**Objective:** To determine if there is an optimal size for the leading follicle in ovulation induction cycles with Clomiphene Citrate (CC) or Letrozole triggered with hCG, that results in a pregnancy. Secondly we sought to look at the effects of endometrial thickness on pregnancy rates in these same cycles.

**Methods:** A retrospective analysis of 988 IUI cycles with CC or Letrozole starting on days 3-5 of the cycle for 5 days. A transvaginal ultrasound was performed between cycle days 11 and 13 and hCG was administered if the leading follicle was greater than or equal to 18 mm. Endometrial thickness was also measured. An IUI was then performed 24 to 36 hours after hCG administration. Pregnancy was recorded as positive if a fetal heart beat was detected at 7 weeks gestational age on ultrasound. Multivariate analysis was performed using logistic regression to build a model for the probability of pregnancy with a second-degree polynomial term for the effect of the size of the leading follicle.

**Results:**
- There was no difference in the optimal leading follicle size was between cycles with Letrozole and CC (p=0.41). For CC the mean size of the leading follicle resulting in a pregnancy was 24mm. For Letrozole the size was 24.8mm.
- There was an interaction between follicle size and endometrial thickness such that with a smaller follicle size a thinner lining was more advantageous but when the follicle was larger a thicker lining was more likely to result in a pregnancy. At the optimal follicle size there was a positive trend such that a greater endometrial thickness resulted in higher pregnancy rates (OR 1.4, p = 0.002).
- Cycles stimulated with Letrozole had a tighter range of follicle sizes that resulted in a pregnancy as compared to CC stimulated cycles which showed a wider range of sizes. As the follicle size moved 2 mm from the optimal size the drop-off in pregnancy rates was more significant with Letrozole compared to CC (p=0.038).
- Overall there was no difference in endometrial lining thickness between the two cycle types (p=0.325).
- Cycles with Letrozole achieved higher pregnancy rates than CC (23% vs 16%) (p=0.024).

**Conclusions:** In the present study we found that there is an optimal size for the leading follicle that maximizes the probability of pregnancy, with lower rates for both smaller and larger sized leading follicles. The optimal size of the leading follicle in ovulation induction with CC and Letrozole is similar for both drugs, 24mm for CC and 24.8mm for Letrozole, and is closely related to the endometrial thickness. For both drug cycles endometrial lining thickness was found not to be significantly different. Endometrial lining thickness was found to be a predictive factor in achieving pregnancy, and thicker endometrial lining resulted in higher pregnancy rates.