Big Data e Inteligencia Artificial:

del concepto a la clínica

Ignacio Hernández Medrano

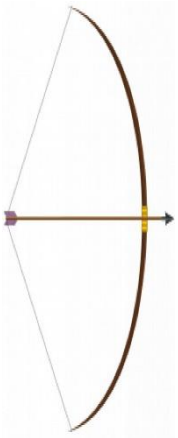
27 de marzo de 2019

Machine Learning: Google Translate Example

explosión big data

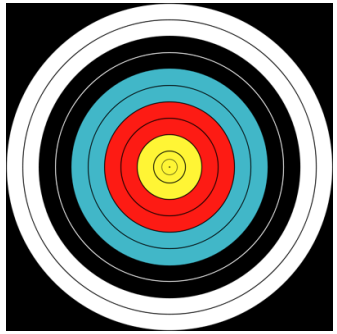
NETFLIX

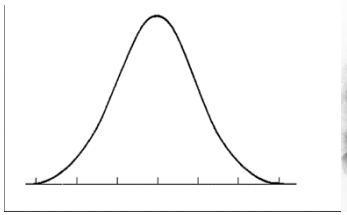
amazon



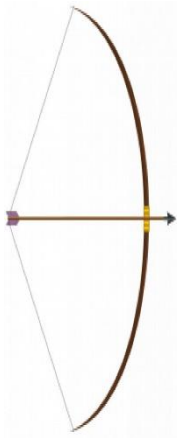
Sabes que sabes
Determinista

$$F = m.a$$
$$N = Kg \cdot \frac{m}{s^2}$$





Sabes que no sabes
Probabilista
(estocástico)



No sabes que no sabes
Machine learning

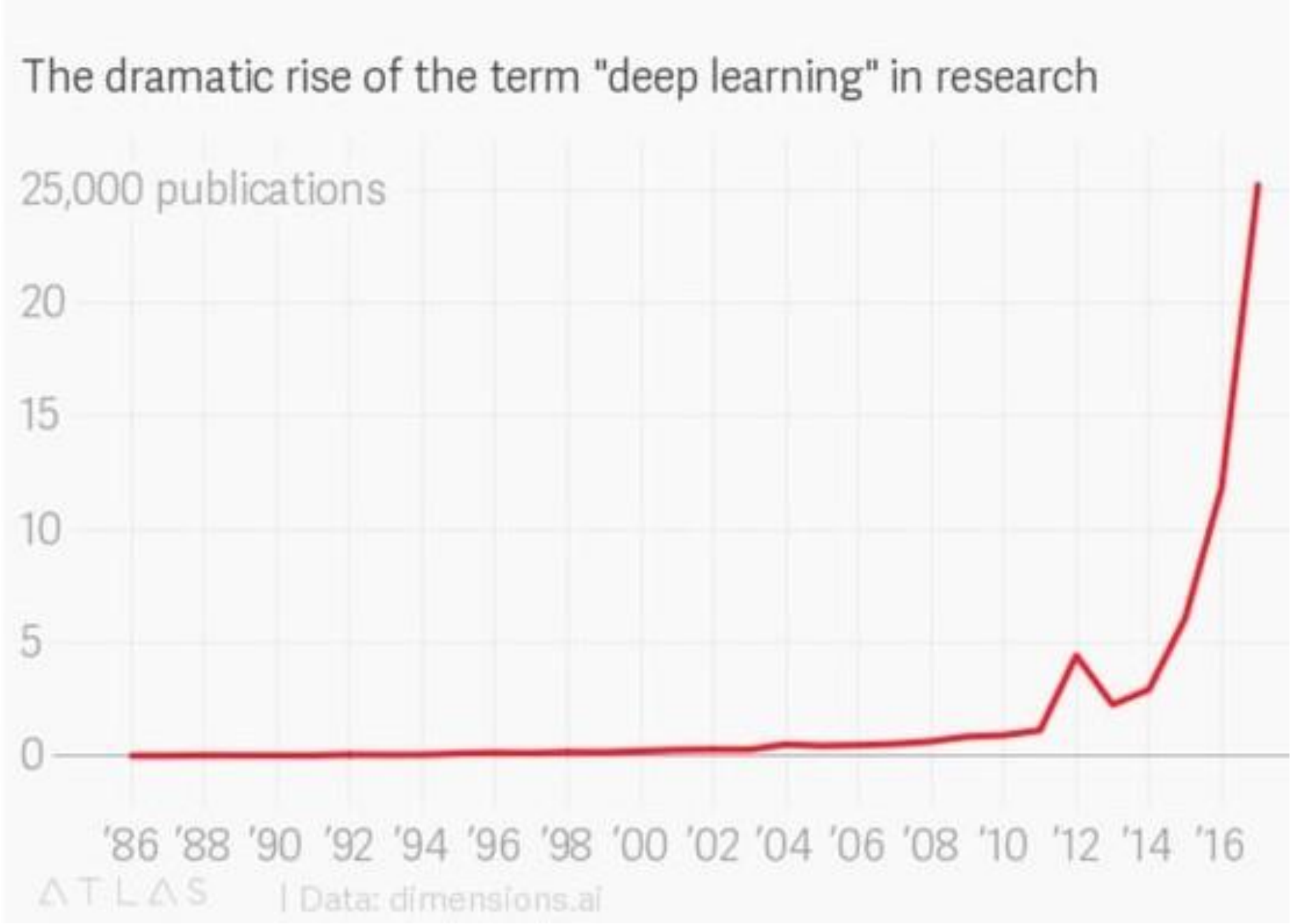
Computers cycles

1 - arithmetic and storing data

2 - connection

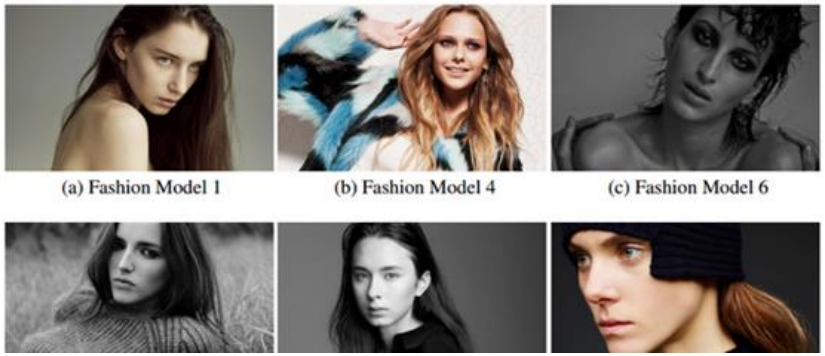
3 - shift place and time

4 - prediction



Machine Learning Algorithm Predicts Which New Faces Will Make It as Fashion Models

A machine-learning algorithm picks out the fashion models most likely to succeed.

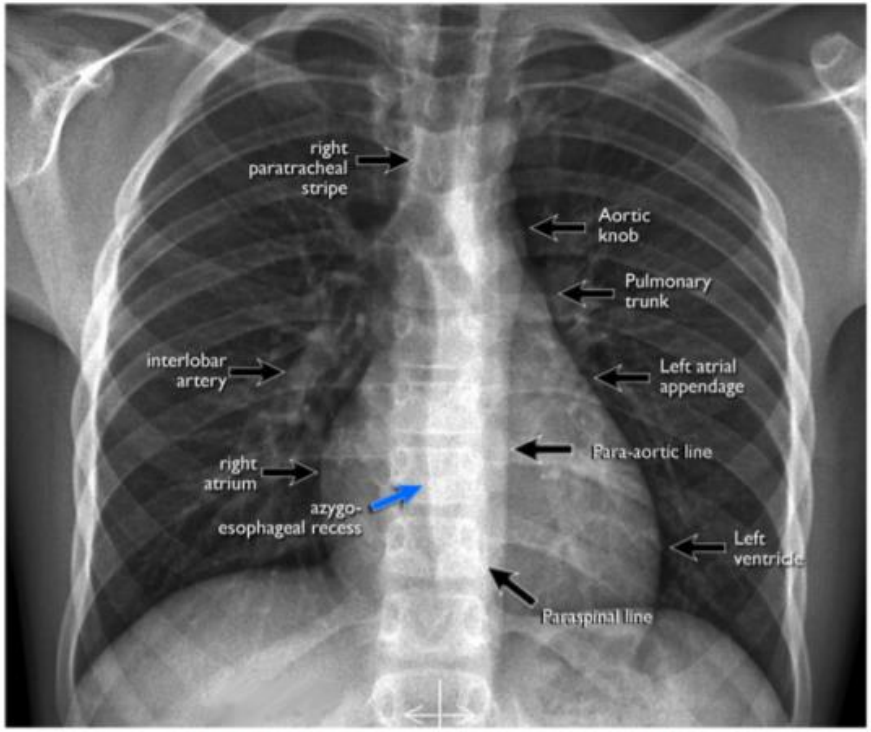


(a) Fashion Model 1 (b) Fashion Model 4 (c) Fashion Model 6

Loro o guacamole

Galleta o chihuahua

Karpathy, Andrej & Li, Fei Fei. Deep Visual-Semantic Alignments for Generating Image Descriptions, CVPR, 2015

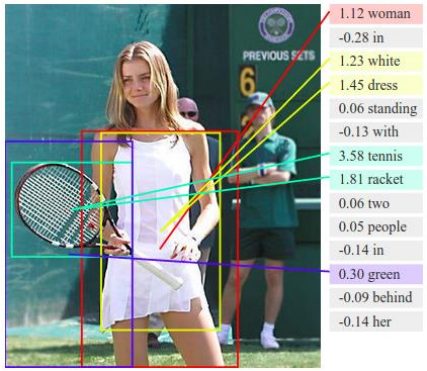


http://www.radiologyassistant.nl/

CLASIFICACIÓN

“perro”

LOCALIZACIÓN



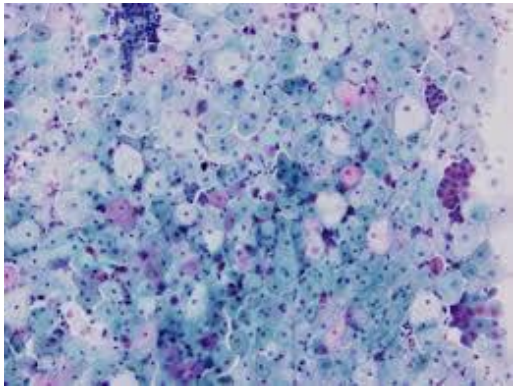
RESUMEN

“un grupo de hombres jugando al fútbol”

CLASIFICACIÓN

“benigno vs maligno”

LOCALIZACIÓN



RESUMEN

“fractura del húmero”

Original Investigation | Innovations in Health Care Delivery

FREE

December 13, 2016

Development and Validation of a Deep Learning Algorithm for Detection of Diabetic Retinopathy in Retinal Fundus Photographs

Varun Gulshan, PhD[1]; Lily Peng, MD, PhD[1]; Marc Coram, PhD[1]; et al

» Author Affiliations | Article Information

JAMA. 2016;316(22):2402-2410. doi:10.1001/jama.2016.17216

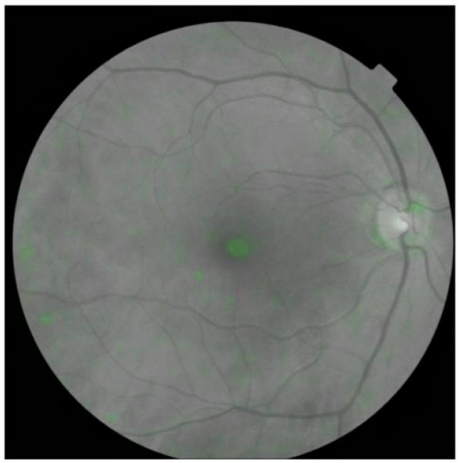
JAMA
The Journal of the American Medical Association

FDA permits marketing of artificial intelligence-based device to detect certain diabetes-related eye problems

FDA News Release

For Immediate Release

Gender



Actual: Female
Predicted: Female

nature biomedical engineering

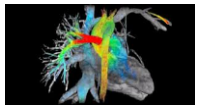
Article | Published: 19 February 2018

Prediction of cardiovascular risk factors from retinal fundus photographs via deep learning

Ryan Poplin, Avinash V. Varadarajan, Katy Blumer, Yun Liu, Michael V. McConnell, Greg S. Corrado, Lily Peng & Dale R. Webster

Nature Biomedical Engineering **2**, 158–164 (2018) | Download Citation

FDA APPROVED

ARTERYS		Noviembre 17
AliveCor		Noviembre 17
Viz.ai		Febrero 18
IDx		Abril 18
IMAGEN		Mayo 18

Annals of Internal Medicine

ORIGINAL RESEARCH

Automated and Clinical Breast Imaging Reporting and Data System Density Measures Predict Risk of Screen-Detected and Interval Cancers

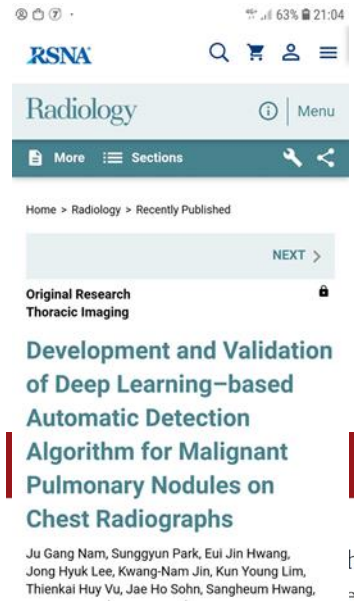
Karla Kerlikowske, MD; Christopher G. Scott, MS; Amir P. Mahmoudzadeh, MScEng; Lin Ma, MS; Stacey Winham, PhD; Matthew R. Jensen, BS; Fang Fang Wu, BS; Serghei Malkov, PhD; V. Shane Pankratz, PhD; Steven R. Cummings, MD; John A. Shepherd, PhD; Kathleen R. Brandt, MD; Diana L. Miglioretti, PhD; and Celine M. Vachon, PhD

Deep neural network improves fracture detection by clinicians

Robert Lindsey, Aaron Daluiski, Sumit Chopra, Alexander Lachapelle, Michael Mozer, Serge Sicular, Douglas Hanel, Michael Gardner, Anurag Gupta, Robert Hotchkiss, and Hollis Potter

PNAS published ahead of print October 22, 2018 https://doi.org/10.1073/pnas.1806905115

Edited by Terrence J. Sejnowski, Salk Institute for Biological Studies, La Jolla, CA, and approved September 14, 2018 (received for review April 25, 2018)

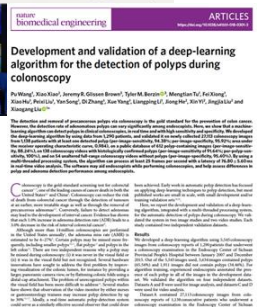


henotypes of genetic

eep learning

Yaron Gurovich, Yair Hanani, Omri Bar, Guy Nadav, Nicole Fleischer, Dekel Gelbman, Lina Basel-Salmon, Peter M. Krawitz, Susanne B. Kamphausen, Martin Zenker, Lynne M. Bird & Karen W. Gripp

Nature Medicine **25**, 60–64 (2019) | Download Citation

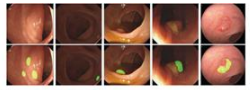


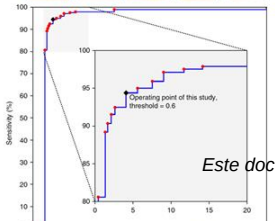
ORIGINAL ARTICLE

OPEN

Impact of Deep Learning Assistance on the Histopathologic Review of Lymph Nodes for Metastatic Breast Cancer

MD, PhD, Robert MacDonald, PhD,* Yun Liu, PhD,* Peter Truszkowski, MD,* p, MD, PhD, FCAP,* Christopher Gammage, MS,* Florence Thng, MS,† Lily Peng, MD, PhD,* and Martin C. Stumpe, PhD**





Biología de sistemas… también exponencial

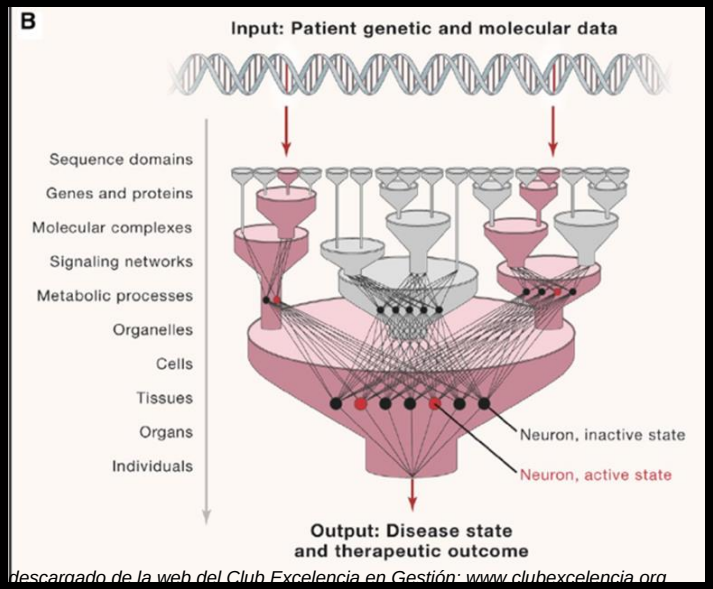
Exposoma: ?

Conectoma: 10^{69}

Proteoma: 10^{20}

Transcriptoma: 10^{16}

Genoma: 10^{9}



- AlQuraishi, M. End-to-end differentiable learning of protein structure. Preprint at https://doi.org/10.1101/265231 (2018).
- Espinoza, J. L. Machine learning for tackling microbiota data and infection complications in immunocompromised patients with cancer. J. Intern. Med. https://doi.org/10.1111/joim.12746 (2018).
- van Dijk, D. et al. Recovering gene interactions from single-cell data using data diffusion. Cell 174, 716–729.e727 (2018).
- Zitnik, M. et al. Machine learning for integrating data in biology and medicine: principles, practice, and opportunities. Preprint at https://doi.org/10.1111/joim.12746 (2018).
- Camacho, D. M. et al. Next-generation machine learning for biological networks. Cell 173, 1581–1592 (2018).
- Kim, H. K. et al. Deep learning improves prediction of CRISPR–Cpf1 guide RNA activity. Nat. Biotechnol. 36, 239–241 (2018).
- Listgarten, J. et al. Prediction of off-target activities for the end-to-end design of CRISPR guide RNAs. Nat. Biomed. Eng. 2, 38–47 (2018).
- Caravagna, G. et al. Detecting repeated cancer evolution from multi-region tumor sequencing data. Nat. Methods 15, 707–714 (2018).
- Manak, M. et al. Live-cell phenotypic-biomarker microfluidic assay for the risk stratification of cancer patients via machine learning. Nature Biomed. Eng. 2, 761–772 (2018).
- Hassabis, D. et al. Neuroscience-inspired artificial intelligence. Neuron 95, 245–258 (2017).
- Robie, A. A. et al. Mapping the neural substrates of behavior. Cell 170, 393–406 e328 (2017).
- Dasgupta, S. et al. A neural algorithm for a fundamental computing problem. Science 358, 793–796 (2017).

- Januszewski, M. et al. High-precision automated reconstruction of neurons with flood-filling networks. Nat. Methods 15, 605–610 (2018).
- Savelli, F. & Knierim, J. J. AI mimics brain codes for navigation. Nature 557, 313–314 (2018).
- Banino, A. et al. Vector-based navigation using grid-like representations in artificial agents. Nature 557, 429–433 (2018).
- Adam, G. C. Two artificial synapses are better than one. Nature 558, 39–40 (2018).
- Wright, C. D. Phase-change devices: crystal-clear neuronal computing. Nat. Nanotechnol. 11, 655–656 (2016).
- Mathis, A. et al. DeepLabCut: markerless pose estimation of user-defined body parts with deep learning. Nat. Neurosci. 21, 1281–1289 (2018).
- Smalley, E. AI-powered drug discovery captures pharma interest. Nat. Biotechnol. 35, 604–605 (2017).
- Schneider, G. Automating drug discovery. Nat. Rev. Drug. Discov. 17, 97–113 (2018).
- Chakradhar, S. Predictable response: finding optimal drugs and doses using artificial intelligence. Nat. Med. 23, 1244–1247 (2017).
- Lowe, D. AI designs organic syntheses. Nature 555, 592–593 (2018).
- Luechtefeld, T. et al. Machine learning of toxicological big data enables read-across structure activity relationships (RASAR) outperforming animal test reproducibility. Toxicol. Sci. 165, 198–212 (2018).
- Hie, B. et al. Realizing private and practical pharmacological collaboration. Science 362, 347–350 (2018).
- Bilsland, E. et al. Plasmodium dihydrofolate reductase is a second enzyme target for the antimalarial action of triclosan. Sci. Rep. 8, 1038 (2018).

Data infrastructure

Google

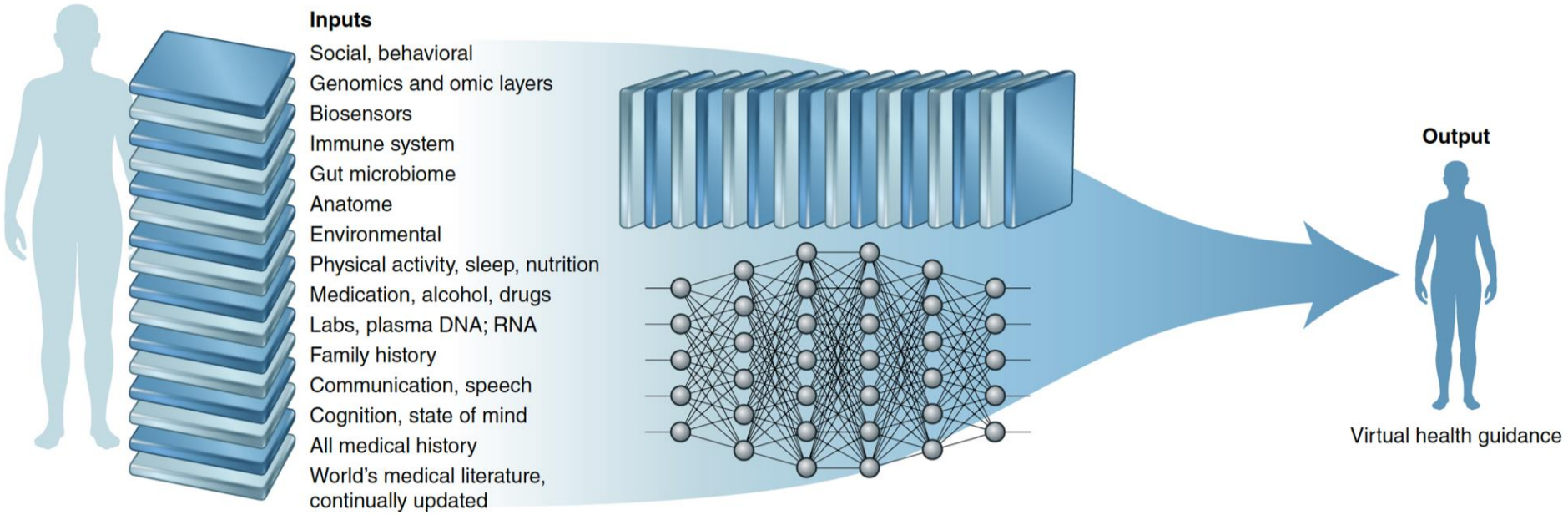
26.000 programadores

J.P.Morgan

30.000 programadores

Healthcare information grows 48% / year

Accenture 2018



Posture
Lumo
Zephyr
Jins Meme

Muscle Activity
Athos

Blood Pressure
iHealth
Withings

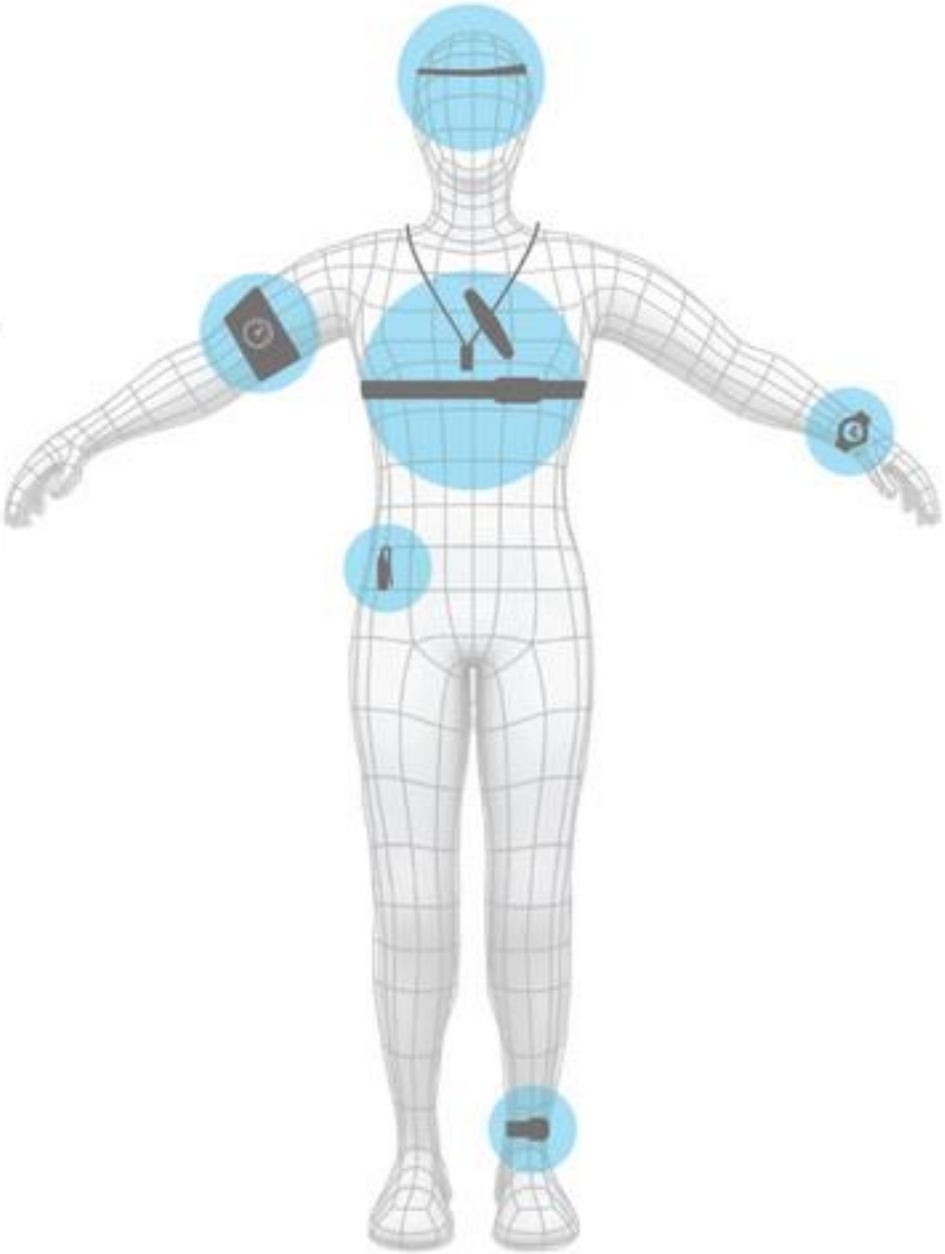
Skin Conductance
Basis
Body Media
Empatica
Neumitra

Movement
Fitbit
Nike Fuelband
Jawbone Up Band
Garmin
Samsung
MC10
Zephyr
Withings
Spire
iHealth
Jins Meme
Proteus
Neumitra
Body Media
Empatica
Owlet

Oxygen Level
iHealth
Withings
Owlet

Hydration
Corventis
MC10

Temperature
Tempdrop
MC10
Empatica
BodyMedia
Basis
Owlet



Brain Activity
NeuroSky
Melon (acquired by DAQRI)
Emotiv

Glucose
Google
Dexcom
Glysens Incorporated

Eye Tracking
Jins Meme

Sleep
FitBit
Rest Devices
Garmin
Nike
Amiigo
BodyMedia
Withings
Samsung
Misfit
Jawbone
iHealth
Basis
Owlet

Respiration
Spire
Zephyr
Rest Devices

Ingestion
Proteus

Heart Tracking
Zephyr
Withings
Sprouting
Proteus
iHeath
Basis
Corventis
AliveCor
Samsung
Garmin
Empatica
Owlet

* This is not a comprehensive list

PixelTech

Smartwatch Algorithm for Automated Detection of Atrial Fibrillation

Joseph M. Bumgarner, MD,[a] Cameron T. Lambert, MD,[a] Ayman A. Hussein, MD,[a] Daniel J. Cantillon, MD,[a] Bryan Baranowski, MD,[a] Kathy Wolski, MPH,[b] Bruce D. Lindsay, MD,[a] Oussama M. Wazni, MD, MBA,[a] Khaldoun G. Tarakji, MD, MPH[a]

ABSTRACT

BACKGROUND The Kardia Band (KB) is a novel technology that enables patients to record a rhythm strip using an Apple Watch (Apple, Cupertino, California). The band is paired with an app providing automated detection of atrial fibrillation (AF).

OBJECTIVES The purpose of this study was to examine whether the KB could accurately differentiate sinus rhythm (SR) from AF compared with physician-interpreted 12-lead electrocardiograms (ECGs) and KB recordings.

METHODS Consecutive patients with AF presenting for cardioversion (CV) were enrolled. Patients underwent pre-CV ECG along with a KB recording. If CV was performed, a post-CV ECG was obtained along with a KB recording. The KB interpretations were compared to physician-reviewed ECGs. The KB recordings were reviewed by blinded electrophysiologists and compared to ECG interpretations. Sensitivity, specificity, and K coefficient were measured.

RESULTS A total of 100 patients were enrolled (age 68 ± 11 years). Eight patients did not undergo CV as they were found to be in SR. There were 169 simultaneous ECG and KB recordings. Fifty-seven were noninterpretable by the KB. Compared with ECG, the KB interpreted AF with 93% sensitivity, 84% specificity, and a K coefficient of 0.77. Physician interpretation of KB recordings demonstrated 99% sensitivity, 83% specificity, and a K coefficient of 0.83. Of the 57 noninterpretable KB recordings, interpreting electrophysiologists diagnosed AF with 100% sensitivity, 80% specificity, and a K coefficient of 0.74. Among 113 cases where KB and physician readings of the same recording were interpretable, agreement was excellent (K coefficient = 0.88).

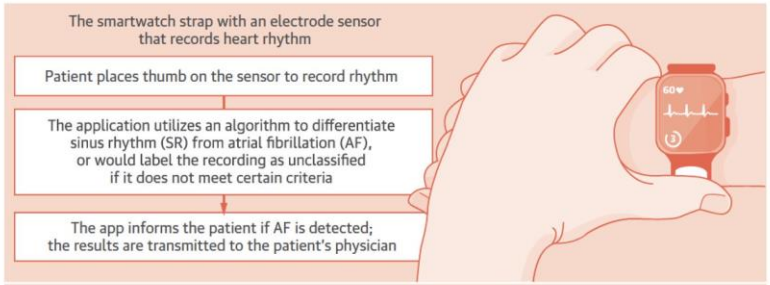
CONCLUSIONS The KB algorithm for AF detection supported by physician review can accurately differentiate AF from SR. This technology can help screen patients prior to elective CV and avoid unnecessary procedures.
(J Am Coll Cardiol 2018;71:2381–8)

Atrial fibrillation (AF) is the most commonly encountered arrhythmia in clinical practice and population-based studies forecast over 6 million individuals living with this diagnosis by 2050 (1,2). It is a chronic condition whose prevalence increases with age, and represents a growing economic burden for our health care system (3,4). Although the journey of AF begins with an initial

From the [a]Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio; and the [b]Cleveland Clinic Coordinating Center for Clinical Research (C5Research), Cleveland Clinic, Cleveland, Ohio. AliveCor provided the Kardia Band monitors that were connected to an Apple Watch and paired via Bluetooth to a smartphone device for utilization in the study. AliveCor was not involved in the design, implementation, data analysis, or manuscript preparation of the study. Dr. Hussein has served as a consultant for Abbott and Biosense Webster. Dr. Cantillon has served as a consultant for Abbott, Boston Scientific, Stryker Sustainability, and LifeWatch. Dr. Wazni has received a speaker honorarium from Spectranetics. Dr. Tarakji has served on the medical advisory board of Medtronic and AliveCor. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received February 14, 2018; revised manuscript received March 1, 2018, accepted March 2, 2018.

CENTRAL ILLUSTRATION Automated Atrial Fibrillation Detection Algorithm Using Novel Smartwatch Technology

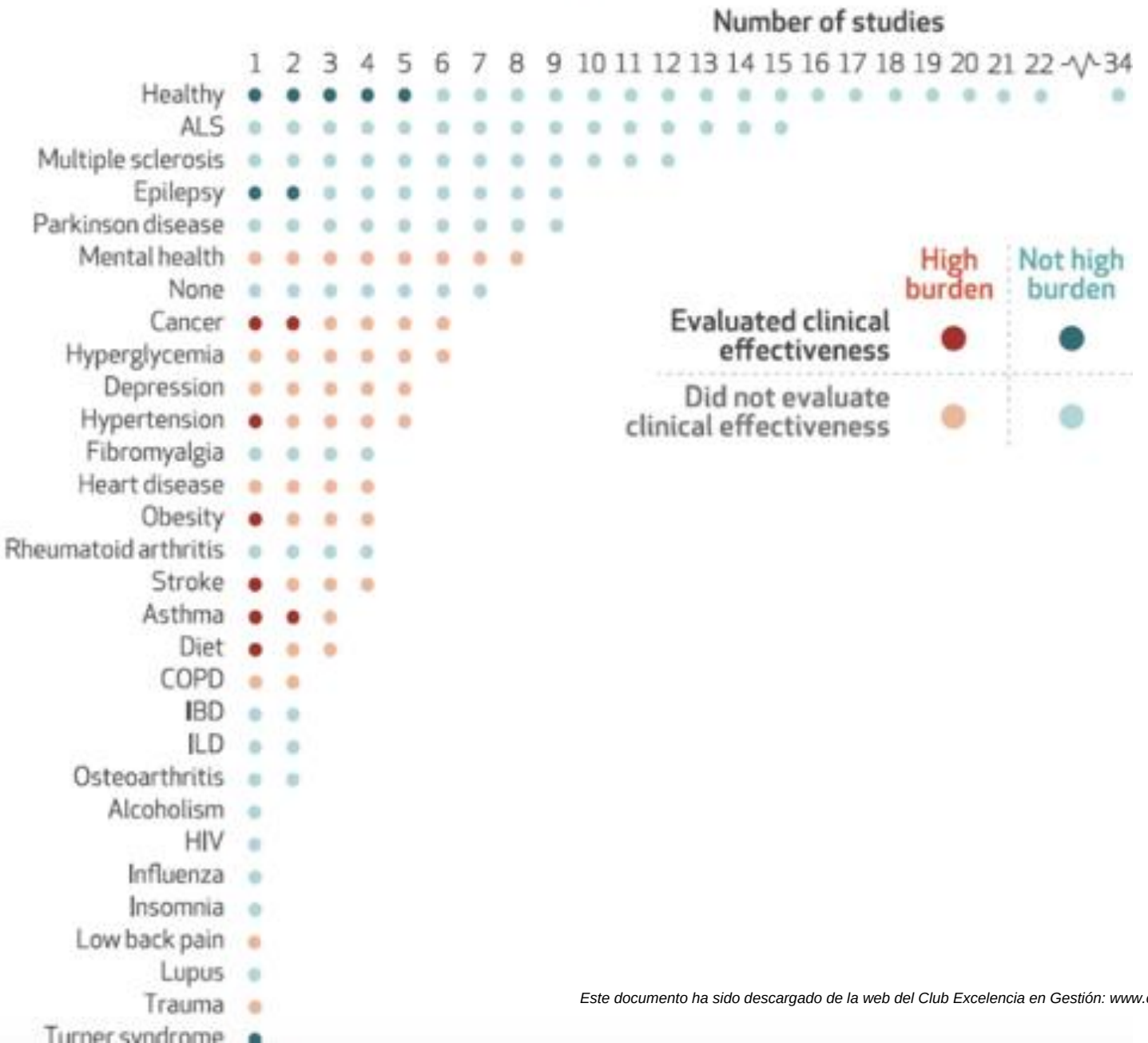


Method for interpreting the recording:	% of patients with interpretable results	Accuracy of AF diagnosis compared to 12 lead electrocardiogram
App algorithm only	66%	93% sensitivity; 84% specificity
Physician only	87%	99% sensitivity; 83% specificity
Recordings labeled as "unclassified" by the app algorithm when reviewed by physician	100%	100% sensitivity; 80% specificity

Bumgarner, J.M. et al. J Am Coll Cardiol. 2018;71(21):2381–8.

FIGURE 1 The Kardia Band From AliveCor Paired With an Apple Smartwatch

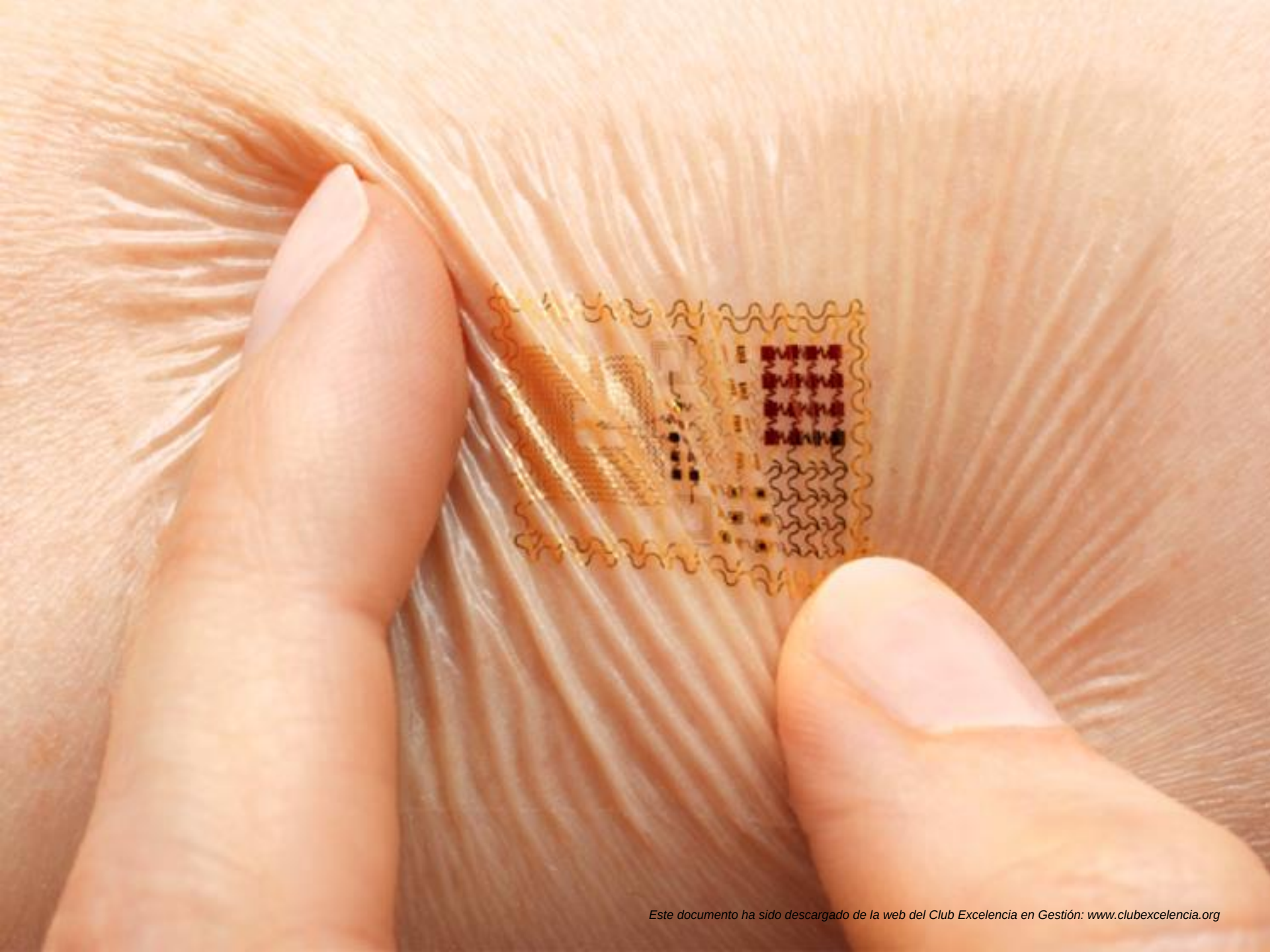
Studies by the twenty top-funded privately held US-based digital health companies, by burden level and clinical effectiveness and by population, condition, or risk factor



Digital Medicine Clinical Trials

Condition	Digital Intervention	Impact	Citation
Asthma	Inhaler Sensor + GPS for hot spots	Reduce rescue inhaler use by 78%; 48% more symptom-free days (Louisville Air)	Barrett, Health Affairs, April 2018
Hypertension	Smartphone app RCT	Improved medication adherence	Morawski, JAMA Internal Med 2018
Diabetes	Telemedicine RCT	Improved control of Type 2 diabetes	Wild et al, PLOS Medicine, 2016
Heart failure	Telemedicine RCT	Less hospital admission and mortality	Koehler, Lancet, 2018
Inflammatory Bowel Disease	Telemedicine RCT	Striking reduction in outpatient visits and hospital admissions	De Jong, Lancet 2017
Cancer	Smartphone app RCT	Improved survival in lung cancer	Denis, ASCO 2018
Headaches	Telemedicine RCT	As effective as traditional consultations	Muller, Neurology, 2017
Visual Impairment	Smartphone app RCT	Marked improvement of detection among school children in Kenya	Rono, Lancet Global Health, 2018
Insomnia	Digital CBT RCT	Major reduction in insomnia among patients with mental health conditions	Freeman, Lancet Psychiatry, 2017
Attention deficit disorder	Video game RCT	Significant improvement of attention performance in children and adolescents	Kollins, December 2017 and Proof of Concept PLOS One, 2018
Schizophrenia	Avatar CBT RCT	Significant reduction of hallucinations	Craig, Lancet Psychiatry 2017

CBT-cognitive behavioral therapy, RCT-randomized controlled trial



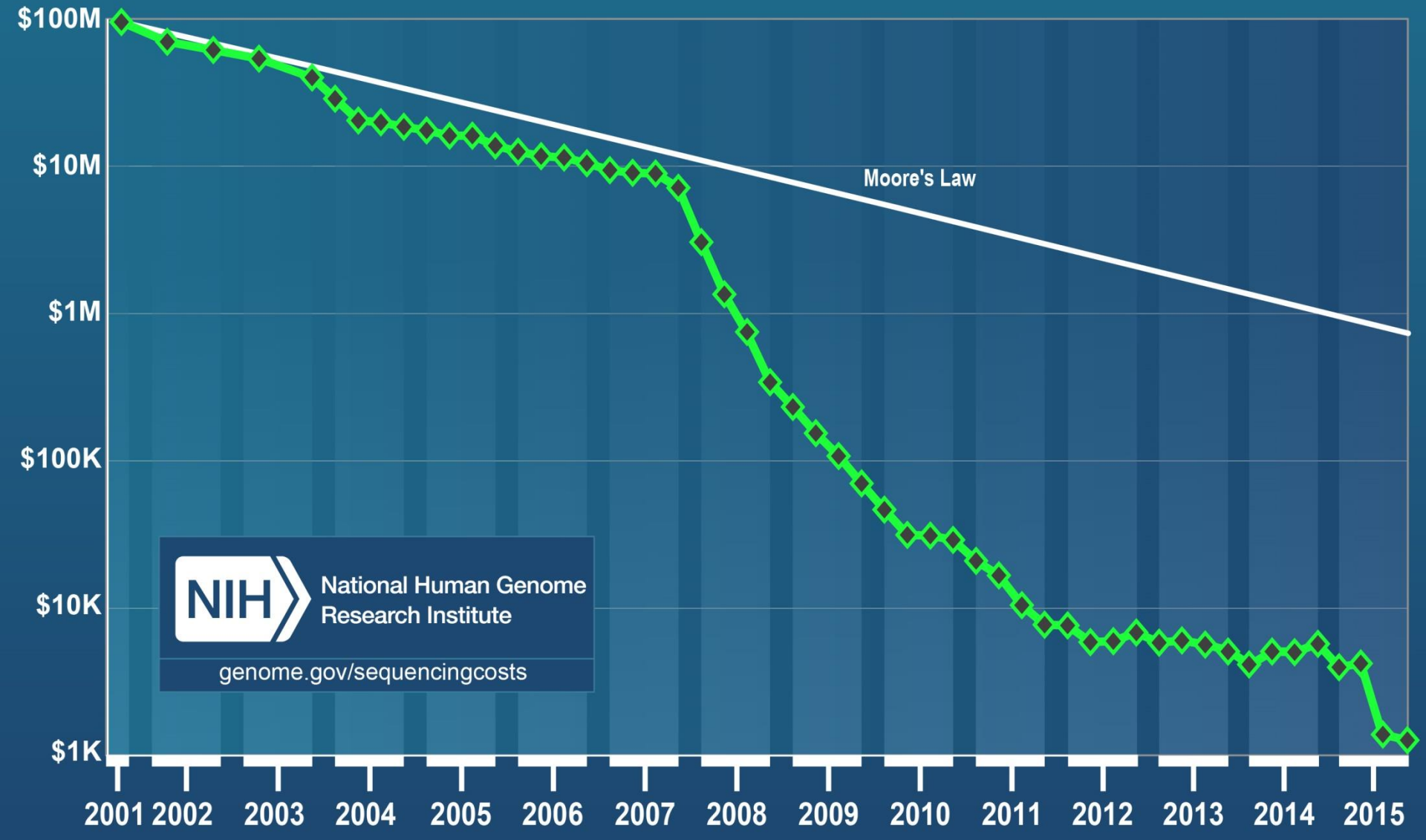
FDA News Release

FDA selects participants for new digital health software precertification pilot program

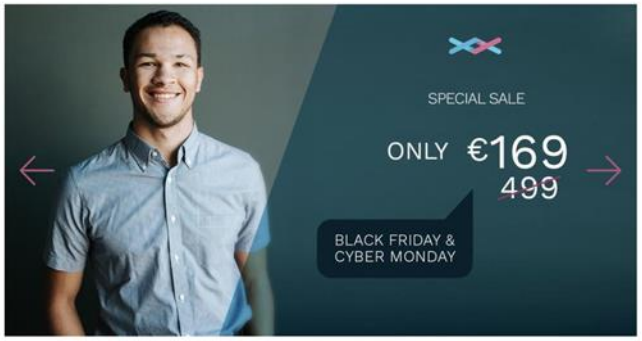
Pilot program aims to advance the development of novel digital health applications

For Immediate Release September 26, 2017

Cost per Genome



Home / Home Page Europe / My Full DNA: Whole Genome Sequencing with mtDNA



My Full DNA: Whole Genome Sequencing with mtDNA

€169.00 EUR ~~€850.00 EUR~~ You save €681.00 EUR

1

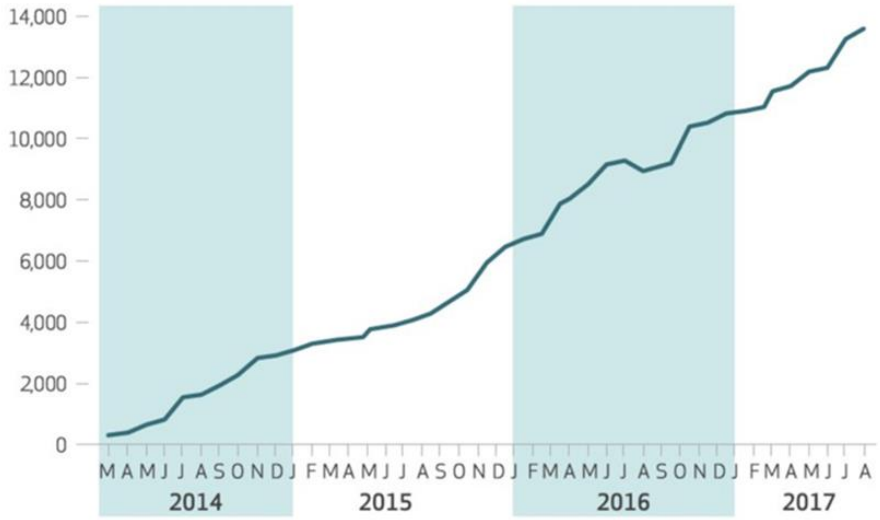
ADD TO CART

Sample Customized Report on Genetic Diseases

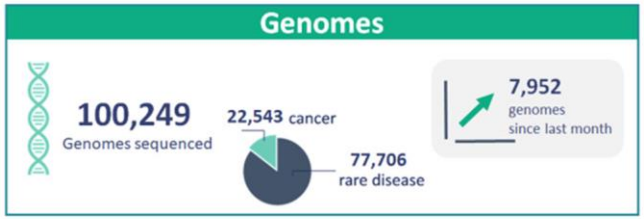
Sample Health & Wellness Report

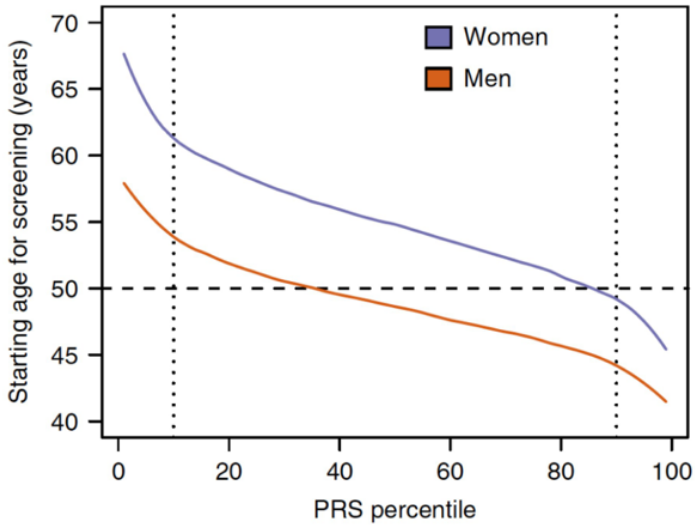
DESCRIPTION

Cumulative number of new genetic tests on the market, by month, March 2014–August 2017



Percentages of spending on genetic testing in six clinical domains, by quarter, 2014–16





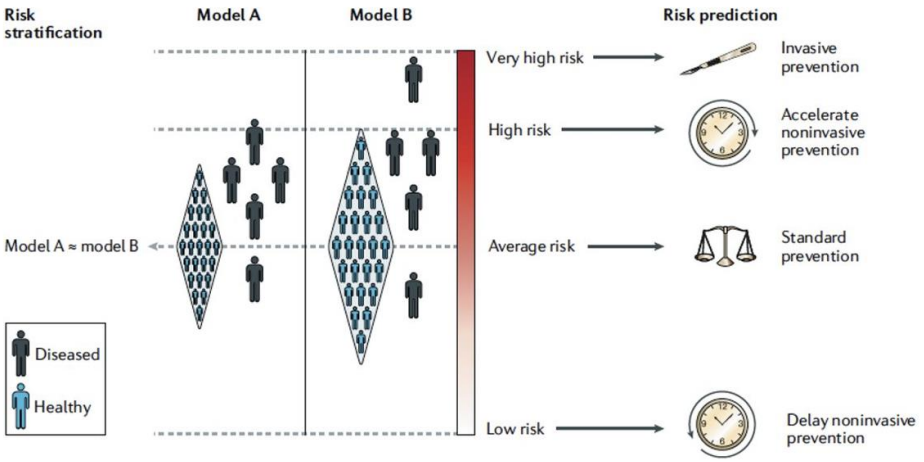
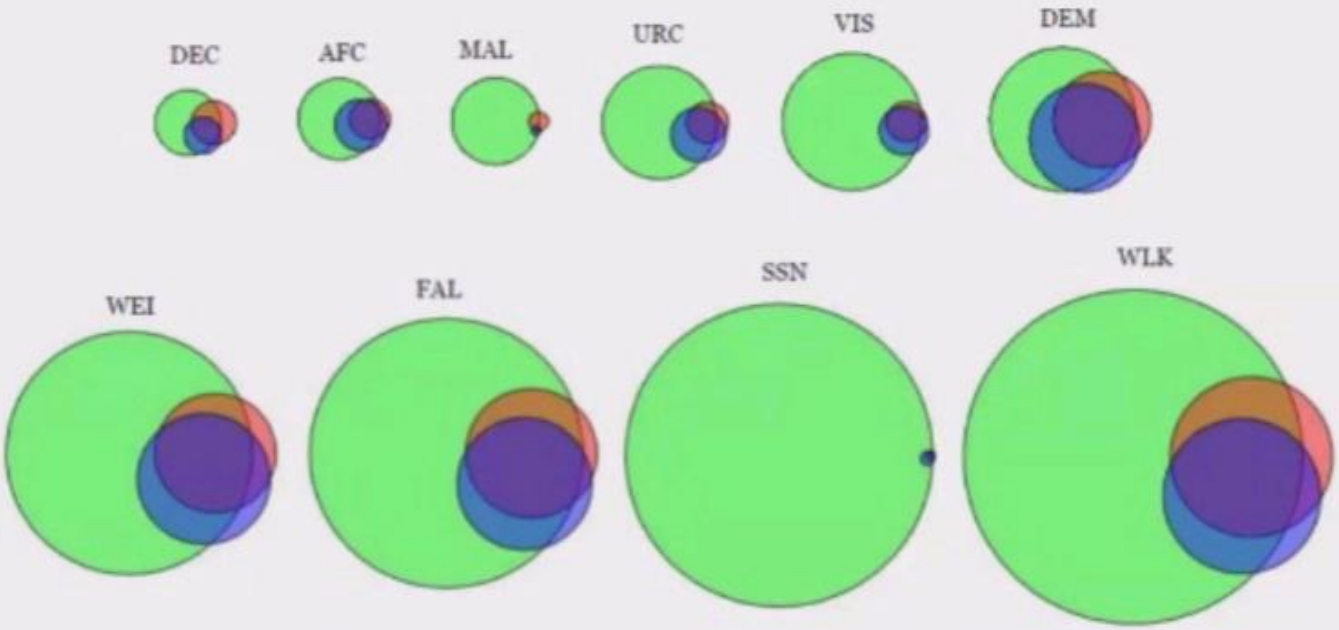


Fig. 3 | Recommended age to start CRC screening based on a polygenic risk score.

Discovery of common and rare genetic risk variants for colorectal cancer

To further dissect the genetic architecture of colorectal cancer (CRC), we performed whole-genome sequencing of 1,439 cases and 720 controls, imputed discovered sequence variants and Haplotype Reference Consortium panel variants into genome-wide association study data, and tested for association in 34,869 cases and 29,051 controls. Findings were followed up in an additional 23,262 cases and 38,296 controls. We discovered a strongly protective 0.3% frequency variant signal at *CHD1*. In a combined meta-analysis of 125,478 individuals, we identified 40 new independent signals at $P < 5 \times 10^{-8}$, bringing the number of known independent signals for CRC to ~100. New signals implicate lower-frequency variants, Krüppel-like factors, Hedgehog signaling, Hippo-YAP signaling, long noncoding RNAs and somatic drivers, and support a role for immune function. Heritability analyses suggest that CRC risk is highly polygenic, and larger, more comprehensive studies enabling rare variant analysis will improve understanding of biology underlying this risk and influence personalized screening strategies and drug development.

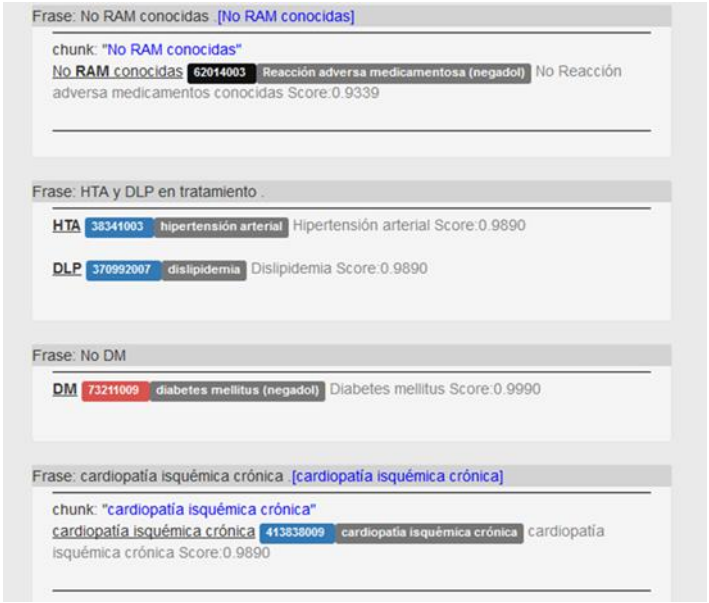
Key clinical concepts are "locked" in free text



DEC	Ulcer
AFC	Stool incontinence
MAL	Malnutrition
URC	Urin. incontinence
VIS	Visually impaired
DEM	Dementia
WEI	Weight loss
FAL	Fall risk
SSN	Social support
WLK	Walking difficulty

Added value of free text represented by the Venn diagram
Circle sizes represent the number of patients identified by each methodology/data-source
*Green: EHR Free Text; **Blue**: EHR Structured; **Red**: Insurance Claims*

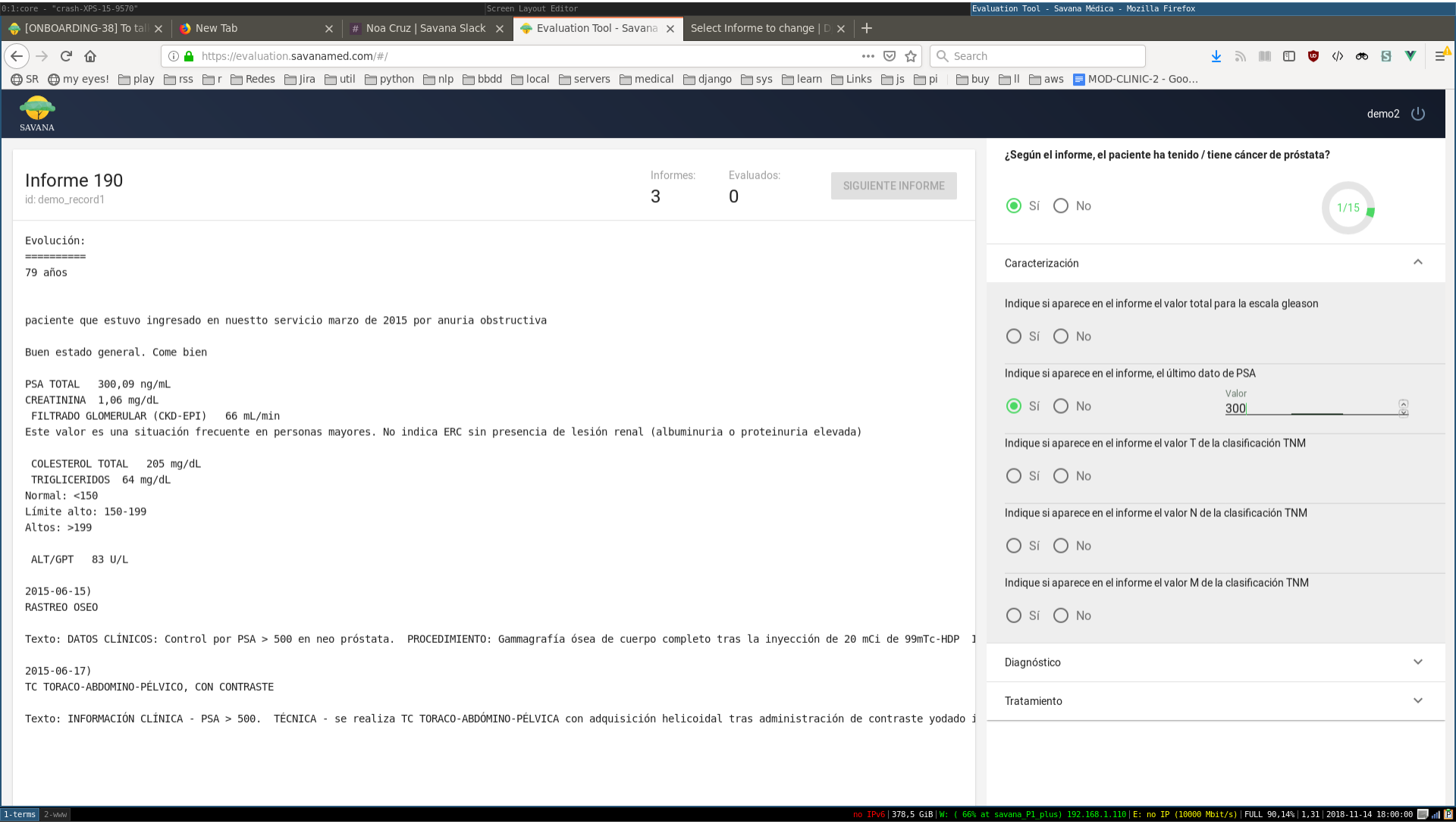
[1] Source: Johns Hopkins CPHIT 2016



Savana: Re-using Electronic Health Records with Artificial Intelligence

Ignacio Hernández Medrano[1], Jorge Tello Guijarro[1], Cristóbal Belda[2], Alberto Ureña[1], Ignacio Salcedo[1], Luis Espinosa-Anke[1,3], Horacio Saggion[3]

[1]*Savana*
[2]*HM Hospitales*
[3]*TALN DTIC, Universitat Pompeu Fabra, Barcelona (Spain)*



Validación de Savana en cardiopatía isquémica, por cardiólogos

Hospital 1

Primary variable	TP	FP	FN	Precision	Recall	F-score
Hipercolesterolemia primaria	9	0	0	1,00	1,00	**1,00**
Hipertrigliceridemia	6	0	0	1,00	1,00	**1,00**
Infarto agudo de miocardio	5	0	0	1,00	1,00	**1,00**
Angina estable	1	2	0	0,33	1,00	**0,50**
Cardiopatía isquémica	26	5	0	0,84	1,00	**0,91**
Accidente cerebrovascular (ACVA), Ictus	5	6	10	0,45	0,33	**0,38**
Accidente isquémico transitorio (AIT, TIA)	4	0	0	1,00	1,00	**1,00**
Diabetes mellitus	157	0	3	1,00	0,98	**0,99**
Enfermedad renal crónica	36	0	10	1,00	0,78	**0,88**
Aterosclerosis carotídea	0	0	4	0,00	0,00	0,00
Enfermedad coronaria multivaso	0	4	0	0,00	0,00	0,00
Enfermedad coronaria de 1 vaso	0	0	4	0,00	0,00	0,00

Hospital 2

Primary variable	TP	FP	FN	Precision	Recall	F-score
Síndrome coronario agudo	1	0	0	1,00	1,00	**1,00**
Angina estable	1	1	0	0,50	1,00	**0,67**
Cardiopatía isquémica	9	0	0	1,00	1,00	**1,00**
Accidente cerebrovascular (ACVA), Ictus	8	0	0	1,00	1,00	**1,00**
Enfermedad arterial periférica	1	0	0	1,00	1,00	**1,00**
Diabetes mellitus	30	0	2	1,00	0,94	**0,97**
Enfermedad renal crónica	3	0	2	1,00	0,60	**0,75**

0,96

sescam
Servicio de Salud de Castilla-La Mancha

El Servicio de Salud de Castilla-La Mancha (SESCAM) es la institución encargada de la gestión de la salud en la comunidad autónoma de Castilla-La Mancha.

Objetivo del proyecto

Implantar un sistema de soporte a la decisión en tiempo real que mejorase la adherencia de los profesionales del SESCAM a las diferentes vías clínicas establecidas por dicho Servicio de Salud.

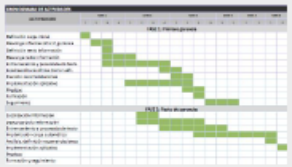
La importancia de la adherencia a las vías clínicas

La vía clínica es una herramienta organizativa multidisciplinaria que permite llevar a cabo una secuencia óptima para llegar a un determinado diagnóstico o realizar un procedimiento, donde se incluyen todas las diferentes actividades de los profesionales que intervienen en la atención al paciente durante la estancia hospitalaria o cuando acude a consulta. Las vías clínicas son una de las principales herramientas de la gestión de la calidad asistencial para la estandarización de los procesos asistenciales y su implantación permite disminuir la variabilidad de la práctica clínica.

3 fases de proyecto

1. Utilizando la tecnología de **SAVANA Manager** se ha analizado toda información clínica necesaria para poder cuantificar la adherencia a las distintas vías y se han establecido recomendaciones que ayuden a mejorar los índices de adherencia.
2. Se ha habilitado en cada estación clínica objetivo el sistema de soporte en tiempo real desarrollado por **Accenture** con la tecnología de **Procesado del Leng**
   Primaria cuando alg
   proceso asistencial
3. Se ha monitorizado

prueba se ha implantado en 5 meses, en el Área de Atención Primaria de Mancha Centro.



de las mejores prácticas.

Resultados

- La adherencia a las vías clínicas ha mejorado en 8 vías clínicas, siendo significativo ($p<0,05$) en 3 de ellas.
- Los usuarios de los Centros de Salud ven la solución como un instrumento útil que no entorpece ni afecta a la dinámica de su trabajo.

"La tecnología de Savana es flexible y maneja diferentes tipos de formato, siempre que sean de tipo texto. El uso de herramientas avanzadas de análisis de datos y servicios terminológicos permiten extraer de los sistemas una información de valor para el clínico. Dispone de un algoritmo de anonimización que cumple con todos los requerimientos de privacidad.

Dr. Luis Morell Baladrón
Director de Sistemas de la Información SESCAM

"La implantación de la solución de Savana/Accenture ha supuesto una mejora en la adherencia a las vías clínicas, lo que ha repercutido muy positivamente en la calidad asistencial, y ayudando al profesional en la toma de decisiones y disminuyendo la variabilidad de la práctica clínica en nuestros centros"

Dr. Alfonso Abaigar
Director de Atención Primaria SESCAM

Hiperpotasemias en un click con Savana

P. DE SEQUERA, P. ARRANZ*, M. ALBALATE, E. CORCHETE, R. PÉREZ-GARCÍA , M.ORTEGA-GÓMEZ, M. PUERTA, R. ALCÁZAR, C. RUIZ-CARO, J. MARTÍN-NAVARRO.
S. Nefrología. S. de Control de Gestión. Hospital Universitario Infanta Leonor.

INTRODUCCIÓN

La hiperpotasemia, definida como una concentración de potasio en plasma mayor de 5 mmol/L, es un trastorno electrolítico grave, que se asocia con mayor mortalidad, y cuya incidencia está aumentando.

OBJETIVO

Estudiar la epidemiología de la hiperpotasemia en nuestro hospital investigando a través del S. Admisión-Documentación clínica y con el buscador SAVANA.

MÉTODOS

Estudio transversal y observacional durante un año (01/01/2016-31/12/2016), que incluye adultos mayores de 18 años con el diagnóstico principal o secundario en el informe de alta de hipe), con los datos prop

taforma capaz de reutilizar el te desde la información no

XXXIX Congreso SEMI / VI Congreso Ibérico / XXXVI Congreso SOCALMI V - 23

ENCEFALOPATÍA DE WERNICKE. ESTUDIO RETROSPECTIVO 2011-2016 MEDIANTE SISTEMA DE BÚSQUEDA SAVANA

M. Ulla Anes[1], B. Escolano[1], T. Bellver[1], R. Pacheco[1], G. Gª-Meleón[1], V. Pardo[1], M. Duffort[1]
[1]M. Interna. Hospital Infanta Leonor. Madrid (Madrid)

OBJETIVOS

La Encefalopatía de Wernicke (EW) es una entidad infradiagnosticada que se asocia habitualmente a alcoholismo. Se caracteriza por la tríada clásica (encefalopatía, oftalmoplejía y/o nistagmo y ataxia). En series de necropsias, la EW fue diagnosticada en vida sólo en un tercio de los pacientes. Nuestro trabajo es un estudio descriptivo de los pacientes con EW ingresados en el Hospital Universitario Infanta Leonor durante el periodo 2011-2016, utilizando la herramienta de búsqueda SAVANA, de reciente implantación en nuestro hospital.

MATERIAL Y MÉTODOS

Estudio transversal y observacional, periodo Enero-2011/Diciembre 2016, que incluye a adultos con diagnóstico principal o secundario en el informe de alta de EW. El sistema SAVANA es una plataforma de búsqueda con capacidad de reutilizar el contenido de las historias clínicas electrónicas, directamente desde la información no estructurada (escrita en lenguaje natural o texto libre). Tiene capacidad para realizar en un "click" una búsqueda en los 3.5 millones de documentos del hospital.

RESULTADOS

36 episodios de ingreso en 24 pacientes. 58%V, 42%M. Edad X 51a. Desviación típica 9a, Moda 48a. Servicios implicados en el manejo: Neurología 47%, M. Interna 19%, Urgencias 19%, A.Digestivo 8%, Cirugía General/digestiva 3%, Unidad Hospitalización Media Estancia 3%. Antecedentes Personales: Alcoholismo 50% (Edad X 54a, V 66,6%), Delirium 16% (Edad X 58a, V 100%), Deterioro Cognitivo/Demencia 16% (Edad X 60a, V100%), Cirrosis Hepática 11% (Edad X 60a, V 100%) , Varices Esofágicas 8% (Edad X 60a, V 100%). Pruebas Complementarias durante el ingreso: TAC 39% de los pacientes (49% craneal), RMN 17% (80% craneal), Serología Virales (hepatotropos, VIH) 25%, Estudio Hormonal (función tiroidea y suprarrenal) 11%, Estudio Endoscópico Alto 11%. Tratamiento durante el ingreso: Inhibidores de la Bomba de Protones 61%, Vitamina B (Tiamina 28%, Piridoxina 22%, complejo B1-B6-B12 17%, B12 y Ácido Fólico 22%), Antipsicóticos (Tiaprida) 39%, Lactulosa 39%, Ansiolíticos (Clorazepato Dipotásico) 33%, Furosemida 22%, Espironolactona 22%, Antidepresivos (Venlafaxina)17%, (trazodona) 17%.

DISCUSIÓN

En nuestro entorno, más del 80% de los casos de EW se relacionan con malnutrición asociada al abuso de alcohol. No obstante, procesos neoplásicos,cirugía gastrointestinal, hiperemesis gravídica y ayuno/desnutrición pueden desencadenar una EW sin antecedentes previos de etilismo. El tratamiento es sencillo (reposición inmediata de Tiamina durante 3-5 días). No obstante, dosis subterapeuticas o la ausencia de tratamiento pueden ocasionar la muerte (20% de los casos) o un Síndrome de Korsakoff (forma irreversible de amnesia anterógrada). En nuestra serie, la prevalencia de EW en el sexo femenino es elevada (42%), aunque su asociación con procesos cronicos la hepatopatía etílica (cirrosis) ocurre de forma privativa en los varones. No es infrecuente el desarrollo de Síndrome Confusional (en relación con deprivación alcohólica). En la mitad de los pacientes, precisa de pruebas de imagen craneal (TAC,RMN) para descartar organicidad. La administración de Tiamina (sola o asociada a B6-B12) se objetiva en el 45% de los casos, en el resto, el diagnóstico de EW probablemente se efectuó en procesos previos (36 episodios en 24 pacientes).

CONCLUSIONES

1.- En nuestra serie, hay alta prevalencia de EW en mujeres (en la bibliografía 2-3 veces más prevalente en el sexo masculino). 2.-La relación EW y alcohol es indiscutible, acompañándose en ocasiones de Síndrome Confusional Agudo en el contexto de deprivación alcohólica. 3.- Se ha administrado Tiamina en la mitad de los

Hospital Universitario Infanta Leonor

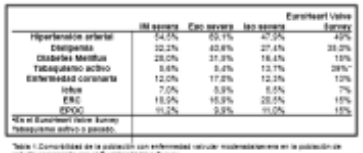
CAMBIOS EPIDEMIOLÓGICOS EN LA PATOLOGÍA VALVULAR EN LOS ÚLTIMOS 10 AÑOS: IMPLICACIONES FUTURAS EN EL ABORDAJE TERAPEUTICO

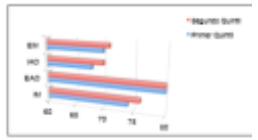
Cristina de Cortina Cansarera[1], Mª Del Mar Sarrión Catalá[1], Laura Mora Yagüe[1], Silvia Jiménez Loeches[1], Elloy Gómez Mariscal[1], Verónica Suberviola Sánchez-Caballero[1], Cristina Beltrán Herrera[1], David Vaquerizo Cubillo[1] y Roberto Muñoz Aguilera[1]
[1]Hospital Universitario Infanta Leonor. Madrid

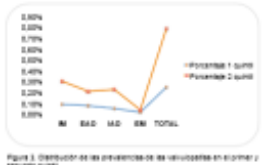
INTRODUCCION: Hay pocos datos actualizados sobre la epidemiología de la enfermedad valvular (EV) en nuestro país. Debido a un envejecimiento y por tanto, una mayor supervivencia media de la población, la prevalencia de la EV está aumentando. Los pacientes con EV tienen una mayor comorbilidad, lo que confiere un mayor riesgo quirúrgico. El objetivo de este estudio fue describir la prevalencia y distribución temporal de la EV en el área de población de referencia de nuestro centro hospitalario a lo largo del periodo 2008-2017 y describir las principales características demográficas de los pacientes con EV, comparándolos con las de la población del EuroHeartSurvey.

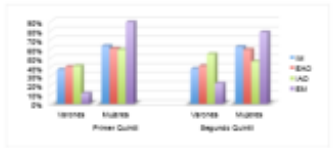
MÉTODOS: Mediante el empleo de una nueva herramienta tecnológica (Savana®) basada en la tecnología EHRead, diseñada para el análisis del 'big data'en términos descriptivos y predictivos, se extrajo la información clínica relevante de las historias médicas electrónicas. Se analizaron todos los informes generados en el área de hospitalización, urgencias o consultas externas de nuestro hospital. Fueron seleccionados los pacientes con un diagnóstico de EV moderada o severa. Se estimó la prevalencia de EV en 2 periodos de tiempo, desde Febrero 2008 hasta Febrero 2013 y desde Marzo 2013 hasta Diciembre 2017.

RESULTADOS: La prevalencia de EV en nuestra población fue 1.04% (n=3431). La insuficiencia mitral fue la valvulopatía más frecuente (2.4%, n=1316), seguida de la estenosis aórtica (2.3%, n=967) e insuficiencia aórtica (0.20%, n=939). Hubo una clara predominancia del sexo femenino (53%, Figura 2), y la edad media fue 76 años (edad media EuroHeart Valve Survey 68 años). Figura 1. En el primer periodo (2008-2013) la prevalencia fue 0.25%, con un aumento significativo hasta 0.70% en el segundo periodo (2013-2018). Esta tendencia fue consistente en todos los tipos de valvulopatías (Figura 3). La prevalencia de las distintas comorbilidades fue mayor que en otros estudios epidemiológicos previamente publicados (Table 1).









CONCLUSION: En nuestra serie en los últimos 10 años, hay un claro aumento en la edad de presentación de la enfermedad valvular moderada/severa y con un gran número de comorbilidades comparado con el EuroHeart Valve Survey, lo que refuerza la idea de que las nuevas terapias percutáneas deberán jugar un papel fundamental en el tratamiento de este tipo de pacientes. Aunque la prevalencia puede estar infraestimada en nuestra población, debido a la metodología, refleja una patología en aumento diagnosticada en pacientes de edad más avanzada y cada vez más enfermos.

SEC 20 SEVILLA 18

Únete al CORAZON de la cardiología

7. ASTHMA EMER... ONS IN AN ADULT... OFMADRID (SPA...

...M., Garcimartin Galicia M.I., R...
Somoza Álvarez M.L., Pérez-Al...
...a Leonor University Hospital, Ma...

BACKGROUND:

- Asthma is a heterogeneous chronic inflammatory airways disease that repr... prevalence and increasing trends in morbidity. Each year in Western Europe ... emergency health care and 10% require an emergency department visit.
- The aim of this study is to describe the epidemiological features, exacerbation ... of patients with emergency admissions for asthma

MATERIAL AND METHODS:

- We conducted a retrospective descriptive study of the emergency visits for asthm... Leonor University Hospital (Madrid, Spain).
- Data were collected from the electronic clinical history, using the Ehreader techn... of medical concepts using controlled terminology basis and computational linguistic

RESULTS:

776 emergency admissions for asthma, in 671 patients were included

- Mean age was 53 ± 22 years, mode 50 years and 73% were female

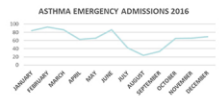


Figure 1. Asthma emergency admissions. Distribution by months

Figure 2. Pollen levels in Madrid (Spain) in 2016

41% exacerbations triggered by respiratory infections

DISCHARGED TREATMENT	% PATIENTS
Salbutamol	80
ICS	23
LABA/ICS	21
LAMA	40
Oral corticosteroid	68
Antibiotics	23

DIAGNOSIS TESTS	% PATIENTS
Blood gas	41
Blood test	52
Chest X-Ray	49
EKG	20
CT	3
Flu test	5

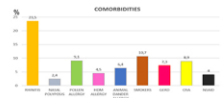


Figure 3. Comorbidities in patients with asthma attendance

CONCLUSIONS:

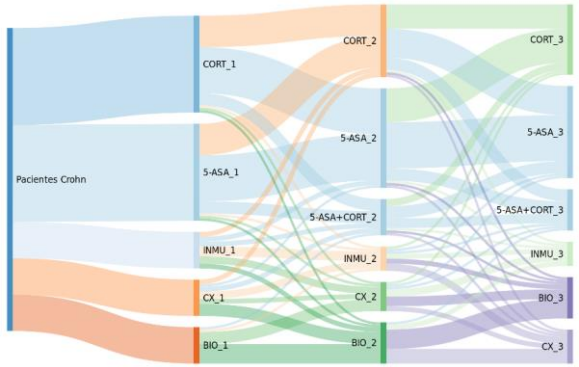
- ✓ The profile of a patient that requires an emergency visit due to an asthma exacerbation is a medium age female.
- ✓ Asthma exacerbations in Madrid are seasonal, in winter and spring, in relation with respiratory infections and pollen exposure respectively.

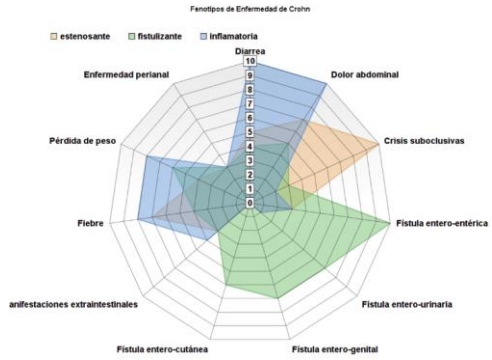
REFERENCES:

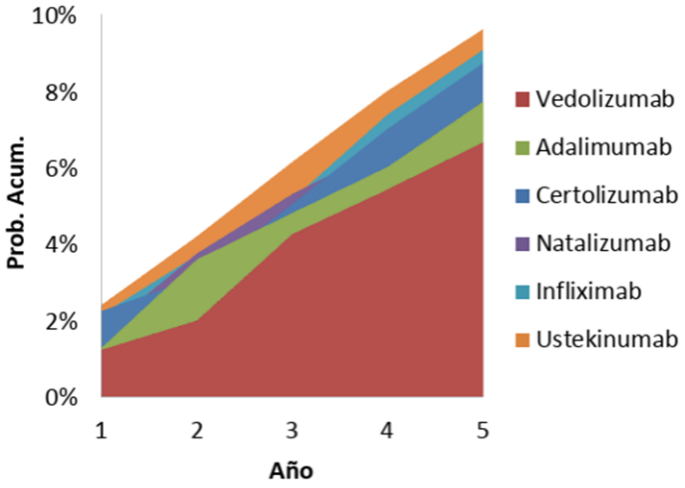
http://www.polenes.com/home

ENFERMEDAD INFLAMATORIA:

patient journey, predicción de respuesta a biológicos, fenotipado automático







Proyecto seleccionado por la Comisión Europea

European Commission

SMEs in HORIZON 2020

10
ENTRE
2500
EMPRESAS
TECNOLÓGICAS

France

Belgium

Austria

España

Switzerland

United Kingdom

Ireland

Germany

SAVANA

SavanaManager

HEALTHCARE Analytics News | HRA DATA DRIVEN INTELLIGENCE

Newsletter Sign

NEWS ▾ | RESOURCES | VIDEOS | HRA TODAY

Predictive Patient Surveillance System Receives FDA Clearance

Ryan Black
JANUARY 08, 2018

(WAVE Clinical Platform. Image courtesy Excel Medical.)

Florida-based medical device maker Excel Medical today announced that its WAVE Clinical Platform has received clearance from the FDA. The system allows for constant patient monitoring, analyzed and delivered to hospital staff in real time, to prevent unexpected deaths in the hospital.

Resources ▾ How To ▾

PMC ▾ | Advanced | Journal list

List › HHS Author Manuscripts › PMC3673290

HHS Public Access
Author manuscript
Peer-reviewed and accepted for publication
About author manuscripts | Submit a manuscript

Crit Care Med. Author manuscript; available in PMC 2013 Jun 5. PMCID:
Published in final edited form as: NIHMSID:
Crit Care Med. 2011 Jan; 39(1): 65–72.
doi: 10.1097/CCM.0b013e3181fb7b1c

Cardiorespiratory inst… integrated monitoring…

Marilyn Hravnak, PhD, Michael A. D…

JAMA Surgery | Journals | Enter Search Term

You May A…

The Value of Clinical Colorectal Cancer Registries in Colorectal Cancer Research
Review | June 20, 2018

New Online | Views 0 | Citations 0 | Altmetric 14

Surgical Innovation

June 20, 2018

Automated Performance Metrics and Machine Learning Algorithms to Measure Surgeon Performance and Anticipate Clinical Outcomes in Robotic Surgery

Andrew J. Hung, MD[1]; Jian Chen, MD[1]; Inderbir S. Gill, MD[1]

> Author Affiliations

More

Science Robotics | Home | News | Journals | Topics | Careers

Search Jobs on ScienceCareers.org | ScienceCareers FROM THE JOURNAL SCIENCE

Log in | My…

SHARE | RESEARCH ARTICLE | HUMAN-ROBOT INTERACTION

Personalized machine learning for robot perception of affect and engagement in autism therapy

Ognjen Rudovic[1,*], Jaeryoung Lee[2], Miles Dai[1], Björn Schuller[3,4] and Rosalind W. Picard[1]

• See all authors and affiliations

Science Robotics 27 Jun 2018:
Vol. 3, Issue 19, eaao6760
DOI: 10.1126/scirobotics.aao6760

…d localization of surgically resectable
…a multi-analyte blood test

Li[6], Yuxuan Wang[1,2,3,4], Christopher Thoburn[3], Bahman Afsari[7], Ludmila Danilova[7], Christopher …
…ons

DOI: 10.1126/science.aar3247

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed ▾ | Evidence-Based Pediatric Outcom…

Advanced

Format: Abstract ▾ | Send to ▾

Pediatr Crit Care Med. 2015 Sep;16(7):e207-16. doi: 10.1097/PCC.0000000000000481.

Evidence-Based Pediatric Outcome Predictors to Guide the Allocation of Critical Care Resources in a Mass Casualty Event.

Toltzis P[1], Soto-Campos G, Shelton C, Kuhn EM, Hahn R, Kar…

Article | Figures & Data | Info & Metrics | eLetters | PDF

You are currently viewing the abstract. | View Full Text

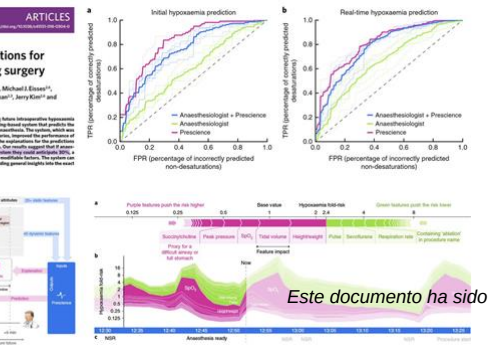
Abstract

Earlier detection is key to reducing cancer deaths. Here we describe a blood test that can detect eight common cancer types through assessment of the levels of circulating proteins and mutations in cell-free DNA. We applied this test, called CancerSEEK, to 1,005 patients with non-met… colorect… cancer t… (ovary, li… availabl… healthy … number…

---

nature biomedical engineering | ARTICLES

…ning predictions for …mia during surgery



PLOS ONE

RESEARCH ARTICLE

Personalized survival predictions via Trees of Predictors: An application to cardiac transplantation

Jinsung Yoon[1], William R. Zame[1], Amitava Banerjee[2], Martin Cadeiras[1], Ahmed M. Alaa[1], Mihaela van der Schaar[1,3,4]*

1 University of California Los Angeles, Los Angeles, California, United States of America, 2 Farr Institute of Health Informatics Research, University College, London, United Kingdom, 3 University of Oxford, Oxford, United Kingdom, 4 Alan Turing Institute, London, United Kingdom

* mihaela.vanderschaar@oxford-man.ox.ac.uk

---

npj Digital Medicine

Article | OPEN | Published: 06 November 2018

Machine-learned epidemiology: real-time detection of foodborne illness at scale

Adam Sadilek, Stephanie Caty, Lauren DiPrete, Raed Mansour, Tom Schenk Jr, Mark Bergtholdt, Ashish Jha, Prem Ramaswami & Evgeniy Gabrilovich

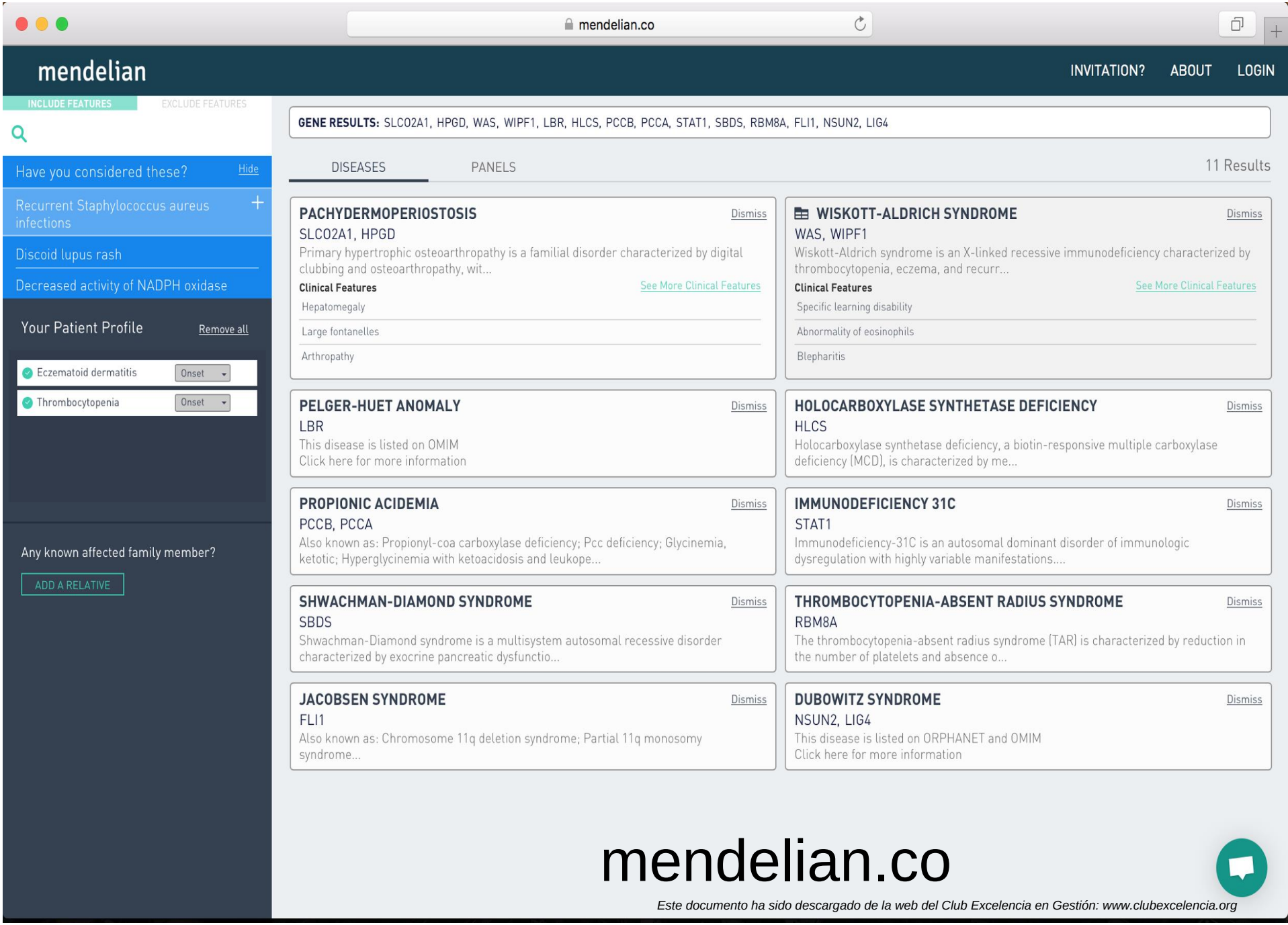
npj Digital Medicine **1**, Article number: 36 (2018) | Download Citation

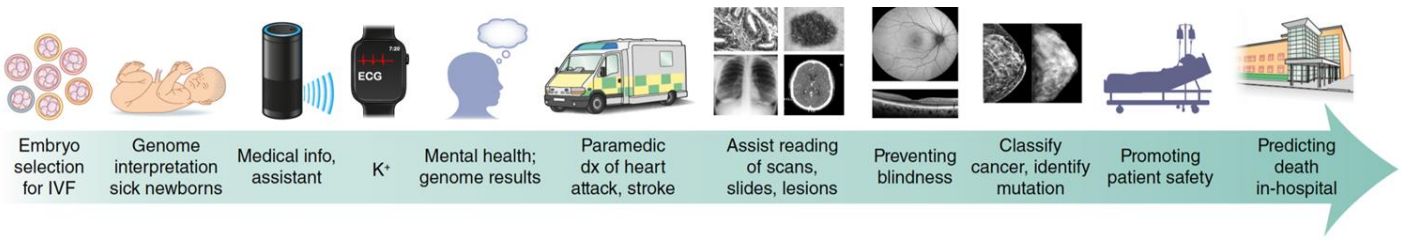
Table 1 | Peer-reviewed publications of AI algorithms compared with doctors

Specialty	Images	Publication
Radiology/neurology	CT head, acute neurological events	Nam et al.[8]
	CT head for brain hemorrhage	Arbabshirani et al.[19]
	CT head for trauma	Chilamkurthy et al.[20]
	CXR for metastatic lung nodules	Nam et al.[8]
	CXR for multiple findings	Singh et al.[7]
	Mammography for breast density*	Lehman et al.[26]
	Wrist X-ray	Lindsey et al.[9]
Pathology	Breast cancer	Bejnordi et al.[3]
	Lung cancer (+driver mutation)	Coudray et al.[33]
	Brain tumors (+methylation)	Capper et al.[45]
	Breast cancer metastases*	Steiner et al.[35]
	Breast cancer metastases	Liu et al.[34]
Dermatology	Skin cancers	Esteva et al.[47]
	Melanoma	Haenssle et al.[48]
	Skin lesions	Han et al.[49]
Ophthalmology	Diabetic retinopathy	Gulshan et al.[51]
	Diabetic retinopathy*	Abramoff et al.[31]
	Diabetic retinopathy*	Kanagasingam et al.[32]
	Congenital cataracts	Long et al.[38]
	Retinal diseases (OCT)	De Fauw et al.[56]
	Macular degeneration	Burlina et al.[52]
	Retinopathy of prematurity	Brown et al.[60]
	AMD and diabetic retinopathy	Kermany et al.
Gastroenterology	Polyps at colonoscopy*	Mori et al.
	Polyps at colonoscopy	Wang et al.[37]
Cardiology	Echocardiography	Madani et al.
	Echocardiography	Zhang et al.[24]

Table 3 | Selected reports of machine- and deep-learning algorithms to predict clinical outcomes and related parameters

Prediction	*n*	AUC	Publication (Reference number)
In-hospital mortality, unplanned readmission, prolonged LOS, final discharge diagnosis	216,221	0.93*0.75†0.85#	Rajkomar et al.[96]
All-cause 3–12 month mortality	221,284	0.93˙	Avati et al.[91]
Readmission	1,068	0.78	Shameer et al.[106]
Sepsis	230,936	0.67	Horng et al.[102]
Septic shock	16,234	0.83	Henry et al.[103]
Severe sepsis	203,000	0.85@	Culliton et al.[104]
Clostridium difficile infection	256,732	0.82++	Oh et al.[93]
Developing diseases	704,587	range	Miotto et al.[97]
Diagnosis	18,590	0.96	Yang et al.[90]
Dementia	76,367	0.91	Cleret de Langavant et al.[92]
Alzheimer's Disease (+amyloid imaging)	273	0.91	Mathotaarachchi et al.[98]
Mortality after cancer chemotherapy	26,946	0.94	Elfiky et al.[95]
Disease onset for 133 conditions	298,000	range	Razavian et al.[105]
Suicide	5,543	0.84	Walsh et al.[86]
Delirium	18,223	0.68	Wong et al.[100]





Basada en síntomas

Intuitiva

⇨

Basada en patrones

Basada en la evidencia

⇨

Basada en **algoritmos**

De **precisión**

babylon

nature medicine

LETTERS

https://doi.org/10.1038/s41591-018-0335-9

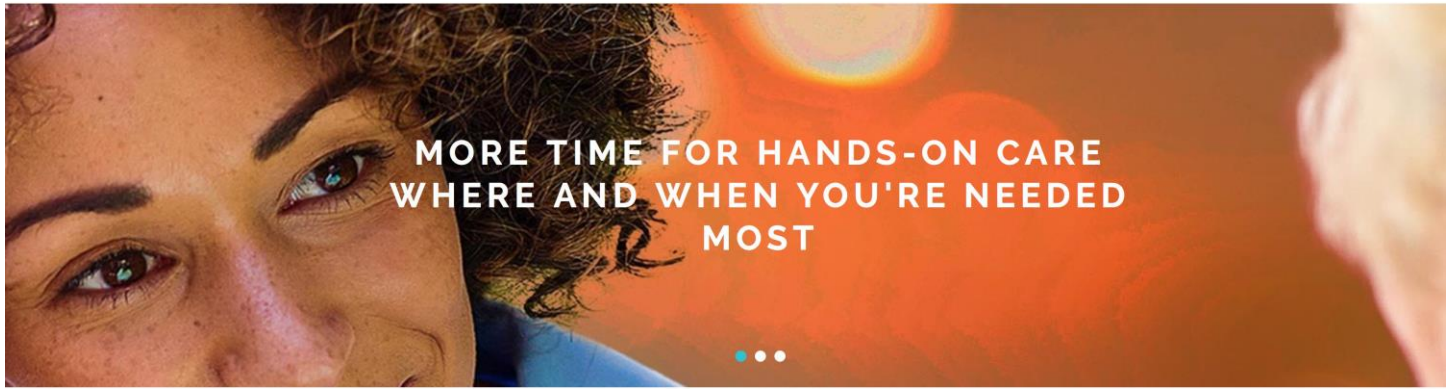
Evaluation and accurate diagnoses of pediatric diseases using artificial intelligence

Huiying Liang[1,7], Brian Y. Tsui[2,7], Hao Ni[3,7], Carolina C. S. Valentim[2,7], Sally L. Baxter[2,7], Guangjian Liu[1,7], Wenjia Cai[2], Daniel S. Kermany[1,2], Xin Sun[1], Jiancong Chen[2], Liya He[1], Jie Zhu[1], Pin Tian[2], Hua Shao[2], Lianghong Zheng[4,5], Rui Hou[4,5], Sierra Hewett[1,2], Gen Li[1,2], Ping Liang[3], Xuan Zang[3], Zhiqi Zhang[3], Liyan Pan[1], Huimin Cai[4,5], Rujuan Ling[1], Shuhua Li[1], Yongwang Cui[1], Shusheng Tang[1], Hong Ye[1], Xiaoyan Huang[1], Waner He[1], Wenqing Liang[1], Qing Zhang[1], Jianmin Jiang[1], Wei Yu[1], Jianqun Gao[1], Wanxing Ou[1], Yingmin Deng[1], Qiaozhen Hou[1], Bei Wang[1], Cuichan Yao[1], Yan Liang[1], Shu Zhang[1], Yaou Duan[2], Runze Zhang[2], Sarah Gibson[2], Charlotte L. Zhang[2], Oulan Li[2], Edward D. Zhang[2], Gabriel Karin[2], Nathan Nguyen[2], Xiaokang Wu[1,2], Cindy Wen[2], Jie Xu[2], Wenqin Xu[2], Bochu Wang[2], Winston Wang[2], Jing Li[1,2], Bianca Pizzato[2], Caroline Bao[2], Daoman Xiang[1], Wanting He[1,2], Suiqin He[2], Yugui Zhou[1,2], Weldon Haw[2,6], Michael Goldbaum[2], Adriana Tremoulet[2], Chun-Nan Hsu[2], Hannah Carter[2], Long Zhu[3], Kang Zhang[1,2,6]* and Huimin Xia[1]*

100.000 cabinas x 100 pacientes/día

Oxehealth MORE TIME. IN TIME.

Settings Solution Partners News About Careers Contact



When AIs Outperform Doctors: The Dangers of a Tort-Induced Over-Reliance on Machine Learning and What (Not) to Do About it

University of Miami Legal Studies Research Paper No. 18-3

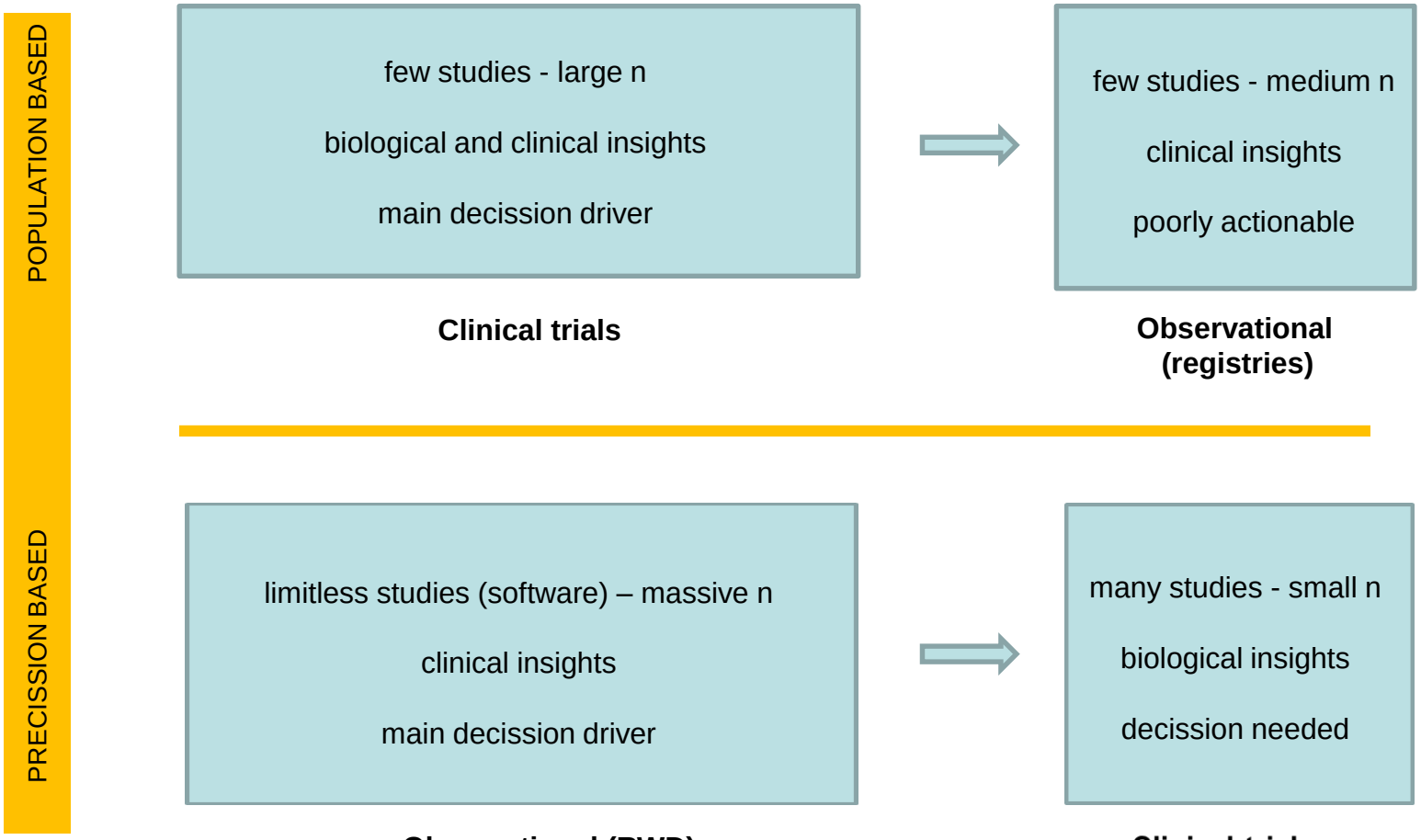
57 Pages • Posted: 13 Feb 2018

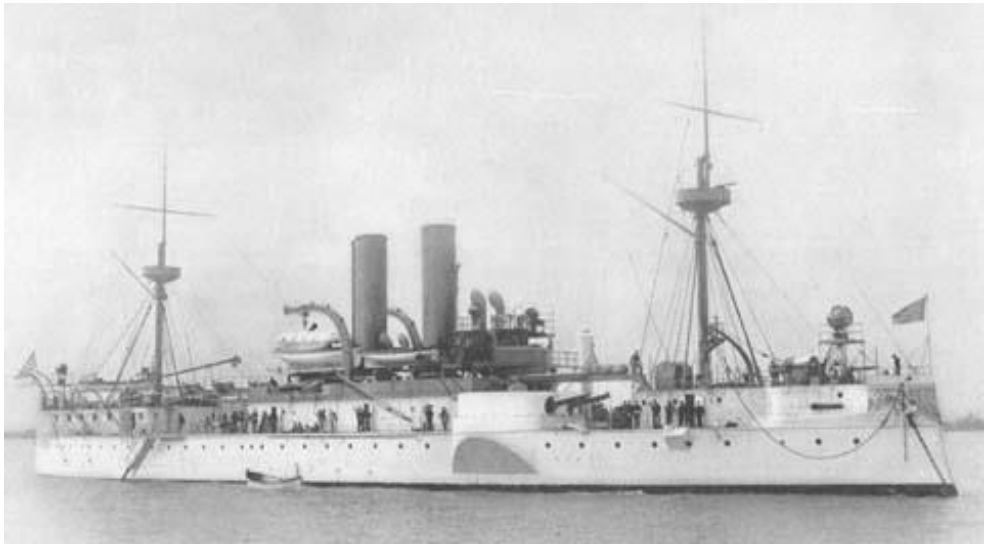
A. Michael Froomkin
University of Miami - School of Law

Ian R. Kerr
University of Ottawa - Common Law Section

Joelle Pineau
McGill University

Date Written: January 31, 2018





To achieve great things, two things are needed:
a plan, and not quite enough time.

Leonard Bernstein

Para **procesamiento de texto en historia clínica**: ihmedrano@savanamed.com

Este documento ha sido descargado de la web del Club Excelencia en Gestión: www.clubexcelencia.org