

## Is Tummy Time Important? You Decide

1. Typical development womb to 4 months-purpose and preparation
2. Back to Sleep Program-Problems and Risks
3. Equipment Hazards

### Your Role is Critical

1. Help parents understand a newborn's environment and the importance of swaddling, limiting stimulation and establishing a consistent routine now and for years to come.
2. Help them understand that each stage of development prepares them to be successful at the next one. Don't attempt to skip stages of development (processing sensory information and developing controlled movement) by added equipment or artificial positioning.
3. Tummy Time (the foundation of development) at least 3-5x/day beginning as a newborn.

### Terms

Prone-tummy

Supine-back, spine

Flex-bend

Extend-straighten

### Developmental Principals

1. Movement is developed head to bottom
2. Weight bearing (normalizes tone, sensory input) and elongation of muscle precede muscle control
3. Core to distal
4. Extensors to flexors (unilateral to bilateral) -> lateral (co-activation)->rotation (concentric-eccentric)
5. Gross motor to fine motor (PT -> OT)
6. Immature to mature patterns

### Red Flags

- Immature pattern is kept too long
- Stiff/tight or floppy
- Too much extension-arching the back, straight/locked legs, up on toes
- Asymmetry-one side does more than the other, lack of balance of control, lacks midline control,
- Unusual movement pattern or lack a variety of movement patterns
- Delayed gross motor skills
  - 3 month-good head control, symmetry midline orientation
  - 6 month-sitting independently freeing hands
  - 9 months-crawling primary form of mobility
  - 12 months-walking (average age 11.2 months, as late as 16-18 months)
- If parent is concerned-listen; often see things when looking at the baby pictures

*If a child has medical history/diagnosis indicative of a problem or you are seeing some of these red flags I would recommend a referral as early as 3-4 months. (with the exception of maybe a medically fragile child)*

## The Womb

The first month of a baby's life is very important as he/she adjusts from the warmth and safety of the womb to the realities of the outside world. Too often babies are overstimulated with their new environments unable to process the incredible amount of new sensory information they are receiving (sound, sight, touch, movement).

- pressure, secure and safe
- crowded-flexed posture, deep
- warm and soft
- muted sound
- dark-no visual stimulation
- water-gravity eliminated, gentle
- resistance
- gentle movements
- air and nourishment provided

## Newborn-First Month-Coming from the womb-Elongation and Sensory organization

1. Posture-physiological normal flexion tone (result of central nervous system maturation) and flexion tightness due to in utero position- (preemies-more extension)

- flexion-hips, knee, foot, neck, shoulders, elbow, wrist, fingers
- positioning and extensor activity will elongate flexor muscles

*We want to build in muscle control while muscles are being elongated, not try to get it after elongation.*

2. Movement

- random movements are primarily a result of gravity and reflexes.
- mouth to hand-accessible when prone or swaddled, cannot move arm against gravity to bring to mouth
- tummy-deep pressure into face, hands, forearms and shoulders-sensory/proprioceptive feedback-secure (contrast to lying on back)
- tummy-elongation of physiological flexion
- tummy-first antigravity muscle control is lifting head (extension and uncontrolled rotation) producing vestibular stimulation, feels first weight shift inferior and lateral

## The 2<sup>nd</sup> Month-Developing Head Control

1. General:

- Physiological flexor tone and tightness has been reduced (may appear low tone) and is being replaced with asymmetric extensor activity-more mobility, working on developing control

2. Supine

- head is rarely in midline (more mobility, only has unilateral control)
- while on their back the baby can track side to side while turning head, briefly fixate in midline
- if rattle is placed in hand, the baby can briefly retain it due to palmar grasp reflex but does not pay attention to it-involuntarily drops
- legs in variety of movement patterns

and positions

3. Prone

- lifts head to 45 degree momentarily- unilateral extension (not in midline)-stimulation of visual, proprioceptive (awareness of posture, where the body is at in space) and vestibular systems, (sense of movement, related to balance) and elongation of shoulder and chest muscles
- head bobbing and turning (weight shift to face side-immature pattern)
- primitive forearm propping (elbow behind shoulder joint and close to body, weight on outside of forearm and hand, fingers fisted) can bring head and mouth to hand for
- calming (hand is too far away to do this while on back)

### The 3rd Month-Good Head Control

1. General-development of good head control

- beginning symmetry and midline orientation are
- extremities beginning antigravity control of
- closely paired with head control ocular (visual) motor control is

2. Supine

- the head (bilateral control of flexors) symmetry and midline orientation of
- 180 degree, eye hand regard regard an object in midline and track
- activities and antigravity flexor control of arms increase in bilateral symmetrical
- develop body awareness brings hands to mouth and body-
- and reciprocally patterns active kicking in supine-symmetrical
- reducing tactile sensitivity-begin abdominal strengthening foot to foot play-body awareness and

3. Prone

- prop on forearms with sustained head elevation 45-90 degrees maintains without bobbing (increase in spinal extention, shoulder girdle development, elongation of neck muscles, hip flexors and abdominals, visual and sensory development)
  - rotate head to R and L-weight shift
  - laterally-important sensory info unable to control neck flexion-looks
  - down at toy and loses it
  - weight bearing-muscles around shoulder joint are involved in simultaneous stability and mobility-if doesn't control may accidentally roll to side
- Pink Flag-working on propping up on hands, but with bad position-no significant med history, new skill, everything else looks good

4. Supported Sitting

- sustained head lifting-both flexors

and extensor working together (most difficult when prone)

## The 4th Month-Symmetry and Midline, Beginning Function

### 1. General

- marks the beginning of controlled, purposeful movements and the beginning of alternating, coordinated movements (prone on elbows to pivot prone)
- symmetry and midline orientation are established
- very active visually-must have previously establish head control
- stability of the cervical spine and shoulder girdle provide a base for the muscles of the tongue and jaw to work off of (preparation for baby food)

### 2. Supine

- lower extremity symmetric flexing and extending-develop pelvic mobility and control
- hands to midline and various part of the body - hand to knee play (abdominal strength, elongate hip extensors)
- roll to side lying- shapes rib cage, new visual and vestibular orientation, asymmetric tactile and proprioceptive feedback (roll tummy to back at 5 months, back to tummy at 6 months)  
Flexed Rolling Movement pattern: neck flexion-facilitates neutral spine and trunk, downward gaze  
**Red Flag: frequent or sole use of a extended movement pattern where the baby attempts to roll by extending neck which further facilitates arching the back and an upward gaze (seen more often in preemies)**
- visually track an object without turning heads (dissociation of eyes and head-important for reading in the future)
- downward gaze with neck flexion- visually observe their bodies
- active control at shoulder for reaching-light touch to abdominals facilitates more coordinated and successful movement, ulnar (outside) grasp (first weight bearing surface, immature pattern)
- because the baby cannot manipulate the toy with hands, mouthing of toy is important for early development of perceptual awareness of shapes, sizes and textures-also decreases tongue and mouth sensitivity

### 3. Prone

- hold head up to 90 degree in midline, rotates head resulting in lateral weight shift through shoulder
- forearm and occasional extended arm support (extended arm 5 months)-deep pressure into hands, desensitize, (progress to open hand and lateral weight shift through hand)
- attempts to play with toy without being able to raise arm (reach for toy at 5 months)-develops greater flexor control at neck (able to look down at toy)
- "The development of shoulder girdle control ... in forearm weight bearing appears to contribute significantly to the development of the the oblique abdominals musculature." (these muscles control rotation of the trunk)
- pivot prone-extensor activity and stimulates vestibular system, elongates abdominals and hip flexors, strengthen hip extensors (important for sitting and standing)

- "As head-neck stability and active mobility improve, there is a concomitant increase in ocular muscle control and mobility. Ocular control both contributes to and depends upon head control"
  - hips extend and legs come together
4. Sitting
- **Red Flag-frog legged position-blocks lateral and posterior weight**
  - sit unsupported for several seconds
- (sit independently freeing hands at 6 months)

### **Is Tummy Time Important?**

**How will you explain the importance of tummy time to parents? Why is it important?**

1.

2.

3.

4.

Resources: Motor Skills Acquisition in the First Year, Lois Bly, M.A., PT

For you created my inmost being; you knit me together in my mother's womb.

I praise you because I am fearfully and wonderfully made  
your works are wonderful, I know that full well. Psalm 139-13-14

## American Academy of Pediatrics

### 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 Vol. 116 No. 5 November 2005

#### Independent risk factors for SIDS:

- prone sleeping position
- sleeping on a soft surface, pillows, blankets
- bed sharing
- maternal smoking during pregnancy
- overheating
- late or no prenatal care, young maternal age, preterm birth and low birth weight
- Unaccustomed prone position (increase SIDS by as much as 18 fold)
- majority of SIDS deaths occur between 1 and 4 months

#### Additional ways to prevent SIDS

- Don't smoke, baby should be in a smoke free environment
- Breast feed
- Keep baby in a crib in your room
- Use a pacifier
- Don't over dress
- Fan to circulate air

## American Physical Therapy Association

### Lack of Time on Tummy Shown to Hinder Achievement of Developmental Milestones

- 2/3s of those surveyed say they've seen an increase in early motor delays in infants over the past six years. Lack of tummy time is the number one contributor to the escalation in cases.
- We have seen first-hand what the **lack of tummy time can mean for a baby: developmental, cognitive, and organizational skills delays, eye-tracking problems, and behavioral issues**, to name just some complications. (APTA spokesperson Judy Towne Jennings, PT, MA, a physical therapist and researcher from Fairfield, Ohio)
- New parents now use car seats that also serve as infant carriers, this generation of babies spends prolonged periods of time in one position.
- Ideally, babies should be placed on their tummies after every nap, diaper change and feeding, starting with 1-2 minutes (APTA spokesperson Judy Towne Jennings, PT, MA, a physical therapist and researcher from Fairfield, Ohio)
- There is an alarming increase in skull deformation. Study at Children's Hospital and Regional Medical Center in Seattle, Washington, found that prior to 1992, the prevalence of misshapen heads among infants was reportedly 5 percent. In recent years, craniofacial center and primary care providers reported a **dramatic increase of up to 600 percent in referrals for misshapen heads.**

# Supine and Prone Infant Positioning: A Winning Combination

Journal of Perinatal Education, Winter 2004, Vol. 13, No 1

Martha Wilson Jones, RN, BSN

- “supine positioning for sleep is clearly evidence-based and has saved the lives of many children”
- “The first trend noted following the change to supine sleep positioning involves delays in acquisition of early gross motor milestones”
- Finding of Mildred and colleagues (1995) “significant association between the knowledge of SIDS and fears connected with prone play positioning, 26% reported never placing their infant in a prone position for play”
- several studies identified “delays in acquisition of early gross motor milestones”
- “high guard” position has been seen more frequently since the change in sleep position.” “...infants get “stuck” in this position, which can affect hand to mouth activities, fine motor skills that involve hand midline play and reaching, and gross motor activities that require forearm propping.”
- “Positional or acquired torticollis...diagnosis seen more commonly in infants who sleep in the supine position”
- referral of infants with plagiocephaly “researches discover that, in the period of time between 1992 to 1994, the number of referrals was six times greater than that during the preceding 13 years.”
- “researchers discovered that all of the affected infants included in this study were put to sleep in the back or sidelying position showing a direct association with the change to nonprone sleep position and the finding of an increased incidence of deformational plagiocephaly. Of these infants, 75% resolved with frequent head turning, 23% resolved with helmet molding therapy, and 4% required surgery.”
- “Panchal and colleagues examined 42 infants with plagiocephaly...standardized test of cognitive and psychomotor skills...0% of the subjects in the group were accelerated, 67% were normal, 20% demonstrated delays in cognitive and psychomotor development”
- “Milloer and Clarren performed a medical record review of 64 patients with persistent plagiocephaly and were able to document the need of special education services needed in 39.7% of children with this condition. This was contrasted to 7.7% of siblings within these families, which served as controls.”
- Untreated plagiocephaly can also cause abnormal occlusion, temporomandibular joint difficulties and strabismus.
- “Watching for occiput flattening and treating early with counter positioning may be the easiest ways to avoid complication requiring therapy and other intervention.”

## Table 1 Strategies to Prevent and Treat Infant Head Molding

- Change the position of the infant's head throughout the day to prevent pressure to same side.
- Limit the time in supine position in car seat, infant swing, and infant carriers.
- Change the position of the infant's crib relative to the door in order to encourage the infant to look in the opposite direction.
- Reverse the head-to-toe position of the infant in the crib, weekly.
- Provide visual stimulation to the infant in all vision fields.
- Change toy, mobile, and crib positions, weekly.
- Watch for "high guard" positioning (arms held up and externally rotated), and make sure the infant has midline play opportunities.
- Recognize and treat torticollis, plagiocephaly, and shoulder retraction as early as possible for optimal treatment.

Information gathered from clinical experience as well as the following sources: Heikengren, Sapala, & Gale, 1998; Hunter & Mallov, 2002; and Neufeld & Birkett, 2000.

# **Supine and Prone Infant Positioning: A Winning Combination**

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## **Table 2 Strategies for Promoting Prone Play**

- Provide supervised prone or side-lying playtime, daily.
- Begin with 15 minutes per day and increase by 1 minute per week.
- If infant does not initially like being in prone position, place blanket roll under its chest so it can see beyond the floor and then decrease the thickness over time as the infant's skills progress. This allows the infant to work on head control as well as upper body strength while he/she is in a more functional position for visual stimulation and play activities.
- Parent can lie supine with the infant prone on the parent's chest to interact with the infant.
- Parent can place the infant in prone position on a table or in an infant seat and then sit within the infant's range of vision while keeping a hand ready for safety.
- Put interesting objects e.g., toys, pictures, or even goldfish in a bowl) in the infant's visual field. Remember that the most interesting object to an infant is the parent's face.

Information gathered from clinical experience as well as the following sources: Heikengren, Sapala, & Gale, 1998; Hunter & Mallov, 2002; and Neufeld & Birkett, 2000.

## **Table 3 Strategies to Decrease the Risk of Sudden Infant Death Syndrome**

- For the first 6 months of life, the infant should be placed in a supine position to sleep, unless specifically medically indicated otherwise.
- Side-lying is preferred to prone; however, because the baby may inadvertently roll, side-lying is not as safe as supine.
- Infants who are able to roll over should still be placed in supine position for sleep, initially.
- Mattress should be firm, not soft.
- Soft bedding under the infant may cause suffocation or strangulation. This includes pillows, quilts, water beds, and sofas.
- Adult beds may increase the risk of SIDS. Infant may become trapped between the mattress and bed or wall, causing suffocation and strangling.
- Pillows and blankets should be avoided. Use blanket sleepers if room or home temperature is cold.
- Overheating may increase the risk of SIDS. Try to avoid overdressing the baby or overheating the room.
- Avoid smoking in home with infants. Passive smoke increases the risk of SIDS.
- Stuffed animals should not be placed in bed with infant.
- Breastfeeding should be encouraged.

Sources: AAP, 1996, 1998, 2000; Hunter & Malloy, 2002; and Willinger et al., 1998.

# **Your Role is Critical**

**When you talk to parents about SIDS and the back to sleep program, give them the whole picture.**

- **Don't just emphasize one risk factor (prone sleeping) educate them about all the risk factors and additional ways to prevent SIDS. (refer to previous tables)**
- **You must also tell them about the problems and risks factors that are being identified from babies spending too much time on their backs and in other baby equipment. Including:**
  - **Delayed gross motor skills**
  - **Poorly developed shoulder control and fine motor delays**
  - **Organizational skills delays**
  - **Eye tracking problems**
  - **Behavioral issues**
  - **Positional or acquired torticollis (tightness in the sternocleidomastoid muscle resulting in head tilting and turning to the opposite direction)**
  - **Plagioccephaly-head deformities (and associated delays in cognitive and psychomotor development, TMJ difficulties and vision problems)**
- **Identify red flags and problems early and make the appropriate referrals for additional help**

***Building Babies Better***  
*Developing a Solid Foundation for Your Child*  
Roxanne Small, PT

## **Equipment Hazards-“Bad Habits”**

### Walkers and Jump Up Seats

- Do not use baby walkers or exersaucers with a child at any age.
- Many babies are placed in these types of seats before they can sit independently, which is even worse.
- They also encourage a child to be visually attentive to his environment, but not in a way that is connected or coordinated with his body.
- Walkers are not good for the foot structure because they encourage the foot to push only with toes.
- They promote the use of just the extensor muscles to stay upright verse the flexor and extensor muscles working together for control. Both muscles groups are needed to function independently. (Susan Kohl)

### Car Seats:

- Not only are babies transported in plastic seats many babies sleep in them and spend much time awake in them.
- Time in the infant seat is known as “zero developmental time.” Decrease parent carrying time limits sensory experiences of touch, proprioception and smooth vestibular movement. The infant also is limited in ability to move and develop head and trunk control.

### Early Standing

- Do not encourage standing until a child does it all by himself. (This includes holding a baby and bouncing them on your legs to bear weight)
- This includes providing push toys before they are ready to walk.
- The body is designed for “cruise walking” sideways around furniture before walking forward. This “cruise walking” helps build muscles on the sides of the hips which are essential to good standing stability.
- Walking at 13 to 15 months of age provides time to experience and develop skills in crawling and creeping. Do not try to accelerate this timetable for a baby.

### Television

- a visual activity that contributes zero to developmental time-stops playing and moving and child stares at the television
- visual activity does not connect vision with the movement of their own body
- interferes with building a solid sensory-motor foundation

### Music and Noise

- Music and noise should not be a constant for a baby.
- Babies are generally overly stimulated and need help to be in an environment that encourages, calm, relaxed function.

### Visual Stimulation in Crib

Avoid placing visually stimulating items in the crib, such as mirror or mobiles. The crib should be place where baby calms, sleeps, and moves.

***Building Babies Better***  
*Developing a Solid Foundation for Your Child*  
 Roxanne Small, PT

By not putting babies on their tummy, some babies:

- heads will become flattened
- opportunities to build neck and back muscle strength and coordination are lost
- Work done during “tummy time” forms the foundation for sitting, standing and walking

Tummy Time: doing it less than three times per day does not give the nervous system the optimum opportunity to change

**From birth to six months of age, babies need to play with their movements and touch sensations. They are trying to organize their very stimulating environment. Toys are more appropriate after six months of age.**

Carrying babies has changed significantly over the past 25 years. Plastic is “in” and human touch is “out” Not only are babies transported in plastic seats, many babies sleep in them and spend much time awake in them. Time in the infant seat is known as “zero developmental time.” this means that there is no appropriate sensory input happening during this time.

	Car seat	Parent Carrying
Vision/Parent Bonding		
Sensory-Touch, Auditory, Smell		
Sensory-Movement		
Motor Development		

**During the ages of birth to six months, the focus needs to be on the more basic systems of touch, muscle sensation, and movement coordination, rather than the higher sensory system of vision**

The sensation of deep pressure is a critical sensory function that is a foundation for coordinated movement.

- Normalizer-decrease high muscle tone (tight muscles) and increase low muscle tone (loose muscles).
- Improves muscle sensation and, thereby, improves muscles function

## The First Month

The first month of your baby's life is very important as he/she adjusts from the warmth and safety of the womb to the realities of the outside world. Your baby's understanding of all this new sensory (sound, seeing, touch, movement) information and their response to it will form the foundation for the rest of their development.

Here are some suggestions to help you think about your baby's womb experience and how you can help him adjust to his new world.

The womb	Transitioning Outside the Womb
Crowded	Swaddle lay on tummy to begin lengthening muscles while giving opportunity to strengthen provide opportunities for weight bearing and deep pressure
Warm and soft	Dress appropriately-not too warm not too cold Less plastic more human touch
Muted Sound	Limit noise, quiet times Hold against body to hear heart beat Human voice
Dark, no visual stimulation	dark to sleep simple to look at and understand-solids, pastel, black and white your face is the best not moving
Water-gravity eliminated, gentle resistance	Positioning to allow for the development of building muscle strength as while muscles are being elongated-Tummy Time Deep pressure against your baby body while on their tummy helps them to feel where there body is and prepares their muscles to work
Gentle movements	Avoid jaring, sudden movement Carry your baby in your arms
Air and nourishment provide	Consistent schedule of eating, sleeping and playing

Know the risks of too much time on the back and in infant seats or other equipment:

- Delayed gross motor skills
- Poorly developed shoulder control and fine motor delays
- Organizational skills delays
- Eye tracking problems
- Behavioral issues
- Positional or acquired torticollis (tightness in the sternocleidomastoid muscle resulting in head tilting and turning to the opposite direction)
- Plagioccephaly-head deformities (and associated delays in cognitive and psychomotor development, TMJ difficulties and vision problems)