# NHS considers DNA test to prevent adverse drug reactions



The National Health Service (NHS) is considering the implementation of a straightforward DNA test designed to predict and prevent adverse drug reactions (ADRs), which could potentially save thousands of lives in the UK. This follows a significant study that has reviewed all recorded ADRs in Britain since 1964, revealing that a mere three genes may be responsible for a substantial number of these reactions. The scientists behind this research are advocating for routine genetic testing to be conducted prior to prescribing certain medications to patients.

Research indicates that ADRs account for approximately one out of every 15 acute hospital admissions, resulting in over 5,000 fatalities annually in England. The risk of experiencing potentially fatal reactions increases particularly among older individuals who are often managing multiple health conditions. Notably, one in ten elderly patients is reported to be on at least eight prescribed medications per week.

The comprehensive study comprised an analysis of over one million reports of dangerous drug reactions recorded in Britain, underscoring its scale and significance. Co-author Professor Sir Mark Caulfield highlighted the findings, stating, “This is the largest analysis of the potential role of pharmacogenomics in adverse reactions from a national spontaneous reporting system. It suggests that 9% of these reports may relate to our genetic make-up.” He further remarked on the potential for preventability: “This could be avoidable if we had measured the genetic make-up of the person before prescribing these medicines. It is time for the NHS to consider adopting pre-emptive testing for known genes that interact with medications.”

The origins of Britain's Yellow Card Scheme can be traced back to 1964, established in response to the thalidomide tragedy—a drug that caused severe birth defects when administered to pregnant women for morning sickness. This voluntary reporting system, overseen by the Medicines and Healthcare products Regulatory Agency (MHRA), enables healthcare professionals, patients, and caregivers to report suspected ADRs, contributing to vital drug safety surveillance across the UK.

The scheme has amassed over one million reports and serves as an essential element of drug safety within the country. Its findings revealed that around 9% of reported ADRs are linked to medications whose side effect risk is partially determined by the patient's genetic profile. Notably, three quarters of these specific ADRs are associated with only three genes. The research team at Queen Mary University of London posits that implementing genetic testing before prescription could significantly mitigate the incidence of ADRs in these scenarios.

Dr Emma Magavern, the study's lead researcher from Queen Mary’s Centre for Clinical Pharmacology, emphasised the importance of understanding the historical landscape of side effects reported in the UK. She stated, “It is important to understand the landscape of side effects reported nationally over the past half century to elucidate the impact that prospective use of genetic testing to personalise prescribing may have in the UK.”

Previous research indicates that over 99% of individuals carry genetic variants that might lead to ADRs, resulting in a range of complications including extended hospital stays or even fatalities. The financial toll of ADRs on the NHS is estimated to exceed £2 billion annually.

ADRs are typically categorised into two groups: Type A reactions, which are more common and often dose-dependent, meaning they could potentially be avoided with appropriate dosing; and Type B reactions, which tend to be more severe and occur when a patient's body cannot tolerate a specific drug combination.

June Raine, the chief executive of the MHRA, acknowledged the relevance of the study, asserting, “This study shows how reports of suspected side effects to the Yellow Card scheme can help us better understand and prevent serious side effects, including those linked to genetic factors.” The Yellow Card Scheme is currently collaborating with Genomics England and the UK Biobank to develop a comprehensive dataset that combines ADR reports with patients’ genetic information. For those wishing to report a suspected ADR, information is available through the Yellow Card scheme’s website, app, or dedicated helpline.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.genomicsengland.co.uk/news/genetic-testing-could-lower-the-risk-of-adverse-drug-reactions-for-thousands-of-patients-with-cancer> - This article supports the claim that genetic testing can lower the risk of adverse drug reactions for thousands of patients with cancer by identifying genetic variants linked to harmful reactions to certain medications.
* <https://www.genomicseducation.hee.nhs.uk/blog/a-world-first-in-pre-emptive-pharmacogenomic-testing/> - This article highlights a study demonstrating a 30% reduction in adverse reactions through pharmacogenomic testing, underscoring the potential benefits of genetic testing in preventing adverse drug reactions.
* <https://www.genomicsengland.co.uk/blog/genomic-testing-could-lower-the-risk-of-adverse-drug-reactions-for-thousands-of-patients-with-cancer> - This blog post explains how pharmacogenomics can help predict drug responses and=$((reduce)) the risk of adverse drug reactions, emphasizing the potential for genetic testing in cancer treatment.
* <https://www.mhra.gov.uk/yellowcard> - This link to the Yellow Card Scheme's official website provides information on reporting suspected adverse drug reactions, supporting the narrative about the importance of drug safety surveillance in the UK.
* <https://www.nhs.uk/news/pharmacogenetics/personalised-genetic-testing-for-medicines/> - This article discusses personalized genetic testing in the context of the NHS, highlighting efforts to tailor drug prescriptions based on individual genetic profiles to minimize adverse reactions.