

# Perinatal Services BC Health Promotion Guideline 1 Safe Sleep Environment Guideline For Infants 0 to 12 Months of Age

February 2011

**Perinatal Services BC**  
West Tower, 3<sup>rd</sup> Floor  
555 West 12<sup>th</sup> Avenue  
Vancouver, BC  
Canada V5Z 3X7  
Tel: (604) 877-2121  
[www.perinatalservicesbc.ca](http://www.perinatalservicesbc.ca)



While every attempt has been made to ensure that the information contained herein is clinically accurate and current, Perinatal Services BC acknowledges that many issues remain controversial, and therefore may be subject to practice interpretation.

© Perinatal Services BC, 2011

<b>Executive Summary</b> . . . . .	2
<b>1.0 Introduction</b> . . . . .	4
<b>2.0 Definitions</b> . . . . .	4
<b>3.0 Background and Clinical and Public Health Significance of Safe Sleep</b> . . . . .	4
<b>4.0 Key Protective Factors</b> . . . . .	5
<b>5.0 Key Risk Factors</b> . . . . .	6
<b>6.0 Sleep Position</b> . . . . .	6
<b>Back to Sleep Literature</b> . . . . .	6
a) Crying (fussy) Babies . . . . .	7
b) Preterm, Near-Term and Term Low Birth Weight Infants . . . . .	7
c) Positional Plagiocephaly . . . . .	7
<b>7.0 Sleep Environment</b> . . . . .	7
a) Exposure to Tobacco and Secondhand Smoke . . . . .	7
b) Room Sharing (co-sleeping). . . . .	8
c) Bedsharing . . . . .	8
d) Breastfeeding . . . . .	10
e) Thermoregulation . . . . .	11
i. Sleepwear and Coverings . . . . .	11
ii. Swaddling . . . . .	11
iii. Room Temperature . . . . .	12
<b>8.0 Sleep Surfaces</b> . . . . .	12
a) Firm Surfaces Free of Hazards . . . . .	12
b) Cribs, Bassinets/Cradles and Other Environments Used for Infant Sleep . . . . .	13
i. Cribs and Bassinets/Cradles . . . . .	13
ii. Portable Cribs . . . . .	13
iii. Play Pens . . . . .	13
iv. Play Yards . . . . .	13
v. Car Seats . . . . .	14
vi. Slings/Soft Carriers . . . . .	14
c) Infant Swings, Strollers, Bouncy Seats and Similar Equipment . . . . .	15
<b>9.0 Cultural Awareness</b> . . . . .	15
<b>10.0 Special Situations</b> . . . . .	16
a) Multiple Births . . . . .	16
b) Other . . . . .	16
<b>11.0 Evolving Knowledge.</b> . . . .	16
Pacifiers. . . . .	16
<b>12.0 Glossary</b> . . . . .	17
<b>Appendices</b> . . . . .	18
A. Education and Anticipatory Guidance on Safe Infant Sleep Practices to be Provided by Health Care Providers to Parents/Caregivers. . . . .	18
B. Additional Bedsharing Literature . . . . .	20
C. Slings: Unsafe Positioning of Infants . . . . .	22
Literature on Slings . . . . .	23
D. Aboriginal Issues and Practices . . . . .	24
<b>Development Committee</b> . . . . .	25
<b>References</b> . . . . .	26

## Executive Summary

Sudden infant death syndrome (SIDS) is the death of an infant under one year of age which is sudden and unexpected and without a clear cause.<sup>1</sup> Research has identified certain risk factors that are associated to SIDS. Sudden Unexplained Death in Infancy (SUDI) is the sudden unexpected and unexplained death of an infant where external risk factors are present and may or may not contribute to the death. The death may be natural, or there may be an accidental external asphyxia component.

The purpose of the Safe Sleep Environment Guideline for Infants is to provide health care providers with information about infant safe sleep practices in the prevention of SIDS and SUDI infant deaths.

As knowledge about sudden infant death in sleep-related circumstances evolves, terminology and definitions have changed. Many countries including Canada are using SIDS and SUDI language and definitions to describe infant deaths in sleep related circumstances. These changes are causing a diagnostic shift in the mortality data. The distinction allows for better understanding of risk factors involved and for targeting strategies to reduce the risk of further deaths.<sup>2</sup>

Every sleep counts! Each time a baby is placed down to sleep – at night or for naps – it is important for parents and caregivers to ensure the infant is in a safe sleep environment. As infants sleep many hours each day, parents need to know where it is safe to put an infant to sleep and when it is essential to move an infant from an unsafe sleep environment. Sleep environments are often thought to relate only to the crib in the infant's home, but all aspects of the infant's sleep environment, both within and outside the home setting, need to be considered every time the infant sleeps. Parents and caregivers need to be aware of hazards and practices that pose risks to safe infant sleep.

*This safe sleep guideline applies to both hospital and community settings and pertains to infants one year of age and younger.*

It is important for health care providers to model and discuss safe sleep practices at every contact. Safe sleep practices include: placing the baby on his/her back to sleep, having the infant sleep in the room with the parents/caregivers (room sharing), having a smoke free environment, breastfeeding exclusively for the first six months, preventing infant overheating, and ensuring the infant's sleep surface is firm, free of pillows and other soft hazards. It is also important that care providers **not** model behaviours in the hospital or community setting that carry risk – such as swaddling, covering the infant's head (bedding, hat or toque use indoors), bedsharing when the mother wishes to sleep after cuddling or nursing, or using a carseat, swing, bouncy chair etc. for infant sleep.

No sleep environment is completely risk free. The section on bedsharing is a contentious portion of this document. The working group strongly supports breastfeeding initiation and continuance. Frequent nighttime feeding is a factor in breast milk supply. A number of the working group raised concerns that bedsharing should be supported if there were no risk factors present. They felt the evidence related to bedsharing was inconclusive. Others on the working group felt that room sharing with the infant sleeping on a separate sleep surface beside the mother could support nighttime feeding and thereby foster breastfeeding success while ensuring a safe sleep environment. Based on a comprehensive review of the evidence, the majority of the guideline working group felt that the evidence of harm from bedsharing in the absence of risk factors did not support a blanket recommendation for or against bedsharing when no risk factors are present.

The following are seven key recommendations to support safe infant sleep.

1. **Infants must be placed on their back to sleep (supine). (A)**
2. **The fetus and infant should not be exposed to tobacco and secondhand smoke. (A)**
3. **Infants and parents/caregivers should sleep in close proximity in the same room (on a separate safe sleep surface) for the first six months; having the infant in close proximity has been found to reduce SIDS. (B)**
4. **Breastfeeding is recommended as it is a protective measure against SIDS. (A)**
5. **Infant overheating should be avoided. (A)**
6. **Infant sleep surfaces must be firm and be free of hazards. (A)**
7. **Cribs, cradles and bassinets must meet standards as per the Crib and Cradle Regulations. (A)**

Health care providers should raise awareness (prenatally and postnatally) about safe sleep practices/ environments by asking the parents what the sleep plans are for their infant. They need to be sensitive and respectful during conversations around safe sleep practices as sleep practices vary in different cultures. It is recognized that despite the potential risk, some parents may choose to share a bed with their baby, for example the mother may fall asleep while breastfeeding or when trying to settle a distressed or fussy baby. Parents need to have information to reduce the risk of sharing a sleep surface with their infant:

- The infant must be placed on his/her back for sleep
- The mattress must be firm and flat (not a pillowtop or waterbed mattress, couch, sofa or recliner)
- The parent must ensure that the infant will not fall out of the bed or get trapped between the mattress and the wall or bedframe (headboard/footboard)
- Baby's sleeping area must be free from pillows, heavy blankets (including duvets) and stuffed toys
- Blankets must not cover the baby's head
- The baby must not be overdressed (e.g. bundled, toque) and the room must not be too warm ( $\leq 20^{\circ}\text{C}$ )
- Any adult in the bed must know that the infant is in the bed
- The baby must not be left alone in the adult bed
- Other children and pets should not be in the bed
- The parents should not have recently consumed alcohol or be using illicit drugs
- The environment must be smoke free

**When risk factors are present advise parents and caregivers that the sharing of any surface is unsafe.**

Appendix A provides health care providers with an outline of education and anticipatory guidance to be provided to parents and caregivers.

## 1.0 Introduction

Each time a baby is placed down to sleep – at night or for naps – it is important for parents and caregivers to ensure the infant is in a safe sleep environment.

Every sleep time counts. Sleep environments are often thought to relate only to the crib in the home, but all sleep environments (in the home and in other settings) along with associated factors need to be considered every time the infant is placed down to sleep. This document includes information for environments where an infant sleeps – in the hospital, in the home and in other settings.

*These guidelines pertain to infants one year of age and younger.*

Areas addressed in relation to safe infant sleep include:

- Key Protective Factors
- Key Risk Factors
- Sleep Position
- Sleep Environment
- Sleep Surfaces
- Cultural Awareness
- Special Situations
- Evolving Knowledge

## 2.0 Definitions

In this guideline (excluding literature reviews) the terminology used and their meanings are:

- Sudden Infant Death Syndrome (SIDS) – the death of an infant under one year of age which is sudden and unexpected and without a clear cause<sup>3</sup>
- Sudden Unexplained Death in Infancy (SUDI) – the sudden unexpected and unexplained death of an infant where external risk factors are noted as possibly contributing to the death
- Room sharing – caregiver and infant sharing a room, but not a sleep surface
- Bedsharing – a sleeping arrangement in which the baby shares the same sleep surface as another person usually the mother

A glossary of terms is provided at the end of the document.

*In the literature reviewed and referenced, the term co sleeping is used inconsistently, often being used interchangeably with bedsharing. The inconsistent use of terminology needs to be taken into account when reading the literature summaries. Consideration also needs to be given to the varying definitions used for bedsharing in the studies relating to bedsharing.*

## 3.0 Background, Clinical and Public Health Significance

With the introduction of the Back to Sleep campaign the rate of SIDS in BC, has decreased from 9.9/10,000 in 1992 – 1996 to 4.2/10,000 in 1997 – 2001, to 3.7 – 4.2/10,000 since that time.<sup>4</sup> However world-wide, sudden infant death remains the number one cause of post-neonatal death, that is, from 1 month to 1 year of age. These deaths are less common in the first month of life, peak at 2 to 4 months of life, and approximately 90% occur by 6 months of life. Males are more affected, as are certain cultural or racial groups. In Canada and globally, Aboriginal and indigenous peoples are over-represented for SIDS and SUDI related deaths.<sup>5</sup>

In 2009, The Child Death Review Unit of the BC Coroner's Service released a report *Safe and Sound: A Five Year*

### 3.0 Background, Clinical and Public Health Significance, *cont.*

*Retrospective Report on Sudden Infant Death in Sleep-related Circumstances.*<sup>6</sup> In B.C. there were 113 sudden infant deaths in sleep-related circumstances over 5 years (out of approximately 200,000 births in that time period). Most of the deaths occurred before four months of age and seventy-three (65%) of the 113 infants were male. Aboriginal and preterm babies were over represented, 34 (30%) and 39 (35%) cases respectively. Many of the risk factors noted related to the physical environment such as sleep position, unsafe sleep surfaces, overheating, exposure to tobacco smoke, bedsharing and being away from home. Other risk factors noted related to a poor socioeconomic environment and lack of early and regular prenatal care. In the 2007 Annual Report from the Child Death Review Unit, one of the recommendations was to the Provincial Health Officer of BC to expand the scope “of the existing safe sleep task force to address safe sleep practices in all environments, from hospital to home, in a manner that is representational for all peoples and cultures across the province.”<sup>7</sup>

The Ministry of Health Services was designated responsible for responding to the recommendation. As a result, a multidisciplinary provincial working group led by Perinatal Services BC (formerly BC Perinatal Health Program) was convened to address practice and safety issues pertaining to infant sleep and has drafted this guideline.

The quality of the recommendations in this guideline has been determined using the criteria described by The Canadian Task Force on Preventive Health Care (Table 1).<sup>8</sup>

**Table 1**

#### **Levels of recommendations\***

<b>Recommendation A</b>	There is good evidence to recommend the clinical preventive action
<b>Recommendation B</b>	There is fair evidence to recommend the clinical preventive action
<b>Recommendation C</b>	The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making
<b>Recommendation D</b>	There is fair evidence to recommend against the clinical preventive action
<b>Recommendation I</b>	There is insufficient evidence (in quantity or quality) to make a recommendation; however other factors may influence decision making

\*Recommendations included in this guideline have been adapted from the Levels of Quality of Evidence for Treatment Recommendations described in The Canadian Task Force on Preventive Health Care

### 4.0 Key Protective Factors

**Key protective factors for infants that have been identified include:**

- **Supine sleep position**<sup>9,10</sup>
- **A tobacco free environment**<sup>11</sup> – from prenatal through infancy, an important protective factor for the infant
- **A firm sleep surface**<sup>12</sup> – without adjacent spaces that could entrap the infant
- **Exclusive breastfeeding**<sup>13,14,15,16</sup> – for the first six months of the infant’s life
- **Room sharing**

## 5.0 Key Risk Factors

**Key risk factors for infants that have been identified include:**

- Prone sleep position
- Exposure to tobacco smoke<sup>17</sup> – by mother (including prenatal tobacco use), partner and others in the household (including smoking that occurs outside the home) and the smoke residue on surfaces in the environment<sup>18</sup>
- Not breastfeeding
- Soft sleep surfaces – such as pillow top mattresses, waterbeds, couches, sofas, and armchairs
- Soft hazards in the infant’s sleep environment – including pillows, soft toys, bumper pads, quilts, comforters and sheep skin
- Bedsharing
- Overheating<sup>19,20</sup>
- Bedding that can cover the infant’s head

## 6.0 Sleep Position

### ***Recommendation 1:***

**Infants must be placed on their back to sleep (supine). (A)**

- **Near term and low birth weight infants are to be placed on their back unless ordered otherwise for medical reasons. (A)**
- **Preterm infants with lengthy hospital stays are to be treated like term infants (on back to sleep) as they approach discharge. (A)**
  - **Inform parents/caregivers that preterm infants have a higher incidence of SIDS. (A)**
  - **There are few exceptions to this sleep position; exceptions will be identified by the multidisciplinary team, documented and communicated to all care providers and parents/caregivers. (I)**
- **Strategies to prevent positional plagiocephaly should be taught to parents/caregivers. (B)**

### **Back to Sleep Literature**

As knowledge about sudden infant death in sleep-related circumstances evolves, terminology and definitions have changed. Many countries including Canada are using language and definitions to describe infant deaths in sleep related circumstances – Sudden Infant Death Syndrome (SIDS) and Sudden Unexplained Death in Infancy (SUDI). These changes are causing a diagnostic shift in the mortality data. The distinction is to allow better understanding of risk factors involved and for targeting strategies to reduce the risk of further deaths.<sup>21</sup>

In a 1985 report, Davis<sup>22</sup> stated that in Hong Kong where the custom called for supine infant sleep position, Sudden Infant Death Syndrome (SIDS) was a rare problem. In 1987 Netherlands began a campaign advising supine infant sleep position.<sup>23</sup> Campaigns followed in the United Kingdom, New Zealand and Australia in 1991, the United States and Sweden in 1992 and Canada in 1993.<sup>24</sup> The advice was based on the epidemiology of SIDS and physiological evidence that showed that infants who sleep on their back had lower arousal thresholds and less slow-wave sleep (SWS) when compared to infants who slept on their stomachs.<sup>25</sup>

## 6.0 Sleep Position, *cont.*

### a) *Crying (Fussy) Babies*

Fussy babies often sleep less.

Parents often try many strategies to address the infant's crying.

Parents need to consider safe sleep practices **each time** they put their baby down when attempting to soothe a fussy baby.

It is important for parents and caregivers to know that fussy infants must be placed on their back when put down to sleep.

### b) *Preterm, Near-Term and Term Low Birth Weight Infants*

**Preterm infants** (born before 37 completed weeks) are at increased risk for sudden infant death.<sup>26</sup> Parents may observe their baby in settings (during the hospital stay) that are not safe environments when in the home setting. These practices include: the use of “head huggers”, supportive rolls behind and/or around the infant and/or the infant placed prone.<sup>27</sup>

Babies born preterm may spend considerable time in a neonatal intensive care unit and techniques may be used that involve positioning to simulate the intrauterine environment.<sup>28,29</sup> Preterm infants with lengthy hospitalizations should have a comprehensive discharge planning process incorporating a modeling of behaviours for parents to practice upon the infant's discharge from hospital. Beginning several weeks prior to discharge, parents should see a transitioning of the baby's sleep position – from prone to side-lying to the infant placed supine on a firm flat surface and with a light cover with the infant's arms free. Every step of the transition process needs to have education and support to reinforce safe sleep practices including the rationale as to why alternate practices have been used at a particular time for the infant.

The **near-term infant** (34 – 37 weeks) and the **term low birth weight infant** follows the same recommendations for safe sleeping as the healthy term infant – on the back on a firm flat surface from birth. While in the hospital up to 70% of low birth weight (< 2500 gm) infants are placed in a side-lying position due to health care professionals' concerns of aspiration.<sup>30</sup> If observing or learning to use this position, parents often copy it when in the home setting.<sup>31</sup> Parents cannot be expected to follow best practices in the home setting if alternate practices are observed in the hospital setting.

### c) *Positional Plagiocephaly*

Positional plagiocephaly is a misshapen (flat) head caused by constant pressure on one area of the skull, usually the occiput. In the past 10 – 15 years there has been an increase in plagiocephaly likely the result of the ‘Back to Sleep’ campaign to reduce the incidence of SIDS. Along with this knowledge there has been an avoidance of placing infants in the prone position while awake for play.<sup>32</sup> If an infant spends much of the time on the back or has a strong positional preference when sleeping flattening of the skull may occur. Care providers need to provide strategies to parents/caregivers to prevent plagiocephaly.<sup>33</sup>

## 7.0 Sleep Environment

### a) *Exposure to Tobacco and Secondhand Smoke*

#### **Recommendation 2:**

**The fetus and infant should not be exposed to tobacco and secondhand smoke. (A)**

- **Inform parents/caregivers that any kind of tobacco exposure increases the risk of SIDS. (A)**

Maternal smoking pre and postnatal and exposure to second hand smoke impacts the health of the fetus and has consequences for the newborn. Infants of women who smoke during and after pregnancy are three times more likely to die of SIDS than infants whose mothers do not smoke; the more cigarettes smoked, the greater

## 7.0 Sleep Environment, *cont.*

the risk.<sup>34,35</sup> Infants of mothers and fathers who smoke only after pregnancy are twice as likely to die of SIDS than babies not exposed to second hand smoke.<sup>36,37</sup>

### b) Room Sharing (co sleeping)

#### **Recommendation 3:**

**Infants and parents/caregivers should sleep in close proximity in the same room (on a separate safe sleep surface) for the first six months; having the infant in close proximity has been found to reduce SIDS. (B)**

Room sharing (co sleeping) – refers to a sleeping arrangement in which the infant and parent(s) sleeps in the same room but do not share the same sleep surface.

The Canadian Paediatric Society (CPS) recommends having the baby sleep in their own crib in the same room as her parents for the first six months of life. Being in close proximity to the mother permits easy, close access to the infant for breastfeeding, other care needs and is protective against SIDS.<sup>38</sup> Having the baby close by also increases maternal infant bonding. The CPS does not recommend bedsharing. The American Academy of Pediatrics (AAP) recommends “that the mother and infant sleep in close proximity to one another to facilitate breastfeeding.”<sup>39</sup>

A recent United States study by Hauck et al<sup>40</sup> that examined the sleeping arrangements for infants from birth to 1 year of age found that during the first month the majority of infants slept in the mother’s room at night (85.3%), and by six months this frequency declined to 45.1%.

Research by Blair has shown that “babies who sleep close to a committed adult caregiver have half the chance of dying of SIDS compared with those infants who sleep in a room alone or even in a room with other children.” According to Blair, “this closeness may take the form of a crib by the bed or bedsharing with mother”.<sup>41</sup>

### c) Bedsharing

**Bedsharing has been found, in retrospective reviews, to be associated with SIDS (B)**

- **Infants and parents/caregivers should sleep in close proximity in the same room (on a separate safe sleep surface) for the first six months; having the infant in close proximity has been found to reduce SIDS. (B)**
- **Inform parents/caregivers that reducing the risk of sharing a sleep surface include: placing the infant on his/her back for sleep; smoke free environment; a firm and flat mattress; ensuring the infant will not fall out of the bed or get trapped between the mattress and the wall or bedframe; keeping the baby’s sleeping area free from pillows, heavy blankets and stuffed toys; keeping the covers away from the baby’s head; preventing the baby from overheating (not overdressing, not having the room too warm); adults in the bed must know the infant is in the bed; and, the parents should not have recently consumed alcohol or be using illicit drugs. Other children or pets should not be in the bed and the infant should never be left alone in the adult bed. (A)**

**When risk factors are present advise parents/caregivers that the sharing of any surface is unsafe.**

Bedsharing refers to a sleeping arrangement where the infant sleeps with another sleeping person, often the mother on the same bed or sleep surface. This definition does not include those time periods when the infant shares the same sleep surface for breastfeeding, bonding or cuddling while the mother or partner is awake.

The Canadian Paediatric Society (CPS) and Public Health Agency of Canada (PHAC) do not recommend

## 7.0 Sleep Environment, *cont.*

bedsharing. The CPS also acknowledges that some parents will, nonetheless, choose to share a bed with their child.”<sup>42</sup>

While there are no Canadian studies that have assessed the sleeping arrangements for infants the Hauck study<sup>43</sup> in the United States reported that during the first three months, 59% to 65% of the mothers lay down or slept with their infant at night. The most common location during the first three months was a bed followed by a “couch or other place not a bed” (12.3% to 17.8%). More than 75% of the women who ever laid down/slept with their infant usually slept when lying down with the infant. The bedsharing rate among all women ranged from 41.5% at two weeks of age to 30.7% at six months of age. In this study bedsharing was defined as the mother sleeping when lying with the infant on the same bed or other sleeping surfaces for her nighttime sleep or during the major sleep period.

In the British Columbia Coroners Safe and Sound Report (2009) all of the 51 infants who were bedsharing at the time of death were bedsharing where risk factors were present.<sup>44</sup> “Once the infants who were exposed to environmental tobacco smoke, bedsharing with a caregiver under the influence of alcohol or illicit drugs, placed prone or side-lying or bedsharing with a sibling were excluded, only two bedsharing infants remained. Neither infant was breastfed at the time of death.”<sup>45</sup>

Retrospective reviews have found bedsharing to be associated with SIDS. The systematic review by Horsley et al<sup>46</sup> highlighted three general difficulties with the studies: few of the studies specifically investigated the harms or benefits of bedsharing but rather the risks for SIDS; definitions used for bedsharing, particularly in the risk studies, were too heterogenous to compare across the studies; and, there was incomplete reporting of interactions which hampered synthesis.

In a four year population based case-control study Blair et al, found alcohol or drug use prior to sharing a bed with the infant to be nine times more prevalent among the parents of infants who had died of SIDS than among those in the control group and six times more prevalent than among those of a high risk comparison group. Although many of the infants who had died of SIDS had shared a sleep surface in a hazardous environment, Blair states that the major influences on risk are alcohol or drug use prior to sharing a sleep surface with an infant and these risks are amenable to change and specific education needs to be given to parents.<sup>47</sup>

In a longitudinal, population-based study in the United Kingdom, Blair et al, sought to further the knowledge about bedsharing and breastfeeding by examining bedsharing and breastfeeding habits during 5 periods in the first 4 years of the child’s life (0-2 months, 6-8 months, 17-20 months, etc.). Their results showed that mothers who shared a bed with their newborns were better educated and of a higher socioeconomic status, and that those whose children routinely slept in their beds during the first 15 months of life reported a significantly greater incidence of breastfeeding. The authors concluded that “Given the likely beneficial effects of bed sharing on breastfeeding rates and duration, risk reduction messages to prevent sudden infant deaths would be targeted more appropriately to unsafe infant care practices such as sleeping on sofas, bed sharing after the use of alcohol or drugs, or bed sharing by parents who smoke.”<sup>48</sup>

In many cases bedsharing had occurred with another risk factor(s) also present. Prospective studies have found that bedsharing with risk factors (e.g. tobacco, alcohol or illicit drug use) increases the risk of SIDS. Although no studies have shown bedsharing to be 100 per cent safe, factors can be modified to reduce risk.

A few retrospective studies have indicated that bedsharing may be associated with a higher incidence of SIDS for younger babies. The age of the infant varies in the studies with less than 8 weeks identified in one study<sup>49</sup> with a few other studies indicating infants less than 16 to 20 weeks of age are at higher risk.<sup>50,51</sup> In two of the studies (Carpenter, Ruys) a significant number of bedsharing infants shared the bed with mothers and/or partners who smoked (90% and 67% respectively). In the study by Ruys, for the infants less than 6 months of age who had died of SIDS, 24 of the 36 bedsharing cases had at least one parent who smoked. Ruys’ concluded that from the age of 4 months onwards bedsharing was no longer a risk factor.<sup>52</sup> Some literature suggests that bedsharing at any age of infancy is only unsafe when the mother smoked in pregnancy or if either parent continues to smoke.<sup>53</sup>

The bedsharing literature does not specifically address swaddling. The swaddled infant has restricted movement and the inability to use his/her arms to move away from potential harm and may be at risk for

## 7.0 Sleep Environment, *cont.*

overheating, a risk factor for SIDS. Swaddling should not be recommended to parents, this practice is of particular significance for parents who choose to bedshare (to avoid overheating).

In colder rooms, infants who are bedsharing tend to spend more time with their faces covered by bedding. Bedding over the face has been implicated as a risk factor for SIDS.

**Adult hospital beds have a number of risk factors making them an unsafe sleep surface for infants** – narrow beds, risk of the infant falling out of the bed and requiring the use of pillows against bedrails to prevent the infant from falling out of bed. It is recommended:

- Mothers and infants be monitored regularly when the infant is in the bed for breastfeeding or skin-to-skin care
- Babies be placed on their backs in the bassinet upon completion of breastfeeding, cuddling or skin-to-skin care if mother wishes to sleep or is asleep
- Infants be placed in bassinets beside mothers' beds to give the mother better access to the baby for feeding, cuddling and observation

See Appendix B for additional bedsharing literature.

Based on a comprehensive review of the evidence, the majority of the guideline working group felt that the evidence of harm from bedsharing in the absence of risk factors did not support making a blanket recommendation for or against bedsharing when no risk factors are present.

All parents need to be counseled about risk factors if bedsharing.

Health care providers should raise awareness (prenatally and postnatally) about safe sleep practices/ environments by asking parents what the sleep plans are for their infant. Care providers need to be sensitive and respectful during conversations around safe sleep practices as sleep practices vary in different cultures. It is recognized that despite the potential risk, some breastfeeding parents may choose to share a bed with their baby, the mother may fall asleep while breastfeeding or a mother of a distressed (fussy baby) who will not settle may choose to lie down with her baby. Parents need to have information to reduce the risk of sharing a sleep surface with their infant.

***When risk factors are present advise parents/caregivers that sharing any surface is unsafe.***

### d) ***Breastfeeding***

#### ***Recommendation 4:***

**Breastfeeding is recommended as it is a protective measure against SIDS. (A)**

Several studies have found breastfeeding is protective for SIDS.

- One meta analysis of 23 reports concluded that **formula fed infants were more than twice as likely to die from SIDS** than breast fed infants with an adjusted odds ratio of 2.11 (95% CI 1.66-2.68)<sup>54</sup>
- The USA Agency for Healthcare Research and Quality (AHRQ) carried out a stringent meta analysis incorporating six studies (SIDS was rigorously defined and the duration of breastfeeding was defined). Results indicated that any breastfeeding reduced the risk of SIDS compared with never breastfeeding with an adjusted odds ratio of 0.64 (95% CI 0.51 – 0.81)<sup>55</sup>

## 7.0 Sleep Environment, *cont.*

### e) Thermoregulation

#### **Recommendation 5:**

**Infant overheating should be avoided. (A)**

- **The indoor use of infant toques or hats is not needed once the infant's temperature is stable after birth.<sup>56,57</sup> (A)**
- **Advise parents/caregivers to use a sleeper blanket/sleep sack or a blanket tucked firmly under the bottom end of the mattress with the infant's arms free when placed down to sleep.<sup>58,59</sup> (B)**
- **Advise parents/caregivers not to use loose bedding such as quilts and duvets to prevent the infant's head being covered during sleep. (B)**
- **Swaddling should not be modeled or recommended to parents and caregivers as it may lead to overheating. (B)**
- **Advise parents/caregivers that a room that is too warm (> 20°C) is a risk factor for SIDS when the infant also is overdressed, bundled, extra blankets or the presence of external heat sources (such as sharing a bed).**

Overheating from warm weather is not an issue provided that there is no barrier (i.e. extra clothing, bundling, extra blankets) to sweating or evaporation.

#### **i. Sleepwear and Coverings**

The use of a 'sleeper blanket' in place of a blanket reduces the incidence of turning from back to front during sleep and reinforces putting a baby to sleep on her back. Placing infants in a 'sleeper blanket' replaces the need for blankets also preventing bedding from covering the infant's head that leads to increased temperature and CO<sub>2</sub> rebreathing.<sup>60</sup>

If a blanket is used it needs to be tucked firmly under the end of the crib mattress and only reach the infant's chest (to prevent the sheet/blanket from covering the infant's head).

Parents need to be taught not to over-dress infants/and not to over insulate when the infant has an infection or a fever.<sup>61</sup> A general rule of thumb (although supporting evidence is lacking) is to dress an infant in one layer more than an adult.

#### **ii. Swaddling**

Swaddling itself may be a risk factor for SIDS – based on a four-year case control study of SIDS in South West England where 24% of the SIDS infants were swaddled (most placed supine), compared to 6% of control infants.<sup>62</sup>

Swaddling infants restricts the infant's movements. It is practiced in a variety of cultures. Studies have shown numerous risks and few benefits to the practice of swaddling.

Risks included:

- Overheating due to over-wrapping<sup>63,64</sup>
- Decrease in arousal associated with swaddling<sup>65</sup>
- Chest infections due to the tightness of wrapping<sup>66,67</sup>
- Older, larger infants are able to escape from the swaddle, resulting in a blanket that may cover the head.<sup>68</sup>
- Restricted movements and inability to use arms to move away from a potential harm

## 7.0 Sleep Environment, *cont.*

In a few studies, the authors identified potential benefits including:

- Promotion of supine position
- Swaddled infants slept longer and aroused less – the motor restraint of swaddling is thought to inhibit the startle reflex, thus reducing frequency of arousals<sup>69</sup> Although noted as a ‘benefit’ by the authors it is a potential benefit only if one is looking for longer sleep periods. The decreased rousability noted in the infants is a known risk factor for SIDS.

### iii. Room Temperature

Study findings<sup>70</sup> in examining the effects of room temperature on bedsharing behaviours of infants who regularly slept with one or more parent for a minimum of five hours per night indicate the following:

- A room temperature of greater than 20°C is a risk factor for SIDS<sup>71</sup>
- In winter, parents decide the room temperature based on their perception of the cold weather and excessively overdress their infants.<sup>72</sup>

One theory suggests **overheating** plays an important role in SIDS risk.<sup>73</sup>

- Many of the risk factors for suffocation from rebreathing CO<sub>2</sub> are also risk factors for over heating
- Excessive room temperature and over dressing significantly increase the risk of SIDS

Overheating from warm weather is not an issue provided that there is no barrier (i.e. extra clothing) to sweating or evaporation.

## 8.0 Sleep Surfaces

### a) Firm Surfaces Free of Hazards

#### **Recommendation 6:**

**Infant sleep surfaces must be firm and be free of hazards. (A)**

Unsafe sleep surfaces for infants include: waterbeds, pillow-top mattresses, couches, sofas, armchairs, recliners and sheepskins. An infant can get trapped in the crevices of couches, sofas, armchairs or recliners and suffocate.

- Cribs, cradles or bassinet mattresses should fit snugly with  $\leq 3$  cm space between the mattress and sides when the mattress is pushed into one corner (there should not be any spaces around the mattress that could entrap an infant)
- Many surfaces are not designed for infant sleep or are not covered by Canadian regulations relating to infant safety during sleep, including adult beds, infant car seats, slings and soft carriers, infant swings, bouncy seats and strollers

#### **Sleeping arrangements outside the home**

When infants sleep outside the home (i.e. usual sleeping environment) special attention to sleep arrangements is critical to an infant’s safety (such as when visiting family and friends, traveling, in a child care setting, or with alternate caregivers).

Primary and other caregivers awareness and preparedness for safe sleeping practices will ensure infants remain safe when sleeping away from their usual home environment.

## 8.0 Sleep Surfaces, *cont.*

### b) Cribs, Bassinets and Cradles and Other Environments Used for Infant Sleep

#### **Recommendation 7:**

**Cribs and other sleep equipment must meet standards as per the Crib and Cradle Regulations.<sup>74</sup> (A)**

- **Advise parents/caregivers that infant equipment such as play pens, play yards and strollers are not designed for sleep and are not included in Crib and Cradle Regulations. If portable cribs are used as a sleep surface they should be assembled and used correctly for every use.**
- **Car seats and other infant carriers are not designed for infant sleeping. Advise parents/caregivers and others providing infant care to not intentionally put infants to sleep on one of these surfaces.<sup>75</sup>**

#### **i. Cribs and Bassinets /Cradles**

Cribs made prior to September 1986 do not meet current safety regulations and should not be used. Families and caregivers need to know that when using a crib it is important that:

- The crib meets current Canadian regulations (and is not on a recall list)
- The crib is properly assembled
- The mattress must not be more than 15 cm thick

The Government of Canada has recently published changes to the Crib and Cradle Regulations so that the specifications for standard cribs also applies to bassinets.<sup>76,77</sup>

If parents choose to use a bassinet/cradle the same principles apply regarding the sleep surface and bedding that has been outlined plus the following safety measures for bassinets:

- The mattress must not be more than 8 cm thick
- There is adequate air circulation
- Meets current regulations<sup>78</sup>

#### **ii. Portable Cribs**

Portable cribs are less expensive and take up less room than standard cribs, but may pose **unique risks**. Users of portable cribs must:

- Correctly assemble the portable crib every time it is used
- Have a mattress that fits snugly in the crib
- Use appropriate size bedding (full-sized crib sheets can become loose and pose a hazard for entanglement)

#### **iii. Play Pens**

Play pen regulations are specific to play pens, which are not designed for sleeping. This means that fabric or soft sided cribs may not be as safe as standard cribs for sleeping

- In Canada, requirements for fabric or soft-sided cribs are not included in the Crib and Cradle Regulations of the Hazardous Product Act (HPA), except to indicate that the size of the openings on any mesh fabric must meet the requirement of the HPA Play Pen Regulations

#### **iv. Play Yards**

Play yards (an enhanced version of a playpen) are often used by parents as a multi-purpose environment for play, sleep and changing the infant; some come with a portable change table and/or bassinet.

## 8.0 Sleep Surfaces, *cont.*

Specific risks include:

- Incorrect use of the components of multi-use play yards
- Putting an infant to sleep on the raised change table portion of a play yard (a risk for strangulation from the restraint strap)
- Placing the infant in the play area or the play yard when the change table is in place

For both portable cribs and play yards with a shorter head-to-toe length than a standard crib the infant can become too tall posing a risk of suffocation in the soft sided railings.

Infants wiggle during sleep and have become entrapped in harnesses or straps, wedged in the side of a stroller or suffocated when the face becomes covered by a blanket. Infants' airways may be compromised when sleeping in car seats, slings/soft carriers, infant swings, strollers, bouncy seats and similar equipment.

### v. Car Seats

Car seats are designed and regulated for transporting infants safely (keeping the infant secure and protecting the infant in a crash) while in a moving vehicle; they are not intended to be used as devices for feeding, sleeping or infant holding.

- The configuration of the seat, the harness, and the infant's airway, may lead to respiratory compromise<sup>79,80</sup>
- Infant car seats are not designed as sleep equipment and should only be used for transporting the infant in a vehicle

### vi. Slings/Soft Carriers

In industrialized countries an increasing number of parents are carrying their infants (awake and sleeping) in slings for several hours a day.<sup>81</sup> Many types of slings and soft infant carriers are available. Some parents create a sling or carrier out of a scarf. Infant support differs depending on the type (For more information on slings refer to Appendix C).

Health Canada released a general advisory, March 2010,<sup>82</sup> advising parents and caregivers to exercise caution when using infant slings and soft infant carriers. One of the areas of concern was related to infant suffocation resulting from improper positioning of the baby. Areas of concern identified were:

- Bag/duffle type slings where the infant was in the chin to chest position and suffocation can occur, and
- Ring type slings (carry the infant upright) put the baby at risk when the baby's face is against the parent/caregiver's body.

When a sling is used:

- It is important to ensure an adequate air supply and that the infant's airway is unobstructed
  - Ring type slings, which carry infants in an upright position snug with the parent's chest, protect the infant's airway<sup>83</sup>
    - A baby whose face is turned sideways with cheek against the parent's chest, the head slightly extended and body, shoulder and face snug (so the baby can't move) is secured in a safe position
    - This position would also provide neck support needed for a preterm infant
- Caregivers should not zip up their coats around a baby in a sling or soft carrier to keep the baby warm<sup>84</sup>
- Babies should be checked frequently by the parent or caregiver while the baby is in a sling or soft carrier
- Parents or caregivers of preterm infants, low birth weight, babies in fragile health or with breathing issues (such as a cold) should use extra caution and consult their care provider prior to using a sling or soft carrier<sup>85</sup>

## 8.0 Sleep Surfaces, *cont.*

- To ensure safety, women who nurse their infants in bag/duffle type slings should change the baby's position after feeding so the baby's head and body are upright and are clear of the sling and the mother's body<sup>86</sup>

### c) Infant Swings, Strollers, Bouncy Seats and Similar Equipment

The CPS states that infant carriers (an infant swing being one type) must not replace the crib as a sleep surface due to the risk of the harness straps causing upper airway obstruction. Health Canada Consumer Product Safety information states that infant swings are not intended for an infant to sleep in and should not be used for extended periods of time.<sup>87</sup>

Specific research was not found regarding the use of swings, strollers, bouncy seats and other similar equipment as safe sleep environments for infants. Infant swings, strollers, bouncy seats and other similar equipment are *not* recommended safe sleep environment for infants. Reports from governmental consumer safety branches report infant deaths occurring in each of these devices *when infants have been left sleeping unattended* (e.g. parent not present or is also asleep.) Infants who fall asleep in this type of equipment should not be left unattended if not transferred to a safe sleep surface.

## 9.0 Cultural Awareness

Practices related to an infant's sleep environment vary by country and cultural group. In most non westernized cultures the mother commonly shares a bed with her infant.<sup>88</sup> In certain cultures where bedsharing is common the SIDS rates are low, such as in Japan and Hong Kong, Bangladeshi and other Asian Communities in the UK and Pacific Island communities in New Zealand.<sup>89</sup> In other cultures bedsharing is common and the SIDS rate is high; these cultures include African black populations in the United States and Maori and Canadian Aboriginal populations. As identified by Blair (2007) it is not bedsharing that distinguishes these cultures but other mediating factors such as smoking and use of alcohol and drugs, which in conjunction with bedsharing may put infants at risk.<sup>90</sup> In the 2009 study published by Blair et al which identified socioeconomic markers as being more prevalent among the families of SIDS infants, "the major influences on risk were from factors amenable to change within the infant's sleeping environment" (i.e. advising parents of the specific circumstances that put infants at risk).<sup>91</sup> Health care providers should become aware of cultural practices, personal philosophies or social determinants related to the infant's sleep environment.

The authors of the International Child Care Practices Study: infant sleeping environment which collected descriptive data on child care from a range of different countries and cultures stated that "methods of bedsharing differ cross-culturally, and although further details were sought on different bedsharing practices, it was not possible to build up a composite picture of 'typical' bedsharing practices in the different communities."<sup>92</sup> This study included 21 centres in 17 countries with Manitoba, Canada as one of the sites.

Research is lacking on Aboriginal peoples' traditional practices on sleep environments (such as where babies sleep, the use of cradleboards and breastfeeding) and its association with infant health outcomes. While campaigns to encourage supine sleeping have been credited with reducing SIDS within general populations, a corresponding reduction has not been observed among First Nation infants, despite the fact they are traditionally placed on their backs to sleep.<sup>93</sup>

- For Aboriginal people in Canada the infant mortality is decreasing, however it remains at twice the rate of other Canadian populations.<sup>94,95</sup> The 2009 BC Provincial Health Officer's Report indicates SIDS as the most common cause of post neonatal (28 – 364 days after birth) death in Status First Nation people with the deaths linked to infant sleep position, poverty and exposure to environmental tobacco smoke.<sup>96</sup> These data do not include other Aboriginal groups such as non-Status individuals, Inuit or Metis.<sup>97</sup> Tobacco use among Aboriginal women during pregnancy and exposure to environmental tobacco smoke following birth are significant risk factors for Aboriginal infants. Social determinants of health such as low maternal education, poor financial situation, poor housing and overcrowding are complex and intersecting factors that also contribute to sudden infant death among Aboriginal infants.

## 9.0 Cultural Awareness, *cont.*

Many studies have shown prenatal care during the first trimester reduced infant mortality rates. There is a need for outreach education and prenatal and postnatal care for Aboriginal women.<sup>98</sup> Understanding the Aboriginal cultural perspective and social context in which the infant will live are important when providing education and information about a safe sleep environment.

Refer to Appendix D for additional information on Aboriginal Issues and Practices.

## 10.0 Special Situations

Although this guideline aims to outline safe sleep practices for healthy term infants, several special situations require separate consideration. These include multiple births and infants with other health care needs.

### a) Multiple Births

Co-bedding of multiple gestation infants in the hospital has become more common worldwide.<sup>99</sup> The practice of placing twins or higher-order multiples in the same crib or incubator was first reported in the 1940s and has been standard practice in much of Europe for more than a decade.<sup>100</sup> The literature on the risks and benefits of co-bedding multiples is limited to the hospital setting.<sup>101</sup>

Some observational evidence suggests certain physiologic benefits of co-bedding twins, including evidence of an easier transition home and fewer hospitalizations.<sup>102</sup> There are limited analytical studies to support the claims of observational studies.

Currently, the risks and benefits of co-bedding multiples in hospitals have not been adequately studied to make specific recommendations. Without adequate information and education, parents may introduce makeshift barriers between the infants and include other hazardous paraphernalia into their babies' sleeping environments.<sup>103</sup>

### b) Other

Infants with health care issues requiring sleep arrangements not outlined in this document will have education provided to the parents and caregivers regarding the infant's unique needs. Safe sleep education needs to be reviewed and reinforced in the home setting.

## 11.0 Evolving Knowledge

### Pacifiers

Some studies have looked at an association between pacifier use and a reduced risk for SIDS. No studies have shown an increased risk. Results from these studies varied with one concluding that a pacifier could be a favourable factor in preventing SIDS,<sup>104</sup> another recommending a pacifier for formula fed infants,<sup>105</sup> and another concluding that babies who routinely use a pacifier but who do not do so for their last sleep are at higher risk for SIDS.<sup>106</sup> Ball's study showed that among infants who slept in cribs, pacifier users were more likely to be in the same room as the parents than non pacifier users and suggested that the relationship between pacifiers and SIDS is not a causal one. The pacifier may be acting as a means of keeping the baby in closer proximity to the parent rather than being directly protective against SIDS.<sup>107</sup> Based on the evidence at this time no recommendation can be made for or against the use of a pacifier to reduce the risk of SIDS/SUDI.<sup>108</sup>

## 12.0 Glossary

**Aboriginal:** Inclusive of First Nations (Status and Non-Status), Métis and Inuit peoples

- First Nation describes a member of a First Nations band or tribe. First Nation can be either status or non-status
  - Status Indians are registered under the Indian Act and entitled to rights and benefits under the law
  - Non-Status Indians are not registered or governed by the Indian Act
- Inuit are a distinct group of people that reside primarily in the Canadian North including Nunavut, North West Territories (Inuvialuit), Northern Quebec (Nunatsiavut)
- Metis are persons of mixed First Nation and European ancestry who self-identify as Metis, of historic Metis Nation ancestry and are distinct from other Aboriginal people. Unlike Status Indians and Inuit, Metis people are not entitled to the provisions of the Indian Act (Aboriginal Act Now 2009)

**Adult mattress:** In this guideline, an adult mattress would include mattresses on adult beds, children's beds, futon beds or day beds

**Alternate caregiver:** Includes any caregiver who is not the infant's parent (i.e. mother, father)

**Bedsharing:** A sleeping arrangement in which the baby shares the same sleep surface as another person usually the mother (In some literature may be referred to as co-sleeping)

**Co-bedding twins:** Twins sleeping in the same crib

**Crib clutter:** Unnecessary items in the crib environment; may include bumper pads, stuffed animals and toys, extra blankets or pillows

**Exclusively breastfed:** Receiving no other liquid than breast milk, except for medicines or vitamin/mineral supplements

**Infant sling / soft carrier:** A device suspended from a caregivers body that allows a caregiver to carry the infant while keeping their hands free. These carriers may be backpack or sling-like in design

**Low birth weight:** Birth weight of less than 2,500 grams (5 pounds, 8 ounces)

**Multifactorial:** Involving or controlled by multiple factors, generally genetic and/or environmental factors

**Nesting:** A form of containment for the preterm infant using supportive rolls or blankets placed around the infant in the shape of an oval

**Overheating:** Becoming excessively or undesirably hot

**Positional plagiocephaly:** An asymmetrical misshapen head caused by constant pressure on one area of the skull, usually the occiput

**Preterm:** Being born prior to 37 completed weeks of gestation

**Prone:** Lying face downward (on one's tummy)

**Risk factors:** An aspect of personal behaviour or characteristic, lifestyle, or environmental exposure that evidence has shown to be associated with undesirable health outcomes

**Room sharing:** Caregiver and infant sharing a room, but not a sleep surface

**Secondhand smoke:** Environmental tobacco smoke (ETS) containing more than 4,000 chemical compounds. Includes smoke from the burning cigarette and that exhaled by the smoker

**Sorption:** Adherence to surfaces

**Sudden Infant Death Syndrome (SIDS):** The death of an infant under one year of age which is sudden and unexpected and without a clear cause

**Sudden Unexplained Death in Infancy (SUDI):** The sudden unexpected and unexplained death of an infant where external risk factors are noted as possibly contributing to the death

**Supine:** Lying face upward (on one's back)

**Third-hand smoke:** The residue from tobacco smoke that clings to surfaces after a cigarette has been extinguished

**Trimester:** A three month period

## Appendix A

### Education and Anticipatory Guidance on Safe Infant Sleep Practices for Parents to be Provided by Health Care Providers

It is important to provide parents/caregivers with information so that they can make informed decisions. Introduce information about safe infant sleep practices in the prenatal period; provide education and anticipatory guidance postpartum and at other contacts in community settings (based on family knowledge needs).

The hospital environment provides an opportunity to model, provide and reinforce information about safe sleep practices for newborns. The community setting provides the opportunity to enhance or reinforce knowledge regarding safe infant sleep practices. Parents often mirror practices observed or taught in the hospital and community settings.

All parents should be asked where their infant will be sleeping and care providers need to discuss socioeconomic factors and cultural practices that may be a contributing factor to parental decisions.

Care providers cannot assume that all families practice only one type of sleeping arrangement all the time. Parents should also be advised to share information on safe infant sleep practices with anyone who may care for their baby.

#### *Education and anticipatory guidance on:*

##### **Sleep position**

- The infant is always positioned on its back (supine) for sleep
- The infant's bassinet is kept flat (even for babies that are mucousy or spitting up) and positional props are not used
- Fussy babies follow safe sleep practices (back to sleep) – assist the mother/ family develop a proactive plan to address fussiness and crying taking into account infant safety
  - Inform about typical crying features of infants; there may be times when they will not be able to soothe or settle their infant
- Prevention of plagiocephaly – advise supervised 'tummy time', holding/carrying infant vs using an infant seat, swing etc. and alternating positioning in the crib (have infant's head at opposite ends of the crib each day)
- The near term and term low birth weight infant is placed supine and flat from birth
- Preterm infants are placed supine, flat, and without supporting rolls or nesting prior to hospital discharge unless their medical condition indicates otherwise

##### **Sleep environment**

- The importance of a smoke free environment (includes mother smoking during and after pregnancy, partner and other members in the household)
- Infants sleeping in the same room as the parents for the first six months of life
- Safe and unsafe sleep surfaces
  - Sleep surface is firm
  - No soft hazards in the infant's sleep environment (such as pillows, soft toys, quilts, cluttered crib)
  - Cribs and cradles meet Canadian Crib and Cradle Regulations
- Avoid infant overheating – not overdressed, swaddled, no use of a toque or covering head (with blanket) indoors once stable following birth, room temperature should be moderate ( $\leq 20^{\circ}$  C)
- If twins are co-bedded safe sleep practices apply and no barriers or props placed between the infants
- When medical indications require alternate positioning provide parents/caregivers with education regarding the alternate positioning and rationale for its use
- Pacifiers should not be introduced until breastfeeding is well established

## Appendix A, cont.

**Bedsharing is a complex practice. Parents considering sharing a bed with their full term infant need to be aware of the following safe infant care practices in addition to those noted above. Reducing unsafe infant care practices is a priority.**

- Infant is breastfed and with the lactating mother
- Sleep surface is firm without any adjacent spaces that could be a hazard (entrapment) for the infant (such as placing a futon or firm mattress on the floor away from the walls and furniture)
- No recent parental consumption of alcohol
- No parental use of illicit drugs
- Other adults in the bed are aware the infant is in the bed
- Siblings and pets are not in the bed with the infant
- Infant is not left alone in an adult bed
- Mother should not be excessively tired
- Mothers concerned that any medication taken may cause CNS impairment (sedate or impair rousability) consult their healthcare provider before changing dosage or discontinuing a medication

### Cultural awareness

It is important for health care providers to:

- Gain knowledge about cultural beliefs and values of their patients/clients infant sleep practices
- Provide information on safe infant sleep practices throughout the continuum of care — prenatally, postpartum and beyond at other contact opportunities
- Promote and provide education on safe infant sleep environments, avoidance of risk factors for unsafe situations and factors contributing to the prevention of SIDS
- Assist the woman/family, based on individual needs, in the development of plans for a safe sleeping environment for their infant (inside and outside the home setting) taking into consideration their social context
- Provide contact information, such as the health unit or HealthLinkBC, for parents or caregivers as a resource if questions about safe sleep practices arise

### Additional Bedsharing Literature

In many cultures mother-infant bedsharing continues to be the norm for infant sleeping. For example, in Asian countries such as Japan, mother and infants bedsharing on futons remains the norm. In Hong Kong, mother-infant bedsharing and supine sleep position for infants represent the cultural norm.<sup>109</sup>

Where a baby sleeps is not as simple as some western societies want it to be, despite current medical commentary and recommendations not supporting bedsharing.<sup>110</sup> McKenna and Volpe's study exploring western health care providers sleep recommendations, personal sleep practices and interpretations showed the decision to bed share is highly personal and not dependent on recommendations from others or the medical community. For many, choosing a particular sleeping arrangement was based on factors such as: convenience, attentiveness, physical proximity, increased likelihood to detect and respond to a health crisis and enhanced emotional connection with the infant contributing to happier, healthier emotionally developed infants. For others, choosing a sleeping arrangement may be based on the social determinants of health such as housing, poverty and education.

Mothers and infants bedsharing or sleeping within close proximity to each other represents normal, healthy behaviour. Nighttime breastfeeding represents a species-wide adaptation that is ever-present and a biologically and emotionally enriching sleep environment for a mother and infant.<sup>111</sup> McKenna's publication *Sleeping with Your Baby A Parent's Guide to Cosleeping* (i.e. bedsharing) describes the correct way to cosleep as "each bed-sharer should agree that he or she is equally responsible for the infant and acknowledge that the infant is present." The parents do not smoke, are sober, have made the decision to bedshare and are breastfeeding. The mattress is placed on the floor away from walls and furniture, only a light blanket is used and there aren't any pillows near the infant. No other children, pets or stuffed toys should be in the bed with the infant.<sup>112</sup>

The biology underlying breastfeeding behaviour is enhanced by night time mother-infant proximity whether sleeping in the same bed or within arms reach on a different surface.<sup>113</sup> Increased sensory contact and proximity between mother and infant induces potential beneficial behavioural and physiologic changes in the infant, reported by mothers as less infant crying, more maternal and infant sleep, and increased milk supply due to the increased frequency of night-time breastfeeding that close contact facilitates.<sup>114,115,116,117,118</sup>

Ball reported on the potential beneficial behavioural and physiologic changes in the infant with bedsharing. These include: less infant crying, more maternal and infant sleep and increased maternal milk supply due to the increased frequency of night-time breastfeeding.<sup>119</sup>

Studies comparing exclusively breastfeeding, bedsharing and solitary sleeping mothers showed that even in deepest sleep mothers aroused 30% more frequently when they bedshared. A high percentage of the arousals overlapped with the infant's arousals, and in about two-thirds of those times the infant aroused first, suggesting a relatively high responsivity on the part of the mother. McKenna postulated that the heightened sensitivity might increase the chance that mothers could more quickly detect and intervene against any adverse events than if they were separated from the baby.<sup>120</sup>

In the systematic review by Horsley et al<sup>121</sup> forty observational studies were reviewed examining evidence of benefits and harms to children associated with bedsharing, factors altering bedsharing risk, and effective strategies for reducing harms associated with bedsharing. Horsley and colleagues found that the evidence consistently suggested that there may be an association between bedsharing and SIDS among smokers (however defined) but the evidence was not consistent among nonsmokers. They went on to state that this does not mean that no association between bedsharing and SIDS exists among nonsmokers, but that existing data does not convincingly establish such an association. They did find a positive association between bedsharing and breastfeeding although data could not establish causality. They highlighted three general difficulties with the studies: few of the studies specifically investigated the harms or benefits of bedsharing but rather the risks for SIDS; definitions used for bedsharing, particularly in the risk studies, were too heterogenous to compare across the studies; and, there was incomplete reporting of interactions which hampered synthesis. The above noted studies and others confirmed prone sleeping and exposure to tobacco products during and after pregnancy as potent risk factors for SIDS. The studies also highlighted the unsafe sleep environments (such as prone sleep, exposure to tobacco smoke, covering of head) as noted by others.

## Appendix B, cont.

Although the Canadian Pediatric Society does not endorse bedsharing, their literature review on safe sleep environments for infants includes literature that indicates:

- Breastfed infants who share a bed with their mother feed more often and for a longer duration than solitary sleeping infants<sup>122</sup>
- When bedsharing and breastfeeding occur together, certain benefits can be derived by both mother and infant. Mothers enjoy a close night-time relationship with their young child, who might then be more encouraged to continue breastfeeding<sup>123,124</sup>
- The risk of SIDS is increased when infants bedshare with mothers who smoke cigarettes
- Bedsharing with an adult who is extremely fatigued or impaired by alcohol or drugs can be hazardous to the infant
- The use of soft bedding, pillows and covers that can cover the head of the infant increase the risk of death in all sleeping environments
- Sleeping with an infant on a sofa is associated with a particularly high risk of sudden infant death in infancy
- An infant is more at risk of sudden unexpected death if he/she bedshares with people other than his/her parent

A four year population based case-control study of all sudden unexpected deaths in infancy in counties of England by Blair et al<sup>125</sup> showed that one-half of the SIDS deaths occurred while the infants were alone in a crib and one half while sleeping with their parents. Although the risk was strong if the infant slept with the parent on the sofa, it was only significant among those infants who shared a surface with an adult who had recently consumed alcohol or drugs. According to Peter Fleming, one of the authors of the study, a positive message coming from the study is that the incidence of SIDS is much less if breastfeeding mothers do not smoke, drink or take drugs if they share a sleep surface with their infant. Their study reported the following key findings related to bedsharing and SIDS (based on last sleep for SIDS infants and the reference sleep for controls): maternal smoking during pregnancy, recent consumption of alcohol or drugs, co-sleeping on a sofa, infant sleeping on a pillow (soft surface), swaddling before sleep, prone sleeping, being in fair to poor health for the last sleep (as described by parents) and being preterm.

There is no published evidence to support that parental use of drugs (excluding exposure to tobacco and tobacco smoke, alcohol, methadone and or illicit substances such as cannabis, heroin, cocaine, amphetamines) that cause central nervous system (CNS) impairment, such as hypnotics or opioid narcotics, is associated with SIDS. Certain drugs, both prescription and over-the-counter, are known to cause sedation and alter functional capacity.<sup>126</sup> Conflicting advice is provided with some guideline documents making reference to avoid these drugs despite the absence of evidence. For example, the CPS and the policy review from the Public Health Agency of Canada state that “consciousness-depressing drugs” are a risk factor for SIDS while information on the Motherisk website does not make any recommendations about the risk for SIDS and parental drug use and the Policy Statement from the American Academy of Pediatrics do not make specific recommendations around drugs other than tobacco and alcohol.<sup>127,128</sup> Due to lack of evidence associating drugs that cause CNS impairment with an increased risk of SIDS, it is not possible to make specific recommendations to avoid these drugs.<sup>129</sup>

In a review of 213 SIDS deaths over a ten-year period Ruys et al<sup>130</sup> investigated the risk of sudden infant death during bed-sharing in the first six months of life and the protective effect of breastfeeding and reported that of the 136 SIDS deaths less than six months of age, 26% bed-shared. In a reference group of 1628 babies only 9.4% were bed-sharing in the night prior to the interview. After correcting for smoking of one or both parents the odds ratio for SIDS during bed-sharing with parents decreased with age from 9.1 at 1-month to 1.3 at 4 through 5 months of age. The excess risk (OR>1) associated with bed-sharing is itself not statistically influenced by the presence or absence of breastfeeding. The authors concluded that bed-sharing is a risk factor for all babies of less than 4 months of age.

Of all studies, Blair (2009)<sup>131</sup> is the only prospective study where all others are based on record reviews of SIDS deaths.

Unsafe positioning of infants in slings

*Sling type carriers*



*Ring type infant carrier*



Infant's head should be turned to the side

Do not zip baby in a jacket

## Literature on slings

A small study of 24 preterm and 12 term infants was undertaken by Stening et al, to assess whether the use of infant slings was associated with cardiorespiratory implications. The infants were monitored in 3 conditions: carried vertically in a sling in supine position; carried horizontally in a sling in supine position; and positioned laterally in a stroller. Their findings showed:

- No clinically relevant systematic changes were noted in any of the three conditions for either preterm or term infants
- Some clinically irrelevant desaturation episodes were seen in the preterm group leading the authors to suggest that slings be used with caution for preterm infants before they reach full term age

As this study was short term there is a caution that this study may not be applicable to long-term situations.<sup>132</sup>

Identified risks from bag/ duffle type slings include:

- blocking the baby's breathing and suffocating the baby within a few minutes<sup>133</sup>
- The infant is carried lower on the parent's upper body or near the parent's hips. In this position the infant may be in a curled position and the neck may be bent, which can restrict the airway causing suffocation.<sup>134</sup>

## Appendix D: Aboriginal Issues and Practices

A British Columbia population-based study conducted from 1981 to 2000, found that the incidence of SIDS was higher for both rural and urban Status First Nations compared to rural non-First Nations.<sup>135</sup>

In a study to identify practices and risk factors associated with SIDS within a Cree population north of Edmonton, AB<sup>136</sup> the study authors found that:

- All Cree infants slept supine and were tightly swaddled with a thin blanket
- The head and neck were not covered
- 80% of infants co-bedded with the mother and often other siblings
- Co-bedding (i.e. bedsharing) was practiced to fulfill the mother's desire to be physically close to her infant
- The temperature of the house averaged 24°C during the winter
- Prenatal smoking was common

The study authors concluded that prenatal smoking and swaddling infants in very warm houses may contribute to the higher incidence of SIDS among the Cree community. The authors did not comment on the high rate of co-bedding with swaddling and smoking also being a factor.

## Development Committee

### Members of the Infant Safe Sleeping Environment Development Committee

Perinatal Services BC (PSBC) would like to acknowledge the committee who developed the Safe Sleep Environment Guideline for Infants 0 to 12 Months of Age. Committee members included:

Brenda Wagner	Committee Chair, Formerly Medical Director, BC Perinatal Health Program Medical Director, Maternal Infant Child and Youth Program, Fraser Health
Barbara Selwood	Lead, Health Promotion and Prevention, Perinatal Services BC
Lucy Barney	Lead, Aboriginal Health, Perinatal Services BC
Taslin Janmohamed-Velani	Coordinator Knowledge Translation, Perinatal Services BC
Radhika Bhagat	Clinical Nurse Specialist, 0-5 years, Vancouver Community, Vancouver Coastal Health
Patty Keith	Director, Maternal/Child Planning, Vancouver Coastal Health
Marianne Brophy	Lactation Consultant, Breastfeeding Committee for Canada Representative BC Baby-Friendly Network Representative
Roberta Hewat	Associate Professor Emerita, University of British Columbia
Joan Robillard	Family Medicine, Vancouver
Tansey Ramanzin	Medical Reviewer/Coroner, Child Death Review Unit, BC Coroners Service
Kim Belle	Occupational Therapist, NICU, Royal Columbian Hospital
Carla Springinotic	Manager, Early Childhood Health and Screening, Healthy Women, Children and Youth Secretariat, Population and Public Health, BC Ministry of Health Services
Charmaine Enns	Medical Health Officer, Vancouver Island Health
Patty Hallam	Public Health Nursing Program Consultant-ECD, Interior Health
Tanya (Baker) Momtazian	Registered Midwife, Nelson
Jeffrey Simons	Pediatrician, Prince Rupert

## References (Endnotes)

- 1 Public Health Agency of Canada, SIDS. Accessed December 14, 2009.
- 2 Child Death Review Unit, British Columbia Coroners Service, *Safe and Sound: A Five Year Retrospective*, 2009. <http://www.pssg.gov.bc.ca/coroners/child-death-review/docs/sudden-infant-death-cdru-report.pdf>
- 3 Public Health Agency of Canada, SIDS retrieved December 14, 2009.
- 4 BC Vital Statistics Agency.
- 5 Kendall. Perry. Office of the Provincial Health Officer. 2009. Pathways to health and healing: 2nd report on the health and well-being of aboriginal people in British Columbia. *Provincial Health Officer's Annual Report 2007*.
- 6 Child Death Review Unit, British Columbia Coroners Service, *Safe and Sound: A Five Year Retrospective*, 2009. <http://www.pssg.gov.bc.ca/coroners/child-death-review/docs/sudden-infant-death-cdru-report.pdf>.
- 7 Child Death Review Unit, BC Coroners Service. *Annual Report*. 2007 <http://www.pssg.gov.bc.ca/coroners/child-death-review/docs/CDRU-2007annualreport.pdf>
- 8 <http://www.ctfphc.org/>
- 9 Davies DP. 1985. Cot death in Hong Kong: A rare problem? *Lancet* 2:1346-1349.
- 10 Henderson-Smart DJ, Ponsonby AL, Murphy E. Reducing the risk of sudden infant death syndrome. A review of the scientific literature. *J Paediatr Child Health* 1998;34:213-9.
- 11 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 12 Health Canada, April 11, 2009 <http://gazette.gc.ca/rp-pr/p1/2009/2009-04-11/html/reg4-eng.html> Accessed May 13, 2010.
- 13 Health Canada. (2004). *Exclusive breastfeeding duration – 2004 Health Canada recommendation*. [http://www.hc-sc.gc.ca/fn-an/nutrition/child-enfant/infant-nourisson/exd\\_br\\_dur\\_am\\_excel\\_e.html](http://www.hc-sc.gc.ca/fn-an/nutrition/child-enfant/infant-nourisson/exd_br_dur_am_excel_e.html).
- 14 Canadian Paediatric Society, Dietitians of Canada & Health Canada. (2005). *Nutrition for healthy term infants*. Minister of Public Works and Government Services. Ottawa: Author.
- 15 World Health Organization. (2001). *The optimal duration of exclusive breastfeeding: Report of an expert consultation*. Department of Nutrition for Health and Development, Department of Child and Adolescent Health and Development, WHO, Geneva, Switzerland: Author. <http://www.who.int/child-adolescent-health>.
- 16 World Health Organization. (2003). *Global strategy for infant and young child feeding*. Geneva, Switzerland: Author. [http://www.who.int/nut/documents/gs\\_infant-feeding-text-eng.pdf](http://www.who.int/nut/documents/gs_infant-feeding-text-eng.pdf).
- 17 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 18 Sleiman M, Gundel LA, et al. 2010. Formation of carcinogens indoors by surface-mediated reactions of nicotine with nitrous acid, leading to potential *thirdhand smoke* hazards. *PNAS*. 107:15; 6576-6581.
- 19 Guntheroth W, Spiers, P. (2001). Spontaneous arousals in supine infants while swaddled and unswaddled during rapid eye movement and quiet sleep. *Pediatrics*, 110(6), e70.
- 20 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 21 Child Death Review Unit, British Columbia Coroners Service, *Safe and Sound: A Five Year Retrospective*, 2009
- 22 Davies DP. 1985. Cot death in Hong Kong: A rare problem? *Lancet* 2:1346-1349.
- 23 Hogberg, U, Bergstrom E (2000). "Suffocated prone: the iatrogenic tragedy of SIDS". *Am J Public Health*. 90(4):527-31.
- 24 Hogberg; Rusen ID, Lui S, Sauve R, Joseph KS, Kramer MS (2004). "Sudden infant death syndrome in Canada: trends in rates and risk factors, 1985 – 1998". *Chronic Dis Can* 25(1): 1-6, PMID 15298482.
- 25 Kattwinkel, J, Hauck, FR, Moon RY, Malloy M and Willinger M (2006). Infant Death Syndrome: In Reply, Bed Sharing with Unimpaired Parents Is Not an Important Risk for Sudden Infant Death Syndrome. *Pediatrics* 117; 994-996.
- 26 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 27 Ferrari F, Bertoncelli N, Gallo C, Roversi MF, Guerra MP, Ranzi A, Hadders-Algra M (2007). Posture and movement in healthy preterm infants in supine position in and outside the nest. *Archives of disease in childhood. Fetal and neonatal edition* 92(5), p. 386-390.
- 28 Als H, Lawhon G, Brown E, Gibes R, Duffy FH, McAnulty G, Blickman JG (1986). Individualized behavioral and environmental care for the very low birth weight preterm infant at high risk for bronchopulmonary dysplasia: Neonatal intensive care unit and developmental outcome. *Pediatrics* 78, p. 1123-32.
- 29 Ferrari F, Bertoncelli N, Gallo C, Roversi MF, Guerra MP, Ranzi A, Hadders-Algra M (2007). Posture and movement in healthy preterm infants in supine position in and outside the nest. *Archives of disease in childhood. Fetal and neonatal edition* 92(5), p. 386-390.
- 30 Blair PS, Platt MW, Smith IJ, Fleming PH & the CESDI SUDI Research Group (2006). Sudden infant death syndrome and sleeping position in preterm and low birth weight infants: an opportunity for targeted intervention. *Archives of Disease in Childhood* 91, p. 101-106.

## References (Endnotes), cont.

- 31 Vernacchio L, Corwin MJ, Lesko SM, Vezina RM, Hunt CE, Hoffman HJ, Willinger M & Mitchell AA (2003). Sleep position of low birth weight infants. *Pediatrics* 111, p. 633-640.
- 32 Mildred J, Beard K, Dallwitz A, Unwin J. 1995. Play position is influenced by knowledge of SIDS sleep position recommendations. *J Pediatr Child Health*. 31:499-502.
- 33 BC Children's Hospital Handout. *A Clinician's Guide to Positional Plagiocephaly*. June 2008.
- 34 US Department of Health and Human Services. 2001. Smoking and women's health. *A report of the Surgeon General*. Rockville: USDHHS.
- 35 Schoendorf K, Kiely J. 1992. Relationship of sudden infant death syndrome to maternal smoking during and after pregnancy. *Pediatrics*. 90:905-908.
- 36 Cook D Strachan D. 1999. Summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax*. 54:357-366.
- 37 World Health Organization. 1999. *International consultation on environmental tobacco smoke and child health: Consultation report*. WHO/NCD/TFI99.10.
- 38 Community Pediatric Committee, (2009) Recommendations for safe sleeping environments for infants and children. *Paediatrics & Child Health*. CPS 9(9), 659-663.
- 39 Buswell, S, Parent-Infant Co-sleeping and Its Relationship to Breastfeeding. *Journal of Pediatric Health Care*, 2007; Vol 21, No. 1. p 22-28.
- 40 Hauch FR, Signore C, Fein SB, Raju, TNK. (2008). Infant Sleeping Arrangements and Practices During the First Year of Life. *Pediatrics*: 122(supp 2): S113-S120. Available at [http://pediatrics.aappublications.org/cgi/reprint/122/Supplement\\_2/S113](http://pediatrics.aappublications.org/cgi/reprint/122/Supplement_2/S113)
- 41 Blair, PS, Fleming PJ, Smith IJ et al. (1999). Babies sleeping with parents: case-control study of factors influencing the risk of the sudden infant death syndrome. CESDI SUDI research group. *British Medical Journal*. 319:1457-1462).
- 42 Community Pediatric Committee, (2009) Recommendations for safe sleeping environments for infants and children. *Paediatrics & Child Health*. CPS 9(9), 659-663.
- 43 Hauch FR, Signore C, Fein SB, Raju, TNK. (2008). Infant Sleeping Arrangements and Practices During the First Year of Life. *Pediatrics*: 122(supp 2): S113-S120. Available at [http://pediatrics.aappublications.org/cgi/reprint/122/Supplement\\_2/S113](http://pediatrics.aappublications.org/cgi/reprint/122/Supplement_2/S113)
- 44 Child Death Review Unit, British Columbia Coroners Service, *Safe and Sound: A Five Year Retrospective*, 2009
- 45 Ibid.
- 46 Horsley T, Clifford T et al. (2007). Benefits and Harms Associated with the Practice of Bed Sharing. *Arch Pediatr Adolesc Med*; 161(3):237-245.
- 47 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 48 Blair PS, Heron J & Fleming PJ. (2010). Relationship Between Bed Sharing and Breastfeeding: Longitudinal, Population-Based Analysis. *Pediatrics*. 126(5):e1118-1127. Published online October 18, 2010.
- 49 Carpenter RG, Irgens LM Blair PS et al. 2004. Sudden unexplained infant death in 20 regions in Europe : case control study. *The Lancet*, 363, 185-191.
- 50 McGarvey C, McDonnell M et al. 2003. Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland. *Archives of Disease in Childhood*. 88(12),158-1064.
- 51 McGarvey, 2006
- 52 Ruys J, de Jong GA, Brand R, Engelberts AC, Semmekrot, BA. (2007). Bed-sharing in the first four months of life: a risk factor for sudden infant death. *Acta Paediatrica* 96, p. 1399-1403.
- 53 Blair PJ, Blair PS, Bacon c, et al. (1996) Environment of infants during sleep and risk of the sudden infant death syndrome : results of 1993-5 case-control study for confidential inquiry into still births and deaths in infancy. *BMJ*. 313:191-195 (27 July).
- 54 McVea, KL, TurnerPD, Pepler DK. The role of breastfeeding in sudden infant death syndrome. *J Hum Lact*. 2000; 16:13-20.
- 55 Ip S, Chung, Raman G, Chew P, Magula N, DeVine D, et al. Breastfeeding and maternal and infant health outcomes in developed countries. Evidence report/technology assessment No. 153 (prepared by Tufts-New England Medical Center Evidence-based Practice Center, under contract No. 290-02-0022) *Agency for Healthcare Research and Quality*; 2007.p.1-186. <http://www.pediatrics.org/cgi/content/full/119/4/e827>
- 56 Elabbassi EB, Chardon K, Bach V, Telliez F, Delanaud S, Libert JP. (2002). Head insulation and heat loss in naked and clothed newborns using a thermal mannequin. *Am. Assoc. Phys. Medicine*, 29(6), 1090-1096.
- 57 Lang N, Bromiker R, Arad I.. (2004). The effect of weevols. Cotton head covering and length of stay with the mother following delivery on infant temperature. *International Journal of Nursing Studies*, 41, 843-846.
- 58 Wilson CA et al. (1994) Clothing and bedding and its relevance to sudden infant death syndrome: Further results from the New Zealand Cot Death Study. *J Paediatr Child Health*, 30, 506-512.
- 59 L'Hoir MP, Engelberts AC, van Well GT, et al (1998). "Risk and preventive factors for cot death in The Netherlands, a low-incidence country". *Eur. J. Pediatr*. 157 (8): 681-688.

## References (Endnotes), cont.

- 60 Ibid
- 61 Guntheroth and Spiers, 2001
- 62 Blair PS, Sidebotham P, Evanson-Coombe C et al. (2009) *BMJ*; 339:b3666.
- 63 Ibid
- 64 Gerard C, Harris, K, Thach, B. (2002b). Spontaneous arousals in supine infants while swaddled and unswaddled during rapid eye movement and quiet sleep. *Pediatrics*, 110(6), e70.
- 65 Richardson H, Walker A & Horne R. 2009. Minimizing the risks of sudden infant death syndrome: to swaddle or not to swaddle? *The Journal of Pediatrics*. 155(4),475-481.
- 66 Van Sleuwen B, Englebets A., Boere-Boonekamp M, Juis W, Schulpen T, L'Hoir M. (2007). Swaddling: a systematic review. *Pediatrics*, 120(4), e1097-106.
- 67 Gerard, 2002b
- 68 Gerard, 2002b
- 69 Van Sleuwen B, Englebets A., Boere-Boonekamp M, Juis W, Schulpen T, L'Hoir M. (2007). Swaddling: a systematic review. *Pediatrics*, 120(4), e1097-106.
- 70 Baddock, Galland et al, 2007
- 71 Kahn, A., Bauche, P., Grosswasser, J. Dramaix, M., Scaillet, S. & the Working Group of the Group Belge de Pediatres Francophones. (2001). Maternal education and risk factors for sudden death in infants. *European Journal of Pediatrics*, 160, 505-508.
- 72 Guntheroth W, Spiers, P. (2001). Spontaneous arousals in supine infants while swaddled and unswaddled during rapid eye movement and quiet sleep. *Pediatrics*, 110(6), e70.
- 73 Guntheroth and Spiers, 2001
- 74 Health Canada, Hazardous Products Act, 1986.
- 75 Health Canada, Hazardous Products Act, 1986.
- 76 Health Canada, April 11, 2009 <http://gazette.gc.ca/rp-pr/p1/2009/2009-04-11/html/reg4-eng.html> Accessed May 13, 2010.
- 77 <http://gazette.gc.ca/rp-pr/p1/2009/2009-04-11/html/reg3-eng.html>
- 78 <http://gazette.gc.ca/rp-pr/p1/2009/2009-04-11/html/reg3-eng.html>
- 79 Cote A, Bairam, A, Deschesne M, , Hatzakis G. (2007). Sudden infant deaths in sitting devices. *Archives of Disease in Childhood*, 93, 384-389.
- 80 Kornhauser CCerar L., Scirica C., Stucin Gantar I., Osredkar D., Neubauber D., Kinane TB. (2009). A Comparison of Respiratory Patterns in Healthy Term Infants Place in Car Safety Seats and Beds. *Pediatrics*, 124, e396-402.)
- 81 Stening W, Nitsch P, Wassmer G & Bernhard R. 2002. Cardiorespiratory Stability of Premature and Term Infants Carried in Infant Slings. *Pediatrics*. 110(5), 879-883.
- 82 March 12, 2010 [http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/\\_2010/2010\\_36-eng.php](http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/_2010/2010_36-eng.php).
- 83 Academy of Breastfeeding medicine March 2010 <http://www.bfmed.org>.
- 84 Health Canada [http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/\\_2010/2010\\_36-eng.php](http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/_2010/2010_36-eng.php).
- 85 Ibid.
- 86 Ibid.
- 87 Health Canada Consumer Product Safety information <http://www.hc-sc.gc.ca/cps-spc/advisories-avis/aw-am/sleep-sommeil-eng.php>.
- 88 Mosko S, McKenna et al. 1993. Parent-infant co-sleeping: the appropriate context for the study of infant sleep and implications for sudden infant death syndrome (SIDS) research. *J Behav Med*. 16:598-610.
- 89 Blair PS, Sidebotham P, et al. 2009. Hazardous cosleeping environments and risk factors amenable to change: case-control study of SIDS in south west England. *BMJ*. 339-b3666.
- 90 Blair PS, Fleming P. 2007. Co-sleeping and infant death. In: David TJ, ed. *Recent advances in paediatrics*. 24, London: Royal Society of Medicine Press.
- 91 Blair PS, Sidebotham P, et al. 2009.
- 92 Nelson EA, Taylor BJ, et al. (2001). International Child Care Practices Study: infant sleeping environment. *Early Hum Dev*. Apr;62(1):43-55.
- 93 Wilson C. 2000. Cree infant care practices and sudden infant death syndrome. *Canadian Journal of Public Health. Revue Canadienne De Sante Publique*, 91(2)133-136.
- 94 Smylie, J, Adomako, P, (2009). *Indigenous children's health report: health assessment in action*. Keenan Research Centre. The Centre for Research on Inner City Health.

## References (Endnotes), cont.

- 95 Kendall, Perry. Office of the Provincial Health Officer. 2009. Pathways to health and healing: 2nd report on the health and well-being of aboriginal people in British Columbia. *Provincial Health Officer's Annual Report 2007*.
- 96 Ibid.
- 97 Ibid.
- 98 Smylie, 2009.
- 99 Touch S, Epstein M, Pohl C, & Greenspan J, 2002. The Impact of co-bedding on sleep patterns in preterm twins. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(4), 484.
- 100 Tomashek KM, Wallman C & the Committee on Fetus and Newborn (2007). Cobedding Twins and Higher-Order Multiples in a Hospital Setting. *Pediatrics*, 120, 1359-1366
- 101 Ibid.
- 102 Mosko S, Richard C, McKenna J, Drummond S (1996). Infant sleep architecture during bedsharing and possible implications for SIDS. *Sleep* 19(9), p. 677-84.
- 103 Ball, H. Parent-infant Bed-sharing Behavior: effects of feeding type, and presence of father. *Human Nature: an interdisciplinary biosocial perspective*. 17(3):301-318.
- 104 Arnestad M, Andersen M, Rognum TO. 1997. Is the use of a dummy or carry-cot of importance for sudden infant death? *Eur J Pediatr*. 156:968-970.
- 105 L'Hoir MP, Engelberta AC, van Well GTJ, et al. (1998).
- 106 Fleming PJ, Blair PH, Pollard K, et al. 1999. Confidential Enquiry into Stillbirths and Deaths in Infancy/Sudden Unexpected Deaths in Infants Research Team. Pacifier use and sudden infant death syndrome: Results from the Confidential Enquiry into Stillbirths and Deaths in Infancy/Sudden Unexplained Deaths in Infancy case control study. *Arch Dis Child*. 81:112-116.
- 107 Ball H. (2007). Together or apart? A behavioural and physiological investigation of sleeping arrangements for twin babies. *Midwifery*. 23(4):404-412.
- 108 Community Paediatrics Committee Canadian Paediatric Society. 2003. Reaffirmed 2009. *Paediatrics & Child Health*. 8(8) 515-519.
- 109 Davies DP. 1985. Cot death in Hong Kong: a rare problem? *Lancet* 2:1346-1348.
- 110 McKenna, J, Volpe LE, (2007). Sleeping With Baby” An Internet-Based Sampling of Parental Experiences, Choices, Perceptions, and Interpretations in a Western Industrialized Context. *Inf. Child Dev*. 16:359-385.
- 111 McKenna, J. (2007) *Sleeping with your Baby: A Parent's Guide to Cosleeping*. Platypus Media, LLC. Washington, DC.
- 112 Ibid.
- 113 McKenna, JJ, Mosko S, Richard E, et al. (1994). Mutual behavioral and physiological influences among solitary and co-sleeping mother-infant pairs: Implications for SIDS. *Early Human Development*. 38:182-201.
- 114 Ball H, Hooker E, Kelly P. (1999). Where will the baby sleep? Attitudes and practices of new and experienced parents regarding cosleeping with their new-born infants. *American Anthropologist*. 101(1):143 -151.
- 115 McCoy RC, Hunt CL, Leska SM, et al. (2004). Frequency of bed sharing and its relationship to breastfeeding. *Developmental and Behavioural Pediatrics*. 25:141-149.
- 116 Rigda RS, McMillen IC, Buchley P. (2000). Bed sharing patterns in a cohort of Australian infants during the first six months after birth. *Journal of Pediatrics and Child Health*. 36:117-121.
- 117 Ball HL. (2002). Reasons to bedshare: why parents sleep with their infants. *Journal of Reproductive and Infant Psychology*. 20:207-222.
- 118 McKenna JJ, Mosko SS, Richard CA. (1997). Bed sharing promotes breastfeeding. *Pediatrics*. 100:214-219.
- 119 Ball, H, Hooker E, Kelly P. (1999).
- 120 McKenna JJ, Mosko SS, Richard CA. (1997).
- 121 Horsley T, Clifford T, Barrowman N, et al. 2007. Benefits and Harms Associated with the Practice of Bed Sharing. *Arch Pediatr Adolesc Med*. 161(3);237-245.
- 122 McKenna JJ, Mosko SS, Richard CA (1997).
- 123 Stein MT, Colaruso C, McKenna JJ, Powers NG. (2001). Cosleeping (bedsharing) Among Infants and Toddlers. *Pediatrics*. 107:873-877.
- 124 Richard C, Mosko S, McKenna J, Drummond S. (1996). Sleeping position, orientation and proximity in bed-sharing infants and mothers. *Sleep*. 19:685-690.
- 125 Blair PS, Sidebotham P, et al. 2009.
- 126 Lyznicki JM, Doege TC, Davis RM, et al. Sleepiness, driving and motor vehicle crashes. *JAMA*. 1998;279:1908-13.
- 127 Motherisk Professionals Web Site. The Hospital for Sick Children. Available at: <http://www.motherisk.org/prof/index.jsp>. Accessed on December 2, 2009

## References (Endnotes), cont.

- 128 Task Force on Sudden Infant Death Syndrome, American Academy of Pediatrics. 2005. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*. 116:1245-55.
- 129 Ministry of Health Drug Use Optimization, Pharmaceutical Services Division. Working Group Statement Infant Safe Sleep Guideline Development Working Group. Email communication June 21, 2010.
- 130 Ruys J, de Jong GA, Brand R, Engelbert AC, Semmekrot, BA. (2007). Bed-sharing in the first four months of life: a risk factor for sudden infant death. *Acta Paediatrica*. 96:1399-1403.
- 131 Blair PS, Sidebotham P, et al. 2009.
- 132 Stening W, Nitsch P, Wassmer G & Bernhard R. 2002. Cardiorespiratory Stability of Premature and Term Infants Carried in Infant Slings. *Pediatrics*. 110:879-883.
- 133 Health Canada [http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/\\_2010/2010\\_36-eng.php](http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/_2010/2010_36-eng.php).
- 134 Ibid
- 135 Luo ZC, Kierans WJ, Wilkinds, R Liston, Uh SH, Kramer M. 2004. Infant Mortality among First Nations versus non-First-Nations in British Columbia” temporal trends in rural versus urban areas, 1981-2000. *International Journal of Epidemiology*. 33:1252-1259. <http://ije.oxfordjournals.org/content/33/6/1252.full.pdf>.
- 136 Wilson C. 2000. Cree infant care practices and sudden infant death syndrome. *Canadian Journal of Public Health. Revue Canadienne De Sante Publique*, 91(2)133-136.



**Perinatal Services BC**

West Tower, 3<sup>rd</sup> Floor  
555 West 12<sup>th</sup> Avenue  
Vancouver, BC Canada V5Z 3X7  
Tel: (604) 877-2121

[www.perinatalservicesbc.ca](http://www.perinatalservicesbc.ca)



The Best Place on Earth

While every attempt has been made to ensure that the information contained herein is clinically accurate and current, Perinatal Services BC acknowledges that many issues remain controversial, and therefore may be subject to practice interpretation.