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Health Heritage

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POWERED BY NANTWORKS

Health Heritage is a patient-facing, web-based application that empowers consumers to collect, analyze and share their detailed personal & family health histories. Health Heritage establishes a “living legacy” for children and future generations and can also be a vital and unique addition to research consortiums and biobanks.

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Health Heritage: History

- Developed as NCI-funded research project at University of Virginia: 2010-11
  - Analytic validation published in *Public Health Genomics* 2010;13:477–491 demonstrating that Health Heritage consistently outperformed PCPs in the completeness and accuracy of family health history collection.

- Launched at NorthShore University HealthSystem: May, 2014
  - 4 hospitals & 2,000 clinicians in northern Chicago suburbs; Epic EMR; Available to all patients through a link in their patient portal
  - Clinical validation published in *Familial Cancer* 2015; 15:331-339 demonstrating agreement (97%) between Health Heritage's referral for genetic evaluation versus a genetics team relying on guidelines and expertise.
  - Patients are now independently scheduling appropriate genetic evaluations and other preventative services based on Health Heritage recommendations.

- Acquired by NantHealth, a precision cancer care company: Sept, 2015

  Founded and led by Dr. Patrick Soon-Shiong www.nanthealth.com

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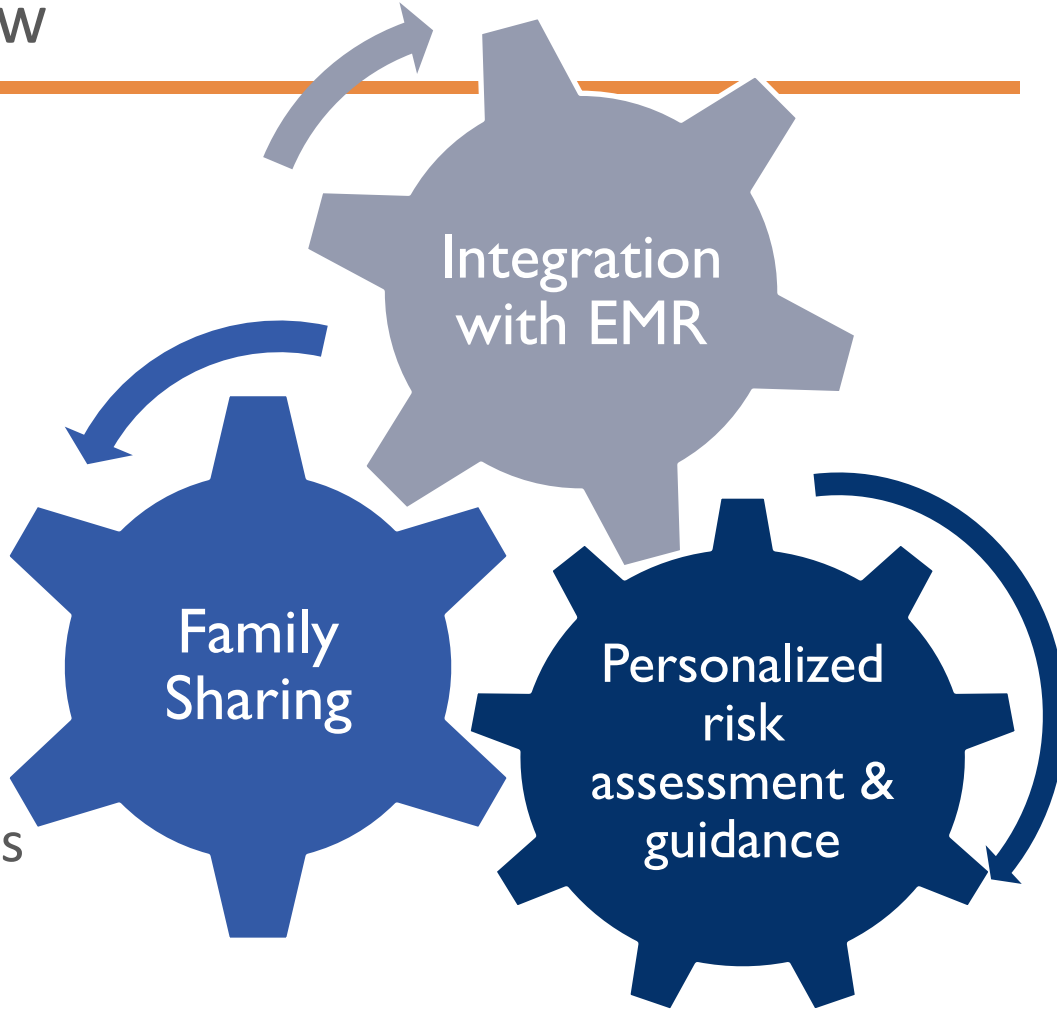
Health Heritage: Overview

1. Automatic transfer and interpretation of detailed personal data from EMR & return of risk reports to PCPs
2. Sharing of accurate info between family members
3. Continuously updated and personalized recommendations based on guidelines and evidence



Easy for <u>patients</u> to collect, maintain, and share their family health history.

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Health Heritage: EMR Integration & Family Sharing

- Data pulled from EMR using SQL queries to Clarity database
- Discrete data translated to and from other coding schemes (e.g. SNOMED, ICD-9)
- Pathology reports processed using our Natural Language Processing (NLP) solution (e.g. number/type of colon polyps, specific cancer diagnoses)
- Risk assessment reports are sent back to the patient's medical record (at patient discretion) as an HL7 ORU message
- Global family tree modeled as a directed acyclic graph using mother and father links; allows for family sharing using "scoping" and "permissions"

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Health Heritage: Personalized risk assessment

Current Conditions:

Breast Cancer
Colorectal Cancer
Melanoma
Ovarian Cancer
Pancreatic Cancer
Prostate Cancer
Uterine Cancer

Planned:

Lung Cancer
Thyroid Cancer
Cardiovascular Disease
Diabetes
Hypertension
Stroke
Alzheimer's/Dementia

Risk engine based on guidelines where available (e.g., NCCN & ACS), extensive literature review, and open source quantitative risk models

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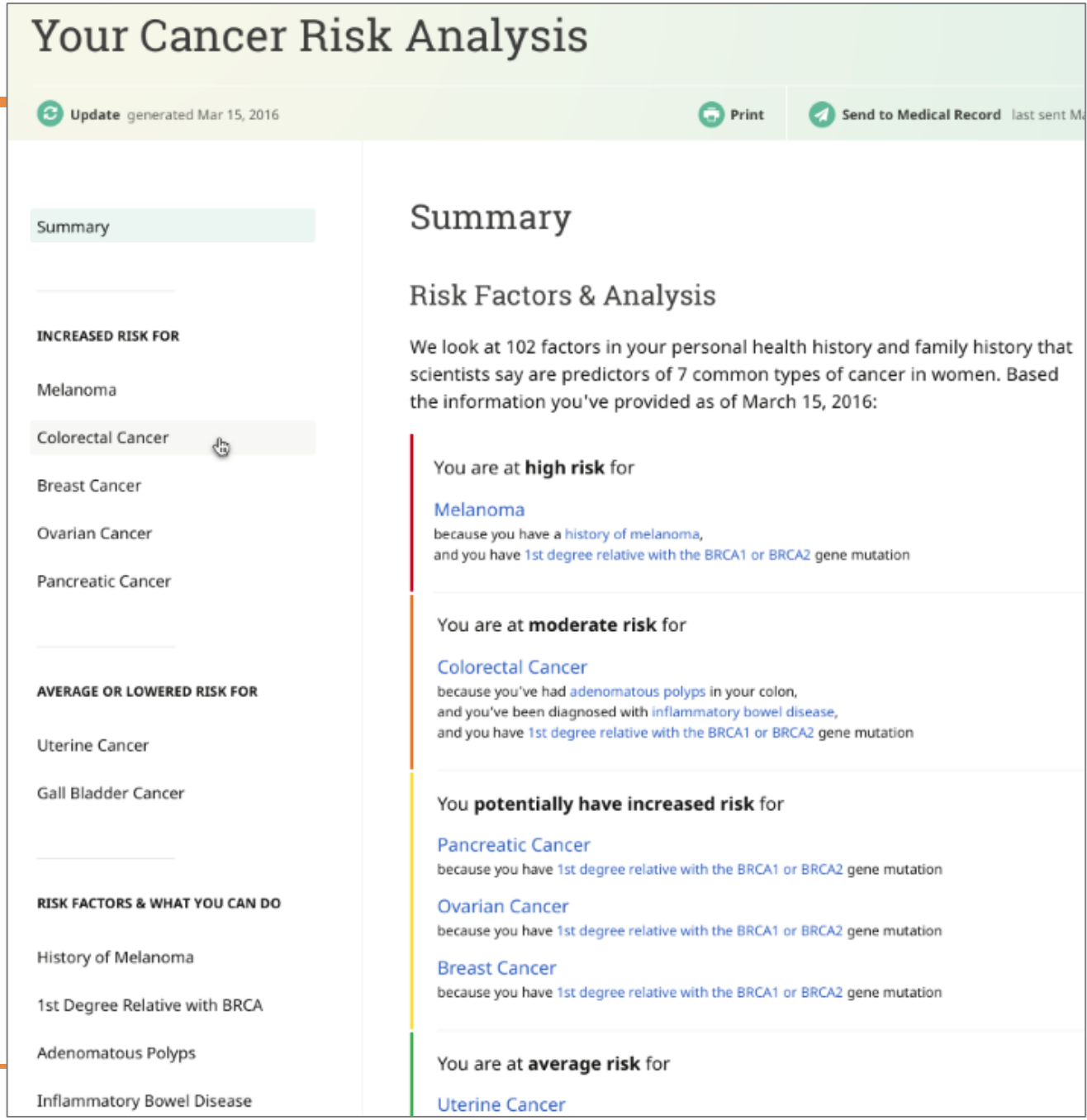
Health Heritage:

Each risk factor (algorithm) is linked to a risk level and evidence-based recommendations:

1. Genetic/Specialty Services
2. Cancer Screening
3. Risk Reduction



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Health Heritage: Current (*future*) development

- Cloud-native architecture; improved performance and scalability
- Modern responsive web app to enable phone/tablet use
- Use in CancerMoonshot2020 research data collection with over 20,000 participants anticipated (www.cancermoonshot2020.org)
- Integration with clinical warehouses and bio-banking initiatives at large integrated health systems & integration with other apps (HL7 v3 Pedigree?)
- *Disease risk coverage beyond cancer to include common cardiovascular, neurologic, and metabolic conditions.*
- *Enable consumers to upload data from other sources (e.g., Blue Button/NATE)*
- *Connecting/sharing with family members via Facebook®*

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