

# Umbilical Cord Infection with Immersion Tub Bathing and Immersion Swaddle Bathing – What’s the Risk?

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Tub bathing whether by swaddle bathing or immersion bathing is superior to sponge bathing for reducing temperature loss and decreasing behavioral stress for full term and preterm infants.<sup>1,2,3,4,5,6</sup> Tub bathing also improves caregiver satisfaction.<sup>1</sup> However, traditional bathing practices commonly use sponge bathing until the umbilical cord falls off due to the notion that tub bathing can lead to an increase in umbilical cord infection. Evidence does not support this notion. In four randomized controlled trials directly comparing tub baths and sponge baths, tub bathing was not shown to cause cord infection. Tub baths do reduce temperature loss and improve infant comfort.

Bryanton<sup>1</sup> divided 102 healthy term infants into 2 groups, an experimental tub bathing group and a control sponge bathing group. Their aim was to compare the effects of traditional sponge bathing and tub bathing methods on healing and infection of the umbilical cord in healthy term infants. Using an umbilicus assessment scale, they found no differences in cord healing scores between the two groups. They did find, however, that the infants had significantly less temperature loss and they were significantly more content with tub bathing.

Henningson et al<sup>7</sup> divided 205 infants into a bathing group (immersed in a tub and hand washed with non medicated soap) and a washing group (wiped with a wet face flannel and non medicated soap) and compared the effects on infection rate, bacterial colonization rate, body temperature, and crying. The infants were observed for infection for 5-6 days during their hospital stay. Specimens from the umbilical cords were cultured. No statistically significant differences were found between the two groups for clinical signs of infection or bacterial colonization rates. However, change in rectal body temperature was highly significant. The tub bathed infants had less temperature loss compared to the washed group.

In the study by Hylan et al<sup>8</sup> their aim was to compare the effects in the newborn babies of washing and bathing in regard to bacterial colonization rate, clinical infection rate, body

temperature and crying. Infants from two maternity wards in Sweden were divided into two groups, 305 were bathed in a tub and 313 were washed with a washcloth. Soap was not used on either group. No differences in bacterial colonization or signs of infection were found between bathing and washing. However, temperature loss and crying were both highly significant. Bathing in a tub had less temperature loss and a decrease in crying compared to the group washed with a cloth.

Ayyildiz et al<sup>9</sup> separated 100 healthy full-term infants and their mothers into two groups, tub bathing and sponge bathing. They evaluated the influence of sponge and tub bathing methods on umbilical cord separation time in full term babies. They found that tub bathing delayed the separation of umbilical cord. No differences were found in cord infection rates, but the study lacked statistical power to make conclusions.

While tub bathing did not lead to increase in cord infection for clean settings, cord infection remains a concern in third world settings.<sup>10,11,12</sup> Approaches to prevention of cord infection in the third world need to be different and more conservative than in modern societies that have clean water, clean birthing situations, and the ability to treat infections quickly and effectively. Large antiseptic studies done in the third world show that moistening the cord with antiseptic solution does lead to a slightly longer time until cord separation. Longer time to cord separation did not lead to increase in cord infection rates or increase in death, however, as the antiseptic killed the bacteria. Bathing studies on cord separation are less conclusive and too small to be sure. The traditions of delay in cord separation and the possible infection from unclean tubs and water could fuel the reasoning for waiting for cord separation prior to bathing.

Choosing sponge bathing over tub bathing exposes the infant to its own set of risks- cold stress and behavioral stress. Hypothermia triggers increased need for oxygen consumption and glucose utilization leaving an infant at risk for hypoglycemia or respiratory compromise, both of which may require additional medical testing, lengthened stay, or transfer to a higher level of care.

Behavioral stress cues are the infant’s communication. When caregivers attend to stress cues, medical procedures and caregiving practices can be transformed to less stressful experiences. Stressful experiences in the preterm infant have been shown to change the structure and function of the brain.<sup>13,14</sup> Increased exposure to stressors is associated with decreased

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brain size in the frontal and parietal regions, altered brain microstructure and function connectivity in the temporal lobes, and alterations in neurobehavior at term equivalent.<sup>13</sup> Negative or painful experiences have the potential for negative effects on development. Altering procedures to decrease behavioral stress has the potential to enhance the infant's long term developmental outcome.

When an infant is more content in the bath, not only does the infant experience less stress, but the family or caregiver also enjoys a more stress-free activity. An enjoyable experience can lead to increase in parent involvement and patient satisfaction.

Immersion tub bathing or swaddled immersion bathing is supported by nursing organizations. The Neonatal Skin Care Guideline published by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) and National Association of Neonatal Nurses (NANN) supports immersion tub bathing or swaddled immersion bathing. They determined that tub bathing did not have an association with increase in bacterial colonization of the cord, cord infection, or cord healing.<sup>15</sup>

The importance of infant comfort and warmth should be considered regardless of the bathing method used. If tub bathing is determined to be unsafe due to unclean water or otherwise, measures to ensure infant warmth and comfort should still be implemented. Providing containment and positional support and being mindful of behavioral communication can help the caregiver bathe without the bath becoming an infant stressor.<sup>16</sup>

Of the many studies investigating the differences between sponge bathing and tub bathing on hypothermia, motor stress, physiologic stress, maternal comfort, and caregiver satisfaction, none have attributed any increase in cord infection to tub bathing in modern hospitals using clean water. The event is so rare that large enough studies cannot be done to determine if either method will minimally change cord infection risk. This is not the case when evaluating temperature loss and infant comfort. The data provide clear evidence that immersion tub bathing and immersion swaddle bathing are superior for decreasing temperature loss and increasing infant comfort.

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