The University of Florida College of Pharmacy used personalized medicine to customize pain management and enhance safety of patient care.

**Overview of organization**

The University of Florida (UF) Health serves 1.5 million patients and is the largest comprehensive academic health center in the Southeastern US. This includes five hospitals (UF Health Hospital, Shands Children’s Hospital and a Veterans Affairs Medical Center, UF Health Jacksonville, and UF Health North) and a network of primary and specialty care centers throughout Northeast Florida and Southeast Georgia. The Health Science Center encompasses the colleges of Dentistry, Medicine, Nursing, Pharmacy, Public Health and Health Professions and Veterinary Medicine.

**Interprofessional Team**

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**Project Summary**

The University of Florida (UF) Health Personalized Medicine Program (PMP), a pharmacist-led effort to overcome barriers and facilitate clinical adoption of pharmacogenetic testing, focused their attention on opiates to improve patient outcomes through better-informed prescribing decisions.

**Importance**

Adverse drug effects are associated with significant morbidity, mortality, and healthcare costs. Genotype influences the risk for adverse drug effects, such as the risk for life-threatening respiratory depression with select opioids. Despite evidence supporting incorporation of genotype data into drug prescribing decisions to reduce the occurrence of adverse drug effects and improve patient outcomes, barriers have hindered clinical uptake of pharmacogenetics.
**Background**

University of Florida (UF) Health identified that opiate agonists were the second most frequently reported drug class linked to preventable adverse events with associated adverse outcomes and the prevalence of uncontrolled postsurgical pain.¹ The UF PMP data revealed that over 80% of their patients tested have at least one genetic variant that influences response to commonly prescribed medications. Focusing specifically on opioids, five to ten percent of patients inherit a deficiency in CYP2D6, which reduces the effectiveness of select opioids, while 1% to 2% have excess CYP2D6 enzyme activity making them at risk for serious and potentially life-threatening adverse effects with opioids.

**Actions**

UF’s PMP team, led by pharmacists and including physician champions and experts in clinical genotyping and health informatics launched the initiative with six key steps: evaluate the evidence, establish genotyping procedures, build informatics systems, provide education to the care team, track metrics and examine outcomes, and disseminate results at professional meetings and through publication.

The genotyping procedures were established in the clinical pathology laboratory, and genotyping is available to order across the health system. Pharmacy consultation and electronic clinical decision support was made available to assist physicians with incorporation of genotype results into prescribing decisions. They have expanded testing to other UF Health hospitals and established the infrastructure to support implementation of the service for additional gene–drug pairs. UF established a pharmacist-led Pharmacogenetics Consultation Clinic to optimize drug therapy plans for referred patients based on genotype results. In order to train the next generation of leaders in pharmacogenetic implementation, UF provides educational programs for providers, trainees, and students that incorporate personal genotype evaluation and has one of only two ASHP-accredited PGY2 residencies in pharmacogenetics.

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Objectives

- Increase overall safety of care.
- Enhance patient management and outcomes.

Results

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<th>Increased Overall Safety of Care</th>
<th>Enhanced Patient Management</th>
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<td>• Of the initial patients referred to the Pharmacogenomics Consultation Clinic, 76% had at least one genotype predictive of poor response to their existing therapy.</td>
<td>• In clinical study in 7 UF health clinics, chronic pain patients receiving PMP guided care reported a 30% (clinically meaningful) reduction in pain intensity compared to none who were being managed by traditional approaches.</td>
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<td>• Patients who will benefit the most were referred to the clinic.</td>
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Initiative Continuation

UF’s PMP team’s impactful work on CYP2C19 genotyping to predict clopidogrel response\(^2\) in patients undergoing percutaneous coronary intervention, led to their expansion into other gene-drug pairs including for pain management. CYP2D6 genetic testing related to opioids has been expanded to patients undergoing arthroplastic surgery pre-emptively to guide post-operative prescribing, as part of a pilot. At UF, their plan is to expand genotyping to patients undergoing other elective surgical procedures incorporating lessons learned from the pilot program. In addition, a second pharmacist was hired to expand the Pharmacogenomics Consultation Clinic given the growing volume of patients and physician demand. UF is advancing their work at the national level as part of an NIH funded network, Implementing Genomics in Practice (IGNITE) consortium to enhance incorporating genomic information into clinical care and explore methods for effective implementation, diffusion and sustainability in diverse clinical settings.

About the Award for Excellence in Medication Safety

The Award for Excellence in Medication Safety is a nationally acclaimed awards program that recognizes outstanding pharmacist leadership, teamwork, innovation and patient outcomes that demonstrate improvements in patient safety within a medication-use system in acute and ambulatory care settings. For over a decade, the award has been a collaboration between the ASHP Foundation and the Cardinal Health Foundation, to showcase the critical value and importance of pharmacist leadership in impacting the effective and safe use of medications on patient care and outcomes.

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\(^2\) The CYP2C19 genotype is a major determinant of clopidogrel effectiveness in preventing major adverse cardiovascular effects, including death, myocardial infarction, and stroke.