



## Art of prevention: The importance of feeding traditions

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Contact dermatitis (CD) is an inflammatory skin condition that results from cutaneous exposure. Irritant CD (ICD), which accounts for 80% of all CD cases, is most commonly caused by rapid and repeated wet-to-dry cycles, but irritation from substances such as saliva, soap, and wipes also plays a role. The remaining 20% of CD cases are due to allergic CD (ACD), a type IV delayed hypersensitivity reaction that occurs after sensitization and subsequent exposure to a specific allergen (Esser and Martin, 2017; Fonacier and Noor, 2018). Protein CD refers to an eczematous dermatitis that results from cutaneous exposure to protein, typically in foods (Renz et al., 2018). Thought to be a Th2-skewed, mixed type I and type IV hypersensitivity reaction with downstream generation of antigen-specific immunoglobulin E, protein CD presents as acute pruritus or stinging within minutes of skin exposure on a backdrop of chronic eczema (Brancaccio and Alvarez, 2004; Fonacier and Noor, 2018; Hjorth and Roed-Petersen, 1976; Janssens et al., 1995). Sensitization requires either pre-existing ICD or irritation from the sensitizer itself.

Tolerance is typically achieved when first exposure is through the intestinal epithelium, and food protein presentation results in regulatory T-cell induction (Renz et al., 2018). Sensitization may occur when the first exposure is through the skin, resulting in type 2 cell induction (Noti et al., 2014). Infants without prior mucosal exposure to a food have not had the opportunity to build immunologic tolerance. In addition, children with impaired barrier function

may be at a higher risk of ICD and subsequent sensitization to substances that are not inherently irritating, such as foods (Czarnowicki et al., 2017). For example, atopic dermatitis, which affects 8% to 18% of children, features an impaired skin barrier that independently increases susceptibility to both ICD and ACD (Gittler et al., 2013). Similarly, chapping due to drooling can cause ICD and may provide the innate immune signals causing keratinocyte release of thymic stromal lymphopoietin or interleukin-31, which promotes sensitization.

Differing feeding practices in children result in variable exposure of the skin to foods. Cutaneous contact with foods, especially fruits, vegetables, and spices, can lead to sensitization and result in the development of ACD (Fisher et al., 2018). An even broader range of foods and food-based chemicals has been shown to cause ICD (Fisher et al., 2018). In prior centuries, food was introduced using long-handled infant feeding spoons to direct the food “down the hatch” while minimizing skin contact (Fig. 1). However, the current cultural practice of supporting early independence through self-feeding in infant-toddlers now leads to inadvertent application of food peri-orally (and beyond) through self-feeding (Fig. 2). We speculate that these changes in infant feeding may explain the increased incidence of food allergy.

In India, where self-feeding is discouraged and parents often directly feed their children, the incidence of food allergy is lower (Arakali et al., 2017). Peanut allergy is more common in the United States, where the first peanut exposure is usually to peanut butter, as compared with Israel where the first exposure is sucking on Bamba snacks, which minimizes skin exposure (Du Toit et al.,

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**Fig. 1.** Long-handled feeding spoons.



**Fig. 2.** Self-feeding in young children can result in cutaneous exposure of the facial skin to sensitizing food antigens.

2008). In the Learning Early About Peanut trial, early introduction to peanut protein in the form of Bamba snacks, peanut butter, or peanut flour was related to significantly decreased incidence of peanut allergy in high-risk infants with severe eczema compared with those told to avoid peanut protein (Du Toit et al., 2015).

### Practical intervention pearl

Based on the available literature, we encourage mothers to use infant feeding spoons when introducing new foods and to refrain from introducing new foods to infants with active perioral-facial dermatitis until the dermatitis is healed. The use of a barrier cream prior to feeds can help protect potentially vulnerable skin. We do not have prospective study evidence in support, but there is no risk to the use of infant feeding spoons. The introduction of foods early in life does not appear to carry any health risks (Perkin et al., 2016).

### Cautions

Parents should be aware that skin exposure even to food protein dust in the home and other environmental exposures that foster cross reactions can cause sensitization prior to the first oral introduction (Brough et al., 2013). If prolonged perioral inflammation precludes the introduction of new foods past 1 year of age, consultation with a physician is advised to consider both nutritional consequences and the increased risk of anaphylaxis associated with unrecognized sensitization and prolonged systemic avoidance.

### Conflict of Interest

None.

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