



## **Increasing Academic Performance While Reducing Obesity Background and Justification**

**Reducing obesity is a public health priority.** Obesity is currently one of the most prevalent, yet controllable, health problems that impact children as well as adults.<sup>1</sup> In the past 20 years, the number of overweight children has practically doubled, and the number of overweight adolescents has nearly tripled.<sup>2</sup> Three in ten Georgia middle school students (29.7 percent) and one in four high school students (26.7 percent) were at risk for overweight or were actually overweight.<sup>3</sup> There has been a sharp rise in hospitalizations of overweight children for the diseases associated with obesity such as diabetes and sleep apnea.<sup>4</sup> Hospital costs related to childhood obesity have more than tripled over the last 20 years from \$35 million in 1979 to \$127 million in 1999.<sup>4-5</sup> Overweight children have a higher level of moderate to severe asthma, higher fasting blood insulin levels (a risk factor for Type II Diabetes), greater likelihood of elevated blood pressure levels, and increased orthopedic conditions than children of normal weight.<sup>6</sup> In addition, childhood obesity predicts an increased probability of obesity in adulthood.<sup>1,7,8</sup>

**Obese children face both physical and psychological barriers that can reduce academic achievement.** Overweight students were four times more likely than healthy students to report "impaired school functioning."<sup>9</sup> One study of overweight inner city students found that these children were twice as likely to be in special education or other remedial class settings.<sup>10</sup> Another study of 11,192 kindergartners found that overweight students in comparison to students who were not overweight, had significantly lower reading and math scores at the beginning and end of the school year.<sup>11</sup> Another study among overweight boys in kindergarten found a negative effect for being overweight that was not explained by factors such as ethnicity or the mother's level of education.<sup>12</sup>

**Obesity reduces connectedness to schools – which also reduces the potential for higher academic achievement.** There are psychosocial effects that affect overweight and obese youth, such as stigma, lack of self-esteem, and poor body image.<sup>8,13-15</sup> Studies demonstrate that children rank obese peers as the least preferred friends. This can lead to isolation and limited ability to develop social skills resulting in lower self-esteem.<sup>16</sup> Not feeling connected to school has also been related to lower academic achievement.<sup>17-18</sup>

**Increased physical activity and improved nutrition is related to a reduction in obesity.** A school is an ideal place to influence the health of students, since more than 95 percent of youth in the United States ages 5-17 are enrolled. Children take part in physical education classes and eat one or two meals during the school day. These activities address the two main factors in preventing and treating childhood obesity: diet and exercise.

**There is strong evidence that school-based physical education is effective in increasing the levels of physical activity and improving physical fitness.**<sup>19</sup> Twelve different studies were reviewed by a CDC panel. Reported behavioral outcomes include increases in energy

expenditure,<sup>20-22</sup> increases in percentage of class time spent in moderate to vigorous physical activity<sup>21,23-28i</sup> and increases in self reported type and frequency of physical activities outside of school. Two<sup>26-27</sup> of three studies showed increase in flexibility as measured through sit-and reach tests. Muscular endurance increased in two studies. These interventions were also associated with an increase in knowledge about exercise,<sup>25,27</sup> fitness, and nutrition.<sup>23-24,26</sup>

**Providing more opportunity for increased physical activity (by reducing class time) does not lead to a decrease in test scores and can lead to an increase in test scores.**<sup>8,28-29</sup> In one study, 546 primary students in an urban and rural school who received one extra hour per day of physical education were compared to students from the same schools who received the standard physical education program plus one extra hour (13-14%) more instruction per week. Academic performance in French, math, English and science were maintained or even enhanced by an increase in a student's level of physical activity even though it meant a 13-14% reduction in instruction time.

**Physical activity is essential to brain function.**<sup>30</sup> Although the brain only comprises two percent of one's body weight, it uses more than 20 percent of one's available oxygen supply. Blood will pool in the groin area if one is sitting for long periods of time rendering brain function less efficient, hence, one's learning and performance suffer. When students sit for long periods – when reading or listening to a lecture, for example – it becomes increasingly difficult to receive explicit information. The hippocampus, which receives and temporarily stores all explicit information, acts as a surge protector. When it receives too much information, it shuts down. Further learning becomes difficult or impossible.<sup>8</sup> Brain researcher, Sousa found that 20 minutes was optimal for a learning segment, followed by two to five minutes of movement.<sup>30,31</sup>

**Increased physical activity leads to higher levels of fitness which is associated with higher achievement.**<sup>32</sup> The California Department of Education found a distinct relationship between the physical fitness of students and their academic achievement. The study matched scores from the 2001 Stanford Achievement Test, Ninth Edition with the results of the mandated physical fitness test (*FITNESSGRAM*), also given in 2001. The study matched reading and mathematics scores with fitness scores of 353,000 fifth graders, 322,000 seventh graders and 279,000 ninth graders. For each grade level, higher achievement was associated with higher levels of fitness. At all three grade levels, the average score for students almost doubled in both reading and mathematics when comparing students who could only pass one fitness test with those students that could pass all six fitness tests.<sup>32</sup>

**Exercise is associated with improved academic outcomes, maintenance of positive interpersonal relationships, and reduced incidence of depression, anxiety and fatigue.** In a review of the literature, Symons et al<sup>33</sup> concluded that there was a strong connection between physical activity and positive academic outcomes. They further noted that participation in vigorous physical activity was linked to a reduction in anxiety, tension and depression that can decrease students' attitudes about self and schooling.

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