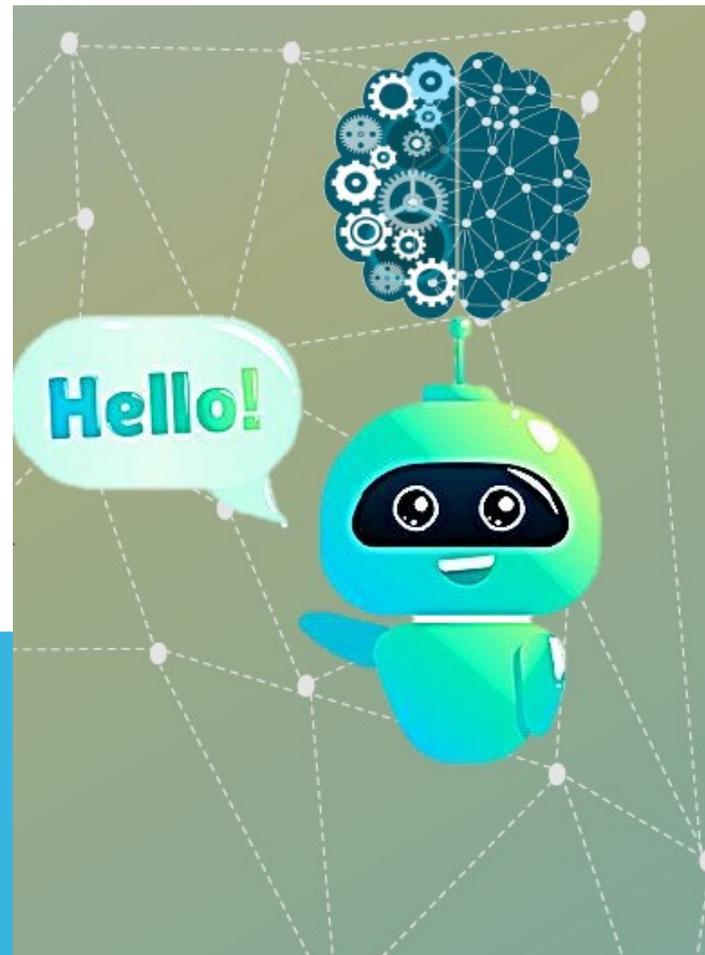


*\*IN THE NAME OF GOD\**

# *Applications of AI in Internal Medicine*

- *N.Rahimian*
- *MD, Internist*
- *IUMS*



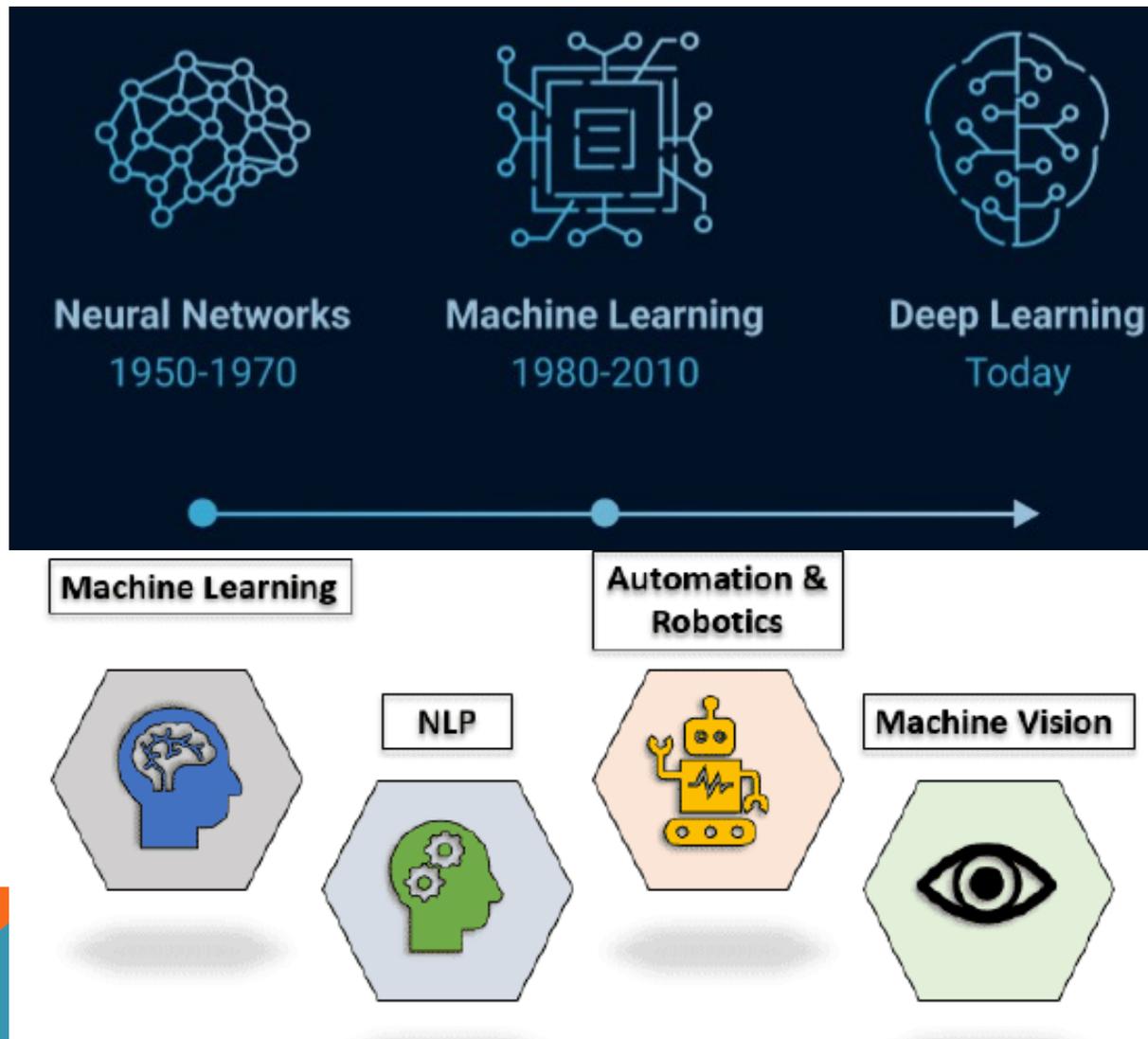
# AI



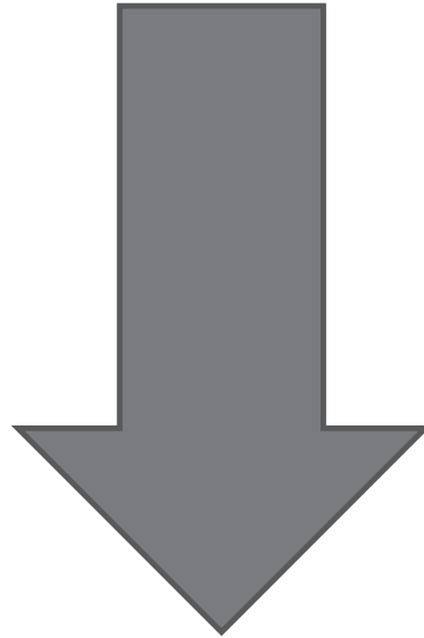
# INTERNAL MEDICINE



# INTRODUCTION

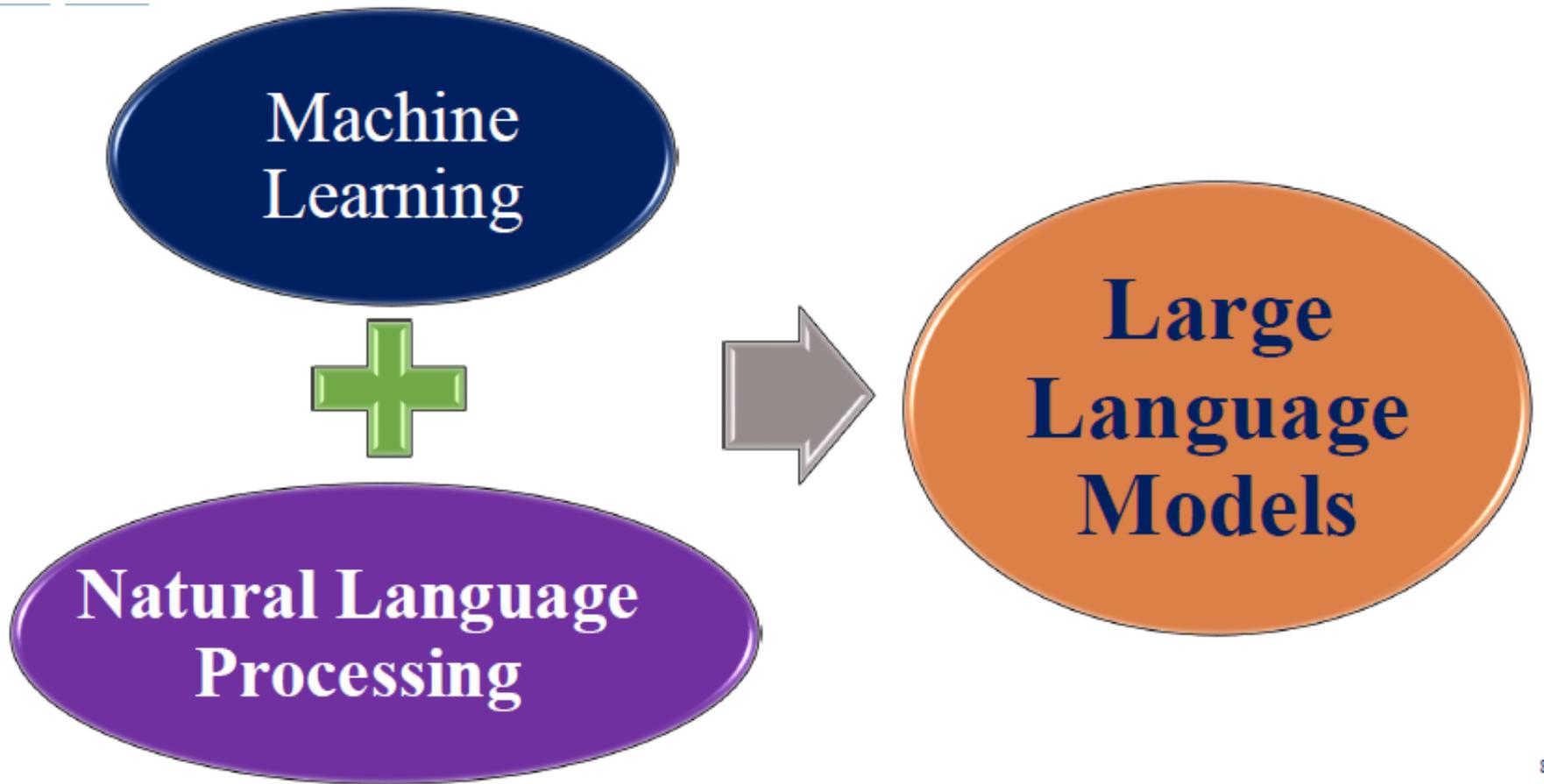


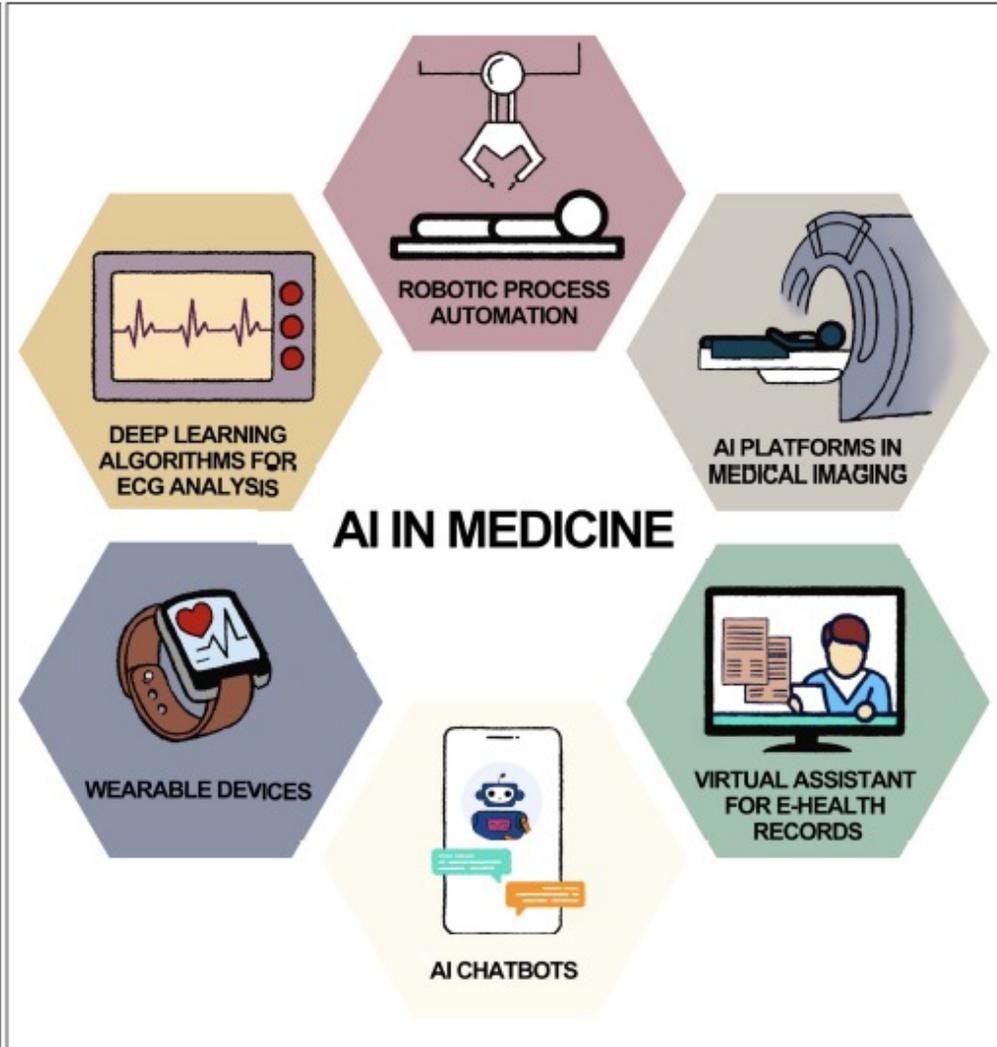
# *TERMINOLOGY*

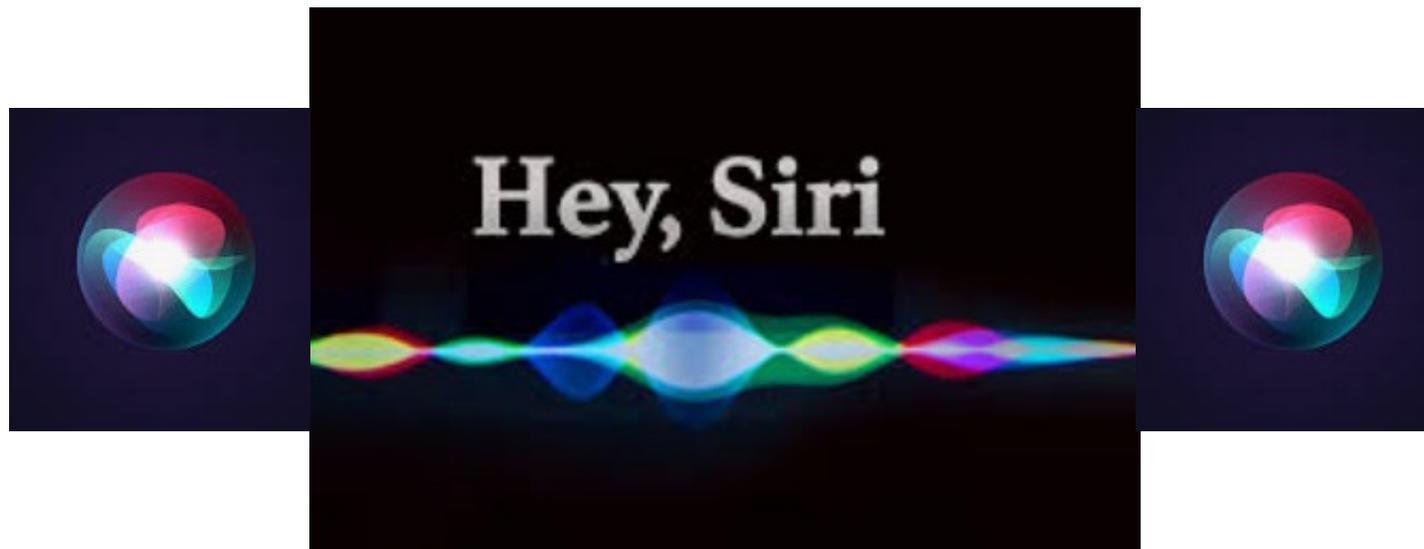


Machine learning	Involves programming algorithms to make decisions or predictions based on data
Deep learning	A type of ML that utilizes artificial neural networks for processing and analyzing a significant amount of data
Natural language processing	A branch of AI that aims to teach computers how to comprehend and analyse human language
Robotics	The study and development of robots capable of performing tasks autonomously or with human assistance
Computer vision	Machines' ability to interpret and comprehend images and video
Expert systems	AI systems that mimic a human expert's decision-making abilities in a specific field
Neural networks	Computer systems that are designed to mimic the structure and function of the human brain
Cognitive computing	AI systems that can simulate human thought processes, including perception, reasoning, and problem-solving

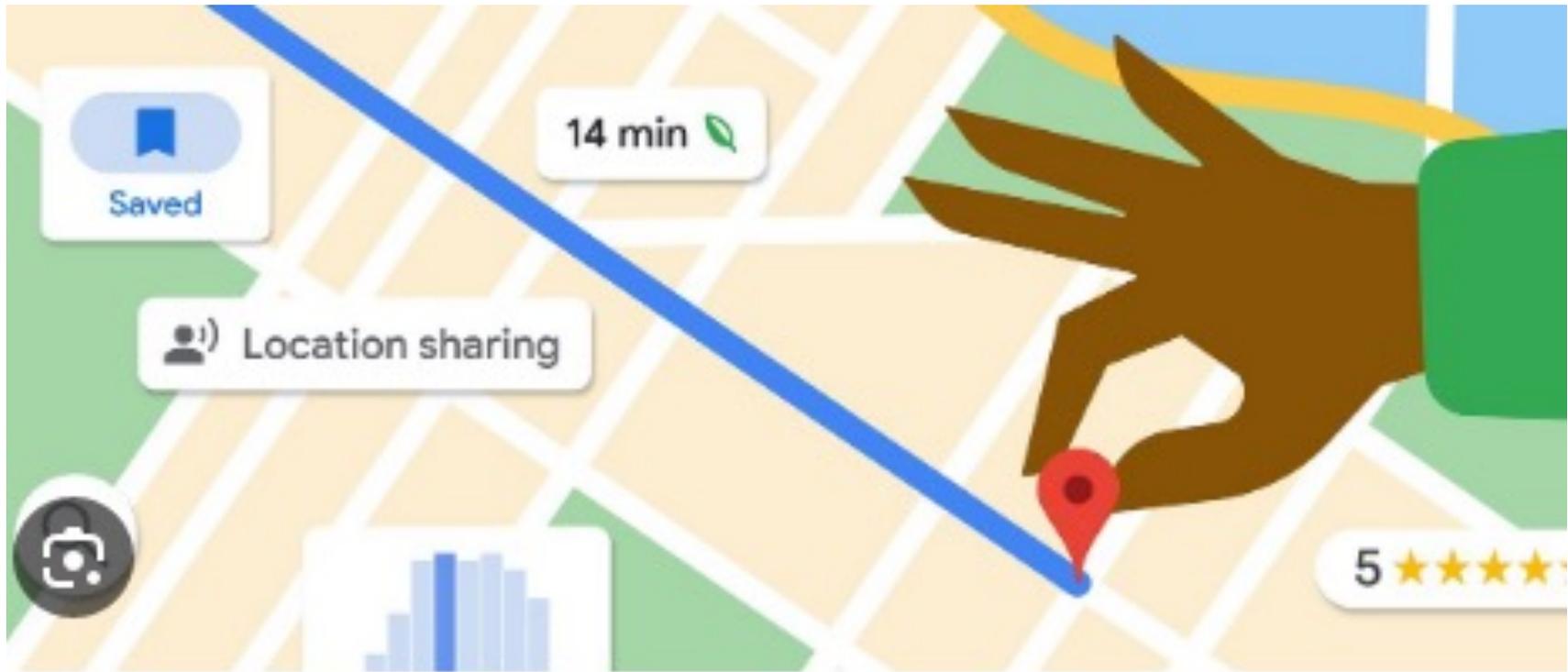
Natural language generation	The process of using AI to generate human-like language in written or spoken form
Data mining	The revelation of patterns and insights in large datasets
Bayesian networks	A probabilistic graphical model used for probabilistic reasoning
Swarm intelligence	The collective behavior of decentralized, self-organized systems
Decision trees	A graphical representation of decision-making processes
Support vector machines (SVM)	A machine learning algorithm used for classification and regression analysis
Human-in-the-loop	A type of AI system that incorporates human feedback to improve performance





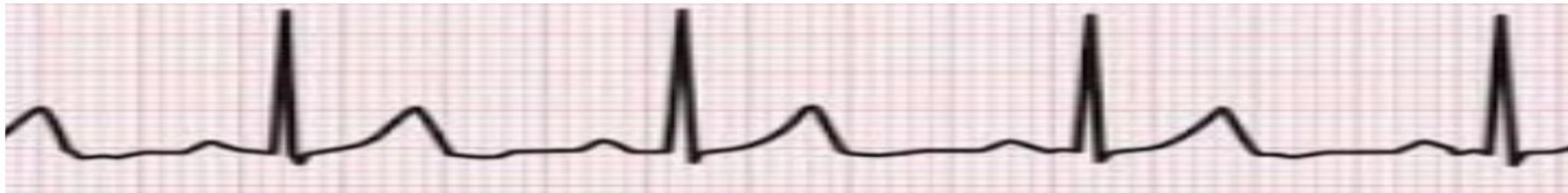


# NAVIGATORS



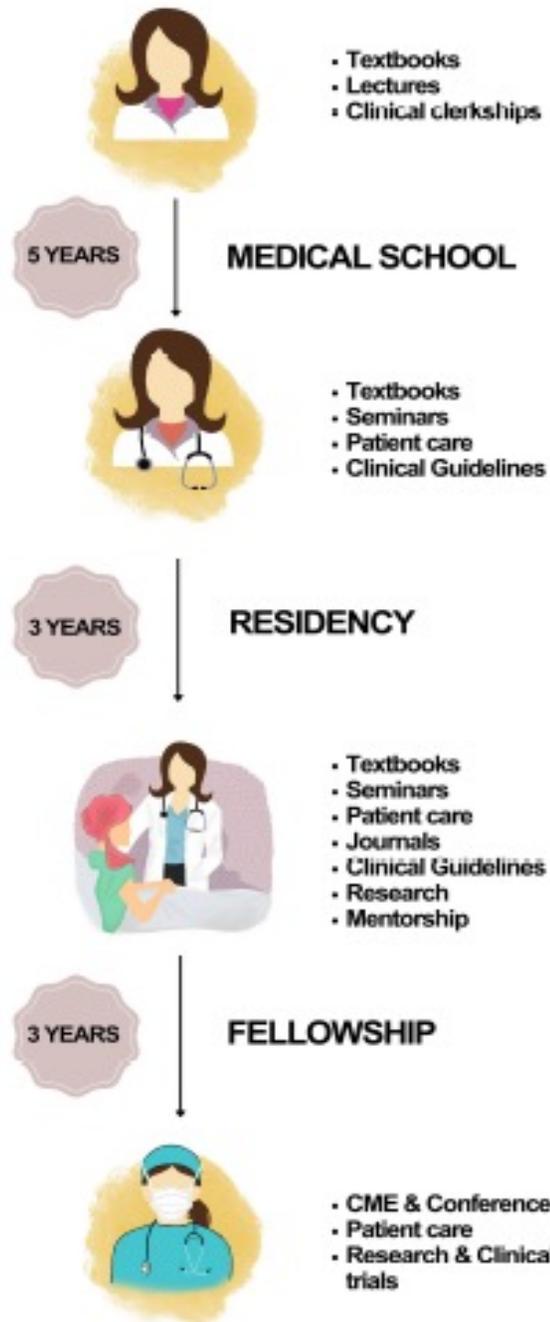
# ONLINE SYSTEMS



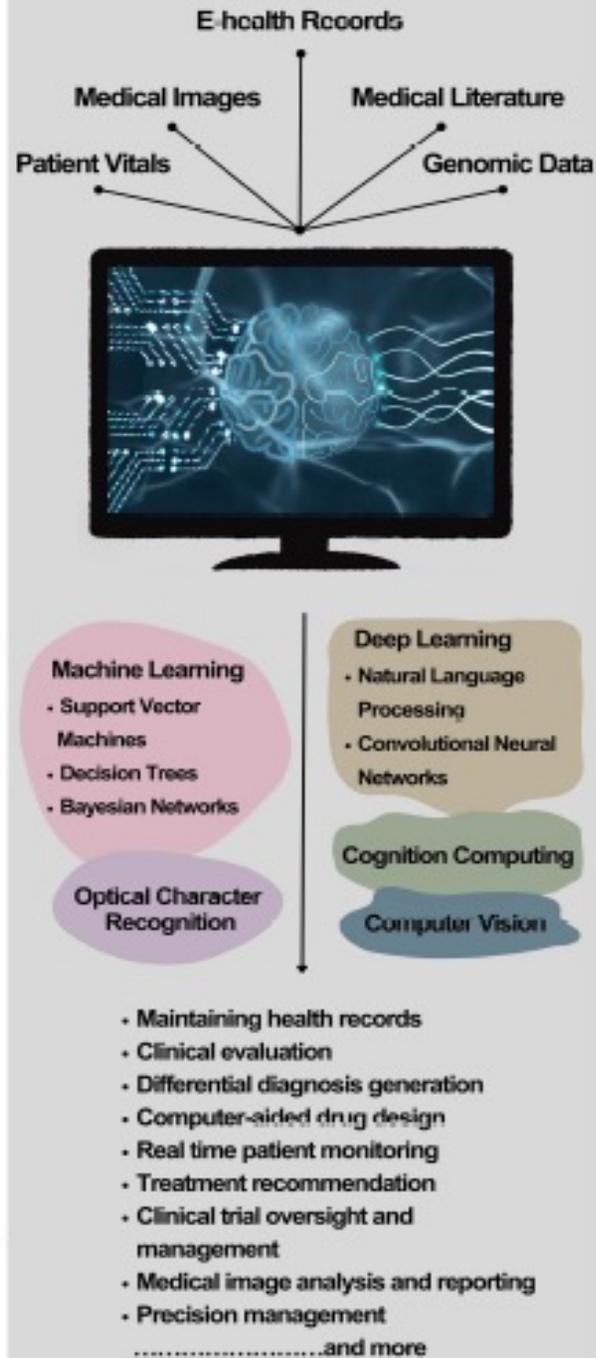




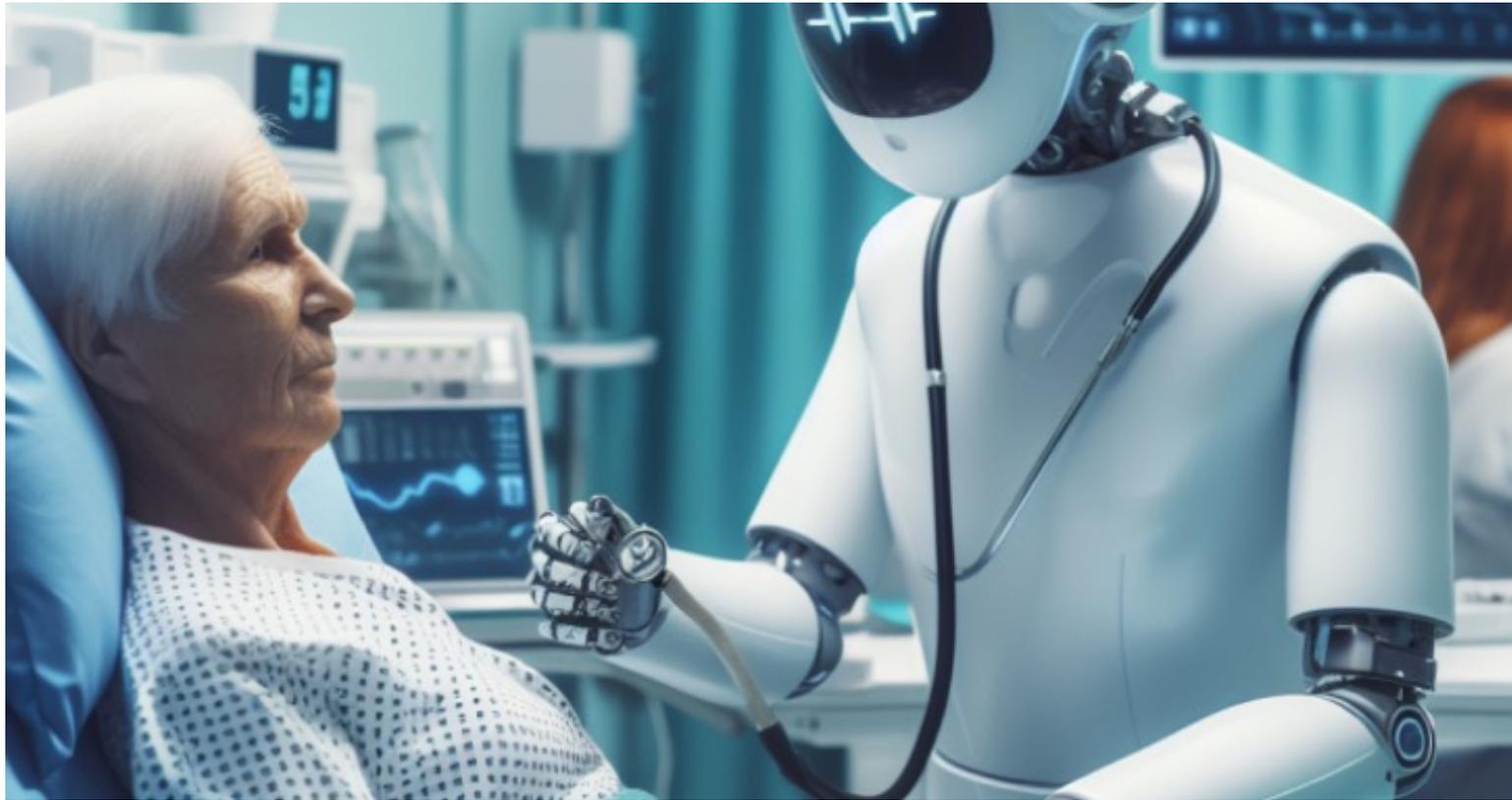
# PHYSICIAN



# ARTIFICIAL INTELLIGENCE

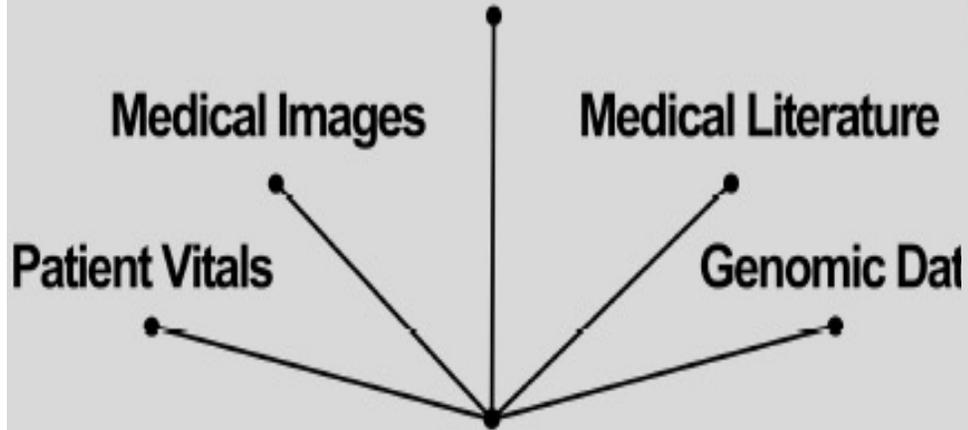


# ***AI DOCTOR***



# ARTIFICIAL INTELLIGENCE

## E-health Records



### Machine Learning

- Support Vector Machines
- Decision Trees
- Bayesian Networks

### Optical Character Recognition

### Deep Learning

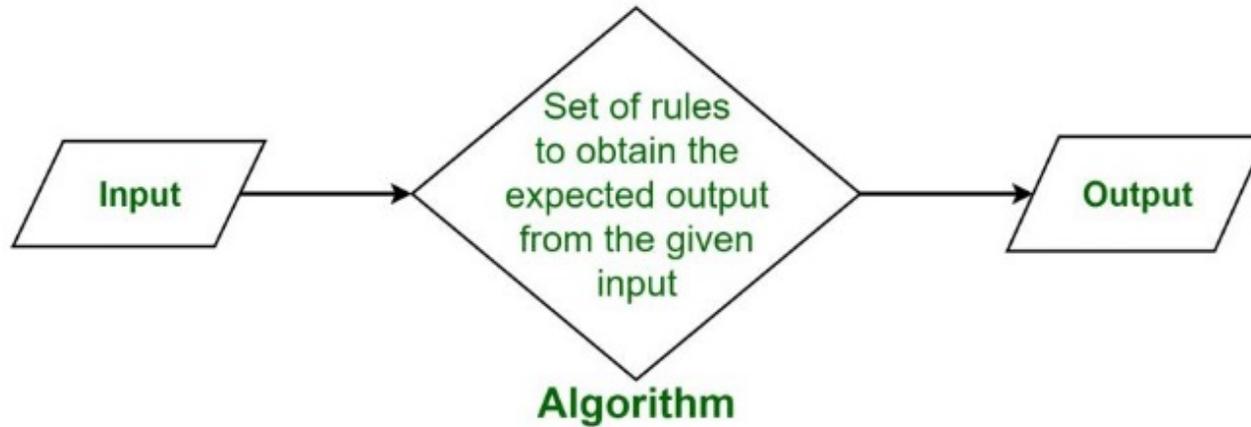
- Natural Language Processing
- Convolutional Neural Networks

### Cognition Computing

### Computer Vision

- Maintaining health records
- Clinical evaluation
- Differential diagnosis generation
- Computer-aided drug design
- Real time patient monitoring
- Treatment recommendation
- Clinical trial oversight and management
- Medical image analysis and reporting
- Precision management
- .....and more

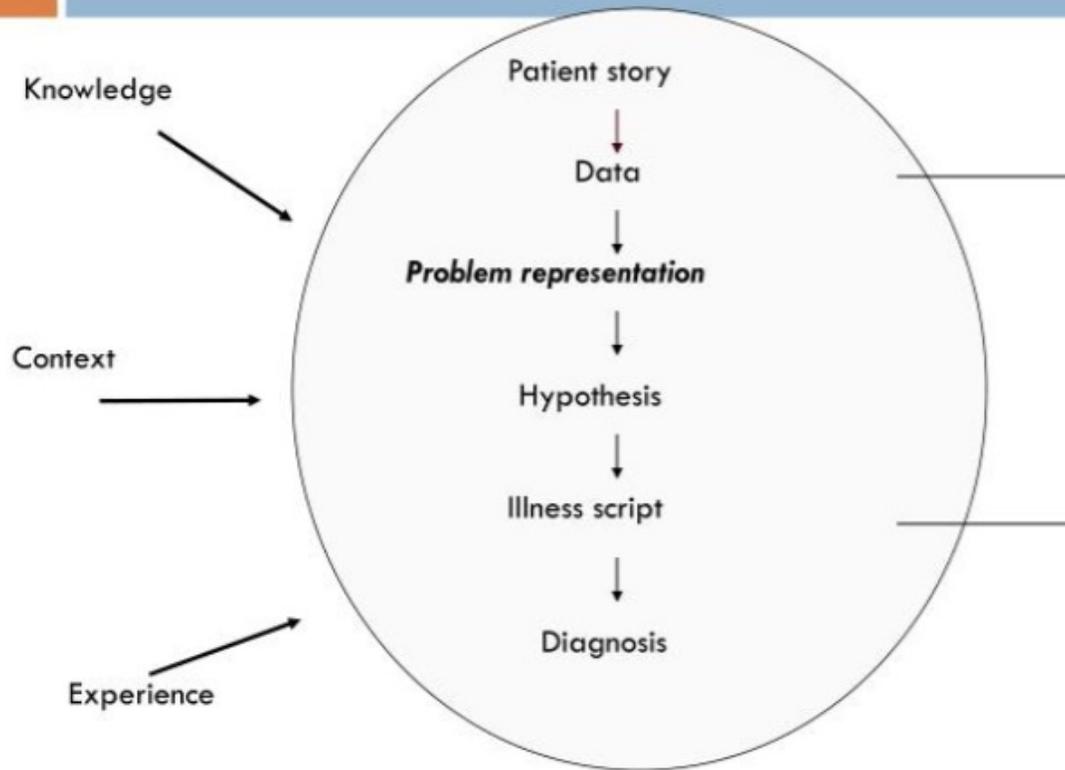
## What is Algorithm?



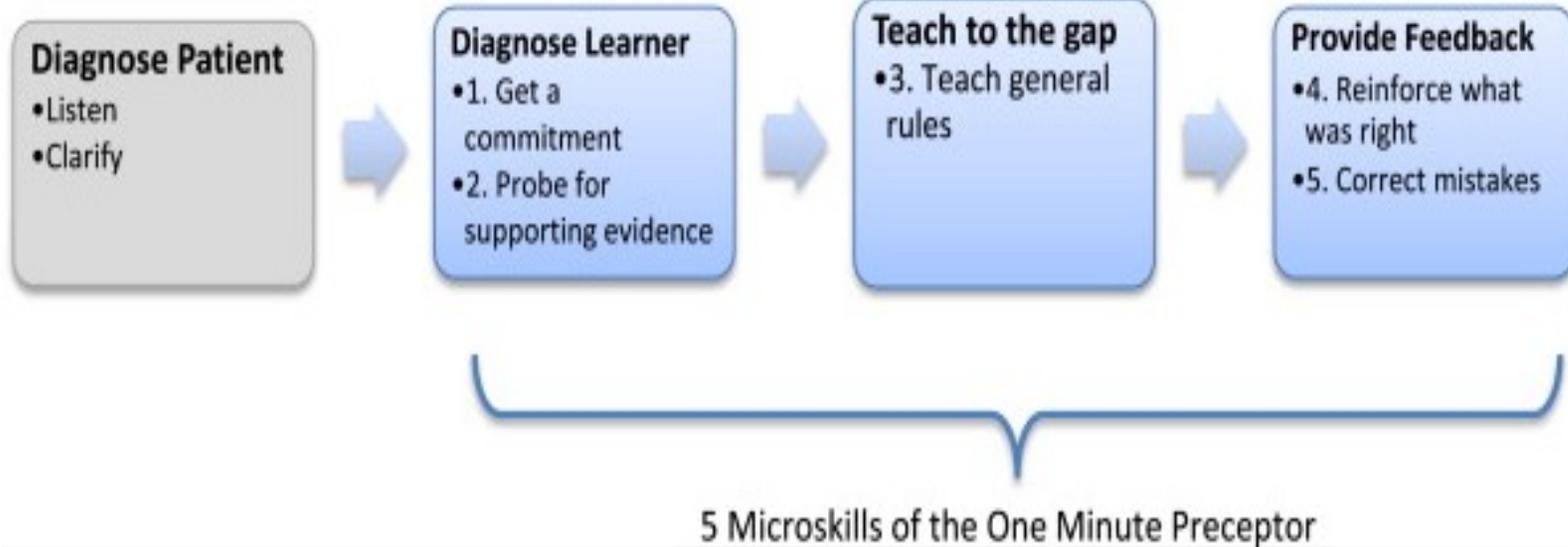
## What is the Algorithm?



# Clinical Diagnostic Reasoning



# CLINICAL REASONING



## SNAPPS

- SUMMARIZE THE PATIENT CASE
- NARROW THE DIFFERENTIAL
- ANALYZE THE DIFFERENTIAL
- PROBE THE PRECEPTOR
- PLAN MANAGEMENT
- SELF DIRECTED LEARNING

# AI IN INTERNAL MEDICINE



## Internal Medicine



Cardiology



Nephrology



Internal Medicine



Neurology



Metabolism  
and Nutrition



Vascular Surgery



# HX TAKING

## وزارت بهداشت، درمان و آموزش پزشکی

Ministry of Health & Medical Education  
 دانشگاه علوم پزشکی: **University of Medical Science:**

مرکز پزشکی آموزشی درمانی: **Medical Center:**

برگ شرح حال و معاینه بدنی

شماره پرونده: **Unit No:**

### MEDICAL HISTORY & PHYSICAL EXAMINATION SHEET

Attending Physician:	پزشک معالج:	Ward:	بخش:	Name:	نام:	Family Name:	نام خانوادگی:
Date of Admission:	تاریخ پذیرش:	Room:	اتاق:	Date of Birth:	تاریخ تولد:	Father Name:	نام پدر:
		Bed:	تخت:				
Chief Complaint: ..... شکایت اصلی بیمار:							
History of Present Illness: ..... تاریخچه بیماری فعلی:							
Past Diseases History: ..... تاریخچه بیماریهای قبلی:							
Current Drug Therapy & Other Addiction: ..... داروهای در حال مصرف و سایر اعتیادات:							
Allergy to: ..... حساسیت به:							
Family History: ..... سوابق فامیلی:							
Physical & Clinical Examination: ..... معاینات بدنی و بررسی های بالینی:							
Skin:	<input type="checkbox"/>	پوست:	<input type="checkbox"/>	SKull:	<input type="checkbox"/>	جمجمه:	<input type="checkbox"/>
Ear:	<input type="checkbox"/>	گوش:	<input type="checkbox"/>				
Please Complete the Reverse Side. لطفاً پشت صفحه را تکمیل کنید.							

# CHAT BOTS



VS



VS



**Bard**

Powered By Google

**Chat GPT**

Powered By Open AI

**Bing Chat**

Powered By Microsoft



# OpenAI



## ChatGPT

# ChatGPT



### Examples

"Explain quantum computing in simple terms"

"Got any creative ideas for a 10 year old's birthday?"

"How do I make an HTTP request in Javascript?"



### Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



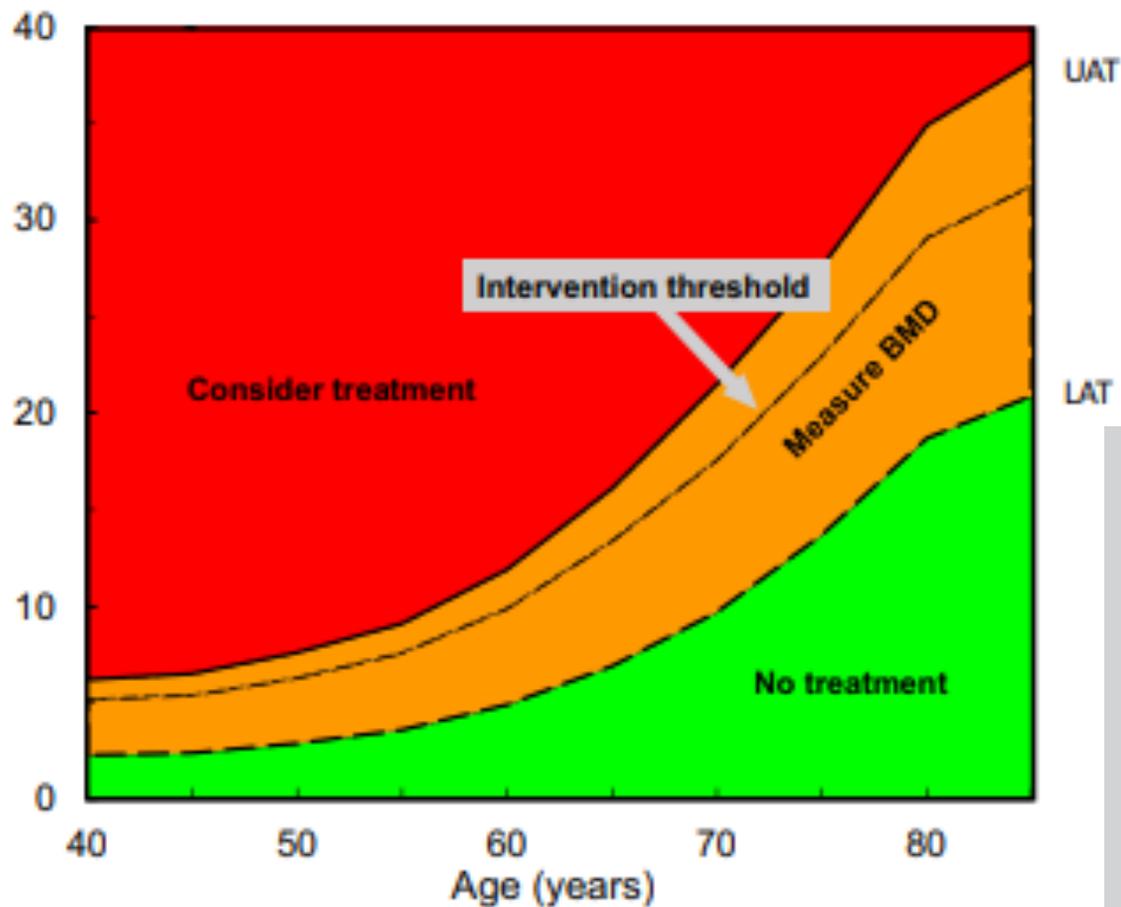
### Limitations

May occasionally generate incorrect information

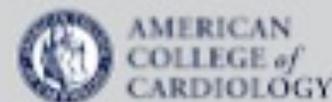
May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

Ten year probability (%)



ASCVD Risk Estimator Plus



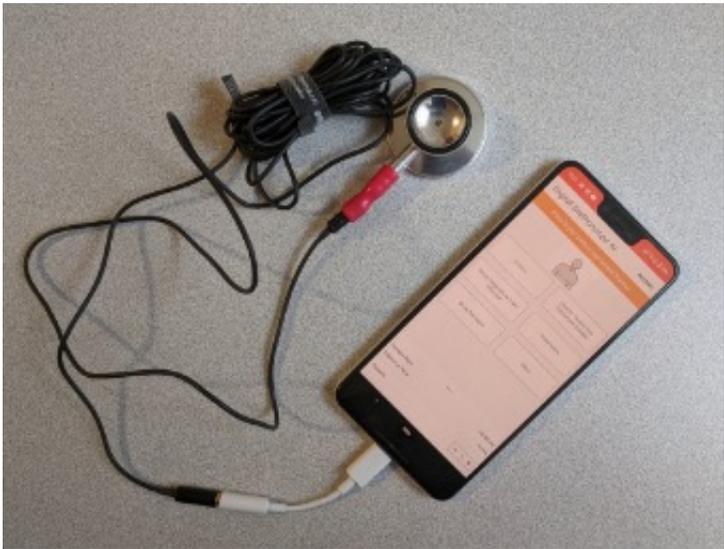
# HX TAKING



PH/E



# AI STETHOSCOPE



# AI STETHOSCOPE



# ECG-ENABLED STETHOSCOPE



# DDXS AND FINAL DIAGNOSIS



# COUGH SOUNDS

## Coronavirus diagnosis using cough sounds: Artificial intelligence approaches



Kazem Askari Nasab<sup>1</sup>



Jamal Mirzaei<sup>2,3</sup>



Alireza Zali<sup>4,5\*</sup>



Sarfenaz Gholizadeh<sup>6</sup>



Meisam Akhlaghdoust<sup>4,5</sup>

<sup>1</sup> Materials Science and Engineering Department, Sharif University of Technology, Tehran, Iran

<sup>2</sup> Infectious Disease Research Center, Department of Infectious Diseases, Aja University of Medical Sciences, Tehran, Iran

<sup>3</sup> Infectious Disease Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>4</sup> Functional Neurosurgery Research Center, Shohada Tajrish Comprehensive Neurosurgical Center of Excellence, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>5</sup> USERN Office, Functional Neurosurgery Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>6</sup> Civil Engineering Department, Tehran University of Technology, Tehran, Iran

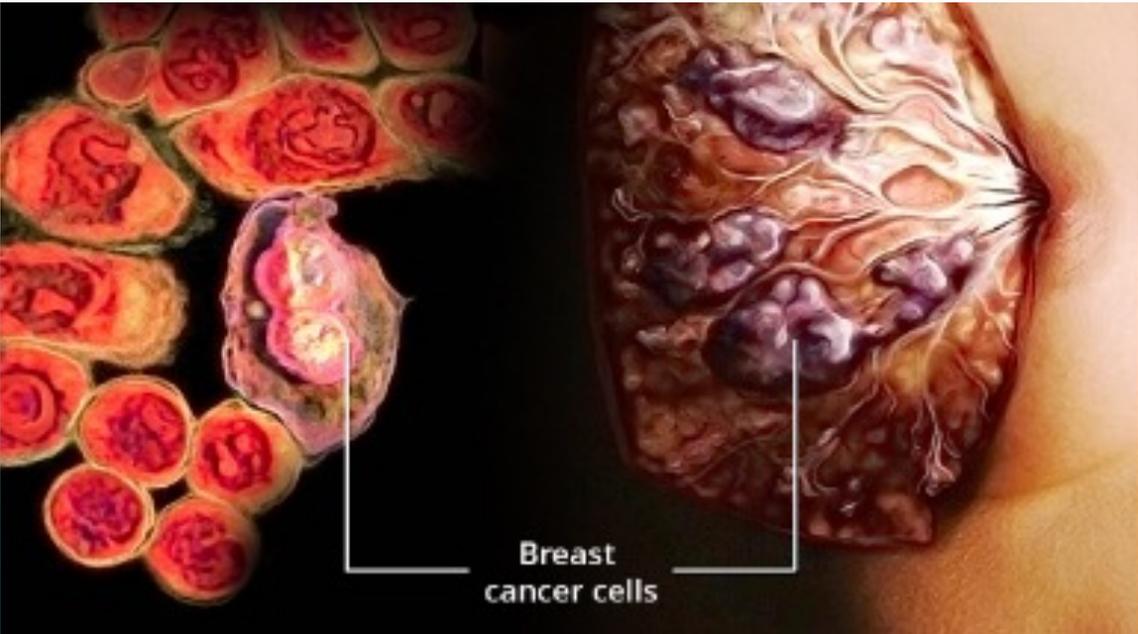
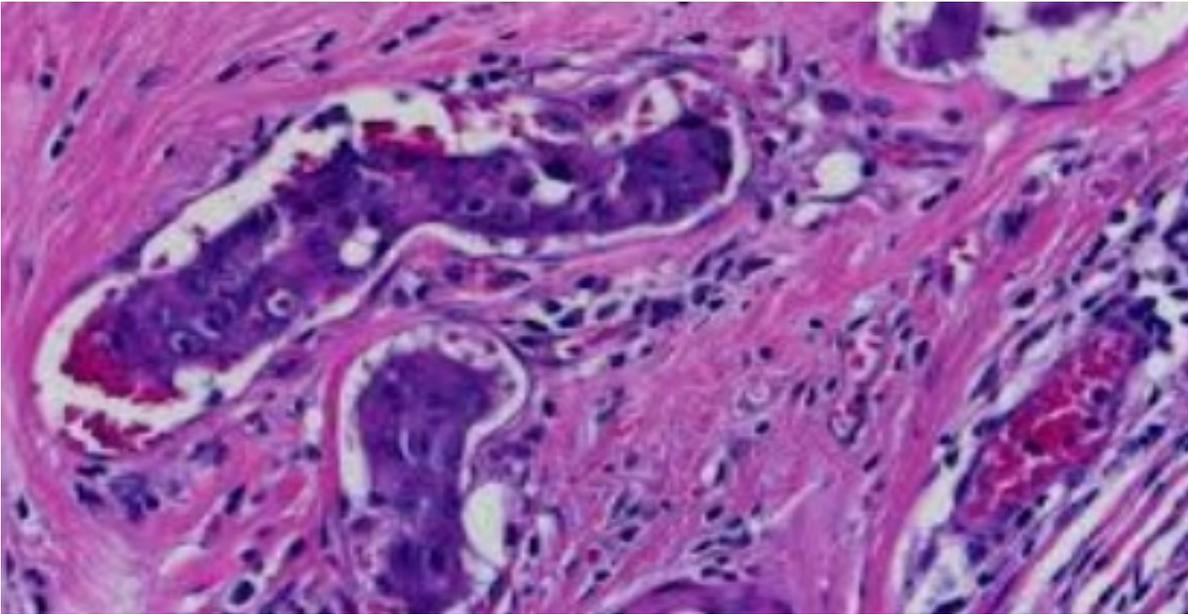
# PATHOLOGY



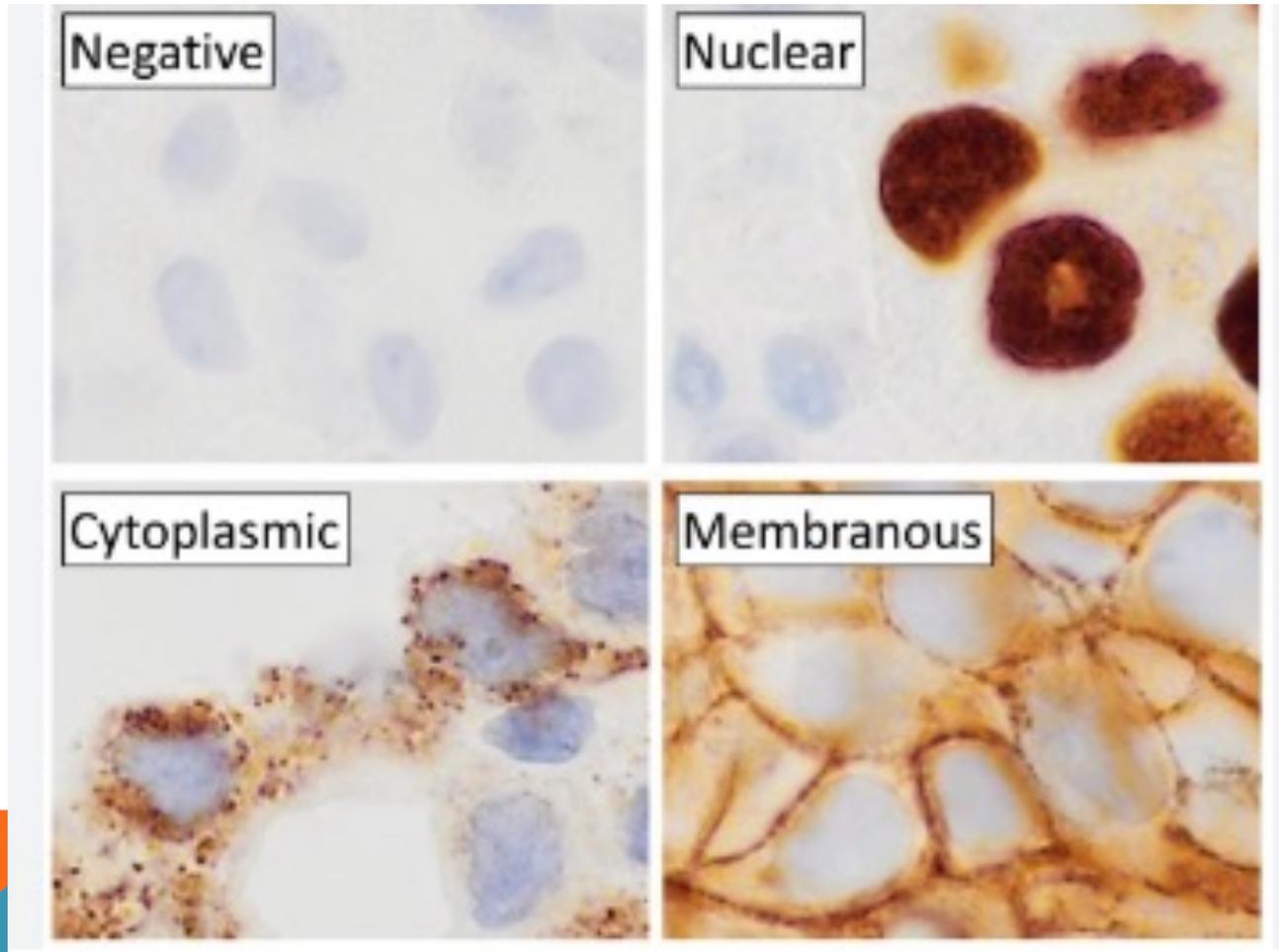
# PATHOLOGY



# PATHOLOGY



# IHC



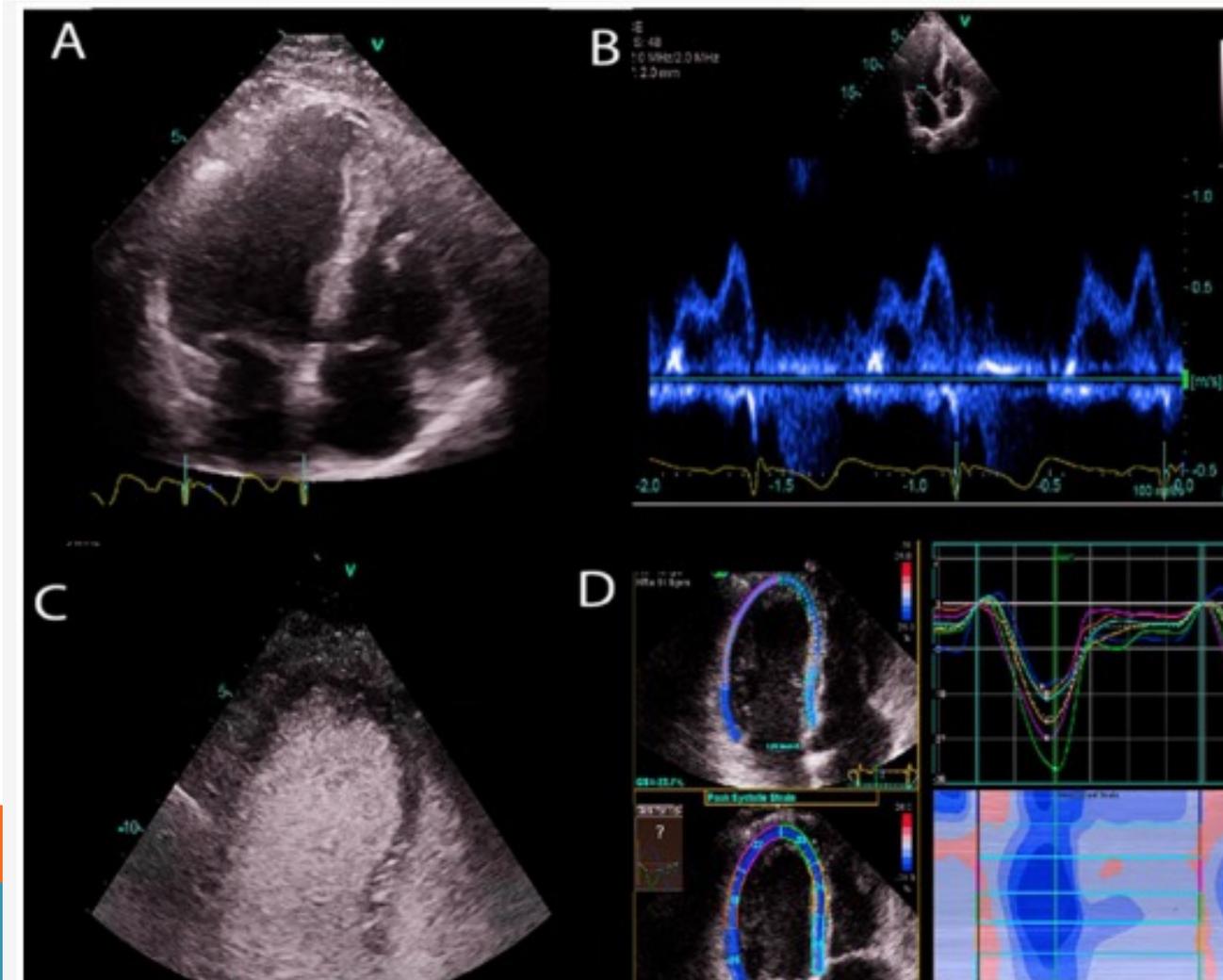
# IMAGING



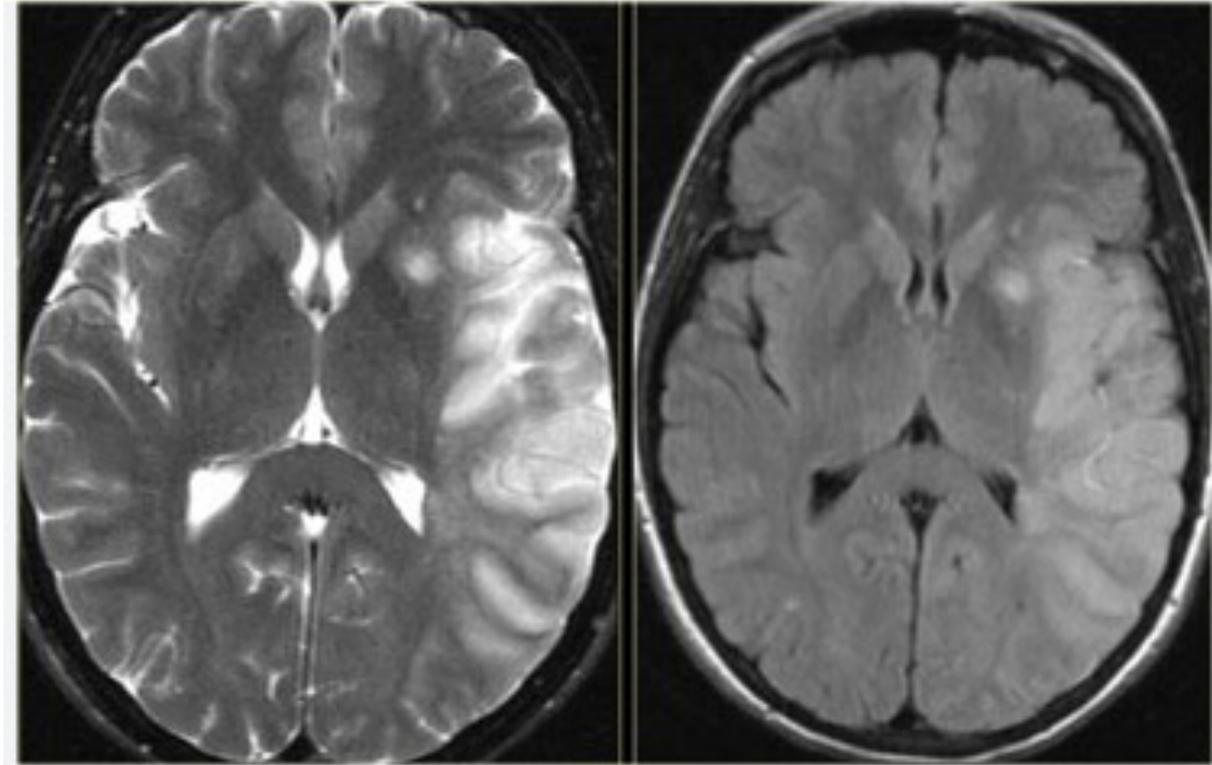
# IMAGING



# AI ECHOCARDIOGRAPHY



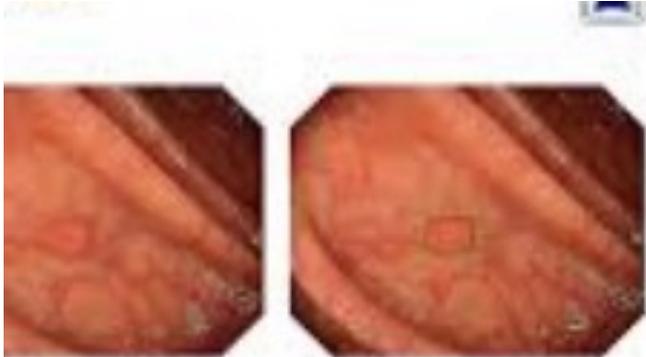
# MRI



# CONTRAST



# ENDOSCOPY

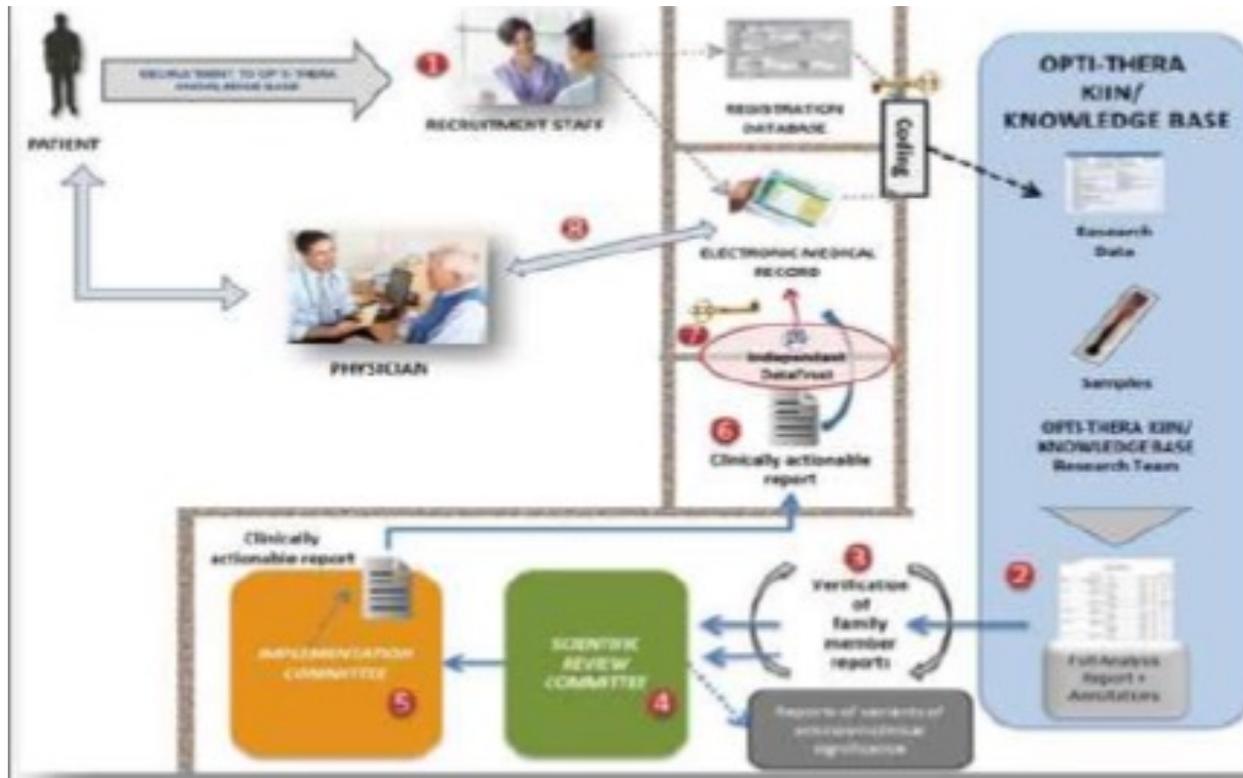


Light

ENDO-AD-CAD with marker



# TREATMENT





***Thank You for your Attention***

