

The Science of Touch: Benefits for Healthy Baby Development and Potential Link to Immunity

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Disclosures

- The opinions expressed in this talk are that of Dr. Hernandez-Reif and not that of her employer or the program sponsor
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Touch is Fundamental

- Sensory stimulation is required for normal development across the animal kingdom¹

¹Ardiel, et al. *Paediatric Child Health* 2010; 15: 153–6

Touch is Fundamental

- Touch has a positive effect on¹
 - infants' perceptual-cognitive and motor development
 - parenting

Without touch, children experience cognitive and neurodevelopmental delays^{2,3}

Massage Has Ancient Roots and extends across cultures

Massage therapy was


- Described in China, India and Egypt ~2000 years ago
- Defined by Hippocrates in 400 BC as 'the art of rubbing'

Massage is one of the most effective forms of touch, with the positive impact of therapy shown in diverse patient populations¹

Healthy Infants Benefit From Massage

Evidence

Infant massage by mothers:

- Enhanced infants circadian rhythm adjustment¹
- Reduced colic²
- Raised sleep hormones and improved sleep^{3,4}
- Improved⁴
 - Daily weight gain
 - Sociability and soothability
 - Interaction behaviours
 - Stress hormone levels 

Routine Touch and Massage Have Been Shown to Benefit Early Interactions

According to 1 study, infants who experienced routine touch and massage (compared to those who did not) showed¹:

- 50% more eye contact
- 3 times more positive expressions

Routine Touch and Massage Have Been Shown to Benefit Growth, Development, Communication and Learning

- Routine massage in preterm babies is associated with increased physical activity¹
- In another study, on healthy preschool age children, routine massage led to better cognition²

* Remember - Massage techniques for preterm infants differ

¹Lee HK. *Taehan Kanho Hakhoe Chi*. 2005;35(8):1451–1460

²Hart S, et al. *Early Child Dev Care*. 1998;143(1):59–64.

Massage Enhances Infant and Caregiver Bonding

Fathers who massaged their infants showed more positive interactions with their infants, compared with fathers providing no massage

Improved

- Expressiveness
- Enjoyment
- Warmth
- Acceptance
- Responsivity

Increased

- Playing time
- Feeding time
- Overall caregiving

Healthy Full-term Infants Benefit From Moderate-Pressure Massage¹

Infants receiving moderate vs light pressure massage showed

Significantly greater first month growth in weight and length

Improved sleep-wake behavior

Significantly improved performance on Brazelton Scale²:

- More Oriented
- Less Excitable – More Relaxed
- Less Depression

Full-term newborns (N=104) randomly assigned to moderate-pressure vs light-pressure massage

Preterm Infants Benefit From Touch and Massage

Evidence

Enhanced immune function and increased daily weight gain¹

Improved body fat deposition and growth in preterm boys²

Improved heart rate variability³

Accelerated brain maturation in low-risk preterm infants⁴

**Massage techniques for preterm infants differ*

Benefits of Massage Enhanced With Oil / Other Appropriate Emollient

- Appropriate emollients, such as oil or lotion, make massage strokes smoother and more rhythmic
- Oil-massaged infants showed:
 - Less restlessness (motor activity)
 - Less averting behaviour (grimacing and head turning)
 - Less stress behaviour (mouthing and clenched fists)
 - More substantial fall in saliva cortisol levels

1-month-old, healthy infants
(N=60) randomised to massage
either with or without mineral oil

Benefits of Massage Enhanced with Oil / Other Appropriate Emollient

- Lotion-massaged infants showed:
 - Shorter latency to sleep for newborns
 - Fewer night wakings and longer sleep for newborns
 - Longer sleep for mothers
- Oil, lotion or other appropriate emollient may also provide beneficial moisturizing and protection from dryness and external environment

Healthy Newborn Infants
N=76 newborns; N=59 at one month follow-up, randomized to massage either with or without lotion or to no massage

Not All Oils / Other Emollients Are Suitable for Baby Skin

- Oils vary in structure, stability and composition
 - Composition of vegetable oils often not fully characterized
 - Natural oils, not specifically formulated for baby skin can be chemically and biologically active; may damage skin barrier leading to skin dryness ¹⁻³
 - Shop-bought cooking grade olive oils should not be used on babies' skin ³
- Lotions can vary in ingredients, formulation and testing
- Oils, lotions, other emollients should be appropriately formulated and safety evaluated for use on babies' uniquely different and still developing skin ^{4,5}

¹ Rawlings, A., & Lomabard, K. A review on the extensive skin benefits of mineral oil. *Int J Cosmet Sci*. 2012, 34(6):511-8.

² Telofski, et al. The infant skin barrier: can we preserve, protect, and enhance the barrier? *Dermatol Res Pract* 2012; 2012: 1987892;

³ Danby, et al. Effect of olive and sunflower seed oil on the adult skin barrier: implications for neonatal skin care *Ped Dermatol* 2013; 30: 42–50

⁴ Nikolovski et al. Barrier Function and Water-Holding and Transport Properties of Infant Stratum Corneum Are Different from Adult and Continue to Develop through the First Year of Life. *J Invest Dermatol*. 2008;128:1728–1736.

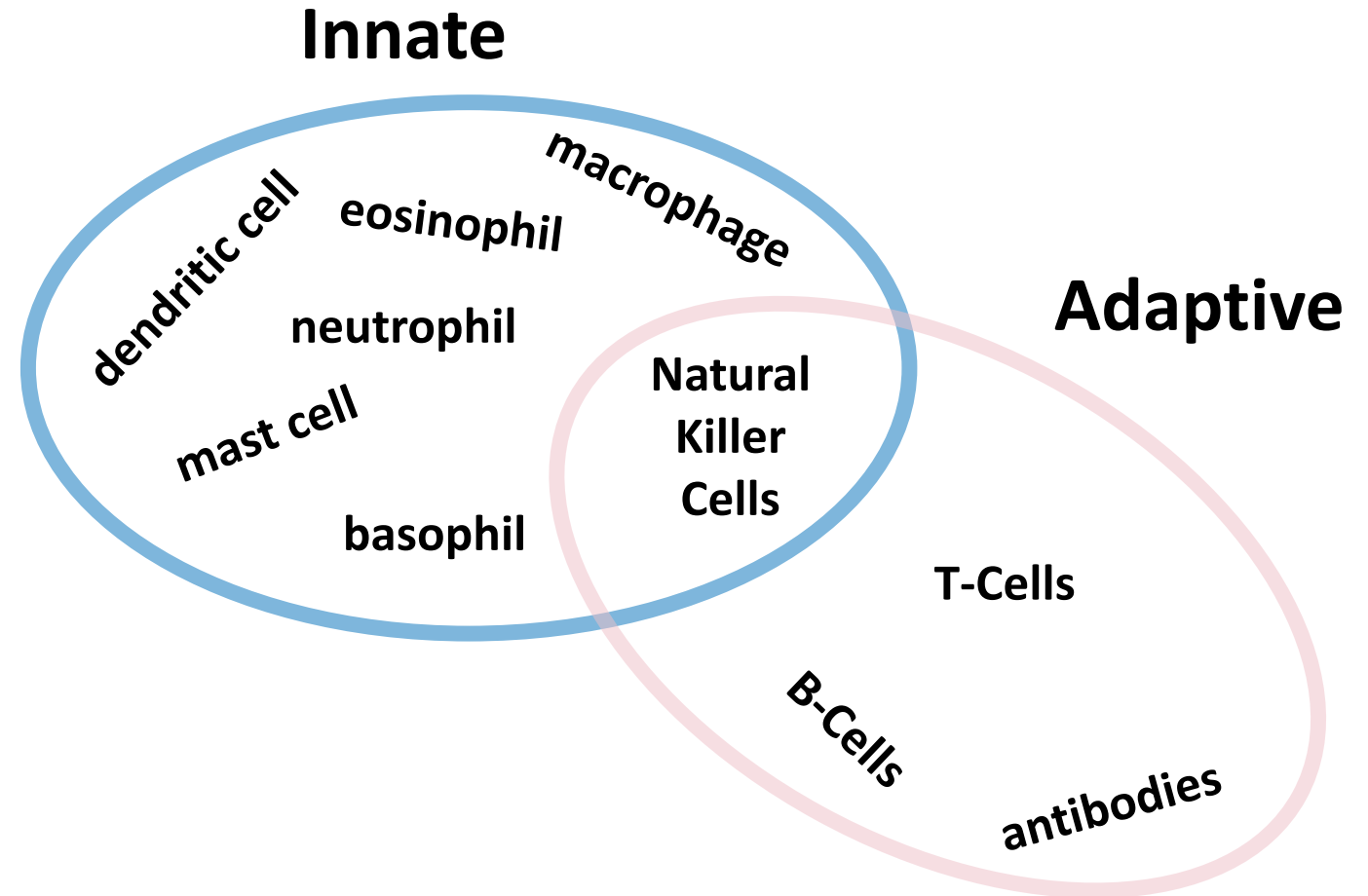
⁵ Stamatias et al. Formulating for unique needs of baby skin. *Personal Care*. 2011;(June):31-36.

Touch and the Immune System



Routine Touch and Massage Appear to Benefit Immune Function

- Human immunity develops in 2 phases
 - Prenatal (genetic + maternal environment)
 - Postnatal (environmental)



1 Kolb B, et al. Brain Plasticity and Behaviour in the Developing Brain *J Can Acad Child Adolesc Psychiatry*. 2011;20(4):265–276;

2 Simon, Hollander, McMichael Evolution of the immune system in humans from infancy to old age. 2015 *Proc. R. Soc. B* 282: 20143085.

Routine Massage Appears to Benefit Immune Function

Evidence

Animal Research

↑ *T cells* in mice when hand stroked every day for 10 days¹

Preterm Infants

↑ *NK cytotoxicity* after daily massage for 5 days while in the NICU²

Cancer (Leukemia)

↑ *WBC & neutrophils* after daily massages by parents for 1 month (mean child age 6.9 yrs old)³

¹Major, Rattazzi, Brod, Pilipović, Leposavić, & D'Acquisto *Sci Rep.* 2015,5:10913

²Ang, Lua, Mathur, Thomas, Asmar, Savasan, Buck, Long, & Shankaran *Pediatrics* 2012,130,1549-1558

³Field, Cullen, Diego, Hernandez-Reif, et al., (2001). *J Bodywork Movement Therapies*, 4, 271

Routine Massage Appears to Benefit Immune Function

Evidence

Children and Adolescents with HIV

- 12 wks massage *preserved immune functions* in 2-8 yr olds;
 - control group showed >20% ↓ in *CD4 count* ¹
- 12 wks massage ↑ *NK cells* in 2-4 yr olds; *preserved or improved immune function (CD4+CD25+ cells)* in 5-8 yr olds; control group showed >30% ↓ in *CD4* ²
- 12 wks chair massage ↑ *NK cells* and ↑ *CD4 count*; improved *CD4/CD8* ratio in 13-19 yr. old adolescents ³

¹ Shor-Posner, Miguez, Hernandez-Reif, et al. (2004). Massage treatment in HIV-1 infected Dominican children: a preliminary report on the efficacy of massage therapy to preserve the immune system in children without antiretroviral medication. *Journal of Alternative and Complementary Medicine*, 10 (6), 1093-1095. ² Shor-Posner G, Hernandez-Reif M, et al., (2006). Impact of a massage therapy clinical trial on immune status in young Dominican children infected with HIV-1. *Journal of Alternative & Complementary Medicine*, 12, 511-516. ³ Diego MA, Field T, Hernandez-Reif M, et al., (2001). HIV adolescents show improved immune function following massage therapy. *Int J Neurosci*. 2001 Jan;106(1-2):35-45.

Conclusion: Touch, Massage & Multimodal Stimulation Confer Benefits to Both Babies and Parents

- Full Term, Healthy
- Preterm*, Vulnerable
- Children Who are Unwell
- Mothers, Fathers

** Remember - Massage techniques for preterm infants differ*

Touch is More Important Than We Think!

Spread the Word!

Asante Sana

Ngiyabonga

Takk

Děkuji

Arigato

Obrigada

Merci

Dankie

Bedankt

Danke

Thank You !

Tack

Xie xie

Gracias

شكرًا

Ευχαριστώ

e dupe

Terima Kasih

Obrigado

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