**Background articles –** we know pts get subjective and objective improvements in symptoms, mobility, and activity after TJA. Whether or not this translates into better health outcomes is unknown.

* improvements in pain
  + Nunez (2007): significant improvement in pain scores as measured by Western Ontario and McMaster Universities Osteoarthritis Index
  + Gillespie (2007): improvements in pain after TKA, but improvements are less in obese pt
* improvements in quality of life
  + Cushnaghan (2009): TKA pts declined in SF-36 vitality scores compared to controls
  + Nunez (2007):
* improvements in physical function/activity/functional ability
  + Yoshida (2008):
  + Cushnaghan (2009): TKA pts improved in SF-36 physical function scores compared to controls 6 yrs after surgery. Improvement smaller in obese pts vs non-obese pts.
  + Lachiewicz (2008): physical activity, measured by Lower Extremity Activity Scale, increased significantly from preop levels 2 yrs after TKA.
  + Nunez (2007): significant improvement in postop stiffness and function scores as measured by Western Ontario and McMaster Universities Osteoarthritis Index
* Effects of our measures on TJA outcomes and complications
  + Gillespie (2007): Obese pts have increased risk of complications and early implant failure
  + McLaughlin (2006): no difference in clinical and radiologic outcomes or complications between obese and non-obese THA pts
  + Gandhi (2010): pts w/ metabolic syndrome have poorer outcomes as measured by WOMAC scores 1 yr s/p TJA
  + Malinzak (2009): diabetic pts 3x more likely to get a deep infection compared to nondiabetic pts after TJA.
  + Marchant (2009): poor glycemic control is associated with increased odds of surgical and systemic complications as compared to pts with controlled diabetes.
  + Ahmed (2011): hypertensive pts had higher risk of prolonged wound discharge and infection after THA than normotensive pts.

**BMI –** theoretically, surgical interventions like TJA that reduce the symptomatic barriers to exercise in OA pts should facilitate weight loss.

* Stets (2010): corrected for natural weight gains in North Americans. Found that TJA pts trended toward weight loss after correction. Clinically significant weight loss in 20% of subjects.
* Dowsey (2010): amongst obese pts, clinically significant weight loss in 12%. Weight gain in 21%.
* Zeni (2010): TKA pts showed significant increase in BMI over 2 yrs compared to control subjects (66% of TKA pts gained weight)
* Abu-Rajab (2009): despite improved Oxford outcome scores in all pts, 212/450 TJA pts gained weight in 1 yr.
* Lachiewicz (2008): no significant weight change, but BMI increased significantly after TKA.
* Aderinto (2005): the majority of pts following THA gain weight; 60% of non-obese pts and 75% of obese pts. Obese pts gained more weight than non-obese pts.
* Heisel (2005): TJA pts with normal BMI and obese pts do not lose weight after surgery, while overweight pts gained a significant amt of weight after surgery.
* Jain (2003): mean increase in BMI of 2.1% at 2 yrs after TJA.
* Yong (2010): no significant change in BMI at 2 yrs after TKA.

Summary: most studies show no change or an increase in weight/BMI after TJA. However, there is one study that controlled for the natural weight gain seen in the general North American population and showed that TJA pts trended toward weight loss.

* Rational for our study: just because BMI does not change, does not mean pts may not be healthier. Study shows that obese pts who are more active (as TJA pts theoretically are) are healthier than obese pts who are sedentary (citation). Lachiewicz (2008) study shows that activity increases even though weight does not decrease.
* Clinically significant weight loss is variably defined in existing literature. We could consider using the FDA definition (as in Stets, 2010).
* One year may be too short of a time to look for weight changes. We should consider going to 2-3 yrs out

**HTN** – OA pts afforded increased mobility and functional ability should be able to be more active and thus benefit from exercise-related improvements in their blood pressures.

* Yong (2010): at 2 years s/p TKA, both mean systolic and diastolic blood pressures went down significantly.

Summary: in one study, TKA has a beneficial effect on both systolic and diastolic blood pressure.

* We should consider controlling our data on BP changes for normal, age-related increase in BP
* It would be interesting to compare changes in BP in pts who were normotensive preoperatively vs. those with a previous Dx of hypertension

**A1c** – the increase in activity after TJA should help to decrease hyperglycemia and insulin resistance in pts with DM.

* Yong (2010): 2 years after TKA, there is a significant increase in fasting plasma glucose level and the prevalence of DM. However, the presence of pts meeting criteria for metabolic syndrome did not change 2 years post-surgery, despite an increase in levels of physical activity.

Summary: based on the single study above, TJA shows no benefit in terms of glycemic control or in protecting against the development of DM or metabolic syndrome.

**Lipids –** if pts become more active and/or manage to lose weight after TJA, then one would expect metabolic factors like blood sugar control and lipid profiles to improve.

* Yong (2010): despite improvements in knee function and increases in activity, there was no significant change in HDL 2 years s/p TKA. However, the mean triglyceride level was lowered significantly.

Summary: the impact of TJA on metabolic factors serum lipid levels is mixed, showing a decrease in triglyceride levels but no change in HDL. A possible effect on LDL has not been studied.

Notes on the Yong (2010) article: this was the only study I could find that looked at what we are interested in. It was in a Korean population of 169 pts, 152 (90%) of whom were women. I expect that with a more even number of men, and in an American population, our data may be significantly different. Our study would also expand on the Yong study by ideally having a larger sample size.