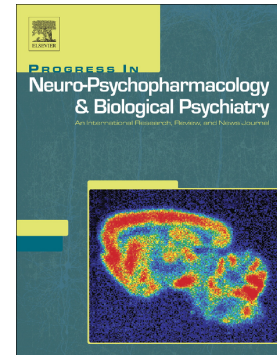


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## Pharmacogenetic tests to guide drug treatment in depression: comparison of the available testing kits and clinical trials

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### Abstract

The empirical approach to drug choice and dosing in depression often results into inadequate response and side effects. Pharmacogenetic (PGx) testing appears a promising way to implement personalized treatments. A systematic review was performed to identify available PGx tests, compare the genes they include with clinical guidelines and drug labels, and assess the quality of published clinical studies.

~40 commercial PGx tests are available and potential benefits were estimated for nine of them by clinical studies. The most part of studies are observational (9/21) or non-randomized case-control trials that compared standard care with PGx-guided treatment (6/21), six randomized controlled trials (RCTs) are available. The only genes included in all the available PGx tests and with recommendations in current clinical guidelines and drug labels are CYP2D6 and CYP2C19. There is heterogeneity among outcome measures across studies (response, remission, improvement, health care utilization, medication tolerability), as well as in trial design. Relatively weak clinical benefits were reported by RCTs and higher clinical benefits by non-RCTs, but the last group showed greater risk of bias. Lack of patient and rater's blindness, retrospective design and possible confounders (concomitant medications and medical diseases, lack of wash out prior to inclusion, no assessment of compliance etc.) were the main issues. Estimations of cost savings provided heterogeneous findings.

Variants in CYP2D6 and CYP2C19 have already adequate support for clinical application. The development of future PGx tests should include best practices for clinical evidence development and for health economic assessment.

**Keywords:** pharmacogenetics; pharmacogenetic test; antidepressant; efficacy; personalized medicine

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