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Developing an international Collection of Virtual Patients for Clinical Reasoning

Inga Hege on behalf of the iCoViP consortium



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Erasmus+ Strategic Partnership of



Clinical Reasoning

Clinical reasoning encompasses health professionals' thinking and acting in assessment, diagnostic and management processes in clinical situations taking into account the patient's specific circumstances and preferences.

-> Due to its multifactorial nature and unconscious components, it is difficult to learn and teach.

-> Deliberate & frequent practice and feedback are important

Young M et al. The terminology of clinical reasoning in health professions education: Implications and considerations. Med Teach 2019;41(11):1277–84.



Virtual Patients (VPs)

- First impression
- History
- Physical exam
- Other exams (lab, x-ray,...)
- Final diagnosis
- Management / Prognosis



Learning Analytics

- Number & type of entries and connections
- Various scores
- Diagnostic accuracy & errors
- Confidence with final diagnosis
- Detailed analysis of summary statement (NLP)
- Time on task
- -> Direct feedback to learners about their clinical reasoning

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- -> Overview for educators (performance & quality)
- -> Research studies on clinical reasoning with VPs
- -> Allows an adaptive learning environment



- Provide a high-quality multilingual VP collection (n=200) for medical students / young professionals for the training of clinical reasoning and preparation of mobility activities
- Raise awareness about VPs and their curricular integration among educators and faculty staff
- Sustain and extend the partnership and strengthen the collaboration

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Project based on

- Experiences from previous projects
 - Using one VP system (CASUS)





- Carefully plan the collection (not random) and VPs
- Translation process established in NetWorM/VP-Work
- Research on clinical reasoning teaching
 - Short, focused VPs, allowing comparing & contrasting
 - Use of concept mapping approach
 - Based on key symptoms (not diagnoses)



Results - Blueprint

Blueprint describing the 200 VPs with

- Patient data (name, age, sex, sexual orientation, job, socioeconomic status,...)
- Disease-related data (key symptoms, final diagnosis, acuity,...)
- Place of encounter
- Mapping to national competency frameworks (in progress)

-> Important to guarantee a diverse and realistic patient population

Urresti-Gundlach M, Tolks D, Kiessling C, Wagner-Menghin M, Härtl A, Hege I. Do virtual patients prepare medical students for the real world? Development and application of a framework to compare a virtual patient collection with population data. BMC Med Educ 2017;17.

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VP Name	Available Languages	Key Symptom	Final Diagnosis/-es	Onset		Disease Grou	up۱	VP Age	VP Sex		VP Profession	VP Socioecon.	VP Ethnicity	V
Heidi Wagner	en,de,pl,es	fever	thyreoid carcinoma	Subacute	٣	neoplastic	*	11	female	Ŧ	- (Child)		Caucasian	N
Dominik Maller	en,de,es,pl	fever	myocarditis	Acute	Ŧ	vascular	Ŧ	35	male	Ŧ	insurance agent		Caucasian	N
Katharina Rigger	en,de,es,pl	headache	migraine	Chronic	Ŧ	vascular	Ŧ	43	female	Ŧ	Lawyer	High	Caucasian	N
Stephanie Turner	en,de,pl,es	cough	asthma	Chronic	Ŧ	immunologic	Ŧ	26	female	Ŧ	Waitress, studer	nt	Caucasian	N
Josef Schröder	de,en	dyspnea	pleural effusion (Bronch	Subacute	Ŧ		Ŧ	74	male	Ŧ	Retired Lawyer		Caucasian	N
Annemarie Winke	en,de,es,pl	hypertension	polycytemia vera	Chronic	Ŧ	neoplastic	Ŧ	59	female	Ŧ	Laundry owner		Caucasian	N
Stefan Müller	en,de,pl,es	fatigue	diabetes type I	Subacute	Ŧ	metabolic	Ŧ	38	male	Ŧ	Engineer		Caucasian	N
Calvin Warner	en,de,pl,es	dyspnea	COPD exacerbation	Acute	Ŧ	toxic	Ŧ	63	male	Ŧ	Technician		Afro American	N
Moritz Hager	en,de,es,pl	delayed growth	partial AV canal	Chronic	Ŧ	congenital	Ŧ	4	male	Ŧ	- (Child)		Caucasian	N
Elisabeth Kagerl	en,de,es,pl	headache	tension-type headache	Chronic	Ŧ		Ŧ	47	female	Ŧ	Unemployed	Unemployed	Caucasian	N
Erik Marte	en,de,pl,es	headache	subarachnoidal bleedin	Acute	Ŧ	vascular	Ŧ	64	male	Ŧ			Caucasian	N
Anja Winterberg	en,de,pl,es	palpitations	hyperthyreosis, Basedo	Subacute	Ŧ	metabolic	Ŧ	31	female	Ŧ	Maternal Leave		Caucasian	N
Fred Bower	en,de,pl,es	diarrhea	Colitis (pseudomembra	Acute	Ŧ	toxic	Ŧ	83	male	Ŧ			Caucasian	N
Hedwig Paul	en,de,pl,es	fatigue	primary biliary cholangi	Chronic	Ŧ	infectious	Ŧ	61	female	Ŧ	Social Worker		Caucasian	N
Theodor Meissne	de	hematemesis	ulcus vetriculi	Acute	Ŧ	toxic	Ŧ	67	male	Ŧ	Retired soldier		Caucasian	N
Karina Schmitt	en,de,pl,es	jaundice	autoimmune hepatitis	Chronic	Ŧ	immunologic	Ŧ	58	female	Ŧ	SOS childrens v	i	Caucasian	N
Martha Eberle	en,de,pl,es	hematoma	hemophilia A	Acute	Ŧ	congenital	Ŧ	78	female	Ŧ	Retired		Caucasian	N
Kurt Baier	de,en	palpitations	struma nodosa	Acute	Ŧ	neoplastic	Ŧ	51	male	Ŧ	Farmer		Caucasian	N
Reinhard Bachme	en,de,pl,es	headache	adenoma hypophysis	Subacute	Ŧ	neoplastic	Ŧ	42	male	Ŧ	Flight Attendant		Caucasian	N
Frank Reiter	en,de,pl	syncope / loss of cond	sick-sinus syndrom	Acute	Ŧ		Ŧ	61	male	Ŧ	Judge	High	Caucasian	N
Miray Günal	en,de,es	fever	pneumonia	Acute	Ŧ	infectious	Ŧ	28	female	Ŧ	Travel Guide		Caucasian	Ye
Tim Wagemann	en,de,pl	abdominal pain	lleus, colon carcinoma	Subacute	Ŧ	neoplastic	Ŧ	60	male	Ŧ	Real Estate Mar	1	Caucasian	N
Nina Sanders	en,de,pl	dyspnea	Graves disease	Acute	Ŧ	infectious	Ŧ	28	female	Ŧ	Vet		Caucasian	N
Michael Bauer	de,en	lower urinary tract syr	post-Streptococcal Glor	Acute	Ŧ	infectious	Ŧ	27	male	Ŧ	Engineer		Caucasian	N
Benedikt Vogt	en,de	headache	renal stenosis	Acute	Ŧ	vascular	Ŧ	54	male	Ŧ	Electrician		Caucasian	N
Norman Jacobs	en,de,es	abdominal pain	hepatitis C	Subacute	Ŧ	infectious	Ŧ	32	male	Ŧ	Banking Manage	ər	Afro American	N
Kai Thälmann	en,de,es	lower urinary tract syr	urolithiasis	Acute	Ŧ		Ŧ	37	male	Ŧ	Software Engine	er	Caucasian	N
Pia Horcek	en,de	palpitations	thorax contusion, atrial	Acute	Ŧ	traumatic	Ŧ	22	female	Ŧ	Student		Caucasian	N

http://icovip.eu/results/

Results - VPs

- 65 VPs (former projects) mostly already in all project languages
- Publicly accessible at https://crt.casus.net
- Process for VP creation, review and translation in CASUS
 - VPs created in English by partners
 - Reviewed formally and didactically & revised
 - Translated by partners into their language (supported by DeepL) and check

• Added to open courses

Results - Collaboration

- Overcoming the traditional medical specialties remains a challenge
- Corona is a challenge for team building, but was the booster for the project
- Inspiring discussions with partners on "side" aspects of the project
 - Definition of socioeconomic status, migration background,...

- Adaptations of VPs to national contexts?
- Dealing with differences and political issues

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Outlook

- Piloting of VPs within different educational scenarios
- Include aspects of Occupational Medicine?
- Integrating the VPs into a clinical reasoning curriculum developed by the Erasmus+ project DID-ACT (www.did-act.eu)
- Developing a guideline on how to integrate the VPs into curricula including best practice examples
- Developing a model for sustaining and extending the VP collection



Thank you!

More information on: **www.icovip.eu**



iCoViP kick-off meeting in April 2021

