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## Impact of the CYP2D6 genotype on the clinical effects of metoprolol: a prospective longitudinal study

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### Abstract

After administration of metoprolol, plasma concentrations of the drug are markedly higher in CYP2D6 poor metabolizers (PMs) than in non-PMs. In a prospective double-blind 3-month study, we investigated whether this translates into differences in metoprolol's effects after initiation of therapy. Despite administering equal doses to PMs and non-PMs, metoprolol plasma concentrations were 4.9-fold higher in the PM group. Metoprolol evoked significantly and persistently greater reductions in heart rate, diastolic blood pressure, and mean arterial pressure in PMs than in non-PMs. It appears, therefore, that the CYP2D6 genotype contributes to interindividual differences in metoprolol response.

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Clin Pharmacol Ther. 2005 Oct;78(4):378-87. doi: 10.1016/j.clpt.2005.07.004.  
 PMID: 16198657 Clinical Trial.

[Genetic variation in the CYP2D6 gene is associated with a lower heart rate and blood pressure in beta-blocker users.](#)

Bijl MJ, Visser LE, van Schaik RH, Kors JA, Witterman JC, Hofman A, Vulto AG, van Gelder T, Stricker BH.

Clin Pharmacol Ther. 2009 Jan;85(1):45-50. doi: 10.1038/clpt.2008.172. Epub 2008 Sep 10.  
 PMID: 18784654

[Pharmacokinetics and CYP2D6 genotypes do not predict metoprolol adverse events or efficacy in hypertension.](#)

Zineh I, Beitelshees AL, Gaedigk A, Walker JR, Pauly DF, Eberst K, Leeder JS, Phillips MS, Gelfand CA, Johnson JA.

Clin Pharmacol Ther. 2004 Dec;76(6):536-44. doi: 10.1016/j.clpt.2004.08.020.  
 PMID: 15592325

[Effect of desvenlafaxine on the cytochrome P450 2D6 enzyme system.](#)

Preskorn SH, Nichols AI, Paul J, Patroneva AL, Helzner EC, Guico-Pabia CJ.

J Psychiatr Pract. 2008 Nov;14(6):368-78. doi: 10.1097/01.pra.0000341891.43501.6b.  
 PMID: 19057238 Review.

[Metoprolol Therapy and CYP2D6 Genotype.](#)

Dean L.

2017 Apr 4. In: Pratt VM, McLeod HL, Rubinstein WS, Scott SA, Dean LC, Kattman BL, Malheiro AJ, editors. Medical Genetics Summaries [Internet]. Bethesda (MD): National Center for Biotechnology Information (US); 2012-.

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Meloché M, Khazaka M, Kassem I, Barhdadi A, Dubé MP, de Denus S.

Br J Clin Pharmacol. 2020 Jun;86(6):1015-1033. doi: 10.1111/bcp.14247. Epub 2020 Apr 5.  
 PMID: 32090368 Review.

[Impact of genotype-predicted CYP2D6 metabolism on clinical effects and tolerability of metoprolol in patients after myocardial infarction - a prospective observational study.](#)

Anstensrud AK, Molden E, Haug HJ, Qazi R, Muriq H, Fosshaug LE, Spigset O, Øie E.

Eur J Clin Pharmacol. 2020 May;76(5):673-683. doi: 10.1007/s00228-020-02832-0. Epub 2020 Jan 15.  
 PMID: 31940084

[Pharmacogenomics And Hypertension: Current Insights.](#)

Oliveira-Paula GH, Pereira SC, Tanus-Santos JE, Lacchini R.

Pharmacogenomics Pers Med. 2019 Nov 22;12:341-359. doi: 10.2147/PGPM.S230201. eCollection 2019.  
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