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## **(R)evolutionary Health Care**

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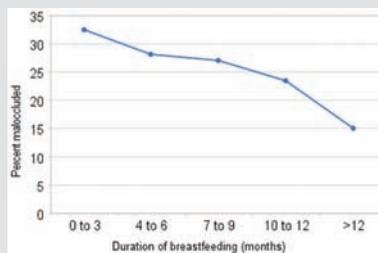
## (R)evolutionary Health Care

Dear ICAN Readership, Of the myriad well-known health benefits conferred on breastfed children, protection against later development of malocclusion (poorly aligned jaws and crooked teeth; Figure 1) seems to be the least studied and understood. Most dentists, orthodontists, oral surgeons, and other allied health care professionals are seemingly unaware of the fact that now highly prevalent malocclusion and impacted wisdom teeth did not even exist appreciably in humans until shortly after the beginning of the Industrial Revolution during the early to mid-18th century.<sup>1</sup> Similarly, dental caries (tooth decay), the most common chronic disease in US children, does not appear in the human fossil record until about 13 000 years ago,<sup>2</sup> and also did not exist appreciably in our more recent ancestors until around the Era of Industrialization.

Given that our species, *Homo sapiens*, has existed for more than 200 000 years with relatively cavity-free and malocclusion-free mouths, these (now) common oral health maladies simply cannot be attributable to some anomalous event that might have affected the human genome over the past 350 years or so; genetic change (eg, mutations, etc) requires thousands of years to be permanently incorporated into our genome. Through its emphasis on how environmental factors can influence the way genes are phenotypically expressed, the new scientific discipline of epigenetics

**Figure 1.**

Malocclusion by Duration of Breastfeeding.



Reprinted from Labbok MH, Hendershot GE. Does breast-feeding protect against malocclusion? An analysis of the 1981 Child Health Supplement to the National Health Interview Survey. *Am J Prev Med.* 1987;3(4):227-232.

provides a much better explanation (than “purely genetic”) for why modern children are now so susceptible to chronic *Diseases of Civilization* such as type 2 diabetes, obstructive sleep apnea (OSA), and the aforementioned dental diseases.

### Evolutionary Medicine

In an effort to clarify to skeptics of modern evolutionary theory about how the process of *natural selection* actually works toward bringing about genomic change, Theodosius Dobzhansky, a prominent Russian geneticist and evolutionary biologist, wrote the essay, “Nothing in Biology Makes Sense Unless Viewed in the Light of Evolution.”<sup>3</sup>

Consistent with Dobzhansky’s hypothesis is the newly emerging educational discipline in medicine called *Evolutionary Medicine* (EM), also known as *Darwinian Medicine*.<sup>4</sup> EM is essentially an educational framework proposing that diseases are best understood when evaluated from the perspective of modern evolutionary theory. The basic question that the EM paradigm attempts to answer is why, for over millions of years of human evolution, has *natural selection* apparently left us still vulnerable to disease. For example, since *all* living organisms are involved in a similar struggle to survive and reproduce, when one wishes to investigate how to best prevent, treat, and/or eradicate an infectious disease, it might be a good idea to look at the infection from the *pathogen’s point of view*. Another EM explanation for why humans get sick is described by Nesse and Williams<sup>5</sup> as the *Mismatch* hypothesis, which postulates that our ancient human genome now finds itself *mismatched* to modern environmental challenges such as unhealthy eating and physical inactivity.

It is now scientifically validated that human milk, breastfeeding, and baby-led weaning (BLW) regimens all confer several major lifelong health advantages to children. What is also becoming increasingly clear is how different types of infant and early childhood feeding (IECF) regimens can produce differing health outcomes for children in later life. For example, if fed during infancy and early childhood according to a typically *modern* IECF (ie,

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little or no breastfeeding or human milk, formula fed with bottles and artificial nipples, and weaned with purees, highly processed, and soft-textured *baby foods*), children are at greater risk for developing chronic diseases (*of Civilization*) that are bidirectionally associated with sleep disordered breathing (SDB) and narrow hard palates<sup>6</sup> (eg, dental caries, ear infections, OSA, attention deficit disorder, obesity, etc). However, when fed during infancy and early childhood according to an *ancestral* pattern of infant and early childhood feeding (ie, exclusive and *on-demand* breastfeeding for the first 4-8 months of life, followed by up to 2 years, and beyond, of continued breastfeeding while weaning according to a BLW regimen), children seem to be less susceptible to, or protected

from, diseases associated with SDB and high/narrow palates.

### Future Considerations

If the EM model is effectively applied in the fields of dentistry and dietetics, it seems fairly clear that more effective preventive, treatment, and research strategies could emerge to help solve the myriad health problems associated with unhealthy eating. . . . Evolutionary Oral Medicine and Darwinian Dietetics anyone?■

### References

1. Gilbert SF. Ecological developmental biology: developmental biology meets the real world. *Dev Biol.* 2001;233:1-12.
2. Gibbons A. Evolutionary biology. An evolutionary theory of dentistry. *Science.* 2012;336:973-975.
3. Dobzhansky T. Nothing in biology makes sense except in the light of evolution. *Am Biol Teacher.* 1973;35:125-129.
4. Nesse RM. Evolution: medicine's most basic science. *Lancet.* 2008;372:S21-S27.
5. Nesse RM, Williams GC. *Why We Get Sick: The New Science of Darwinian Medicine.* New York, NY: Random House; 1994.
6. Montgomery-Downs H, Crabtree VM, Sans Capdevila O, Gozal D. Infant-feeding methods and childhood sleep-disordered breathing. *Pediatrics.* 2007;120:1030-1035.

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