There is growing recognition of the importance and potential benefit of information technology and electronic medical records in providing quality care for women. Incorporation of obstetrician-gynecologist-specific requirements by electronic medical record vendors is essential to achieve appropriate electronic medical record functionality for obstetrician-gynecologists. Obstetricians and gynecologists record and document patient care in ways that are unique to medicine. Current electronic medical record systems are often limited in their usefulness for the practice of obstetrics and gynecology because of the absence of obstetrician-gynecologist specialty-specific requirements and functions. The Certification Commission on Health Information Technology is currently the only federally recognized body for certification of electronic medical record systems. As Certification Commission on Health Information Technology expands the certification criteria for electronic medical records, the special requirements identified in this report will be used as a framework for developing obstetrician-gynecologist specialty-specific criteria to be incorporated into the Certification Commission on Health Information Technology endorsement for electronic medical records used by obstetrician-gynecologists. (Obstet Gynecol 2010;116:140–3)

Obstetrician–gynecologists often find that current electronic medical record systems are inadequate for documenting and exchanging clinical information because of the absence of obstetrician–gynecologist-specific functions and features. This article is intended to delineate functional requirements unique to the needs of obstetrician–gynecologists that are lacking in current basic electronic medical record certification requirements as developed by the Certification Commission on Health Information Technology. This article does not address issues of electronic medical record “usability.” Usability refers to the number of clicks or screens a user must use to accomplish a task.

The electronic medical record requirements of obstetrics and gynecology differ from other medical specialties for several reasons. First, obstetrics and gynecology is a medical and surgical specialty. Second, it is hospital-based and office-based. Third, obstetric care, whether in the office or hospital, requires data fields and image displays, unlike other medical or surgical disciplines. Although there are a few enterprise vendors that offer products that attempt to address the hospital and office component of obstetrics, those products are not oriented toward small, independent, office practices. Even with enterprise-hosted (hospital-hosted) solutions, there are no completely integrated systems for obstetric care and gynecologic care in and between both office and hospital settings.

Systems designed for workflows of other primary care specialties, such as family practice or internal medicine, fail to accommodate the frequent visits of antenatal care with a flow sheet display.1 Because of the frequency of visits, the need to see both maternal and fetal trends, and the necessity to document this information in less time than it takes to see the patient, the information should optimally be displayed on a single screen, requiring a minimum of clicks and key strokes to complete an encounter. Capture of other important parameters, including ultrasound images and reports, nonstress test graphic reports, and recorded images of gynecologic procedures including, for example, laparoscopy, colposcopy, cystoscopy, and hysteroscopy, is usually absent. Remote access to critical information often is limited or nonexistent, whether on full function personal computers or via “smart phones” (eg, iPhone, Black-
berry, Android). Future electronic medical record systems should correct these deficiencies.

**OBSTETRICS**

Because obstetric care is episodic, with frequent visits (monthly initially, increasing to weekly or even more frequently at term), the amount of information and the specificity of information to be captured and reviewed changes with the progression of the pregnancy. This information must be accessible by multiple simultaneous users in all locations of care: office, clinic, labor and delivery suite, and operating room. Unlike other chronic conditions (eg, diabetes, hypertension) with a possibly similar frequency of visits, progress through pregnancy requires specialized laboratory testing, imaging, and counseling, all of which must be ordered and reviewed at the appropriate time, often in more than one location.

During antenatal office visits, imaging studies (usually ultrasounds) are frequently performed. Storage of the reports in an accessible manner and storage of either representative images (typical) or all images (more likely in consultant and subspecialist encounters) requires integration of a higher order than is currently available. Changes in estimated delivery dates based on ultrasound measurements should easily be accommodated automatically with appropriate documentation of the “before” and “after” dates and with a rationale for the change. Fetal well-being may be evaluated by ultrasound as part of a biophysical profile. Fetal status may be evaluated via nonstress tests in which fetal heart rate response to stimulation (acoustic or movement) is recorded in a graph form. Storage of those graphs, immediate display, annotation, capture of significant events, and remote access for evaluation are needed for completeness and delivery of quality care. Interchange of nonstress test images from office to office (for example, as in consultation with a maternal–fetal medicine specialist) should also be accommodated.

Few existing electronic medical record systems accommodate the single-flow sheet concept, in which the majority of routine obstetrical information can be reviewed from a single screen. Concentrating relevant information in a “dashboard” display is especially important in providing quality prenatal care. This does not mean that a display must look like a specific American College of Obstetricians and Gynecologists, Hollister-Briggs, or POPRAS paper product. The electronic medium is not the same as paper, and forcing vendors or designers to use outdated technology will not advance the usability of products; good design will. Moreover, as noted hereafter, use of existing paper-based displays as templates does not take into account possible clinical decision–support methodologies that could trigger different types of displays based on varied inputs and analyses.

Obstetric patients examined in the office setting will most likely deliver their babies in a hospital setting. Interoperability between office systems and hospital electronic systems is severely lacking, although standards exist2 and are being further refined through the work of the collaborative known as Integrating the Healthcare Enterprise.3 Today, most offices that have implemented electronic medical record systems are still required to print a report of the visits and mail, fax, or hand-deliver the record to their labor and delivery unit.

There is also the requirement to capture and store data in an obstetric medical record for substantially longer durations than typically provided in most electronic systems. Because medico-legal liability in so-called birth injury cases extends to the age of majority with years added for discovery (an often indeterminate interval in some jurisdictions), the durability of storage formats and future readability is a significant concern.

**GYNECOLOGY**

Admittedly obstetric practice presents more special requirements than gynecologic practice. Nevertheless, office-based and hospital-based gynecology does have special requirements, including the capture of images from a variety of sources. Colposcopy with documentation of cervical topology, biopsy locations, and the like should be accommodated in a specialty-specific electronic medical record. Similarly, procedures such as laparoscopy, cystoscopy, or hysteroscopy may have video records and the need for still-image capture and annotation. Abdomino-pelvic ultrasound is a vital diagnostic tool whose images must be retained and transmitted to affect coordinated care. Mammography and breast ultrasound demand similar capabilities. As in obstetric care, assisted reproductive technologies and gynecologic oncology require serial tracking of laboratory data and imaging studies. Chemotherapy may be administered in both hospital and ambulatory care settings and require flow sheets for adequate documentation. Urodynamic testing, including anorectal manometry and endoanal ultrasound documentation requirements, should also be accommodated.

**Clinical Decision and Guidelines Support**

The complexity of all medical care increasingly taxes busy providers. The likelihood of missing a significant problem, laboratory result, or need for a timely test or treatment will soon necessitate clinical decision support and guideline compliance assistance.4 electronic medi-
cal record with clinical decision-support capabilities offer the opportunity to automate aspects of the process, providing a safety net for optimizing the delivery of quality care. Existing warnings and alerts, however, are usually inflexible, unable to change quickly with the evolving standards of care, and are not tied to specific standards set by recognized national organizations such as the Centers for Disease Control and Prevention and the American College of Obstetricians and Gynecologists. Electronic medical record platforms must provide for seamless integration of clinical decision support and standards of care that are being updated continuously. Adoption of clinical decision support relies on an appropriate, yet minimally intrusive, disruption of workflow consistent with optimal patient safety.5

Specific examples of required alerts in obstetrics include early testing (first trimester) for genetic abnormalities, and the administration of Rho (D) immune globulin prophylaxis. Guidelines outlining appropriate therapies for problems such as herpes or other sexually transmitted diseases, diabetes, and hypertension, among many others, will facilitate the delivery of optimal care.6

Obstetrician–Gynecologist-Specific Functionality Testing for Electronic Medical Records Systems

The Certification Commission for Healthcare Information Technology is currently the only federally recognized body for certification of electronic medical record systems. Since 2006,7 the Certification Commission on Health Information Technology has been certifying increasing levels of functionality (116 criteria in 2006, 96 additional criteria in 2007, and so on) that electronic medical record systems are required to meet for a passing grade. In 2008, child health–8 and cardiovascular-specific9 elements were added to expand the criteria to fit a particular population and specialty. However, the Certification Commission on Health Information Technology criteria are still incomplete for many specialties, including obstetrics and gynecology. Currently, the Certification Commission on Health Information Technology interoperability requirements are insufficient to transmit the data contained within American College of Obstetricians and Gynecologists’ Antepartum Forms.

The Certification Commission on Health Information Technology has been petitioned to include specific functionality for obstetrics and gynecology, as identified in this article and further expounded in Box 1. Consistent with the Certification Commission on Health Information Technology work method, expert panels of interested parties will take the broad topics provided here and generate requirements. These expert panels, when constituted, call on volunteers from

**Box 1. Specific Functionality Required for Obstetrician–Gynecologist Electronic Medical Records**

- Immunization management with pregnancy specifics, eg, human papillomavirus (cervical cancer) immunization
- Growth: Fetal development tracking
- Medication management: Gynecologic oncology dosing
- Patient identification: Assisted reproductive technology (tracking sperm, egg donors) and multiple gestations
- Normative data: fetal development, pregnancy laboratory values
- Privacy: reproductive history and choice, eg:
  - Contraception, abortion
  - Teenagers/parental notification
  - State law
- Pregnancy flow sheet
- Pregnancy education, counseling, and materials, as well as timing (trimester) of counseling in pregnancy
- Pregnancy laboratory testing by trimester, eg:
  - Genetic testing offered to all pregnant women
- Pregnancy medication requirements by trimester, eg:
  - RhoGam administration with amniocentesis, bleeding
  - Beta Strep
- Cord blood banking
- Genetic (family) history, pre-pregnancy counseling, genetic evaluation of problem pregnancy
- Fetal age display
- Chronologic documentation
- Images (still, video)
  - Image capture, retrieval, annotation, display
  - In-office operative procedures (biopsies, hysteroscopy, colposcopy, urodynamics)
  - Ultrasound imaging
  - Biophysical profiles
  - Endoanal ultrasound
  - Cystoscopy images
- Waveforms: Fetal heart rate monitoring, uterine contractions, nonstress testing
  - Capture
  - Retrieval
  - Annotation
  - Display
- Record retention: Medico-legal requirements
- Estimated date of confinement (due date) management
  - Ultrasound refinement
  - Assisted reproductive technology
- Clinical decision support for guidelines
- Chemotherapy flow sheets
- Urodynamics testing
- Anorectal manometry
the provider community and vendor community. The American College of Obstetricians and Gynecologists will assist in the Certification Commission on Health Information Technology process by providing volunteer resources to complete the Certification Commission on Health Information Technology criteria for obstetrics and gynecology. This report will serve as a framework for defining such functionality testing to the Certification Commission and to individual obstetricians–gynecologists evaluating electronic medical record systems for their practices.

REFERENCES


