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## A flash of inspiration: Enhancing dental student drug recognition

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# A flash of inspiration: Enhancing dental student drug recognition

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## 1 | PROBLEM

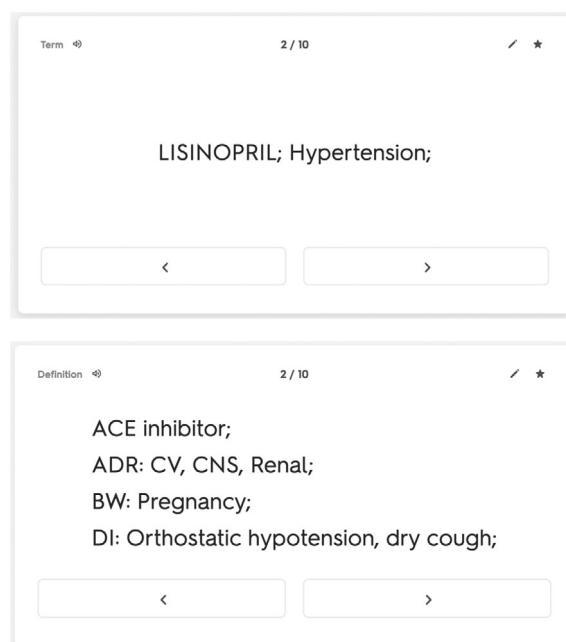
### 1.1 | Students struggle with basic drug recognition on entering the clinic

Students preparing for exams often retain the complexities of a subject but instant recognition and recall is something that, for most, takes time and consistent, repeated study to establish. This can happen through well-managed spaced learning (iterative study) prior to examination; given the preponderance of massed study (cramming for a subject),<sup>1</sup> however, many students require long-term exposure in the clinic to patients' medical histories to achieve instant recall. Understanding the applied pharmacology of common drugs is a current American Dental Association accreditation standard. Ideally, dental students should demonstrate a consistent level of basic drug recognition and the ability to retrieve that information prior to encountering patients.

## 2 | SOLUTION

### 2.1 | An instructor-created database of essential information on the most prescribed drugs

The database comprised the most prescribed drugs compiled from two primary sources, Fuentes et al.,<sup>2</sup> including mechanism of action, indication, contraindication, and Food and Drug Administration boxed warnings for the

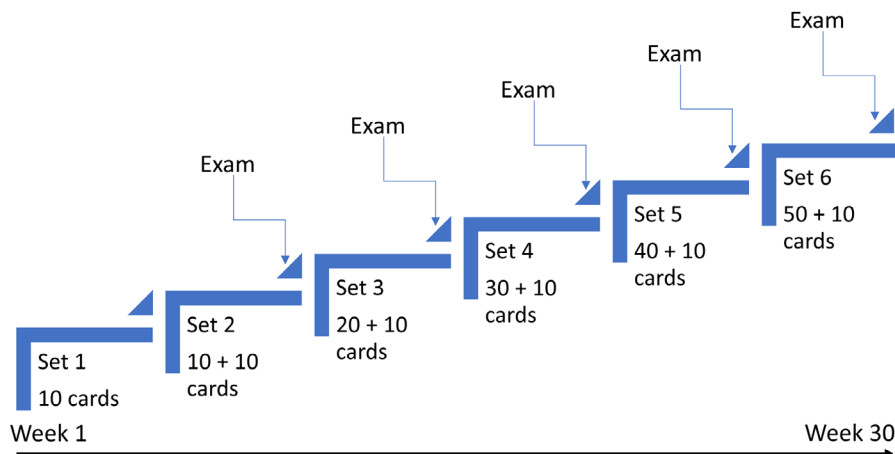


**FIGURE 1** Example of instructor-created flashcards, front (top panel) and back (lower panel). The front bears the drug name and indication; the back bears the most common mechanism, systems affected by most common Adverse drug reactions (ADR), life-threatening drug reactions with Food and Drug Administration (FDA) boxed warning (BW), and dental implications impacting either dental therapeutics or patient management (DI).

most prescribed drugs, to which was added where relevant the dental implications for each drug using the web-based subscription drug database Lexicomp (Lexicomp.com).

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**FIGURE 2** Timeline for administration of flashcards and administration of formal summative mid-term and final assessments. From Set 2 onwards, with each incremental addition of 10 cards, the students were tested on the new cards plus all previous cards by formal assessment. By the fifth exam, students were tested on knowledge of all 60 drugs.

Flashcards are commonly used by students as study aids at all levels but much less frequently as a teaching framework by instructors in higher education. Using Quizlet (Quizlet.com), software designed for iterative study, retrieval practice, and spaced learning,<sup>3</sup> a set of electronic flashcards was created from the drug database (Figure 1). Quizlet also creates formative self-tests tailored to student’s own card learning level. A “Teacher Panel” provides a view of class activity and progress. For the initial trial, only 6 decks were used, 60 drug cards in total. The first deck contained drugs 1–10, the second drugs 1–20 and so on each deck adding ten drug cards to the previous deck (Figure 2). Students were also required to demonstrate weekly progress by taking the self-test at least once a week, monitored using the Teacher Panel. Thus, students focused on the iterative study of a few drugs at a time with manageable incremental additions. Each new deck was released at 5-week intervals followed by testing through multiple choice questioning as part of the regular summative, mid-term, or final examinations.

### 3 | RESULTS

The flashcards were trialed in limited form over two academic years (one independent class per year) with 60 implemented out of 200 created. First student cohort, weekly study was encouraged by course points allotment for completion of each step but for a large class (~145 students annually) surveillance of weekly compliance was cumbersome. Second student cohort, weekly study was made a simple course requirement, which worked better. Anecdotally, no student complained about the flashcard system itself, and several students have reported the use of the learned information in the clinic. Interestingly,

**TABLE 1** Voluntary anonymous rating of flashcard sets using Quizlet internal polling, out of 285 possible student respondents.

Card set (# of cards)	Quizlet Internal Star Rating (0–5)	Number of responses
1 (10)	5.0	69
2 (20)	5.0	45
3 (30)	5.0	37
4 (40)	5.0	24
5 (50)	4.7	29
6 (60)	5.0	21

flashcard-derived information was used and cited by students for other didactic course assignments. Anonymous student voluntary scoring of the flashcards using the Quizlet app internal system was a mean of 4.95/5, mode of 5/5 (Table 1). We conclude that students appreciated the flashcard system, and that instructor-derived flashcards did not replace holistic instruction of medications and systems but complemented with the aim of improving essential drug recognition and recall in the clinic. Therefore, our flashcard decks will be retained and expanded for future cohorts.

#### KEYWORDS

basic sciences, cognition, education, educational technology, human learning & problem-solving, instructional materials/methods, oral medicine, preclinical skills/topics, professional interest, teaching, Quizlet, Flashcards

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