Going with the flow: the emergence of menstrual science

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BACKGROUND
Menstruation is a universal human experience from menarche to menopause. It is estimated that approximately 26% of the global population menstruates, with approximately 800 million individuals menstruating each day.¹ While menstruation is considered a healthy vital sign and physiological process within the reproductive age group, it is often associated with stigma and normalization of pain. These factors, along with gaps in health literacy, contribute to the transformation of what should be a healthy and routine experience for much of the world’s population into a potentially distressing experience. Historically, women experienced far fewer lifetime menstrual cycles due to factors such as pregnancy, lactation, poor nutrition and shorter lifespans than their modern counterparts. In today’s world, women can expect to have over 400 menstrual cycles in their lifetime.²

MENSTRUATION RESEARCH
The study by DeLoughery et al³ in this issue of the Journal adds to our understanding of the menstrual experience as it relates to menstrual blood loss (MBL) and the absorptive capacities of a variety of menstrual products. Consistent with women’s health research in general, menstruation-focused research has been, and continues to be, underrepresented in the medical literature. A PubMed search of “menstrual blood” resulted in one publication between 1941 and 1950, followed by a steady increase to and plateau of only 400 publications in the last several decades, during which time there were approximately 10 000 publications related to erectile dysfunction. There have been struggles defining standard terminology related to menstrual bleeding, and it was not until 2005 that the Menstrual Disorders Working Group of the International Federation of Gynecology and Obstetrics (FIGO) called for common language to define regularity, frequency, duration and volume of menstrual cycles.⁴ The publication of standard terminologies by the American College of Obstetrics and Gynecology in 2013 represented a pivotal step in standardising study protocols to investigate normal and abnormal menstruation.⁵

Achieving consensus around the volume of MBL has similarly been a challenge. In 1966, a study of 476 Swedish women calculated MBL during a single menstrual cycle using the alkaline haematin (AH) method, in which spectrophotometry measures blood content extracted from menstrual products. This study found significant decreases in haemoglobin when blood loss exceeded 80 mL.⁶ The AH method has remained the gold standard for MBL measurement. Other less exact, but more practical, validated techniques for measuring MBL include the Pictorial Bleeding Assessment Chart or the menstrual pictogram, although these techniques often exclude modern menstrual products such as cups, discs or underwear.⁷ Whether reported menstrual product capacities are reliably associated with AH measurements remains unclear. This lack of clarity may be partly due to lack of industry standardisation for absorbency levels. Although labelling of tampon absorbency levels is strictly regulated based on saline absorption capacity, there is no regulation in pad labelling, resulting in differences among, and even within, brands.⁷ Saline absorption is a surrogate for menstrual blood, but it is not a clinically meaningful endpoint that measures how a patient feels or functions with the tampon. The study by DeLoughery et al³ modernises our understanding of menstrual product capacity by using red blood cells rather than saline. Moreover, it is inclusive of commonly used menstrual products including cups, discs, underwear and reusable pads. Most importantly, it provides practical, clinically relevant
information to help patients match a product with their own menstrual protection needs, and better plan for the expense.

FINANCIAL IMPACT OF MENSTRUATION
Having data-driven estimates of modern menstrual product capacity is all the more important when we consider that menstruators carry the financial burden of accessing and purchasing menstrual products, pain control modalities, laundry and other menstrual hygiene items. There is also an unspoken cost of access to clean water. The financial toll includes school absences and missed work days, detrimentally affecting individuals globally. Some uniquely affected populations include those experiencing homelessness, incarcerated menstruators, and those who struggle with physical and mental illness. In the United States, 64% of low-income women reported being unable to afford menstrual products within the last year, and 21% experienced this every month. In addition, lost work hours attributable to abnormal uterine bleeding related to fibroids have been estimated to result in total costs up to US$17.2 billion.

The first country to remove tax from the sale of menstrual products was Kenya in 2004. In 2021, the government of Scotland was the first to implement an Act requiring all schools and public bodies to provide period products for free. Other countries across the world are enacting programmes to increase access to menstrual products in schools and public spaces. In the United States, stakeholder groups and policymakers have been advocating for insurance-funded access to menstrual products as a preventive care tool. While these efforts aim to improve menstrual equity, resources such as water, sanitation infrastructure, safe washrooms and basic menstrual products continue to remain limited to adequately support menstruation worldwide. More education and promotion of contraceptive use to improve menstrual cycle control and to optimise menstrual suppression is long overdue. In the meantime, in addition to regular questions on quality, pain and flow of menstrual cycles, healthcare providers (HCPs) should discuss access and barriers to menstrual products. HCPs should be up to date on current reusable menstrual products and how access to these products may differ from access to disposable products.

THE FUTURE OF MENSTRUAL BLOOD AND MENSTRUAL PRODUCTS
Recent studies suggest that menstrual blood itself may prove to be a window into health. Menstrual cups and specialised pads allow for reproducible, passive collection of menstrual effluent, which can then be used for diagnostic purposes. Samples of menstrual blood are being studied as a noninvasive diagnostic modality for endometriosis. Among other clinical innovations, menstrual blood may offer a new avenue for cervical cancer screening by human papillomavirus (HPV) detection and genotyping, and glycaemic control monitoring by glycated haemoglobin (HbA1c). With so many future possibilities for deriving clinical value from menstrual blood, one can almost imagine a future in which menstrual stigma is replaced by clinical opportunity.

Menstruation presents a multitude of challenges that have a profound impact on the overall well-being of individuals throughout their reproductive health journey. A thorough grasp of the complex dynamics of the normal menstrual cycle, coupled with proper use of suitable menstrual products, forms the essential foundation for enhancing quality of life and providing better care for these individuals. The DeLoughery et al study lays these fundamental building blocks, illuminating new avenues of understanding, opportunities and advancements in research within a significantly overlooked field.

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REFERENCES
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