

## On childhood obesity prevention: “Exercise is medicine” vs. “exercise is vaccine”

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### **Abstract:**

The most recent report on the obesity epidemic by the U.S. Institute of Medicine (IOM) has painted a bleak picture of reality in the U.S.<sup>1</sup> It reports that two third of adults and almost one third of children are either overweight or obese by any counts of measures. Situations in other countries do not seem optimistic either. According to the World Health Organization (WHO), the numbers of obese children have increased during the last decade to an estimated 35 million in developing countries and 8 million in developed countries worldwide.<sup>2</sup> In China childhood overweight and obesity rates increased by approximately five-fold from 1985 to 2000.<sup>3</sup> Recent statistics show that 20.3% and 13.4% boys were classified as overweight or obese, respectively; while 13.5% and 4.1% of the girls were overweight or obese.<sup>4</sup>

**Keywords:** childhood | obesity | exercise | opinion

### **Article:**

The most recent report on the obesity epidemic by the U.S. Institute of Medicine (IOM) has painted a bleak picture of reality in the U.S.<sup>1</sup> It reports that two third of adults and almost one third of children are either overweight or obese by any counts of measures. Situations in other countries do not seem optimistic either. According to the World Health Organization (WHO), the numbers of obese children have increased during the last decade to an estimated 35 million in developing countries and 8 million in developed countries worldwide.<sup>2</sup> In China childhood overweight and obesity rates increased by approximately five-fold from 1985 to 2000.<sup>3</sup> Recent statistics show that 20.3% and 13.4% boys were classified as overweight or obese, respectively; while 13.5% and 4.1% of the girls were overweight or obese.<sup>4</sup>

There is consensus about the obesity epidemic and its devastating consequence on children across the countries. Similarly there is consensus on how to address it: promoting healthy nutrition and increasing physical activity. There is, however, little philosophical consensus on how these approaches can be most effectively used in dealing with childhood obesity. One philosophical orientation is the treatment position. A typical representation of this position is

manifested in the popular metaphor of “Exercise is medicine”. The other is a not-so-popular orientation with rarely-heard metaphor “Exercise is vaccine”. Although the two may be connected in some way (e.g., one can argue vaccine is medicine too), they are fundamentally different in terms of intervention timing and subsequent health and behavior outcomes. There is no doubt that both are needed in addressing the childhood obesity epidemic. But each can lead to personal and social consequences different from those of the other.

## 1. “Exercise is medicine”

This metaphor implies that overweight and obesity are sicknesses and require medical attention. It sends, rightly so, a strong message to those who are suffering from excessive body weight and obesity that they need to seek medical help. Exercise is conveyed to be an effective medicine one has to take in order to cure the disease. Growing out of this treatment perspective is an important hidden message that fighting against the overweight/obesity disease is primarily a personal responsibility. That is, the individual is responsible for seeking help and following the treatment protocol. If recurrences occur, it is the individual's responsibility to start the treatment all over again. As the evidence in the IOM report suggests, this person-focused approach has not been successful since 1980 when the obesity rate was 15% of the population and the U.S. began the fight against obesity.

The medicine metaphor may be particularly ineffective in stopping children from becoming obese adults. Using an unscientific calculation, one can conclude that among the two thirds obese U.S. adults, one half of them were not overweight or obese in their childhood and/or adolescent years (2–19 years of age). A reasoning may also lead to a conclusion that under the treatment approach, one third of the obese children lost the battle after they became adults. Could they have been successful if they had not been left to themselves (and their families) to figure out necessary knowledge, skill, and motivation to fend off gradual erosion of their willpower needed to maintain a healthy body weight? Because the body weight issue has become such a personal one, physical education teachers, the most likely source of help, become hesitant to overtly mention “weight control” and “weight loss” to these children and reluctant to design individualized exercise tasks for them for the very purpose. It is not uncommon to observe in schools that overweight/obese children go along with others in physical education and display difficulties in almost all physical activity tasks. These classes and content become irrelevant for them. Consequently, the children become powerless and prone to accepting the vicious cycle of treatment-recurrence.

## 2. “Exercise is vaccine”

The vaccine approach has been most effective in controlling epidemics. For example, smallpox was not controlled until the smallpox vaccine was introduced for population application and became a social and societal effort. But obesity prevention cannot be achieved through finding a magic one-shot vaccine.<sup>1</sup> For this very reason, the vaccination metaphor actually implies a continuous social and societal effort, as the IOM report openly indicates. Its success requires shifting the responsibility of controlling individual body weight from the individual to the society.<sup>1</sup>

It seems that this metaphor is particularly relevant for school-based childhood obesity intervention. It allows a shift of focus from treatment to prevention. The strength of a “weight control vaccination” lies in the implied application structure: individual efforts are part of an institutional and societal effort. The advantage of this approach is that success of the prevention depends on individual success; while the institutional effort provides both a guidance and support for the individual. This collective effort has been successful in controlling various epidemics in the past. We should be confident that this philosophical shift from the treatment to prevention will be successful in childhood obesity prevention.

### 3. The vaccine delivery system

School based intervention is such a collective effort. As a matter of fact, it is the only strategy IOM recommends as effective for childhood obesity prevention based on its extensive review of available research evidence.<sup>1</sup> The goal of the intervention is to “make schools a focal point for obesity prevention”; for which adopting the vaccine metaphor is naturally relevant. Schools, after all, are not hospitals, teachers are not physicians. They are not qualified to “treat” a disease, but they are part of the societal structure that promotes public health. It is common practice that all schools check all children's vaccination record upon their enrollment. When a child misses a particular vaccination, the school is obliged to refer the child to appropriate health institutions to receive the vaccination. Communities, individuals, and society fully understand and appreciate this practice. This public appreciation should and can be extended to schools' effort in helping curb the childhood obesity crisis.

A primary approach to achieving the goal of childhood obesity prevention is to require quality physical education at all levels of schooling.<sup>1</sup> A radical conceptualization, under the vaccine metaphor, is to view physical education as a vaccination delivery system. This conceptualization requires physical education professionals to philosophically endorse the following. (a) All school-age children are likely to become obese adults because the odds of becoming obese are very great due to the fact that children are the most powerless, thus the most vulnerable, population. (b) Scientific evidence from obesity research must be accepted and acted upon: physical activity can help reduce the chance of becoming overweight and obese. (c) Increasing and maintaining moderately high intensity physical activity (metabolic equivalent >3.0) must be embraced as a paramount guideline in planning any physical education experience for children. (d) Caloric balanced living behavior must be taught as a major part of content. At this point of time, it may not be a radical idea to consider using caloric-balance as a curriculum development framework.

One important aspect of the vaccination system is that along with the institutional effort personal responsibility must be centrally instilled in children (and their families). Children who miss a vaccination will remain at risk if they do not go or their parents/guardians do not take them to the institution where the vaccine is delivered. Physical activity as a vaccine alone does not immune an individual from the various hyperkinetic conditions. It can only be effective when individuals use it regularly in combination of other positive behavioral changes, such as keeping a healthy diet. In other words, physical activity is only effective when incorporated as part of daily life and performed regularly. Therefore, children should be educated on how to deliver the daily dosage of physical activity to themselves not only in but also outside the school. Toward this end,

physical education, as an important vaccine delivery system, must do the seemingly impossible: not only taking the children to the vaccine delivery site (i.e., the gymnasium) to receive the daily dosage but also educating them about why this life-long, daily vaccination is required for a healthy, enjoyable, and productive personal life. With over 40 million children's future at risk, developing, strengthening, and maintaining such a vaccination system worldwide is a worthy effort.

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