

## A continuous culture medium with a lower concentration of lactate has a pronounced effect on the percentage of usable blastocysts on day 5.

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### INTRODUCTION

Studies have shown that day 5 is the most desirable day to obtain blastocysts that are of an expansion, grade and quality to be utilized for transfer and/or vitrification procedures as those result in the highest success of clinical pregnancy, as compared to day 6/7 blastocysts, that do not meet criteria. Moreover, recent studies have indicated that there is an increase in chromosomal correctness of embryos cultured in a 1mM lactate environment as opposed to the higher 6-10mM lactate concentrations that have historically been believed necessary for successful blastocyst culture and resulting pregnancy.

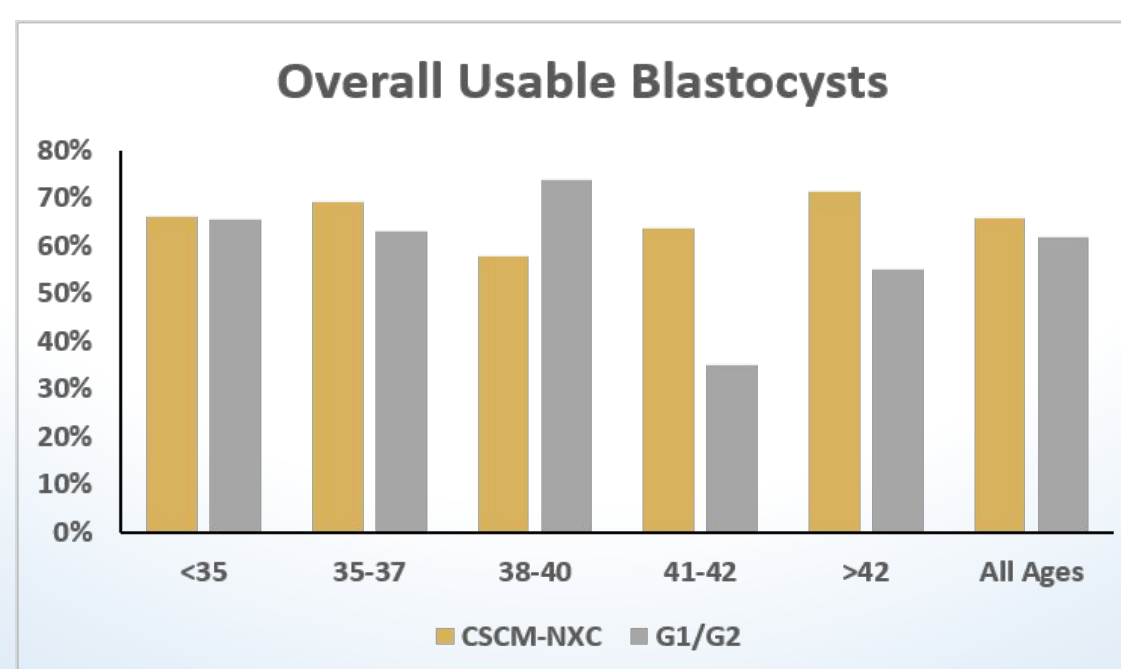
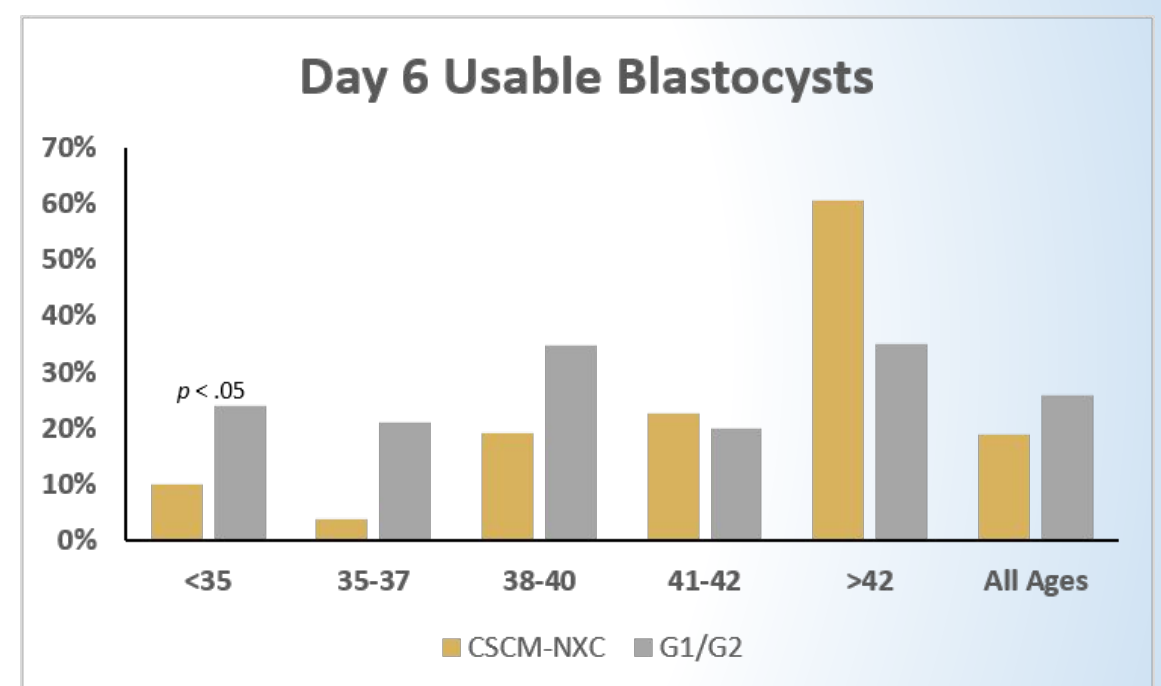
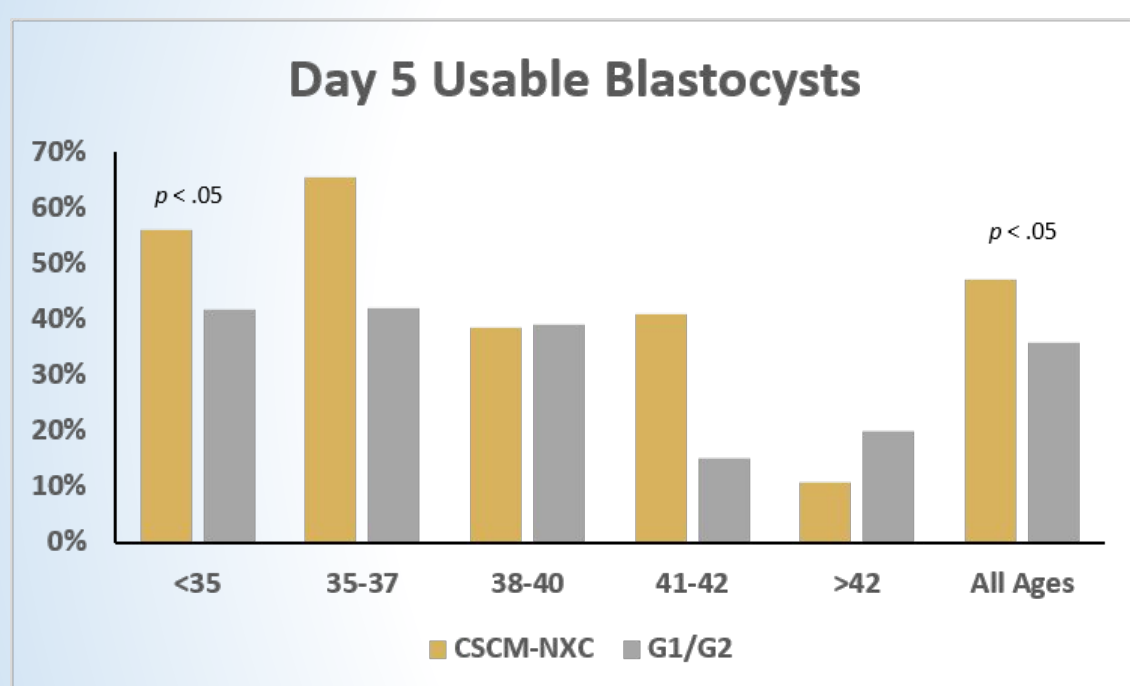
### STUDY QUESTION

Does Continuous Single Culture Medium NX, an embryo culture medium containing 1mM lactate, support increased blastocyst development over high lactate Vitrolife G1/G2 Series sequential culture?

### STUDY DESIGN AND METHODS

A prospective split sibling oocytes study was performed on 50 ICSI and IMSI cycles from October 2020 through April 2021. Oocytes were divided into the low lactate medium and high lactate gradient medium immediately following ICSI/IMSI and thereafter cultured in those medium until the final day of blastocyst culture. All patient ages were included in the sample population.

This study was carried out in a private clinic. All patient stimulation protocol information and diagnosis' were recorded; however, there was no restriction on participation. The endpoint was to analyse the resulting usable blastocyst rates on day 5 and day 6 in both arms of the study, using a denominator of normal 2PN fertilization. If a blastocyst was transferred or cryopreserved on day 5 or day 6, it was determined to be usable.



### RESULTS

The resulting data was stratified not only by day 5 and day 6 usable blastocyst rates but also by patient age. It illustrates a statistically significant improvement in day 5 usable blastocysts for patients <35 in CSCM-NXC vs G1/G2 at 56% and 42%, respectively, a 14% increase ( $p < .05$ ). The overall day 5 usable blastocyst rate was also statistically significant in CSCM-NXC (47%) as compared to G1/G2 (36%), ( $p < .05$ ) with all ages considered. Additionally, on day 5, there was a higher percentage of usable blastocysts demonstrated in low lactate vs high in patients aged 35-37 (65% vs 42%, respectively) and 41-42 (41% vs 15%). Statistical significance was reversed in patients <35 on day 6, with G1/G2 having 24% usable blasts and CSCM-NXC 10% ( $p < .05$ ). Interestingly, though not significant, G1/G2 had an increase in usable blastocyst percentage on day 5 in patients >42 (20% vs 11%), but overall, CSCM-NXC saw an increase in that same age group by 16%

### CONCLUSIONS

There is a statistically significant increase in day 5 usable blastocysts in low lactate culture medium compared to the one with high lactate medium.

Though statistical significance was found in this study, a greater number will help to bolster the statistical power of the observations. Additionally, more studies are needed in order to ascertain if low lactate has an effect on the development prior to ICSI and resulting culture.

The mechanism of action that leads to the successful embryo development in low lactate embryo culture medium is vastly unknown, so further studies are required in order to understand the complexities and the impact of the observations provided.