

Secrets of Baby Behavior: Improving Compliance with Infant Feeding Guidelines at WIC

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Introduction: WIC

- Despite extensive nutrition education provided to WIC participants, many do not comply with infant feeding guidelines
 - 44% of WIC participants BF exclusively for 1 mo
 - 15% BF exclusively for 4 mo
 - 5% BF exclusively for 6 mo
 - WIC participants are more than 4x more likely than non-participants to start solids before 4 mo
- These behaviors are associated with increased risk for childhood obesity

Research Focus

- What are low-income mothers' barriers to compliance with infant feeding guidelines?
- What can be done to overcome those barriers and prevent overfeeding of young infants?



Results from UC Davis Studies

- Focus groups (2003-2008)
 - 87 English-speaking, 67 Spanish-speaking low-income mothers
- 4 WIC agencies
 - Community Resource Project WIC Sacramento, Solano County, Yolo County, Butte County
- Sessions recorded and transcribed (supplemented with field notes)
- Transcriptions reviewed and independently coded by 3 researchers
 - Coding differences resolved by consensus

Infant Feeding Intentions/Practices

- Majority planned to breastfeed (though most planned to mix feed)
- Many changed plans after the baby was born (gave formula in first mo)
 - Clinical issues were reported but not in great numbers
- Most reported giving solids at 4 mo on pre-session survey, but earlier intro was mentioned frequently
 - Cereal not always considered a solid food
 - Few gave juice or sugary drinks

Results – Focus Groups (2003)

“Breast is best.”

- Health messages regarding breastfeeding were loud and clear
 - *“Helps them protect against viruses better, breastfeeding. It’s also very important for development of the brain and eyes.”*
 - *“My mom breastfed my brothers and so that was something I wanted to do with my son because, you know, that special bond, and I feel there’s a bond and it’s healthier.”*

UCD Focus Groups (2003)

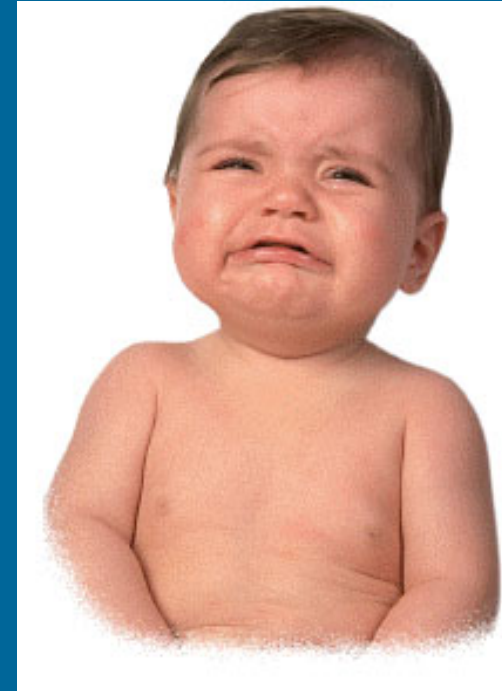
- **Some** mothers reported latch difficulty, pain, other clinical challenges
- **Many** mothers reported that their infants were not satisfied when they followed guidelines
 - We asked how could they tell?
 - Many of the mothers told us about their baby's behavior



Results – Focus Groups (2003)

- Mothers believe babies cry because of hunger (and that formula and cereal prevent hunger)

“When I gave formula, the baby no longer cried and slept, and that is when I decided not to give him breast milk.”



Results – Focus Groups (2003)

- They believe babies wake because of hunger
 - *“The baby sleeps better with formula.”*
 - *“From the time she was maybe 3 or 4 months old, I started putting a little cereal in her bottle, and it was like at night. It would help her; she would be full and sleep through the night.”*



Results – Focus Groups (2003)

- They think their babies will stay full longer if they are overfed
 - *“He was not full, and I gave him other things. My baby used to wake up, but now I am giving him formula if he is already full and he no longer wakes up.”*



Results – Focus Groups (2003)

- **Moms were pressured by others to feed:**
 - *“ His dad went and bought the formula and he still would wake up. Oh my God, I’m not going to get no sleep. His grandma, she went and bought the rice cereal and started mixing it up, and he’d eat it and he’d burp a little and then he started sleeping more and more because he was full, but before that he was not full, he was always hungry and crying. His dad would say, ‘Are you feeding him?’”*

Results – Focus Groups (2003)

- Mothers understand what is best, but many believe that their circumstances *force* them to make other choices
 - Full, quiet, sleeping child is norm
- Mothers believe that health care providers/ support staff do not understand what they are experiencing
 - *“They don’t see what you’re going through. They are not there to see that you can’t do it and you keep trying. It’s like, ‘You try it.’ ”*

Infant Behavior and Feeding Practices: Additional Research

- **Qualitative study of low-income mothers and dietitians in the WIC program**
 - Examined beliefs about childhood overweight among mothers (adults and teens) of children 12-36 mo
- **Mothers perceived their children were not satisfied**
 - *“It’s 6 in the morning and your baby is crying and all he wants is a bottle and you can’t do nothing but give him milk because that’s all they [WIC] give you. He takes like 4 bottles every hour. Just a little dab of cereal would do that baby. Give that baby some cereal and milk and that baby is out for the whole night. That’s all the baby wants is cereal.”*

Infant Behavior and Feeding Practices: Additional Research

- **Mothers frequently used food to shape behavior**
 - Mothers “thought that giving a fussy baby a bottle was a ‘quick fix’ for quieting them. The mothers used crying as the main signal to help them determine how often their babies needed to be fed.”
 - When their infants grew older, mothers switched from using the bottle to table foods to influence their children’s behavior



Feeding in Response to Baby Behavior

- Crying and waking are considered to be “hunger cues” by many mothers
 - If breastfeeding, they start adding formula
 - Add more formula, and more formula
 - Start solid foods (cereal in the bottle)
 - Add other solid foods
 - Feed every time the baby makes noise

What can we do?

- We can help parents
 - To tell the difference between hunger and other cues
 - To know why babies wake up
 - To gain confidence in their abilities to know what their babies need



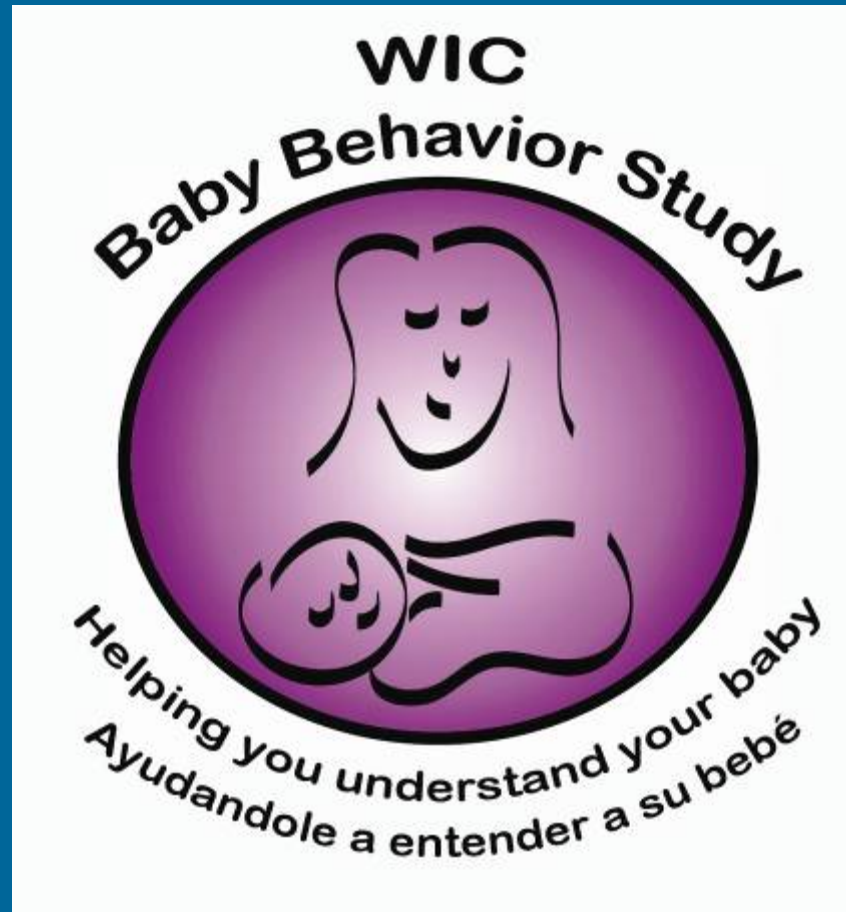
Infant Behavior Research

- Infant behavior has been explored and documented for more than 30 years
 - Brazelton, 1973
 - Barnard 1978, 1987, 1993
- Teaching parents about infant behavior is nothing **nEW** (Leitch, Nur Res, 1999)
 - Interventions have been shown to improve mother-infant attachment and promote infant development
 - Infant-feeding outcomes have not been investigated

Challenges in Developing an Intervention

- Dealing with unrealistic parental/societal expectations about “normal” infant behavior
 - Interventions must address issues that are important to parents (e.g. full=quiet sleeping infants)
 - Assisting overburdened WIC staff to better understand baby behavior and be prepared to answer caregiver questions
 - Reducing complex messages into more accessible “units”
 - Ensuring that interventions do not require excessive amounts of time
-

Fit WIC Baby Behavior Study



Study Design

- Funded by USDA WIC Special Projects Grant (2006-2009)
- 3-year quasi-randomized controlled trial (8 sites)
 - Year 1: Material development, staff training, and baseline data collection
 - Year 2: Intervention period
 - Year 3: Post-intervention data collection, write-up, and dissemination
- Concept: Create a *clinic environment* supporting positive caregiver-infant interactions
 - Social marketing materials, staff training, handouts, classes, activities, incentives

Site Selection



- 15 sites applied – all willing to be randomized
 - Sites with outside funding for BF were ineligible
 - 12 matched on size, geography, infant feeding
 - 8 pairs chosen randomly – first site of each pair was assigned to intervention group
- 4 Northern California sites
 - 2 near Sacramento
 - 2 in Oakland
- 4 Southern California sites
 - 2 in LA/Orange County
 - 2 in San Diego

Project Overview

- Each intervention site participated in 4 trainings (over 3-4 months)
 - Control sites received 1 training on assessing growth
- Staff trained in infant behavior, counseling methods, modeling positive interactions
 - Given handouts in English and Spanish
- Education staff given class outlines, handouts, and props for classes
- Clinic-wide data collected pre- and post-intervention, individual participants were not followed
 - Exposure to intervention messages varied widely

Data Collection

- Staff survey – baseline/post
- Participant survey (baseline/post) – attitudes, beliefs, infant feeding practices
 - Prenatal/postnatal, English and Spanish
- Class pre-/post-tests and evaluations
- Birth weights (reported) and weights of 5-7 mo-old infants – baseline/post
- Standardized assessment of site compliance through phone calls and visits
- Staff interviews and participant focus groups
- Comparison of ISIS (food package) data

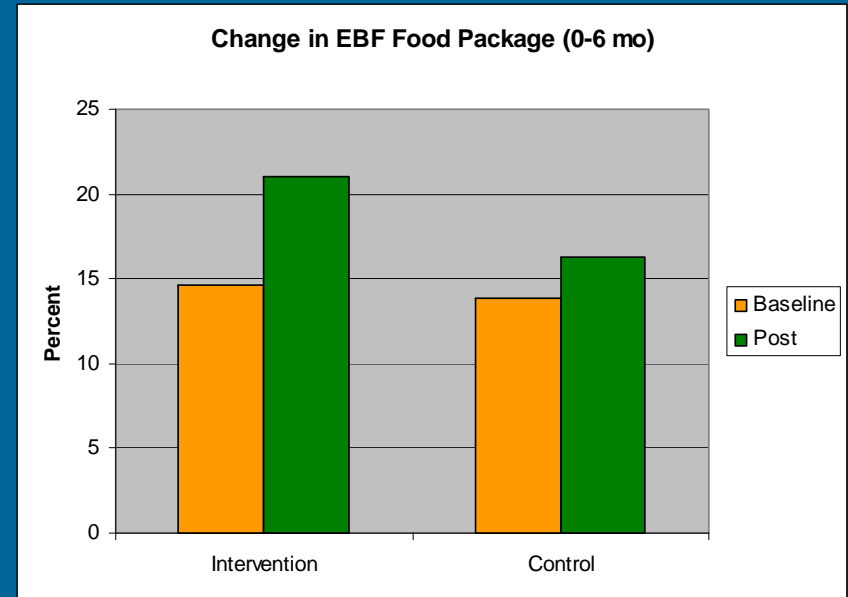


Population Characteristics

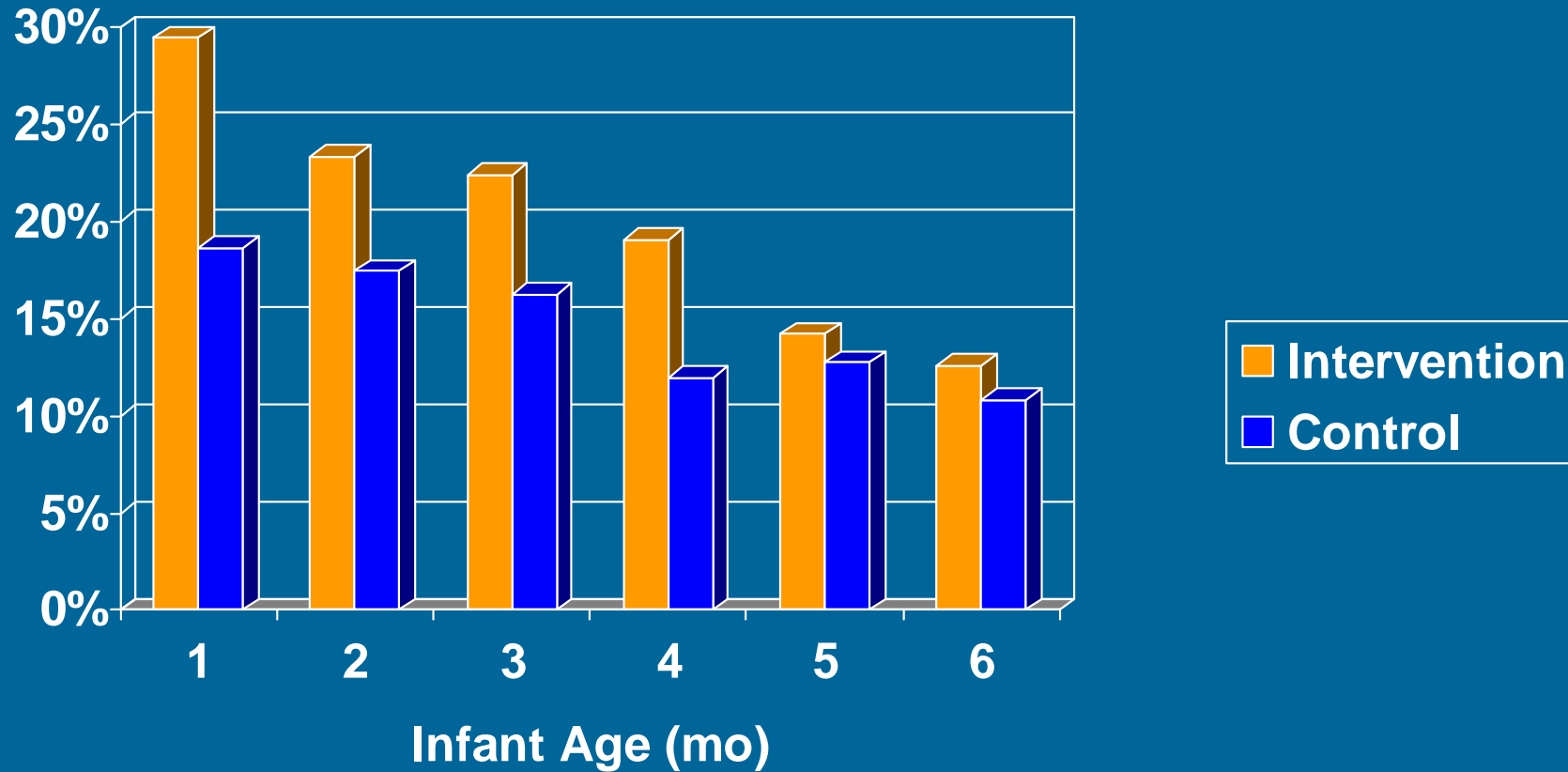
- More than 80% of intervention group was Latino vs just over 70% in the control group
 - Significantly more of the respondents in the intervention group completed the survey in Spanish
 - About half of the prenatal and postnatal samples were born outside of the US
- About 1/3 of the respondents:
 - Had completed less than a high school education
 - Were employed outside the home
- Average age of respondents was 27 and half had 2 children in the home

All Sites Combined: Food Package Selection

- Increase in Excl BF Food Package
 - Intervention = 6.3% (43% higher than baseline)
 - Control = 2.3% (16.5% higher than baseline)
- Decreased formula use
 - 3.4% reduction in exclusive formula feeding food package
 - 7% reduction in distribution of cans of formula while caseload increased 3.6%



Exclusive BF Food Package by Age



Infant Weights

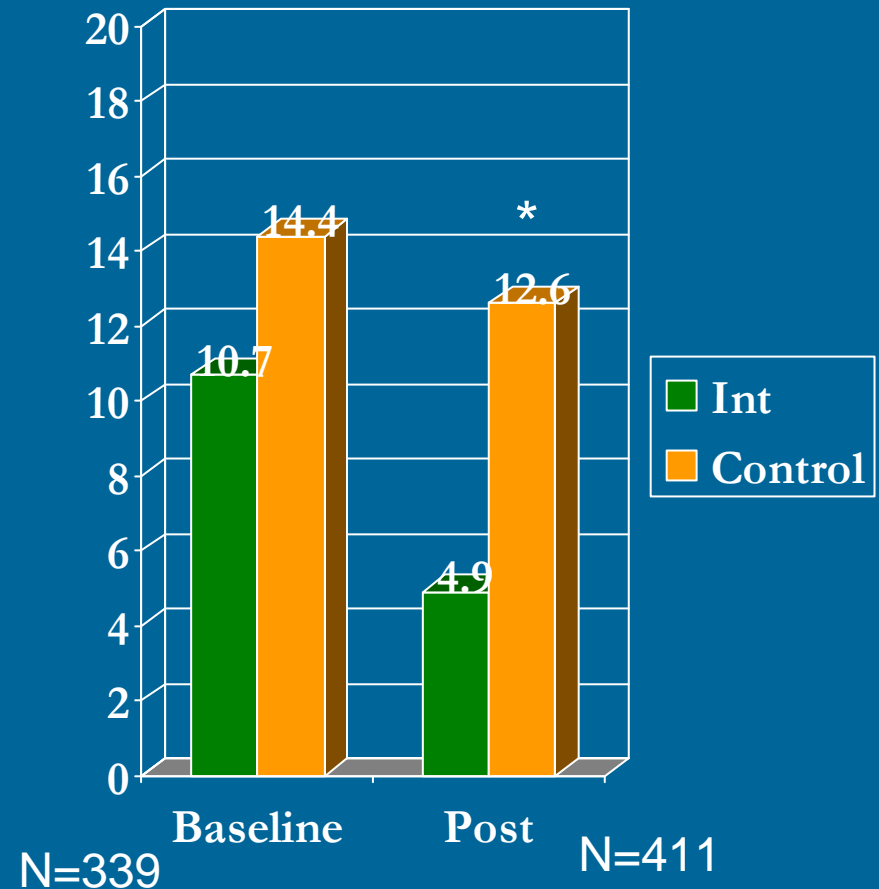
- Weights of 5-7 month-old infants obtained in clinics using scales provided
 - Challenging to obtain (n=427 at baseline, n=517 at end of study, however missing data made many unusable)
- Used reported birth weights to determine infant gain
- Made assumptions about weight of infant clothing



Infants >95th percentile wt/age

- Attained weight for age > 95th percentile 5-7 mo

Note: 21% of the obtained weights were missing data for this calculation, assumptions made about weight of infant clothing



Normal Infant Behavior

- Baby behavior information is another “tool” to help parents with feeding decisions
- Does not replace current breastfeeding or nutrition support
- Our handouts and trainings are *simplified* versions of infant behavioral theory
 - akin to the “5-a-day” approach to nutrition education



Secrets of Baby Behavior: Training Highlights

Infant States, Cues, and Sleep Patterns



Crying

- Tears
- Jerking motions
- Color changes
- Tight muscles
- Rapid breathing
- Generally don't respond



Basis: Primary means of expressing any distress

Irritable (Active Alert)

- Lots of body and facial movement
- Irregular breathing
- Eyes open but may not want to interact
- Sometimes fussy
- Sensitive to what's going on inside and around them
- Common before feeding



Basis: Distracted or distressed by bodily functions, mild fatigue, excessive stimulation

Quiet Alert

- Little body movement
- Eyes open and wide
- Steady, regular breathing
- Highly responsive
- Wants to learn and play - interactive
- For young babies, requires active effort to control! Tiring.



Basis: Innate desire to learn, communicate, find comfort

Drowsy

- Variable movement
- Irregular breathing
- Opens and closes eyes
- Eyes glazed
- Takes time to react
- Easily startled



Basis: Fatigue, satiation, overstimulation

Active Sleep

- Moves a little every now and then
- Irregular breathing
- Facial twitches
- Rapid Eye Movements (REM)
- Easy to wake



Basis: Need for neural activity to promote brain growth

Quiet Sleep

- No body movement
- Rhythmic breathing
- Bursts of sucking
- Startles but does not wake
- Does not respond
- Hard to wake



Basis: Need for complete recovery and rest

Infant Communication

- Healthy infants will try to give cues to “tell” others what they need
- By responding to cues, caregivers help infants change states as needed and assist them to improve their ability to provide clear cues
 - Better response = better cues
 - Infants learn to communicate



Types of Infant Cues

- Young infants try to tell caregivers when they want to interact **(engagement cues)**
- Young infants try to tell caregivers when they need to “take a break” or do something different **(disengagement cues)**



Engagement Cues

“I want to be near you”



■ Obvious

- Looking intently at faces
- Rooting
- Feeding sounds
- Smiling
- Smooth body movements

■ Subtle

- Eyes open
- Face relaxed
- Feeding posture
- Raising head
- Following voices and faces

Disengagement Cues

“I need something to be different”



■ Obvious

- Turns away
- Pushes, arches away
- Crying
- Choking, coughing
- Extending fingers, stiff hand
- Falling asleep

■ Subtle

- Looks away
- Faster breathing
- Yawning
- Hand to ear
- Grimace
- Glazed look

Clustered Cues: Hunger

- Clenched fingers and fists over chest and tummy
- Flexed arms and legs
- Mouthing
- Rooting
- Fast breathing
- Sucking noises/motions



Clustered Cues: Full

- Arms and legs extended
- Fingers extended and relaxed
- Pushing away
- Falling asleep
- Slow or decreased sucking
- Back arching



Helping Parents Respond to Cues

- Engagement cues
 - Interact and play with baby
 - Best time to learn, play, feed
 - Keep in mind that engagement is hard work!
- Disengagement cues
 - Consider all causes (babies can't be specific)
 - Change the environment (diapers included)
 - Fix the problem, provide comfort
 - Stop interactions (siblings too)
 - Let the baby have a break

Sleep Patterns in Infancy



Average Night Waking

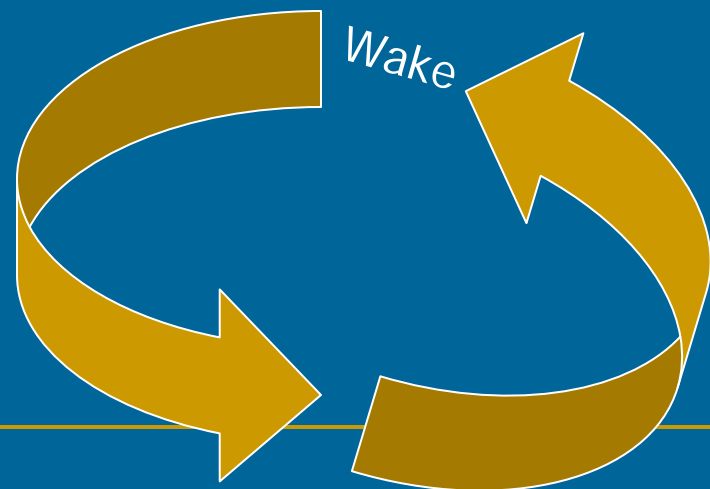
- Parents tend to report a wide range of night waking
- Average waking at night is:
 - 2-3 times by 2 mo
 - 2 times by 4 mo
 - 1 time at 6 mo
- Babies wake when sick, uncomfortable, or because of a change in routine
- Too much waking is stressful and should be investigated

Infant Sleep States

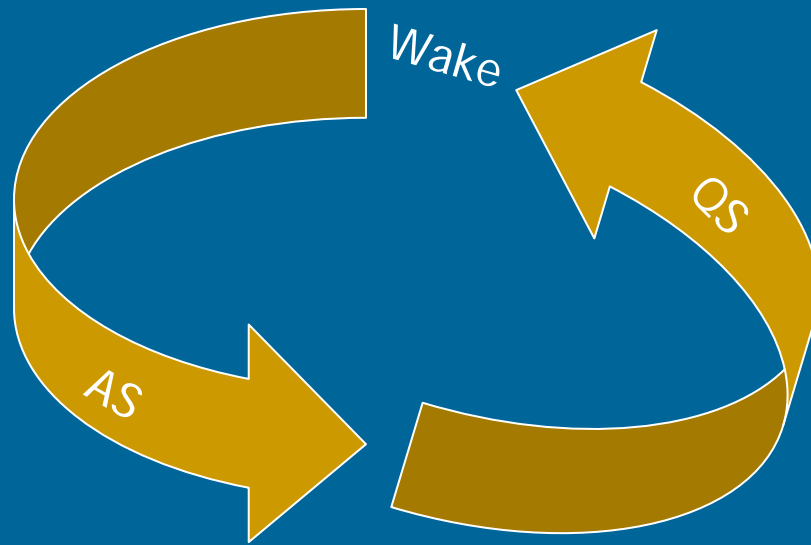
- Active sleep (REM) is considered to be important for brain development
 - Babies dream and blood flows to the brain bringing nutrients to active brain cells
 - Images stimulate brain function
- Quiet sleep is deep sleep, no dreaming or movement, important for the brain to rest
- Infants “cycle” through active sleep, quiet sleep, and waking

Infant Sleep Cycles

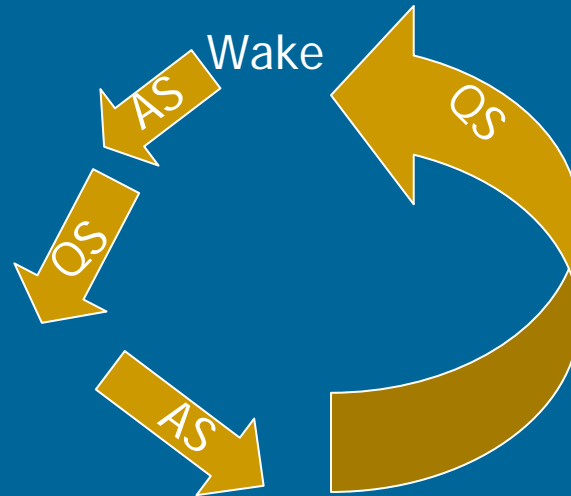
- Infant sleep cycles are 60 minutes long (adult cycles are 90 minutes long)
- Infants sleep 13-14 hours per day from 2-12 months
- Initially, newborns may wake with each cycle (every 1-2 hours)



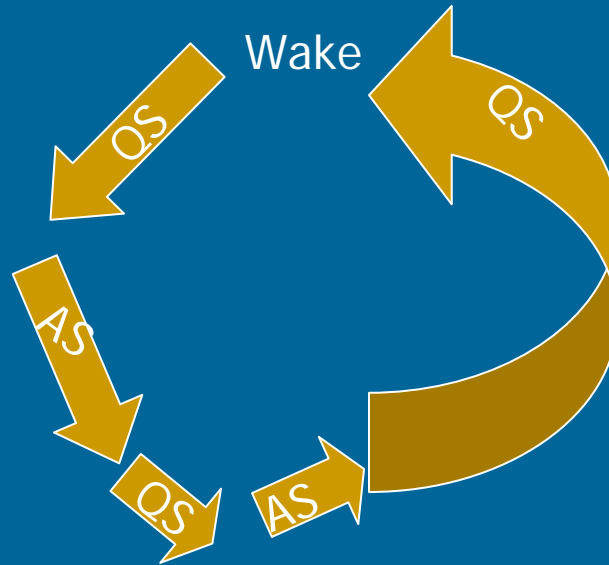
Newborn Sleep/Wake Cycle



2-Month-Old Infant Sleep/Wake Cycle



4+ Month-Old Infant Sleep/Wake Cycle



Infant Sleep Patterns

- As they mature, infants can link cycles together (won't require caregiver with every cycle)
 - ≤ 2 mo (links 2 cycles: 2 hrs)
 - 3 - 4 mo (links 4 cycles: 4 hrs)
 - ≥ 6 mo (links several cycles: 6-8 hrs)
- So, infants will sleep longer and will not be as easy to wake as they get older

Why Active Sleep and Night Waking are Good

- Waking and active sleep are important for brain development
- Waking may be essential to survival—needs must be met for breathing, feeding, warmth
- Breastfeeding mothers' hormonal cycles are interrupted by night feeds, not having periods may lower risk for hormone related cancers
- Therefore, active sleep and waking at night are beneficial for mother and baby

Infant Feeding and Sleep

- Breastfed infants do wake more than formula-fed infants
 - Breastfed infants have more active sleep (more likely to wake up)
 - Babies digest breast milk more quickly than formula – this is best for their development and growth
- Formula-feeding moms can promote active sleep by putting babies “back to sleep” or using pacifiers

“Normal” Crying

- Crying makes adults want to help (important for survival)
- ALL infants cry (crying is used to communicate needs)
 - Babies cry more in the first 6 wks than at any other age (up to 2.5 hrs per day)
 - Crying decreases over the next 10 weeks (most babies cry much less by 4 mo of age)



Why Do Babies Cry?

- Discomfort
- Distress
- Hunger
- Fatigue
- Overstimulation
- Frustration
- Pain
- Distracted
- Fear



Is There a “Hungry Cry”?

- Babies cry whenever they are uncomfortable or unhappy
- How can caregivers tell when a crying baby is hungry?
- Hungry babies *might* cry but they will ALSO bring their hands to their face, clench their hands, flex their arms and legs, root, make sucking motions and noises
- All these behaviors together help us know when a baby is hungry

Helping Parents Deal with Crying

- Infant crying is stressful to everyone
- Parents can be taught to watch for cues to minimize crying and to recognize all the reasons why infants cry
- Parents can be taught soothing techniques though soothing should not be overemphasized
 - Soothing techniques should be tools given to parents as part of an overall strategy to promote positive interactions

Let's Take a Quick Look at the Handouts



Understanding Baby Cues

- Key Messages
 - “I want to be near you” cues
 - “I need a break” cues
 - Ideas for caregivers to respond to cues



Understanding Your Baby's Cues

Do you find it hard to know what your baby needs? Do you want to know how to help your baby be calm and happy?

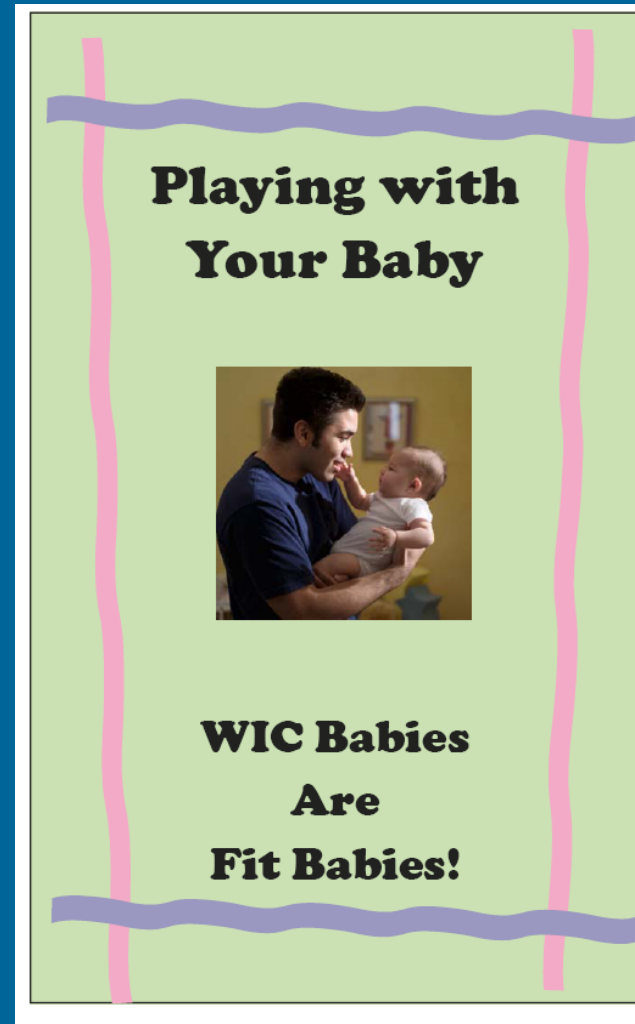


Thankfully, babies have cues that show parents what they need. Looking for cues can make it easier for you to help your baby be calm and happy.



Playing with your baby

- Key Messages
 - Physical activity is important for babies
 - Babies need to develop strength and coordination in large muscles and small muscles
 - Safety



Healthy Sleep for You and Your Baby

- Key Messages
 - Active versus quiet sleep
 - Why active sleep is good for babies
 - Sleep cycles
 - How sleep patterns change
 - Tips for sleepy parents

Healthy Sleep: For You and Your Baby

When babies are young, waking keeps them safe and healthy.



Waking up with babies can be hard for new parents. Knowing what to expect will help you feel more relaxed and confident.

Why Do Babies Cry?

- Key messages
 - Tips about preventing crying as well as dealing with crying babies
 - We include information about excessive crying and soothing techniques but we don't want to overemphasize soothing
 - We want parents to interact with their babies, not just soothe them

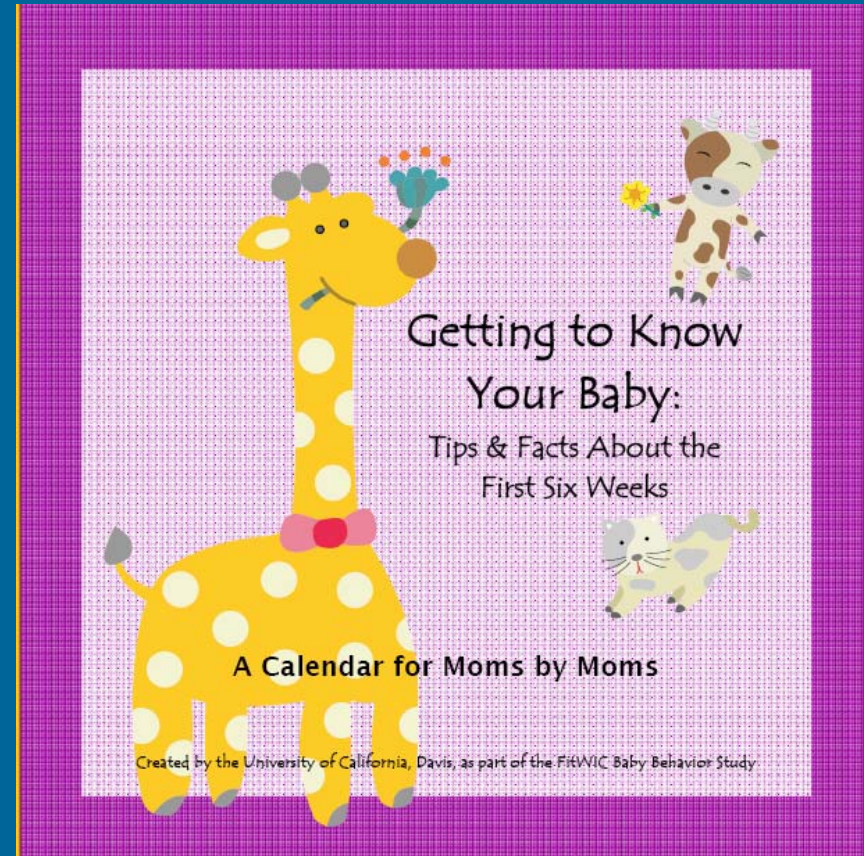
Why do
Babies
Cry?



It can be very upsetting
when babies cry.
Crying is normal, but there are
things you can do to reduce it.

Getting to Know Your Baby

- This booklet/calendar is intended to be handed out to pregnant women during a prenatal class
 - The book provides facts and tips to help new moms cope during the first 6 weeks postpartum



Social Marketing Materials

- Posters
- Handouts for partners, grandparents, child care providers

What does it mean...



...to sleep like a baby?

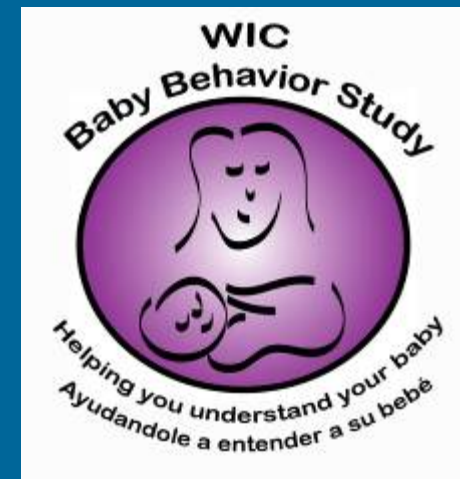
Young babies don't sleep like adults. Knowing more about how babies sleep can help tired parents. WIC can help you understand how your baby sleeps. Just ask us!



Materials on FitWIC website



- All of the WIC Baby Behavior materials will be posted on the Fit WIC website, upon approval by USDA Food and Nutrition Service
- Class outlines and training materials will also be shared, upon approval by USDA FNS



http://www.nal.usda.gov/wicworks/Sharing_Center/statedev_FIT.html

Summary

- Well-intentioned parents may resort to inappropriate feeding practices in attempts to control their infants' behaviors
- Education related to normal infant behavior resulted in increased compliance with infant feeding guidelines and reduced numbers of infants classified at risk for unhealthy weight
 - Effect strongest in young infants
- Further work needed to determine if messages would be effective in other populations and if additional behavioral education would be effective in reducing inappropriate feeding of older infants and toddlers

Secrets of Baby Behavior

- Materials developed for Non-WIC families
- Higher reading level, dense text
- Shorter and longer versions
- More information may be obtained from our website <http://lactation.ucdavis.edu>

