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More than 170 years ago, a healthy 15-year-old girl from England, died after receiving a chloroform anesthetic before the removal of an infected toenail. Hannah Greener's death was the first death attributed to this novel drug, which had recently replaced the use of ether as anesthesia for surgical pain relief. As a result of other deaths reported by clinicians and the public, a commission was established to investigate the problem. All English doctors were requested to report deaths caused by the anesthesia and the findings were later published in *The Lancet* Journal.

Although at that time these efforts didn't come under the term pharmacovigilance, this is considered as one of the first major attempts to monitor the correlation between the risk and the benefit of a drug in order to improve patients' safety.

Many years later, the pharmaceutical industry continues to develop and test a huge number of drugs designed to treat and prevent diseases. And the work doesn't stop with launching a new medicine licensed for sale on the market. Per laws and regulations, Pharma companies are required to continue monitoring for possible adverse drug reactions (ADR) to a specific medication. If such adverse events occur, they need to promptly report them to the regulators.

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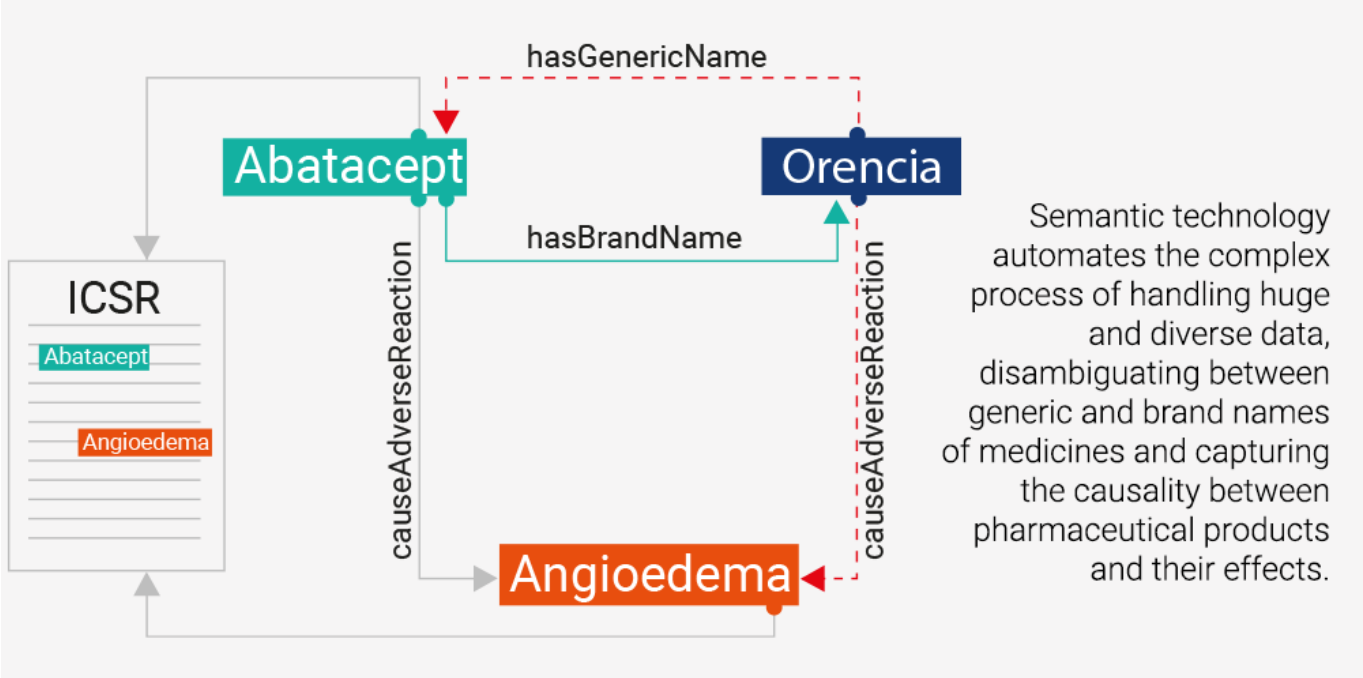
The Hurdles of Collecting Drug Safety Data

While drug discovery and development strategies for new drugs have undergone significant changes over the 170 years since Hannah Greener's death, the amount of data and information about administering drugs, drug-drug interactions, side effects and drug efficacy has soared.

These data and information come in various formats and from multiple sources such as proprietary company data, Individual Case Safety Reports (ICSRs), regulatory pharmacovigilance guidelines, medical literature, public datasets of medical terminology or the public reporting systems for adverse events (FDA, EMA).

As a result, one of the biggest challenges for the Pharma industry is how to quickly and efficiently track all relevant data. For example, although scientific literature provides invaluable information about adverse events reporting, Pharma companies are investing enormous time and effort in monitoring and assessing huge volumes of free-flowing texts.



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Coming to the Rescue: Semantic Technology

The solution to a smart and dynamic monitoring of scientific literature lies in semantic technology and its power to extract information from various sources and in various formats, interlink them and infer new knowledge out of explicit facts. With its help, Pharma companies can put their proprietary adverse events data in the context of publicly available data and get the bigger picture.

Semantic technology automates the complex process of handling huge and diverse data, disambiguating between generic and brand names of medicines and capturing the causality between pharmaceutical products and their effects. This makes the identification of potential adverse events mentioned in scientific literature much easier and more efficient.

Ontotext's Smart Solution for Monitoring Adverse Events in Scientific Literature

Text analysis and knowledge graph technology are at the core of Ontotext's solution for tracking and collecting drug safety data. Text analysis extracts structured facts out of scientific literature texts and the knowledge graph creates a dynamic collection of interlinked descriptions of drug-related entities and more abstract concepts.

Thanks to the comprehensiveness of the knowledge graph describing all currently known drug adverse events, the new safety signals are automatically detected as they are ingested in the knowledge graph. This reduces the time and effort Pharma companies spend on collecting, detecting, assessing, monitoring and preventing adverse effects of pharmaceutical products.

Read our case study to see how our smart AI-based solution helps pharmaceutical companies monitor adverse events timely and efficiently or discuss your particular use case with us.

Book a Discovery Call

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