The future of obstetrics/gynecology in 2020: a clearer vision. Transformational forces and thriving in the new system

David C. Lagrew Jr, MD; Todd R. Jenkins, MD

THE PROBLEM: Payment reform and care redesign only partially lead to an improved health care system, but other carefully chosen changes are needed to meet the challenges ahead.

A SOLUTION: The digital conversion of health information enables communication, analysis for care refinement, and transparency. Carefully chosen disruptive technology breakthroughs should allow physicians to thrive in the future.

This article is the final article of a 3-part series.

In the first 2 articles of this series,[1,2] we discussed the unprecedented external and internal pressure on the specialty of obstetrics and gynecology. We introduced a framework of guiding principles for change known as the Triple Aim[2] that would (1) improve the health of a population, (2) enhance the patient experience, and (3) control costs and the concept of transformational forces that we can use to affect these diverse changes. The first 2 framework forces involve payment reform and care redesign. This article completes the description of the transformational forces by describing how new methods of care will take advantage of health information technology and disruptive innovation. Finally, we will emphasize the characteristics of providers who will thrive and prosper in this transformed practice of obstetrics and gynecology.

Force 3: digital clinical data and health information technology

By 2020, the transformation of clinical data into electronic records likely will be nearly complete. A robust functioning electronic medical record system with capabilities for documentation, result retrieval, ordering, and decision support and interoperability (ability of systems to exchange information) with outside systems will be in most physician offices, clinics, and hospitals. Currently, most practitioners are in their learning curve with electronic records; however, adoption of electronic records continues, with most providers now showing favorable usage. That said, challenges still exist, particularly for those older practitioners and those in solo practices.[3] Those physician practices and organizations without these robust information technology solutions will be disadvantaged and unable to function as part of an effective clinical team. Furthermore, patients increasingly see electronic records as a benefit to their care.[4] We believe that increased regulatory control, market forces, and industry consolidation should solve the current problem of poor interoperability. The Office of the National Coordinator program of meaningful use incentivizes organizations to adopt standards for information exchange and, although still somewhat limited and with multiple barriers,[5] is an example of regulatory pressures to adopt interoperability.[6] Today's hodgepodge of information storage is akin to other past digital battles, such as video recording formats that were resolved by market forces. It will also be necessary to solve problems that are related to semantic interoperability, security issues, and data definition issues. The records will include multiple formats of images, sounds, videos, and waveforms all at immediate retrieval. The patient's 'record' will be a collection of information obtained locally and from other sources of care.

In this world of exchangeable patient information, the patient becomes the "owner" of the information. Health care providers and institutions become custodians of the information generated by their care. Thus, the information is freely available to all providers that are given permission by the patient (or their designee). In addition, widespread use of patient portals allows the patient to contribute and constantly check the information recorded by providers.[7] As an important part of the care team, the patient quickly can check their history, allergies, medications, transfer clinical data, answer health questionnaires or surveys, and help guide their care. Patients will be connected constantly to their health care team by smartphones and other mobile communication devices. Home monitoring devices will allow care and assessment to occur 24/7/365, because internet-connected devices continually transmit data to data centers. In these centers, computer algorithms that are based on evidence-based protocols screen data, obviate the need for the addition of expensive human staffing, and immediately alert providers of concerning values and trends.[8-10] As a result of these electronic connections, patients will have the opportunity to arrive routinely with completed

From Memorial Care Health System and the Department of Obstetrics and Gynecology, Division of Maternal Fetal Medicine, University of California, Irvine, Fountain Valley, CA (Dr Lagrew); the Department of Obstetrics and Gynecology, University of Alabama, Birmingham, Birmingham, AL (Dr Jenkins).

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paperwork to scheduled surgeries or office visits and with large amounts of collected measurements for consultations; therefore, evaluations would take place with more complete background information and data sets. Office visits will be more efficient and effective and result in a reduced number of physical office visits and potentially a reduced provider workload.

Furthermore, once information and communication becomes digital, the opportunities for care to be provided by telemedicine from remote sites should expand rapidly. In many centers, patients already are able to obtain routine care for standard low-risk ailments by e-visits, which can be managed by electronic communication. This format for care meets the time needs of the patient and is markedly more efficient for providers. E-visit patients typically are screened by physician extenders who use evidence-based protocols that allow prompt replies and electronic prescriptions. Organizations, such as Kaiser Permanente and the Veterans Affairs system have demonstrated that they can provide specialty care with the use of telemedicine and much more efficiently distribute expertise.[11,12] These opportunities for care will be augmented by telehealth (patient-only interactions) in which detailed clinical education and instructions regarding conservative, patient-directed treatment can be provided. Patients will be able to go to their primary care physician's office to have a consultation with a remote subspecialist, which would save time for both parties. The net effect of e-visits will free up office time for physicians to focus on patients who have more acute concerns and genuinely need to be seen face-to-face. As recent headlines at the Veterans Affairs system demonstrate, these transformative efforts must always be balanced with continuous quality improvement and oversight as organizations adapt to the future environment.[13,14]

The large volume of health care data will allow providers to have a much more complete picture of the patient status. Digital information can be freely, quickly, and securely shared and available at the point of care. The clinicians have almost immediate access to laboratory and imaging results. They have an overview of all the notes and documents, regardless of setting, that are available as soon as other providers complete them. Vital signs and other data can be presented graphically, which has been shown to improve interpretation.[15] Rules and alerts can be created to augment the provider's ability to identify and avoid potential errors. Our own experience has been that, once providers get used to practicing with a much more robust view of the chart, they quickly become uncomfortable with the limited information of the paper chart.

Electronic medical records allow for the surveillance of health care and assessment of the degree of adherence to evidence-based protocols. This real-time, constant outcome, quality, and cost-effectiveness feedback allows for a more rapid pace of care improvement. By using 'Big Data' analysis of the risk-adjusted, complete detailed information, more effective and efficient care can be designed; even rare events, such as maternal death, can be tracked to see the effect of changes.[15] Providers can review their own performance data, identify areas of variance in their practice, and receive helpful tips and comparison data for self-improvement. Provider performance data from large databases allow performance to be measured and fed back by a combination of meeting performance standards, outcome measures, and patient experience data rather than a subjective assessment.[16] Not only will physicians use this data, but also public reporting of physician and hospital data has become common widespread and will become even more commonplace.[17] Patients will be given the data to help guide their own health care decisions through direct comparison of costs, quality, and patient satisfaction.[18] Both the baby-boomer and millennial generations have demanded similar transparency from other industries outside of health care, which will come increasingly important with the availability of purchasing exchanges laid out in the Affordable Care Act.[19]

As the amount of information explodes with new advances in areas such as genomics and proteomics, the ability for human analysis will be challenged. In the digital future, the "genetic history" section of the chart will be a critical component to the provision of personal care. Constant screening by decision support tools will allow a "look over the shoulders" of providers to check their care and make sure that they see important trends or changing information. The digitization of information will enable us to take advantage of many of the disruptive clinical innovations.

Force 4: disruptive clinical innovations

Scientific advances that have the potential to change clinical practice radically and improve clinical outcomes are known as 'disruptive clinical innovations.' Indeed, many of these advances actually will change the delivery of health care, prevent or cure diseases, and reduce complications, which will markedly improve patient outcomes and cost. Of course, it will be essential that each new development be measured against the goals of the Triple Aim: (1) improve the health of the population, (2) obtain the best experience for the patient, and (3) control costs. Of course, the scope of development is broad and beyond the scope of this article, but we will discuss some of the more recent innovations in obstetrics and gynecology that have the potential to be quite disruptive.

Genomics and epigenomics

The human genome project, completed in 2003, identified >20,500 genes and illuminated tremendous possibilities for diagnosis and treatment. However, the task of linking genes to human diseases and conditions as well as research into variation and its impact on health has only begun.[20] This new discipline, known as genomics, is the "branch of molecular biology concerned with the structure, function, evolution, and mapping of genomes."[21] The technologic advancements in equipment to analyze genetic material has allowed for rapid analysis at lowered costs. The advancements allow incredible diagnostic and therapeutic advancements. More recently, scientists have discovered that 90% of "dark