





- PBL – problem-based learning
- WebSP
- RoD
- Open Labyrinth
- Interaktivní algoritmy péče o akutního pacienta
- YouTube.com – kinoautomaty
- Moodle+MEDIMED



# PBL / CBL

## Problem / Case-based learning



„Facilitating the acquisition of effective reasoning skills is considered by many to be one of the important goals of Problem Based Learning.“

- Barrows HS, Tamblyn RM. *Problem-based learning: An approach to medical education*. New York: Springer, 1980.
- Barrows HS, Feltovich PJ. The clinical reasoning process. *Medical Education* 1987;21:86-91.
- Conlee M, Koschmann T. Representations of Clinical Reasoning in PBL Meetings: The Inquiry Trace. *Teaching and Learning in Medicine* 1997; 9:51-55.
- Poulton T. The replacement of 'paper' cases by interactive online virtual patients in problem-based learning. *Medical teacher* 2009;31:752-758.
- Botezatu M, Hult H, Tessma MK, Fors U. Virtual patient simulation for learning and assessment: Superior results in comparison with regular course exams. *Medical Teacher* 2010;32:845-850



# PBL

## Problem-based learning

- Výuka v malých skupinách studentů
- Tutor moderuje, nevyučuje
- Studenti si sami shánějí podklady a přednášejí si navzájem
- PBL sezení jsou vhodně a promyšleně doplněná teoretickými přednáškami



Patient Presentation	Case Information
<p>You are the Casualty officer in Accident and Emergency when Tori Hutchinson, a 26 year old, is brought in by ambulance with severe breathing difficulties and covered in an urticarial rash. She had been eating in a nearby restaurant, and then complained of breathing difficulties, hoarseness and dizziness and then collapsed. She is very frightened and difficult to understand clearly.</p> <p>She says she develops mild rashes after take-away meals and vigorous exercise. She had eczema as a baby and still gets patches of eczema, sometimes needing steroid creams. She steers clear of nuts.</p> <p>Blood pressure: 85/50 Pulse: 130 beats per minute, regular Respiration: 26 breaths per minute</p> <p>Tori is in poor condition. You have to think quickly what to do.</p>	<p>Case Tori and Dave Hutchinson (2004) ID: 35390</p> <p><a href="#">Reset Case</a></p> <p><b>Case Pathway</b></p> <p><a href="#">Review your pathway</a></p> <p><b>Case Score</b></p>
<p><a href="#">Give her an IV injection of adrenaline</a></p>	
<p><a href="#">Give her an intramuscular injection of adrenaline and IV anti-histamine and hydrocortisone</a></p>	
<p><a href="#">Give her an IV injection of adrenaline IV anti-histamine, and IV hydrocortisone</a></p>	
<p><a href="#">Give her an intramuscular injection of adrenaline</a></p>	



# WebSP

## Web Based Simulation of Patients





# WebSP - představení

Na základě jaké zkušenosti WebSP představujeme?

- Prof. Uno Fors a kol.
  - Karolinska Institutet, Stockholm University



Za jakých podmínek je WebSP k dispozici pro LF MU?

- Zdarma
- Podpis licenční smlouvy



# WebSP - IT specifikace



- Webová aplikace
- Programovací jazyk Java
- Včetně administračního rozhraní
- Podrobná dokumentace
- Testovací verze v anglickém jazyce





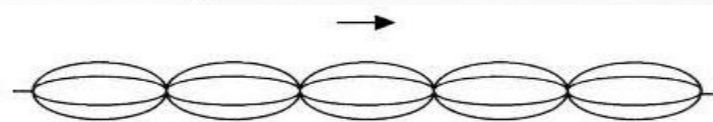
- Asistence IT podpory (IBA MU)
  - Zprovoznění v prostředí LF MU
  - Překlad základní struktury



- Bez asistence IT podpory
  - Vytváření klinických případů
  - Využití šablon a existujících případů v angličtině
  - Použití ve výuce se studenty

# WebSP - lineární struktura

- Vytváření případů s lineární strukturou



- Není možné vytvářet jakékoli průchody ve formátu větvení (branched structure)
- Průchod případem je striktně definovaný
- Možnosti změn jsou omezeny dostupnou funkcionalitou



# WebSP - ukázka




waiting room | settings | help | about | Log out

introduction | patient interview | physical examination | lab/imaging | diagnosis | therapy | feedback | Logged in as: Martin Komenda

Patient: John Smith ?

Course: IBA  
Case created by: Martin Komenda  
Mail: komenda@iba.muni.cz



This is a standard patient with no acute problems intended as a basis for creation of new cases.

WebSp Turn edit on



### Development, implementation and pilot evaluation of a Web-based Virtual Patient Case Simulation environment – Web-SP

Nabil Zary<sup>1\*</sup>, Gunilla Johnson<sup>2</sup>, Jonas Boberg<sup>3</sup> and Uno GH Fors<sup>1</sup>

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Email: Nabil.Zary<sup>1</sup>, Nabil.Zary@ki.se; Gunilla.Johnson<sup>2</sup> - Gunilla.Johnson@ki.se; Jonas.Boberg<sup>3</sup> - Jonas.Boberg@medsci.uu.se; Uno.GH.Fors<sup>1</sup> - Uno.GH.Fors@ki.se  
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#### Abstract

**Background:** The Web-based Simulation of Patients (Web-SP) project was initiated in order to facilitate the use of realistic and interactive virtual patients (VP) in medicine and healthcare education. Web-SP focuses on moving beyond the technology savvy teachers, when integrating simulation-based education into health sciences curricula, by making the creation and use of virtual patients easier. The project strives to provide a common generic platform for design/creation, management, evaluation and sharing of web-based virtual patients. The aim of this study was to evaluate if it was possible to develop a web-based virtual patient case simulation environment where the entire case authoring process might be handled by teachers and which would be flexible enough to be used in different healthcare disciplines.

**Results:** The Web-SP system was constructed to support easy authoring, management and presentation of virtual patient cases. The case authoring environment was found to facilitate for teachers to create full-fledged patient cases without the assistance of computer specialists. Web-SP was successfully implemented at several universities by taking into account key factors such as cost, access, security, scalability and flexibility. Pilot evaluations in medical, dentistry and pharmacy courses shows that students regarded Web-SP as easy to use, engaging and to be of educational value. Cases adapted for all three disciplines were judged to be of significant educational value by the course leaders.

**Conclusion:** The Web-SP system seems to fulfil the aim of providing a common generic platform for creation, management and evaluation of web-based virtual patient cases. The responses regarding the authoring environment indicated that the system might be user-friendly enough to appeal to a majority of the academic staff. In terms of implementation strengths, Web-SP seems to fulfil most needs from course directors and teachers from various educational institutions and disciplines. The system is currently in use or under implementation in several healthcare disciplines at more than ten universities worldwide. Future aims include structuring the exchange of cases between teachers and academic institutions by building a VP library function. We intend to follow up the positive results presented in this paper with other studies looking at the learning outcomes, critical thinking and patient management. Studying the potential of Web-SP as an assessment tool will also be performed.

More information about Web-SP: <http://websp.lime.ki.se>

### Web-based virtual patients in dentistry: factors influencing the use of cases in the Web-SP system

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#### Keywords

computer aided instruction; computer assisted learning; computer based simulation; dental education; patient simulation; virtual patient.

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Accepted: 27 July 2006

doi:10.1186/1500-5679-2007-00470-x

#### Abstract

We studied the students' acceptance and utilization of virtual patients (VPs) authored by faculty using the Web-SP system over two consecutive years. We also studied factors of importance for the utilization of VPs for self-assessment. Both year-groups studied found the Web-SP system easy to use and their overall opinion of Web-SP was positive (Median: 5, p25-p75: 4-5). They found the VPs engaging, realistic, fun to use, interactive and relevant to their course. Students used, on average, 9.68 VPs per course, which constitutes 43 percent of the available VPs. The number of VPs available seemed to be sufficient for the target courses, even if some of the students preferred a higher number of VPs. Of the VPs encountered, 71% (CI: 68-75%) were VPs with feedback, and correspondingly 29% of the VPs chosen were without feedback. The difference in utilization between both types of VPs was significant, at  $p < 0.001$ . Thus, the students clearly favoured VPs with feedback compared to VPs without feedback. There were three modes of engagement in which the VP was utilized. Mode 1 was the preferred mode for VPs without feedback, while mode 3 was dominant for VPs with feedback. Whether or not a VP was selected for review during a teacher led seminar or not, did not affect student behaviour; at least on the surface. Teacher led seminars may still be of importance to provide credibility to the VPs by integrating them into the curriculum.

#### Introduction

Dental education generally uses a blend of different teaching methodologies, but much of the teaching of clinical problem solving and therapy planning has traditionally been done during clinical courses which students attend during the final years of their studies. As a complement, paper-based educational cases (PBC) have been used for many years to enable students to train and self-assess their clinical reasoning abilities. This was also the case at the School of Dentistry at Karolinska Institute (KI) where a paper version of a typical situational case would include background about the patient, positive lab findings, intra-oral photos and x-rays gathered from real clinical cases. When using PBCs, students receive a hardcopy of a number of cases and when finished studying, they return the paper-based cases to the teacher to make them available to other students. Feedback was only provided for certain PBCs presented during scheduled case seminars. Problems associated with the paper-based medium, such as the lack of accessibility, the cost and time resources to replicate the x-rays, intra-oral photos and other material needed for the paper-based cases,

urged a change of technology (1) to improve the delivery and increase the accessibility of the valuable patient cases gathered over a long period of time.

Studies have shown that there is a potential for effective computer-assisted learning (CAL) in undergraduate clinical dental programmes(2) and that it can be used as an adjunct to traditional education or as a means of self-instruction (2-4). The advantages of computer-assisted learning are seen for example in self-paced and self-directed learning and increased motivation (5). The use of CAL in dentistry dates back to the 1980s (6) and various applications aimed at presenting patient cases and/or demonstrating certain practical tasks, have been developed since then (7-11). One example of this is virtual patient (VP) systems, which are interactive computer programs that simulate real-life clinical scenarios in which the student acts as a health care professional. In these scenarios, the student obtains a history, performs physical examinations, orders and interprets lab and/or imaging tests and finally makes diagnostic and therapeutic decisions (13, 14).

Even though the VP lab at KI has developed VP systems for dedicated disciplines such as nephrology and dermatology (15),





+

- Zdarma
- Webová aplikace
- Přehled o chování studentů
- Snadné použití šablon
- Příjemné prostředí pro vytváření nových případů
- Publikační výstupy

-

- Pouze lineární struktura
- Jasně definovaný průchod případem
- Programovací jazyk Java

# RoD

## Reactions on Display





## Co nového RoD přináší:

- Interaktivní práce s případovými klinickými studiiemi
- Prezentace scénářů založených každodenních aktivitách
- Začlenění videozáznamů popisujících danou situaci
- Možnost rozhodnutí, jak se bude případ vyvíjet







Na základě jaké zkušenosti RoD představujeme?

- Prof. Uno Fors a kol.
- Karolinska Institutet, Stockholm University



Za jakých podmínek je RoD k dispozici pro LF MU?

- Zdarma
- Podpis licenční smlouvy



- Lokální aplikace
  - Bez IT zásahu nelze snadno využít jako webovou aplikaci
- Nástroj Adobe Authoware
  - licencovaný sw
- Chybí administační rozhraní
- Testovací verze v anglickém jazyce



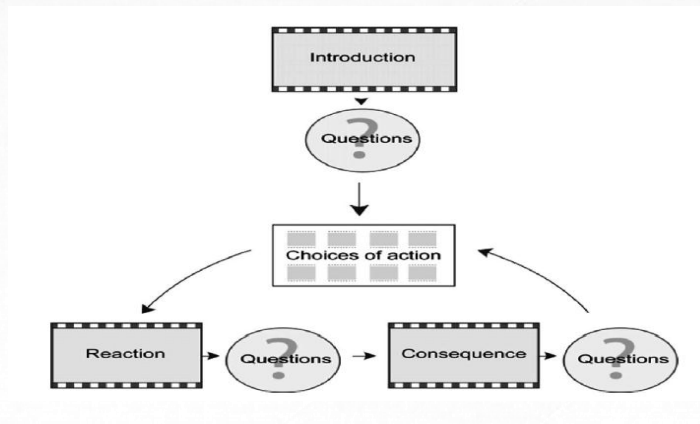


- Asistence IT podpory (IBA MU)
  - Zprovoznění v prostředí LF MU
  - Překlad základní struktury
  - Nahrání a zpracování videozáznamů
  - Vytváření klinických případů
  
- Bez asistence IT podpory
  - Použití ve výuce se studenty v počítačové učebně

# RoD - větvená struktura



- Vytváření případů s větvenou strukturou



- Relativně snadný překlad existujících případů
- Složitá definice zcela nového případu (spolupráce s IT)

# RoD - ukázka



# RoD

Reactions on Display

Please enter current User name and Password to Log in

User name:

Password:

OK





*Informatics for Health & Social Care*  
March 2009; 34(2): 106–115

**informa**  
healthcare

## **A pilot for a computer-based simulation system for risk estimation and treatment of mentally disordered offenders**

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<sup>1</sup>Department of Learning, Informatics, Management and Ethics (LIME), Karolinska Institutet, Stockholm, Sweden, <sup>2</sup>Department of Clinical Neuroscience, Division of Forensic Psychiatry, Karolinska Institutet, Stockholm, Sweden and <sup>3</sup>Department of Forensic Psychiatry, National Board of Forensic Medicine, Stockholm, Sweden

### **Abstract**

Risk/need analysis and treatment of mentally disordered offenders (MDOs) take place in constrained clinical settings, but violence has to be considered in a context where both social and cultural factors are of significance. One way to improve treatment and risk/need analysis of MDOs could be to develop simulation systems where users interact with video-based scenarios. The objective of this study was to develop and pilot test a simulation system to be used as a tool to study MDOs and possibly also to play a part in their rehabilitation. Collaboration between simulation and forensic psychiatry experts and a professional film team was set up. A simulation system called 'Reactions on Display' (RoD) was developed and a pilot study with eight patients and 13 staff members was carried out. Results from the study showed that RoD's interface and design were well received by patients and staff. Participants indicated that they found the video sequences realistic and the system enjoyable to use. The pilot study of RoD was positive, but further research should study possible clinical outcomes of the system. However, we believe that RoD could provide an advance in treatment and risk/need analysis of MDOs.

**Keywords:** *Computer simulation, forensic psychiatry, risk assessment, violence*

### **1. Introduction**

Violence in society is gaining public attention and is also described as an international phenomenon [1]. Violence committed by mentally disordered offenders (MDOs) has recently attracted considerable attention in Sweden because of several cases of unprovoked crimes of violence with fatal outcomes. During the last decade, great efforts have been made to increase the knowledge of circumstances that may be related to relapses into violence and criminal behaviour by MDOs.

Violence is hardly carried out as a solitary act but has to be considered in a context where both social and cultural factors and also different kinds of triggers are of decisive significance. The inability to recreate this in clinical settings is presumed to be a cause of today's limited

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DOI: 10.1080/17538150903014395



# RoD - shrnutí



+

- Zdarma
- Větvená struktura s možností integrace multimediálních prvků
- Snadný překlad existujících případů

-

- Lokální aplikace
- Větvená struktura podmíněna složitější přípravou
- Neintuitivní prostředí pro autory





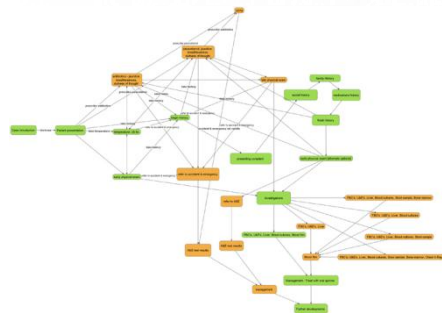
# Open Labyrinth - představení



OpenLabyrinth

OpenLabyrinth je webová aplikace pro vytváření hratelných učebních pomůcek:

- simulace,
- bludiště,
- algoritmy,
- virtuální pacienti.



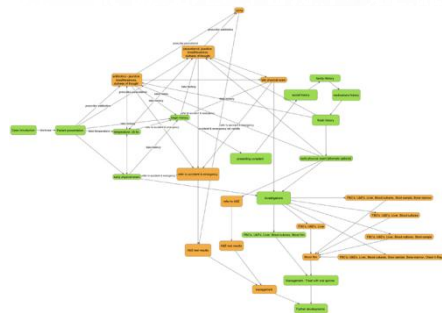
# Open Labyrinth - zkušenosti



OpenLabyrinth

Vytváření a používání větvených virtuálních pacientů na:

- St George's University in London
- síť VIRTUALPATIENTS.EU
- Projekt mEDUCATOR (linked labyrinth+)

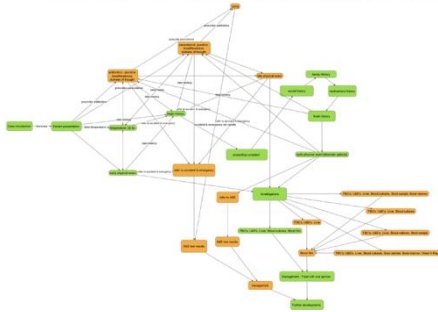


# Open Labyrinth – vývoj, licence



OpenLabyrinth

- Learning Technology Section of the College of Medicine and Veterinary Medicine at the University of Edinburgh
- Northern Ontario School of Medicine and the University of Edinburgh
- Partneři v Kanadě, UK, Německu, Austrálii a USA



Academic Free License  
(AFL) v. 3.0

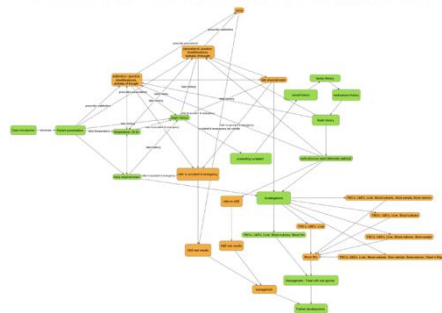


# Open Labyrinth – IT specifikace

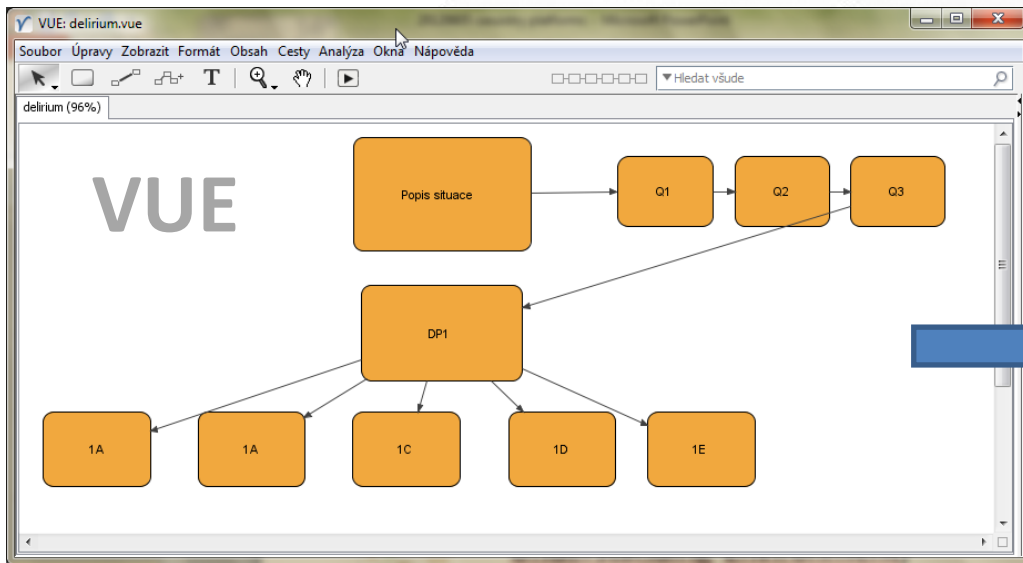


OpenLabyrinth

- Webová aplikace (ASP, MS SQL)
- Česká mutace zatím není k dispozici
- Odladěn provoz na serveru IBA MU
- Integrace s VUE (Visual Understanding Environment)



# Open Labyrinth – prostředí



edit node 34 in Map 17 - Mozilla Firefox

Soubor Úpravy Zobrazení Historie Záložky Nástroje Nápověda

Edit Node 34 in Map 17

147.251.147.81/labyrinth/editmnode.asp?Id=34&mapId=17

Negnavštěvovanější Přehled zpráv XAMPP JBA/RECETOX Mail :: V... MARKTIME Seznam Slovník Překladáče Google Parallels Plesk Control... IS MUNI

Zakázat Cookies CSS Formuláře Obrázky Informace Různé Orámovat Velikost okna Nástroje Zobrazit zdrojový kód Nastavení

OpenLabyrinth

an open pathway delivery system

preview

editor

- global  
- nodes  
- node grid  
- sections  
- links  
- counters

HTML - WYSIWYG

Popis situace

title

Jste volán jako konziliární psychiatr pro náhlý rozvoj neklidu a nepřehledného chování k 60ti létemu pacientovi, hospitalizovanému po operaci traumatické fraktury krčku femuru.

Při příchodu na JIP chirurgické kliniky je pacient omezen v lůžku, protože se snažil vytrhnout si venózní kanyly a močový katetr. Při vyšetření je při vědomí, naváže s vámi kontakt, sdělí své základní osobní údaje - své jméno, kde bydlí, kde je zaměstnán.

Při pohovoru spolupracuje, odpovídá bez delších latencí, hovor o složitějších tématech je

node content

Styles Format

zotero

# Open Labyrinth – ukázka



**OpenLabyrinth**

OpenLabyrinth is an open source educational pathway authoring and delivery system

## Labyrinths I am Authoring (2)

[o] Delirium - pro testování



Jste volán jako konziliární psychiatr pro náhlý r...

[o] Rozvoj neklidu 60-letého pacienta po operaci traumatické fraktury krčku femoru



, Tomáš  
Kašpárek  
(author)

Jste volán jako konziliární psychiatr pro náhlý r...

# Open Labyrinth – shrnutí



+

- AFL – academic free licence
- Pokračující vývoj
- Masivně používáno v zahraničí
- Větvené rozhodovací stromy
- Integrace otázek a počítadel do uzlů
- Uzly typu „must avoid“ a „must visit“

-

- ASP / MS SQL
- Neintuitivní prostředí pro autory





**AKUTNE.CZ** **Postpunkční cefalea v pôrodnictve** 00:00

Mladá prvoročička, 23 rokov, pôrod prirodzenou cestou, pre veľké bolesti požaduje epidurálnu analgéziu. Aké laboratórne vyšetrenia budeme požadovať na vykonanie zákroku?

- Koagulácia, krvný obraz
- Krvný obraz, glykémia
- Koagulácia, glykémia
- Koagulácia, cholesterolemia

Nápoivída není k dispozíci

SPO<sub>2</sub> není zapojená sonda  
EKG není možnost měření  
RR není zapojená sonda  
NIBP není zapojená sonda  
glc není možnost měření  
KO není možnost měření  
ABR není možnost měření  
elektrolyty není možnost měření







- Interaktivní algoritmy péče o akutního pacienta vznikají s využitím webové aplikace z dílny IBA MU.



- Nevětvené, a tedy umožňují jen lineární průchod
- Zaměření na akutní medicínu: časový faktor, údaje z monitorace vitálních funkcí

# Algoritmy AKUTNE.CZ - zkušenosti



- Interaktivní algoritmy obohacují výuku témat akutní medicíny na LF MU od 2007.



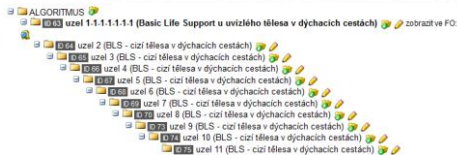
- Dosud vytvořeno 21 algoritmů
- Jinde dosud nenasazeno



# Algoritmy AKUTNE.CZ – vývoj, licence



- Webové studio IBA MU
- Vývoj podpořen granty FRVŠ a projektem OP VK



# Algoritmy AKUTNE.CZ – IT specifikace



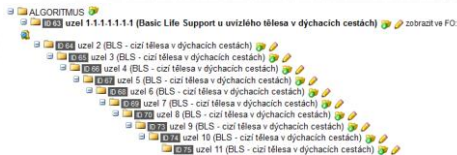
- PHP/MySQL/Flash

- XML

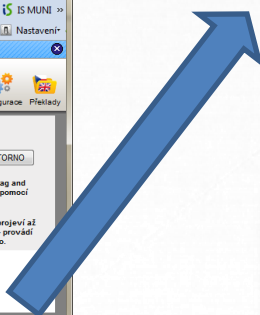
- Jednotlivé algoritmy lze provozovat i lokálně

- Provoz na serveru IBA MU

- Česká a anglická jazyková mutace



# Algoritmy AKUTNE.CZ – prostředí



# Algoritmy AKUTNE.CZ – ukázka



Uživatel **Daniel Schwarz [schwarzd]**, přihlášen: 02.06.2012, 13:43 h

**IBA**

Návštěvy | Uživatelé | Aktuality | Konference | Semináře a workshopy | Hromadný e-mail | Anketý | Testy | Otázky k testům | Algoritmy | Fotogalerie | Publikace a výukové materiály | Výuková témata | Plně stránky | Konfigurace | Překlady

### Tvorba algoritmů

[Popis algoritmů](#)  
[posl. úpravy: 13.5.2010, 12:23]

Počet uzlů: 267  
Dokončeno: 228  
Nedokončeno: 39

**Algoritmus:**  
Akutní koronární syndrom

Hledat text:

Filtr:  
Spravuje:

Dokončeno:

Zobrazit

Aktualizovat XML algoritmy

Přehled vyplněnosti

Tisk

### ALGORITMUS

- ALGORITMUS
  - ID 242 uzel 1-1-1 (Akutní koronární syndrom) zobrazit ve FO:
    - ID 243 uzel 2 (Fyzikální vyšetření)
    - ID 245 uzel 3 (Diagnostika)
      - ID 246 uzel 4 (Terapie prvního kontaktu)
        - ID 247 uzel 5 (Transport)
          - ID 248 uzel 6 (Laboratorní diagnostika)
            - ID 302 uzel 7 (Koronarografie)
              - ID 252 uzel 8-1 (Následná farmakoterapie)

### NEZAŘAZENO

- ID 305 uzel 8-1-1-1-1 (ACS)
- ID 306 uzel 8-1-1-1 (Ventrikulografie)
- ID 303 uzel 8-1-1 (Koronarografie)
- ID 307 uzel 8 (Stent do ACD)

current language: portal version 1.7.9c :: 20/01/2010

Sbalit vše | Rozbalit vše

ULOŽIT NA POZADÍ | STORNO

Změna se provádí metodou drag and drop (chycením a přetažením) pomocí myši.

**POZOR:** Jakékoliv změny se projeví až po aktualizaci XML algoritmů - provádí MASTER pomocí tlačítka vlevo.

zotero

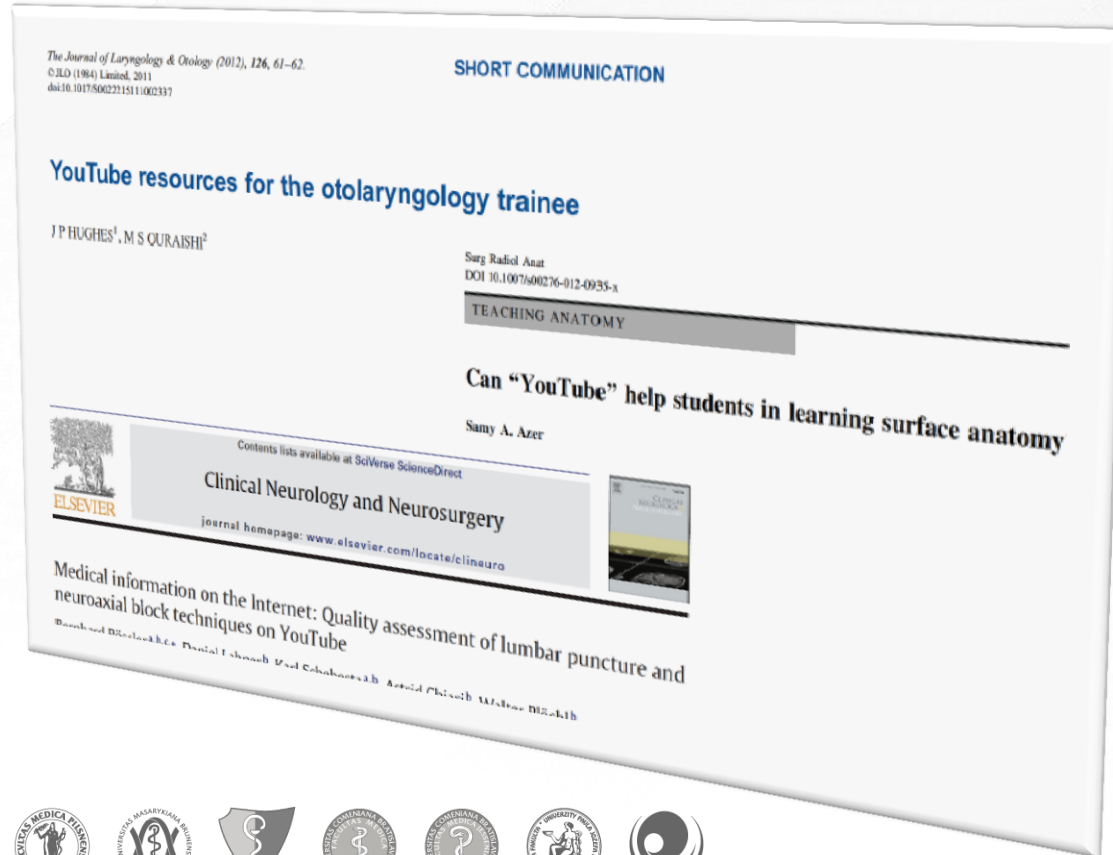
# Algoritmy AKUTNE.CZ – shrnutí

+

- Úzké zaměření na akutní medicínu
- Pokračující vývoj na IBA MU
- Game-like přehrávač pro jednotlivé algoritmy
- Uzly typu „špatně, zopakuj“ a „rest in peace“

-

- Úzké zaměření na akutní medicínu
- Nevětvené algoritmy
- Anonymní uživatelé









## Time to Talk, Time to Change - interactive video

Subscribe 48 videos



0:12 / 0:19

Lika Add to Share

95,888

71 likes, 4 dislikes

Uploaded by [ttonow2008](#) on Mar 17, 2011

Dave's just come back to work after being unwell with mental illness. Chad, his colleague decides to ask him how he is. How will Dave react?

## Time to Talk, Time to Change - interactive video

Subscribe 45 videos

**Choose options**

How will Dave react?

- mobile meltdown
- taste explosion
- absolutely fine

0:13 / 0:19

Lika Add to Share

95,883

## Interaktivní videa



# YouTube - kinoautomaty – shrnutí



+

- Technologie zdarma
- Pokračující vývoj (Google)
- Budoucnost 3-D videa
- Vrstva s popisky
- Interaktivní videa
- Integrace se sociálními sítěmi (Facebook, Twitter, Google+, ...)

-

- YouTube recommends...
- Otevřeno pro všechny



# Pozvánka

## VI. konference MEFANET 2012

- 27.-28.11.2012
- hotel INTERNATIONAL, Brno

mefanet

