



# Improving the Genomic Literacy of Healthcare Professionals through the Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

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# Learning Objective

- Describe how the Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG) is improving genomic literacy for healthcare professionals, particularly in pharmacogenomics.



# Genomics is here... but are healthcare professionals ready?

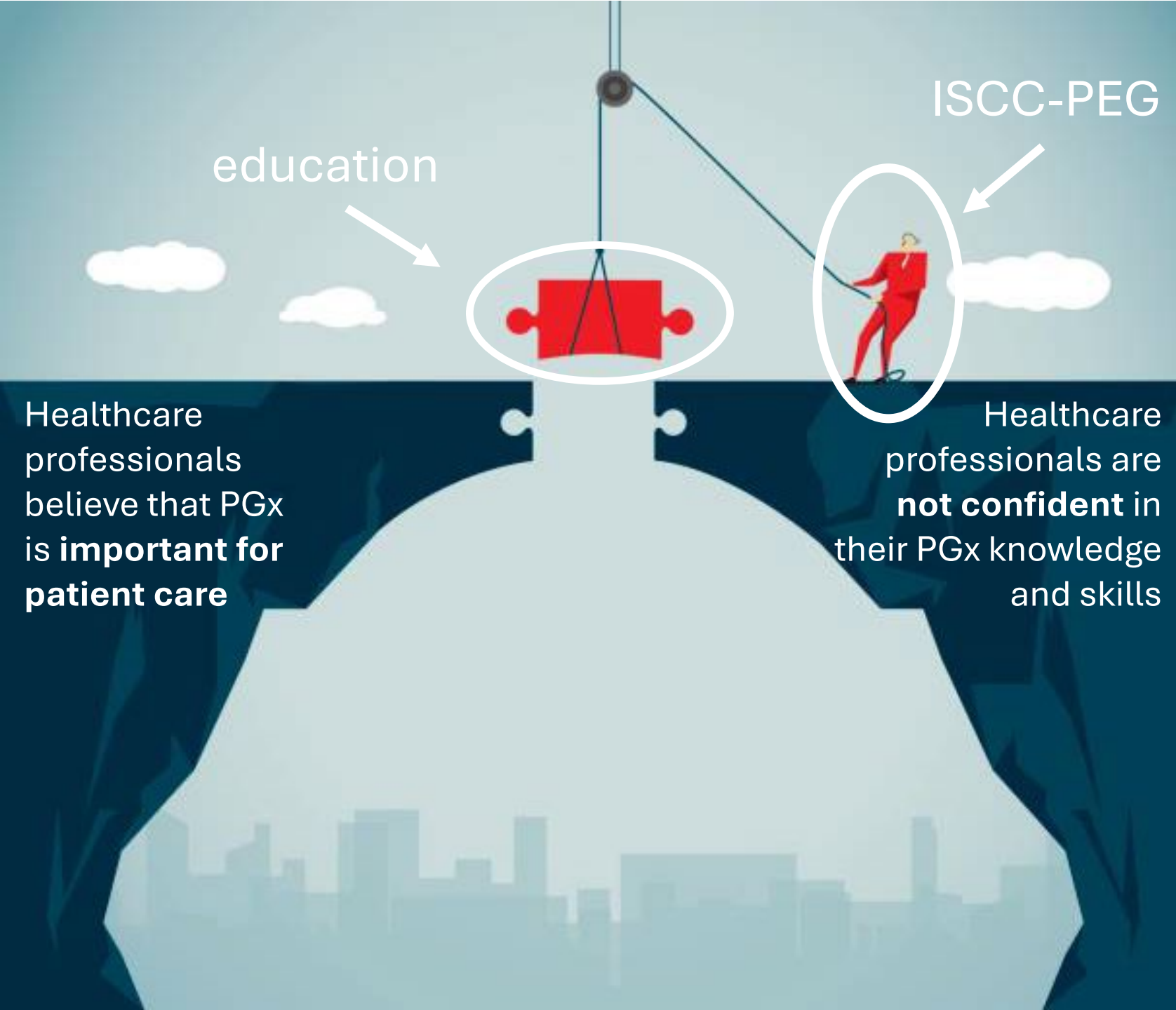
Healthcare professionals believe that PGx is **important for patient care**

Healthcare professionals are **not confident** in their PGx knowledge and skills

← What the data say



- Albassam, et al. *PLoS One*. 2018; 13(9):e0203033.  
Behr, et al. *Pharmacogenomics*. 2023; doi: 10.2217/pgx-2023-0028.  
Ho, et al. *Per Med*. 2022; 19(1): 15-23.  
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education

ISCC-PEG

Healthcare professionals believe that PGx is **important for patient care**

Healthcare professionals are **not confident** in their PGx knowledge and skills

How can we bridge the gap?

# Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

*Established in 2013*



## **Mission:**

*To **improve genomic literacy of healthcare providers** and enhance the effective practice of clinical genomic medicine by facilitating interactions among key stakeholders in genomics education. Through ISCC-PEG, members can collaborate to identify educational needs and potential solutions, share best practices in educational approaches and develop educational resources.*



National Human Genome  
Research Institute

<https://www.genome.gov/ISCC-PEG>



Donna Messersmith, PhD Richard Haspel, MD, PhD

# Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

## Goals:

1. Gather and facilitate dissemination of best practices and resources in genomics education and promote their translation into evidence based clinical care
2. Assist key stakeholders, including societies, professional organizations, NIH institutes, industry and individuals with expertise in medical education, in identifying gaps and barriers in genomics education for healthcare providers
3. Develop resources to promote healthcare provider education and effective practice of clinical genomic medicine

# Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

*>300 members from 61 organizations, 11 government institute groups, and 8 companies*

pharmacists

physicians

scientists

nurses



genetic counselors

physician assistants





# Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

## Project Groups:

Adult Cardiovascular  
Genomics

Direct-to-Consumer  
Genetic Testing

Inclusive Genetics

LGBTQI+ Issues in  
Genomics

Nursing Genomics

OB/GYN Genetics  
Curriculum

 Pharmacogenomics

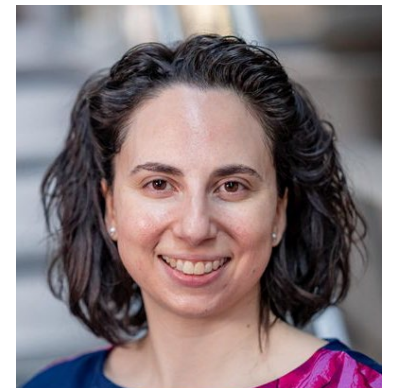
Physician Assistants  
in Genomics

Rare Diseases

# ISCC-PEG Pharmacogenomics Project Group

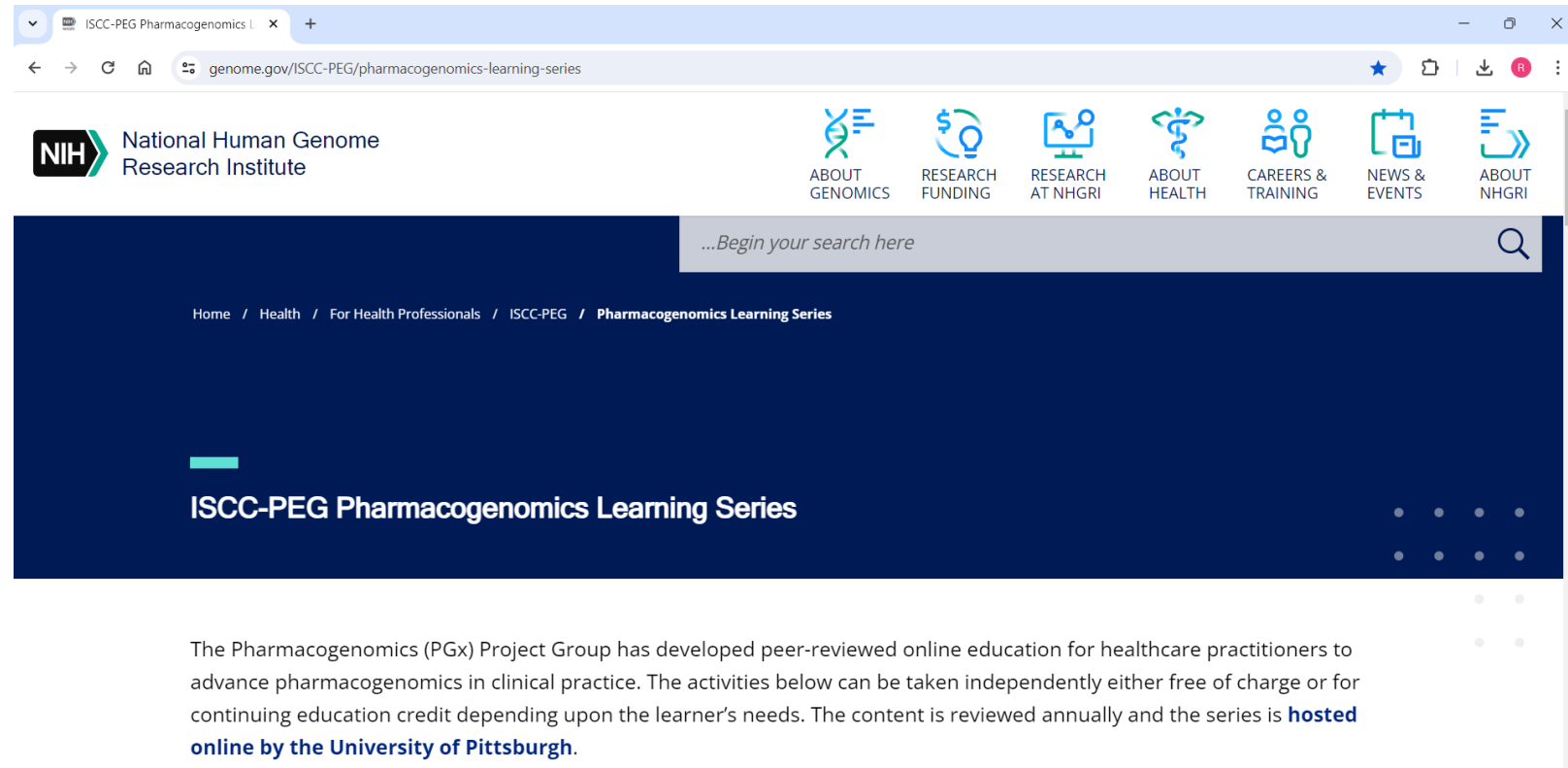
- Co-Chairs: Philip Empey, PharmD, PhD and Roseann Donnelly, PharmD
- >50 members, multidisciplinary
- Goals:

1. Create and/or re-purpose pharmacogenomics educational content and resources targeted to clinicians
2. Prepare for presentations at clinician professional meetings
3. Tailor pharmacogenomics educational content for nurses, pharmacists, physician assistants, genetic counselors, physicians, researchers, and other healthcare professionals
4. Educate the public in pharmacogenomics to improve healthcare



# ISCC-PEG PGx Learning Series

- ✓ Expert content
- ✓ Contemporary topics
- ✓ High accessibility
- ✓ For all healthcare professionals
- ✓ Broad dissemination



NIH National Human Genome Research Institute

ABOUT GENOMICS RESEARCH FUNDING RESEARCH AT NHGRI ABOUT HEALTH CAREERS & TRAINING NEWS & EVENTS ABOUT NHGRI

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Home / Health / For Health Professionals / ISCC-PEG / Pharmacogenomics Learning Series

## ISCC-PEG Pharmacogenomics Learning Series

The Pharmacogenomics (PGx) Project Group has developed peer-reviewed online education for healthcare practitioners to advance pharmacogenomics in clinical practice. The activities below can be taken independently either free of charge or for continuing education credit depending upon the learner's needs. The content is reviewed annually and the series is **hosted online by the University of Pittsburgh**.

<https://www.genome.gov/ISCC-PEG/pharmacogenomics-learning-series>

# ISCC-PEG PGx Learning Series

Module	Authors	Live?
Pharmacogenomics Nomenclature	Spoorthy Reddy	✓
Pharmacogenomics Resources	Philip Empey, Ben Brown	✓
Practical Aspects of Pharmacogenomics Implementation	Otito Iwuchukwu, Jenny Nguyen	✓
Direct-to-Consumer Pharmacogenomic Testing	Roseann Donnelly	✓
Genetic Testing	Emili Leary, Philip Empey	
Economics of Pharmacogenomic Testing	Karen Niemchick	
Navigating PGx Test Coverage in Medicare Populations	Ben Brown, Christine Formea, Sara Rogers	
Genotype-Guided Clopidogrel Treatment	Andrew Monte	
Optimization of Psychiatric Treatment with Pharmacogenomics	Keegan Hovlan, Andy Eugene, Daniel Mueller	

# Self-paced, accessible, on-demand



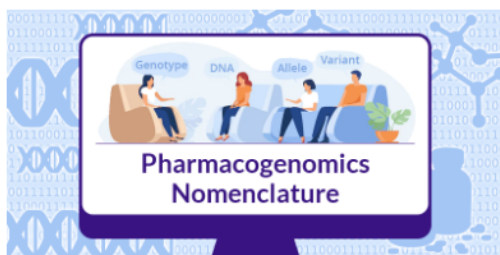
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## ISCC-PEG Pharmacogenomics Learning Series

The NHGRI Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG) aims to improve genomic literacy of healthcare professionals and enhance the effective practice of clinical genomic medicine by facilitating interactions among the key stakeholders in genomics education.

The Pharmacogenomics (PGx) Project Group has developed the pharmacogenomics educational modules. The activities can be taken independently either free of charge or for continuing education credit depending upon the learner needs.



### Pharmacogenomics (PGx) Nomenclature

This module educates healthcare professionals about pharmacogenomics nomenclature and how to apply pharmacogenomics information into clinical decision making.

Enroll



### Pharmacogenomics (PGx) Resources

This module educates healthcare professionals about evidence-based pharmacogenomic resources from the Food & Drug Administration (FDA), the Clinical Pharmacogenetics Implementation Consortium (CPIC), and the Pharmacogenomics Knowledgebase (PharmGKB).

Enroll

# Highly interactive with cases and debriefs

The screenshot displays a multi-tabbed interface for 'Test2Learn'. The left sidebar shows a course navigation menu with 'Pharmacology' selected. The main content area shows 'Question 5' with the following text:

On its Gene-Drugs page (<https://cpicpgx.org/genes-drugs/> [opens in a new tab]), the CPIC website offers a simple listing of gene-drug pairs with levels of evidence, whether there is PGx on the FDA label, and links to the peer-reviewed CPIC guideline publications. Each pair is also assigned prioritization, or a CPIC level.

Use this table to determine the CPIC level for each gene-drug pair below. Drag each gene-drug pair to its corresponding CPIC level.

CYP2D6-hydrocodone	CPIC Level A
OPRM1-hydrocodone	CPIC Level B
UGT1A4-lamotrigine	CPIC Level C
CYP2C19-citalopram	CPIC Level D

A 'SUBMIT' button is located at the bottom right of the question card.

# Disseminated with continuing education

- Free to learn!
- Continuing education (small fee) for:
  - Pharmacists (CPE)
  - Physicians (CME)
  - Nurses (CNE)
  - Physician Assistants (AAPA)

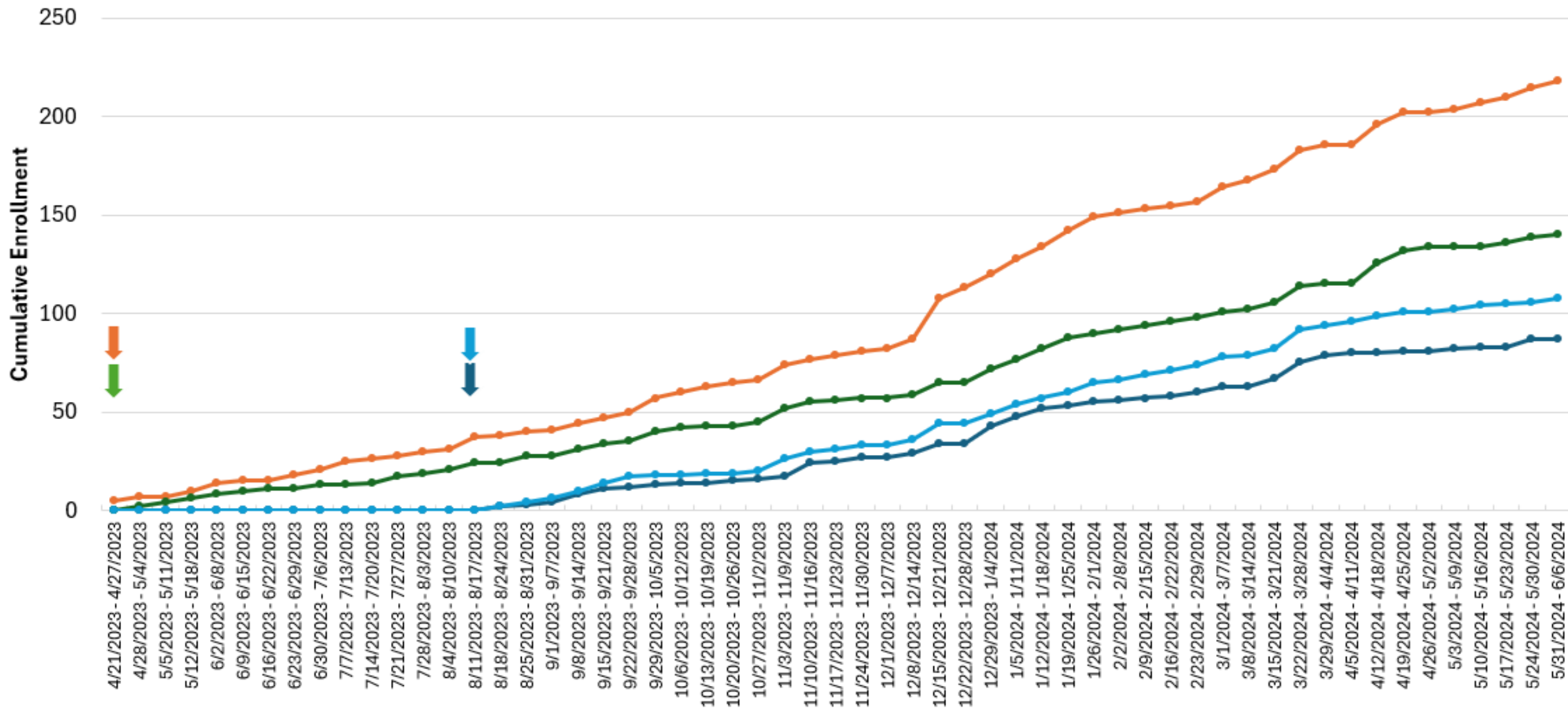
- Produced/hosted at the  University of Pittsburgh | School of Pharmacy

Check it out and share with your colleagues!



# ISCC-PEG PGx Learning Series Enrollment

- Direct-to-Consumer Pharmacogenomic Testing
- Pharmacogenomics Nomenclature
- Pharmacogenomics Resources
- Practical Aspects of Pharmacogenomics Implementation




Cumulative to date is n=553 (individual registrations) across 4 courses with little marketing. Arrows are launch dates.



# ISCC-PEG Pharmacogenomics Project Group

- Co-Chairs: Philip Empey, PharmD, PhD and Roseann Donnelly, PharmD
- >50 members, multidisciplinary
- Goals:
  1. Create and/or re-purpose pharmacogenomics educational content and resources targeted to clinicians
  2. Prepare for presentations at clinician professional meetings
  3. Tailor pharmacogenomics educational content for nurses, pharmacists, physician assistants, genetic counselors, physicians, researchers, and other healthcare professionals
  4. Educate the public in pharmacogenomics to improve healthcare





AAFP Presentations at the American Academy of Family Physicians (AAFP) Annual Meeting

- 2021 Pharmacogenetics: Basic Concepts and Practical Application
- 2022 Using Pharmacogenomics in Practice: A Step-by-Step Guide
- 2023 Pharmacogenetics: Principles and Application
- 2024 Pharmacogenomics: Mental Health



Robert Ostrander, MD

# Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)

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Adult Cardiovascular  
Genomics



Direct-to-Consumer  
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Inclusive Genetics

LGBTQI+ Issues in  
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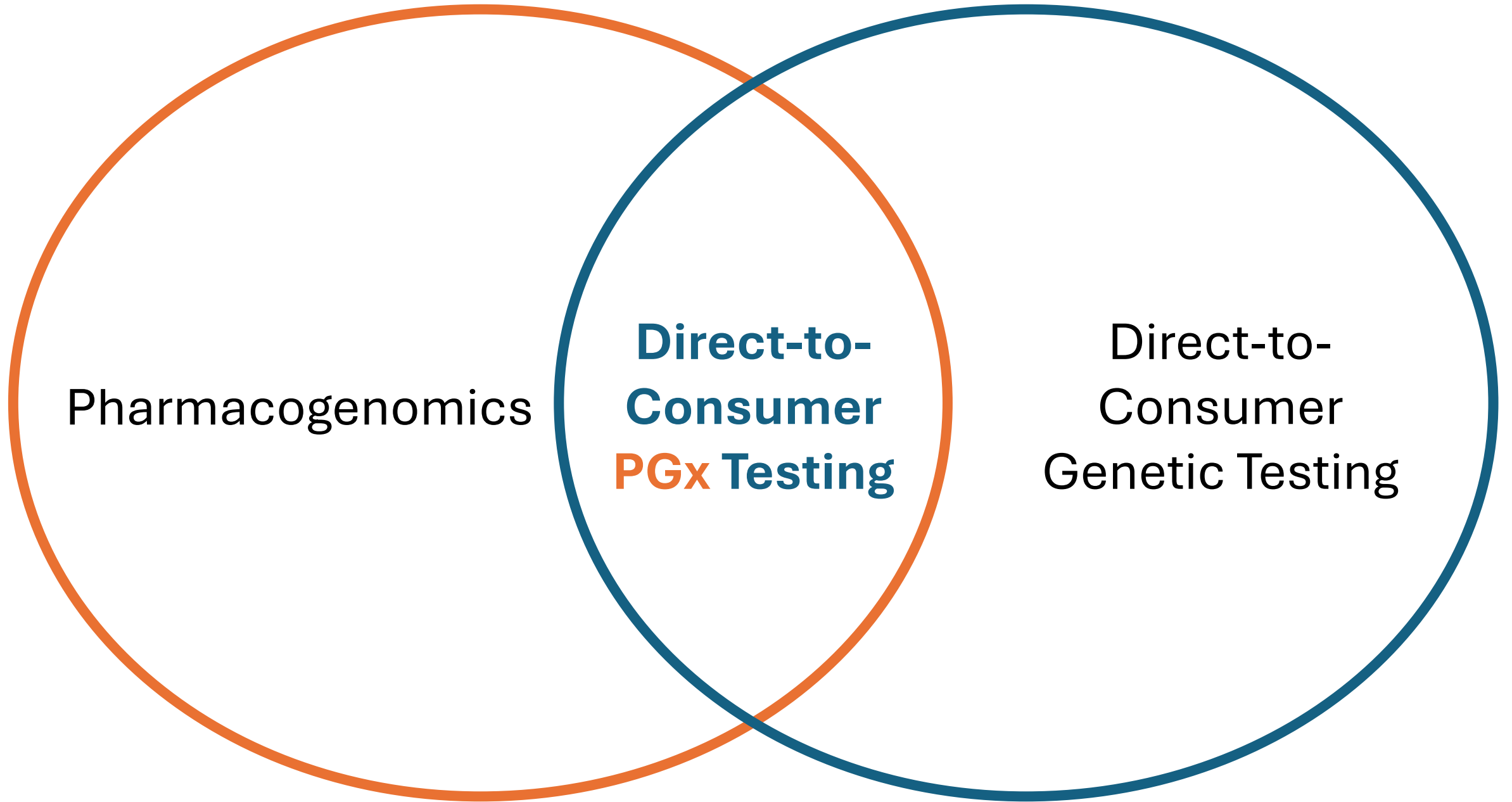
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Pharmacogenomics

Physician Assistants  
in Genomics

Rare Diseases



Pharmacogenomics

Direct-to-  
Consumer  
PGx Testing

Direct-to-  
Consumer  
Genetic Testing

# ISCC-PEG Direct-to-Consumer Genetic Testing Project Group

- Co-Chairs: Tracey Weiler, PhD and Houriya Ayoubieh, MD
- >30 members, multidisciplinary
- Goals:
  1. Assessing need, generating ideas and facilitating development for additional DTC-GT educational resources for healthcare professionals and trainees
  2. Identifying venues to partner with to develop and distribute DTC-GT educational resources appropriate to the needs of organizations needing DTC-GT education (ISCC-PEG member organizations and others)
  3. Collecting and documenting existing DTC-GT information resources (including educational, position statements and peer-reviewed literature and news media)



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Home / Health / For Health Professionals / Healthcare Provider Genomics Education Resources / Direct-to-Consumer Genetic Testing FAQ for Healthcare Professionals

# Direct-to-Consumer Genetic Testing FAQ

## For Healthcare Professionals



The Direct-to-Consumer Genetic Testing (DTC-GT) Project Group of the **Inter-Society Coordinating Committee for Practitioner Education in Genomics** has created a DTC-GT Frequently Asked Questions (FAQ) resource designed for the general clinician who may see patients requesting guidance on DTC-GT. This FAQ is intended to help healthcare professionals understand the diverse landscape of DTC-GT, the benefits and limitations of these tests and how results of DTC-GT may affect their patients' health, wellness and medical decision making.



## Explore This Page

[Direct-to-Consumer Genetic Testing for Healthcare Professionals >](#)

[Possible DTC-GT Results >](#)

[DTC-GT and Adopted Adults >](#)

[DTC-GT and Pharmacogenomic Information >](#)

[DTC-GT Raw Data, Third-Party Interpretation Services and Data Privacy >](#)

[DTC-GT and Insurance Coverage >](#)

[Costs of Genetic Testing >](#)

[DTC-GT Information for Patients >](#)

[Genetic Counselors and Other Genetics Professionals >](#)

[Videos from Healthcare Professionals' Genomics Education Week >](#)

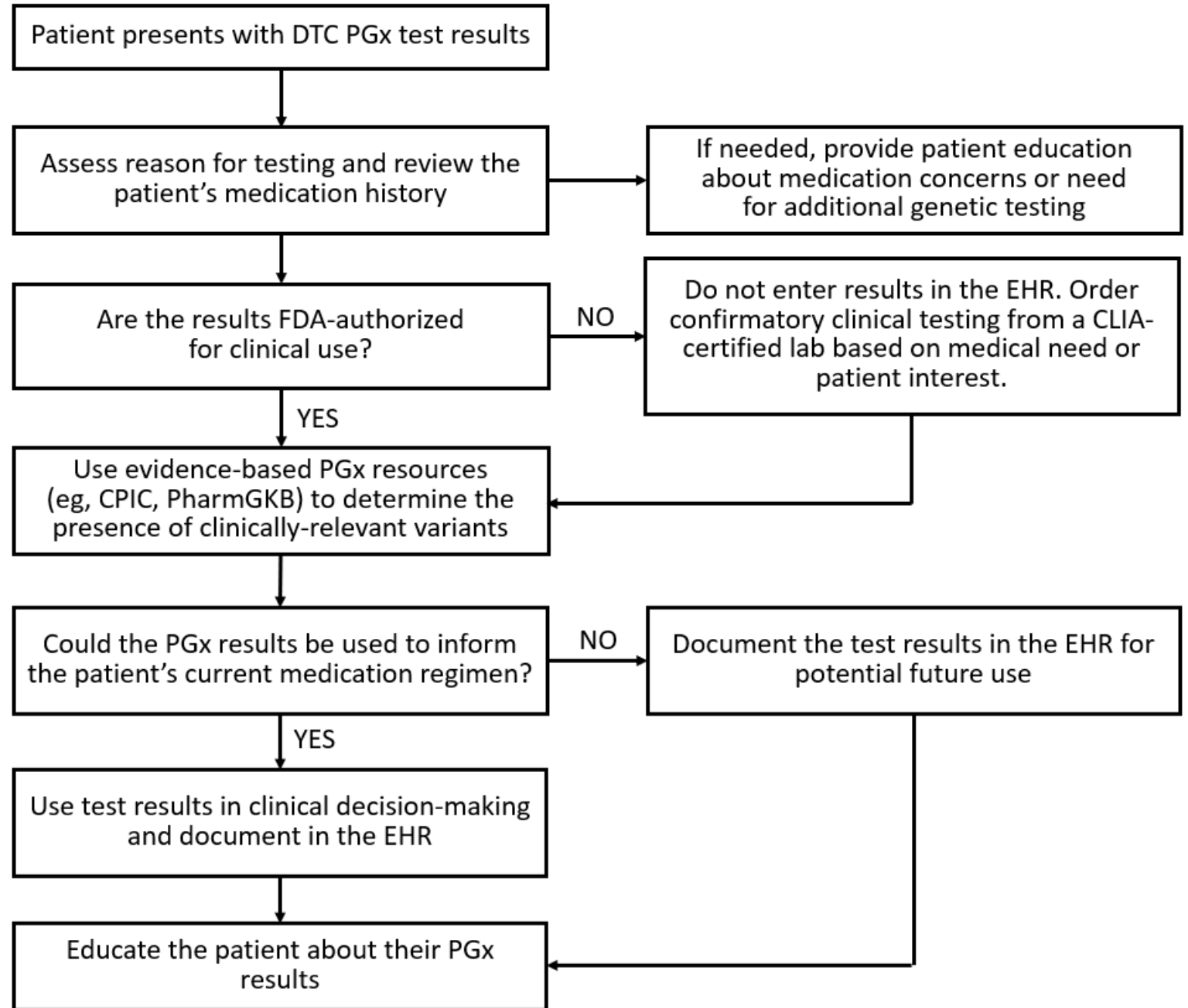
[Bibliography >](#)

[Authors and Reviewers >](#)

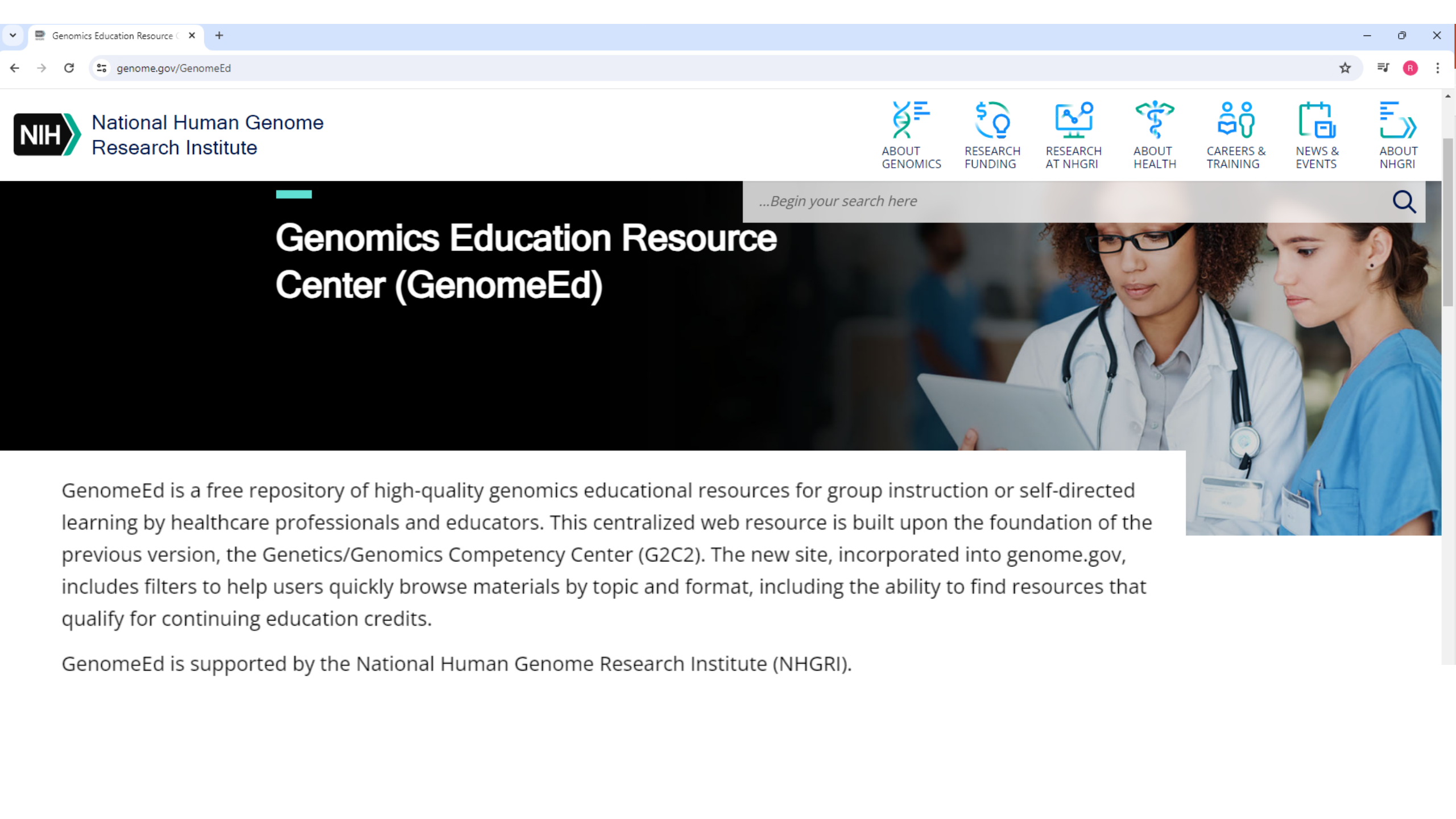
**Manuscript Title:**  
“When Patients Present  
with Direct-to-Consumer  
Pharmacogenomic Test  
Results”



**Authors:**  
Roseann S. Donnelly, PharmD  
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Elizabeth Kudron, MD, MPH  
Rachel Mills, MS  
Tracey Weiler, PhD  
Philip E. Empey, PharmD, PhD







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# Genomics Education Resource Center (GenomeEd)



GenomeEd is a free repository of high-quality genomics educational resources for group instruction or self-directed learning by healthcare professionals and educators. This centralized web resource is built upon the foundation of the previous version, the Genetics/Genomics Competency Center (G2C2). The new site, incorporated into genome.gov, includes filters to help users quickly browse materials by topic and format, including the ability to find resources that qualify for continuing education credits.

GenomeEd is supported by the National Human Genome Research Institute (NHGRI).

Displaying 1 - 18 of 18

Topic

Pharmacogenomics

- Any -
- Clinical Genetics
- Ethical, Legal and Social Implications
- Family History
- General Genomics
- Genetic Conditions
- Genetic Counseling
- Genetic/Genomic Testing
- Pharmacogenomics**
- Risk Assessment

Resource Format

- Any -

Continuing Education

- Any -

Filter

Reset

WEBSITE | FREE

### Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG) — National Human Genome Research Institute (NHGRI)

June 01, 2022 — The Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG) facilitates genomics education for healthcare providers through collaborative efforts among representatives of professional societies, industry and individuals.

**Continuing Education:** No

**Topic:** Genetic/Genomic Testing, Pharmacogenomics

CERTIFICATE | PAID

### Applied Pharmacogenomics Certificate Program — American College of Clinical Pharmacy (ACCP)

June 01, 2022 — Enables participants to apply pharmacogenomic information to clinical practice and select the most appropriate therapeutic interventions.

**Continuing Education:** Yes

**Topic:** Pharmacogenomics

DATABASE | FREE

### Clinical Genome Resource (ClinGen) — ClinGen - National Institutes of Health (NIH)

June 01, 2022 — Defines the clinical relevance of genes and variants for use in precision medicine and research.

**Continuing Education:** No

**Topic:** Clinical Genetics, Pharmacogenomics

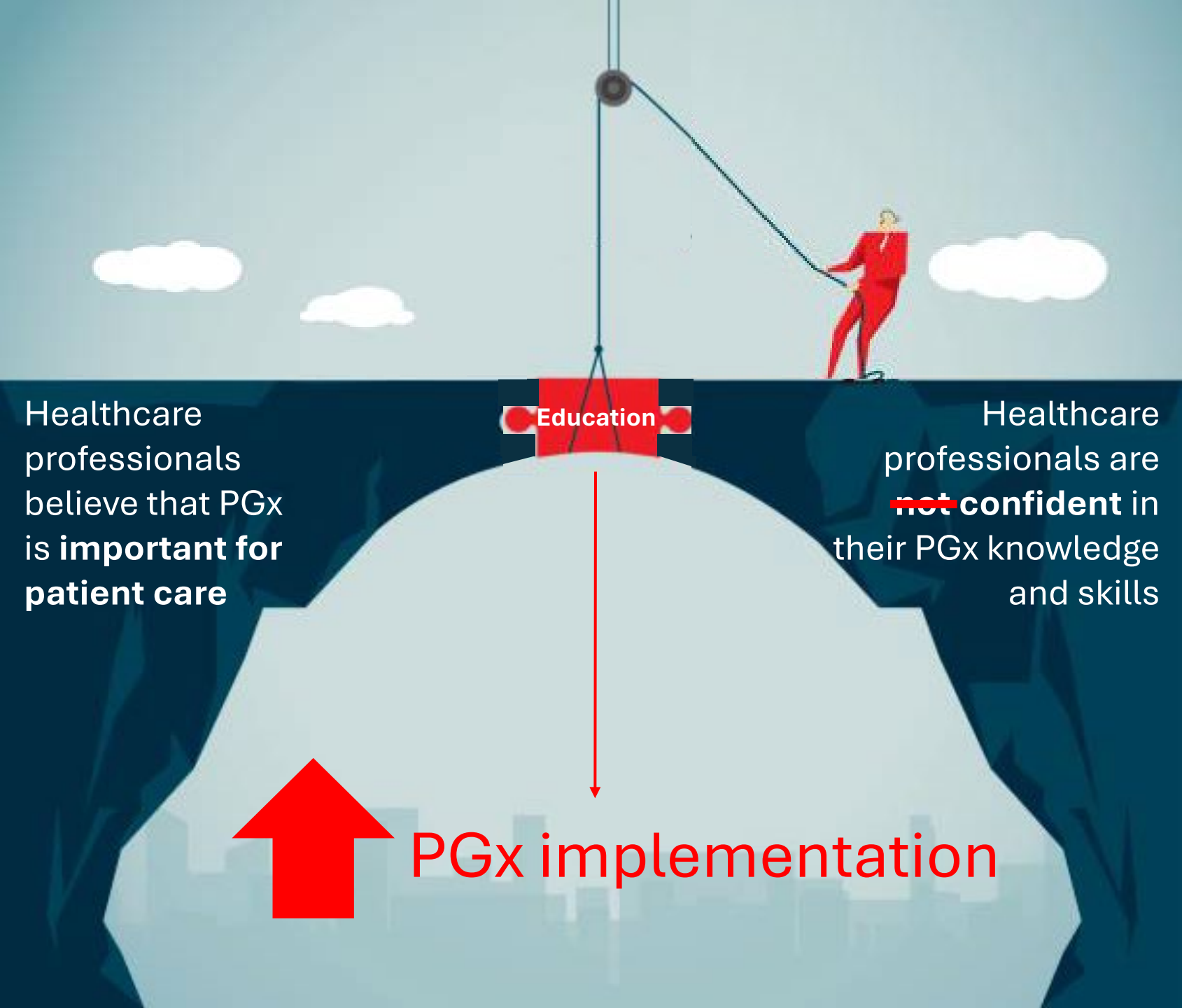
# Interested in genomics education? Join ISCC-PEG!

- Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC-PEG)
  - Free to join!
  - Collaborate to:
    - Identify educational needs and potential solutions
    - Share best practices in educational approaches
    - Develop educational resources
  - Scholars program:
    - Student opportunity: Work on a genetics/genomics-related education project under the mentorship of an ISCC-PEG member
    - Two-year appointment
    - Travel funded for the annual ISCC-PEG in-person meeting



Please visit:

[genome.gov/iscc](https://genome.gov/iscc)



The goal

# Acknowledgements

- National Human Genome Research Institute (NHGRI)
- ISCC-PEG Co-Chairs: Donna Messersmith, PhD and Richard Haspel, MD, PhD
- Beth Tuck, MA, NHGRI Education and Community Involvement Branch Chief
- ISCC-PEG Pharmacogenomics Project Group Co-Chair: Philip Empey, PharmD, PhD
- ISCC-PEG Direct-to-Consumer Genetic Testing Project Group Co-Chairs: Tracey Weiler, PhD and Houriya Ayoubieh, MD
- Members of the ISCC-PEG project groups



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