

Adolescent Bariatric Surgery

Roundtable on Obesity Solutions - April 6, 2017

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Nationwide Children's Hospital, Columbus, Ohio**



DISCLOSURE

Title: Adolescent Bariatric Surgery

Presenter Name: Marc Michalsky

As previously disclosed, these are the companies with which I have a financial or other relationship(s):

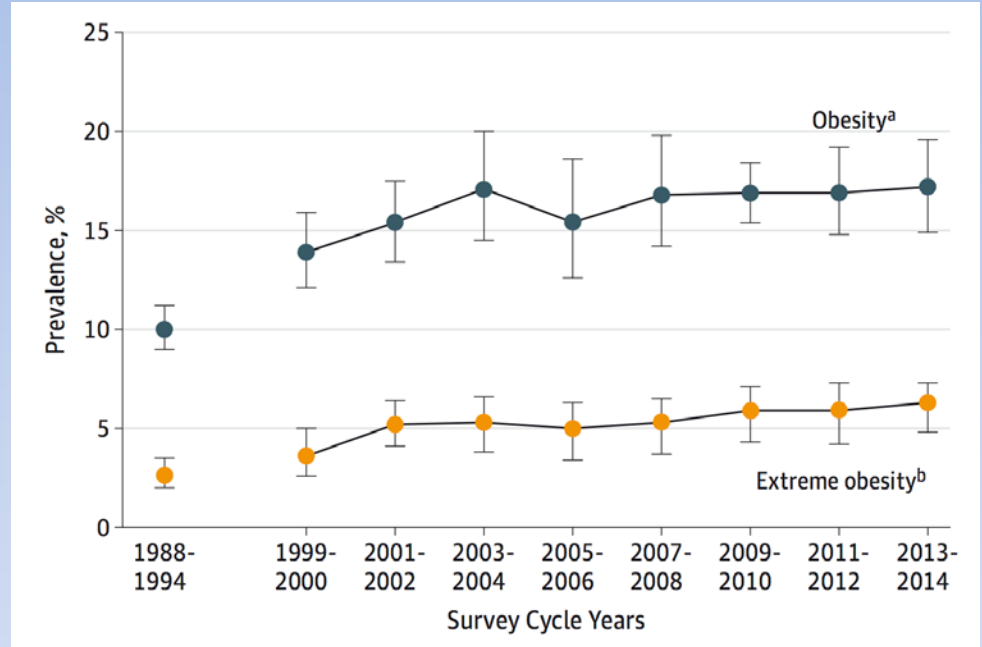
Company Name(s)	Nature of Relationship(s)
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No declarations at this time

Trends in Obesity Prevalence Among Children and Adolescents in the U.S., 1988-1994 Through 2013-2014

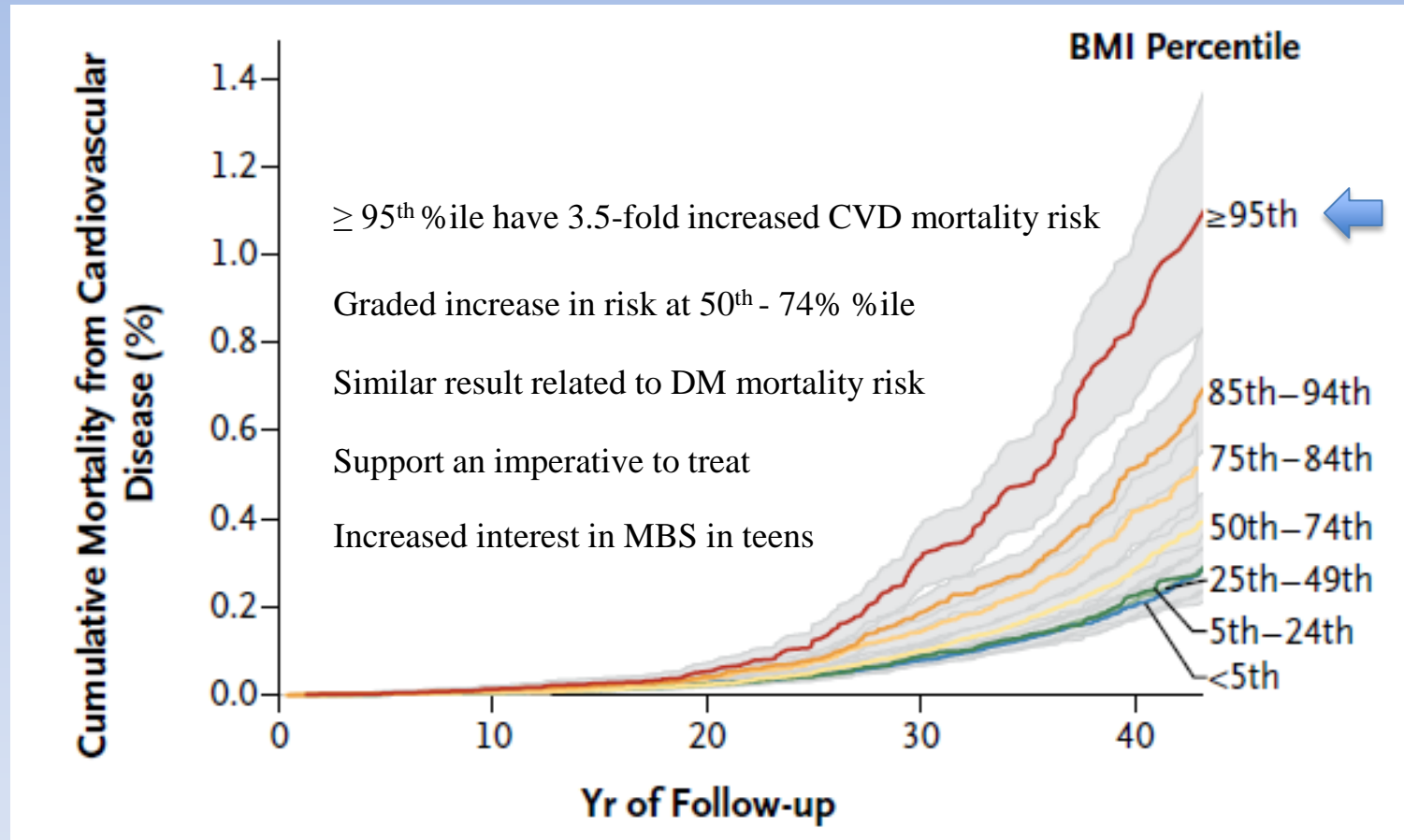
NHANES 2013-2014

	Obesity (BMI ≥ 95 th)	Extreme Obesity (BMI ≥ 120 th)
Overall Pop (2-19 years)	17.2%	6.0%
Adolescents (12-19 years)	20.6%	9.1%



- ≈ 5-6 million Extremely Obese in U.S.
- Extremely Obese Children → Extremely Obese Adults
- Data support adolescent WLS as an effective treatment

Childhood BMI Predicts Cardiovascular Mortality in Adulthood



	%	N
Dyslipidemia	74.4	180
Sleep Apnea	56.6	137
Joint Pain*	45.6	110
Hypertension	45.0	109
Back Pain*	45.2	109
Fatty liver disease*	36.9	89
PCOS** (females only)	20.9	38
Chronic Kidney Disease (any stage)‡	19.2	43
Diabetes	13.6	33
Blount's Disease	3.7	9
Pseudotumor cerebri	2.5	6

* Denominator = 241 (lower than 242 due to missing data)

** PCOS, polycystic ovary syndrome

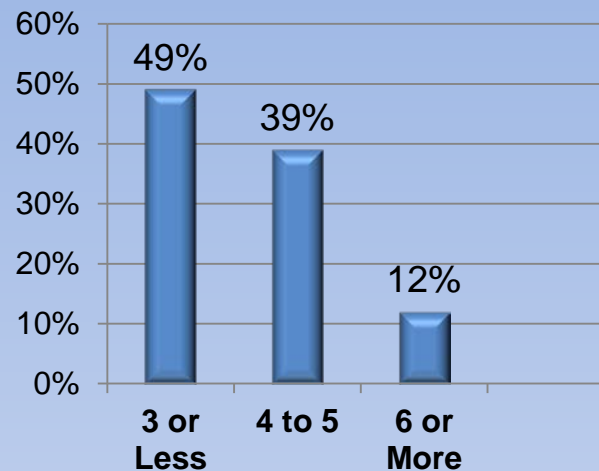
‡ Denominator = 224 (lower than 242 due to missing laboratory data)

	%	N
Microalbuminuria	14	32
Macroalbuminuria	3	7
Hypertension	45	109
eGFR < 60 mL/min/1.73m ² *	3	7
eGFR > 150 mL/min/1.73m ² *	7	17

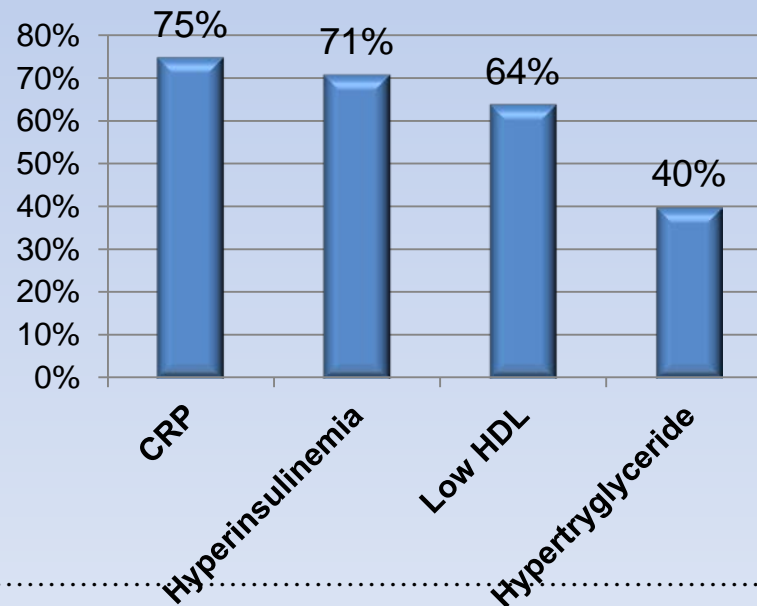
* Normal eGFR = 90-150 ml/min/1.73m²

Xiao et.al. Obesity, 2014

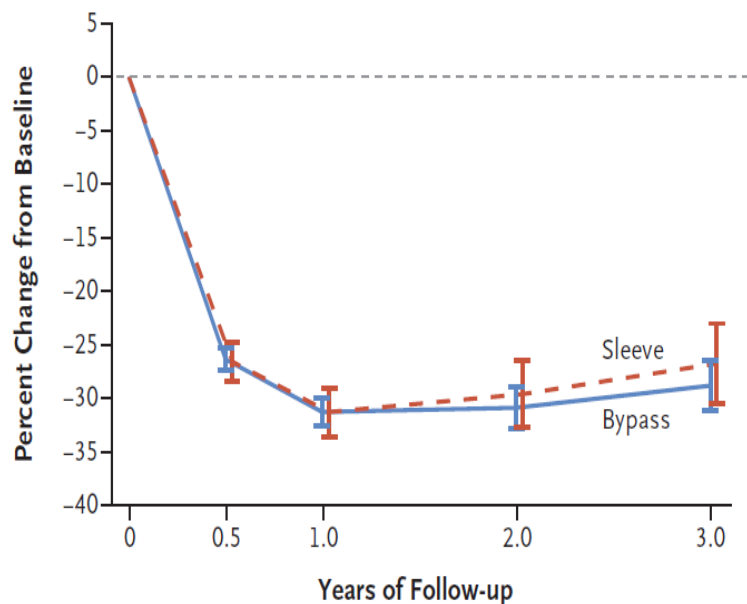
Number of Comorbid Conditions



Laboratory Abnormalities



Favorable Longitudinal Outcomes



No. of Participants

Bypass	161	140	140	137	131
Sleeve	67	56	61	58	52

	Counts	Modeled Remission
	n / N	% (95% CI)
Type 2 Diabetes	19 / 20	90% (65-98)
Pre-Diabetes	13 / 17	77% (48-92)
Dyslipidemia	84 / 128	66% (56-74)
Elevated Blood Pressure	56 / 76	73% (60-83)
Abnormal Kidney Function	19 / 22	86% (63-90)

Micronutrients and Related Abnormalities

	Baseline		3 years		p
		Modeled Prevalence		Modeled Prevalence	
	n / N	% (95% CI)	n / N	% (95% CI)	
Low Ferritin	11 / 225	5% (3-9)	98 / 171	57% (49-65)	<0.001
Low 25-OH-Vit D	83 / 223	37% (30-35)	74 / 172	42% (34-50)	0.37
High Transferrin	7 / 225	3% (1-7)	0 / 171	16% (11-24)	<0.001
Low Vitamin A	13 / 221	6% (3-10)	22 / 170	13% (8-20)	0.02
High PTH	18 / 223	8% (5-13)	16 / 172	9% (5-15)	0.77
Low Vitamin B12	1 / 222	<1% (<1-3)	13 / 160	8% (4-14)	0.005
Low Folate	6 / 173	3% (1-7)	10 / 132	7% (4-14)	0.13

Consensus Development; Ongoing Evolution (2004 - 2012)

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Bariatric Surgery for Severely Overweight Adolescents: Concerns and Recommendations

Thomas H. Inge, Nancy F. Krebs, Victor F. Garcia, Joseph A. Skelton, Karen S. Guice, Richard S. Strauss, Craig T. Albanese, Mary L. Brandt, Lawrence D. Hammer, Carol M. Harmon, Timothy D. Kane, William J. Klish, Keith T. Oldham, Colin D. Rudolph, Michael A. Helmrath, Edward Donovan and Stephen R. Daniels

Pediatrics 2004;114:217
DOI: 10.1542/peds.114.1.217

nature publishing group

The Lehman Series

ARTICLES

INTERVENTION AND PREVENTION

Best Practice Updates for Pediatric/Adolescent Weight Loss Surgery

Janey S.A. Pratt^{1,2}, Carine M. Lenders³, Emily A. Dionne², Alison G. Hoppin², George L.K. Hsu⁴, Thomas H. Inge⁵, David F. Lawlor¹, Margaret F. Marino³, Alan F. Meyers³, Jennifer L. Rosenblum² and Vivian M. Sanchez⁶

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Developing Criteria for Pediatric/Adolescent Bariatric Surgery Programs

Marc Michalsky, Robert E. Kramer, Michelle A. Fullmer, Michele Polfuss, Renee Porter, Wendy Ward-Begnoche, Elizabeth A. Getzoff, Meredith Dreyer, Stacy Stolzman and Kirk W. Reichard

Pediatrics 2011;128:S65
DOI: 10.1542/peds.2011-0480F



ELSEVIER

Surgery for Obesity and Related Diseases 8 (2012) 1–7

SURGERY FOR OBESITY
AND RELATED DISEASES

ASMBS guidelines

ASMBS pediatric committee best practice guidelines

Marc Michalsky, M.D., F.A.C.S., F.A.A.P.^{a,*}, Kirk Reichard, M.D., F.A.C.S., F.A.A.P.^b, Thomas Inge, M.D., F.A.C.S., F.A.A.P.^c, Janey Pratt, M.D., F.A.C.S.^d, Carine Lenders, M.D., F.A.A.P.^e

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Received September 16, 2011; accepted September 16, 2011

Eligibility Criteria

Development of National Consensus

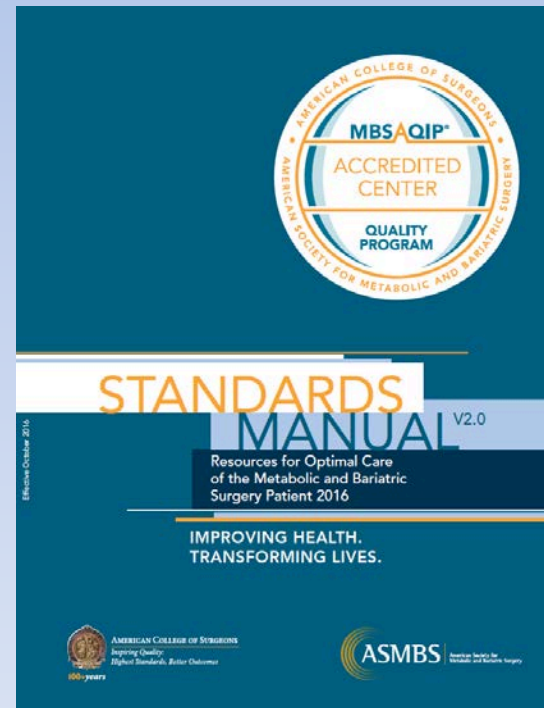
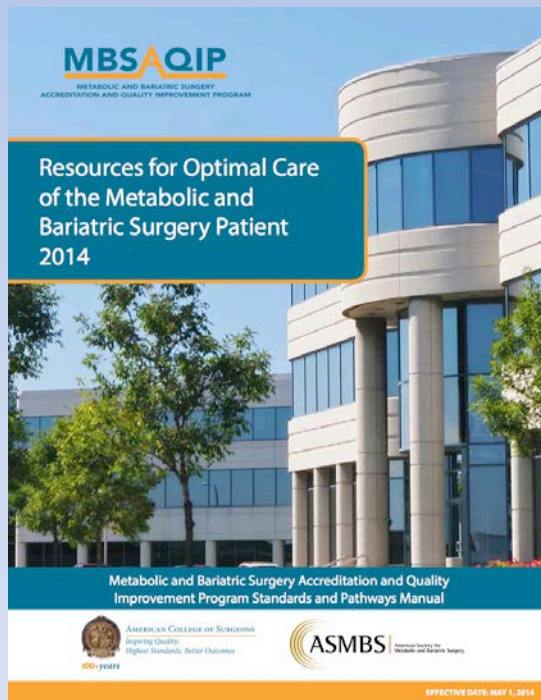
BMI (kg/m)	Comorbidities
≥ 35	Serious: T2DM, Mod/Severe, OSA (AHI >15), Pseudotumor, Severe Steatohepatitis
≥ 40	Other: Mild OSA (AHI>5), IR, HTN, IFG, dyslipidemia, Impaired QOL

Eligibility Criteria	Comorbidities
Tanner Stage	IV or V (unless severe comorbid disease warrants “early” WLS)
Skeletal Maturity	≥ 95% estimated growth
Lifestyle Changes	Demonstrate ability to understand dietary/physical changes (post-op)
Psychosocial	Mature decision making (understand risk/benefits of surgery) Family and social support Probability of patient/family compliance (dietary, medication, etc)

National Accreditation Standards

American College of Surgeons

American Society of Metabolic and Bariatric Surgery



Prevalence of Adolescent WLS U.S.

ARTICLE

Recent National Trends in the Use of Adolescent Inpatient Bariatric Surgery

2000 Through 2009

- Objective: Determine national rate of adolescent WLS (2000-2009)
Methods: Retrospective analysis – Kids' Inpatient Database
Subjects: Age 10-19 years - inpatient bariatric procedure

	2000	2003	2006	2009
Rate per 100,000	0.8	2.3	2.2	2.4
Procedure Count	328	987	925	1009

Results may underestimate the number of adolescent WLS cases

Challenges in Access to Care



- Objective:** Determine influencing factors related to insurance authorization
- Methods:** Retrospective review: consecutive cases at 5 centers (2009-2011)
Outcomes included number and timing of authorizations, denials and appeals.
- Results:** 57 adolescents (74% female); mean age 16 years (range 12-17).
47% insurance authorization at original request.
Public Ins 42% initial approval
Private Ins 56% initial approval
80% of initial denials were approved after appeal; as many as 5
11% were unable to obtain authorization
Age <18 years cited as most common reason for denial

Attitudes Towards Adolescent WLS

OTHER

To Cut or Not to Cut: Physicians' Perspectives on Referring Adolescents for Bariatric Surgery

Susan J. Woolford · Sarah J. Clark ·
Achameleh Gebremariam · Matthew M. Davis ·
Gary L. Freed

Objective: Assess PCP opinions regarding referrals for adolescent WLS

Methods: Survey 375 pediatricians and 375 family physicians

1. Whether they would refer for WLS
2. Minimum Age
3. Prerequisites towards WLS

Results: 48% would never refer an adolescent
46% endorse minimal age of 18 years
99% endorsed participation in monitored weight management program prior to referral for WLS

Conclusions

- High quality data supports the use of WLS in the pediatric population.
- Consensus-driven best practice guidelines and accreditation standards have been established.
- Procedural prevalence has remained stable despite favorable outcomes and standardization of care.
- Access to care is limited by several variables.
- Efforts should be undertaken to increase both public and professional awareness related to WLS as an effective treatment strategy.