# Building Better Endometria for IVF: usER Testing and Clinical Trends in Endometrial Quality Over Time.

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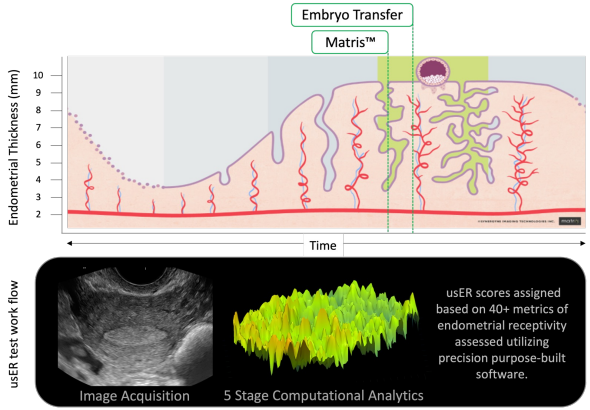
## Background

### Endometrial Assessment - Standard of Care

The quality of endometrial preparation is an often-overlooked contributor to the overall success or failure of IVF cycles. Endometrial thickness measurement has remained as standard of care assessment of the quality of endometrial preparations, however, the prognostic value of these measurements is controversial within the literature (1).

### usER Testing & Endometrial Receptivity

usER testing (MatrisTM, Synergyne Imaging Technology, Inc, Saskatoon, SK) is a non-invasive per-cycle approach to assess the quality of endometrial preparations ~48 hours ahead of each anticipated embryo transfer. The usER test scores endometrial quality on a 10-point scale and has been shown to improve pregnancy rates and conserve embryos through selection of endometria with usER scores of 7 or higher for embryo transfer (2-4).




## Study Objectives

- To determine if routine usER testing could be used to identify improvements in endometrial preparations over time through refinement and standardization of protocols.
- To determine if achieving consistently higher quality endometrial preparations was associated with changes in pregnancy rates.

## Study Design & Duration

Retrospective non-interventional analysis including 2905 IVF cycles conducted at a Canadian multi-clinician fertility care centre. Data were acquired from a chart review of deidentified patient files from 2014 – 2021.

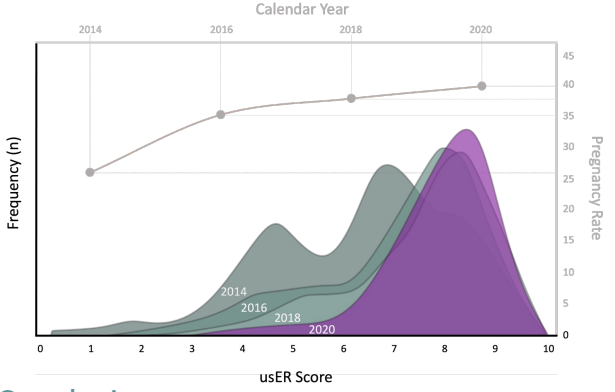
## Patient Demographics

| Year | 2014 | 2016 | 2018 | 2020 |
|---|---|---|---|---|
| Number of cycles | 138 | 448 | 641 | 222 |
| Mean Patient Age | 36.5 | 36.6 | 36.0 | 37.0 |
| Patient Age Range | 24.9-46.7 | 24.5-50.3 | 26.7-49.6 | 25.4-49.9 |
| Fresh Embryo Transfer Cycles (n) | 138 | 95 | 102 | 12 |
| Frozen Embryo Transfer Cycles (n) | 0 | 353 | 539 | 210 |
| Mean Endometrial Thickness (mm) | 9.5 | 8.8 | 9.5 | 9.5 |
| Female Factor Infertility Diagnosis | 39.9% | 47.5% | 46.3% | 57.7% |
| Male Infertility Diagnosis | 32.6% | 23.4% | 17.9% | 12.2% |
| Male and Female Infertility Diagnosis | 15.9% | 8.7% | 14.5% | 7.7% |
| Idiopathic Infertility Diagnosis | 11.6% | 20.3% | 21.2% | 22.5% |

*Even numbered years are displayed for readability. Odd year data available on request.

## Results

1. The distribution of usER scores followed a bimodal pattern across all years analyzed.
2. The year-over-year distribution of usER scores incrementally tightened around the mode above 7 over time (ANOVA: p<0.0001).
3. Pregnancy rates followed an upward trend between 2014-2020.




## Conclusions

- Refinement of endometrial preparation protocols results in significant changes to the distribution of usER scores over time.
- usER testing is sensitive enough to identify changes in the endometrial quality over time and can be used to enhance endometrial preparation protocols
- Increased proportion of usER scores above 7.0 was associated with increase in pregnancy rate per transfer.

## References & Resources:

1) Mathyk B. et al (2023) RBMO, 47.
2) Pierson R. et al (2012) Fertil Steril *98*, S225.
3) Cadesky K. et al (2019). Proceedings of the CFAS *19-21*, p121.
4) Pierson H. et al (2021). Fertil Steril. 116, E-312