Pharmacogenetic guidelines and decision support tools for depression treatment: application to late-life

Harris A. EYRE1,2,3, Chad A. BOUSMAN4,5,6, Bernhard T BAUNE1, Eric J Lenze7, Charles REYNOLDS III8, Daniel MUELLER9

1 Department of Psychiatry, University of Melbourne, Melbourne, Victoria, Australia
2 IMPACT SRC, School of Medicine, Deakin University, Geelong, Victoria, Australia
3 Innovation Institute, Texas Medical Center, Houston, Texas, USA
4 Departments of Medical Genetics, Psychiatry, and Physiology & Pharmacology, University of Calgary, Calgary, Alberta, Canada
5 Alberta Children’s Hospital Research Institute, Calgary, Alberta, Canada
6 Hotchkiss Brain Institute, University of Calgary, Calgary, Alberta, Canada
7 Department of Psychiatry, Washington University, St Louis, Missouri, USA
8 Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, USA
9 Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada

Introduction
Late-life depression (LLD) is a major depressive disorder that affects someone after the age of 60 years.

LLD is frequently associated with inadequate response and remission from antidepressants, in addition to polypharmacy. Pharmacogenetics offers a promising approach to improve clinical outcomes in LLD via new discoveries determining the genetic basis of response rates and side effects, as well as the development of tailored pharmacogenetic-based decision support tools.

Objectives
This review evaluates the LLD pharmacogenetic evidence base and the extent to which this was incorporated into existing commercial decision support tools and clinical pharmacogenetic guidelines.

Methods
The literature search for included papers involved searching Embase, PsycINFO, Ovid Medline, ScienceDirector, Google Scholar, ClinicalTrials.Gov, the Cochrane Central Register of Clinical Trials, and other grey data sources. These databases were searched up to May 2018.

Findings
While available pharmacogenetic guidelines and tools are likely useful to improve outcomes and reduce side-effects in LLD treatment, the prospective trial evidence is limited. Efficacy studies have focused primarily in MDD presenting in adults and as such, there are a paucity of studies focused on depression in older adults. There is early promising data examining the cost-effectiveness of pharmacogenetic-based DSTs in LLD.

Conclusions
Unique factors relevant to LLD need to be considered in the development of pharmacogenetic-based DSTs for LLD, including pathophysiological factors, diverse ethnicities, medical comorbidities, cognitive health, and other phenotypic and treatment-related factors such as polypharmacy.

References
2. ..., Jayaram M, Eyre H, ..., Berk M, Hopwood M, Ng C (2017) Antidepressant prescribing in the precision medicine era: a prescriber’s primer on pharmacogenetic tools. BMC Psychiatry. 17:60