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## A Commentary on "Parents' Knowledge, Attitudes, and Beliefs of Childhood Fever Management in Jordan": The Role of Healthcare Professionals in Caregiver Fever Phobia

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Abnormal elevation of body temperature in the setting of infection is an inescapable aspect of the human condition. Commonly known as fever, this powerful yet frequently misunderstood physiologic response has been documented in a variety of animal species besides humans, including fish and reptiles.<sup>1</sup> The often inappropriate response to fever by caregivers and medical professionals is also well documented. In their study, “Parents’ Knowledge, Attitudes, and Beliefs of Childhood Fever Management in Jordan: A Cross-Sectional Study,” Athamneh and colleagues add to the growing body of literature demonstrating that “fever phobia” appears to be a universal trait.

It isn’t difficult to understand how fever might have come to strike such fear in the hearts of parents all over the world. Prior to immunizations, antibiotics, and other advances of modern medicine, the development of fever often represented a life-threatening condition. Despite the fact that today the vast majority of fevers in children are caused by self-limited viral infections, the cultural inertia behind fever phobia may be difficult to overcome without extensive educational campaigns targeted at caregivers.

Medical professionals also play a role. Our approach to fever management often involves unnecessary laboratory tests, imaging studies, and doses of broad spectrum antibiotics. This overly aggressive

approach adds to parental anxiety and helps to establish a vicious cycle where patients of worried caregivers tend to undergo more evaluation and treatment.<sup>2</sup>

Since the 1980's, when Barton Schmitt published the seminal paper on the subject of fever phobia,<sup>3</sup> there have been several additional studies confirming and cataloging the causative factors and potentially dangerous resulting behaviors. These studies have shown that fever phobia exists in both parents and pediatric medical professionals.

Schmitt found that 94% of parents thought that fever could cause harmful side effects. Sixty-three percent of parents were very worried about serious direct harm from fever with 18% believing that brain damage could occur with temperatures less than 102°F. In addition, 16% believed that temperatures could rise to 110°F to 120°F if untreated.

A 2001 paper<sup>2</sup> that revisited fever phobia revealed that 91% of caregivers thought fever could cause harmful side effects including seizure (32%), brain damage (21%) and death (14%). Coma and blindness also made the list. 85% of caregivers would wake sleeping children to give antipyretics and a quarter of caregivers gave antipyretics for temperatures unlikely to cause any symptoms.

Fever phobia can put children at significant risk. Many studies done since 2001 have confirmed that parents frequently dose antipyretics

incorrectly, putting their children at risk for serious liver and kidney injury.<sup>5</sup> Unwarranted fear of fever leads to unnecessary medications, and if a dose that is too high is given too frequently, the results can be disastrous. Nearly three-quarters of caregivers admitted to the ineffective use of sponging to reduce fever, two-thirds of which used cool or cold water, or even rubbing alcohol.

Athamneh et al found similar results in their study of a population of parents in Jordan. Ninety-seven percent of parents worried about potential harm from untreated fever, including brain damage (58%). Three percent were concerned that death might occur directly because of fever. Almost half of respondents alternate antipyretics when an elevated temperature doesn't normalize. Ice packs and cold sponging were used by 22% and 47% of caregivers respectively.

Caregiver fever phobia is reinforced by the actions of pediatric medical professionals. Fever is often the first symptom pediatricians ask about and the first vital sign checked. We emphasize that our lab and imaging investigations are necessary because of the elevated temperature and tend to treat any and all fever with antipyretics. Fever also plays a large role in discharge instructions from emergency departments and inpatient facilities, which commonly contain warnings to call or return if fever develops or persists.

Much of this is appropriate, but information is often incomplete, inconsistent, and even incorrect. In the early 1990's, May and Bauchner looked into the role pediatricians play in fostering the development of fever phobia. They performed a survey of pediatricians in Massachusetts which found that 10% almost never discussed the definition of fever, 25% almost never discussed the effects of fever and 15% almost never discussed the cause of fever.<sup>5</sup>

Pediatricians for the most part agreed that parents should not wake a sleeping child to check temperature or give antipyretics, but the majority advocated treating low and likely asymptomatic temperatures. May and Bauchner found that 65% of pediatricians believed that fever could be dangerous with 21% of pediatricians listing brain damage as a potential complication. Just over a quarter listed death as a possible result.

In 2000, Mayoral et al published survey results in Pediatrics revealing that nearly a decade later pediatricians still commonly held false beliefs about fever and its management.<sup>6</sup> Fifty percent of the respondents recommended alternating antipyretics for instance. Nearly a third of the pediatricians in the survey cited a nonexistent policy of the American Academy of Pediatrics as support of the practice.

Pediatricians tend to only discuss fever when children are sick. When we do discuss it at well-child visits, it usually involves warnings of

when to seek medical care without education on the many commonly held false beliefs. Our emphasis of fever without accurately explaining what fever is leaves parents anxious and forces them to rely on alternative sources of information or to simply assume the worst.

There is merit to the idea that fever has a beneficial purpose but it remains somewhat controversial. Elevating our core body temperature in response to infection is a primitive and almost universal response, seen even in cold-blooded species. Lizards, for example, have been observed staying in the sun longer and fish seeking warmer water when ill. This implies that there is some degree of survival advantage in being able to develop a fever.<sup>7,8</sup>

Some bacteria and viruses do grow poorly when exposed to higher temperatures.<sup>9</sup> Iron is required for growth by many pathogenic bacteria, and it appears that fever decreases availability of it in the blood. Test tube studies have shown that elevated temperatures may increase the activity of various components of the immune system. There are a few non-primate experiments, particularly in rats and rabbits, that have shown improved outcomes with fever and even some human studies showing prolonged symptoms when fever is treated aggressively.

But these studies were small and difficult to extrapolate to all humans or to all specific fever causing infections. Plus there is also data

showing that the immune system may actually become impaired during fevers above 104°F-105°F, and that outcomes in some illnesses may be worse, particularly in critically ill patients. The data is a mixed picture essentially and the jury is still out. Regardless, any benefit of fever is likely so minimal that it would not preclude treatment of a miserable patient.

Most medical professionals that care for children practice good medicine the vast majority of the time. But we are human and thus vulnerable to all of the weaknesses inherent in being human. Why are we so afraid of fever? Perhaps because of the biases, logical fallacies, and intellectual stumbling blocks plaguing all of humanity to varying degrees. Or is it that we are simply parroting behaviors learned during impressionable years as medical learners?

Old habits are infamously hard to break in medicine, and unfortunately new bad habits are all too easy to acquire. For example, a new trend that I have noticed is the use of concurrent dosing of ibuprofen and acetaminophen as well as the use of intravenous dosing of antipyretics. Because the risk of fever is extremely low, even arguably nonexistent in the vast majority of ill children, these escalations in our approach will likely lead to an unfavorable risk versus benefit ratio. And they will likely lead to an increase in parental anxiety when the next fever comes around.

There will always be a subjective component to medicine, an “art” inherent in the practice. In order to best care for our patients, however, we must be wary of the use of this subjectivity as a shield against appropriate criticism and an impediment to change. The science of medicine, preferably bolstered by the maintenance of intellectual humility even as our years of experience add up, and the acquisition of good critical thinking skills are necessary to recover from or avoid problems like fever phobia.

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