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Smart on FHIR for Genomics

Specifications To Enable FHIR-based Clinico-Genomics Apps

HL7 Fast Healthcare Interoperability Resources (HL7 FHIR®) is poised to make genomic apps at the point of care a reality, as described in **SMART on FHIR Genomics: Facilitating Standardized Clinico-Genomic Apps** (*Journal of the American Medical Informatics Association*, August 2015).

The paper's authors (including Gil Alterovitz and David Kreda) describe how researchers at Harvard Medical School, Boston Children's Hospital, and Vanderbilt University created working prototypes of genomic FHIR resources and SMART on FHIR profiles:

Both to develop and test our solution, we attached a FHIR Application Protocol Interface (API) layer to proprietary sequencing platforms and EHRs in order to expose gene variant data for presentation to the end-user. Three representative

apps based on the SMART platform were built to test end-to-end feasibility, including integration of genomic and clinical data. Our prototyping work suggest that an entirely data (and web) standards-based approach could prove both effective and efficient for advancing personalized medicine.

At scale, this effort will yield broad dividends. It would enable genetic sequencing vendors to deliver data and analytical reports to the point of care.

In addition, genetic sequencing vendors will be able to use the same SMART on FHIR technology being adopted by EHR vendors to access clinical data, which assists in the analysis of sequencing results.

Finally, the same SMART on FHIR solution will offer app developers a simple, developer-friendly way to access both the clinical and sequencing data to create diverse clinico-genomics apps (Figure 1).

The progress in incorporating SMART on FHIR Genomics specifications into FHIR has been a joint effort with the HL7 Clinical Genomics Work Group.

This synergy has allowed feedback and interaction in improving standards, allowing FHIR to incorporate views from different stakeholders. SMART on FHIR Genomics components are already part of proposed FHIR's Draft Standard for Trial Use Release 2 (DSTU 2) after being balloted positively within the work group this past March.

At the May 2015 HL7 FHIR meeting in Paris, the HL7 Clinical Genomics Work Group submitted a follow-on Project Scope Statement to further expand clinical genomics in FHIR, including ideas for SMART on FHIR Genomics components that are not yet part the DSTU R2. The Project Scope Statement calls for resource extensions,

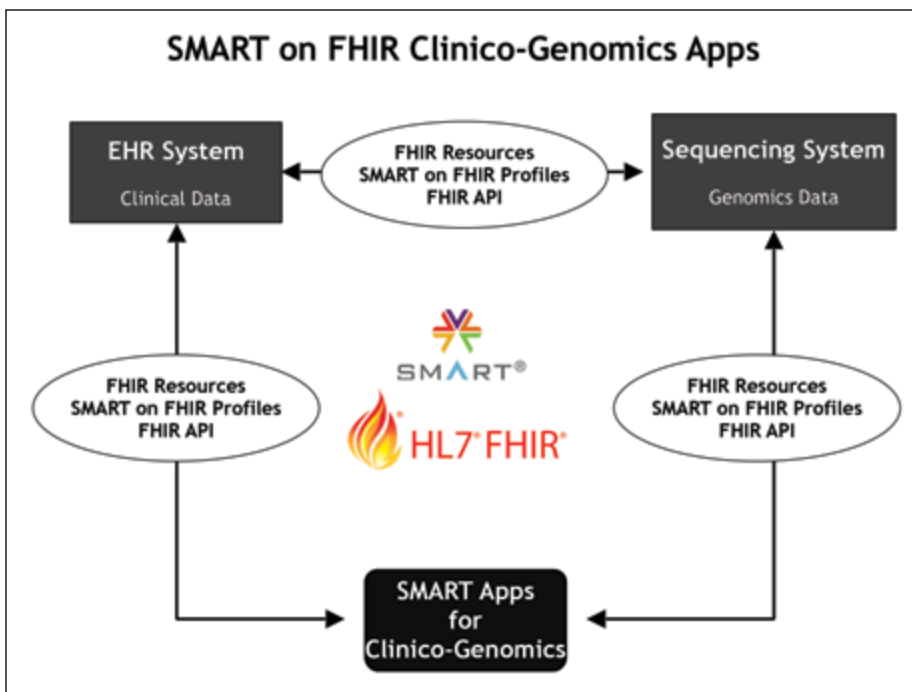


Figure 1: SMART on FHIR Clinico-Genomics Apps

profiles, terminology standards, and a new sequence resource to enable FHIR to handle clinical genetic and genomic data, as well as biomolecular findings and interpretations. The HL7 FHIR Domain Experts Steering Division approved the project scope statement and work in ongoing to

develop specifications for the next FHIR release.

With continuing HL7 community support, next year's FHIR Normative Edition will substantially advance the integration of genomic data into clinical care. ■

About SMART on FHIR

SMART on FHIR is a specification developed at Harvard Medical School and Boston Children's Hospital for a standards-based medical app platform.

In addition to adopting HL7 FHIR for baseline resource definitions and the FHIR RESTful API, SMART provides FHIR profiles for ensuring semantic consistency.

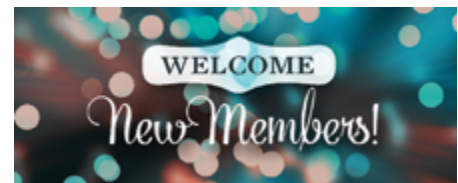
SMART has also adopted the OAuth2 and OpenID Connect web standards for authorization and authentication, respectively.

SMART provides specifications and software for launching HTML5-based web apps or native mobile apps from or linked to an EHR system.

For more information, please visit:

<http://smarthealthit.org>.

The SMART logo is the registered trademark of Boston Children's Hospital.



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