-infant bed-sharing: A systematic narrative synthesis of the literature and implications for future research. *Matern Child Health J* 2015; 19: 675-690.

<sup>27</sup> Salm Ward TC, Doering JJ. Application of a socio-ecological model to mother-infant bed-sharing. *Health Educ Behav* 2014; 41: 577-589.

**Appendix Table 1: Full Analysis of Information and Materials Received**

	<b>Number (n)</b>	<b>Percentage (%)</b>
Received any information	401	95
Info -- Back to sleep	365	87
Info -- Room share, not bed share	307	73
How information was received		
No information received	15	4
Received resources, but no discussion	38	9
Multiple methods	281	67
Video	68	16
Handouts	281	67
Posters	105	25
Nurse demonstrated Safe Sleep	123	29
Nurse talked to me	254	60
Nurse showed flip chart	12	3
I received a phone call	17	4
Time talking about Safe Sleep		
No one talked to me	40	10
<5min	163	42
5-10min	141	36
>10min	43	11
The information was helpful	353	91
Shared information with others	343	82
Received any item	331	79
Sleep gown	297	71
Sleep gown (Medicaid only)	99	77
Board book	247	59
Board book (Medicaid only)	81	63
Bassinet	96	23
Bassinet (Medicaid only)	78	61



**Appendix Table 2: Full Sample Logistic Regression Results**

The results of the logistic regression models for each of the six outcome variables are represented in the columns.

Predictor variables	Knowledge (Back to sleep)		Knowledge (Room share)		Behavior (Back to sleep)		Behavior (Baby sleeps alone)		Behavior (Room share)		Behavior (Baby sleeps in adult bed)	
	n=399		n=410		n=398		n=392		n=389		n=381	
Medicaid status											0.58	
Parent age <sup>a</sup>	1.93	***	0.81						1.42	*		
Race												
White	(ref)		(ref)		(ref)		(ref)		(ref)		(ref)	
Black	0.26	**			0.32		**				2.97	
Other	0.36	*			0.86						5.93	
Ethnicity												
Education level <sup>a</sup>									0.83		.	0.74
Married	0.45	.	1.73		.	1.67		.				
Focus infant is only child in home												
Hospital location (urban)	3.29	*										
Received any info									4.66		.	0.13
Receive info-back to sleep							2.29		*	0.21	*	***
Receive info-room share			2.27		**	1.86		*				
Received any item												
Received sleep gown												
Received board book	2.05	.							1.52			
Received bassinet	0.50								3.74		**	
Postnatal depression risk	na		na						3.03		*	
Fatigue level <sup>a</sup>	na		na						0.63		*	
How well does baby sleep <sup>a</sup>	na		na		1.73	*						
My baby lets me get reasonable sleep	na		na		0.36	.			0.25		**	
How often does baby cry <sup>a</sup>	na		na				0.61		**			1.43
Breastfeed	na		na						2.89		.	2.75

Knowledge (Back to sleep)	X	na	3.71	**	0.46		0.43	**	
Knowledge (Room share)	na	X			0.42	*	4.71	*	
Behavior (Back to sleep)	na	na	X						0.49
Behavior (Baby sleeps alone)	na	na			X		na		
Behavior (Room share)	na	na	na		na		X		
Behavior (Baby sleeps in adult bed)	na	na							X
Behavior (Baby sleeps in crib)	na	na	4.26	***			2.53	*	na

Notes: All predictor variables are listed in the first column. All tested outcomes are listed in the top row. The table reports odds ratios of all variables selected into each model using AIC model selection. Variables with blanks were not selected into the model, and na signifies that the variable was not considered for the model. Significance levels: blank = not significant; . = 10%; \* = 5%; \*\* = 1%; \*\*\* = 0.1%.

<sup>a</sup> All ordinal variables are coded in increasing order. Positive correlation signifies: Parent age (older); Education level (higher); Fatigue level (higher); How well does baby sleep (better); and How often does baby cry (more).

**Appendix Table 3: Medicaid Subset Logistic Regression Results**

The results of the logistic regression models for each of the five outcome variables are represented in the columns.

Predictor variables	Knowledge (Back to sleep)	Knowledge (Room share)	Behavior (Back to sleep)	Behavior (Baby sleeps alone)	Behavior (Baby sleeps in adult bed)
	n=128	n=127	n=116	n=121	n=120
Parent age <sup>a</sup>	1.39		5.64 **		
Race					
White	(ref)	(ref)	(ref)	(ref)	(ref)
Black			0.03 **	0.24 **	5.87 **
Other			0.22	0.23 *	5.93 *
Ethnicity					
Education level <sup>a</sup>		0.75	0.33 **		
Married		3.00	0.06 **		
Focus infant is only child in home				0.30 *	3.32 *
Hospital location (urban)					
Received any info					
Receive info-back to sleep	2.72				
Receive info-room share		7.03 ** *			
Received any item				3.10	3.74
Received sleep gown			5.16		
Received board book					
Received bassinet					0.16 **
Postnatal depression risk	na	na			
Fatigue level <sup>a</sup>	na	na	0.49		
How well does baby sleep <sup>a</sup>	na	na	4.48 *	1.72	0.33 **
My baby lets me get reasonable sleep	na	na			
How often does baby cry <sup>a</sup>	na	na	2.44		
Breastfeed	na	na	17.29 *		
Knowledge (Back to sleep)	X	na	8.41 *		

Knowledge (Room share)	na	X			
Behavior (Back to sleep)	na	na	X		
Behavior (Baby sleeps alone)	na	na		X	
Behavior (Room share)	na	na	na	na	
Behavior (Baby sleeps in adult bed)	na	na	4.44		X
Behavior (Baby sleeps in crib)	na	na			na

Notes: All predictor variables are listed in the first column. All tested outcomes are listed in the top row (low sample size prevented modeling the outcome Behavior--Room share). The table reports odds ratios of all variables selected into each model using AIC model selection. Variables with blanks were not selected into the model, and na signifies that the variable was not considered for the model. All ordinal variables are coded in increasing order. Significance levels: blank = not significant; . = 10%; \* = 5%; \*\* = 1%; \*\*\* = 0.1%.

<sup>a</sup> All ordinal variables are coded in increasing order. Positive correlation signifies: Parent age (older); Education level (higher); Fatigue level (higher); How well does baby sleep (better); and How often does baby cry (more).

## APPENDIX: Safe to Sleep Infant Sleep Survey, OPEN-ENDED QUESTIONS

The survey asked if parents changed their plans or practices for their baby's sleep based on what they learned from the hospital.

### Affirmative responses included:

"I PREVIOUSLY THOUGHT THE SAFEST SLEEP POSITION FOR BABIES WAS THEIR SIDE. HOWEVER, AFTER ADVISEMENT FROM HOSPITAL, I POSITION MY BABY ON HIS BACK FOR SLEEPING."

"AT THE HOSPITAL I LEARNED HOW TO SWADDLE AND NOW I DO THAT AND PLACE MY SON ON HIS BACK AND IT WORKS GREAT! I WANT MY BABY TO SLEEP SAFE SO I DO MY BEST TO SWADDLE HIM AND PLACE HIM ON HIS BACK EVERY TIME!"

### Dissenting responses include:

"I STILL ALLOW BABY TO SLEEP PRONE BECAUSE I BELIEVE SIDS IS CAUSED BY NERVE GASES RELEASED BY CHEMICALS IN THE MATTRESS."

"I BED SHARED A FEW TIMES OUT OF EXHAUSTION."

The survey asked the question: What else would you like for us to know about your baby's sleep or about the information and items you received from the hospital?

### Many responses expressed gratitude for the information and/or items:

"WE LOVED THE SAFE SLEEP GOWN THAT WE RECEIVED AT THE HOSPITAL. NOT ONLY WAS IT HELPFUL IN REMINDING US THAT SLEEPING ON HER BACK IS THE MOST SAFE, BUT IT WAS SUCH A CUTE OUTFIT - WE LOVED THE DESIGN! EVEN THOUGH WE HAD SO MANY OUTFITS FOR HER, IT WAS ONE OF OUR FAVORITE GOWNS TO PUT HER TO SLEEP IN AFTER WE CAME HOME FROM THE HOSPITAL :) "

"I REALLY APPRECIATED THE TRAVEL BASSINET AND THE GOWN. WE HAVENT USED THE BASSINET VERY OFTEN BECAUSE MY BABY HAS A CRIB HOWEVER SOME OF MY FRIENDS BABIES EXCLUSIVELY SLEEP IN THEIR TRAVEL BASSINET BECAUSE THEY DONT HAVE CRIBS SO IT REALLY HELPED THEM!"

"Loved the gown. It was adorable and got the message across perfectly."

"i received a book called 'back to sleep' and my older daughters enjoy reading it to the baby"

"THE HOSPITAL RECOMMENDED THAT I WATCH ABOUT VIDEO BEFORE BEING DISCHARGED. THE VIDEO WAS HELPFUL. I FEEL ALL HOSPITALS SHOULD ENCOURAGE PARENTS TO WATCH THE VIDEO TO BECOME AWARE OF HOW TO CARE FOR A BABY."

"THE INFORMATION AND ITEMS PROVIDED WERE AWESOME AND VERY ENCOURAGING...SAFE SLEEP EDUCATION IS EXTREMELY IMPORTANT ... ESPECIALLY FOR FIRST TIME MOMS WHO MAY HAVE NEVER BEEN EDUCATED ON THE BEST WAYS TO REDUCE THE POSSIBILITIES OF SIDS. I ENCOURAGE ALL THAT THE STATE OF GEORGIA IS DOING TO EDUCATE PARENTS ON HOW TO KEEP THEIR PRECIOUS ONES SAFE!!!"

### Some gave suggestions for further information they wish they had received:

"IT WOULD BE HELPFUL TO HAVE MORE INFORMATION AT THE HOSPITAL ABOUT HOW TO GET BABIES TO SLEEP ON THEIR BACKS AND STAY ASLEEP - FOR EXAMPLE USING SWADDLES TO KEEP THE STARTLE REFLEX FROM WAKING THEM UP."

"MAKE SURE DOCTORS ARE GIVING OUT THE INFORMATION ABOUT CLASSES AND/OR INSTRUCTIONS ON CARING FOR A NEW BORN. ONCE YOU HAVE THE BABY.. YOU WILL BE IN PANIC MODE AND NOT KNOW HOW TO TAKE CARE OF THE BABY. THE PARENTS/CARE GIVER NEED THE INFORMATION BEFORE THE BABY IS BORN."

### Other respondents expressed reasons for not adhering to "Back to Sleep":

"YES I WOULD LIKE TO SHARE MY BABY LIKES TO SLEEP ON ITS STOMACH AND SIDE. I TRIED SO MANY TIMES WITH THE BACK AND ALL I GOT WAS CRIES EVERLASTING UNTIL I PICKED UP OR PUT ON STOMACH. I'M GUESSING EVERY BABY IS DIFFERENT I THINK IN DUE TIME IT BE ON ITS"

"THE BABY AT 5 WEEKS STILL WILL NOT SLEEP IN HER CRIB ALONE. SHE WAKES UP ALMOST IMMEDIATELY AND DOES NOT CRY HERSELF BACK TO SLEEP, SHE SIMPLY KEEPS CRYING. SHE SLEEPS BEST IN MY ARMS OR ON MY CHEST AND HAS SINCE THE TIME OF HER BIRTH."

"I FIND THIS WHOLE SLEEP POSITION THING OVER KILL. THEY HAVE CHANGED THE RECOMMENDED SLEEP POSITION SEVERAL TIMES."

"He sleeps on his stomach. When he slept on his back he wouldn't sleep good nor for very long at all."

If you had not received the travel bassinet from the hospital, where would your baby have slept?

MADE A PALLET

TRAVELING- CAR SEAT / HOME-CRIB

WITH ME

IN BED WITH YOU UNTIL COULD GET ONE

IN HIS CRIB OR COSLEEP WITH US

EN CUNA Y EN MI CAMA (CRADLE AND IN MY BED)

CAR SEAT

BABY BED

BABY SLEEPS IN PACK AND PLAY NEXT TO MY BED

CAMA (BED)

IN THE SWING WHEN IN LIVING ROOM OR CRIB IN ROOM

PACK N PLAY

WE WOULD PROBABLY TAKE THE PACK 'N' PLAY WITH US EVERYWHERE

ROCK N PLAY

I ONLY USE IT WHEN SHE VISITS FAMILY DURING THE DAY. (EXAMPLE: MY MOM)

GREAT FOR USE IN ANY ROOM, BUT MOST USE IN LIVING ROOM. OTHERWISE WOULD BE ON COUCH  
BESIDE ME OR IN BOUNCER