

**Title: The eMERGE Network: Challenges and Lessons Learned**

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A large-scale adoption of electronic medical records (EMRs), though expensive and logistically challenging, can potentially establish new frontiers in personalized medicine. The **e**lectronic **M**edical **R**ecords and **G**enomics (eMERGE) Network ([www.gwas.net](http://www.gwas.net)) is a consortium of five participating sites (Group Health Seattle, Marshfield, Mayo, Northwestern and Vanderbilt) funded by NHGRI to investigate the synergies between EMRs and genomic research.

The goal of eMERGE is to conduct genome-wide association studies (GWAs) in approximately 19,000 individuals using EMR-derived phenotypes and biorepository-derived genome-wide genotypes. While eMERGE is still underway, dissemination of important challenges and lessons learned from the network can benefit the scientific community. Challenges faced by eMERGE include development of EMR-based algorithms requiring multidisciplinary expertise in clinical care, genetics/genomics, and biomedical informatics; implementation and validation of algorithms among different types of EMR data; informed consent or re-consent of patients for genomic research; and the return of incidental findings. Among the lessons learned, the Network can provide model consent language that may engage clinic patients participating in genomic research. Furthermore, eMERGE EMR-based algorithms should be transportable to different institutions with varying data structures. However, a standardized EMR system would be more efficient for cost-effective research.

The key strengths of eMERGE include a collaborative nature, the potential for external Network efforts, the ability to rapidly extract phenotypes from EMRs, the transportability of algorithms, and cost-effectiveness for longitudinal clinical research. The eMERGE Network is now in a unique position to produce standards for collaboration among different institutions that can encourage the use of EMRs in genomic research and guide clinical care.

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