GENESYS Diagnostics INC.

CAP ACCREDITED
COLLEGE of AMERICAN PATHOLOGISTS

Clinical Laboratory Improvement Amendments

PHARMACONEGETICS IN PAIN

PRECISION PAIN MANAGEMENT

GENESYS Diagnostics Inc. can help prescribers improve pain management by determining the patient's ability to metabolize opioids, and to clarify which drugs and doses will be most effective during treatment through Pharmacogenetic (PGx) tests.

Genesys Diagnostics Pharmacogenetic (PGx) tests can help prescribers improve pain management by determining the patient's ability to metabolize opioids and to clarify which drugs and doses will be most effective during treatment. Most Americans have either experienced chronic pain or know someone who has. One out of five people experiencing chronic pain can have significant changes to their lives, such as employment status, residence, or personal freedom and mobility. Only 58% of current chronic pain sufferers that use prescription pain medication say they feel relief (2). Pain clinicians should perform PGx tests to lower the probability of adverse drug events (ADEs) and to optimize drug efficacy. Between 20-30% of patients possess genetic alterations in one of three major CYP450 enzymes, causing poor metabolism and thus mitigating medication affects (1). The Joint Commission's Sentinel Event Alert 49 identified opioid analgesics among the most frequently associated medications with ADEs, most ADEs are caused via drug/drug interactions (DDIs). Causes of opioid ADEs are also associated with poor knowledge of potencies, poor prescription/administration practices of the types of drugs/modalities, and poor patient monitoring during treatment (3).

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PGX PAIN PANELS

- **Pain Management Panel:** CYP1A2, CYP2D6, CYP2C19, CYP3A4, CYP3A5, CYP2B6, CYP2C9, OPRM1, Factor 11, Factor V, MTHFR
- **Comprehensive Panel:** CYP1A2, CYP2B6, CYP2C19, CYP2D6, CYP2C9, VKORC1, CYP3A4, CYP3A5, ADRA2A, OPRM1, COMT, Factor 11, Factor V, MTHFR, APOE, SLCO1B1, HTR2A

GENESYS Diagnostics Inc. Personalized Patient Care Panel identifies all metabolizer types, as well as any significant genetic variants in key metabolism enzymes: CYP2D6, CYP2C9, VKORC1, CYP2C19, CYP3A4, and CYP3A5.

OPTIMAL PRESCRIPTION PRACTICES

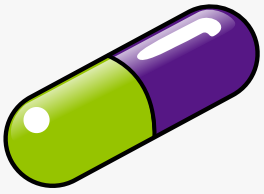
Most opioids are oxidatively metabolized and catalyzed by cytochrome CYP450 enzymes located in the liver and small intestine enterocytes. Common genetic variations in CYP450 can alter the rate of metabolism of drugs and may cause variations in efficacy or ADEs. Most opioid analgesics are metabolized by either CYP2D6, along with many non-steroidal anti-inflammatory drugs, or by CYP3A4/5 into more active metabolites. CYP2D6 and CYP3A4/5 are believed to metabolize 30% of all pharmaceuticals and are essential for metabolism of many commonly prescribed opioids including codeine, dihydrocodeine, oxycontin, and hydrocodone.

Pain management patients who do not respond to opioid analgesic properties of common opioids likely cannot metabolize them due to genetic incapability of generating the metabolite required for metabolism. Without knowledge of a patient's genetic profile, a physician may need to go through months of trial-and-error prescribing to find the best drug type and dosage for your care.

References
1. https://www.practicalpainmanagement.com/treatments/pharmacological/opioids/making-practical-sense-cytochrome-p450 Tennant. Forest, MD, DPH, Making Practical Sense of Cytochrome P450, Practical Pain Management
2.http://www.researchamerica.org/sites/default/files/uploads/poll2003pain.pdfPeter D. Hart ResearchAssociates, Americans Talk About Pain: A Survey Among Adults Nationwide {August 2003):7.
3.TheJoint Commission. SentinelEvent Alert 1ssue 49: Safe Use of Opioidsin Hospitals. August 8, 2012:1.

ABOUT US

Genesys Diagnostics provides a range of clinical diagnostic services to physicians, hospitals, and laboratories across the country.



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