

# KnowledgeMap: Comprehensive Curriculum Content Management and Mapping System for Medical Education

## Summary

KnowledgeMap is a web accessible comprehensive content management system with robust mapping capabilities across the entire curriculum (at the level of full lectures, not just outlines or syllabi) that facilitates overall design, management, and evaluation of a coherent and coordinated curriculum.

## Addressed Need

- » Most medical schools provide educational texts (curricular contents) and methods for curricular content evaluation online.
- » However, very few schools store content in a searchable database and the large volume of curriculum documents provided during medical school education makes it difficult to find information and to understand where similar topics are taught.
- » Manually updated curricular database systems are costly and time consuming, as it typically requires labor-intensive data entry and substantial manual organization.
- » Automated concept “mapping” and display of “relevant” segments of curricular content are highly desirable to help educators locate, integrate, evaluate, and iteratively improve medical school curriculum content.

## Technology Description

KnowledgeMap is a full-featured content management system with curriculum mapping capabilities to identify learning opportunities and deficiencies by providing robust searching tools across the entire curriculum. Its unique attribute is a full-text mapping of curricular documents uploaded by faculty (as slide shows, PDFs, HTML, or word processing documents) to concepts from the National Library of Medicine’s Unified Medical Language System. KnowledgeMap’s concept identifier uses approximate natural language processing techniques and rigorous score-based algorithms. Tools developed for KnowledgeMap allow quick searches of the curriculum, generation of relevant PubMed queries, and rapid assessment of where concepts are taught in the medical school.

## Unique Features

- » KnowledgeMap uses other words and concepts to figure out ambiguous terms. For example, you could enter CHF, (which may be referring to congestive heart failure, congenital hepatic fibrosis or crimean hemorrhagic fever), and it will use the words around the acronym in the sentence to determine and distinguish its different usages.
- » KnowledgeMap can also identify broad concepts covered in the curriculum, For examples, If you would like to know the breadth of curriculum content in “Geriatrics” area,

you may enter “Geriatrics” in search box, Knowledge map constructs a large list of sub-concepts the user can choose from, such as “Alzheimer’s disease” “aging and nutrition” and more. The search will yield documents that contain information that falls under the concept of geriatrics, even if the word “geriatrics” doesn’t actually appear in the text.

## History and Adoption

- » KnowledgeMap was developed within the Vanderbilt University School of Medicine (VUSM) to enhance the delivery of medical education and has been used effectively since 2002.
- » Currently in use at several other medical schools and has potential applications in dental, osteopathic and other allied biomedical educational programs.
- » KnowledgeMap is compatible with other curriculum management systems such as blackboard and webCT, providing a complimentary set of features to these applications.
- » List of publications related to KnowledgeMap project: <http://knowledgemap.mc.vanderbilt.edu/research/publications>
- » Demo:<http://knowledgemap.mc.vanderbilt.edu/KM/kmscreencast/>

## Value Proposition

Faculty and Administration:

- » Enables medical school faculty and administration to manage curricular documents such that they might efficiently evaluate where, how and when a subject is taught within the curriculum and determine the most effective and responsive delivery of medical education.
- » Allows faculty and administration to quickly assess how much effort is devoted to each topic.and by each instructor
- » Facilitates administrators and lecturers to revise curricula by highlighting redundancies and omissions.
- » Helpful tool in meeting the increasing reporting requirements of documentation of curriculum objectives, depth of coverage, and content integration, providing automated data export for reporting to LCME and ACGME.

Students:

- » Search for all lecture documents for a particular topic of interest and find all concepts in the curriculum
- » View the entire Curriculum as a single unit, allowing students to not only review past topics, but to also see how that topic will be developed in future courses

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### VU REFERENCE: VU0492

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