



# SOUVENIR

5<sup>th</sup> Annual CME of Dr. Athavale Foundation & Pediatric Alumni, LTMGH

# DAFPAL

# CME 2016

**Practical Pediatric Endocrinology  
– Understanding Hormones**

**27<sup>th</sup> November 2016**

New Auditorium, LTMMC & LTMGH, Sion, Mumbai 400022.



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# Childhood Obesity: An Overview from Adult Physician's Perspective

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## PREVALENCE OF CHILDHOOD OBESITY:

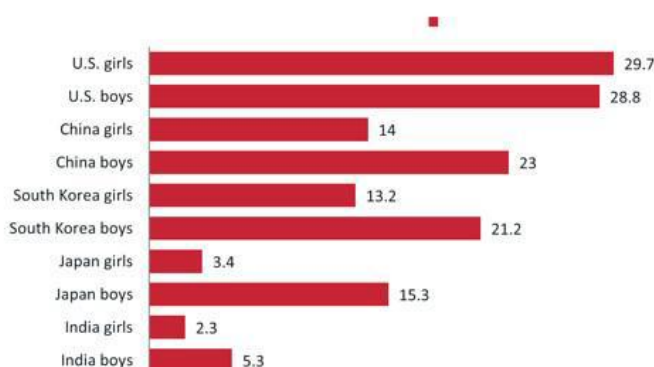
The true prevalence of obesity in childhood is difficult to determine as there is no internationally accepted definition of pathological adiposity in the paediatric age group. Body weight is reasonably well correlated with body fat but is also highly correlated with height, and children of the same weight but different heights can have differing amounts of adiposity. In children the relationship between body mass index (BMI) and body fat varies considerably with age and pubertal maturation.

Although there is no accepted definition for severe obesity in childhood, a BMI SD>2.5 (weight off the chart) is often used in specialist centers and the crossing of weight percentile lines upwards is an early indication of the risk of severe obesity.

Depending on the criteria used, prevalence figures for childhood obesity range from 4% to 11% in most developed countries.

### Childhood Obesity Rates

Percentage of overweight and obese children under the age of 20 in select countries



Source: Select countries; The Lancet, University of Washington | WSJ.com

Childhood obesity is emerging as a global problem. Its immediate adverse effects include orthopaedic complications, sleep apnoea, and psychosocial disorders. As obese children are more likely to become obese adults, we may expect to see public health consequences as a result of the emergence in later life of associated co morbidities, such as type 2 diabetes mellitus and hypertension.

**WHO SHOULD BE HELD RESPONSIBLE FOR THE INCREASE IN INCIDENCE / PREVALENCE OF CHILDHOOD OBESITY?**

- Genes
- Ethnicity
- LIFE STYLE : (MODIFIABLE)
  - EATING BEHAVIOUR
  - PHYSICAL ACTIVITY

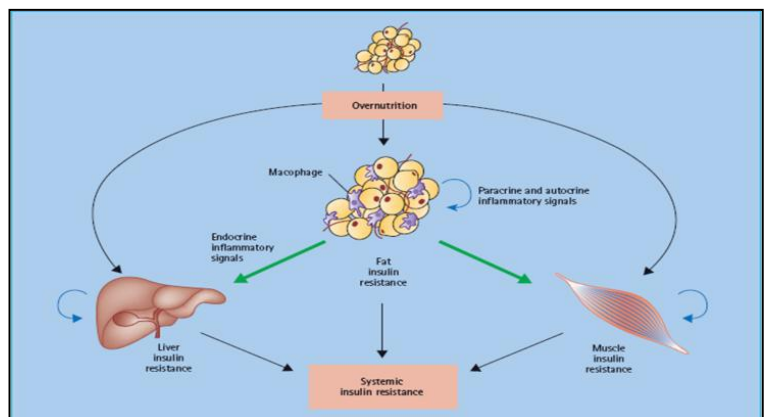
- Stewart, Liu and Rodriguez (2011), states that childhood obesity is directly proportional to the socio-economic status of the family.
- Increased risk of childhood obesity is noted in the families where mother works more hours per week which is highly seen in high socio-economic status families (Stewart et al., 2011).
- On the contrary Stewart et al. (2011) also states that maternal unemployment also shows increased in the childhood Body Mass Index leading to overweight and obesity.

**WHO SHOULD BE BLAMED FOR THE LIFE STYLE?**

- PARENTS
- SCHOOL
- DOCTORS (HEALTH CARE PROVIDERS)

**FOOD IS AN ENVIRONMENTAL AGENT FOR OBESITY:**

- Costs of Food: The relative prices of foods high in sugar and fat have decreased since the early 1980s compared with those of fruits and vegetables. There is a rise in prices of fruits and vegetables.
- Quantity of food eaten.
- Portion size.
- Energy Density.
- Styles of eating.
- Restaurants and fast food establishments.
- Night eating syndrome.
- Frequency of food intake.
- Calorically sweetened soft drinks.
- Dietary fat.





### LOW LEVEL OF PHYSICAL ACTIVITY:

- Television
- Video
- Video games
- Mobile
- Small families
- Less number of siblings/cousins/friends
- Working parents
- Insecurity among parents
- Vanishing playgrounds
- Education/career competition



### SLEEP TIME AND ENVIRONMENTAL LIGHT:

- Less sleep in Childhood: More chances of Obesity.
- Less exposure to natural light: More chances of Obesity.

*Journal of Pediatric Health Care*  
**Characterization of Childhood Obesity and Behavioral Factors**  
Jessica Olson, BSN, RN; Heather Aldrich, PhD; Tiffany J. Callahan, MPH, BA; Eilyn E. Matthews, PhD, RN, AOCNS, CBSM, FAAN; Bonnie Gance-Cleveland, PhD, RNC, PNP, FAAN | [Disclosures](#)  
*J Pediatr Health Care.* 2016;30(5):444-452.

**ABSTRACT AND INTRODUCTION**

**Abstract**

**Introduction:** Childhood obesity is a major public health threat in the United States. Recent data indicate that 34.2% of children ages 6 to 11 years are overweight or obese. The purpose of this study is to describe childhood obesity levels and identify risk behaviors in two school-based health centers in Michigan, one urban and one rural.

Children in the healthy weight group have longer nocturnal sleep duration, eat breakfast more days per week, report more physical activity per day, and are more likely to be from the rural location than are children in the overweight/obese weight category. The average number of hours of sleep per night reported by participants was 9.30. Sleeping less than 10 hours per night was significantly associated with obesity. This finding agrees with the current literature in the area of sleep and childhood obesity

### EPIGENETIC AND INTRAUTERINE IMPRINTING:

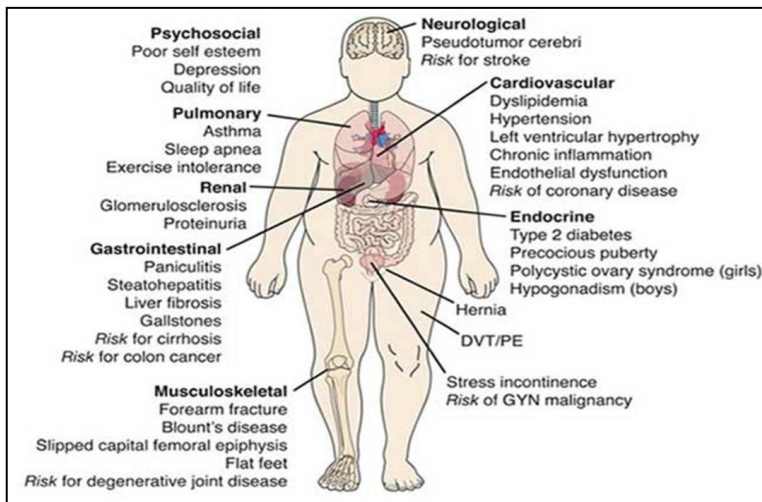
- Infants who are small for their age are at higher risk for metabolic disorders later in life.
- Calorie restriction during first trimester may increase the subsequent risk of overweight in offspring.
- Increased risk of obesity in off springs of diabetic mothers.
- Increased risk of Obesity in off springs of smoker mothers.

## Low Vitamin B<sub>12</sub> and Leptin: Link to Metabolic Risk in Next Generation?

Becky McCall  
November 17, 2016

Vitamin B<sub>12</sub> deficiency during pregnancy may predispose children to metabolic problems such as type 2 diabetes in the future, suggests new research presented at the recent [UK Society for Endocrinology Annual Conference](#) in Brighton.

### PROBLEMS ASSOCIATED WITH CHILDHOOD AND ADOLESCENT OBESITY:



### Obesity May Increase Cognitive Decline via Inflammation

Liam Davenport  
October 24, 2016

Being overweight or obese leads to clinically meaningful increases in the rate of cognitive decline in association with changes in inflammatory markers in the blood, a new analysis of longitudinal data suggests.

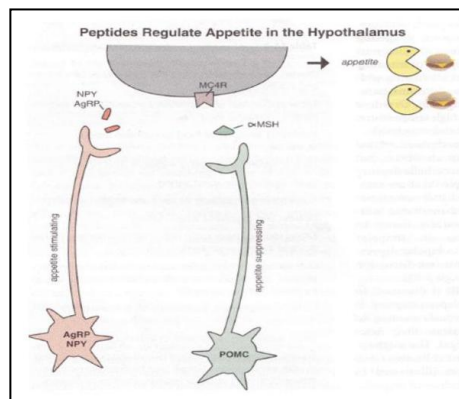
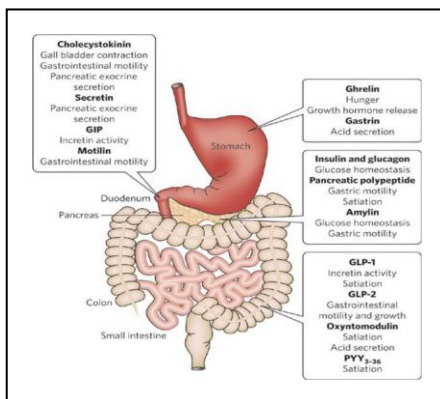
The results, which indicate that an increased body mass index (BMI) may accelerate cognitive decline by several months via increases in serum C-reactive protein (CRP) levels, may help explain those of previous studies that link obesity with poorer brain health.

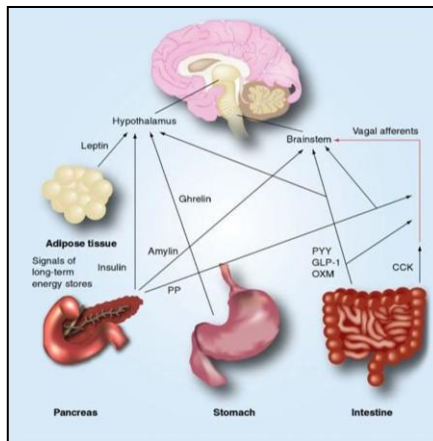
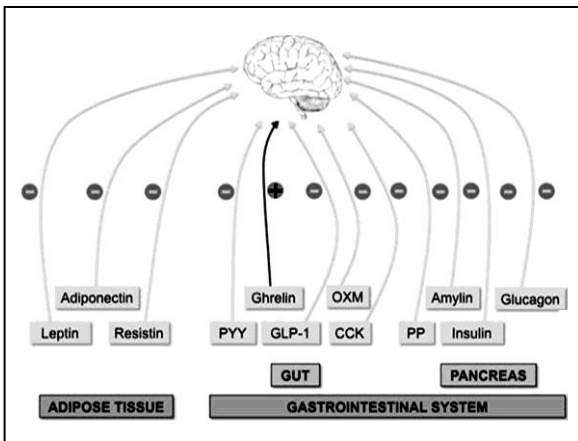
### ROLE OF CNS IN THE REGULATION OF APPETITE:

After the discoveries that hypothalamic lesions could cause obesity, it also became apparent that lesions in other regions, such as the lateral hypothalamus, could cause leanness.

Based on these results, it was suggested that a **feeding center was located in the lateral hypothalamus and a satiety center in the ventromedial hypothalamus (VMH).**

As a result of these and other studies, the importance of the hypothalamus as an integrator and effector of energy balance and neuroendocrine function was generally accepted.





## IS OBESITY AN IMPULSIVE-COMPULSIVE DISORDER?

### FOOD ADDICTION :

- Enhanced reward of food/enhanced motivation and drive to consume food.
- Increasing amounts of food to maintain satiety, tolerance.
- Lack of control over eating: Can not stop.
- Great deal of time spent eating.
- Conditioning and habits to food and food cues.
- Distress and dysphoria when dieting
- Eating too rapidly or too much when not hungry, to the point of being uncomfortably full.
- Overeating maintained despite knowledge of adverse physical and psychological consequences caused by excessive eating.
- Eating alone, feeling disgusted with oneself, guilty or depressed.
- Binge eating with/without purging.



### FAT IS THE NEW TASTE:

- Fat is considered as Taste now.
- Fat is addictive.

### WHAT SCHOOLS ARE DOING?

- Whole focus is on academics.
- Day to day academic competition.

The poster is titled "WHAT SCHOOLS CAN DO TO HELP". It lists several strategies for schools to promote nutrition and health education:

- EDUCATE STAFF AND PROMOTE NUTRITION
- DEVELOP A NEW COURSE OF STUDY FOR HEALTH EDUCATION.
- MAKE PHYSICAL EDUCATION MANDATORY
- INCREASE OPPORTUNITIES FOR STUDENTS TO ENGAGE IN PHYSICAL ACTIVITY
- PROMOTE NUTRITION THROUGH SCHOOL LUNCHES AND BREAKFASTS BY EXPANDING BUDGETS AND OFFERING APPEALING NUTRITIOUS CHOICES
- MAKE SCHOOLS HAVE APPEALING, HEALTHY CHOICES IN FOODS AND BEVERAGES OFFERED IN VENDING MACHINES

The poster also features an illustration of a girl with a yellow backpack and a lunchbox, and a small illustration of a school bus.



- No control over the canteen food supplies.
- No freshly made food available in school canteens.
- Majorly Fried and Junk foods available.
- Vanishing playgrounds in the primary schools.
- Multiple batches and hence less attention.

**FOOD MENU AT MY DAUGHTER’S SCHOOL: Is it really healthy???**

DAYS	MENU
MONDAY	Sandwiches/Paratha/Cereals
TUESDAY	Aloo Tikki/Paneer Tikki/Pasta
WEDNESDAY	Idli/Dhokla/Sprouts/Fruits
THURSDAY	Pulao/Poha/Salads
FRIDAY	Biscuits/Chips/Dry Snacks/French Fries

**Food offered at various famous primary schools in Mumbai is comprised mainly of Samosa, Poori, Pav bhaaji and similar type of items. (Sad!!!)**



**WHAT CAN WE DO?**

- Change the kitchen concept. (Something what we don’t want to give to our children, we should also stay away from them. Please remember, we are the first teacher(s) of our children. Let only healthy food cook in our kitchen.)
- Eat together as a family on dining table (no watching TV while eating).
- Modify the eating behaviour of parents.
- Make the parents understand the fact that they have already transferred their genes to the child. That can’t be modified. But they can impart a healthy life style to their Children.
- Encourage playful bond between Parents and Children.
- Awareness programs in all the schools (teachers and canteen).
- Approach the government body to draft guidelines about the quality of food served in School Canteens.

- Fast Foods should be labelled as addictive and injurious to health.
- Awareness about importance of Physical Activities.
- Awareness about “OSA” and its management.
- Treat the treatable causes and complications of Obesity.
- Prevent the preventable causes and complications of Obesity.

Medscape Medical News

## **USPSTF: Draft Screening Guidelines for Obesity in Kids, Teens Released**

Kristin Jenkins

November 01, 2016

Clinicians are encouraged to screen all children from 6 to 18 years of age for obesity by making body mass index (BMI) measurement part of usual care, according to new draft recommendations on screening for obesity in children and adolescents from the United States Preventive Services Task Force (USPSTF).

- Childhood Obesity is a Global epidemic and its prevention, control and management need to be the responsibility of all the medical & paramedical fraternity along with each and every responsible citizen.

### **WHAT SHOULD BE OUR TARGET?**

- Weight (BMI)
- Adipostat (The weight threshold in the brain)
- Stomach size (Volume and capacity)
- Need (Calorie requirement to lead healthy, active and productive life)
- Greed (Taste, Cravings, Addiction, Dependence on particular type of food)
- Hormones (Insulin, GH, Cortisol, Leptin, Adiponectin, Ghrelin, Incretins etc.)
- Neurotransmitters (Dopamine, Adrenaline, Serotonin etc.)

### **INVESTIGATIONS:**

- BSL (Fasting and 2 hrs PP)
- Lipid Profile
- TSH, Free T3, Free T4
- Urinary free cortisol (as needed)
- Genetic testing (as needed)
- Serum Leptin (not recommended routinely)
- Serum Insulin (Appropriate references are lacking)



**MANAGEMENT:**

- Identify the treatable/modifiable causes and manage them.
- Manage the complications simultaneously.
- Counselling & life style modification.
- Diet and Nutrition.(Without causing malnutrition)
- Physical Activity.
- Medicines
- (Metformin, Orlistat, Cetilistat,Hormones)
- Gastric Banding/Ballooning
- Bariatric Surgery.

### Eating Pulses 'Could Help With Weight Loss'



Peter Russell  
April 05, 2016

Eating one serving of pulses each day could contribute to modest weight loss, according to a new study.

Canadian researchers say that because beans, peas, chickpeas and lentils take longer to digest than many other foods, they can keep hunger pangs away by making you feel fuller for longer.

The analysis, published in the American Journal of Clinical Nutrition, reviewed results from 21 clinical trials involving 940 adults.

**POTENTIAL ADVANCEMENTS IN OBESITY MANAGEMENT:**

- Leptin (Recombinant Leptin)
- Advanced Incretins
- Medicines targeting Amylin.
- Medicines targeting Ghrelin and other mediators of feeding.
- Neurobiofeedback and Transcranial Stimulation.
- Neurotransmitters control (Dopamine, NE, Serotonin, GABA etc)
- Advanced Antidepressants, Mood stabilizers , Antianxiety medicines.
- Monoclonal Antibodies.
- Genetic Testing
- Drugs targeting AgRP, NYP,CART,MCH,MC4R etc.
- Peptides
- Nutrigenomics
- DNA analysis for Diet???
- Telemedicine/Online follow up programs.

## **ACTIONS OF BARIATRIC SURGERY:**

- **DECREASED FOOD INTAKE :**
  - REDUCED SIZE OF STOMACH.
  - EARLY STRETCHING OF STOMACH STIMULATING VAGUS.
- **ENHANCED GASTRIC EMPTYING:**
  - SHORTENING OF THE GIT
- **DECREASED GHRELIN**
- **IMPROVED GLP-1**
- **POTENTIAL ENHANCEMENT OF PPY, CCK.**
- **MALABSORPTION**
- **EARLY SATIETY**

## **EFFECTS OF NON INVASIVE TECHNOLOGIES:**

- Subcutaneous Lipo-deflation (Zerona, Verju)
- Leptin Sensitivity (Zerona, Verju)
- NO release (Zerona, Verju)
- Lowering of Cholesterol (Zerona, Verju)
- Subcutaneous Lipolysis (HIFU, Cryolipolysis)
- Energy Hormesis



## **MANAGE THE POTENTIAL SIDE EFFECTS OF WEIGHT MANAGEMENT:**

- Nutritional Deficiencies
- Altered Immunity
- Sagging Skin
- Loss of Buccal fat
- Hair loss
- Menstrual Irregularities
- Constipation/Bloating
- Mood changes.
- Plateau effect leading to feeling low and giving up.

- Fatty liver, Gall stones, Electrolyte imbalances are some of the potential side effects of rapid weight loss.

### **HINDRANCES IN WEIGHT MANAGEMENT**

- Amotivation (Patient and Parents)
- Lack of Family/Peer support.
- Lack of Education in population about Obesity.
- Majority of patients come for Obesity management because of Aesthetic reasons.
- Lack of awareness about complications of Obesity.
- Lack of awareness about advances in Obesity management.
- Searching for quick fixes and permanent solutions only.
- Affordability is one of the major determinant.
- Fear of regaining of weight is one of the factor which delays the decision.
- Patients don't want to participate actively.
- Everything is attributed to diet and activity only.
- One important factor which influences Obesity management adversely is that the managing physicians don't have enough time to educate , explain , motivate and follow the patients.
- Obesity needs to be considered as a disease and should be managed/treated as a disease. This notion is missing ...
- Drug induced Obesity is usually overlooked in Hypertension , Diabetes and Rheumatology patients.
- **Team efforts are missing. Criticism has dominated over appreciation in Medical fraternity.**