

Al in the WILD

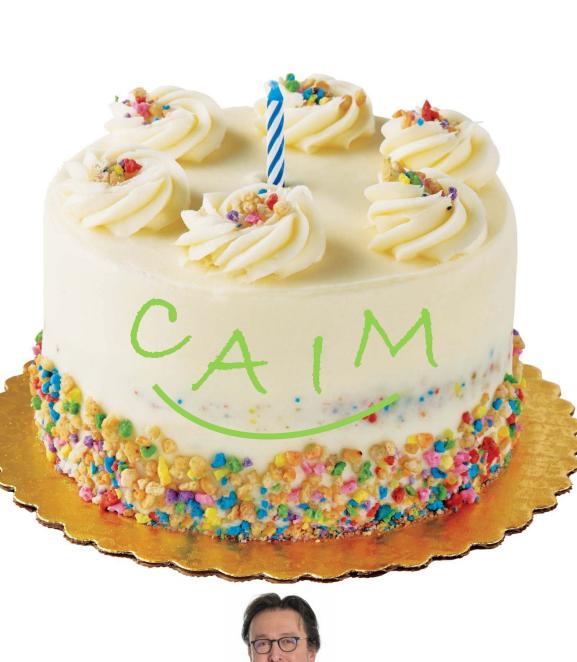
An Invitation to Translational Investigations

Wolf Hautz, Department of Emergency Medicine Inselspital University Hospital Bern



















A child prodigy



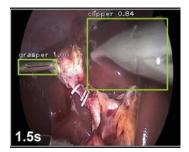


Diagnose Covid pneumonia more accurate than expert radiologists



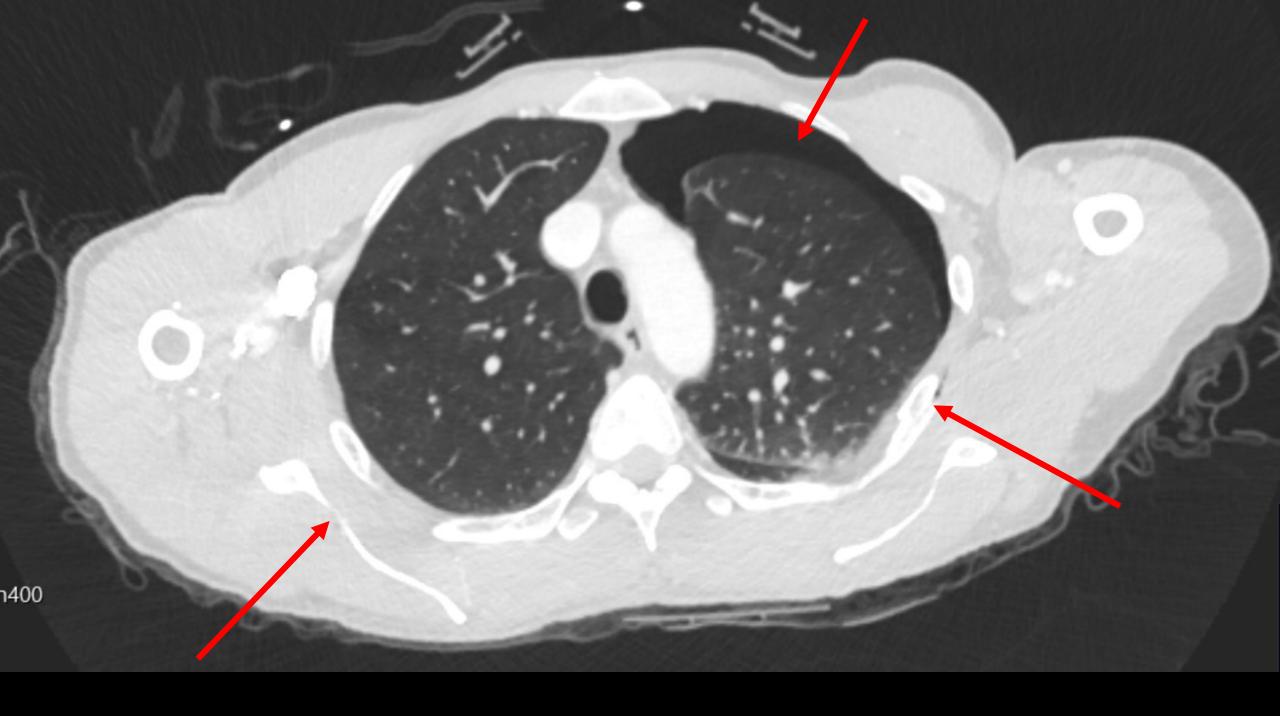
Tell you how healthy your diet is from smartphone pictures

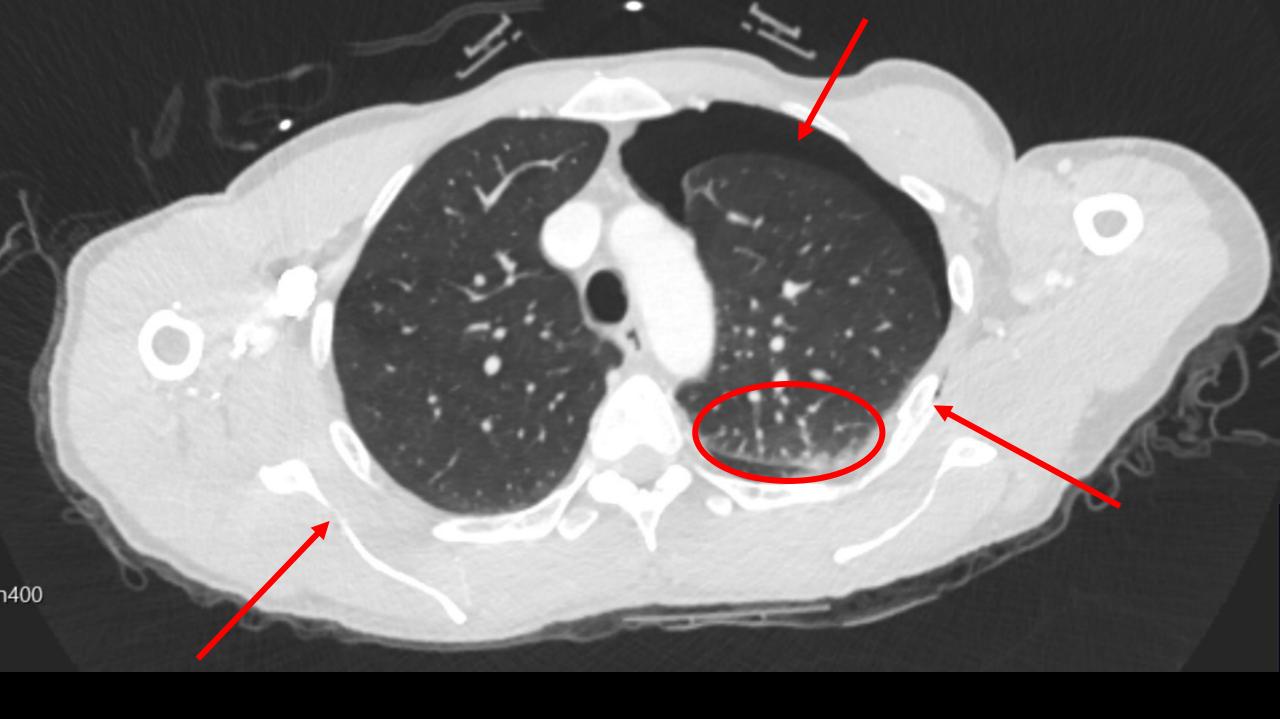
Vasilougly MF et al, Nutritients 2020, doi: 10.3390/nu12123763



Assess you how skilled your surgeon is

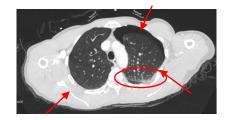
Lavanchy JL et al, Scientific Reports 2021, doi: 10.1038/s41598-021-84295-6





Where we need your help (most)

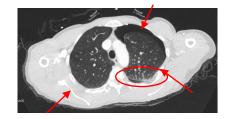




The most frequently missed pathology in acute care? The second one! Mattson B et al, BMJopen 2018, doi: 10.1136/bmjopen-2017-020230

Where we need your help (most)





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One in ten diagnoses is wrong (in acute care)

Balogh et al. National Academic Press; 2015, doi: 10.17226/21794 Hautz WE at al, Scand J Trauma Resuc 2019, doi: 0.1186/s13049-019-0629-z

Where we need your help (most)





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Current diagnostic decision support is of unknown value

Hautz WE et al, SNF funding, 2020, http://p3.snf.ch/project-187284

Diagnostic decision support

Name	ICD10	Info	Match
Sepsis und Schock	R65.21	Info	100%
Lungenembolie	127.82	Info	99%
Kardiogener Schock	R57.0	Info	82%
Coronavirus	B97.21	Info	82%
Perikarderguss / Tamponade	131.3	Info	80%
Natriumazid-Toxizität	T54.2	Info	64%
Pneumothorax	J93.9	Info	61%
ARDS	J80	Info	55%
Herzinsuffizienz / CHF	150.20	Info	55%
Lungenödem	J81.0	Info	55%
Aspirationssyndrome	J69.0	Info	53%
Aortenaneurysma / Dissektion	171	Info	51%
Anaphylaxie	T78.2	Info	49%



Diagnostic decision support

Name	ICD10	Info	Match	
Sepsis und Schock	R65.21	Info	100%	Blood Cultures, labs
Lungenembolie	127.82	Info	99%	CT-Scan
Kardiogener Schock	R57.0	Info	82%	More labs, Ultrasound
Coronavirus	B97.21	Info	82%	PCR test, Xray
Perikarderguss / Tamponade	131.3	Info	80%	Echocardiographia
Natriumazid-Toxizität	T54.2	Info	64%	
Pneumothorax	J93.9	Info	61%	
ARDS	J80	Info	55%	
Herzinsuffizienz / CHF	150.20	Info	55%	
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Anaphylaxie	T78.2	Info	49%	

Why our problems are hard



Anamnese Diagnostik Therapie		
Diagnosen	(
16.03.2021 12:13:30		<i>Im Vergleich zur VU</i> : V or u ntersuchung
 Erneuter epileptischer Anfall am 16.03.2021 bei bekannter struktureller fokaler sensibler Epilepsie Symptomatik bei Eintritt: Armbetontes sensomotrisches Hemisyndrom rechts (NIHSS 4) 	1	
- Bekannte Anfallsseminologie: Anfälle mit aufsteigenden Kribbelparästhesien am rechten Arm		
- 26.02.2021 EEG: Keine epilepsietypischen Potentiale		VU vom 18.12.: Verkehrsunfall
- Apydan 1800 mg/d	5	
2) Postoperatives Liquorkissen fronto-parietal links i.R. Do. 3		
- MR Schädel vom 15.02.2021: Im Vergleich zur VU vom 18.12.2020 neu aufgetretene intrakranielle extraaxiale		
Flüssigkeitskollektion (Lamelle von max. 20 mm)fronto-parietal links mit dadurch Kompression des benachbarten Hirnparenchyms mit zunehmendem Ödem ebenda.		
- St.n. Rekraniotomie und Revision der Duraplastik sowie Einlage einer Lumbaldrainage am 16.02.2021	\$	
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Sonstige Anamnese		
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Why our problems are hard



Justification

all intermixed

current treatment

suggested procedure

with actual diagnosis

contradictory evidence

	Diagnostik	Therapie		
gnosen				ſ
16.03.2021 12:1			^	
		am 16.03.2021 bei bekannter struktureller fokaler sensibler Epilepsie		
		betontes sensomotrisches Hemisyndrom rechts (NIHSS 4)		4
		Anfälle mit aufsteigenden Kribbelparästhesien am rechten Arm		E.
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		fronto-parietal links i.R. Dg. 3		
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		von max. 20 mm)fronto-parietal links mit dadurch Kompression des be	enachbarten	
		idem Ödem ebenda. Fina des Diversitatile servis Finitese sinse Lumbelderingen em 16.02.200	14	
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Your next challenge?



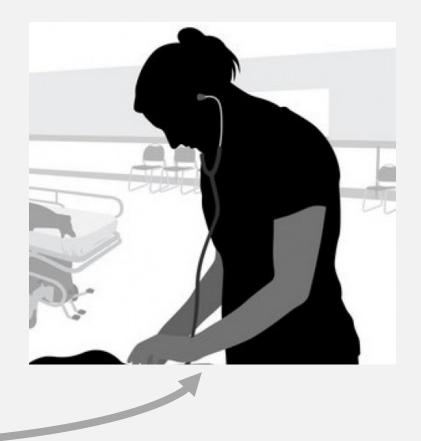
Compared to images or videos

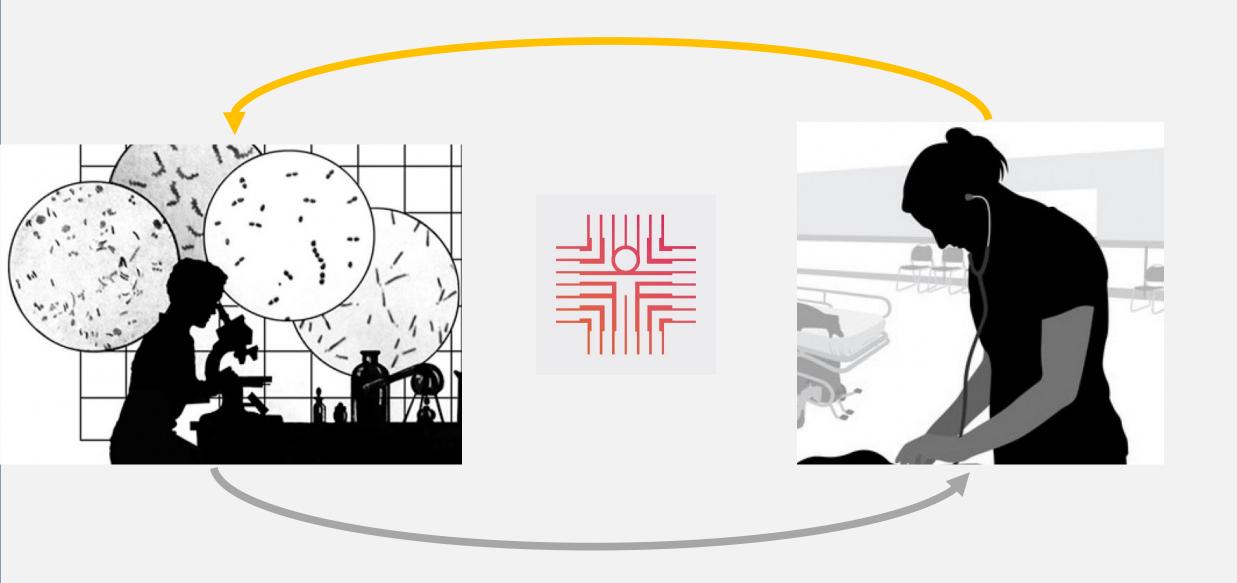
- Much more information in much less data
- Data are ambiguous
- Meaning is context dependent
- Data are much less structured
- The space of correct possible outcomes is vast

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nature > npj digital medicine > perspectives > article

Perspective Open Access Published: 16 August 2019

The "inconvenient truth" about AI in healthcare

Trishan Panch, Heather Mattie & Leo Anthony Celi 🖂

npj Digital Medicine 2, Article number: 77 (2019) Cite this article

However, "the inconvenient truth" is that at present the algorithms that feature prominently in research literature are in fact not, for the most part, executable at the frontlines of clinical practice. This is for two reasons: first, these AI innovations by themselves do not re-engineer

What we bring to the journey

In depth knowledge of when and why we make diagnostic errors



Statistician





Social Scientist



Cognitive psychologist



Physician



Rehab. Specialist



AI in the WILD wolf.hautz@insel.ch