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The Role of Phase II Metabolic Enzymes and Drug Transporters on Buprenorphine Pharmacogenomics in Opioid Use Disorder Management

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Opioid use disorder (OUD) constitutes a significant public health challenge, especially within the African American community. Approaches for combating the OUD epidemic have included cognitive behavioral therapy (CBT) and medication-assisted treatment (MAT) with either methadone, buprenorphine, or naltrexone. Although there are treatment modalities available for OUD management, there is variability in treatment outcomes among patients. Some of the variability may be attributable to genetic variations, or genetic polymorphisms, in the genes responsible for the pharmacokinetics (PK) and pharmacodynamics (PD) of the drugs used for MAT. Pharmacogenomics is the study of how genetic polymorphisms impact drug response. Pharmacogenomic testing has elucidated that the CYP3A4*1B polymorphism conferred an ultrarapid metabolizer phenotype in a cohort of African American patients being managed on buprenorphine. However, some Phase II metabolic enzymes and drug transporters interact with buprenorphine and their contributions to buprenorphine pharmacogenomics are not fully understood. More genetic targets of interest need to be interrogated in order to gain a better understanding of the gene-drug interactions that impact buprenorphine PK and PD. Furthermore, pharmacogenomic considerations need to be included in the clinical trial process to ensure that the results generated from the research are generalizable to a broader scope of patients.