SECRETS OF BABY BEHAVIOR
Today’s program will be presented by:

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Q&A by:

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http://www.cdc.gov/chronicdisease/about/state-public-health-actions.htm
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Disclosure

- I have no actual or potential conflicts of interest in relation to this program/presentation.
- I will not discuss any investigational or off-label use of any drugs.
Secrets of Baby Behavior Program

- Recognition that inappropriate infant feeding behaviors - link to child obesity

- Infant feeding often linked to misunderstanding of infant cues

- Secrets of Baby Behavior approach to feeding:
  - Engage parents and caregivers to understand behavior
  - Infant Crying, Infant cues, Infant Sleep

Early childhood obesity

- 8.1% infants & toddlers over 95th percentile weight for length NHANES 2012
  - Ogden et. al. NHANES 2012, JAMA. 2014;311:806-814
- Crossing more than 2 major growth percentiles from birth – 6 mo associated with greater odds of obesity at 5 y.o. and 10 y.o.
Protective Effect of Breastfeeding

- Fair evidence exists that BF inversely associated with obesity; both length of breastfeeding and exclusivity important.
- Direct breastfeeding associated with improved appetite control later
- Bottle use rather than contents may be the risk factor for obesity

CDC & P. Division of Nutrition and Physical Activity: Research to Practice Series No. 4. 2007
Bottle use in action
Infant Feeding Recommendations relative to childhood obesity

- Breastfeeding is associated with decreased risk
  - Exclusive for 6 months
  - Feed by cues, not the clock
- Early solid food introduction related to increased risk
  - Wait until developmentally ready, not before 4-6 months

Monasta 2010; Stettler 2010; Grote 2011; Huh 2011
## CDC Breastfeeding Report Card

<table>
<thead>
<tr>
<th>State</th>
<th>Ever Breastfed</th>
<th>Breastfeeding @ 6 months</th>
<th>Breastfeeding @ 12 months</th>
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<td>U.S. National 2016</td>
<td>81.1%</td>
<td>51.8%</td>
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<td>85.2%</td>
<td>55.3%</td>
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<table>
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<th>State</th>
<th>Exclusive BF 3 months</th>
<th>Exclusive BF 6 months</th>
<th>% BF infants receiving formula before 2 days</th>
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<td>22.3%</td>
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<td>44%</td>
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<tr>
<td>Connecticut 2011</td>
<td>43.4%</td>
<td>16.2%</td>
<td>19.1%</td>
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</tbody>
</table>

Barriers to Compliance with Infant Feeding recommendations

- In a UC Davis study, the researchers investigated why so many WIC mothers in California stopped breastfeeding (or gave formula in addition to breast milk) in first few days postpartum.

- Some reported pain or problems but many more reported insufficient milk or that their babies were not satisfied.

  - Citing Baby behavior as indicator

Heinig et al. 2006
Many mothers believe babies cry because of hunger (formula and cereal prevent hunger)

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

Heinig et al. 2006
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 at night. It would help her; she would be full and sleep through the night.”

Heinig et al. 2006
They think their babies will stay full longer if they are overfed.

“My baby used to wake up, but now I am giving him formula even if he is already full and he no longer wakes up.”

Heinig et al. 2006
Parents’ Unrealistic Expectations

- Parents and other caregivers have idealized the “quiet, full, sleeping” baby
- “Real” babies wake and cry
- Mom perceives there is no solution to the problem of trying to exclusively breastfeed but baby still cries at times throughout day and night

Stern 1998; Heinig et al. 2006
Emotional Regulation in Action

Believing there is no solution is like looking at a brick wall

“ I can’t do this...”

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USDA WIC Special Projects Grant

- UC Davis Human Lactation Center and California WIC partnered for a 3-year USDA WIC Special Projects Grant (2006-2009)

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Study Design

- 3-year quasi-randomized educational intervention (8 sites in CA)
  - 1 year intervention period
- Concept: Create a clinic environment supporting positive caregiver-infant interactions
  - Training, social marketing, handouts, classes, activities
  - Effort to create messaging that can be delivered quickly, effectively, and inoffensively

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

- **Goal:** Provide parents with anticipatory guidance and the skills to *interact* more effectively with their infants
  
  - Addresses “trigger” behaviors that result in overfeeding or inappropriate feeding practices

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

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Breastfeeding Rates CA WIC Infants 0-2 Months

Source: CA State WIC ISIS Data
Infants >95\textsuperscript{th} percentile wt/age

- Attained weight-for-age > 95\textsuperscript{th} percentile (5-7 months of age)
  - Baseline: N = 339
  - Post: N = 411
  - * P < .01

WHO growth standards

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Infant States

- Crying
- Irritable
- Quiet Alert
- Drowsy
- Active Sleep
- Quiet Sleep

All babies move through these 6 states...

...but not always in a predictable way!

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Quiet Alert

- Little body movement
- Eyes open and wide
- Steady, regular breathing
- Highly responsive
- Wants to learn and play – interactive
- **Tiring!** This state requires effort to control.

Key Message: Moms feel rested, but babies work hard during quiet alert periods
Changing States

Babies can move through the states on their own, but sometimes they will need a caregiver’s help moving from one state to another...

**Variety to Waken**
- Use different positions, touch, & words
- Will take longer if very drowsy or in deep sleep
- Can take up to 10 to 15 minutes for very young infants to wake up enough to eat well

**Repetition to Soothe**
- Address the child’s needs – see if change in position or circumstances helps
- Repeat actions or words over and over
- May take time if infant is very upset

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Barnard 2010
Key Messages for Parents

- Sleepy babies need lots of stimulation
- Using the same actions and sounds over and over will calm overstimulated babies
- Parents should be patient
  - Listen for a change in the cry for a few minutes before trying something else
Secrets of Baby Behavior

Infant Cues

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Types of Infant Cues

- Infant cues are **specific behaviors** (movements, noises, etc) babies use to communicate what type of interaction, if any, they need

  - **Engagement cues** – behaviors that indicate that a baby wants to interact

  - **Disengagement cues** – behaviors that indicate that a baby needs something to be different

Kelly et al. 2003
Engagement Cues

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

- Eyes open
- Face relaxed
- Feeding posture
- Raising head
- Following voice and face

Kelly et al. 2003
Engagement Cues
Disengagement Cues

- Turns away
- Pushes, arches away
- Crying
- Choking, coughing
- Extending fingers, stiff hands
- Falling asleep
- Looks away
- Faster breathing
- Yawning
- Hand to ear
- Grimace
- Glazed look

Kelly et al. 2003
Disengagement Cues
Clustered Cues: Hunger

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

Key Message: A hungry baby will give several cues together to alert caregivers

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Key Messages for Parents

- Cues are simplistic and NOT specific
  - Parents may need to “play detective” to figure out what their babies are trying to tell them
  - When babies’ cues are not addressed, they “escalate”

- For most healthy term babies, feeding cues are obvious
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Infant Crying

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Crying: Babies’ “Super Power”

- Crying results in a sound that affects the nervous system in most adults
  - Drives adult activity!
- Needs to be stressful in order to motivate caregiver
- Must be loud to rouse sleeping caregivers
- Important skill

St. James-Roberts 2001
“Normal” Crying

- ALL infants cry
  - Crying is used to communicate needs
  - Many newborns cry more than older infants as they adapt to their new postnatal environment and struggle to provide readable cues
- As adults respond to cues and babies refine their cues, crying lessens – any responsive caregiver can assist in this process

Hiscock H. 2006; Nugent 2007
Assessing Crying: Challenges

- Parents perceive crying as continuous even though babies typically cry in short bursts.
- Tolerance for crying may influence perceived duration.
- Ability to calm a crying baby associated with parenting confidence.

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Green 2001; Leavitt 2001
Is There a “Hungry Cry”?

- 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
- All hungry babies should be fed!

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Caregivers can help crying babies (who have been fed) by:

- Promoting self-soothing skills
  - Letting babies suck: hands/pacifier
  - Showing their faces to babies
- Using “repetition to soothe”
  - Speaking softly over and over
  - Holding, rocking, stroking the baby over and over
  - One action at a time, avoid overstimulation
- Babies will take longer to calm down if they are very young or very upset-persist with one action before trying another

Kelly et al. 2003; Nugent 2007
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Infant Sleep

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Misconceptions about Infant Sleep

- Many parents thought babies would either sleep through the night OR wake up all night long
  - “Good” babies sleep through the night
  - If babies do not sleep through the night, they will “wake constantly”

- Goal becomes to “fix” the infant’s sleep “problem,” rather than addressing the normal sleep deprivation caregivers feel related to the infant’s need for care in the night

Heinig 2006; UC Davis Human Lactation Center (unpublished); Wolfson 1992
Infant Sleep States

Active Sleep is Light Sleep

- Important for brain development
  - Dreaming results in REM
  - Images stimulate brain function
  - Blood flow to the brain is increased, bringing nutrients to active brain cells

Quiet Sleep is Deep Sleep

- Important for the brain to rest and recover
  - No dreaming
  - Memory development and growth


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Newborn Sleep/Wake Cycle

- Newborns start sleep in Active Sleep, dreaming for 20-30 minutes, and move to Quiet Sleep.
- ½ of their sleep in Active Sleep, ½ in Quiet Sleep.
- Initially, newborns will wake with each cycle (every 1-2 hours).
  - Small stomachs = frequent feeds
- Infants who are **sensitive to position changes** may wake up easily when put down in Active Sleep.

Heraghty et al. 2008; Hoppenbrouwers et al. 1988; Peirano et al. 2003
2-Month-Old Sleep/Wake Cycle

- Infants begin with shorter periods of Active Sleep then move into Quiet Sleep
- They start to have longer quiet sleep periods at night

Parmelee 1964
Older Infant Sleep/Wake Cycle: 3+ months

- Sleep patterns become more consistent over time
  - More likely to fall asleep into Quiet Sleep
  - Sleep patterns follow the light-dark cycle
  - Able to sleep longer stretches during the nighttime

Heraghty et al. 2008; Jenni and LeBourgeois 2006; Peirano et al. 2003; Parmelee 1964
Reasons for Excessive Waking

- Baby’s body is immature – can’t maintain sleep state or tune out stimulation
- Illness or injury
- TV in room (or other intermittent stimulation/noise)
- Caffeine or med exposure (breastfeeding mothers)
- Change in routine
- Baby is hungry
- May need to refer to provider

Infant Feeding and Sleep

- Breastfed infants have more Active Sleep
  - More likely to wake up if uncomfortable or need parental assistance
  - Reduced risk of SIDS in BF babies may be linked to ability to awaken more easily
- Promote Active Sleep by putting babies “back to sleep” or using pacifiers after BF established
- However, no significant difference in maternal sleep by feeding method

McVea 2000; Horne et al. 2004; Rosen 2008; Montgomery-Downs et al. 2010
Key Messages: Infant Sleep

- Infant sleep patterns change. As infants get older:
  - They sleep for longer stretches
  - Will be more likely to fall asleep in Quiet Sleep state
  - Encourage caregivers can look for signs of Quiet Sleep before laying baby down

- Active sleep and night waking are beneficial
  - Babies wake more easily when in Active Sleep
    - Waking may be essential for survival
  - Dreaming is important for brain development

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Caregiver-Infant Interactions
Successful Interactions take 3 Steps

- Caregiver needs to **LOOK** at the baby
- Caregiver needs to **RECOGNIZE** what the baby needs
- Caregiver needs to know how to **RESPOND** appropriately

Schiffman 2003
Look

- What are some reasons that caregivers would not be looking at their babies?
Recognize

- Caregivers who don’t recognize their babies’ cues will seem frustrated with their babies’ behavior
  - “She cries all the time.”
  - “She’s constantly hungry.”
  - “My mom says I should just let her cry.”

- Parents believe behavior is “random” or “comes out of nowhere”
  - They may assume that their babies are thinking like older children or adults- exhibiting “controlling” behaviors
  - They may be concerned about “spoiling” the baby
Caregivers who respond inappropriately
- Respond to almost every cue by feeding the baby
- Get frustrated if the baby does not react immediately
- May result in interactions that make things worse
  - Escalation of cues, crying, and increased stress

Barriers to appropriate response
- Lack of knowledge or comfort with baby
- Lack of confidence
Promoting Positive Interactions
Engage and validate the caregiver:
What to say ...”Look!”

- Say something nice about the baby’s ability to communicate with that caregiver
- “Aren’t babies amazing, they can to tell us what they want with their bodies and their noises....”
- Help them see what their babies are telling them
- “Mom, I’m waving my arms to get your attention...”
Provide Basic Information: “Recognize”

- Describe the cue being given, when it is used, and how it differs from other cues.

- “Isn’t it wonderful that your baby can tell you what he wants? Every baby is different but it looks like your baby wants you to...”

- Support the caregiver as she tries to recognize her baby’s cues by asking her to verify your perception or ask for her ideas.
Provide Basic Information: “Respond”

- Help caregiver check for obvious reasons - diaper, hunger, etc.
  - Support the caregiver’s efforts to respond

- Not obvious?
  - Help caregiver to look for patterns of engagement or disengagement cues to guide response
  - Play detective to identify reason(s)

- Still crying?
  - Repetition to soothe
Keep it Simple & Relevant

- Important to provide simple messages (caregivers are often tired and overwhelmed)
- Messages must be relevant to the caregiver’s needs and concerns
  - What do they need at that moment to feel better about handling baby?
- More than one source of information is best
  - Consistent messaging needed across settings (nurses, doctors, hospital staff, office staff, WIC staff)
  - More exposure = more learning
The Secrets of Baby Behavior Training in CT is brought to you by the CT Department of Public Health WIC program through a five-year **CDC 1305 grant (SHAPe)**. In addition to other chronic disease prevention work, the Department is addressing three key areas to improve the breastfeeding landscape in Connecticut. For more information on how WIC supports breastfeeding please visit the CT WIC Breastfeeding webpage.


CDC & P. Division of Nutrition and Physical Activity. Does breastfeeding reduce the risk of pediatric overweight? Research to Practice Series No. 4. 2007. Accessed via: 

http://www.cdc.gov/breastfeeding/data/reportcard.htm