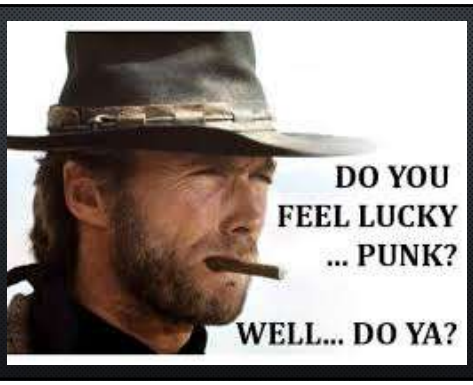
Obesity and Surgery

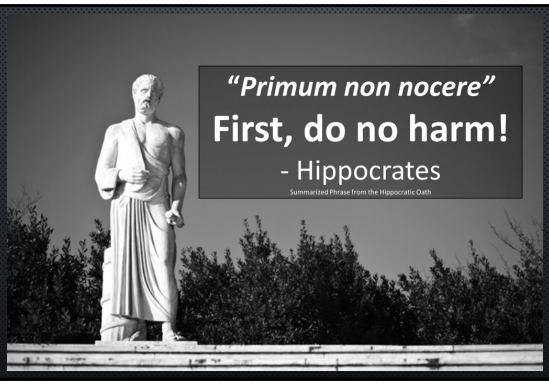
Just Say No!

Judd Cummings MD, FACS
Clinical Assistant Professor
Department of Orthopedics
University of Arizona

Disclosures

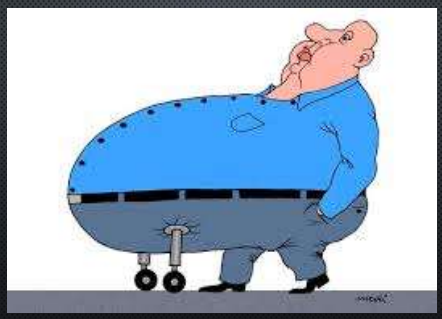
- Consultant:
  - Microport Orthopedics
  - Onkos Surgical
- Medical Board:
  - Artoss, Inc





"First do no harm"

- It is a popular misconception *that the phrase "First do no harm"* (*Latin*: *Primum non nocere*) is a part of the Hippocratic oath. Strictly speaking, the phrase does not appear in the oath, though an equivalent phrase is found in Epidemics, Book I, of the Hippocratic school: "Practise two things in your dealings with disease: either help or do not harm the patient". The exact phrase is believed to have originated with the 19th-century surgeon Thomas Inman.



VARIABLES TO CONSIDER

- Complications
- Outcomes
- Implant longevity
- Financial Implications

COMPLICATIONS

- A large meta-analysis of results for obese patients undergoing THA found that they had greater risks of dislocation, infection, thrombus formation, and aseptic loosening of their prostheses Haverkamp D, et al. Obesity in total hip arthroplasty--does it really matter? A meta-analysis. Acta Orthop 2011;82(4):417-422. 21657972
- A review of 1,207 patients undergoing THA found the rate of deep infection in obese patients to be 2.6% and that in morbidly obese patients to be 9.1%, as compared with 1% in nonobese patients Dowsey MM, Choong PF. Obesity is a major risk factor for prosthetic infection after primary hip arthroplasty. Clin Orthop Rel Res 2008;466(1):153-158. 18196388
- Järvenpää et al noted a 33% rate of technical errors intraoperatively in obese patients versus a rate of 10% in nonobese patients, as well as a **five-fold greater frequency of postoperative complications** Järvenpää J, et al. Obesity may impair the early outcome of total knee arthroplasty. Scand J Surg 2010;99(1):45-49. 20501358

COMPLICATIONS……

- Obesity, especially morbid obesity (BMI>40 kg/m^2), has been linked to increased rates for dislocation after total hip arthroplasty. Elkins JM, Daniel M, Pedersen DR, et al: Morbid obesity may increase dislocation in total hip patients: A biomechanical analysis. Clin Orthop Relat Res 2013;471(3):971-980. 22907474
- The rate of periprosthetic joint infection in morbidly obese patients (BMI>40 kg/m^2) ranges from 3.3 to 9.0 times higher than in those with lower BMI values. Samson AJ, Mercer GE, Campbell DG: Total knee replacement in the morbidly obese: A literature review. ANZ J Surg2010;80(9):595-599. 20840400

OUTCOMES

- In a study involving more than 500 patients undergoing TKA, of whom 60% were identified as obese, Dowsey et al found that **only 13% lost weight and 21% actually gained weight after joint replacement.** Dowsey MM, Liew D, Stoney JD, Choong PF: The impact of pre-operative obesity on weight change and outcome in total knee replacement: A prospective study of 529 consecutive patients. J Bone Joint Surg Br 2010;92(4):513-520. 20357327
- Obesity was an independent risk factor for slow recovery in both total hip and total knee arthroplasty. Severely obese patients (BMI>35 kg/m^2) had worse pain and functional recovery than did nonobese patients up to 3 years postoperatively. Jones CA, Cox V, Jhangri GS, Suarez-Almazor ME: Delineating the impact of obesity and its relationship on recovery after total joint arthroplasties. Osteoarthritis Cartilage 2012;20(6):511-518. 22395039

IMPLANT LONGEVITY

- Inferior survival of prostheses in TKA in 41 patients with revision as endpoint Allen AR et al: Total knee replacement in morbidly obese patients: Results of a prospective, matched study. J Bone Joint Surg Br 2006;88(10):1321-1326. 17012421
- With revision for any reason as an end point in 68 patients, survivorship of a prosthetic knee in morbidly obese patients is inferior to that in control subjects Foran JR, Mont MA, Etienne G, Jones LC, Hungerford DS: The outcome of total knee arthroplasty in obese patients. J Bone Joint Surg Am 2004;86(8):1609-1615. 15292406
- In a case-control study of more than 4,420 patients, obesity was significantly associated with the failure of uncemented acetabular cups. The rate of failure increased by a factor of 1.03 for every additional unit of BMI above 25 kg/m^2 Roder C, et al: Obesity, age, sex, diagnosis, and fixation mode differently affect early cup failure in total hip arthroplasty: A matched case-control study of 4420 patients. J Bone Joint Surg Am 2010;92(10):1754-1763. 20720138

FINANCIAL IMPLICATIONS

- THE ANNUAL MEDICAL COST OF OBESITY IS $147 BILLION, AND THAT OF ARTHRITIS IS $128 BILLION ANNUALLY. FLEGAL KM, CARROLL MD, OGDEN CL, CURTIN LR. PREVALENCE AND TRENDS IN OBESITY AMONG US ADULTS, 1999-2008. *JAMA*2010;303(3):235-241. 20071471
- MORBIDLY OBESE PERSONS CONSUME 7% TO 9% MORE RESOURCES FOR KNEE AND HIP ARTHROPLASTY THAN DO NONOBESE PATIENTS ACCORDING TO DATA FROM THE NATIONWIDE INPATIENT SAMPLE 2006. KIM SH. MORBID OBESITY AND EXCESSIVE HOSPITAL RESOURCE CONSUMPTION FOR UNILATERAL PRIMARY HIP AND KNEE ARTHROPLASTY. *J ARTHROPLASTY* 2010;25(8):1258-1266. 19879721

AAOS American Academy of Orthopaedic Surgeons
American Association of Orthopaedic Surgeons

Information Statement

Obesity and Musculoskeletal Care

This Information Statement was developed as an educational tool based on the opinion of the authors. It is not a product of a systematic review. Readers are encouraged to consider the information presented and reach their own conclusions.

Background

Obesity negatively affects orthopaedic management of nearly all musculoskeletal disease processes. Currently, 36% of Americans are obese and by 2030, 42 % of Americans will be defined as obese.[1] An overweight individual is an adult who has a body mass index (BMI) between 25 and 29.9 while an obese individual is an adult who has a BMI of 30 or higher. As the patient population continues to increase in age and in size, appropriate management of patients will hinge upon decisions that incorporate the underlying disease processes that arise in the setting of an elevated BMI. On the basis of global estimates by the World Health Organization in 2008, approximately 1.5 billion adults (>20y.o.) were overweight and 500 million were obese.[2]

Gallup has estimated that obesity-related healthcare costs are $80 billion annually. Current projections calculate that if the obesity rate is held constant over the next 20 years, over $549.5 billion dollars could be saved.[3] Additionally, in the US adult population, the average QALY (Quality Average Life Years) lost per person due to obesity increased 127% from 1993 to 2008.[4] Numerous orthopaedic studies have concluded that the burden of obesity is significant on a variety of outcome measures including infection risk, non-union, persistent pain, cost, and implant failure.

Whether obesity is a disease process or a modifiable/non-modifiable risk factor remains a subject of debate. Although the answers to these questions are important, they may not aid in the approach to specific problems and issues faced by the orthopaedic surgeon. The management of obesity-related complications after trauma surgery, total joint arthroplasty and spine surgery may differ from those in the non-obese. Provision of orthopaedic care in obese patients will require expanding perspectives on treatment options and challenge surgical skills.

INFORMATION STATEMENT JUNE 2014

- ***TOTAL KNEE ARTHROPLASTY*** IN MORBIDLY OBESE INDIVIDUALS HAS HIGHER RISKS OF INFECTION, INCREASED BLOOD LOSS; WOUND RELATED PROBLEMS, AVULSION OF THE MEDIAL COLLATERAL LIGAMENT, COMPONENT MALPOSITIONING, EXTENSOR MECHANISM RUPTURE, AND PATELLAR MALTRACKING.
- ***TOTAL HIP ARTHROPLASTY***, OBESE PATIENTS HAVE HIGHER RISKS FOR HARDWARE MALPOSITIONING, THROMBOEMBOLIC EVENTS, HIGHER BLOOD LOSS, LOOSENING, INFECTION, AND ULTIMATELY, CATASTROPHIC FAILURE.
- ***SHOULDER ARTHROPLASTY*** REQUIRES PRECISE OSTEOTOMIES AND CAREFUL SOFT TISSUE HANDLING. IN HUMERAL HEAD REPLACEMENT SURGERY, OBESITY HAS BEEN SHOWN TO BE A RISK FACTOR REQUIRING A REVISION SURGERY WHILE REVERSE TOTAL SHOULDER ARTHROPLASTY HAS BEEN SHOWN TO HAVE SUCCESSFUL CLINICAL OUTCOMES BUT WITH HIGHER COMPLICATION RATES IN OBESE INDIVIDUALS.

CONCLUSION

- **Clint Wooten, MD**, and **Brian Curtin, MD**, in a 2016 journal editorial, "Morbid Obesity and Total Joint Replacement: Is it Okay to Say 'No?'" Included in this editorial were the principles of non-maleficence, autonomy, beneficence, and justice. The orthopaedic surgeon, ***should treat the whole patient, and has a duty to optimize modifiable risk factors especially when the risk of the surgery outweighs the benefit, and to say "no" if that is the correct answer.*** Wooten C, Curtin B. Orthopedics. 2016 Jul 1;39(4):207-9. doi: 10.3928/01477447-20160628-02

CONCLUSION

- The Workgroup of the American Association of Hip and Knee Surgeons (AAHKS) recommends patient counseling before surgery because morbidly obese (ie, BMI >40) and super-obese (BMI >50) patients have complication profiles that may outweigh the functional benefits of TJA. The consensus of the work group was that a delay in TJA should be considered in patients with a BMI >40, especially when comorbid conditions are present. Workgroup of the American Association of Hip and Knee Surgeons Evidence Based Committee: Obesity and total joint arthroplasty: A literature based review. J Arthroplasty 2013;28(5):714-721.

"First, do no harm. After that, go nuts."