# Researchers harness the power of AI to match patients with the most effective antidepressant for their unique needs

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Researchers at George Mason University's College of Public Health have leveraged the power of artificial intelligence (AI) analytical models to match a patient's medical history to the most effective antidepressant, allowing patients to find symptom relief sooner. The free website, MeAgainMeds.com, provides evidence-based recommendations, allowing clinicians and patients to find the optimal antidepressant the first time.

"Many people with depression must try multiple antidepressants before finding the right one that alleviates their symptoms. Our website reduces the number of medications that patients are asked to try. The system recommends to the patient what has worked for at least 100 other patients with the same exact relevant medical history," said Farrokh Alemi, principal investigator and professor of health informatics at George Mason University's College of Public Health.

AI helped to simplify the very complex task of making thousands of guidelines easily accessible to patients and clinicians. The guidelines that researchers created are complicated because of the amount of clinical information that is relevant in prescribing an antidepressant; AI seamlessly simplifies the task.

With AI at its core, MeAgainMeds.com analyzes clinician or patient responses to a few anonymous medical history questions to determine which oral antidepressant would best meet the specific needs. The website does not ask for any personal identifiable information and it does not prescribe medication changes. Patients are advised to visit their primary health care provider for any changes in medication.

In 2018, the Centers for Disease Control reported that more than 13% of adults use antidepressants, and the number has only increased since the

pandemic and other epidemics since 2020. This website could help millions of people find relief more quickly.

Alemi and his team analyzed 3,678,082 patients who took 10,221,145 antidepressants. The oral antidepressants analyzed were amitriptyline, bupropion, citalopram, desvenlafaxine, doxepin, duloxetine, escitalopram, fluoxetine, mirtazapine, nortriptyline, paroxetine, sertraline, trazodone, and venlafaxine.

From the data, they created 16,770 subgroups of at least 100 cases, using reactions to prior antidepressants, current medication, history of physical illness, history of mental illness, key procedures, and other information. The subgroups and remission rates drive the AI to produce an evidence-based medication recommendation.

"By matching patients to the subgroups, clinicians can prescribe the medication that works best for people with similar medical history," said Alemi. The researchers and website recommend that patients who use the site take the information to their clinicians, who will ultimately decide whether to prescribe the recommended medicine.

Alemi and his team tested a protype version of the site in 2023, which they advertised on social media. At that time, 1,500 patients used the website. Their goal is to improve the website and expand its user base.

The researchers' most recent paper in a series of papers on response to antidepressants analyzed 2,467 subgroups of patients who had received psychotherapy. "Effectiveness of Antidepressants in Combination with Psychotherapy" was published online in *The Journal of Mental Health Policy and Economics* in March 2024.

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**More information:** Effectiveness of Antidepressants in Combination with Psychotherapy, *The Journal of Mental Health Policy and Economics* (2024). pubmed.ncbi.nlm.nih.gov/38634393/

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