

**Skin-to-skin
for all mothers and term babies at birth**

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Gatineau, with permission

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Plan for the next hour

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- ❖ Differentiate kangaroo and skin-to-skin
- ❖ Some little history
- ❖ Techniques for skin-to-skin
- ❖ How to get and find evidences
- ❖ Evidence: skin-to-skin at birth
- ❖ Conclusions
- ❖ Practices to adopt

I have no conflict of interest with this presentation

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Kangaroo or skin-to-skin ?

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VERY important difference:

✓ Kangaroo:
 Prolonged abdomen to abdomen contact of premature baby
 with mother or father Charpak et al., 2000, 2005; Hedberg-Nyqvist et al., 2010

✓ Skin-to-skin:
 Nude abdomen to nude abdomen contact between mother
 and healthy term infant Dumas, Lepage & Grondin, 2007; Cantrill et al., 2014; Widstrom, 2011 and videos

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Some history: kangaroo care

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1978 : in Bogota, Colombia
not enough spaces or incubators
→ nosocomial infections

24hr kangaroo, positive consequences on premature babies to stabilize homeostatic parameters.

Clear evidence ...



Bogota Fundacion Canguro

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Links between kangaroo care and skin-to-skin care

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Plenty of evidence; was so clear for premature babies, it was thought that there should be some benefits for term babies also....

First, introduction in industrialized countries in order to

- ❖ facilitate mother's first attachment experiences
- ❖ encourage first close contacts between parents
- ❖ facilitate initiation of breastfeeding

But a lot more was found!!!!....

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What is safe skin-to-skin

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- Nude newborn's abdomen *directly* on mother's nude chest, *without drying*
- Skin-to-skin is *immediate* (directly from the mother)
- Newborn is completely nude (no diaper, ...)
- Baby is extended as much as possible, so as much skin contact as possible (oxytocin)
- Baby is dried, especially back and head
- Newborn is *then* covered with a dry blanket

DUMAS, 2014; WIDSTROM ET AL. (2011)

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Skin-to-skin at vaginal birth

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Newborn is placed *vertically* between mother's breasts



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Skin-to-skin at caesarean section

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Newborn is placed *horizontally* just below or on mother's breasts



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To convince scientifically-driven professionals

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- ❖ We need the strongest evidence, as skin-to-skin care is still considered a "soft, nice thing to do".
- ❖ So we need evidence to demonstrate that skin-to-skin care is THE SAFEST transition to extrauterine life.



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How to convince: evidence

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Quantitative data
from

- ✓ randomised controlled trials (RCT)
- ✓ systematic reviews
- ✓ meta-analyses
- ✓ cohort studies

NO impression, perception, feeling
NO qualitative data

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Important note

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**We cannot directly apply
research findings
from kangaroo care
to term infants
and vice-versa**

Be careful when reading or reporting literature

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Evidence: **skin-to-skin care**

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My choice of presentation
for this review of literature:

- Physiological benefits for mother and baby
- Benefits on breastfeeding
- Psychosocial benefits for mother and baby



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1. Physiological benefits
for mother and term baby

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- Baby's temperature
- Mother's temperature
- Expulsion of placenta
- Decreased vasoconstriction at feet
- Lower salivary cortisol
- Better oxygenation
- Better glycemia
- Better neuromotor organization
- Reduction of pain reaction during painful procedures



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Baby's temperature

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- Temperature: central, axillary, at foot
- ALWAYS within normal limits
- Temperature better than for
 - swaddled or bundled baby
 - baby with pyjamas in mother's arms
 - baby on warmer
 - swaddled baby in cot
- For babies born vaginally or by caesarean



Picture from Lac Rapide community, Quebec, with permission

Acolet et al., 1989; Anderson et al., 2003; Christensson et al., 1992, 1994, 1995a; Bystrova et al., 2003, 2008; Carfoot et al., 2005; Fardig, 1980; Fransson et al., 2005; Jonas et al., 2007; Kennel & McGrath, 2003; Marin et al., 2010; Nimbalkar et al., 2014; Nolan & Lawrence, 2009

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Baby's temperature

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Skin-to-skin re-warms cold babies
better than incubator or warmer
(hypothermia ≤ 36.3 C)

Christensson et al., 1998; Huang et al., 2006; Huang et al., 2006; Mori et al., 2009-meta-analyses of 23 studies

Skin-to-skin transfer (ambulance, helicopter) is better than transfer
in warmed incubator (sick or premature babies)

Sornheimer et al. 2004, cohort study—not evidence but interesting

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Mother's temperature

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✓ Mother's and baby's temperatures are in reciprocity so no "over-heating"

✓ Mother's axillary temperature stays directly linked to temperature of baby's feet



Christensson et al., 1998; Bystrova et al., 2003, 2008; Bergström et al., 2007, in Uganda

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Decreased vasoconstriction in baby's feet

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Why this interest in baby's feet?

Skin-to-skin reduces the "stress of being born" (Bystrova, 2003)

More than if

- baby is swaddled
- baby is in mom's arms
- baby is in cot in nursery



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Newborn's "self-regulation to stress"

Bystrova et al., 2003, 2008; Ferber and Makhoul, 2004; Lagercrantz & Slotkin, 1986

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Expulsion of placenta

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Skin-to-skin decreases time for placental expulsion

- so less bleeding
- so less maternal anemia

Marin et al., 2010, 274 women

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Decreased salivary cortisol

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When skin-to-skin was immediate at birth,
and prolonged for 60 to 120minutes,
salivary cortisol was low (indicating low stress)

and lower in the 120 minutes group
compared to the 60 minutes group

Takahashi et al., 2011

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Better oxygenation

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- ✓ Baby placed skin-to-skin has better oxygen saturation than bundled baby in incubator
- ✓ Baby placed skin-to-skin have better arterial gases at 90 minutes of life than bundled baby in incubator



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Acolet et al., 1989; Christensson et al., 1992; Nolan & Lawrence, 2009; Takahashi et al., 2011

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Better heart rate

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When skin-to-skin is immediate,
heart rate is stable

Even faster than
if skin-to-skin is not immediate
but around 30 minutes later (...argument for caesarean...)

Christensson, 1992; Takahashi et al., 2011

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Better glycemia

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Baby placed skin-to-skin has better glycemia at 90 minutes of life than bundled baby in cot



Moore et al., 2012 (Cochrane: 94 babies, 2 studies); Anderson et al., 2003 (Cochrane with 806 dyads, 17 studies); Christensson et al., 1992 ----translated into ABM Clinical protocol 1: Guidelines for blood glucose monitoring and treatment in term and late-preterm neonates, 2014

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Neuromotor organization

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During first 4 hours of life

- ✓ More episodes of calm sleep
- ✓ Better scores for optimal flexion
- ✓ Less extension movements

—————> So babies are more coordinated and more stable

Ferber and Makhouf, 2004

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Reduced reaction during painful procedures

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Objectively demonstrated analgesia during invasive procedures such as vitamin K injection and heel lance for PKU

—————> less crying, less grimacing, ↓ heart rhythm,...

Blass and Watt (1999); Carbajal et al. (2003); Chermont et al. (2009); Gray et al. (2000); Gray et al. (2002); Ludington-Hoe et al. (2005); Weissman et al. (2009); Nishutani et al. (2009)

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In summary

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- Harmonizes baby's physiology to safely transfer from life in utero to life outside the uterus
- Maintains baby's energy
- Reduces the stress of birth

(expression «the stress of being born» from Lagercrantz & Slotkin, 1986 then used by Bystrova et al., 2003, 2008)



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2. Benefits on breastfeeding

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- Innate sequence of the human infant
- Initiation of breastfeeding
- Breast massage by baby, Baby's recognition of mom's milk
- Effective sucking, ↑ milk production
- Baby's weight and weight loss
- Exclusivity of breastfeeding
- Breastfeeding duration ad 6 months
- Breastfeeding difficulties



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Innate sequence of the human infant

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➤ Widström and colleagues (1993 , 8 minutes video and 2011, article) :
Baby wakes up slowly, creeps towards breast, turns head towards mom's voice and breast, salivates when smelling nipple, licks nipple then attaches spontaneously

innate sequence of the human infant

➤ This predictable behavior starts around 10 minutes of life when baby is placed in uninterrupted skin-to-skin with mother

Observational studies: Widström et al. 1995, 2011 and videos 1993, 2010, 2011; Matthiesen et al., 2001

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Other practices
also facilitate this innate behavior

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They are so usual that we forget about them....

- Do not interrupt skin-to-skin for at least one hour (WHO, 2009)
- Do not suction unless medically justified (Cantrill et al., 2014)
- Wait for routine treatments at the end of the one hour and do it while baby is in skin-to-skin (Dumas, Savoie, Landry, 2001)

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Influence on initiation of breastfeeding

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When baby is placed skin-to-skin with mother, **uninterrupted**:

- * spontaneously attaches to breast
- * sucking is more effective

Any interruption significantly lengthens process

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Carfoot, 2003, 2005; Matthiesen et al., 2001; Mikiel-Kostyra et al. 2005-meta-analysis; Moore, 2012; Naskica et al., 2009; Nolan & Lawrence, 2009; Righard & Alade 1990; Srivastava et al., 2014; Widström et al., 1990, 1995, 2011

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What has been demonstrated

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Factors negative for initiation of breastfeeding:

- Lack of *immediate* skin-to-skin at birth
- Drying baby before skin-to-skin
- First suckling *after* 2 hours of life
- Force baby to the breast

Cantrill et al., 2014; Mikkel-Kostyra et al. 2005-meta-analysis; Nakao et al., 2008; Widström, et al., 1990, 1993, 2011; Svensson et al., 2013

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Massage of breast by baby

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Massage-touching of breast by baby (chin, hands) increases :

- * oxytocin production
- * number of suckings
- * milk production



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Cantrill et al., 2014; Mathiesen et al., 2001; Widström et al., 1993,2011

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Breast odours, baby's recognition of mom's milk

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If immediate skin-to-skin at birth and uninterrupted for at least 50 minutes,

2 to 4 days old babies
recognize their mother's milk
by movements of the mouth and tongue

Bartocci, 2000; Christensson, Porter & Varendi, 1998; Mizuno et al., 2004; Porter & Varendi,1999; Varendi & al.,1994; Varendi, Porter & Wilberg, 1997; Varendi & Porter, 2001

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Effectiveness of suckings, milk production

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Early sucking (< 2hrs)
positive effect on milk
production at day 3 and day 4

- ✓ more suckings at day 3 and day 4
- ✓ less engorgement
- ✓ more milk ingested



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Bystrova et al., 2007a, 2007b, 2008; Cantrill et al., 2014

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Baby's weight and weight loss

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Babies who had skin-to-skin and were not separated from their mothers:
re-gain their weight loss
3 to 5 days faster
than swaddled babies in nursery
even if babies in nursery received more supplements with formula



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Bystrova et al., 2007c, 2008

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Exclusivity of breastfeeding

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Babies who had skin-to-skin and were not separated from their mothers:
receive less supplement of formula
than swaddled babies in nursery

Significative link between duration of skin-to-skin
and exclusivity of breastfeeding at discharge

Bystrova et al., 2007c, 2008

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Duration of breastfeeding

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Babies who had skin-to-skin and were not separated from their mothers:

are breastfed longer



Aghdas et al., 2014; Anderson et al., 2003-Cochrane; Cantrill et al., 2014; Mikiel-Kostyra et al., 2002; Mizuno et al., 2004; Moore et al., 2007-Cochrane; Thomson et al., 1979; Vaidya et al., 2005; Moore et al., 2012-Cochrane; Srivastava et al., 2014; Thukral et al., 2012

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In summary

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Immediate and uninterrupted skin-to-skin facilitates:

- first sucking
- exclusivity
- duration of breastfeeding
- solving of major breastfeeding difficulties



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3. Psychosocial benefits for mother and baby

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- > Baby cries less
- > Early mother-infant interaction: bonding
- > Maternal well-being-attachment
- > Less infant abandonment, maltreatment
- > Mother-infant interaction at one year old



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Baby cries less

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Babies who had skin-to-skin at birth:

- cry less at birth
- cry less during the first 90 minutes of life
- cry less during first 3 days and first 3 months of life

Anderson et al., 2003-Cochrane of 806 dyads, 17 studies ;Christensson et al.,1992, 1995b; De Château & Wiberg,1977a, 1977b; Ludington-Hoe, 2002; Matthiesen et al., 2001; Moore et al., 2007; Moore et al., 2012-Cochrane

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Early mother-infant interaction: bonding

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Mother:

- More visual contacts, more touching; *en face* position
- More verbal communications
- Keep her baby with her longer, tends to follow whoever takes her baby away from her
- More affectionate during suckings; keeps baby closer to her
- Less postnatal depression

Ali & Lowry ,1981; Anderson et al., 2003- Cochrane; Bigelow et al., 2012; De Château & Wiberg,1977,1988; Feldman et al., 2010; Francis et al., 2002; Hales et al., 1977; Klaus et al., 1972; Matthiesen et al.,2001; Moore et al., 2012-Cochrane; Velandia et al., 2010; Wiberg ,1990; Widström et al.,1990

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Early mother-infant interaction: bonding

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Baby:

- More alert after first cry
- Focuses on mother's face and breast
- More vocalisations



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Ali et Lowry ,1981; Anderson et al., 2003-Cochrane :806 dyads, 17 studies; De Château & Wiberg,1977,1988;Hales et al., 1977; Klaus et al., 1972; Matthiesen et al.,2001; Velandia et al., 2010; Wiberg ,1990; Widström et al.,1990

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Early mother-infant interaction: bonding

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Dumas and colleagues, RCT,
151 dyads videotaped at day 4
during breastfeeding session:

Mothers are *significantly* softer
and more patient

- if had 2 hours uninterrupted skin-to-skin care at birth
- if non separated from birth



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Dumas et al., 2013

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Early mother-infant interaction: bonding

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During a breastfeeding episode filmed on video, at day 4:

- swaddled babies are *abnormally* calmer, sleep more
- mother demonstrates clear tendency to be rougher with her swaddled baby in :
 - * her attempts at latch
 - * her movements to and from baby
 - * her type of stimulation to wake up baby or to latch
 - * her general affective response to baby

Dumas et al., 2013

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Maternal well-being-attachment

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Skin-to-skin:

- Less maternal stress: reduce gastrin blood level
- Better maternal well-being: increased oxytocin

Early breastfeeding:

- Significant less depressive symptoms
- Increased mother's socialization
- Better maternal well-being: bf doubles plasma endorphins

If mom's well-being is repeated frequently → attachment by repeated activation of opioids and oxytocin

Ali et Lowry,1981; Anderson et al., 2003-Cochrane: 806 dyads, 17 studies; Bystrova et al., 2007b, 2008; Carfoot et al., 2005; De Chateau et Wiberg, 1977a, 1977b; Hales et al., 1977; Kennel et Klaus, 1998; Klaus et al., 1972; Klaus et Kennel, 1976; Moore et al., 2007-Cochrane:4 studies, 314 dyads; Widström et al., 1990, 1995-2010; Winberg, 2005

And many qualitative studies on mother's satisfaction

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Less infant abandonment, maltreatment

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- ❖ Significantly reduced parental negligence and maltreatments in socially vulnerable families
- ❖ Less infant early abandonment in postnatal period

? animals

Anderson et al., 2003-Cochrane ;806 dyads, 17 studies ; Lvoif et al.,2000; Strathearn et al., 2009 (bf); Wiberg & Christensson, 1995

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Mother-infant interaction at one year

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Positive influence on:

- * mother's sensitivity
- * ability of child to calm self
- * mutual reciprocity (PCERA)

when child is one year old

and benefited from immediate uninterrupted 2 hours of skin-to-skin with mother, all confounding variables taken into account



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Bystrova et al., 2008, 2009

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Also very important

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A 2 hour separation at birth followed by reunion and rooming-in **DID NOT compensate** for the lack of skin-to-skin at birth

Sensitive period**
Not enough evidences to call it critical period

Bystrova, et al. 2007a, 2007b, 2007c, 2008; Dumas et al, 2013; Kennel et al., 1975; Nissen et al., 1995

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Reuniting mothers and babies after 2 hours
DO NOT compensate for the 2 hour separation from birth

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SO...

“we should respect baby and mother
instinctive
behavioral
and endocrine
interaction sequence”

(Widström, 1988 and 2011)

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Skin-to-skin contact with the father???

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NOT MUCH EVIDENCE

“ *In absence of the mother*, thermoregulation with the father is better than baby bundling and placement in an isolette.”
Christensson et al. (1996):

- Colonisation with family bacteria??
- Ease to drowsiness, ↓ cry duration
(Eriandson, 2007)
- Attachment...vocalisations (Velandia, 2012)



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Are those evidences important???

YESSSSS!!

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We cannot talk about cultural or personal preferences ...
« it is not only nice to do »

We have demonstrated benefits for term babies ...
« so it must be done »



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Importance of those results

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Skin-to-skin has positive influence

- on physiological variables
- on psychosocial variables
- on breastfeeding

Non-separation has positive influence

- on psychosocial variables
- on breastfeeding

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So.....

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What are the evidence-based practices to adopt and to explain to parents?



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Practices to adopt and to explain to parents

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Immediate and uninterrupted skin-to-skin from birth, with mother

NO swaddling, too warm blanketing

No separation for at least 1-2 hours, even for short periods



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Practices to adopt and to explain to parents

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Postpone vitamin K for at least one-two hour

Lobby to remove erythromycin as non evidence-based practice (CPS, 2015; Darling & MacDonald, 2010; Dumas et al. 2001)

Do not weigh/measure baby for at least until end of first feed



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Practices to adopt and to explain to parents

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Encourage first suckling

Hands-off

Calm, respectful environment

Effective support



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Practices to adopt and to explain to parents

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Uninterrupted mother/baby rooming-in from birth

Interrupted as little as possible and only for major reasons noted in chart

Examinations, tests, etc... in mother's room and with skin-to-skin whenever possible



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Do we need to update our perinatal practices?

Yes!!!!!!!!!!



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Thank you for your attention

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