

WORCESTER

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Childhood Obesity



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letter to the editor

To the Editor,

The latest *Worcester Medicine* touched on the issue of providing quality health care to the uninsured and those dealing, temporarily or permanently, with severe financial constraints. It reminded me that the provision of free care by physicians is not new and rekindled some memories of practicing in Worcester in the PM (pre-Medicare and Medicaid) days.

I hope that sharing some of these, while there are still a few around to corroborate the facts, might be interesting.

In the 1950s, on arriving in town to hang out his shingle (and, yes, we did hang out shingles) the young physician was introduced to the fact that the major hospitals would not consider a staff applicant who was not a member of the District Medical Society. Joining the Society meant going before a credentials committee which quizzed you on medical topics (ex.: asking a fully trained internist to discuss the pathophysiology and treatment of erythroblastosis fetalis).

Since that exam was aimed at screening out the unfit, the hospital credential policies were minimal. Admission to a hospital staff was determined, at each institution, by one, or occasionally two, dominant individuals. The criteria used had, often, more to do with unwritten but understood economic, social and ethnic considerations than with professional qualifications. But that's another story.

Appointment to the staff meant initial assignment to one or more of the specialty or sub-specialty outpatient clinics. These clinics were large, very busy, and available to all with no financial restrictions and without recompense to the care providers.

After an appropriate observation period, a successful applicant was promoted to a fairly large "house" ward for several months of the year. Therein, the responsibility was to care for the "service" patients by providing supervision, example and guidance to the house staff. Counsel and consultation was freely and gladly provided by senior staff members.

This provision of unpaid services to a significant number of disadvantaged patients was a source of pride and satisfaction in our profession and gave credence to the answers we had given to our medical school admissions officer when he asked, "Why do you want to become a physician?"

When Medicare and Medicaid arrived in the mid sixties, a gradual transition away from "clinics," "service" admissions and totally free care resulted.

Many of us felt saddened that the young physicians who followed us did not have the opportunity and privilege to experience the personal gratification that we derived from fulfilling those responsibilities.

Francis X. Dufault Jr., MD

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Obesity, Youth At Risk

Paul M. Steen, MD



Paul M. Steen, MD

In the past three decades, the incidence of obesity in children has doubled and it is now estimated that one in five children in the US is overweight. And the age of onset is getting younger, now including preschoolers. Finally, the heaviest children are getting heavier. As a result, childhood obesity is one of the most common problems seen by pediatricians.

During their youth, obese children and adolescents are more likely to have risk factors associated with cardiovascular disease: high blood pressure, high cholesterol, and Type 2 diabetes. Obese children and adolescents are more likely to become obese as adults. One study found that approximately 80% of children who were overweight at aged 10–15 years were obese adults at age 25 years.

In this issue of *Worcester Medicine*, we have explored childhood obesity from multiple aspects. The articles by Auerbach, Savage & Lemon, and Hirsch & Vakil talk about efforts made at the state

and Worcester levels to tackle childhood obesity such as ‘Mass in Motion’ and ‘One Step At A Time’ projects. The article by Lustig examines the science behind sugar ingestion and obesity with good recommendations for actions to be taken. In Pesaturo’s article is a good exploration of drug therapy applications in childhood obesity and some cautions on their use. Anne Kane’s article on media’s influence -- including computers -- shows how public policy may play a critical role in this arena. She also talks about “Advergaming.” If, like me, you’ve never heard of this term, read the article. Lastly, Lebow’s article with the cute title of “Lightening a Heavy Problem” is a good, succinct overview of causes and solutions.

I want to put a plug in for Dale Magee’s article on healthcare in the United Kingdom. Dale presented this at a conference sponsored by our society last fall. There is so much misinformation and outright lies on this subject that I felt this excellent overview should have wider exposure.

At the State of the Union address, the President announced that the First Lady would lead a nationwide effort to curtail childhood obesity. This, at last, raises this important issue to a visible level of recognition where it can’t be ignored by the general public any longer.



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Addressing Obesity on Multiple Levels

John Auerbach, MBA



John Auerbach, MBA

Although Massachusetts compares favorably to most other states, excessive weight and obesity are still major public health problems in the Commonwealth, especially for children. In fact, more than half of the adults and almost one-third of high school and middle school students in Massachusetts are overweight or obese. Unless these numbers decrease, excessive weight and obesity will soon pass smoking as

the leading cause of preventable death in the Commonwealth and in the nation.

To address this significant public health problem, Massachusetts launched Mass in Motion in January 2009. Mass in Motion aims to promote wellness and to prevent excessive weight and obesity in Massachusetts, with a particular focus on the importance of healthy eating and physical activity.

Mass in Motion uses a multi-faceted approach, including:

- The release of a Call to Action that documents the extent of the obesity epidemic in Massachusetts, its consequences, and efforts to combat it
- Support for regulatory changes to promote healthy eating and physical activity, including
 - Body Mass Index (BMI) calculations to assess weight status of public school students in grades 1, 4, 7, and 10
 - Menu labeling for chain restaurants operating in Massachusetts

- An Executive Order by Governor Patrick requiring state agencies responsible for large-scale food purchasing, such as DPH and DMH hospitals, to follow healthy nutritional guidelines in their food service operations. State purchases of food by these agencies run into the tens of millions of dollars per year.

In addition, five major health-funding foundations and other leading health organizations in the Commonwealth have provided grants to cities and towns to make wellness initiatives a priority at the community level. Fitchburg and Worcester are two communities that received Mass in Motion Municipal Wellness Leadership grants to implement policy and systems changes to support healthy eating and physical activity.

The state is also sponsoring a Workplace Wellness program to help employers create work environments that encourage healthy behaviors and reduce absenteeism and health insurance costs. UMASS

Medical School in Worcester and The Montachusett Opportunity Council (MOC) in Fitchburg are implementing the Working on Wellness Program to promote employee health.

Finally, the state also launched the Mass in Motion website, www.mass.gov/massinmotion, which promotes eating better as well as moving more at home, work, and in the community by providing simple, practical, cost-effective

ways for Massachusetts residents to improve eating habits and increase physical activity. Users can also ask experts questions about improving their diet and physical exercise routine and learn how to get involved in building healthy communities.

Another strategy the state is using to combat overweight and obesity in children is changing the foods available in the public schools. The Massachusetts Department of Public Health in collaboration with Harvard Pilgrim Foundation convened a task force to develop and implement a policy to improve school meals. The task force

Mass in Motion aims to promote wellness and to prevent excessive weight and obesity in Massachusetts, with a particular focus on the importance of healthy eating and physical activity.

I spoke at the World Health Organization in Geneva.

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is comprised of representatives from the Department of Elementary and Secondary Education, USDA regional office, School Nutrition Association, Superintendent's Association, School Board Association, School Nurses Association, physicians and representation from other key organizations.

Lastly, the recent revamp of the Massachusetts Women, Infants and Children (WIC) nutrition program further underscores the commitment of the state to serve as a national leader in nutrition innovation. This past October, Massachusetts updated the program to reflect the latest science on healthy diets and address obesity by expanding to include foods that are lower in fat and higher in fiber, such as whole grain cereals and breads and cash-value checks to purchase vegetables and fruits. Some substitutions are also available to meet cultural preferences, with more options possible in the future. This is the first major change in food offerings to low-income women, infants and children in 34 years.

These changes will help families meet the Dietary Guidelines for Americans set by the U.S. Department of Health and Human Services and the Healthy People 2010 Objectives set by the Centers for Disease Control and Prevention as well as follow the American Academy of Pediatrics recommendations for infants.

All of these initiatives further underscore the Department of Public Health's commitment to curtailing the growing obesity problem in the state. For more information on all programs, you can visit the Department of Public Health website at www.mass.gov/dph.

John Auerbach, MBA is the Commissioner of Public Health for the Commonwealth of Massachusetts

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Fructose, Insulin, and Childhood Obesity

Robert H. Lustig, MD



Robert H. Lustig, MD

Introduction:

The obesity epidemic shows no signs of relenting. There is now more obesity globally than there is malnutrition. Not only has the frequency increased, but the severity of obesity in terms of BMI distribution, the prevalence of co-morbidities, and the increases in frequency of bariatric surgery document that obesity is more severe as well. The incidences

of obesity-related insulin resistance and its spinoffs ~ metabolic syndrome, non-alcoholic fatty liver disease, and polycystic ovarian syndrome ~ continue to escalate. Worse yet, the greatest increase in prevalence is in the youngest members of society. The 2 - 5 year old demographic is experiencing the most rapid rise in obesity, and metabolic syndrome is even more frequent among obese children than it is among obese adults. We even have an epidemic of obese 6-month olds. Obesity is said to be an interaction between genetics and environment. Our genes haven't changed in 30 years, but our environment sure has. The obese 6-month old is the "exception that proves the rule." While it is easy to ascribe blame to our current dietary and exercise practices, how does this explain the obese 6-month old? What follows is a brief discussion of the actual biochemical alterations that promote obesity, and a suggestion of the changes we can make in the food environment to halt this childhood obesity epidemic.

Insulin and obesity

Insulin is the energy storage hormone. What you don't burn, you store in fat tissue, under the influence of insulin. This is obvious to every physician who treats diabetic patients, as their weights increase with insulin. Things that make insulin go up cause energy storage, and things that make insulin go down promote energy burning. Insulin does three things which put it front and center in obesity physiology. 1) Insulin drives energy into fat for storage.

2) Insulin interferes with leptin signaling at the hypothalamus (the energy control center of the brain). This results in leptin resistance, which results in decreased sympathetic tone, reducing energy expenditure and physical activity, and in increased vagal activity, which promotes further insulin secretion, appetite, and energy storage. 3) Insulin interferes with the clearance of dopamine in the nucleus accumbens (the reward center of the brain), thus increasing the reward of food. Thus, hyperinsulinemia turns the negative feedback system of energy balance into a positive feedback or "vicious cycle," promoting obesity. Externally, this appears as "gluttony and sloth," but it is biochemically driven.

How does this work? A thin, insulin sensitive 13 year old might consume a daily allotment of 2000 kcal, and burn 2000 kcal daily in order to remain weight-stable, with a stable leptin level. However, if that same 13 year old became hyperinsulinemic and/or insulin resistant, perhaps as many as 250 kcal of his daily allotment would be shunted to storage in adipose tissue, promoting a persistent obligate weight gain. Due to the obligate energy storage, the child now only has 1750 kcal per day to burn. The hyperinsulinemia also results in a lower level of hypothalamic leptin signaling, conveying a central signal of energy insufficiency. The remaining calories available are lower than his energy expenditure; the hypothalamus would sense starvation. Through decreased sympathetic tone, he would reduce his physical activity; through increased vagal tone, he would increase caloric intake and insulin secretion, but now at a much higher level. Furthermore, the insulin prevents the extinguishing of the reward pathway, promoting increased intake as well.

Where did the hyperinsulinemia come from?

At least 3 separate reasons for hyperinsulinemia in children can be discerned. 1) Genetics: children from certain racial and ethnic groups have increased insulin dynamics even prior to the development of obesity, which may predispose them to increased weight gain. 2) Epigenetics: the "fetal origins of adult disease" hypothesis states that those born small- and large-for-gestational age at birth are prone to developing obesity; both birth weight extremes are states of hyperinsulinemia and insulin resistance, which may worsen beyond

the neonatal period. 3) Our food environment: our current Western food environment is highly insulinogenic, as demonstrated by its increased energy density, high fat content, high glycemic index, decreased fiber, and decreased dairy content. But in particular, the monosaccharide fructose appears to be a cornerstone of the obesity epidemic, through its effects on insulin.

Fructose and insulin

The primary stimulus to insulin release at the pancreas is glucose, found in all forms of carbohydrate (refined starch, legumes). Carbohydrate intake increases insulin release and increases weight gain. However, the other insulin-promoting nutrient is fructose, found in sugar. Fructose does not stimulate insulin directly, but rather promotes insulin resistance.

The most commonly used sweetener in the U.S. diet is the disaccharide sucrose (e.g. table sugar), which contains 50% fructose and 50% glucose. However, in North America and other countries, non-diet soft drinks are sweetened with high-fructose corn syrup (HFCS), which contains up to 55% of the monosaccharide fructose. Thanks to its abundance, sweetness, and low price, HFCS has become the most common sweetener used in processed foods. HFCS is found in processed foods ranging from soft drinks and candy bars to crackers to hot dog buns to ketchup. It's not that HFCS is biologically more ominous than sucrose; it's that its low cost has made it available to everyone, especially low socioeconomic groups. Fructose is fructose, whatever its source. Average daily fructose consumption has doubled over the past 30 years and increased 6-fold in the past century. The growing dependence on fructose in the Western diet may be fueling the obesity and T2DM epidemics.

Both animal and human studies demonstrate that high-fructose diets lead to increased energy intake, decreased resting energy expenditure, excess fat deposition, and insulin resistance. The hepatic metabolism of fructose differs significantly from glucose. Fructose is absorbed in the intestine and enters the liver without insulin regulation. There, fructose is converted to fructose-1-phosphate (F1P), consuming ATP and increasing the formation of uric acid, which suppresses the action of nitric oxide on vascular smooth muscle and promotes hypertension. F1P enters the glycolytic pathway without regulation. This leads to an accumulation of xylulose-5-phosphate, which stimulates the process of de novo lipogenesis, increasing VLDL production, which promotes atherogenesis. The glycolysis of fructose ultimately leads to an over-accumulation of acetyl-CoA in the hepatocyte, some of which cannot be metabolized through the Krebs cycle; therefore, it is then reassembled into free fatty acids (which promote pancreatic insulin hypersecretion) and triglycerides

(some of which precipitate in the liver and cause hepatic insulin resistance and non-alcoholic steatohepatitis). Fructose also does not suppress secretion of the so-called "hunger hormone" ghrelin, levels of which correlate with perceived hunger. Finally, fructose has both direct and indirect effects (through insulin) which activate the reward pathway to foment increased consumption, similar to the process of addiction.

In sum, fructose consumption has metabolic and hormonal consequences different from glucose that facilitate development of obesity and the complications of the Metabolic Syndrome. The highest fructose loads are soda (1.7 gm/oz) and juice (1.8 gm/oz).

What can be done?

As you can see, if our food supply has been adulterated, obesity becomes a public health issue, not a personal responsibility issue. This is going to take an exceptional policy effort addressing the food environment, and will take parent, school, community leader, physician, food industry, and politician education and action. But in the meantime, here are some suggestions.

- 1) Remove ALL sugar sweetened beverages from schools and school lunches. Juice, sports drinks, and even chocolate milk are as dangerous as soda.
- 2) Restrict marketing of ANY AND ALL fructose-containing foods to children.
- 3) Provide parent education at various medical interaction points, e.g. prenatally, at birth, and at doctor office visits.
- 4) Consider legislation that subsidizes fresh fruit and vegetable (endogenous fructose) consumption while taxing the consumption of fructose-added foods.
- 5) Change WIC rules so that fresh fruits are covered and juices are not.
- 6) Most importantly, the Food and Drug Administration has given fructose GRAS (generally regarded as safe) status, allowing the food industry to add as much as they want to our food. This designation must be repealed.

There are many other ways to impact the childhood obesity epidemic, working on the energy expenditure side of the argument. But until our food supply is de-fructosified, don't expect the obesity epidemic to go away.

Robert H. Lustig, M.D., is a Professor of Pediatrics, UCSF, San Francisco, CA .

Childhood Obesity in Worcester: What Are We Doing About It?

Clara P. Savage, Ed.D and Stephenie C. Lemon, Ph.D

It was 7:05 a.m. Susie finally arrived at the bus stop with her 10 year old daughter Angela. Sitting on the bench of the sheltered bus stop were her friend Isabella and her two children, Luis and Lola. “Hello friends, what a beautiful day,” Susie said.

Isabella looked worried and just said, “Hi.” “What’s wrong?” Susie responded.

“Well, it’s the letter that I got about my kids’ problem. It shows the Body Mass Index (BMI) screening they did which shows that Luis and Lola are overweight and I need to get in touch with their Pediatrician. I am really afraid they’re going to blame me. Have you got the letter?” She inquired.

“Yes, I got the same letter telling me that Angela is overweight for her age, but I talked to her Pediatrician yesterday, and he recommended that I enroll Angela in a fitness program at the YMCA for children her age. He also gave me instructions about how to replace soda drinks for low-fat milk (1% or skim) or water in all our meals and snacks as well as to limit her TV watching to two hours or less a day.”

“Oh that made me feel better, I can do that,” Isabella said. “I will call our Pediatrician this morning and ask her advice. Thank you.”

This story will be repeated many times throughout the country, as we are finally recognizing the reality of a population of children affected by being overweight and by high rates of obesity. In some states, the Department of Public Health is committed to including parents’ participation in helping their children to maintain healthy weight. Over the past two decades, rates of overweight and obese children in the U.S. have tripled. Currently, approximately 24% of children age 2 to 5, 33% of children age 6 to 11, and 34% of adolescents age 12 to 19 are considered overweight or obese. Worcester’s children are no exception. Given recent trends, we can expect these numbers to continue to increase unless there are major

public health and community initiatives. Being overweight and obese puts children at lifelong risk of obesity and the numerous illnesses associated with it, as well as at risk for decreased alertness and school performance. Whose responsibility is it? We are all accountable -- parents, educators, healthcare and social service providers, churches, city officials, businesses, media, community organizations, and neighbors -- and we must take charge. There are many initiatives underway in Worcester now addressing this important issue.

Common Pathways CHNA 8 (Community Health Network Area) is a five year old Greater Worcester coalition of residents and organizations working together toward a healthier community for all. In 2008, we compiled a Worcester Community Indicators, which identified the prevalent issues affecting our community. We organized our 147 community partners into 10 work groups to execute specific initiatives. The Public Health and Medical Services Work Group focuses on improving the high rates of excessive weight and obesity in our population, particularly in children.

To gain the perspective of community residents, Common Pathways joined forces with UMass Memorial, UMass Medical School, the Harvard School of Public Health, Dana Farber Cancer Institute, Clark University, YWCA, Girls Inc, Planned Parenthood, YMCA, Great Brook Valley and Family Health Centers and other community organizations in reaching out to 11 neighborhood groups of children, adolescents and adults from a variety of backgrounds during the summer of 2009. We engaged residents in small group discussions regarding issues they face, particularly their experience with physical activity and good nutrition. These conversations provided a wealth of information that can be used to guide the next generation of initiatives. We are planning 27 similar neighborhood conversation groups in 2010.

UMass Memorial Health Care/Common Pathways Determination of Need (DoN) is addressing childhood obesity through funding of programs throughout the city. As agreed with the Massachusetts

Department of Public Health (MDPH) to meet the requirements associated with UMass Memorial's Lakeside Wing Expansion, a total of \$1,057,424 is being distributed over a 5 year period to the Worcester community through a collaborative effort with Common Pathways. During 2008-2009, the DoN contributed a total of \$211,485 to support the healthy weight programs through five different grants which target underserved youth ages 3 to 24. In 2009, a total of \$197,350 of DoN funding supported the City initiative for transportation to pools and beaches.

Other important initiatives are:

- Hunger Free and Healthy, funded by the Health Foundation, promotes Farmers Markets, community gardens and healthy school lunches, among other activities.
- A Mass in Motion grant from the Massachusetts Department of Public Health promotes environmental policies related to healthy living.
- Pioneering Healthier Communities, an initiative of YMCA, focuses on policy and environmental change to promote healthy lifestyles.

- The PASA Coalition focuses on promoting and facilitating physical activity among the Latino community.
- The Legacy Project at the Willis Center and YMCA addresses education and health equity for the African American and African immigrant communities.

UMass Medical School recently established the Worcester County Prevention Center (WC-PRC) -- one of 35 Prevention Research Centers funded by the Centers for Disease Control and Prevention. The goal is to develop equitable partnerships between academic and community groups to conduct research, programming, and policies to improve community. The WC-PRC focuses on excessive weight, obesity and associated chronic conditions among individuals living in Central Massachusetts.

Worcester healthcare providers have been making tremendous efforts to educate parents about the need to decrease the intake of calories and increase physical activity for children of all ages. The MDPH's special emphasis is on the engagement and awareness of local leaders and parents concerning children's BMI. It is imperative that

all doctors, nurses and other care providers update their information about Worcester's available resources by visiting MDPH's Mass in Motion website at <http://www.mass.gov/massinmotion>.

For additional information, contact Common Pathways at CommonPathwaysOnline@gmail.com and visit our website, commonpathways.org.

Clara P. Savage, Ed.D, is Director of Common Pathways, a Healthy Communities Coalition for Greater Worcester and CHNA 8

Stephenie C. Lemon, Ph.D, is Director of Worcester County Prevention Research Center, UMass Medical School.

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Implications of Pediatric Obesity on Medication-related Practices

Kimberly A. Pesaturo, PharmD, BCPS



Kimberly A. Pesaturo
PharmD, BCPS

The prevalence of overweight children in the United States has risen over the last several decades.¹ Approximately 17% of children in the US in 2004 were estimated as being overweight, as defined by data from the National Health and Nutrition Examination Survey. Currently, the Centers for Disease Control and Prevention defines children ages two through 19 years as overweight if the child has a body mass index (BMI)-for-age greater than or equal to the 85th and lower than the 95th

percentile.² Obesity in children is defined as BMI-for-age greater than or equal to the 95th percentile. As the prevalence of overweight and obese children rises, pediatric healthcare practitioners are likely to be faced with increasing challenges when dosing medications in these children. In overweight and obese children, weight-based drug dosing practices, changes in physiology, and a lack of pharmacokinetic (PK) and pharmacodynamic (PD) drug data should all be considered in medication dosing.

Most medications are dosed in children using a weight-based approach; that is, drugs are often dosed on a unit per weight basis (i.e. mg/kg or mcg/kg). To ensure appropriate utilization of the weight-based approach, the American Academy of Pediatrics suggests that each child's weight and comorbid status is individually assessed to determine the best approach to dosing a particular patient.³ The majority of pediatric practitioners utilize a weight-based approach in children up to approximately 35 to 40 kg of weight, as implied by studies of medication errors in children.⁴ As a general rule, most weight-based pediatric drug doses should not exceed the standard adult dose for a given medication.

However, weight-based dosing approaches may become more complex when the child in question is overweight or obese. A recent study examined the implications of using "high-dose" regimens of amoxicillin in obese children for acute otitis media.⁵ Study investigators found that children weighing greater than 20 kg were likely to receive lower weight-based amoxicillin doses than children with lower weights. The

study also showed that prescriber approach to amoxicillin dosing in the obese pediatric population was varied.

In addition to weight-based dosing approaches, potential changes in drug distribution and excretion should also be considered when a child is overweight or obese. Patient and drug-specific factors should be reviewed when evaluating risk-benefit of a specific medication dose in an obese child. Volume of distribution (Vd) is a pharmacokinetic (PK) factor that is highly dependent on drug lipophilicity; thus, overweight and obese children may theoretically require higher doses of lipophilic drugs. Similarly, the incidence of non-alcoholic fatty liver disease is increasing in children as the incidence of obesity increases;⁶ however, the implications of fatty liver on drug excretion in children have not been evaluated.⁷ Recent data shows that obese children may have larger kidneys than non-obese children,⁸ which calls into question the effect of obesity on renally-excreted medications. For example, while there is a paucity of data on this subject in children, adult data shows that obese patients are more likely to be under-dosed when receiving initial vancomycin doses.⁹

The growing trends in pediatric obesity also lead to considerations with resources that utilize a child's height to estimate weight. For example, the Broselow Pediatric Emergency Tape™ (BPET™) has been validated in emergency resuscitation medication dosing in normal-weight pediatric patient populations inside and outside of the United States.^{10,11} Consequently, one study that examined the BPET™ in overweight children suggested that its use may actually underestimate drug dosing in emergency situations.¹² It has been suggested that if a child is measured using the BPET™ and appears to weigh more than the BPET™'s estimation, the next weight category up may be used to compensate for the weight discrepancy.¹⁰

Despite efforts to improve medication dosing strategies, several limitations exist when applying drug dosage principles to overweight or obese children. For example, pediatric PK and pharmacodynamic (PD) parameters are often unavailable for many drugs used in the pediatric population. While consideration may be given to PK and PD, these considerations are often hypothetical, and true clinical outcomes may be difficult to determine. Additionally, time to observed clinical effect may be altered when fat-soluble medications are administered

to overweight patients. Many fat-soluble medications require time to distribute from the central compartment to the adipose tissue, thus caution should be observed when estimating time to determine clinical effect.¹³ Finally, as the incidence of hypertension, insulin resistance and metabolic syndrome are also increasing in the pediatric population,¹⁴ more medications may be prescribed to treat new comorbidities. As more medications are being prescribed for comorbid conditions, clinicians must assure that new therapies do not interact with existing medications.

More data continues to support the need for careful consideration of drug dosing in overweight children. One recent study examined potential dosing errors on antimicrobial agents and analgesics in the inpatient pediatric population.¹⁵ In this study, overweight children accounted for approximately one-third of all pediatric admissions, and this population was potentially at greater risk for medication dosing errors than their normal-weight counterparts. Specifically, overweight children were significantly more likely to be under-dosed with antimicrobial agents and analgesics.

In order to ensure appropriate medication dosing in overweight and obese children, guidelines advocate for the use of computerized physician order entry and dose-range checks systems to limit potential medication errors.³ Given the potential complexity of medication dosing in overweight or obese children, healthcare practitioners are encouraged to exercise vigilance when dosing medications in overweight and obese children. Measurement and recording of BMI in all pediatric patients may be necessary to accomplish this goal, and patient's weight should always be readily available in the medical record and on a written prescription. Finally, the assistance of a clinical pharmacist familiar with drug dosing in children may be sought to ensure that dosing approaches are appropriate.

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Media Influences on Childhood Obesity: “Advergaming,” Inactivity, and Motion

Anne Kane, RN, PhD



Anne Kane, RN, PhD

Got kids, or pediatric patients? We're increasingly aware that food advertising on television and elsewhere reaches our nation's children regularly and may influence childhood obesity. We're concerned, but no longer surprised, by reports such as the February, 2004 Issue Brief from the Kaiser Family Foundation (KFF), suggesting children see some 40,000 television ads a year, and most of those are for sweets and fast food (<http://www.kff.org/entmedia/>

[upload/The-Role-Of-Media-in-Childhood-Obesity.pdf](http://www.kff.org/entmedia/upload/The-Role-Of-Media-in-Childhood-Obesity.pdf)). But does limiting children's TV time proportionately limit children's exposure to food products with high calorie counts and little nutritional value? Does limiting TV time improve children's health?

Maybe not, especially if they spend more time on the computer instead. In 2006, KFF released the results of a further inquiry, this time examining the content of websites for children promoting the top brands found in children's television food advertising. "It's Child's Play: Advergaming and the Online Marketing of Food to Children" (July, 2006) describes observations of marketing content delivered to children through product-linked online games. Most promote sugary and/or fast foods with little nutritional value and high calorie counts. Often, the report says, product packaging (e.g., cereal boxes) displays game site addresses so children find the online games easily. The report describes the content of product-promoting sites that engage children in up to 60 games per site, each promoting the food brand to children.¹

As the reports also suggest, the success of advergaming as a tool for reaching children means advergaming could be used to promote healthy food choices as well. In fact, in 2010, a quick web search for "online kids games" + "milk," or "vegetables," or "fruit" brings up enough games to keep a child seated at the computer playing with healthy food choices for hours.

For hours. There's an important culprit. Focusing on the healthiness of children's advergaming content may overlook an even more important concern, a powerful, yet indirect, "media" influence on children's obesity: motion. The time children spend seated in front of the

computer, the TV, or even a board game is generally time when they are physically inactive. Inactivity is such an important factor in obesity and health that the most effective and immediate response to concerns about TV ads and online advergaming of any kind might simply be to move more: increase the amount of time kids (and people of all ages) are in motion.

In a recent interview on NPR's Science Friday 2, David Dunstan of the *Australian Diabetes, Obesity and Lifestyle Study* (AusDiab), and lead author of "Television Viewing Time and Mortality," (Circulation, 121: 384-391 <http://www.ncbi.nlm.nih.gov/pubmed/20065160?dopt=AbstractPlus>), suggested that we've underappreciated the role of muscle contraction in the body's regulatory processes. He encouraged building non-aerobic activity, such as family chores like folding laundry, into television viewing time. In other words, move often. Dunstan also commented on an experimental study in progress, examining the effects of sitting for long periods versus getting up for two minutes every 20 minutes. Results of that study and others may shed additional light on how we talk with young patients and their families about motion, media, and obesity.

At the policy level, public health initiatives such as MASS in Motion (www.mass.gov/massinmotion/), highlighted elsewhere in this issue, offer concrete support for making motion part of our routines. Clearly, obesity and diabetes in children (and adults) is a complex public health problem, fueled in part by the media and the ways children absorb media messages. It's unlikely that we could ever develop effective controls on US marketing media influencing obesity, and the effort to do so would be protracted. In the moment, though, as providers, parents, and public health professionals, we can keep children moving.

(Footnotes)

1 Find the Executive Summary at <http://www.kff.org/entmedia/upload/7537.pdf> to read key findings and see vivid examples of advergaming web pages examined for the study.

2 To hear the 8 minute interview, visit <http://earideas.com/earideas/explore/show/83232/Watching+TV+Could+Shorten+Your+Life> .

Anne is an Assistant Professor in the Graduate School of Nursing at the University of Massachusetts-Worcester and a member of the WDMS Editorial Board.

One Step at a Time: The Worcester District Medical Society Alliance Initiative to Combat Obesity

Julianne Hirsh and Francine Vakil

In 2001, David Satcher, then Surgeon General, declared that obesity had become a major health problem in the United States.¹ Since that time, the medical community has documented the negative effects that obesity has on our health. Diabetes, adverse effects on the cardiovascular system and other complications are consequences of obesity. On July, 16, 2003, in testimony before the Subcommittee on Education Reform, Committee on Education and the Workforce in the United States House of Representatives, Dr. Richard Carmona, successor to Dr. Satcher, stated in his address entitled “The Obesity Crisis in America,” that the solution to the problem of obesity in children is threefold: “...increased physical activity, healthier eating habits and improved health literacy.”² These recommendations necessitate a change in lifestyle and may be difficult, as nutritious diet and getting enough exercise requires information, money and safe places to exercise. The mission of the WDMSA is to educate and to promote good health in our community; hence, the organization chose to address the problem of obesity, particularly among children, beginning in 2005.

WDMSA had previously established a relationship of volunteerism at Elm Park Community School, and therefore that is where we targeted our efforts. In 2007, the school had an enrollment of 432 students -- 389 of low income. Of these students, 60 were provided with free lunch and 29 received lunch at a reduced fee.³ During the academic year of 2005-2006, the Alliance purchased pedometers and journals for all fourth graders at Elm Park. Fortuitously, we received a very generous grant from the Junior

League that year to provide additional nutrition education. The project included an exercise component as well as nutrition information. Hands-on activities encouraged children to see actual grains, unusual fruits and vegetables, and how a saturated

fat looks compared to an unsaturated fat. They ate foods representative of major food groups and learned about the food pyramid. Medical students and nursing students at UMass in Worcester collaborated with us on the curriculum and evaluation. The program ran for 8 weeks and was very well received by the principal of the school, Ruth Ann Melançon, who agreed that increasing the number of students the next

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year would be beneficial.

Over the next two school years, the program grew to include 3 grades at Elm Park. Because of increased numbers of students and therefore increased costs, our local Alliance had to find funding through our state and national organization. The nutrition education component was facilitated again by the volunteer efforts of the Junior League and Amanda Graves, a local chef who is committed to healthy eating. Recognizing that parents are the most important part of any education, the Alliance sponsored community dinners to provide examples of good yet economical food choices. At these community dinners, parents were introduced to the use of the pedometer, the pedometer program at school, and different types of exercise for their children such as martial arts, yoga, baseball, etc. Guest speakers, including Dr. Lynda Young, spoke to the families about healthy weight in children. At Elm Park, the goal to help

children recognize the importance of good eating was facilitated by an initiative to remove sodas and candy from the vending machines. This current school year, 2009-2010, the school nurse practitioner is running a pedometer program once again, with a goal to "walk across America," which also serves as an academic activity by tracking cumulative steps across the United States.

Since Dr. Satcher's declaration that obesity in America -- along with the consequent health complications -- had become a national problem, we as a nation have made some major efforts to eradicate the epidemic. Every day we see foods advertised and promoted because they do not have trans-fats. Some cities have in fact banned the use of these fats in restaurants. Nutrition information is easily available on packaging, and some menus now provide information and low fat choices. But the problem remains a serious one, and as we move forward other problems have been identified. Our cities and towns seem to have been designed to keep us in our cars. Some neighborhoods are unsafe, dark, or without sidewalks and prevent people from walking as much as they could or should. Helping families eat a healthy diet on a budget can be difficult. Funds were needed to continue and expand our program to other schools. As community partners in Mass in Motion and as an involved group with the Massachusetts Department of Public Health Body Mass Index Working Group Panel, we hope to share our model within the framework of these initiatives to enhance positive change efforts affecting improved nutrition and exercise. The WDMSA is prepared to campaign for changes that must be made to combat this preventable disease and improve the quality of life of children and their families in the Worcester area.

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Julianne Hirsh and Francine Vakil are past presidents of the Worcester District Medical Society Alliance.

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How Can We Lighten a Heavy Problem?

Robert Lebow, MD, FACP



Robert Lebow, MD, FACP

I. Extent of the Problem

About two thirds of adults and one-fifth of children are overweight or obese.¹ Over 20% of youths ages 12 - 19 years have abnormal lipid levels according to a report by the Centers for Disease Control on January 22 of this year. The prevalence of abnormal lipids increases with increasing BMI (Body Mass Index).²

II. Associated Conditions

Increased weight leads to increased risk for heart disease, type 2 diabetes, some cancers and stroke.

III. Apparent and Possible Causes

- A) Inactivity: Increased watching of television (or use of the computer) leading to a sedentary lifestyle.
- B) A declining economy leading to both parents working hence less ability to prepare healthful family dinners.
- C) Decreased availability of healthful foods (or increased cost) - particularly in economically depressed areas.
- D) Lack of recreational areas and opportunities for physical activities for both adults and children leading to less exercise.
- E) The declining economy promotes the use of fast -- or highly sugared -- foods (also known as "junk foods") as they are a source of inexpensive calories. These foods appear to be less satisfying to the appetite than more healthful foods.
- F) There is some research suggesting that exposure to BP-A [bisphenol-A] as a fetus later leads to increased adiposity.^{3,4} BP-

A is found in many plastics including can linings. Banning of BP-A has been proposed in Massachusetts. Bp-A is effectively banned in Canada.⁵

IV. Suggested strategies for Improvement and Unintended Consequences

A) Many (24) practical and, I believe, largely uncontroversial strategies are given in the excellent paper by Khan et al in Morbidity and Mortality Weekly Report on July 24, 2009. These include increasing opportunities for physical activity in both school children and the general population and encouraging a wider distribution of healthful foods. The potential problems include finding financing and diversion of resources from more effective to less effective solutions.

B) Michelle Obama has adopted the amelioration of adiposity as her project. She announced on Wed., January 20, 2010, before a conference of mayors (broadcast on C-Span), that federal grants will become available to subsidize new projects that encourage healthy living. She cited several examples such as farmers' markets in poor areas, and a mayor's challenge for his community to lose a million pounds (it already has lost 1/2 million pounds).

C) More controversial is the taxing of foods deemed unhealthful (or sin taxes). Particularly targeted are sugared beverages and the like. These drinks are responsible for over 10% of the calories taken in by children and adolescents.⁶ Such a tax had been proposed several years ago in New York State (and is reportedly again in the proposed budget for 2011). Versions of it have been or are being investigated in other countries. This is parallel to the increase in cigarette taxes which has led to a decline in their use.⁷

Some of the difficulties with such a tax are:

- 1) The voters do not like taxes - particularly in a bad economy.
- 2) Many are suspicious that a government will not keep its word to spend the tax money collected on improving

health.

3) Such taxes are regressive – i.e. they affect the poorest citizens the most.⁷

D) Worcester District Medical Society, upon request by a state legislator, sponsored a resolution to the Massachusetts Medical Society's (MMS's) House of Delegates that, in its original form (to memory) indicated support of "junk food" taxes. The debate showed a substantial portion of the delegates (also to memory) were vigorously opposed to the idea of supporting a tax increase. The resolution did pass -- becoming MMS policy -- in the form that the MMS will supply scientific information to legislators.

E) There is a dictum that a society tends to adapt to and defend the status quo. Many of us profit from, therefore have a vested interest in, the high prevalence of obesity -- from restaurateurs to manufacturers of large and reinforced beds and wheelchairs (and even pharmaceutical companies and doctors).

V. Summary

There is a high prevalence of excessive weight and obese status clearly associated with health problems. Multiple suggestions (and caveats) are given for ameliorating this issue; they range from the practical -- such as increasing opportunities for exercise and increasing the availability of healthful foods -- to the controversial (sin taxes and the banning of BP-A).

VI. Epilogue

The School Nutrition Bill (H. 2092) which directs the Massachusetts Department of Public Health to establish standards for food and drinks sold in schools has just (as of the end of January, 2010) passed the House -- it

awaits its fate in the state Senate as does the Local Farm Products Bill (H. 2107), which makes it easier for schools to buy foods from local farmers. Readers interested in this and similar matters may contact the Massachusetts Public Health Association (www.mphaweb.org) and/or contact their state legislators at the State House (617-722-2000).

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Minding the Gap - Health Care in England

What We Can Learn from a Very Different Health Care System

Dale Magee, MD, MPH



Dale Magee, MD, MPH

Introduction:

As we contemplate major changes in our health care system, much of the rhetoric seems to be based on philosophy, theory and bias. There is something to be learned from a system that exists in a country that is culturally related to the United States and yet manages to deliver health care for much less than we do, and with fewer complaints.

The British National Health Service

took its origin in July of 1946 while England was recovering from World War II, rationing was still occurring, and the medical care infrastructure was in a shambles -- all hospitals in London had been damaged by bombs and most hospitals in the UK dated back to the 19th century. Despite our perceived cultural similarities, we must keep in mind that the English people viewed their government as a social welfare state -- a far cry from how we viewed ourselves in the US, where the mention of such a view could gain you an invitation to Senator Joe McCarthy's Committee on Un-American Activities!

Overall organization:

The system is organized around ~ 150 Primary Care Trusts that are in defined areas with an average of 300,000+ people. These Trusts in turn are responsible for budgeting care in their district. Hospitals are on a budget based on operational costs with no room for expansion without approval of the Trust. Specialists are salaried employees of the hospitals. General Practitioners are in "private" practice with contracting to the NHS through the Trusts. General Practitioners are free to expand their practices, hire other physicians to work for them, and staff as appropriate. The GPs are paid a fixed sum per period for each patient who signs on with them. Lab work, as well as imaging, is performed in the hospitals. Pharmacies are paid fees per prescription.

Patients can choose their GP and can also select a hospital outside of their district for care if they wish. Information is available on hospital performance by condition and procedure including volume, length of stay, complication rate and infection rate. Patients may have copays for eyeglasses and prescriptions but not for other care. Private practice outside of the system exists, but only accounts for ~15% of health care expenditures. Specialists working for the NHS may also have a private practice, but they are obligated to provide certain minimums of service to the Service and must buy their own malpractice insurance outside of the Service.

Some basic questions:

Is access as bad as we have heard?

Yes and no. Access to GPs is fine with a standard of being able to be seen within two business days. Compliance with this standard is >70%. Specialist access is a different story but is improving. If cancer is suspected, access, evaluation and the start of treatment is expected to occur within four weeks; less urgent specialist care was held to an eighteen week standard and now is moving down to twelve weeks -- still much longer than here. The same holds for elective hospital admissions.

Does the medical home work?

It appears to. General Practice offices are located all over the communities, staffed with physicians, mid level practitioners, as well as clerical and nursing support. Average practice size is four physicians. The vast majority of practices are open to new patients. Appointments for specialty referrals are made by the GP offices and patients return to GPs for chronic care. Essentially all offices have electronic medical records and about 20-25% of physician income is the result of a detailed pay for performance program. Because there are no claims, there are regular uploads of patient data to the Service. Performance is measured on the usual quality measures (similar to HEDIS) but, different from our system, the doctors can review the data first. If a patient is misclassified, a test is

inappropriate for an individual, or a patient has been invited for a test 3 times and has not complied, they can be deleted from the measure. Deletion ratios are monitored and outliers can be audited. Performance is also measured on access and patient experience. Although there is no billing for services there is overhead associated with reporting. The average overhead for a GP office is >50% (similar to the US).

Does more money lead to more primary care physicians?

Not likely. In the UK, the average GP earns ~£120,000 per year while the average specialist earns ~£80,000, yet only 25% of physicians are GPs whereas in the U.S. about 33% of physicians are primary care physicians. The gender mix may play into this. Over 70% of medical students in England are women, and most want to enter part time practice. It may be easier working in a hospital as an employee. Full time for specialists is contracted at 40 hours per week and on-call hours are being limited to 12 consecutive hours.

Does Pay for Performance save money?

No, costs have gone up with Pay for Performance. There is some doubt that overall quality is higher. Measures that had shown improvements before Pay for Performance have continued to improve but have not necessarily accelerated.

Does more preventive medicine save money?

Doubtful. They do much less than we do in the way of preventive care and still pay much less than the U.S. for care. Pap smears don't begin until age 25, are only every 3 years and move to every 5 at age 50. This means that an average women in England may have just over a dozen Pap smears in her lifetime, whereas in the U.S. that same woman may have three to four times that

amount. Mammograms start at age 50 and are every 3 years. Cholesterols are primarily aimed at those with CAD, hypertension and diabetes. PSAs are not recommended, but they can perform them on request. Colon cancer screening consists of a stool heme test every 2 years starting at age 60. Yet, their costs are about half what we spend in the U.S. for overall health care. This lends support to the health policy literature that finds that preventive care, while it may be a good investment, costs money rather than saving the system money with avoided illness. The reason seems to be that the vast majority of people screened never would have gotten the disease being screened for and there are many false alarms.

How do their results look?

Not bad. Death rates from cancer are about the same as ours, average lifespan is about the same and infant mortality is lower. While it is not possible to consider all of the population differences (racial, environmental and socioeconomic variables), when one considers that they are delivering health care for about half of what we spend, we do not see radical differences in results.

There is a lot to be learned from the experience of Britain's National Health Service. Their Pay for Performance offers a better approach than what is commonly done here. By the same token, it has not saved money and the jury is still out as to whether or not quality has been improved. Costs are kept down with fewer referrals, salaried specialists, hospitals kept to a strict budget and much less preventive screening. Access is directed mostly to primary care, although publication of access to specialists and hospitals, as well as opening up choice to patients, is improving specialty access.

Dr. Magee is Past President of the Massachusetts and Worcester District Medical Societies and practices Gynecology in Shrewsbury, MA.

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Treatment Options for Childhood Obesity

Evan R. Horton, PharmD



Evan R. Horton, PharmD

Childhood obesity continues to be a growing epidemic in the United States and across the globe. As of 2005, more than 20 million children less than 5 years of age were overweight.¹ In the pediatric population, overweight is defined as body mass index (BMI [kg/m^2]) between the 85th and 94th percentile for age and sex. Obesity is defined as BMI greater than or equal to the 95th percentile.²

Ogden et al.³ reported trends from the National Health and Nutrition Examination Survey (NHANES), which compared surveys from 1976-1980 and 2003-2006. Obesity increased in 2-5 year olds from 5% to 12.4%, in 6-11 year olds from 6.5% to 17%, and in 12-19 year olds from 5%-17.6%. Overweight prevalence was reported as 33.1% and 34.1% for 6-11 year olds and 12-19 year olds respectively. Recent government initiatives, Health People 2010 and Health People 2020, have listed a goal obesity prevalence of 5%.⁴

Children with increased BMI are at an increased risk to develop numerous detrimental disease states including: insulin resistance leading to type 2 diabetes mellitus, dyslipidemias (low-density lipoprotein [LDL], high-density lipoprotein [HDL], triglycerides [TG]), metabolic syndrome, hypertension, obstructive sleep apnea, nonalcoholic fatty liver disease, gallstones, glomerulosclerosis, and hyperandrogenemia and hyperinsulinism, which can cause polycystic ovary disease in adolescent women.⁵ In addition to chronic health problems and disability, obese children are at higher risk for depression and long-standing psychosocial problems throughout life.

Risk factors associated with increased weight and BMI in children include: increased birth weight, ethnic minorities, early introduction of solid foods (prior to 3 months of age), smoking during pregnancy,

overweight parents, sedentary behavior (> 3 hours of television/day), and socioeconomic status. Consequently, both high and low income families have higher rates of obesity compared to middle-income families.⁶

Lifestyle modifications are the major recommendation from every pediatric institution, encompassing dietary changes as well as consistent physical activity. The Endocrine Society published the following dietary recommendations for children who are overweight or obese:⁵

1. avoid calorie-dense, nutrient poor foods
2. control caloric intake
3. decrease the amount of saturated dietary fat
4. increase the amount of dietary fiber, fruits, and vegetables
5. eat timely, regular meals, stressing the importance of not skipping breakfast which can lead to constant snacking later in the day.

Similar dietary recommendations have been suggested by the American Academy of Pediatrics and WHO.¹ These recommendations ultimately depend on family behavior modifications and may be supplemented with consultation by a nutritionist. In addition to nutritional recommendations, the Center for Disease Control (CDC) currently recommends that children engage in a minimum 60 minutes of physical activity each day.⁷

The Endocrine Society guidelines recommend pharmacotherapy in obese children only when intensive lifestyle modifications have failed to show a decrease in weight gain or comorbidities. Pharmacotherapy is not recommended in overweight children unless severe comorbidities remain in light of intensive lifestyle modifications. A family history of cardiovascular disease and/or type 2 diabetes mellitus may present the need for medication therapy.⁵

Several pharmacologic agents have been and are currently being studied for weight control in pediatric obesity. Two agents, orlistat (Xenical®) and sibutramine (Meridia®), have FDA approval for use in pediatric obesity, although there are significant age restrictions

for their use. Metformin (Glucophage®) and topiramate (Topamax®) have been studied in both adults and adolescents with obesity while other agents have been studied for their effects on weight gain, but not specifically in pediatric patients.^{8,9}

Orlistat 120 mg three times daily was approved in 2003 for use in pediatric patients greater than or equal to 12 years of age.¹⁰ Orlistat is the lone agent available for this population. Orlistat decreases the amount of absorbable dietary fat through the inhibition of gastric and pancreatic lipases. In addition to numerous adult clinical trials, several small pilot studies have demonstrated the efficacy and tolerability of orlistat in the adolescent population.⁸ These trials included less than or equal to 20 patients and showed an average reduction in BMI of 2 kg/m². Several of these trials showed decreases in LDL, TG, fasting glucose, and fasting insulin with orlistat. A larger, multicenter, double-blind, placebo-controlled study including over 500 patients showed lower reductions of BMI (0.55 kg/m²) and no effect on lipid or glucose levels.¹¹

Due to minimal systemic absorption, orlistat possesses a relatively benign adverse effect profile. Side effects are related to the gastrointestinal tract and include flatulence, fecal urgency, fecal incontinence, steatorrhea, oily spotting, abdominal pain, nausea, diarrhea, and decreased absorption of fat-soluble vitamins.^{7,8} Although the rate of absorption of fat-soluble vitamins was variable in adolescent trials, the FDA recommends that a multivitamin be taken with orlistat for patients 12-16 years of age.¹⁰

In 2007, the Food & Drug Administration (FDA) approved orlistat (Alli®) for over-the-

counter (OTC) use. The OTC dose is 60 mg three times daily and is only indicated for adult patients.¹²

Sibutramine 5 to 15 mg daily is currently approved for long-term weight loss in

Lifestyle modifications are the major recommendation from every pediatric institution, encompassing dietary changes as well as consistent physical activity.

adults and ages greater than or equal to 16 years. Recent safety concerns from the FDA have limited its use in pediatric patients and further investigation into its side effect profile may limit future use.¹³ Sibutramine works by inhibiting the re-uptake of serotonin, norepinephrine, and dopamine which leads to increased thermogenesis and decreased appetite. Several small clinical trials, a majority lasting 6 months, showed sibutramine to be efficacious in weight loss, decreases in BMI, and positive effects on lipids (LDL, HDL, TG).⁸

Safety concerns surround sibutramine due to notable increases in blood pressure and heart rate during clinical trials and post-marketing studies. Sibutramine is contraindicated in patients with poorly controlled hypertension or cardiovascular disease, as well as children with pre-existing psychiatric disorders, as there have been reports of panic attacks and psychotic episodes with its use. Sibutramine's side effect profile also includes dizziness, dry mouth, constipation, and insomnia.^{8,9}

Although not currently approved for pediatric obesity, metformin has been studied in this population. Several trials have shown metformin to decrease weight, BMI, fasting insulin, and fasting glucose.¹⁴ These trials were small in number (n = 15-45) and weak in design (open label, retrospective), which make them hard to generalize to the population at-large. Currently, a large, 4-arm, placebo-controlled trial is being conducted in Canada, aiming to study metformin and its use in conjunction with different intensities of lifestyle modifications.¹⁵ This two year trial should provide new data on the long-term effects of pharmacotherapy as an adjunctive treatment for childhood obesity.

Several other medications show promise for future treatment options. Topiramate has been minimally studied in pediatric patients, specifically for weight loss in children with epilepsy and bipolar disorder. Octreotide, exenatide, bupropion, zonisamide, and rimonabant (not currently approved in the U.S.) have all positive outcomes in adult trials.⁹

Although not first line treatment in any patient population, medication therapy is a potential adjunctive treatment for those patients who fail lifestyle modifications alone. Orlistat and sibutramine are currently FDA-approved for use in pediatric patients (≥ 12 and ≥ 16 respectively) while metformin has been shown to be effective in several small trials.

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Health Care Cost Containment

Peter Martin, Esq.



Peter Martin, Esq.

With the apparent demise of federal efforts to comprehensively reform the health insurance market, attention may now shift to state-level initiatives such as Massachusetts' ongoing efforts to affordably provide near-universal health care coverage to its citizens. Many of the federal proposal's elements were drawn from the 2006 Massachusetts statute, and some objected to the

federal proposal because it did not

convincingly "bend the cost curve downward." It may be of some interest, therefore, to review a recent report issued by Massachusetts Attorney General Martha Coakley offering preliminary conclusions on effective cost containment measures in the Massachusetts commercial health insurance market. Assuming Massachusetts moves ahead with its health care reform efforts, what may be on the horizon as the state seeks to constrain costs while maintaining widely accessible quality care?

The report was mandated by the cost containment statute passed in 2008 and initially notes that Massachusetts' gains in health care insurance coverage "are jeopardized by unsustainable increases in health care costs." It is important to note that the study concerns the commercial health care insurance marketplace only, not Medicare and MassHealth, and that a final report is not expected until later this year. Consequently, the significance of the report's findings if implemented must at this point be considered limited and speculative. However, the report makes a number of points that suggest possible areas of future state legislative or regulatory action.

Prices paid by insurers vary with providers' market leverage, not quality, patient acuity or status as a teaching or DSH facility. The report points out that leverage may be a matter not just of sheer size, but of geographic location, brand name, or the provision of specialty services. It also does not necessarily correlate with teaching hospital status; one of the more interesting factual findings

in the report was that for one health insurer, eight of the top ten best paid hospitals were community facilities and not academic medical centers. The report strongly suggests that the use of this "leverage," which some may interpret as a sign of a functioning market, ought to give way to perhaps some form of "managed competition" in which uniform measures of cost and quality drive "value-based" purchaser/consumer decision making.

Pay for performance programs do not work to align payment with quality outcomes. Related to the observation that differences in price do not track differences in the quality of services, the report notes that pay for performance programs have so far been small (usually involving less than 10% of a provider's total reimbursement) and used measures negotiated between the insurer and the provider. As a result, such programs have not aligned payment rates with quality measures. A broader PFP program covering a greater proportion of reimbursement and using uniform measures might be a response to this perceived shortcoming.

Hospitals receiving higher insurance reimbursements invest the money in capital and direct/indirect costs. The report claims that hospital unit costs do not track the acuity, complexity or the quality of the health care services provided, but rather the amount of reimbursement received. That is, the higher the reimbursement, the higher those unit costs, but those unit costs in turn do not cause reimbursements to increase. Instead, higher-paid hospitals invest the larger revenues in capital investments and direct and indirect costs. As a result, the rich get richer and patient volume flows ever more strongly toward the "better capitalized, more expensive hospitals."

Global payments do not necessarily result in lower costs. The report notes that some globally-paid provider groups are among the highest cost providers in Massachusetts. The report displays a chart showing that for one health insurer, globally-paid provider groups are scattered widely in a range of groups from low to high PMPM medical expenditures. The intent of the global payment concepts being discussed by the Special Commission on the Health Care Payment System is to restrain costs by moving away from fee-for-service reimbursement and rewarding efficient, coordinated care.

In contrast, the Attorney General's report concludes that global payment schemes may result in better integration of care, but may not control costs. Will the cost containment battle be waged by a reimbursement strategy, such as global payment, or by a market-based strategy, such as "value-based purchasing," or both?

Unit price increases are more important in increasing costs than over-utilization of services. The report concludes from data of two large health plans that 80% of the growth in total medical expenses is due to price increases by providers, and not by higher utilization of services. This finding suggests that utilization controls will be ineffective in controlling health care costs: "Bending the cost curve will require tackling the growth in price and the market dynamics that perpetuate price inflation and lead to irrational price disparities." Tort reform as a response to a perceived over-utilization of services through the practice of "defensive medicine" would not seem to be supported by the Attorney General's report.

Certain health insurance contractual provisions perpetuate pricing disparities. The report noted that certain provisions in contracts between health insurers and providers may create irrational price disparities in the health care marketplace. These include parity or "most favored nation" agreements that guarantee a provider will not

charge an insurer prices greater than it charges any other insurer. Product participation provisions in various ways require an insurer to include a provider in one or more networks or insurance products, thereby stifling the creation of limited network or tiered products. Supplemental payments, such as signing bonuses, lump sum cash payments, or bad debt or government payor shortfall payments, may be paid outside of contractual rate schedules to providers, particularly those with market leverage. The report criticizes such practices for fostering a lack of transparency and perpetuating the exercise of market leverage, at the expense of "consumer value."

The report concludes with some preliminary recommendations for legislative and regulatory actions. First on the list is action to prohibit contractual provisions that "perpetuate market disparities and inhibit product innovation." Increasing payment and quality transparency and standardization is another focus -- the report mentions promoting uniform quality measurement and reporting and tracking medical expenses in order to encourage value-based purchasing by employers and consumers. The report also suggests that action should be taken to align rates paid to providers with quality "or other value-based factors." Finally, the theme of value-based purchasing recurs in the goal of "promoting creation of insurance products and decision-making tools that allow and encourage employers and consumers to make prudent health care decisions."

For the commercial end of the health care marketplace, it appears, based on the Attorney General's preliminary report, that providers can anticipate increased reporting of both quality and financial data, in order to create enough "transparency" for rational market decision making by employers and individuals. There may be some regulatory relief from contracting practices that exclude smaller provider organizations from favorable networks or insurance products. There may be a decreased emphasis on global payment schemes at least until their utility in restraining cost growth is demonstrated, and an increased focus on trying to constrain providers' price increases. Moreover, if the federal health reform agenda turns toward cost control as well as access expansion, innovations such as these may become part of the national health care debate.

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Risk and Reward

Gregory Thomas, Chairman/CEO, Thomas Partners

Awakening to risk...

Most investors define risk as the possibility of losses, not the opportunity for gains. As a consequence, they recognize portfolio risk only when markets fall. When portfolios appreciate in rising markets, stock-picking (not the risk acceptance) gets all the credit.

Academics, however, define risk as relative volatility in falling and rising market environments. Better-than-market performance in a rising market is as likely a sign of higher risk as poorer results when markets fall.

In normal times, markets move up or down in such modest increments that it is hard to see this full-cycle impact of portfolio risk on portfolio performance. The recent period of extreme volatility, however, shines a bright light on its impact and reveals levels of risk not otherwise appreciated.

A college education on risk...

For example, Harvard and Yale outperformed their peers during generally-rising global equity and asset markets. But, when those trends reversed in 2008, each underperformed. Did the Harvard and Yale managers lose their vaunted investment skills when markets topped or were their strategies quite simply riskier than their peers?

All-star fund manager Bill Miller was thought to have “lost his touch” when his 2008 performance badly trailed the S&P 500. But now, Business Week says, “He’s back;” his 2009 performance greatly trumped the market’s rise.

A closer examination reveals that Miller’s Legg Mason Value Trust was down 72.6% from peak to trough -- then back up 98.2%. Was Bill Miller clueless in 2008, but smart in 2009, or was his exaggerated performance in both directions due largely to an exaggerated acceptance of risk?

Risky stocks beget risky portfolios...

While these managers built portfolios that exhibited higher levels of risk, they did not pursue similar investment strategies: Yale and Harvard were asset allocators; Miller favored “value” stocks.

When markets rose in 2009, investors seeking more risk drove riskier stocks higher, sooner. But, “Did this additional volatility in both directions deliver additional reward, or did it just deliver uncompensated risk?”

They did not own the same stocks, either, and each was well diversified. They did, however, own riskier common stocks, particularly stocks that were more economically-sensitive and, thus, more volatile.

Just a few risky stocks can make a whole portfolio riskier, even if well diversified. For example, over the last two years, the S&P 500 (the “S&P”) has been riskier than the Dow Jones Industrial Average (the “Dow”); it went down more than the Dow in 2008 and up more in 2009.

Yet, the S&P is significantly more broadly diversified than the Dow; it has 500 stocks versus the Dow’s 30. In fact, the S&P actually includes all 30 Dow stocks; they represent about 34% of the S&P’s weighting. The addition of non-Dow stocks to the S&P, therefore, did not reduce risk through increased diversification; instead, it increased risk because the non-Dow stocks were, on average, riskier.



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As an example, among the S&P's worst-performers in 2008 were 14 stocks that were also among its best performers in 2009. They came from a broad range of industry sectors: some were domestic in nature, some international, some small and some large. These 14 stocks were down, on average, 83.7% in 2008 and up 229.4% in 2009, but still down 62.5% for the whole period.

In other words, these 14 risky stocks increased the S&P's diversification, but increased the S&P's risk, as well -- and for what end? They also decreased the S&P's returns.

Rational behavior...or not

Academic theory holds that more risk should deliver more reward. So, why didn't the 14 risky stocks increase the S&P's reward?

Among equities, real-world experience is not generally consistent with academic theory. In fact, economist Eugene Fama, acknowledged co-author of Modern Portfolio Theory, studied the relationship of volatility risk to total returns of all stocks from 1963 to 1990 and found that additional risk delivered no additional reward.

There is a logical explanation; in fact, the explanation is at the core of the debate as to whether market prices conform to mathematical models or behavioral instincts.

The theory that risk drives reward among common stocks is based largely on the notion that investors will react to risk in a rational manner: they will rush from risk as it increases and rush to risk as it decreases. Such rational behavior would temper over-pricing and buoy under-pricing.

In actual practice, however, investors rush to risk as market prices rise and rush from risk when they fall. Instead of tempering volatility, this non-rational behavior exacerbates it -- it causes prices to rise too high and fall too low.

No wonder, then, that as markets fell in 2008, riskier stocks fell first (and most) because investors were rushing from risk. When markets rose in 2009, investors seeking more risk drove riskier stocks higher, sooner. But, "Did this additional volatility in both directions deliver additional reward, or did it just deliver uncompensated risk?"

To this question, the academic models and actual experience agree. The S&P was down 56.8% from its October, 2007 peak to its March 2009 bottom; it then rose 64.8%. For the whole cycle, however, the S&P was still down 28.8%.

The near-100% rise in Bill Miller's Legg Mason Value Trust from the March 2009 bottom may seem dramatic -- but not if investors experienced the earlier decline. His investors are still down 45.7% from what they once had.

The overpowering impact of such losses, even if only occasional, is not a statistical fluke. It is a fact of mathematics that down 50% and then up 50% still leaves a portfolio down 25%, whereas down 20% and then up 20% leaves a portfolio down only 4%. If the S&P had gone down only half as much as it did during the downturn, then did not increase at all in the recovery, investors would have realized the same "net, net" performance.

In other words, investors should generally avoid excessive levels of equity risk -- that is, if they want to enjoy more reward.

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WDMS Remembers Its Colleagues

Mario F.D. Moretti, PhD, MD (1929-2009)

Dr. Mario Moretti died on November 10, 2009. Mario moved to Worcester 48 years ago to begin his post-graduate training in Internal Medicine at St. Vincent Hospital. After completing his Residency, he dropped anchor in Shrewsbury, where he practiced primary care medicine for over two generations. He was what everyone says we need more of but nobody wants to be anymore. Having earned two doctorate degrees -- a PhD in entomology from Rutgers University and his MD from the University of Cincinnati -- Mario was a doctor-doctor!

Mario had a wonderful, outgoing, pleasant personality; he loved people and people loved him. Without arranging an appointment, his patients would quietly wait their turn in his reception room listening to Frank Sinatra music, knowing that when called they would not be hurried or timed. Mario's credo was each patient warranted "enough time," not time measured by the clock.

First and foremost, Mario recognized what he didn't know, and promptly referred patients with enigmatic symptoms to colleagues he felt might know more about the issue at hand. He treated patients like they were members of his family and continued to do so throughout the last year of his life while dealing with his own illness. It was said that his six daughters took better care of him than 100 Florence Nightingales! His son Carlo predeceased Mario and that unfortunate happening had an extreme impact on him.

The church was filled to capacity with mourners to attend his funeral Mass where his considerable kindness, compassion and 24/7 availability to his patients was praised and appreciated. He was described as being able to communicate with everyone in a very special way, and as someone who worried more about everybody else than himself.

Following the funeral service, all in attendance stood, applauded, cheered, and whistled for a very beloved physician who maintained very special concern for all those in his care.

As one of his patients expressed following his death in a Letter to the Editor in the Worcester Telegram, "Dr. Mario Moretti was a great humanitarian -- you could search the earth over and you would never find a more gentlemanly, scholarly, or a dearer caring person."

Leonard J. Morse, MD
December 20, 2009

Henry S. M. Uhl, MD (1921-2009)

Henry S. M. Uhl, MD died on August 28, 2009 in Winston Salem, North Carolina. Dr. Uhl served as Director of Medical Education at Worcester City Hospital from 1953-8 at a time when "a Rotating Internship" was popular. He graduated from Princeton University in 1943 and Harvard Medical School in 1947. Dr. Uhl continued his distinguished career in medical education at The Springfield Hospital, Albany Medical College and Brown University, where he was Professor of Medical Science and Associate Director of Medicine. He maintained membership in the Massachusetts Medical Society throughout his professional career of 56 years.

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