

# Combination of Home-Based Hormonal and Mobile Technology for Virtual Monitoring of Menstrual Cycles

Rene Leiva, MD

Lucas DiRienzo

University of Ottawa, Ottawa, Canada

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## THE INNOVATION

COVID-19 has forced an increase in delivery of virtual health care. Menstrual monitoring can help patients with multiple fertility and family planning needs,<sup>1</sup> ranging from irregular cycles, infertility, hormonal disturbances, and natural methods of birth. We present a quality assessment of our implementation of home-based markers (urinary and blood testing plus smartphone applications [apps]) with virtual physician confirmation of menstrual cycles.

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## WHO & WHERE

University-affiliated private family practice in Ottawa, Ontario, Canada.

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## HOW

We have published prior research on separate approaches to home-based hormonal menstrual monitoring. More recently, we have worked to combine the use of these online or smartphone apps into a single process for keeping track of urinary sex hormones or recording cervical secretions, or a combination of both.<sup>2</sup> Any patient interested in monitoring her menstrual cycle is offered this method, but we found the ability to virtually monitor the menstrual cycle for diagnosis and response to treatment of several conditions particularly helpful. We can supervise for normalization of irregular cycles in polycystic ovary syndrome (PCOS) and in adolescents, resolve unusual uterine bleeding, and diagnose fertile window or anovulation in subfertility.

Specifically, we tell patients to monitor their daily cervical secretions, and perform urinary tests for pregnanediol and luteinizing hormone (LH) with use of self-explanatory

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*Conflicts of interest: authors report none.*

### Corresponding author

Rene Leiva

Bruyère Continuing Care

43 Bruyère Street, Ottawa, ON K1N 5C8

[rene.leiva@mail.mcgill.ca](mailto:rene.leiva@mail.mcgill.ca)

smartphone apps (Supplemental Appendix 1, <https://www.AnnFamMed.org/content/19/2/180/suppl/DC1/>, for specific app links). Patients are told to follow the instructions provided by each of the app manufacturers, then submit their results electronically to us for medical interpretation on a regular basis, usually after a full cycle has been completed. However, timely feedback can be provided by health professionals (doctor or clinic nurse) to address any emerging issues. Patients with concern about whether ovulation is occurring are offered opportune lab-based serum progesterone. We have created a document to explain this latter process (Supplemental Appendix 2, <https://www.AnnFamMed.org/content/19/2/180/suppl/DC1/>). For those using fertility awareness methods, this document has links to certified teachers that they can follow for further instructions.

We conducted a chart review/quality assessment of 104 patients including a focused questionnaire of 13 selected patients who have used the process most recently. Patients predicted ovulation with cervical mucus (33%), LH only (25%), and combination of both (42%). Confirmation of the luteal phase per cycle is done effectively with serum progesterone, but several patients are exploring urine testing. In our group, 18% of patients practice this for family planning and 82% for infertility/health reasons. Since the start of the coronavirus disease 2019 (COVID-19) pandemic in our region in mid-March 2020, 4 additional patients have joined.

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## LEARNING

The use of e-technology for monitoring the menstrual cycle in selected patients has been very satisfying for both patient and clinicians. This clinical monitoring virtually and dynamically provided us with timely input in diagnosis and treatment. With higher expectations of virtual care since the pandemic, we have been able to implement our experience in a more effective way with the use of an information sheet. Medical students and nurses have also benefited from this sheet as a quick introduction to the approach. Virtual care is here to stay, so our experience could provide a template on how to monitor the menstrual cycle remotely.

**For additional information, including supplemental appendices, references, and acknowledgments, see <https://www.AnnFamMed.org/content/19/2/180/suppl/DC1/>.**

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**Key words:** menstrual cycle; quality improvement; virtual care; ovulation