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**Does medical students' knowing
more about drugs lead to better
treatment choices?**

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Prescribing errors are common in hospitals and can lead to extended hospitalization and significant morbidity and mortality. Many of these errors are made by junior doctors,¹ partly because they lack competence in clinical pharmacology and therapeutics (CPT) when they graduate. Although there is currently a shift towards more context-based learning, CPT education is traditionally focused on the acquisition of factual drug knowledge rather than the acquisition of skills such as therapeutic reasoning and prescription writing. However, does more factual knowledge improve treatment choices?

We investigated the relationship between factual drug knowledge and treatment appropriateness, by re-analysing data from a previous study involving 895 final-year medical students from 17 medical schools in 15 European countries.² In that study, students' knowledge was evaluated using multiple-choice questions focusing on factual drug knowledge (i.e., working mechanism, side effects, and contraindications and interactions) that every student should know before graduation. Students also had to draw up a treatment plan for common clinical case scenarios that medical graduates should know how to treat, namely, acute bronchitis, gastroesophageal reflux disease, community-acquired pneumonia, osteoarthritis and essential hypertension. Knowledge scores were expressed as a percentage of the maximum score (0-100%). For each clinical case, the research team scored the treatment plan 1 to 3 (1= inappropriate, 2= suboptimal, 3= appropriate). Overall treatment appropriateness was calculated as the mean score of the clinical case scenarios. We used the Spearman correlation coefficient (r_s) to evaluate the relationship between knowledge and treatment scores. Overall, there was a significant but weak positive correlation ($r_s = 0.31$, 95% $P < 0.001$) between drug knowledge and treatment appropriateness.

This weak positive correlation suggests that students' factual drug knowledge has little influence on the appropriateness of their treatment choices, which is consistent with previous studies showing a poor correlation between drug knowledge and the quality of treatment choices among general practitioners³ and recently graduated doctors.⁴ A possible explanation for these findings is that making an appropriate treatment choice is a cognitive skill that requires various high-level cognitive processes. In order to acquire this complex skill, medical students should be trained in a step by step manner, for example by using the World Health Organisation (WHO) Guide to Good Prescribing.⁵ In this model, medical students are explicitly trained to verify the suitability of their treatment choice for a particular patient. Although some factual drug knowledge is required in order to choose an appropriate treatment, it may play a less important role than previously assumed. Simply acquiring knowledge does not guarantee an appropriate treatment choice.

Since CPT education in Europe is still mainly based on the acquisition of factual knowledge by means of lectures and written examinations,⁶ more emphasis should be given to the training and assessment of prescribing skills in undergraduate medical curricula. For example, prescribing skills can be trained in pre-prescribing courses and student-run clinics, preferably as early in the curriculum as possible. By shifting the focus to prescribing skills rather than knowledge acquisition, we hope that students will be better prepared for their prescribing responsibilities by the time they graduate.

REFERENCES

1. Dornan T, Ashcroft D, Heathfield H, et al. An indepth investigation into causes of prescribing errors by foundation trainees in relation to their medical education: EQUIP study. Final report for the GMC, December 2009. Available at: http://www.gmc-uk.org/FINAL_Report_prevalence_and_causes_of_prescribing_errors.pdf_28935150.pdf.
2. Brinkman DJ, Tichelaar J, Schutte T, et al. Essential competencies in prescribing: A first European cross-sectional study among 895 final-year medical students. *Clin Pharmacol Ther.* 2017;101(2):281–289.
3. Grad R, Tamblyn R, McLeod PJ, Snell L, Illescas A, Boudreau D. Does knowledge of drug prescribing predict drug management of standardized patients in office practice? *Med Educ.* 1997;31(2):132–137.
4. Harding S, Brittsen N, Bristow D, et al. The performance of junior doctors in applying clinical pharmacology knowledge and prescribing skills to standardized clinical cases. *Br J Clin Pharmacol.* 2010;69(6):598–606.
5. De Vries TP, Henning RH, Hogerzeil HV, Fresle DA. *Guide to good prescribing.* Geneva: World Health Organization; 1994.
6. Brinkman DJ, Tichelaar J, Okorie M, et al. Pharmacology and therapeutics education in the European Union needs harmonization and modernization: A cross-sectional survey among 185 medical schools in 27 countries. *Clin Pharmacol Ther.* 2017;102(5):815–822.