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Pharmacovigilance: A Comprehensive Review

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Abstract: *Pharmacovigilance is a critical field in healthcare that focuses on the detection, assessment, understanding, and prevention of adverse drug reactions (ADRs) and other drug-related issues. With the increasing complexity of modern pharmacotherapy, pharmacovigilance plays a vital role in ensuring patient safety and the effective use of medications. This review provides a comprehensive overview of pharmacovigilance, highlighting its importance in both pre-market and post-market drug safety. It discusses the key components of pharmacovigilance systems, including ADR reporting, signal detection, risk management, and regulatory frameworks. The review also explores recent advancements, such as the integration of artificial intelligence, big data, and real-world evidence in monitoring drug safety. Challenges in pharmacovigilance, including underreporting, data integrity, and the monitoring of biologics and orphan drugs, are also addressed. Additionally, the review examines the role of pharmacovigilance in special populations, including pediatric, geriatric, and rare disease patients. In conclusion, pharmacovigilance remains an essential discipline in ensuring the continued safety and efficacy of medicinal products, with ongoing advancements enhancing its capabilities.*

Keywords: Pharmacovigilance, Adverse Drug Reactions (ADRs), Signal Detection, Risk Management, Artificial Intelligence, Big Data, Real-World Evidence, Drug Safety, Regulatory Frameworks, Biologics, Orphan Drugs, Pediatric Pharmacovigilance, Geriatric Pharmacovigilance, Reporting Systems, Post-Marketing Surveillance