

PHARMACOGENOMICS (PGx)

Suggested Reading and Publications

Mental Health

- 1. Pharmacogenetic tests and depressive symptom remission: a meta-analysis of randomized controlled trials**
Bousman, C., Arandjelovic, K., and Mancuso, S et.al. 2019 Pharmacogenomics Vol. 20, No. 1
A meta-analysis examines the outcomes of 5 PGx Randomised Controlled Trials in depression and confirmed individuals receiving PGx guidance were nearly twice as likely to achieve symptom remission compared to non-PGX guided patients.
- 2. Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2D6 and CYP2C19 Genotypes and Dosing of Selective Serotonin Reuptake Inhibitors**
Hicks JK, Bishop JR, and Sangkuhl K et.al. Clin Pharmacol Ther. 2015 Aug;98(2):127-34
This guideline provides evidence-based dosing recommendations for SSRIs using CYP2D6 and CYP2C19 genotype results.
- 3. Pharmacogenetic testing among patients with mood and anxiety disorders is associated with decreased utilization and cost: A propensity-score matched study**
Perlis, R., Mehta, R, and Edwards, A et.al. Depress Anxiety. 2018 Oct;35(10):946-952
Shows cost benefit of reduced hospitalisation and adverse events after 6 months of using PGx guided pharmacotherapy.
- 4. Improved efficacy with targeted pharmacogenetic-guided treatment of patients with depression and anxiety: A randomized clinical trial demonstrating clinical utility**
Bradley P, Shiekh M, and Mehra V, et.al. J Psychiatr Res. 2018 Jan;96:100-107
Graphical presentation of data showing how PGx-guided antidepressant treatment significantly improved response and depression remission rates in a moderately sized study.

Pain

- 1. Pharmacogenetics-guided analgesics in major abdominal surgery: Further benefits within an enhanced recovery protocol**
Senagore, A., Champagne, B. and Dosokey, E. et. al. Am J Surg. 2017 Mar;213(3):467-472
Shows PGx guided opioid therapy had a 50% reduction in narcotic consumption and reduced incidence of opioid related side effects.
- 2. Fundamental Considerations for Genetically-Guided Pain Management with Opioids Based on CYP2D6 and OPRM1 Polymorphisms.**
Ruano, G. and Kost, J.A. Pain Physician 2018; 21:E611-E6211
Genetic variations are particularly relevant to opioid drugs used in pain control. This article illustrates how pharmacogenetics can be used to optimise the analgesic benefit of opioids for the patient without increasing the risk of dependence.
- 3. Clinical Pharmacogenetics Implementation Consortium Guidelines for Cytochrome P450 2D6 Genotype and Codeine Therapy: 2014 Update**
Crews K.R, Gaedigk A, and Dunnenberger H.M et.al Clin Pharmacol Ther. 2014 Apr;95(4):376-82
This guideline provides evidence-based dosing recommendations for codeine using CYP2D6 genotype results.

RCPA POSITION STATEMENT:

Utilisation of Pharmacogenetics in Healthcare in Australia

Pharmacogenetics is the study of genetic contributions to individual variability in drug metabolising capacity.

Results from pharmacogenetic and pharmacogenomic tests can help to predict drug efficacy and potential for adverse reactions. This is an increasingly recognised area of healthcare, with good evidence for clinical utility and benefit in specific clinical settings.

In recognition of the growing awareness and application of pharmacogenetics in healthcare, the Royal College of Pathologists of Australasia released a position statement in February 2019, highlighting the need for:

- A collaborative effort between medical disciplines to help implement pharmacogenomics in Australia within a clinically appropriate framework, ensuring patient safety and test quality
- Greater clinician education in this field
- The need to develop local (PBS-relevant) guidelines for drug-gene pairs and prescribing recommendations
- A review of, and consideration for, funding of tests which have sufficient underlying evidence to be implemented clinically

The document also highlights the areas of medicine and clinical practice settings which are most prepared for evidence-based application of pharmacogenetics and pharmacogenomics, and draws attention to international guidelines and resources already available for patients and physicians in these areas.

The full position statement is available here:

<https://www.rcpa.edu.au/Library/College-Policies/Position-Statements/Utilisation-of-pharmacogenetics-in-healthcare>

