

Interaction checking tools

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I've just published [a poster](#) and thought I'd share some of the thinking behind it.

Selection of an optimal drug-drug interaction database for use in oncology and haematology settings

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The Liverpool Cancer Drug Interaction Checker (cancer-druginteractions.org, University of Liverpool) has been discontinued. What are suitable alternative Drug-Drug Interaction (DDI) checking tools for checking interactions between SACT and other medications?

- ❖ To determine the sensitivity, specificity, positive (PPV) and negative predictive values (NPV) of several DDI tools widely accessible to UK Health Professionals.
- ❖ To determine the most appropriate tool/tools for use in clinical practice.

Authors' modification of the standard defined by Abarca *et al* (2006)

Additional clinical information required	Critical medication or drug interaction		Moderate		Severely or life-threatening (urgent)		Not listed		BNF [†]		LexiComp [§]		Liverpool [‡]		FirstDataBank		Cerner-Multum [¶]		PEPD ^{††}		Stockley ^{**}		Scan to access Interaction Tools
Additional clinical information required	Critical medication or drug interaction	Severe	● Avoid combination ● Consider therapy modification	● Should not be co-administered ● Clinically significant interaction requiring monitoring, alteration of dosage or timing ● Avoid Combination ● Caution & continuing recommended	● Major Avoid combination, risk outweighs benefit ● Moderate: should avoid, use only under special circumstances ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	● Life-threatening or contraindicated combination ● High likelihood of interaction or breaking interaction ● Potential for significant interaction. Use with caution and monitor closely	

† from bnf.org.uk; § from UpToDate.com; ‡ Liverpool Cancer Drug Interactions from cancerdruginteractions.co.uk; §§ from medscape.co.uk; †† from drugs.com; ‡‡ from OncoAssist.com; ** from medicinescomplete.com


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Databases



- ❖ Discontinuation of the Liverpool CDI website provides an opportunity for HCPs to review the quality of their reference sources.
- ❖ The Liverpool CDI was **not** the gold standard.
- ❖ DDI tools need to be validated for data quality and user experience.
- ❖ Combination of multiple DDI tools increased probability of detection of clinically important interactions but with the compromise of additional workload.

This research identifies potential high quality data sources which should change clinical practice immediately. Use of the combination of PEPID™ and CernerMultum™ should be considered the new standard of care.

Important note:

-  Detection of a DDI by a tool does not define that an adverse event **will** occur. It highlights it **could** occur. Clinical interpretation is required.

References

Abarca, J. et al. (2006) "Evaluation of the performance of drug-drug interaction screening software in community and hospital pharmacies." *Manag. Care Pharm.* 12, 383-389.

Marcath, L. A. et al. (2018) "Comparison of Nine Tools for Screening Drug-Drug Interactions of Oral Oncolytics." *J. Oncol. Pract.* 14, e368–e374.

Acknowledgements

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Funding

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of the poster



Where did the idea come from?

This [poster](#) wasn't my idea. Perhaps it wasn't really anyone's idea but two people were pretty key in developing the idea. Chloë Waterson, then working at County Durham and Darlington NHS Foundation Trust and Rajinder Nijjar, working for Guys' and St Thomas' and NHS England were the real instigators. We spoke with a few collaborators along the way but these two have become co-investigators on this project because they both asked a question around the same time.

Chloë was first to drop me a note asking if I'd seen that [Liverpool Cancer Drug Interaction](#) checker might be being shut down and what did I think about this. That was nearly 18 months ago. And what did I think? Well my initial thought was a mixture of "Oh that's a shame", "I'm old enough to remember using a book to look up interactions" and "Sounds like it's a money issue, someone will sort it". I did also briefly ponder why that particular tool had become so popular. We briefly spoke about the idea of being able to check what was a good alternative, but did not much more. I did spend a couple of hours studying how the website actually worked and seeing if the data would be available in an archived form if the site was pulled. Anyway, move on a few weeks and Raj sends an email round some colleagues working for NHS England asking what people are using instead. She'd been using UpToDate but was finding problems. Seemingly new interactions surfacing for drugs we'd used together for years and some drugs not being listed (domperidone was her example).

I joined Raj and Chloë together in a Teams call. We tried inviting others who had shown interest on the [BOPA Forum](#) but didn't get any takers. But we had the start of an idea. We wanted to know what was the best alternative. We were still talking as if Liverpool was the gold standard.

We bounced some ideas around about how we could do that. Creating our own test scenarios. Using specificity and sensitivity to measure things. A little searching, followed by more detailed searching revealed we weren't the first to tackle the question of how good a drug interaction checking tool is. A little more work and we were uncovering papers describing oncology specific tools.