CRN EFFECTS ON HUMAN BEINGS: DEVELOPING A TOOL FOR FIRST RESPONDERS

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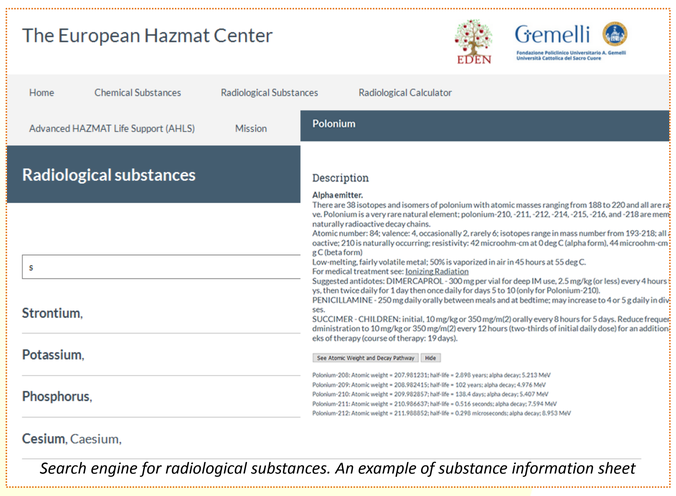
ABSTRACT

Background: The rescuers, deployed in the red zone during a CRN event, are non-medical personnel. First responders have several problems in identifying toxidromes, triaging casualties, understanding English language.
Methods: During an EDEN project demo (Frascati, September 2015) the authors interviewed medical and non-medical first responders (firefigthers, soldiers, policemen, international security agencies staff) in order to understand their difficulties, above all the medical ones, and their needs, during a CBRNe event, so to create a website capable of giving an answer to their necessities. According to the results of this research they designed the website on the Wordpress platform that allows for a good level of independence in editing pages of Hazmat.
Results: We created a website, with an adjustable view for smartphone and tablet. The database's informations derive from multiple sources: we adjusted them to give a simple answer to the needs of the first responders, in collaboration with some toxicologists. The website hazmat-eden.eu was thought as a flexible, simple and light tool, useful for medical and non-rescuers involved in CRN events. The tool was developed within the EDEN* framework and tested during the EDEN demo, organized by ENEA at Frascati in September 2015. Evaluation results were successful. Authors are still receiving feedbacks from EDEN Demo participants, partners and end-users who can help us to improve the tool and its features.
Conclusion: According to the authors this tool will be a rapid and reliable way to obtain medical information during a CRN event in order to manage the Hazmat victims. The authors are going to apply other improvements to the tool, together with EDEN partners and National Rescuers, in order to create a new open repository to support first responders during major incidents involving Hazmat materials.

Keywords: Chemical, Radiological, Nuclear, Hazmat, medical advice, first responder, website, EDEN project, non-medical personnel.

Introduction: Our tool is based on a website: www.hazmat-eden.eu, developed within the EDEN project (End-user driven DEmo for cbrNE) framework. EDEN project was funded from the European Union's Seventh Framework Programme for research, technological development and demonstration. UCSC/Gemelli Hospital, in the persons of the authors, created this website in order to help first responders during a major incident involving Hazmat materials. During a non conventional event first non-medical responders suffer the lack of medical information, which already exists, but is not easily accessible and is not so readily understandable, often because of the medical terminology. Also first medical responders can need medical support about the toxidromes, their clinical manifestations, decontamination procedures and the right management of the hazmat victims.

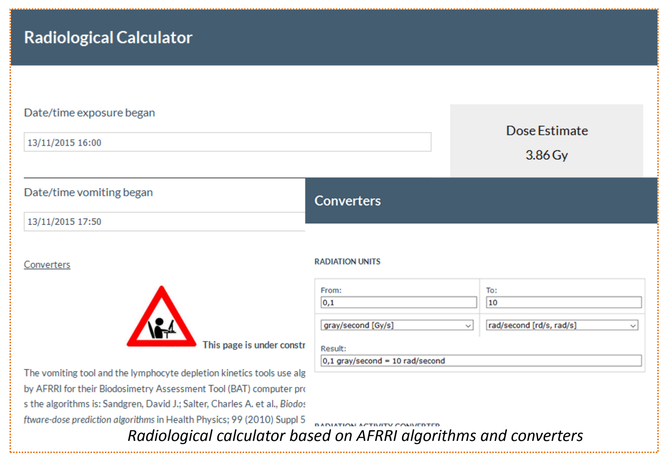
This is Hazmat Repository homepage



Search engine for radiological substances. An example of substance information sheet

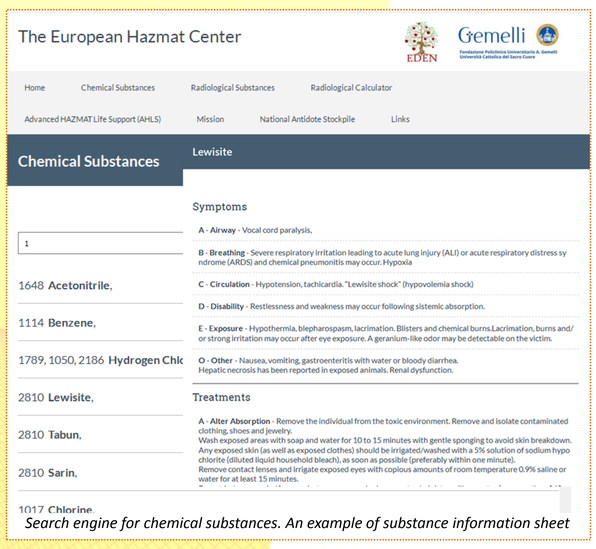
Objectives: The aim of this tool is to create an "easy-to-use and light" website to address the necessities of first responders, above all the non-medical ones, in order to empower them on medical response. The tool is designed for non-medical staff, for the Incident Command Group and also for pre-hospital and hospital rescuers, not often expert in management of Hazmat victims, during a CRNe event and it would like to be a very easy instrument which can help the rescuers to manage the CRNe victims, using a simple language and a simple approach. In the vision of the authors everyone can access the website through a simple registration, that allows the Authors, as CRNe experts, to communicate with operators and give them the medical information they need to manage the victim of the Hazmat event.

Materials and Methods: The Authors used important and reliable websites and tools as source of information: toxnet.nlm.nih.gov, WISER, ERG 2012. The approach to the Hazmat victims is based on AHLS (Advanced Hazmat Life Support) guidelines and each substance information sheet is divided in two parts: signs/symptoms and treatment. The "signs and symptoms part" is based on the simple systematic A-Airway, B-Breathing, C-Circulation, D-Disability, E-Exposure approach. The ABCDE approach is applicable in all clinical emergencies for immediate assessment and treatment. The approach is widely accepted by experts in emergency medicine and likely improves outcomes by helping health care professionals, focusing on the most life-threatening clinical problems. Authors decided to add another category O-Other where the first responders can obtain additional information, not included in the other categories.



Radiological calculator based on AFRRI algorithms and converters

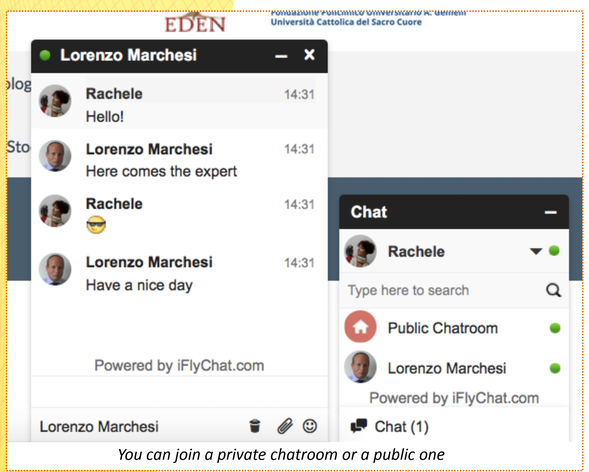
The "treatment part" follows the AHLS poisoning treatment paradigm, another simple systematic ABCDE approach which is the typical one used for the management of the toxidromes: A-Alter absorption and A-Administer Antidote, B-Basics (reassess patient and treat as ABCDE of symptoms), C-Change Catabolism, D-Distribute Differently and E-Enhance Elimination.



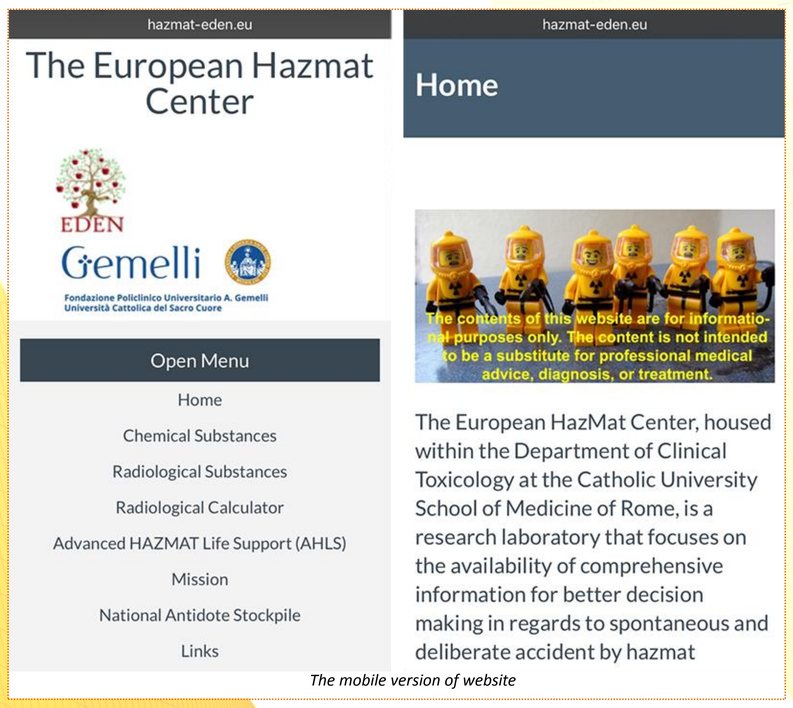
Search engine for chemical substances. An example of substance information sheet

Actually the tool has several features: the possibility to search by Hazmat materials (UN and name), split in chemical and radiological substances; a communication interface with an expert; a simple chat, which allows to send attachments; a dose estimator for exposure - biodosimetry tool (in progress); a calculator for the equivalence of the radiological units; the possibility to identify the substances, starting from the signs and symptoms of the toxidromes they create to the patients (in progress); the possibility to pre-allert the national (italian) antidote stockpile to supply antidotes; a system for the explanation of the medical language via hypertext; the possibility to read the information not only in English, but at least in Italian and French language too (in progress), considering that sometimes first responders can't understand English language. The website is designed on the Wordpress platform which allows for a good level of independence in editing pages of Hazmat. The authors bought a domain that included, among other things, unlimited 1 GB email accounts, visit statistics and the MySQL database, it was ready for Wordpress and for other platforms and it supports various programming languages.

Discussion: Hazmat Repository is still in progress, authors are always seeking for advice from first responders. The website was presented in an European context: during a demo of EDEN project in Frascati and in a dedicated event at UCSC/Gemelli Hospital and will be used in the future EDEN demos. During the presentations of the website, Hazmat has always received a a good rating and stimulated interest. Authors are working on expectations of end-users and on the feasibility of their observation. They wish to develop a multilingual, useful and reliable website that can address first responders necessities within the scopes of the tool.



You can join a private chatroom or a public one



The mobile version of website

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