

# UC San Diego

## Independent Study Projects

### Title

Creating an online quick-reference of neuropsychiatric drugs featuring a randomized quiz generator.

### Permalink

<https://escholarship.org/uc/item/9b54200m>

### Author

Guo, Yueyang

### Publication Date

2013

**Creating an online quick-reference of neuropsychiatric drugs featuring a randomized quiz generator.**

**Yueyang Guo**

### **Project Description**

This medical education independent study project involved the creation of a website, available at <http://ucsdnpdr.nfshost.com>. Hosting is provided by NearlyFreeSpeech.net. Funding is provided out of pocket by author.

### **Project Goals**

This project's main goals include 1) establishing a searchable online reference of common neuropsychiatric medications with a knowledge base at the level of 3<sup>rd</sup>-year medical students and 2) establishing a randomized interactive review system in the form of flashcards and quizzes. A minor goal was to ensure flexibility and modularity in the design so that additions or changes to the database can be easily and rapidly effected. Finally, personal goals include learning and first-hand experience in dynamic website design using the PHP language and MySQL database management.

In relation to these project goals, the website currently has:

- 1) a database capable of either listing medications by major categories or returning the results of searches by medication generic name, brand name, indications, or side effects;
- 2) a randomized flashcard system capable of displaying any of a number of combinations of medication information (eg. pharmacokinetics, indications, side effects, etc.); a randomized multiple-choice quiz generator that will generate questions on indications or side effects; and
- 3) a straightforward update system that separates the generation of the website from the maintenance of the medication database (thus allowing for edits to the database without requiring additional coding in the website itself).

### **Project Methods**

The initial portion of the project involved selecting the medications that would appear on the on website. Selection was primarily based on Dr. Laiken's lectures and includes medications involved in the following major categories: addiction treatment, antidotes and reversal of neuropsychiatric medications, ADHD, anxiety disorders, bipolar disorder, dementia, depression, migraine, muscle and motor disorders, nausea and vomiting, psychotic disorders, and seizure disorders.

The next step was in deciding the level of detail and knowledge that would be available for each medication. This decision was heavily based on my own personal experience going through the 3<sup>rd</sup>-year clerkships: I found the greatest difficulty involved consideration of side effects and establishing the nuances that would place one medication over another for a particular indication. Consequently, the main focus of the website was to provide solid information regarding indications and side effect profiles for medications. The level of knowledge was also adjusted to that of a 3<sup>rd</sup>-year level: for instance, routes of administration would be provided along with which indication is best handled by which route of administration, but the exact dosing of medications will not be provided.

Gathering information for each medication was difficult and time consuming due to the sheer number of routes of administration available to some medications. Eventually, pharmacokinetics and side effect profiles were found to best be acquired at DailyMed.gov, an online repository for drug information sheets. Individual

drug indications were also difficult to acquire as there is no single database that lists all potential uses for a medication, especially if such usage was off-label. In order to best capture the full list of potential uses for a medication while at the same time providing a sense of what the medication is best or most commonly used for, a multi-step process was followed. First, a medication was searched on Wikipedia and Google to provide the initial list of indications, both practical and experimental. This initial list then served as the search terms used on UpToDate.com in order to acquire the treatment protocols for each particular indication. From here, for each indication, all medications in the database were updated based on the description of their use in the UpToDate.com management protocols. Additional information on indications and side effects were provided from Case Files Neurology, PreTest Neurology, and First Aid Psychiatry; all are common review books for 3<sup>rd</sup>-year medical students. The final result includes information gathered from DailyMed.gov, UpToDate.com, and the 3 review books; Wikipedia served only as an initial discovery process. These results were recorded on an Excel spreadsheet for ease of updating.

Although the goal for the website design involved MySQL for managing the database of medications, an attempt was made to bypass this step and solely rely on the Excel file as the source for all the information to be displayed. This decision was made with the thought that future edits and additions would be remarkably easy to make: simply update the Excel file, and the entire website will update itself. Unfortunately, towards completion of the first version of the website, I found that the Excel file had grown too large, and the website simply would not load as it exceeded the available memory of the server. This led to a radical revision and the current method of utilizing MySQL, known for its ability to retrieve information rapidly from large databases, to store all drug information.

## **Conclusion**

To the best knowledge of the author, this is the first medical education website that utilizes a database to randomly generate content for the purposes of an interactive review. Prior to this project, online review content for neuropsychiatric medications appeared in the form of flashcards with fixed and unchanging information. This is also the first website with a searchable database of medications that aims towards rapidly providing information on indications. Public databases on these medications tended to focus only on FDA-approved indications or failed to capture the nuance of a particular medication. Proprietary systems such as UpToDate.com can provide such information but frequently require multiple searches to understand all aspects of a particular medication; additionally, the paragraph format of UpToDate.com is not conducive for reviewing features of a particular medication. Certain iPhone applications are similar in scope to this project. PocketRx, for example, also provides a searchable database (of all drug types), but does not include review content at the time of this writing.