Application of Antidepressant Pharmacogenomics

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Pharmacogenomics has emerged as a potential tool for providing mechanistic explanations for the wide interindividual variability observed in antidepressant pharmacokinetics, therapeutic effectiveness, and adverse drug reaction risk. Genetic polymorphisms in drug-metabolizing enzymes, particularly within the cytochrome P450 system, contribute substantially to this variability. Growing real-world evidence shows that integrating pharmacogenomic information with clinical factors and plasma concentration monitoring can support more precise antidepressant therapy, moving beyond traditional trial-and-error approaches. This talk will discuss current evidence supporting genotype-guided antidepressant therapy and outline challenges and future directions for implementing pharmacogenomic-based precision prescribing in routine mental health care.