Introduction: New tools for enhancing collaborative endometriosis research

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This issue of *Fertility and Sterility* contains four articles by the World Endometriosis Research Foundation whose present objective is global standardization of the collection of phenotypic data and biological samples, designated as the Endometriosis Phenome and Biobanking Harmonisation Project. The aim is to facilitate large-scale international, multicenter trials that are robust, and will result in biomarker and treatment targets to advance research in endometriosis. (Fertil Steril® 2014;■:■–■. ©2014 by American Society for Reproductive Medicine.)

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Endometriosis has been recognized as a pathologic entity for more than a century, with negative impact on the quality of life of millions of women. Despite the considerable efforts of clinicians and basic scientists worldwide to determine the etiology, pathophysiology, and genetic or molecular mechanisms involved in endometriosis, little progress has been made in any of these areas, a failure often attributed to the suspected heterogeneous nature of the disease.

This issue of *Fertility and Sterility* contains four articles by the World Endometriosis Research Foundation, an international group of individuals whose present objective is global standardization of phenotypic data compilation, and biological sample collection and storage, to facilitate collaborative international endometriosis research. The undertaking has been designated as the Endometriosis Phenome and Biobanking Harmonisation Project (EPHect). It is hoped that this project will facilitate large-scale international, multicenter trials that are robust, and will result in biomarker and treatment targets to advance research in endometriosis.

The premise underlying this massive undertaking is that research in endometriosis has been largely unsuccessful in uncovering etiologic mechanisms or diagnostic biomarkers because many studies have been underpowered to detect differences from controls. In addition, studies have been lacking detailed phenotypic data or standardized protocols for collection of biological samples, thus preventing powerful, collaborative, prospective investigations or accurate retrospective meta-analyses.

The series of articles in this issue of *Fertility and Sterility* presents the consensus of two international workshops of World Endometriosis Research Foundation regarding standardization of phenotyping, and sample collection and biobanking. This is to facilitate collaborative endometriosis research.

The first article presents a new standardized surgical form to document the extent and nature of endometriotic lesions in the pelvic cavity. This form is designed to replace the revised American Society of Reproductive Medicine (ASRM or AFS) form, which has been shown time and again not to correlate with the extent of patient symptomatology, nor aid in predicting patient response to treatment. The EPHect

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form uses both demographic and descriptive data, as well as imaging of the pelvis, including the back of the ovaries, to document the extent of disease. The imaging involves dividing the pelvis into six zones for systematic digital recording of lesions and with close-up magnified images of smaller lesions. This article also describes standardized protocols for collection of tissue and fluid samples during surgery.

The second article presents an extensive 30-page self-administered questionnaire to be completed by both patients and controls to provide a comprehensive phenotypic description of specific endometriosis symptomatology and potentially confounding symptoms. The collection of the standardized information contained in this form is aimed at facilitation of collaboration and pooling of individual participant data across research centers to enable much larger sample sizes, and to allow subgroup analyses with adequate statistical power.

The final two articles discuss the development of standard operating procedures for biologic fluid and tissue sample collection, processing, and long-term storage to enable accurate and reproducible molecular phenomic, metabolomic, and genomic investigations. In the investigators' own words, "it is anticipated that the integrated use of the EPHect phenomic data collection instruments together with the adoption of the biologic sample standard operating procedures will for the first time allow large-scale, robust, highly collaborative research into (subtypes of) endometriosis and its associated symptoms, including elucidation of its etiology, the discovery of noninvasive biomarkers of biologically different disease entities, and the development of novel, targeted treatments."

In my opinion, these four articles represent a landmark in facilitating the advancement of endometriosis research by enabling the analysis of comprehensive and powerful data that are as homogeneous as possible. It remains to be seen whether the phenomic data, including the surgical form and the self-administered patient questionnaire, are useful clinically and perhaps the first collaborative studies should be aimed at validation of these tools. It is hopeful that collaborative efforts using validated, standardized tools will result in clinically translatable outcomes in the near future.