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Steven Lindheim

Wright State University, [steven.lindheim@wright.edu](mailto:steven.lindheim@wright.edu)

Stephanie Welsh

Nan Jiang

Wright State University

Amanda Hawkins

Wright State University, [amanda.hawkins@wright.edu](mailto:amanda.hawkins@wright.edu)

Lisa Kellar

Wright State University, [lisa.kellar@wright.edu](mailto:lisa.kellar@wright.edu)

*See next page for additional authors*

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**Authors**

Steven Lindheim, Stephanie Welsh, Nan Jiang, Amanda Hawkins, Lisa Kellar, Rose Maxwell, and Leah D. Whigham

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## Trends in Management of Overweight and Obesity in Obstetrics & Gynecology, Family Medicine and Pediatrics 2011-2015

Steven R Lindheim<sup>1\*</sup>, Stephanie Welsh<sup>1</sup>, Nan Jiang<sup>1</sup>, Amanda Hawkins<sup>1,2</sup>, Lisa Kellar<sup>1,3</sup>, Rose A. Maxwell<sup>1</sup> and Leah D. Whigham<sup>4</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Boonshoft School of Medicine, Wright State University, Dayton, Ohio, USA

<sup>2</sup>Wright Patterson US Air Force Center, Dayton, Ohio, USA

<sup>3</sup>Department of Family Medicine, Boonshoft School of Medicine, Wright State University, Dayton, Ohio, USA

<sup>4</sup>Paso de Norte Institute for Healthy Living, University of Texas at El Paso, El Paso, Texas, USA

\*Corresponding author: Steven R. Lindheim, Department of Obstetrics and Gynecology, Boonshoft School of Medicine, Wright State University, USA, Tel: 937-208-2850; E-mail: steven.lindheim@wright.edu

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### Abstract

**Purpose:** To assess for improvement in the screening and management of overweight and obesity in the past 5 years among Obstetrician-Gynecologists (OB-GYN), Family Physicians (FP), and Pediatricians (Peds).

**Methods:** A retrospective pilot study was conducted, reviewing 150 charts of patients with overweight (body mass index [BMI] 25-29.9 kg/m<sup>2</sup>) and class I (BMI 30-34.9 kg/m<sup>2</sup>), class II (BMI 35-39.9 kg/m<sup>2</sup>), and class III obesity (BMI ≥ 40 kg/m<sup>2</sup>) between 2011 and 2015. Patients were from OB-GYN (n=50), Family Medicine, adult (FP-A) (n=50) and pediatric (FP-P) (n=28), and Peds (n=22) offices.

**Results:** 75% of patients were female; 35.5% had overweight, 40% had class I obesity, 13.3% had class II obesity, and 11.3% had class III obesity. 100% of clinicians used BMI; none used waist circumference. Peds (91%) and FP-P (96%) visits were more likely to include counseling compared to OB-GYN (30%) and FP-A (30%) visits (p<0.001). A decrease in nutrition counseling (71% vs. 29%, p<0.05) occurred between 2011 and 2015.

**Conclusions:** There remains significant room for improvement among all providers. Peds and FP-Ps may be more sensitive to the need for managing obesity than OB-GYNs and FP-As. More efforts are needed to combat the obesity epidemic, starting with accurately identifying and counseling patients with obesity.

### Introduction

Obesity is the most common chronic disease in the United States and affects more than 600 million adults worldwide [1]. Over two-thirds of American adults are overweight (body mass index [BMI] ≥ 25 kg/m<sup>2</sup>), along with about 15% of children aged 2-19 (sex-specific BMI-for-age between the 85th and 94.9th percentile) (2,3). Further, one-third of adults and 17% of children are obese (BMI ≥30 kg/m<sup>2</sup> in adults, and sex-specific BMI-for-age ≥95th percentile in children) (2,3).

The health burden of pediatric obesity is concerning, particularly since children with obesity are less likely to have healthy BMIs as adults [4]. While adult obesity still exceeds childhood obesity in the US, the percent increase in childhood obesity has been greater than that among adults in the past few decades: the relative annual increase between 1971 and 2002 has been reported at 4% in children aged 10-17 years and 1.4% in adults [5].

The health risks of overweight and obesity in adults are well established, including type II diabetes, hypertension, coronary artery disease, stroke, and some cancers [6]. Obesity in children carries similar risks, including type II diabetes, hypertension, and dyslipidemia [7]. Health risks specific to females with overweight and obesity include polycystic ovarian syndrome, anovulation, infertility, and endometrial cancer [6]. Obesity during pregnancy imparts risks to both mother and child, such as gestational diabetes, cesarean section and congenital anomalies [6]. Moreover, children of mothers with obesity have an increased risk of obesity in adult life and increased all-cause mortality [6].

Given the burden of disease incurred by overweight and obesity, national guidelines exist to aid clinicians in managing these conditions. As early as 1998 the National Heart, Lung, and Blood Institute had developed guidelines for categorizing patients by BMI, waist circumference and risk factors; assessing patient motivation to lose weight; and following a treatment

**Keywords:** Obesity; Mass screening; Trends

algorithm including dietary counseling, physical activity, behavioral therapy, medication, and surgical therapies [8]. These guidelines were recently updated in 2013 by the American Heart Association Task Force on Practice Guidelines (AHA), the American College of Cardiology (ACC), and The Obesity Society (TOS), based on evidence from the National Heart, Lung, and Blood Institute [9,10]. The updated guidelines suggest that height, weight and BMI be measured in all adults annually, and in addition, for adults with overweight and obesity, waist circumference should be measured annually [9]. Patients with the cardiovascular risk factors of dyslipidemia and hypertension, in addition to overweight and obesity, should be counseled on comprehensive lifestyle interventions that incorporate reduced caloric intake and increased physical activity [9]. Pharmacotherapy should be considered in patients with BMI  $\geq$  30 or BMI  $\geq$  27 with comorbidities [9]. Patients with a BMI  $\geq$  40 kg/m<sup>2</sup> or with BMI  $\geq$  35 kg/m<sup>2</sup> and comorbidities who have not benefited from lifestyle modification with or without pharmacotherapy should be counseled about bariatric surgery and referred to a specialist [9]. The guidelines also highlight the need for primary care physicians to work closely with their patients to develop individualized care plans that incorporate referrals to professionals trained in nutrition and behavioral psychology [9].

Other national medical organizations have provided recommendations or statements to providers including the American Academy of Pediatrics (AAP), the American College of Obstetrics & Gynecology (ACOG) and the American Academy of Family Physicians (AAFP) [11-17]. Each AAP publication promotes the use of sex-specific BMI percentile for age to screen for overweight and obesity after age 2 [11,15]. Physicians have been encouraged to monitor for excess weight gain relative to linear growth, to assess diet and activity levels, and to encourage healthy behaviors in all patients [11,15]. Based on the ACOG and AAFP recommendations, physicians have been advised to identify patients with overweight and obesity using height, weight, and BMI, and to counsel them about dietary modification and physical activity.

Despite these recommendations, studies suggest that only 25-50% of patients with overweight and obesity are identified and counseled by their physicians [18-21]. However, the majority of studies have relied on self-reported data from physicians and patients, [20-26] and most of the existing literature contains data obtained prior to the release of the updated AHA/ACC/TOS guidelines in 2013 [20-23,27-30]. In our study, we examined trending data gathered from objective chart review to determine obesity identification and management before and after the updated guidelines were released.

## Methods

This was a retrospective chart review study. The charts of patients seen at three Midwestern academic practices, OB-GYN,

FP, and Peds, between January 1, 2011 and December 31, 2015 were reviewed. This study was undertaken with approval by the Wright State University Institutional Review Board.

Charts were selected using a random number generator. Inclusion criteria included adults 18 years and older with a BMI  $\geq$  25 kg/m<sup>2</sup> (n=100) and children five years and older with a sex-specific weight-for-age  $\geq$  85<sup>th</sup> percentile (n=50). Weight-for-age was used in place of BMI-for-age because it was most commonly recorded in the Electronic Medical Records. When weight-for-age was not recorded, it was calculated by the investigators. Pediatric measures of weight were adjusted for age and sex. Following inclusion, information was gathered from the first visit of the year and from all subsequent follow-up visits to the designated care center in that calendar year.

Information abstracted from the charts included demographics (sex, age, race), anthropometric parameters (height, weight, BMI, waist circumference, waist-to-hip ratio), diagnostic and screening information (diabetic screening, metabolic panel, lipid panel, endocrine screening), and information about counseling and referrals. Screening for diabetes was defined as performance of any of the following: blood glucose, hemoglobin A1C, and/or glucose tolerance testing. Endocrine screening was defined as lab testing for thyroid stimulating hormone, follicle stimulating hormone or luteinizing hormone. Counseling was defined as a documented discussion about weight, nutrition, pharmacologic therapy, and/or bariatric surgery. Referrals were defined as a referral to a nutritionist or registered dietitian, psychological counselor, or a bariatric surgeon.

Statistical analysis was performed using IBM SPSS statistical package 24. Chi-square analysis, t-test, and ANOVA were used as appropriate with a significance level of  $\alpha < 0.05$ .

## Results

### Demographics

Seventy-five percent (n=113) of charts reviewed were from female patients. The average age was 41.5  $\pm$  16.4 years for adults, and 10.9  $\pm$  3.8 years for children. Of adult patients (n=100), 45% (n=45) had BMI 25-29.9 kg/m<sup>2</sup>, 18% (n=18) had BMI 30-34.9 kg/m<sup>2</sup>, 20% (n=20) had BMI 35-39.9 kg/m<sup>2</sup>, and 17% (n=17) had BMI  $\geq$  40 kg/m<sup>2</sup>. In pediatric patients (n=50), 16% (n=8) had a weight-for-age between the 85<sup>th</sup> and 94.9<sup>th</sup> percentile and 84% (n=42) had a weight-for-age at or above the 95<sup>th</sup> percentile. Ethnic distribution of all 150 participants included Caucasian (47%, n=70), African American (45%, n=68), Hispanic (4%, n=6), and other (4%, n=6) (Table 1).

**Table 1:** Patient Demographics by Medical Specialty (% (n)), Dayton, OH, 2011-2015, <sup>a</sup>p-values calculated using Chi square for sex, weight category, and race, and ANOVA for age, BMI, and weight-for-age; <sup>b</sup>NS, Not Significant; \*BMI 25-29.9 kg/m<sup>2</sup> for adults, weight-for-age percentile

85-94.9<sup>th</sup> for children, \*\*BMI 30-34.9 kg/m<sup>2</sup> for adults, weight-for-age percentile  $\geq$  95<sup>th</sup> for children, \*\*\*BMI 35-39.9 kg/m<sup>2</sup>, \*\*\*\*BMI  $\geq$  40 kg/m<sup>2</sup>.

Variable	Total	OB-GYN	FP-A	Peds	FP-P	p-value <sup>a</sup>
	(N=150)	(n=50)	(n=50)	(n=22)	(n=28)	
Female	75% (113)	100% (50)	64% (32)	50% (11)	71% (20)	p<0.001
Male	25% (37)	0% (0)	36% (18)	50% (11)	29% (8)	
Age (years)	31 $\pm$ 19.8	39 $\pm$ 17.5	44 $\pm$ 14.8	10 $\pm$ 3.7	12 $\pm$ 3.8	p<0.001
BMI (kg/m <sup>2</sup> )	34 $\pm$ 14.5	33 $\pm$ 7.2	33 $\pm$ 6.4	40 $\pm$ 34.3	32 $\pm$ 6.0	NS <sup>b</sup>
Weight-for-age percentile	N/A	N/A	N/A	98 $\pm$ 4.0	3.74E-195	p<0.001
Overweight*	35.3% (53)	48% (24)	42% (21)	18% (4)	14% (4)	NS
Class I Obesity**	40% (60)	12% (6)	24% (12)	82% (18)	86% (24)	
Class II Obesity***	13.3% (20)	22% (11)	18% (9)	N/A	N/A	
Class III Obesity****	11.3% (17)	18% (9)	16% (8)	N/A	N/A	
Caucasian	47% (70)	75% (38)	38% (19)	45% (10)	11% (3)	p<0.001
African-American	45% (68)	18% (9)	56% (28)	50% (11)	71% (20)	
Hispanic	4% (6)	2% (1)	4% (2)	5% (1)	7% (2)	
Other	4% (6)	4% (2)	2% (1)	0% (0)	11% (3)	

### Screening, counseling and referral

All patient charts (n=150) had a BMI recorded, and 90% (n=45) of children's charts also recorded weight-for-age percentiles. No providers recorded waist-to-hip ratio or waist circumference. Other screening and diagnostic tools for obesity and related conditions were measured inconsistently. Overall rates for diagnostic testing were 27% for metabolic panels, 33%

for diabetic screens, 36% for lipid panels, and 29% for endocrine screens. Rates varied significantly between specialties for metabolic and lipid panels. FPs were more likely to order metabolic panels for both their adult (42%, n=21) and pediatric (39%, n=11) patients with overweight and obesity (p<0.001). OB-GYNs were less likely than the three other specialties to order lipid panels (p<0.001) (Table 2).

**Table 2:** Prevalence of Obesity-Related Testing by Medical Specialty, (%), (n), Dayton, OH, 2011-2015, <sup>a</sup>NS, Not Significant.

Type of Testing	Overall	OB-GYN	FP-A	Peds	FP-P	Chi square p-value
Metabolic panel	27% (40)	14% (7)	42% (21)	5% (1)	39% (11)	p<0.001
Diabetic screen	33% (50)	30% (15)	32% (16)	46% (10)	32% (9)	NS <sup>a</sup>
Lipid panel	43% (64)	10% (5)	64% (32)	55% (12)	54% (15)	p<0.001
Endocrine screen	29% (43)	20% (10)	32% (16)	34% (7)	36% (10)	NS

**Table 3:** Prevalence of Weight-Related Counseling by Medical Specialty (%), (n), Dayton, OH, 2011-2015, <sup>a</sup>NS, Not Significant.

Nature of Counseling	Overall	OB-GYN	FP-A	Peds	FP-P	Chi-square
						p-value
Discuss Weight	51% (77)	30% (15)	30% (15)	91% (20)	96% (27)	p<0.001
Discuss Diet	49% (73)	24% (12)	32% (16)	86% (19)	93% (26)	p<0.001
Discuss Medical Rx	1% (2)	2% (1)	2% (1)	0% (0)	0% (0)	NS <sup>a</sup>
Discuss Surgery	<1% (1)	0% (0)	2% (1)	0% (0)	0% (0)	NS

**Table 4:** Prevalence of Obesity-Related Referral Practices by Specialty (%), (n), Dayton, OH, 2011-2015, <sup>a</sup>NS, Not Significant.

Referred Provider	OB-GYN	FP-A	Peds	FP-P	Chi square
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					p-value
Nutritionist/ Dietitian	0% (0)	14% (7)	18% (4)	21% (6)	p<0.02
Psychologist	2% (1)	10% (5)	14% (3)	11% (3)	NS <sup>a</sup>
Bariatric surgeon	2% (1)	0% (0)	0% (0)	0% (0)	NS

Providers of all specialties provided counseling regarding weight loss (51%, n=77) and nutrition (49%, n=72) more often than regarding medical treatment (1%, n=2) or surgical therapy (<1%, n=1). Peds (91%, n=20) and FP-P (97%, n=27) visits were more likely to include discussion on weight issues compared to OB-GYNs (30% n=15) and FP-A (30%, n=15) visits (p<0.001). Peds (86%, n=19) and FP-P (93%, n=26) visits were also more likely to include nutritional counseling compared to OB-GYNs (24%, n=12) and FP-As (32%, n=16) (p<0.001). In contrast, there were no differences in discussion of medication or surgery between specialties. Of adult patients with BMI  $\geq$  40 kg/m<sup>2</sup> (n=17), only 6% (n=1) had a discussion of bariatric surgery. Of all adult patients (n=100), only 2% (n=2) had a discussion of pharmaceutical therapy. Consistent with guidelines, there was no counseling with respect to medication use or bariatric surgery with pediatric patients (Table 3).

**Table 5:** Obesity Screening and Management Trends (n, (%)), Dayton, OH, 2011-2015, <sup>a</sup>NS, Not Significant.

Variable	2011	2012	2013	2014	2015	Chi square p-value
	(n=21)	(n=9)	(n=75)	(n=28)	(n=17)	
Metabolic panel	5 (24%)	0 (0%)	20 (27%)	10 (36%)	5 (29%)	NS <sup>a</sup>
Diabetic screen	10 (48%)	1 (11%)	22 (29%)	11 (39%)	6 (35%)	NS
Lipid panel	8 (38%)	1 (11%)	38 (51%)	12 (43%)	5 (29%)	NS
Endocrine screen	8 (38%)	0 (0%)	27 (36%)	6 (21%)	2 (12%)	p<0.05
Discuss weight	15 (71%)	3 (33%)	42 (56%)	12 (43%)	5 (29%)	NS
Discuss diet	15 (71%)	3 (33%)	40 (53%)	10 (36%)	5 (29%)	p<0.05
Discuss medication	0 (0%)	1 (11%)	0 (0%)	1 (4%)	0 (0%)	NS
Discuss surgery	1 (5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	NS
Referral to nutrition	4 (19%)	0 (0%)	9 (12%)	3 (11%)	1 (6%)	NS
Referral to psych	1 (5%)	0 (0%)	8 (11%)	2 (7%)	1 (6%)	NS
Referral to bariatric surgeon	0 (0%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	NS

## Discussion

Our findings suggest that overall there was no observed improvement over time in physician practices related to addressing overweight and obesity with patients. Physicians caring for pediatric patients were more likely to provide weight and nutritional counseling than physicians caring for adult patients. Furthermore, Peds, FP-P and FP-A were each more likely to refer patients to a nutritionist or dietitian than OB-GYN.

Nutritionist or dietitian referrals (11%, n=17) were more common than referrals to psychological therapists (8%, n=12) and bariatric surgeons (<1%, n=1) among all specialties (n=150). FP-As (21%, n=6), Peds (18%, n=4), FP-As (14%, n=7) were significantly more likely than OB-GYNs (0%) to refer their patients to a nutritionist or dietitian (p<0.02). There were no significant differences between specialties in referral to psychological therapist or bariatric surgeon. As expected, no pediatric-aged patients were referred to a bariatric surgeon (Table 4).

## Trends over time

Based on the selection of patients from the random number generator, charts were collected from 2011 (n=21), 2012 (n=9), 2013 (n=75), 2014 (n=28) and 2015 (n=17). During the years studied, there was no improvement in any of the parameters evaluated across all specialties studied over the five-year period (Table 5). The only statistically significant changes were declines in the overall study prevalence of endocrine screens (38% in 2011 vs. 12% in 2015) (p<0.05) and diet discussions (71% in 2011 vs. 29% in 2015) (p<0.05).

Obesity screening and management practices have been widely studied among Peds. A 2009 survey of Peds revealed that fewer than half of clinicians identified and managed obesity correctly: 46% of physicians reported calculating patient BMI routinely, and 31% knew the definitions for pediatric overweight and obesity [19]. Another study revealed that Peds identified obesity 53% of the time, however when obesity was identified, 71% provided nutritional counseling and only 22% referred to a dietitian [27]. The authors reported that identification of children with excess weight was perhaps related to the degree of overweight, as Peds recognized only 27% of children with

overweight compared to 86% of children with obesity [28]. A more recent 2015 study revealed a lack of improvement, with documentation of obesity 34% of the time, and appropriate dietary recommendations given 11% of the time [31].

Screening for complications of obesity is also an integral part of management, though recent studies show sub-optimal screening practices. Twenty-two percent of patients with obesity were screened for diabetes, liver, and lipid abnormalities; 52% were screened for only glucose abnormalities; 30% for only liver abnormalities; and 41% for only lipid abnormalities [29]. Other studies revealed that just 4% were screened for diabetes, 9% for lipid abnormalities, and 2% for liver abnormalities [30,32].

With respect to obesity screening and management by providers of adult patients, obesity was detected in 38% of patients and appropriate counseling was provided to less than 25% of patients, according to a national 1995-1996 survey [20]. A 2008 study of primary care providers showed that overall, 49% reported measuring BMI regularly; fewer than 50% provided weight, diet, or exercise counseling; and fewer than 10% referred their patients to nutritionists or other providers [21]. FP-As were most likely to report measuring BMI regularly compared to other adult specialties [21]. OB-GYNs and FPs were both less likely than internists to provide weight counseling to their patients with chronic disease [21]. OB-GYNs were also more likely than FPs and internists to report never having assessed their patients' diet or exercise habits [21].

Other studies report that while 100% of surveyed physicians state that they discuss weight management with their patients with overweight and obesity, just over half of these patients reported having such a discussion with their doctor [18]. Physicians fail to initiate weight loss conversations for a variety of reasons. Some physicians feel ill equipped to advise their patients on weight loss, either from a lack of training or a lack of access to nutritionists or other specialists for referral [33]. Moreover, some physicians feel pessimistic about their patients' motivation or ability to lose weight [22].

Given the increasing awareness of obesity and the widespread promotion of the 2013 AHA/ACC/TOS guidelines, an improvement in management practices was expected. However, our findings did not support this hypothesis. Furthermore, our findings revealed a decline in a few management trends over 2011-2015, which is in conflict with a study from 1999-2008, which found an increase in parents reporting that they were told their child's overweight or obese status by their pediatric provider [23].

At the practices studied, auxiliary staff measure patient height and weight, and BMI is automatically calculated in the Electronic Medical Record, making BMI a convenient tool for obesity screening. However, central adiposity is more highly correlated with cardiovascular risk factors than peripheral adiposity, and this distinction can be overlooked by BMI. Waist circumference is a more reliable indicator of central adiposity, but measurements vary with patient posture, respiration, abdominal wall tension, and stomach contents, making this method more difficult for providers [34]. More education and standardized

procedures may be needed to make alternative measures of obesity more feasible to collect.

We attempted to objectively collect data from physician charts, providing a more accurate picture of practices than self-reported studies. Furthermore, we compared physician practices among several different specialties, again lending more credibility than single-specialty studies. However, we recognize that our study is limited by a small sample size, with potential limits in the generalizability of our results. Also, there was significant variability in the number of charts reviewed per year, which may have adversely affected our trends analysis. Another limitation is that it is also possible that discussions regarding obesity management, diet, exercise, etc., were not documented in the chart. In spite of these limitations, this study suggests that overweight and obesity management is lacking despite recently updated guidelines. Indications for future research include larger-scale studies of physician practices across specialties to assess how obesity management compares across larger populations.

## Conclusion

Screening for and treatment of obesity by physicians is an important aspect of curbing the obesity epidemic. Weight counseling and pharmacotherapy are proven to produce modest weight loss (3-5 kg) and improved health outcomes, while bariatric surgery produces more dramatic weight loss (10-15 kg) [35]. Particularly for pediatric patients, preventing childhood obesity is imperative since children with obesity are more likely to become adults with obesity [36,37]. While national guidelines provide an effective screening and intervention tool for overweight and obesity management, our findings suggest that there remains significant room for improvement, particularly in providers caring for adult patients. Peds and FP-Ps may be more sensitive to the need for managing obesity than OB-GYNs and FP-As, and the other disciplines could learn from these findings.

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