Improving Outcomes and Lowering Costs with Precision Medicine

Presented By:

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Manchester University College of Pharmacy and Life Sciences

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THE RISE ASSOCIATION

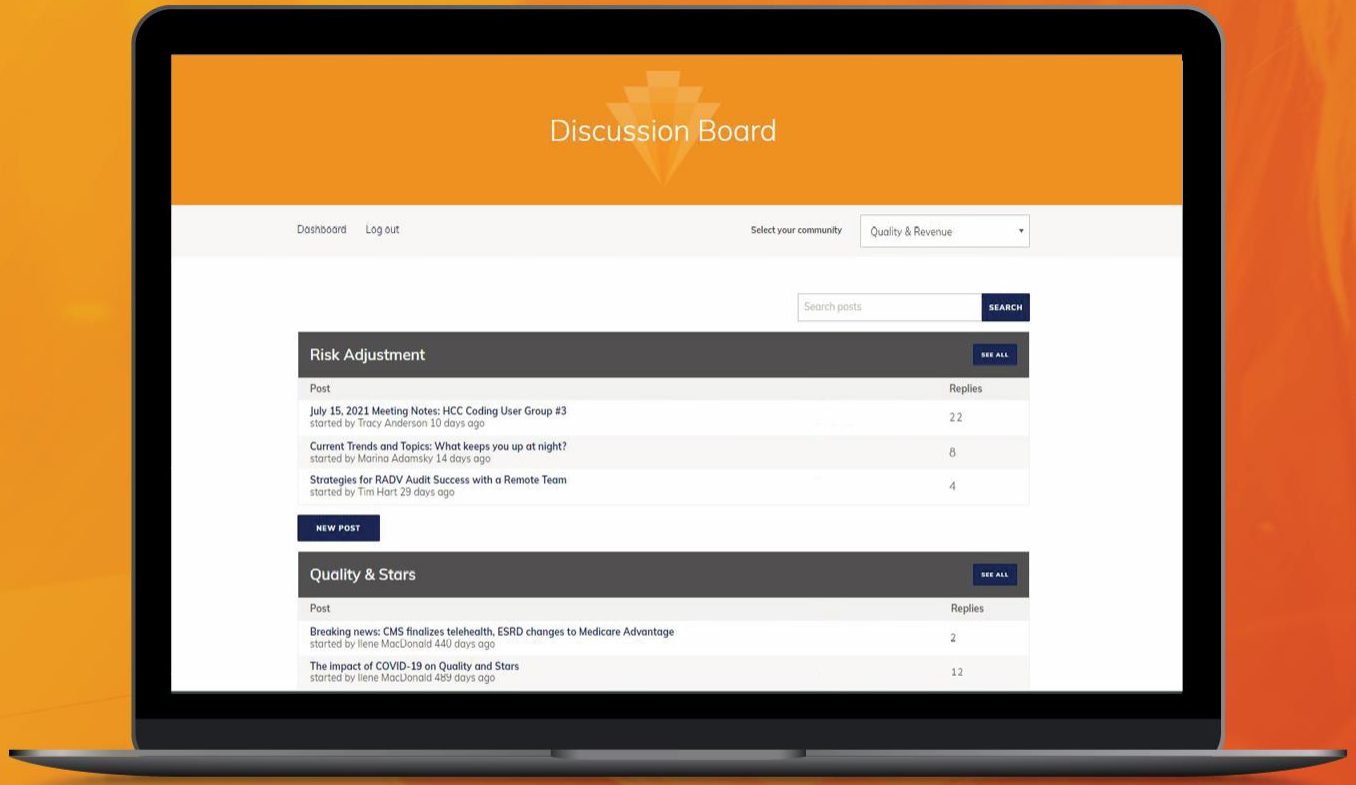
We are a network of health care professionals addressing the challenges posed by the emerging landscape of value-based care and government health care reform.

OUR MISSION

Our mission is to provide a community for like-minded professionals to come together for networking, education, and industry collaboration to stay ahead and advance their careers.

ONE ASSOCIATION
THREE COMMUNITIES

LEARN MORE AT THE RISEHEALTH.ORG/MEMBERSHIP



ASK YOUR QUESTIONS IN OUR DISCUSSION BOARD

Meet LetsGetChecked

We’re a global healthcare solutions company that gives patients the tools to manage their health from home, providing direct access to:

- Health insights
- At-home diagnostics
- Virtual consultations
- Pharmacy services
- Pharmacogenomics

Today we'll be talking about…

1. Understanding precision medicine
2. Evidence and application of pharmacogenomic testing
3. Lowering costs with precision medicine
4. The value of pharmacogenomics for you
5. Q & A

Understanding precision medicine

Dr. Avni Santani, Ph.D, FACMG

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Precision Medicine - Why Now?

80%

Of all treatments involved medications

50%

50% of 5B prescriptions are not filled or not taken as prescribed

$300B

Annual US costs attributed to medication non adherence

82%

Risk of ADR in patients with 7 or more medications

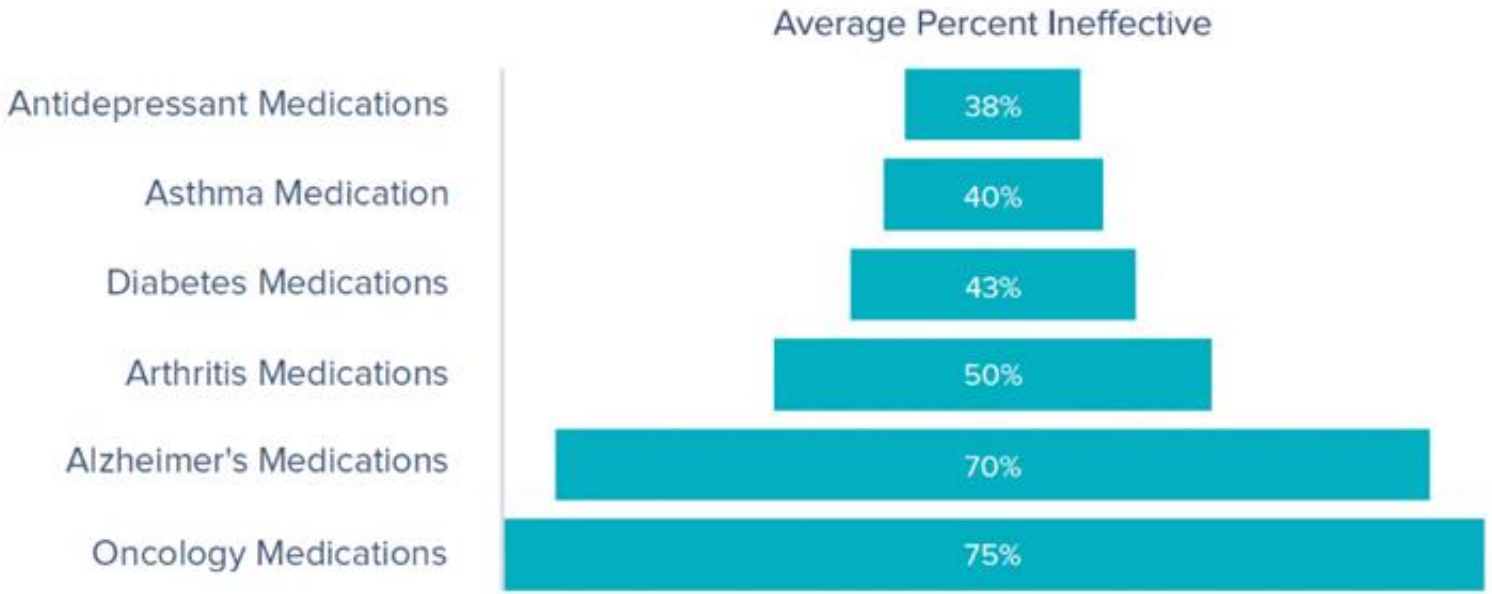
1.5M

Adverse Drug Events due to medication errors

$528B

Estimated cost of morbidity and mortality for non-optimized medications

The average percentage of patients in a given population for which a given drug is ineffective



1. Personalized Medicine Coalition. The personalized medicine report. https://www.personalizedmedicinecoalition.org/Userfiles/PMC-Corporate/file/PMC_The_Personalized_Medicine_Report_Opportunity_Challenges_and_the_Future.pdf. Accessed September 6, 2022.
1. Spear BB, Heath-Chiozzi M, Huff J. Clinical application of pharmacogenetics. Trends in Molecular Medicine. 2001;7(5):201-204

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Pharmacogenomics testing identifies an individual's response to medications

Enabling personalized treatment plans

214M

Patients from 2020 received a medication with PGx implications

99%

Of patients have one PGx variant

+25%

Of the top 200 drugs from 2020 have PGx implications

Pharmacogenomics Applications Across Therapeutic Areas

- Anesthesiology
- Cardiology
- Dermatology
- Endocrinology
- Gastroenterology
- Gynecology
- Hematology
- Infectious Diseases
- Metabolic
- Neurology
- Oncology
- Psychiatry
- Pulmonary
- Rheumatology
- Transplantation
- Urology

https://www.fda.gov/drugs/science-and-research-drugs/table-pharmacogenomic-biomarkers-drug-labeling

PGx Across Practice Settings & Organizations

Community pharmacies

Retirement systems

Long-term care

Regional medical centers

Employer benefit programs

Health plans

1. https://pharmaceutical-journal.com/article/research/how-community-pharmacy-pharmacogenomics-testing-services-around-the-world-can-inform-their-design-and-delivery-in-the-uk
2. https://www.mcknights.com/news/clinical-news/ltc-operator-to-use-genetic-testing-program-to-improve-care-for-residents-with-complex-needs/
3. https://pbghpa.org/will-pharmacogenomics-be-the-next-big-focus-for-employers-benefit-programs/
4. https://trs.ky.gov/wp-content/uploads/2022/03/Real-World-Impact-of-a-Pharmacogenomics-Enriched-Comprehensive-Medication-Management-Program.pdf
5. https://www.firelands.com/care-treatment/health-clinics/pharmacogenetics/

Applications of PGx

Predicting Drug Dose - Warfarin

Genes - CYP2C9 and VKORC1

Action: Dose optimization

Drug Safety - Codeine

Genes: CYP2D6

Action: Dose optimization or alternative analgesics

Utility of Pharmacogenomics (PGx) in improving outcomes while reducing costs

Maximize medication effectiveness

Mitigate medication risk

Improve medication adherence rates

Improve outcomes

Decrease total cost of care

Improve member satisfaction (CAHPS)

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Lee, C. R., Luzum, J. A., Sangkuhl, K., Gammal, R. S., Sabatine, M. S., Stein, C. M., Kisor, D. F., Limdi, N. A., Lee, Y. M., Scott, S. A., Hulot, J. S., Roden, D. M., Gaedigk, A., Caudle, K. E., Klein, T. E., Johnson, J. A., & Shuldiner, A. R. (2022). Clinical Pharmacogenetics Implementation Consortium Guideline for CYP2C19 Genotype and Clopidogrel Therapy: 2022 Update. Clinical pharmacology and therapeutics, 10.1002/cpt.2526. Advance online publication. https://doi.org/10.1002/cpt.2526

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Evidence and application of pharmacogenomic testing in lowering costs

Dr. David F. Kisor, BS, PharmD, FCP

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Key Factors Influencing Growth of PGx

1. Increasing pressure to decrease healthcare costs
2. Rising elderly population demands safe and optimized medication use
3. Increasing number of severe chronic diseases like cardiovascular disease, behavioral health, chronic pain and cancer
4. Growing awareness among policy makers, payers, health care providers and patients
5. The advancements integrated with molecular diagnostics procedures that make PGx testing affordable and accessible

Evidence based PGx guidelines developed by leading professional organizations and FDA

26
Unique evidence-based guidelines[1]

47
new or updated evidence-based guidelines to date[1]

188
PGx guideline annotations when considering evidence-based guidelines from all sources[2]

517
unique drug-gene pairs[3]

122
therapeutic drug recommendations, safety, effect on PK[4]

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1. https://cpicpgx.org/resources/
2. https://www.pharmgkb.org/guidelineAnnotations
3. https://www.fda.gov/drugs/science-and-research-drugs/table-pharmacogenomic-biomarkers-drug-labeling
4. https://www.fda.gov/medical-devices/precision-medicine/table-pharmacogenetic-associations

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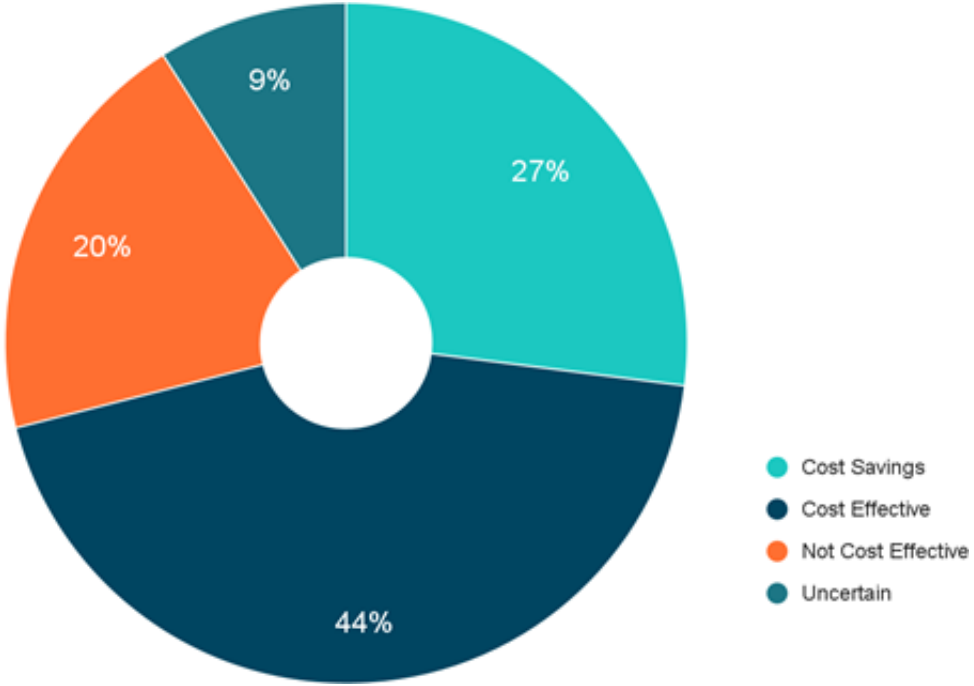
Cost Effectiveness of PGx Testing for Drugs with (CPIC) Guidelines



Morris SA, Alsaidi AT, Verbyla A, et al. Cost Effectiveness of Pharmacogenetic Testing for Drugs with Clinical Pharmacogenetics Implementation Consortium (CPIC) Guidelines: A Systematic Review. Clin Pharmacol Ther. 2022 Dec;112(6):1318-1328. doi: 10.1002/cpt.2754.

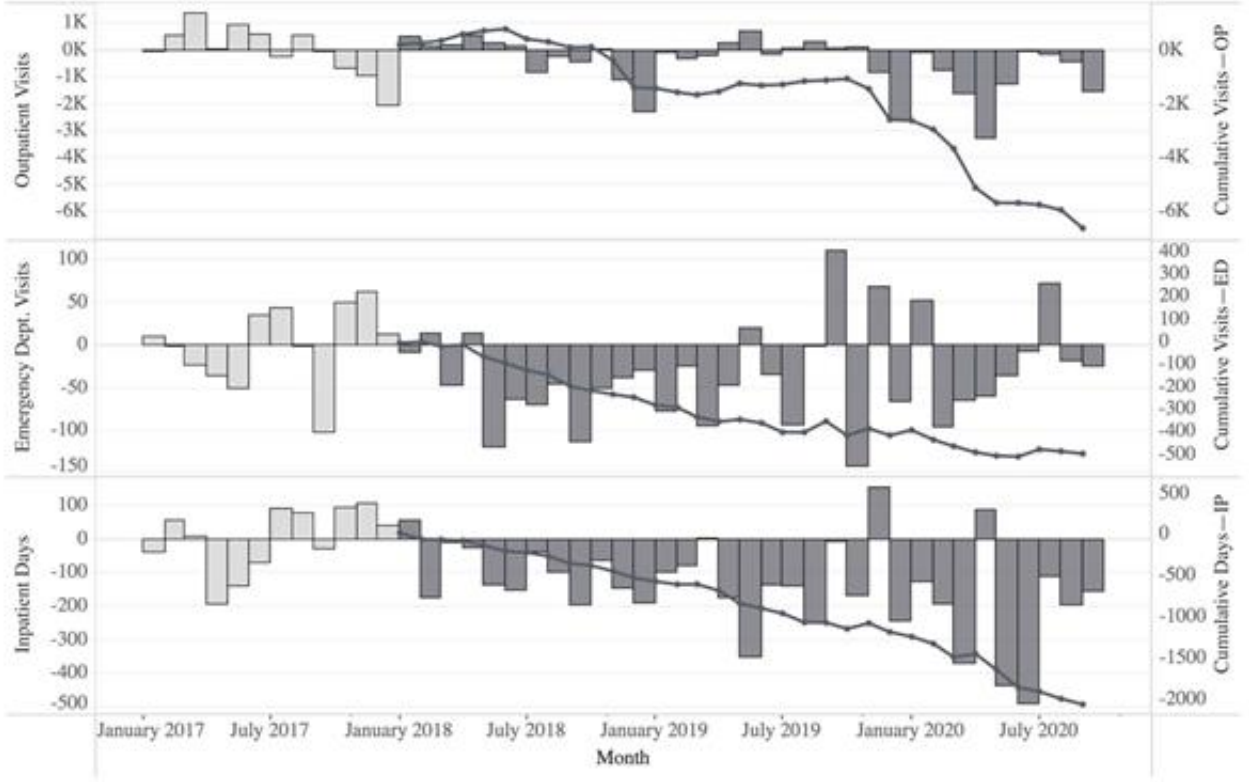
Cost of Prescription Drug-Related Morbidity and Mortality

	Total Cost (billions)*
Total physician visits	$37.8
Total hospital admissions	$174.0
Total emergency department visits	$37.2
Total long-term care admissions	$271.6
Total additional prescriptions	$7.8
Total deaths	-
TOTAL	$528.4

*May not equal events times cost for each resource in this table because of rounding

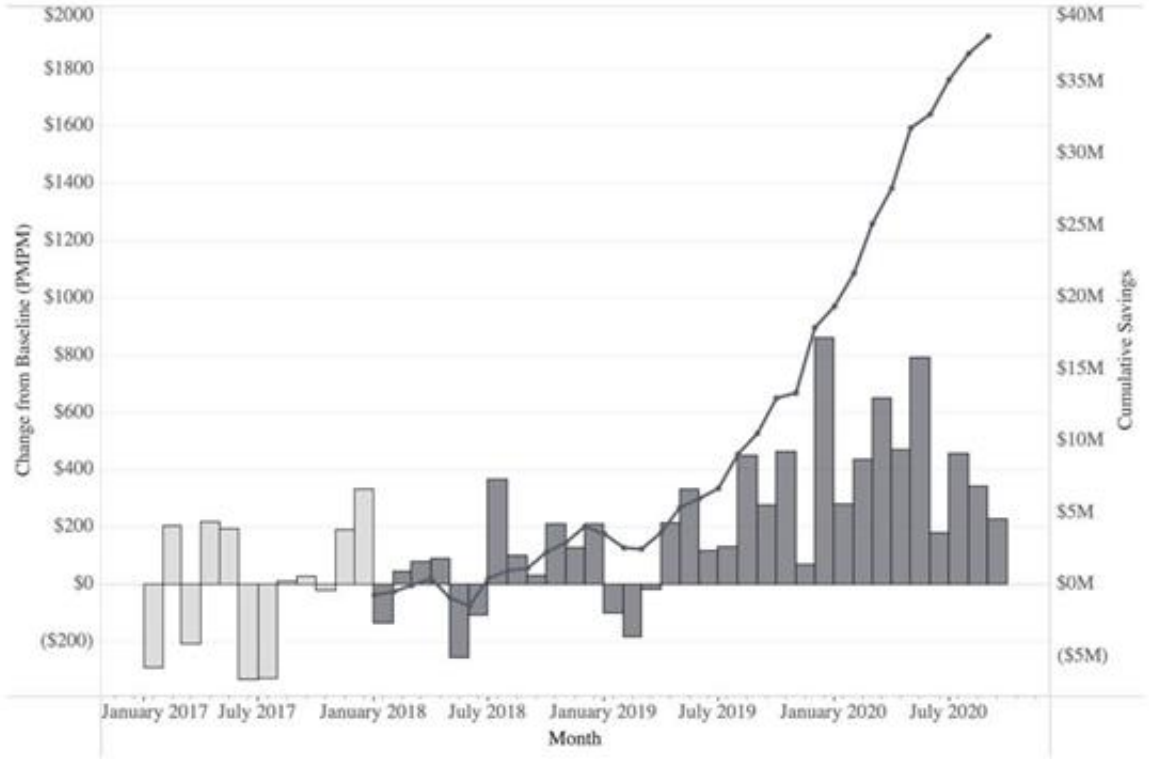
Watanabe JH, McInnis T, Hirsch JD. Cost of Prescription Drug-Related Morbidity and Mortality. Ann Pharmacother. 2018;52(9):829-837.

Decrease in healthcare resource utilization



Jarvis JP , Peter AP, Keogh M, et al. Real-World Impact of a Pharmacogenomics-Enriched Comprehensive Medication Management Program. *J Pers Med*. 2022;12:421.

Cumulative Savings = $37M



Jarvis JP , Peter AP, Keogh M, et al. Real-World Impact of a Pharmacogenomics-Enriched Comprehensive Medication Management Program. *J Pers Med*. 2022;12:421.

Introducing myPGx: A precision medicine solution for payers

Dr. Avni Santani, Ph.D, FACMG

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Value of Pharmacogenomics Testing for Payers

IMPROVE MEMBER SATISFACTION

Optimize patient treatment plans & improve brand equity, CAHPS

IMPROVE HEALTHCARE OUTCOMES

7.6% ↑ in medication adherence[2], improve outcomes[3,4]

DECREASE HEALTHCARE COSTS

20-30% ↓ in ADRs[1,5], ↓ in hospitalizations, ER visits, and Rx costs

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[1]https://pubmed.ncbi.nlm.nih.gov/27955861/
[2]https://pubmed.ncbi.nlm.nih.gov/26086890/
[3]https://pubmed.ncbi.nlm.nih.gov/24018772/
[4]https://pubmed.ncbi.nlm.nih.gov/27272045/
https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01841-4/fulltext

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Implementation considerations for a patient-centered PGx solution for payers

Stakeholders	Seamless Experience	Evidence Backed	Care Pathways/Result	Quality Measures & ROI
Member	for Member,	Approach	Integration	Analytics
HCP	Provider and			
Payer	Payer			

Youssef, E.; Bhattacharya, D.; Sharma, R.; Wright, D.J. A Theory-Informed Systematic Review of Barriers and Enablers to Implementing Multi-Drug Pharmacogenomic Testing. J. Pers. Med. 2022, 12, 1821. https://doi.org/10.3390/jpm12111821

Introducing myPGx

Identifies potential drug-gene interactions for 100+ drugs across three major disease categories, representing 800 million prescriptions, annually.

- ✓ Behavioral health, pain and cardiovascular drugs
- ✓ Member-friendly test and experience
- ✓ Clinical decision support to support medication therapy management

A comprehensive PGx panel across multiple therapeutic areas

	CONDITIONS AT A GLANCE	MEDICATIONS AT A GLANCE	ANNUAL UTILIZATION
 **PAIN MANAGEMENT**	Fibromyalgia Chronic Pain Acute Pain Post Operative Pain	Mobic Ultram Dilaudid Codeine	**87** million prescriptions **38** million patients
 **CARDIOVASCULAR**	High cholesterol Hypertension Heart Disease Blood Clots	Lipitor Toprol Plavix Coumadin	**284** million prescriptions **56** million patients
 **BEHAVIORAL HEALTH**	Depression Anxiety ADHD Bipolar Disorder	Celexa Paxil Ritalin Seroquel	**283** million prescriptions **64** million patients

ClinCalc | AHRQ, data from 2020

Configurable and vertically integrated infrastructure enabling next generation care

Our EMR

Manufacturing & Logistics
ISO & FDA registered for rapid distributic

Home Diagnostics
High-complexity labs in US and EU

Home Genetics
Precision medicine and full genome

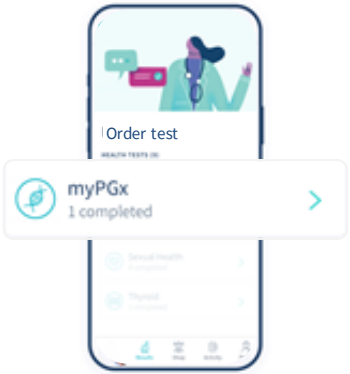
Custom Communications
Dynamic, multi-channel strategy

Telehealth
Chat and video consultations

Wearable data & risk scores
Tracking diet and exercise

E-Prescriptions
Condition focused prescribing

A simple, member-friendly experience



PROGRAM ANNOUNCEMENT

USER-FRIENDLY AT-HOME TEST

FAST & ACCURATE RESULTS

CLINICAL DECISION & MEMBER SUPPORT

ISABELLE | 65

Retired | Medicare member

Experiencing insomnia, nervousness, and trouble concentrating.
In the last year she lost both parents. Primary physician started her on the antidepressant Celexa® (SSRI) but she is still having difficulties. Despite trying different doses and changing medications, her side effects remain.

Takes myPGx and results indicate unable to effectively metabolize the drug.

PCP switches Isabelle to Effexor XR® from Celexa®

Sleeping and concentration improved. Isabelle is able to return to her normal routines.

THANK YOU

Laura Miles | LMiles@letsgetchecked.com