# Collaboration Is Needed to Translate Pharmacology Data Into Better Health Outcomes in Chronic Liver Disease

## TO THE EDITOR:

We thank Ferreira et al. for their response to our article.[1] The authors express their concern regarding the lack of data on pharmacological (pharmacokinetic [PK] and pharmacodynamic [PD]) changes of drugs in patients with chronic liver disease (CLD) and the subsequent insufficient support for prescribing. We share this concern and would like to share our views on this issue in this reply.

The lack of pharmacology data and information for prescribing in CLD is a well-known problem. This is especially true for older drugs,[2] which were marketed before guidance from regulatory agencies recommended PK studies in patients with hepatic impairment before drug approval. Initiatives from Canada and the Netherlands have demonstrated how these pharmacology data can be translated into practical guidance for safe drug use in cirrhosis. Ferreira and colleagues invite other researchers to develop similar initiatives. However, development of such guidance is a complex and time-consuming process requiring contributors with knowledge of pharmacology, hepatology, and medical informatics to retrieve relevant articles, summarize and discuss the findings, and formulate evidence-based advice.[3]

Rather than repeating all the work already undertaken, we recommend collaboration between different research groups to combine our expertise and take the next step forward as a network. Together we can strengthen our capabilities and formulate a practical agenda to improve availability of pharmacology data for translation into practical prescribing recommendations in CLD.

For example, to address the large gap in knowledge of PKPD changes, there should be a list compiled of medicines with missing pharmacology data. As this is probably a long list, it would be necessary to prioritize pharmacological studies based on clinical need for information (i.e., prevalence of medication use or perceived risk of harm in patients with CLD). This will formulate a useful strategy for pharmacology researchers to expand the available evidence base from which the current prescribing recommendations can be refined. We can further work with clinical pharmacy and hepatology colleagues to design clinical research needed to test the validity of the recommendations and their implementation in clinical practice. Collaboration with experts in medical epidemiology will be valuable to measure the impact of prescribing recommendations on patient outcomes over time, particularly with regard to "high-risk" drugs for medication-related harm.

To conclude, we agree with Ferreira and colleagues that joint efforts are needed to improve available information for prescribing in patients with CLD. These efforts should focus on collaboration between international experts to provide a research agenda for pharmacology data, to discuss and strengthen current recommendations, and to validate these in clinical practice. We invite other researchers to join this initiative.

**Rianne A. Weersink, M.Sc., Ph.D.**[1]
**Kelly L. Hayward, B.Pharm., Ph.D.**[2,3]
[1]**Department of Clinical Pharmacy**
**Deventer Hospital**
**Deventer, the Netherlands**
[2]**Centre for Liver Disease Research**
**Faculty of Medicine**
**The University of Queensland**
**Translational Research Institute**
**Brisbane, Australia**
[3]**Department of Gastroenterology and Hepatology**
**Princess Alexandra Hospital**
**Brisbane, Australia**

## REFERENCES

1) **Hayward KL**, **Weersink RA**. Improving medication-related outcomes in chronic liver disease. Hepatol Commun 2020;4:1562-1577.
2) Schlatter C, Egger SS, Tchambaz L, Krähenbühl S. Pharmacokinetic changes of psychotropic drugs in patients with liver disease: implications for dose adaptation. Drug Saf 2009;32:561-578.
3) Weersink RA, Bouma M, Burger DM, Drenth JPH, Hunfeld NGM, Kranenborg M, et al. Evaluating the safety and dosing of drugs in patients with liver cirrhosis by literature review and expert opinion. BMJ Open 2016;6:e012991.

Author names in bold designate shared co-first authorship.

*Supported by the Queensland Health Innovation, Investment, and Research Office (Clinical Research Fellowship to K.H.).*



*View this article online at wileyonlinelibrary.com.*

*DOI 10.1002/hep4.1663*

*Potential conflict of interest: Nothing to report.*