The Influence of Grandmothers and Other Senior Caregivers on Sleep Position Used by African American Infants

Louise Flick, RN, DPH; Caroline Vemulapalli; Barbara B. Stulac, RN; James S. Kemp, MD

Objectives: To describe beliefs about infant sleep position among African American grandmothers and other older caregivers (senior caregivers [SCGs]) and to measure the incremental effect on the rates of prone sleep after educating a group of African American SCGs.

Design: Survey of sleep practices and beliefs. Randomized, controlled trial of a teaching intervention.

Setting: Managed care prenatal clinic for normal risk obstetrics patients.

Participants: Low-income pregnant women, self-identified as African American. An SCG is an older family member or friend to whom they would go for advice about routine child care. Pregnant women randomly assigned to the control group (educated about safe sleep practices) or the experimental group (education for both pregnant women and their SCG).

Intervention: During the third trimester, 2 teaching sessions for pregnant women (both control and experimental groups) and for the experimental group’s SCGs. One-on-one teaching emphasizing that infants should sleep supine.

Main Outcome Measures: During the third trimester, description of rate of preference for prone sleep for infants among pregnant women and SCGs. Effects of teaching SCGs on (1) SCGs’ postnatal beliefs about sleep position as a means to reduce the risk of sudden infant death syndrome, and (2) the eventual rate of prone sleeping among study infants.

Results: One hundred twenty-five women were in the control group; 98 pregnant women and SCG pairs were in the experimental group. Senior caregivers were 47.1 ± 12.4 years old (mean ± SD). Most were grandmothers (either maternal, 72.5%, or paternal, 14.3%) or aunts or sisters (10.2%). No differences were noted in the prenatal rates of the prone preference (controls, 36.3%; experimental group, 35.7%; and SCGs, 34.7%). Teaching SCGs did not increase the rate of the usual prone sleep in the experimental vs the control group (13.3% vs 17.3%, \( \chi^2 = 0.59, P = .44, 95\% \text{ confidence interval for difference from } -5.8\% \text{ to } +13.8\% \)). After the teaching and during the pregnancy, the SCGs became less worried that the infant was susceptible to sudden infant death syndrome (\( \chi^2 = 16.6, P = .003 \)) or likely to die of sudden infant death syndrome (\( \chi^2 = 24.7, P < .001 \)). Their concerns about sudden infant death syndrome were significantly less postnatally, in particular when the infant was placed supine (\( \chi^2 = 19.4, P < .001 \)).

Conclusions: Most African American women and SCGs endorsed the supine sleeping position for infants. Among a group of African American infants, prenatal teaching of their grandmothers and other SCGs did not have a statistically significant incremental effect on the rates of the usual prone sleeping position. Contrary to our starting hypothesis, the SCGs of pregnant women who receive prenatal care seemed responsive to messages about supine sleeping. The Back-to-Sleep message should be delivered prenatally, but special prenatal interventions should attempt to reach women who do not receive prenatal care and SCGs who persist in their opposition to the supine sleeping position.

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The disparity in rates of sudden infant death syndrome (SIDS) between African Americans and whites in the United States continues to increase, despite the worldwide success of interventions to increase supine sleep for infants. In the United States infants are more likely to be placed prone if they are African American and, in one study, living with a grandmother increased the rate of prone sleep. In this country when a grandmother cares for an infant, either as the primary caretaker or as part of a 3-generation household, it is much more likely to occur in an African American family.

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PARTICIPANTS AND METHODS

OUTLINE OF THE STUDY

This study was carried out in a Medicaid, managed care, obstetrics clinic (Barnes-Jewish Women’s Health Center, St Louis, Mo). All pregnant women recruited for the study were self-identified as African American. They were recruited by one of us (C.V. or B.B.S.) early in the third trimester of their pregnancy, while waiting before a routine obstetrics visit. The women were attending the normal-risk clinic; none had antecedent diabetes mellitus, antecedent hypertension, intrauterine growth retardation, or other important complications of pregnancy.

The pregnant women were first asked if there was a person (SCGs) at least 5 years older than them to whom they would go for child care advice. We were interested in studying the effect of educating older advisors (SCGs). We required that the SCG identified be at least 5 years older because of the possibility that age peers, including sisters, would be the primary source for advice.

The pregnant women were then randomized to a control or an experimental group. The control group was taught about safe sleep practices, as described in Table 1. The experimental group and their SCGs were also taught the same material. This design allowed us to measure the incremental effect of teaching SCGs.

At recruitment the pregnant women were administered the prenatal sleep practices questionnaire by one of us (B.B.S.) and filled out the health beliefs questionnaire themselves. Both questionnaires are described below.

At their next prenatal visit, the mothers were taught 4 points of information; the first 3 concerned using firm bedding and avoiding pillows and comforters, proven ways to reduce the risk of sudden infant death syndrome (SIDS). The fourth point was “The baby you care for [your baby] should sleep on his or her back.” A drawing of an African American infant asleep supine was also provided on a handout listing the 4 points of information.

At this time early in the third trimester, either in conjunction with a clinic visit or in their homes, the SCGs were also administered the sleep practices questionnaire by one of us (B.B.S.). The SCGs filled out the health beliefs questionnaires themselves. The SCGs were then taught the same 4 points of information in person by one of us (C.V.), and the same handout was distributed. After the handout was provided, the mothers and SCGs were encouraged to ask questions.

One of us (C.V.), an African American woman in her mid-30s, did the prenatal teaching about safe bedding and the supine sleep position. During the first month of recruitment, side sleeping was also offered as an option. Because information became available that side sleeping was associated with much more risk for sudden death than supine sleep, in July 1996 supine sleep became our only recommendation. If mothers or SCGs asked about side sleeping, our response was that it was better than prone, but that we recommend the back (supine) position for sleep. For clarity and consistency, we have used the words “prone” and “supine” in this report. However, when talking to mothers and SCGs, use of the more idiomatic phrases “on his or her stomach” and “on his or her back” was customary.

Teaching of both mothers and SCGs was repeated by one of us (C.V.) near 36 weeks’ gestation, either in the clinic, or, for the SCGs, by telephone. Questions, if any, were addressed.

Postnatally, the SCGs filled out the beliefs questionnaire at home or in the clinic. Postnatally, only the mothers answered the sleep practices questions, and these were again administered by one of us (B.B.S.), usually in the clinic but sometimes by telephone. When sleep practice questionnaires were administered, they were given by Ms Stulac, and not by Ms Vemulapalli, so that the subjects were not motivated to respond with answers that they did not agree with just to please their “teacher.”

Informed consent was obtained from both mothers and SCGs before administering the questionnaires. The protocols were approved by the institutional review boards of both Washington University and St Louis University.

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RESULTS

PARTICIPANTS

Between June 1, 1996, and March 31, 1998, 312 pregnant women were approached in the prenatal clinic. Thirty refused to participate; another 7 could not be enrolled because they had not planned to consult an SCG for advice. Of the remaining 275 who agreed to participate and who had planned to consult an SCG, 268 women underwent the initial interview. To be considered as enrolled for inclusion in subsequent detailed analyses, all mothers and SCGs had to receive at least 1 of the 2 planned educational sessions.

The initial 268 women recruited were randomized into 2 equal groups. Of these 268, 20 did not return for
teaching, yielding 125 control subjects and 123 experimental subjects (total, 248 subjects). Of the experimental subjects who received the safe sleep education, 25 were eventually unable to recruit a trusted advisor (SCG) to receive the education along with them. These 25 were excluded from statistical comparisons of beliefs and postnatal sleep practices, yielding an experimental sample for these analyses of 98 mother and SCG pairs and a control sample of 125.

The 25 pregnant women in the experimental group who were unable to recruit an SCG were similar to those who had a participating SCG. There were no statistically significant differences in length of gestation when recruited to the study, the mother's age, mother's educational level, number of children, or mother's planned infant sleep positions. However, mothers who were able to recruit SCGs were more likely to have received both teaching sessions (91 [93%] of 98 compared with 18 [72%] of 25, \( \chi^2 = 12.6, P = .003 \)) and to have started their prenatal care 3 weeks earlier in their pregnancy (t = 2.37, \( P = .02 \)).

The overwhelming majority of mothers and SCGs received sleep teaching twice (controls, 117 of 125; experimental, 91 of 98 mothers; and SCGs, 91 of 98). Of those recruited and receiving at least 1 teaching session, the duration of their pregnancy at the time of recruitment was 27.1 ± 3.1 weeks, with little difference between experimental and control subjects (experimental subjects, 26.6 ± 3.9 weeks; controls, 27.4 ± 2.2 weeks; \( P = .08 \)).

Postnatally, the mothers completed both the Sleep Practices Beliefs questionnaires; the SCGs only the beliefs questionnaire (Table 2). Postnatal questionnaires were completed by 110 of 125 control mothers, 90 of 98 experimental mothers, and 83 of 98 SCGs. All data obtained were analyzed; occasionally a follow-up variable on either a mother or an SCG was missing, but all other variables obtained on an individual were entered into the analysis. This allowed greater power at each step. Missing data on individual items caused the sample sizes for each item to vary slightly. Postnatal sleep practice data were completed by mothers at 8.1 ± 3.2 weeks after the...
Associated with the SCGs, media messages in the same residence. The most common reason for picking-schooling, or whether the SCG and mother-to-be lived experimental mothers, and SCGs (44.0%) of 91 SCGs had already heard media messages about supine sleeping position for infants pick.

At enrollment during the prenatal period there was no difference in the rate of intention to use prone sleep, or among those preferring prone sleeping for infants, the maternal or paternal grandmothers, aunts, or sisters. Among the control infants, 44% usually slept supine and 39% usually slept on their side; among the experimental and control groups when compared by sleep position. Among the control infants, 44% usually slept supine and 39% usually slept on their side; among the experimental infants, 50% usually slept supine and 37% reported to have been usually placed on their side or supine and 37% usually slept on their side. Among infants whose mothers had received focused teaching were similar and quite low in both the control and experimental groups (χ² = 0.59, P = .44). Postnatal: compare control with experimental mothers (χ² = 0.59, P = .44).

There were no significant differences between the experimental and control groups when compared by sleep position. Among the control infants, 44% usually slept supine and 39% usually slept on their side; among the experimental infants, 50% usually slept supine and 37% usually slept on their side (χ²=0.05, P = .83; and χ²=0.81, P = .37, respectively). Only 3 (1.8%) of 168 infants reported to have been usually placed on their side or supine had been placed prone the night before.

Although the prenatal rates of preferring prone sleep were similar for the experimental mothers and their SCGs, the mothers’ and SCGs’ preferences were not statistically associated (χ²=0.41, P = .52). That is, prenatally, among those preferring prone sleeping for infants, the experimental group mothers and SCGs were independent groups and tended not to be mother-SCG pairs. During the prenatal period, only 13% of the mother-SCG pairs

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Mothers (n = 125)</th>
<th>Experimental Mothers (n = 98)</th>
<th>SCGs (n = 98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>23.1 (4.8)</td>
<td>22.2 (4.5)</td>
<td>47.1 (12.4)</td>
</tr>
<tr>
<td>Age at first birth, y</td>
<td>18.7 (3.1)</td>
<td>18.2 (2.7)</td>
<td>18.9 (3.9)</td>
</tr>
<tr>
<td>No. of prior children</td>
<td>1.5 (1.7)</td>
<td>1.3 (1.3)</td>
<td>4.1 (2.5)</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>11.9 (1.4)</td>
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*Data are given as mean (SD). Senior caregivers were persons at least 5 years older than the expectant mothers to whom the mothers-to-be would go for child care advice.†Value excludes 1 case where an SCG reported her first birth at age 50 years.

infant's birth (controls, 7.8±2.8 weeks; experimental subjects, 8.4±3.6 weeks; t = 1.48, P = .14).

Subjects who completed all prenatal and postnatal questionnaires and who received at least 1 sleep teaching are described in Table 3. The control and experimental mothers were not statistically significantly different for age, age at birth of the first child, number of years of schooling, or sex of child from pregnancy studied. Most of the SCGs were grandmothers of the unborn children (72.5 % maternal grandmothers, 14.3 % paternal grandmothers, 10.2 % aunts or sisters, and 3.1 % others).

SLEEP POSITION PREFERENCES

At enrollment during the prenatal period there was no difference in the rate of intention to use prone sleep, or to recommend prone sleep, among the control mothers, experimental mothers, and SCGs (Table 4). Forty (44.0%) of 91 SCGs had already heard media messages against prone sleep, with television being the most common source mentioned.

During the prenatal period, there was no effect on the SCGs’ recommendations regarding sleep position associated with the SCGs’ age, parity, number of years of schooling, or whether the SCG and mother-to-be lived in the same residence. The most common reason for pick-

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<tr>
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<td>Enroll expectant mothers and senior caregivers (SCGs) in study</td>
</tr>
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</tr>
<tr>
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The explanation for postnatal data is given in the “Results” section. We were not able to get postnatal data on all mothers and senior caregivers.

Table 2. Sample Sizes for Enrollment, Teaching, and Postnatal Follow-up Questionnaire

<table>
<thead>
<tr>
<th>Group</th>
<th>Randomly Assigned</th>
<th>Study Sample</th>
<th>Attended 2 Teaching Sessions</th>
<th>Postnatal Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mothers</td>
<td>125</td>
<td>125</td>
<td>117</td>
<td>110</td>
</tr>
<tr>
<td>Experimental mothers</td>
<td>123</td>
<td>98†</td>
<td>91</td>
<td>90</td>
</tr>
<tr>
<td>Senior caregivers</td>
<td>0</td>
<td>98</td>
<td>91</td>
<td>83</td>
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Table 1. Timetable for Teaching About Supine Sleeping Position for Infants

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Table 3. Descriptors of Expectant Mothers and Senior Caregivers (SCGs)

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Table 4. Prevalence of Prone Sleeping: Prenatal Intention and Postnatal Practices

<table>
<thead>
<tr>
<th>Group</th>
<th>Prenatal Intention, Prone No. (%)/ of Respondents/Total No. of Respondents</th>
<th>Usual Postnatal Practices, Prone No. (%)/ of Respondents</th>
</tr>
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<tr>
<td>Control mothers</td>
<td>45/124 (36.3)</td>
<td>19/110 (17.3)</td>
</tr>
<tr>
<td>Experimental mothers</td>
<td>35/98 (35.7)</td>
<td>12/90 (13.3)</td>
</tr>
<tr>
<td>Senior caregivers</td>
<td>34/97 (34.7)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

*Prenatal: compare control with experimental mothers (χ² = 0.09, P = .76); compare experimental mothers with senior caregivers (χ² = 1.26, P = .26). Postnatal: compare control with experimental mothers (χ² = 0.59, P = .44).
agreed on plans to place their infant prone. Overall, neither the SCGs’ prenatal preference ($\chi^2 = 1.75, P = .19$) nor her living with the mother ($\chi^2 = 1.87, P = .39$) predicted how the infant was usually placed for sleep postnatally.

All infants were born at 1 hospital, Barnes–Jewish Women’s Health Center. At the time of this study, there was not an established policy that was followed by nursery personnel for sleep position during the immediate postpartum period. When asked, postnatally, how they had heard or learned about new information regarding infant sleep position, only 7 (3.5%) of 200 mothers mentioned the hospital or nursery.

POSTNATAL BELIEFS OF SCGs: INFLUENCE OF THOSE WHO DID NOT CHANGE THEIR BELIEFS ABOUT SLEEP PRACTICES

As a group, the SCGs were amenable to changing their beliefs about many important issues pertinent to SIDS and sleep position. Based on a comparison of answers on the prenatal and postnatal beliefs questionnaires, their awareness of SIDS seems to have been increased. Postnatally they were more likely to say that “crib death scares me” and to say that their “heart beats fast when I think about SIDS” ($\chi^2 = 13.2, P = .01$; and $\chi^2 = 23.5, P < .001$, respectively). Nevertheless, as a group, they worried less about SIDS because the infant used firm bedding ($\chi^2 = 9.9, P = .04$), and they became less likely to believe that the infant was susceptible to SIDS ($\chi^2 = 16.6, P = .003$) or likely to die of SIDS ($\chi^2 = 24.7, P < .001$), perhaps because of the education they had received. They also became much more likely to believe that “If I lay the baby down to sleep on its back, I won’t worry about the heart beats” (prenatal 39.0% vs postnatal 73.2%; $\chi^2 = 19.4, P < .001$).

The teaching about supine sleep and using firm bedding had little nonspecific effect on the SCGs’ confidence in caring for a child, or on their motivation to practice preventive health. For example, when asked postnatally, 81.0% of the SCGs were already confident that they could comfort and quiet an infant without having to place him or her prone. And 80% or more said they eat balanced meals and get regular medical checkups. Thus, the lack of nonspecific effects is not surprising because at enrollment the SCGs as a group were apparently both confident in their ability to care for an infant and motivated to use preventive health practices.

No particular prenatal belief among SCGs seemed to predict postnatal prone sleep placement. However, several of the beliefs that SCGs reported on beliefs questionnaires after the birth were significantly associated with actual use of prone positioning. Prone sleep by the infant the previous night was significantly more likely if the SCG believed, after the child’s birth, that placing a baby supine will make the head flat ($\chi^2 = 6.1, P = .04$), that firm bedding has no benefit in reducing SIDS risk ($\chi^2 = 8.3, P = .004$), and that they will place the baby prone even against medical advice ($\chi^2 = 13.6, P < .001$).

As noted earlier, and regardless of the SCGs’ postnatal beliefs, sharing the same residence with the SCG did not predict that the infant would be placed prone ($\chi^2 = 1.87, P = .17$). A detailed description of the changes in beliefs among mothers is beyond the scope of this article. Our intent was to focus on the influence of SCGs and whether their beliefs could be changed over the last trimester.

Our anecdotal experience in the course of earlier studies suggested that African American grandmothers strongly influence infant sleep practices. We have also found some grandmothers to be outspoken in their opposition to supine sleeping because they believe it favors choking, and these anecdotal findings have been repeated by others. Moreover, the rates of prone sleeping are higher among African American infants and, in one study, this was attributed in part to living with a grandmother. In this study we sought to show the degree of SCGs’ influence on sleep position, the rationale for SCGs’ opinions, and how receptive they are to changing their ideas on infant sleep position. Appreciation of these influences on African American infants and effective interventions to deal with them are needed to reduce their rate of prone sleeping to below the national goal of 10%.

The rate of eventual prone sleeping was lower in both our control and experimental groups than in other studies of African American infants. It may be that a one-on-one intervention like ours is particularly effective. It may also be that because these young mothers obtained prenatal care that they shared attitudes that make them receptive to public health messages. If this generality about women who receive prenatal care is also true for infant sleep position, then a specific information campaign for SCGs from these families may be less necessary.

In earlier studies involving new mothers who had not received prenatal care, we found a low rate of awareness of risk from prone sleeping and a high rate of prone sleep on soft bedding. Many of these mothers were also addicted to cocaine. Studies of grandmothers acting as primary child care providers have shown that they are often made to take that responsibility because of drug addiction among their daughters. Further studies are needed to address the effect of educating SCGs about the benefits of supine sleep when their daughters did not receive prenatal care.

The intervention portion of this study was begun during the prenatal period, because of concerns that ideas held for many years by SCGs might be difficult to change after the infant was born. To our surprise, at enrollment early in the third trimester of pregnancy SCGs were no more likely to prefer prone sleep for infants than the mothers-to-be (35%-36%). Based on subsequent interviews in focus groups, we are confident of the reliability of this finding for SCGs in St Louis. We found that influential pediatricians working in the African American community in St Louis have for many years recommended supine sleeping to avoid smothering in bedding (H. Nash, MD, oral communication, August 17, 1999), and this, in particular, may explain the receptivity in St Louis of African American SCGs to nonprone sleep. Our finding that grandmothers and other SCGs do not favor prone sleep for infants at an increased rate should be explored in other cities. The findings elsewhere will likely vary, depend-
ing on earlier recommendations of health care professionals, and, perhaps, on whether the African Americans have relatively recently moved from the mid-South, as most in St Louis have, or have been longtime residents, or have come to the city from elsewhere, where infant sleep practices may differ.

Because only about one third preferred prone sleep at the time of enrollment, one might expect that teaching about the benefits of supine sleep might have little additional effect on SCGs’ beliefs. Nevertheless, the SCGs’ beliefs changed significantly between the prenatal interview and the follow-up interview 8 weeks after the birth, on many of the beliefs that are associated with placing an infant supine for sleep. Senior caregivers as a group seemed to become more confident that they knew how to reduce SIDS risk factors, particularly if they recommended that the infant sleep supine and use firm bedding. Since all SCGs received the prenatal teaching, it is impossible to attribute these changes to the intervention alone as they may also have been due to media messages and other sources of information about safe sleep practices. Nevertheless, these data do indicate that SCGs in this low-income African American sample are open to such messages and do change their beliefs over a short period.

During the prenatal period in those cases when an SCG reported that she would recommend prone sleep, her daughter or younger relative disagreed with her, more often than not. Furthermore, only 13% of the mother-SCG pairs agreed on plans for eventual infant sleep position, whether prone or nonprone. This suggests that there may have been little conversation between the mother-to-be and her SCG on infant sleep position before the third trimester; or, alternatively, the pregnant woman may have not observed how her SCG placed an infant for sleep. In either case, therefore, it is not surprising that the SCGs’ prenatal preference for prone sleep was not significantly associated with actual postnatal prone use. Furthermore, given the degree to which the SCGs’ beliefs changed between the prenatal interview and the postnatal follow-up interview, this lack of prediction may also stem from the fact that what the SCG eventually advised when the new infant arrived may have been different from what she would advise when asked during the mother-to-be’s seventh month of pregnancy.

It was encouraging that SCGs seemed receptive to teaching about supine sleep on firm bedding, and perhaps were as receptive as the mothers. As noted earlier, the low rate of prone sleeping in both groups of infants might suggest that focused prenatal teaching of all SCGs is not essential to accomplish usual nonprone sleep among infants whose mothers received prenatal care. The young African American mothers in our study show a significant degree of independence in choosing a sleep position for their infant. Even sharing a home with the SCG was not significantly associated with usual prone sleep, regardless of the SCG’s beliefs about the infant’s sleep position. Consequently, a prenatal message directed primarily to the mother should be successful in assuring that infants usually sleep in the nonprone position. In this regard, we must emphasize that our postnatal results describe eventual usual prone sleep. They may not pertain to infrequent prone sleep or prone sleep, for example, only when cared for by a babysitter or in day care. Recent epidemiological studies suggest a very high risk for sudden unexpected infant death (odds ratio, >17.9) when infants are exposed to sleep in the prone position for the first or second time. These reports did not specifically analyze sudden deaths among African American infants, and one can only guess at their risk when inexperienced with prone sleep, but it is likely high. Although our results do not suggest that prenatal education of SCGs will influence rates of usual prone sleep to a large degree, it may be that education of SCGs will be particularly useful in reducing risk associated with first or infrequent exposure to prone sleep.

In a few cases, when an SCG’s postnatal beliefs favoring prone sleep were consistent with the infant’s actual use of the prone position, the SCG was more likely to be worried that supine sleep would make the infant’s occiput flat, to believe that firm bedding would not lessen SIDS risk, and to insist on using the prone position despite medical advice to the contrary. In these cases in particular, postnatal beliefs held by an SCG had “validity” in terms of their association with use of the prone position. Finally, as they were among mothers, concerns about choking during sleep were important as a rationale in determining an SCG’s recommendation for position.

To reduce the rate of usual prone sleep, it seems as if it is unnecessary to provide specific prenatal instruction for all SCGs. The young African American mothers in our study seemed usually to have developed independent ideas about how their infant should be placed for sleep. Our results do, however, suggest specific circumstances when educating SCGs about infant sleep position during the prenatal period will be helpful. It may be appropriate to tailor interventions toward SCGs who persist in favoring prone sleep after 36 weeks of the pregnancy. For these SCGs, the intervention should include information about how to avoid head flattening, the benefits of firm bedding in reducing SIDS risk, and the fact that the evidence favoring supine sleep is overwhelming. It may also be important to point out that many other African American grandmothers accept supine sleep, and to emphasize that published reports in pediatric journals show that choking and aspiration are not more likely among infants sleeping supine.
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